

**FIRST ANNUAL MONITORING REPORT OF
TREE AND SHRUB SURVIVAL
FOR THE DAKOTA ACCESS PIPELINE**

Prepared for:
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Submitted by:
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Updated: January 31, 2019

Introduction

This document is the first of three annual monitoring reports of tree and shrub mitigation on the Dakota Access Pipeline (DAPL). Dakota Access, LLC replanted trees and shrubs removed during construction following methods outlined in the State of North Dakota Public Service Commission (NDPSC) approved Tree and Shrub Reclamation Plan submitted April 2017. The approximately 1,134 mile pipeline transports crude oil from Stanley, North Dakota, to Patoka, Illinois. The North Dakota portion of the DAPL Project is approximately 359 miles in length, and traverses seven counties: Mountrail, Williams, McKenzie, Dunn, Mercer, Morton, and Emmons. The construction right-of-way (ROW) is 75 to 100 feet wide, inclusive of 50 feet of permanent right-of-way (PROW). Where superficially disturbed, the PROW will be maintained in an herbaceous state for the lifetime of the pipeline.

Tree and Shrub Mitigation Plantings

The 2017 inventory of planted tree and shrub species was documented in a letter to the NDPSC dated September 25, 2017 titled Tree and Shrub Baseline Planting Report for Dakota Access Pipeline. In accordance to the NDPSC Tree and Shrub Mitigation Specifications, trees and shrubs removed within the ROW during construction were replaced at a 2:1 ratio, with an additional ~10% as a contingency to account for potential loss while still achieving the required successful reestablishment of trees and shrubs. In total, 88,309 trees and shrubs were planted in spring of 2017 (see Attachment 1 for photos). Two-year-old saplings were purchased from Lincoln Oaks Nursery and the Towner State Nursery in North Dakota. Replacement plantings were the same species as those removed, or in some cases substituted with a similar species as recommended by the North Dakota Forest Service (see Attachment 2 for planting locations). Some shrub species, including willow and snowberry, will naturally regenerate on the reclaimed ROW, increasing the mitigation total. DAPL worked with landowners along the pipeline ROW to determine desired locations and species for planting. Trees and shrubs were planted outside the ROW as requested by landowners; most plantings were placed within windrows and shelter belts. The goal is $\geq 75\%$ survival after three years.

In addition, the PSC identified 83 ROW sites in which a total of 437 trees and shrubs were cleared in excess of the maximum 85 feet allowed. The PSC stipulated that these trees and shrubs must be replaced at a 3:1 ratio as per the Advocacy Staff's July 21, 2017 Memorandum. These sites are noted by footnote 2 in Table 2. Some landowners of these sites declined participation in the replanting program; others declined the full 3:1 allotment of plants. In these cases, those (265) trees and shrubs were re-allotted to another ROW landowner (site 58 in Table 2) who desired more plantings. Table 2 shows the count of the 3:1 mitigation plantings that occurred on each site with a total of 1,311 plantings for the 3:1 mitigation.

2018 Supplemental Planting Program

Some tree species had a high mortality rate after the severe 2017 drought; these effects were mitigated by additional planting of 50,406 trees and shrubs in the spring of 2018 by KC Harvey. Including the 3:1 mitigation planting count of 1,311, 51,717 trees and shrubs were planted during 2018 by KC Harvey. An additional 1,091 plants were planted by the County Soil Conservation Districts. Several of the 2017 planting locations also had high mortality rates due to browsing by ground squirrels and prairie dogs. Supplemental planting was not conducted in these locations since it is anticipated that that continued high mortality rates would occur in these locations. Table 2 documents the number of supplemental plants, the planting location ID, coordinates, and date planted at each location. Locations with poor soils and high prairie dog grazing had poor survival in 2017 and were not re-planted in 2018 (footnote 1 in Table 2). DAPL laid down weed barrier fabric, sprayed deer and rodent deterrent, built fences, installed irrigation systems, and watered all mitigation plants approximately once per week to facilitate plant survival. Juneberry and Bur oak planted in 2018 had high mortality due to the nursery stock. To compensate for losses, the nursery will provide additional plants in the spring of 2019.

Tree and Shrub Mitigation Survival Monitoring

A total of 42,648 trees and shrubs were documented in the planned construction disturbance on the ROW in the Tree and Shrub Reclamation Plan. This quota did not take into account selective use of horizontal drilling techniques to bore beneath the surface, leaving some vegetative communities undisturbed. Monitoring data from September 2018 documented 8,277 originally inventoried trees and shrubs that were not removed during construction, which were included in the total previously thought to be removed and included in the mitigation plan. With this new data, an adjusted total of 34,371 trees and shrubs were actually removed during pipeline construction (Table 1). The adjusted 2:1 replacement count is 68,742. The additional 3:1 mitigation replacement count of 1,311 was added to this for a total of 70,053 plants, with a $\geq 75\%$ survival goal of 52,540 plants.

Survival of planted trees and shrubs was monitored in September of 2018 by counting the number of live stems per species at each planting location. Natural regeneration was surveyed by counting the number of live individuals per species, at 115 points on 16 parcels; this represents a 57% sample of original inventoried trees and shrubs. Table 1 summarizes the number of surviving and regenerating mitigation plants. A total of 52,137 planted trees and shrubs were alive as of September 2018. Regeneration data documented an additional 5,222 plants, for a total of 57,359 surviving mitigation plantings (Table 1). Table 3 provides the 2018 survival counts by species.

This total of 57,359 is approximately 82% of required mitigation, after adjusting for trees and shrubs not removed by selective horizontal drilling and including the additional 1,311 mitigation. This overall total of 57,359 surviving mitigation plants exceeds the 75% survival goal of 52,540 by 4,819 plants.

It is expected that regeneration will continue over the next two years, increasing the overall total. Additional surveys will be completed in 2019 and 2020 to verify natural regeneration.

Tables

Table 1. Summary of tree and shrub mitigation plantings on the Dakota Access Pipeline.

Number Inventoried ¹	Not Removed	Adjusted Number Inventoried	Adjusted Replacement Total (2:1)	3:1 Mitigation Total Planted	2017 Planted	2018 Planted	Natural Re-generation	2018 Alive Count	Total Live
42,648	8,277	34,371	68,742	1,311	88,349	52,808	5,222	52,137	57,359

¹ This is the number of trees and shrubs originally inventoried in the ROW pre-construction.

Table 2. 2018 Supplemental planting summary.

Planting ID	Latitude	Longitude	Planting Date	2:1 Mitigation	3:1 Mitigation	Planted Total
1	48.2944225	-102.6772728	5/29/2018	448		448
2 ¹	48.26318255	-103.6852232	5/30/2018	0		0
3	48.26934199	-103.6451437	5/31/2018	227		227
4	47.946493	-103.8784034	6/1/2018	84		84
5	47.93778005	-103.8659877	6/2/2018	13		13
6 ²	47.79610126	-103.0900395	6/3/2018	6	20	26
7	48.20821813	-103.777444	6/4/2018	19		19
8	47.8202104	-103.4379949	6/5/2018	71		71
9 ²	48.09789918	-103.7661086	6/6/2018	181	3	184
11	48.0611245	-103.8801631	6/7/2018	5		5
12 ²	47.59885504	-102.8873306	6/8/2018	5	432	437
14	48.23655484	-103.7741558	6/9/2018	64		64
15	47.7831623	-103.230411	6/10/2018	74		74
16	48.27003173	-102.8182327	6/11/2018	31		31
17	48.05173821	-103.9020885	6/12/2018	31		31
18	47.31540883	-102.2190145	6/13/2018	473		473
19	48.281282	-103.1752138	6/14/2018	31		31
20 ²	47.36295611	-102.3467518	6/15/2018	6	9	15
21	47.83772676	-103.5042635	6/16/2018	12		12
23	48.27699294	-102.7997969	6/17/2018	5		5
242	47.76885897	-102.8975538	6/18/2018	260	5	265
25	47.80711057	-102.4137086	6/19/2018	112		112
26 ²	47.38127912	-102.3550201	6/20/2018	9	8	17
27	47.98178136	-103.9137015	6/21/2018	2		2
28	48.05016715	-103.906393	6/22/2018	49		49
30	47.79782455	-102.9858637	6/23/2018	10		10
31	47.85753549	-103.6411977	6/24/2018	125		125
32	47.85753549	-103.6411977	6/25/2018	494		494
33	47.79416055	-103.033126	6/26/2018	263		263
34 ²	47.84919911	-103.5944819	6/27/2018	62	15	77
35 ²	48.29086825	-102.7697439	6/28/2018	200	15	215
36 ²	47.29005681	-102.1453142	6/29/2018	663	12	675

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Planting ID	Latitude	Longitude	Planting Date	2:1 Mitigation	3:1 Mitigation	Planted Total
37 ²	47.71449435	-102.8181793	6/30/2018	151	29	180
38	47.805483	-102.9507085	7/1/2018	19		19
39	47.41507067	-102.5110609	7/2/2018	2		2
40 ²	47.47107623	-102.7488777	7/3/2018	442	26	468
41	47.30948443	-102.2162496	7/4/2018	257		257
42	47.52799269	-102.8482141	7/5/2018	835		835
43	47.29535303	-102.1711187	7/6/2018	3330		3330
45	47.84583094	-103.5530773	7/7/2018	56		56
46	47.89975802	-103.7774363	7/8/2018	28		28
47 ²	47.48025326	-102.767663	7/9/2018	1021	173	1194
48 ¹	47.87948473	-103.6674264	7/10/2018	0		0
49	47.95191608	-103.9016831	7/11/2018	224		224
50 ²	47.78369477	-103.7407614	7/12/2018	1931	20	1951
51	47.78391509	-103.1940674	7/13/2018	10		10
52 ¹	48.068269	-103.864297	7/14/2018	0		0
53	48.2528498	-103.7155914	7/15/2018	77		77
54	48.05517608	-103.8798562	7/16/2018	13		13
57 ²	47.74713883	-102.9191297	7/17/2018	23	11	34
58 ³	47.86657741	-103.2935447	7/18/2018	11,879	265	12144
59	48.276298	-103.0427308	7/19/2018	25		25
60 ¹	46.43134631	-100.6179408	7/20/2018	0		0
61 ¹	46.43127856	-100.6197885	7/21/2018	0		0
62	46.43807581	-100.6063375	7/22/2018	268		268
64 ¹	46.43482693	-100.6008226	7/23/2018	0		0
65 ²	47.45681296	-102.7238184	7/24/2018	1320	21	1341
66	47.42139336	-102.6473879	7/25/2018	542		542
67 ^{1,2}	47.68071916	-102.8390711	7/26/2018	0		0
68 ²	47.67386653	-102.8303944	7/27/2018	1257	15	1272
70 ²	47.6523626	-102.835559	7/28/2018	890	15	905
71 ²	47.65075826	-102.8475529	7/29/2018	448	15	463
72 ²	47.64651515	-102.8542116	7/30/2018	1496	15	1511
73 ²	47.64401956	-102.8579891	7/31/2018	626	15	641
74 ²	47.64561382	-102.8615288	8/1/2018	0	8	8
80	48.25989892	-103.6563062	8/2/2018	331		331
81	48.27352719	-103.6429695	8/3/2018	159		159
82 ¹	46.43391765	-100.5986978	8/4/2018	0		0
83	46.43380509	-100.597731	8/5/2018	1879		1879
85	47.49070535	-102.8283484	8/6/2018	74		74
86 ¹	46.43285562	-100.597493	8/7/2018	0		0
90	48.26539116	-103.649313	8/8/2018	225		225
100 ²	48.08760002	-103.799191	8/9/2018	4039	3	4042

Table 3. Tree and shrub species present on the Dakota Access Pipeline.

Species	Number Inventoried	Not Removed	2:1 Replacement Requirement	2:1 Mitigation Planted	3:1 Mitigation Planted	Total Planted	Natural Re-Generation	2018 Alive Count
American Bittersweet	8	0	16	0	0	0	0	0
American Elm	304	3	602	0	0	0	1	0
American Hazelnut	1268	0	2536	2952	27	2979	41	428
American Plum	72	0	144	12809	253	13062	19	11273
Amur honeysuckle	200	146	108	0	0	0	0	0
Amur maple	8	0	16	477	0	477	0	417
Arnold hawthorn	0	0	0	101	0	101	0	0
Bay willow	1	0	2	0	0	0	0	0
Beaked hazel	118	108	20	0	0	0	0	0
Black currant	1033	1023	20	64	0	64	0	64
Black Hills spruce	19	0	38	2589	31	2620	0	974
Boxelder	114	14	200	3268	0	3268	0	34
Bur oak	619	0	1238	2811	23	2834	106	433
Canadian gooseberry	1785	146	3278	0	0	0	20	0
Caragana	0	0	0	460	0	460	0	393
Clove currant	793	0	1586	0	0	0	0	0
Colorado blue spruce	1	0	2	2156	31	2187	0	549
Common buckthorn	1188	0	2376	0	0	0	0	0
Common chokecherry	602	40	1124	20770	245	21015	468	3791
Common juniper	67	2	130	0	0	0	0	0
Common lilac ¹	18	0	36	3640	99	3739	0	4002
Downy hawthorn	0	0	0	2167	12	2179	0	306
Eastern cottonwood	231	69	324	0	0	0	0	0
Eastern red cedar	15	0	30	461	2	463	0	113
Fourwing saltbush	84	0	168	0	0	0	8	0
Fragrant sumac	99	5	188	153	0	153	14	60
Golden currant	912	149	1526	32367	0	32367	15	5045
Greasewood	226	0	452	0	0	0	2	0
Green ash	3618	156	6924	12826	127	12953	160	7211
Hackberry	0	0	0	125	0	125	0	24
Hawthorn	2154	3	4302	0	0	0	0	0
Horizontal juniper	126	3	246	0	0	0	1	0
Indigo bush	16	16	0	0	0	0	0	0
Japanese elm	1	0	2	0	0	0	0	0
Juneberry	0	0	0	1462	2	1464	34	350
Leadplant	22	0	44	0	0	0	0	0
Long-leaved sage	49	0	98	0	0	0	0	0
Meyer spruce	0	0	0	187	13	200	0	200
Missouri River willow	198	0	396	0	0	0	0	0

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Species	Number Inventoried	Not Removed	2:1 Replacement Requirement	2:1 Mitigation Planted	3:1 Mitigation Planted	Total Planted	Natural Re-Generation	2018 Alive Count
Multiflora rose	7	3	8	0	0	0	0	0
Nannyberry viburnum	980	0	1960	2189	6	2195	0	291
Native cottonwood	0	0	0	1231	5	1236	88	245
Paper birch	17	0	34	150	0	150	0	0
Peachleaf willow	30	27	6	175	0	175	33	0
Pekin lilac ¹	0	0	0	2565	54	2619	0	497
Pin cherry	625	0	1250	0	0	0	0	0
Poison ivy	3	0	6	0	0	0	0	0
Ponderosa pine	59	10	98	4207	32	4239	0	1396
Prairie rose	212	11	402	0	0	0	199	0
Quaking aspen	312	31	562	1258	0	1258	60	0
Rabbitbrush	552	0	1104	0	0	0	678	0
Red raspberry	788	0	1576	0	0	0	66	0
Redosier dogwood	1935	1085	1700	4179	0	4179	8	130
Rocky Mountain juniper	238	1	474	4226	11	4237	0	3735
Russian olive	254	68	372	0	0	0	1	0
Sand cherry	314	0	628	1990	37	2027	0	914
Sand sagebrush	21	0	42	0	0	0	0	0
Sandbar willow	5532	4851	1362	1036	0	1036	912	316
Scotch pine	0	0	0	3026	0	3026	0	2515
Serviceberry	106	8	196	0	0	0	0	0
Sharpleaf willow	0	0	0	150	0	150	0	0
Siberian elm	1604	150	2908	198	0	198	0	198
Silver buffaloberry	1187	75	2224	3986	63	4049	52	641
Skunkbush sumac	28	0	56	4893	233	5126	11	3694
Woods rose	125	19	212	46	0	46	114	31
Shrubby cinquefoil	1633	0	3266	0	0	0	0	0
Siberian peashrub	193	20	346	0	0	0	0	0
Silver sage	7664	9	15310	0	0	0	1148	0
Silverberry	573	1	1144	0	0	0	647	0
Snowberry	728	21	1414	0	0	0	258	0
Tatarian honeysuckle	856	0	1712	2496	5	2501	35	1867
Water birch	6	0	12	0	0	0	0	0
White willow	3	0	6	0	0	0	0	0
Winterfat	94	4	180	0	0	0	23	0
TOTAL	42,648	8,277	68,742	139,846	1,311	141,157²	5,222	52,137

1 The monitored total included both lilac species (Common and Pekin) in some locations; therefore the total monitored count exceeds the as-planted count for Common lilacs. Lilac counts are a combined total of Common lilac and Pekin lilac counts for both the as-planted and the monitored counts.

2 This total planted number also includes the 1,091 plants planted in 2018 by the Soil Conservation Districts.

Attachments

1. Tree and Shrub Mitigation on the DAPL: Photos
2. 2017 and 2018 Planting Locations Map

References

1. Dakota Access, LLC. 2017. Tree and Shrub Reclamation Plan for the Dakota Access Pipeline. Bozeman, MT. Prepared by KC Harvey Environmental, LLC, Bozeman, MT.

Attachment 1

Tree and Shrub Mitigation on the DAPL: Photos.



Figure 1. Planted shelter belts.



Figure 2. Green ash sapling.

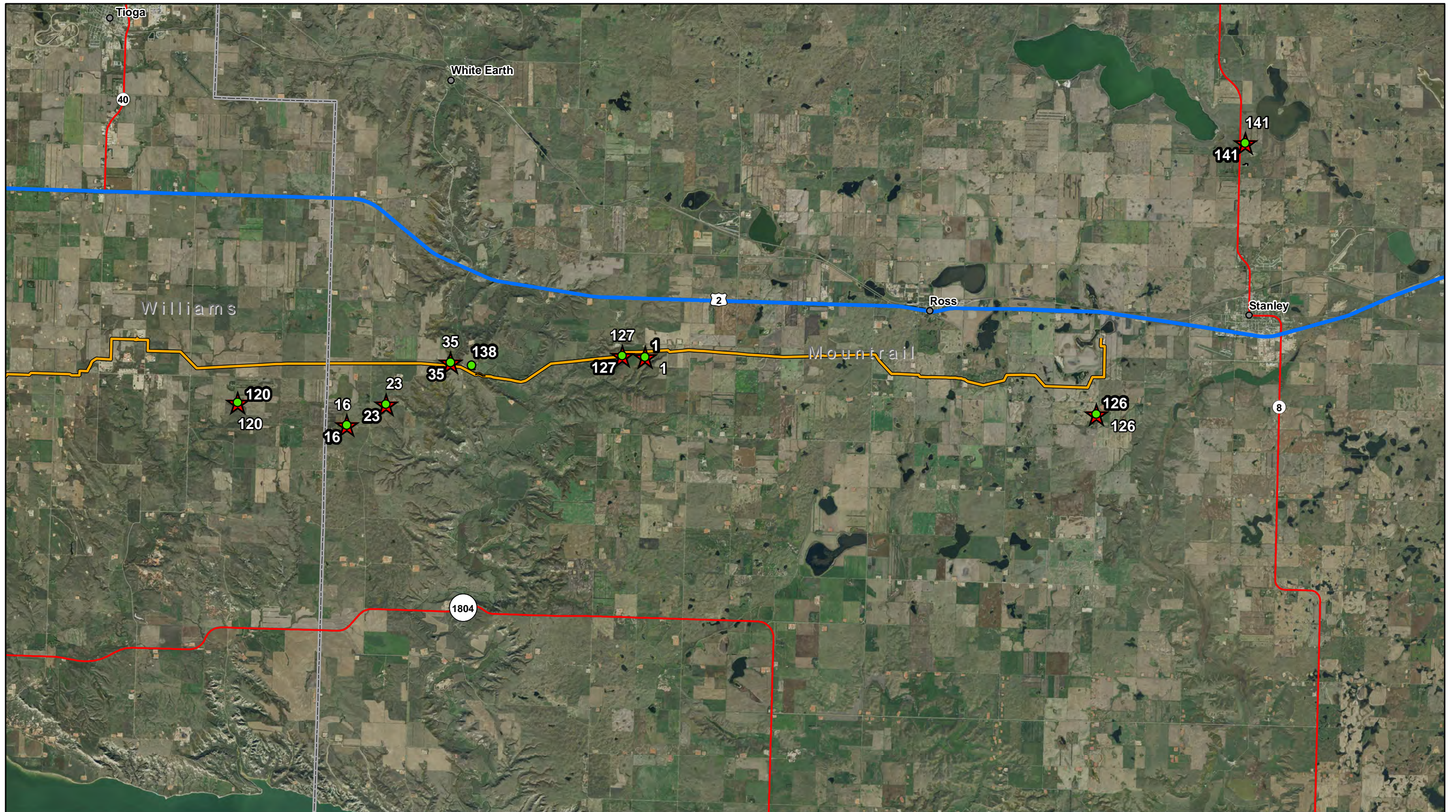


Figure 3. Coniferous wind row.



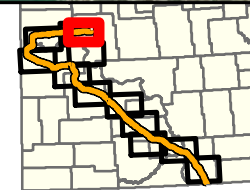
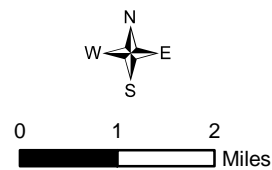
Figure 4. Planted shelter belts.

Attachment 2
2017 and 2018 Planting Locations Map



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Aerial Imagery: NAIP 2017

- 2018 Planting Locations
- ★ 2017 Planting Locations
- Pipeline
- US Highway
- State Highway

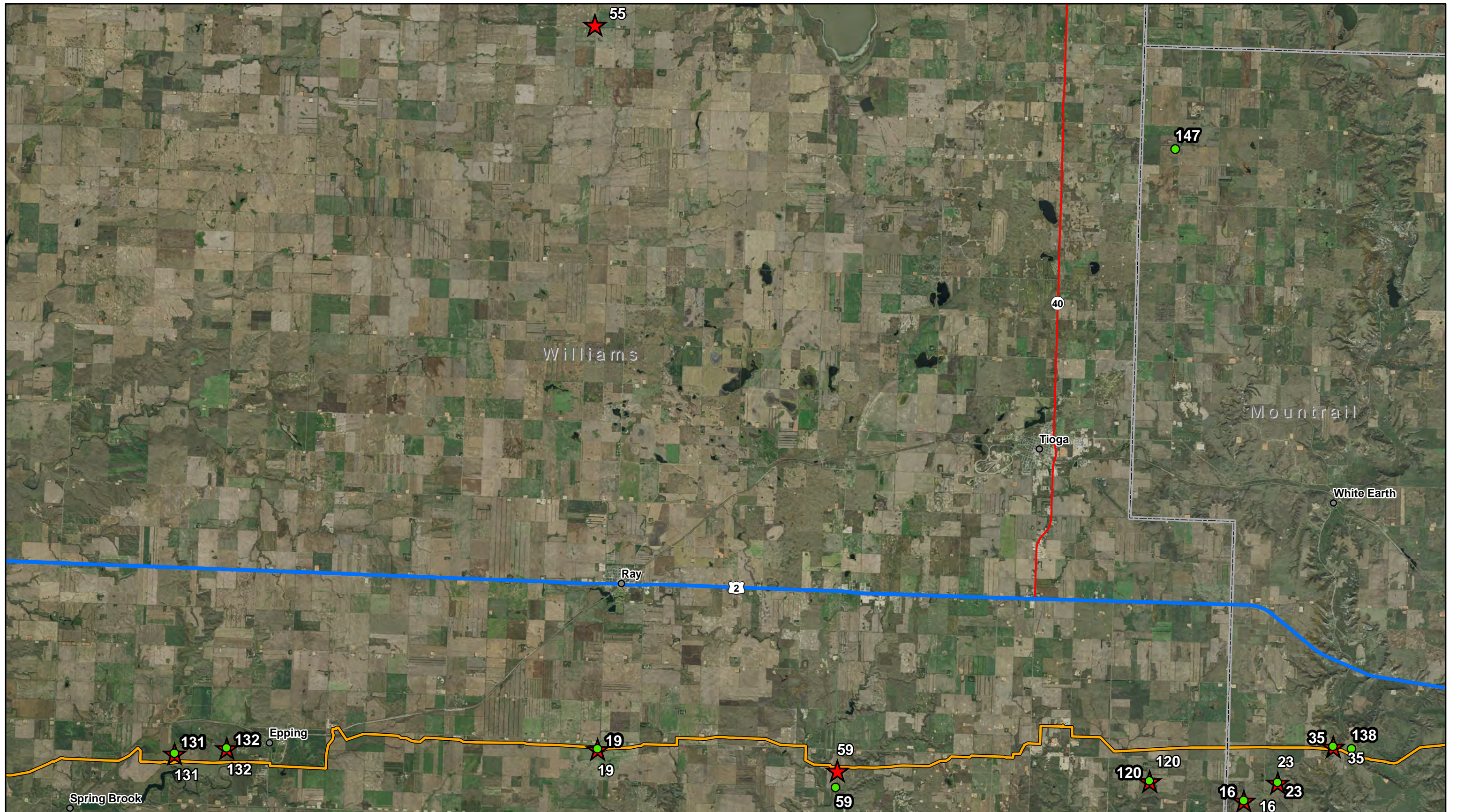
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Tree and Shrub Planting Locations

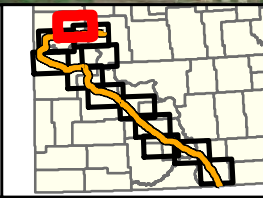
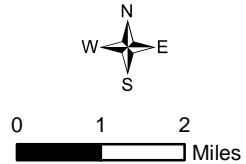
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Date: 9/24/2018



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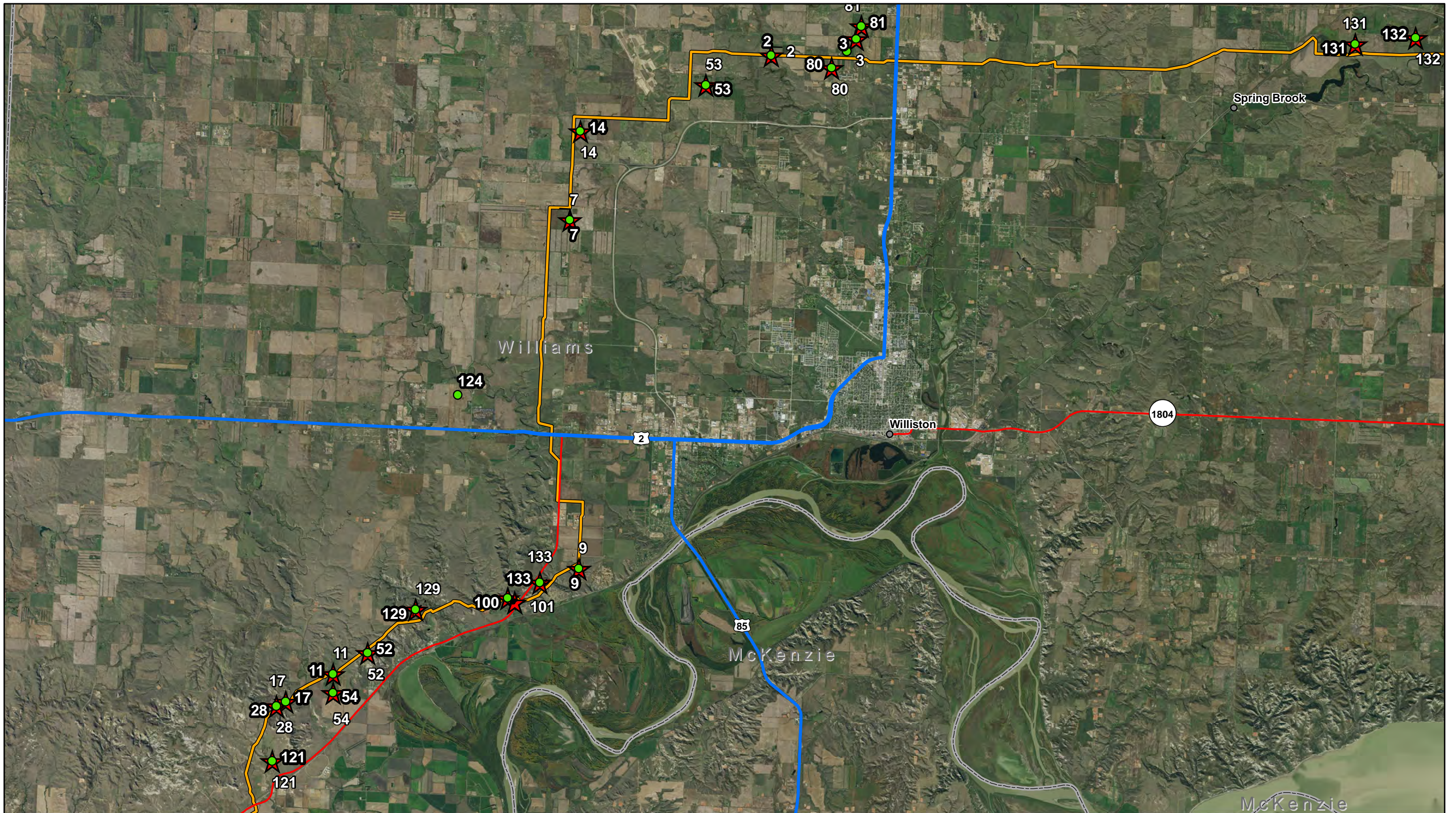


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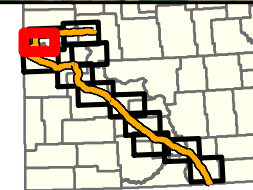
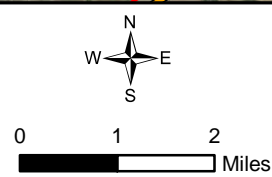
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Map: 2



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Aerial Imagery: NAIP 2017

- 2018 Planting Locations
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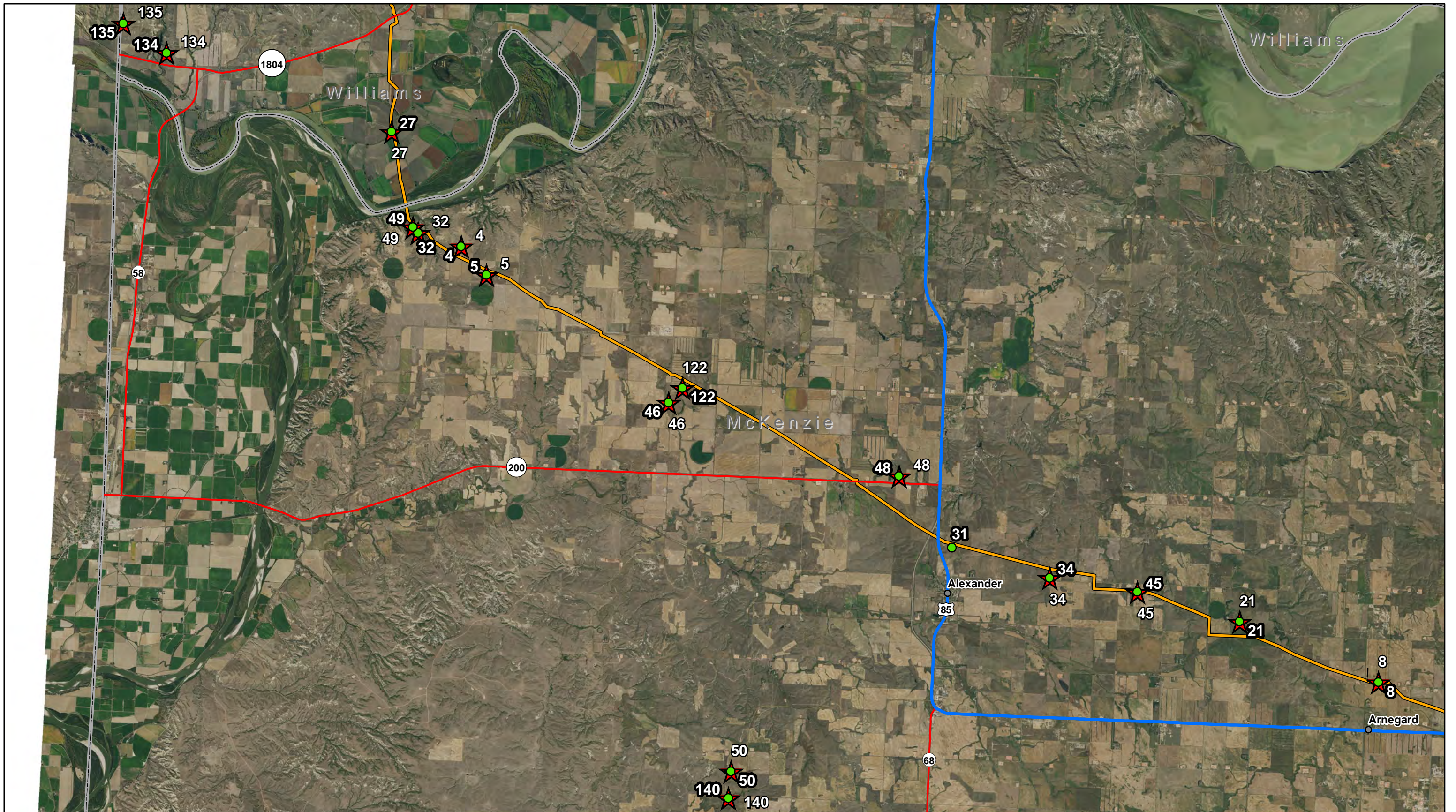
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Dakota Access Pipeline
Tree and Shrub Planting Locations

Map: 3

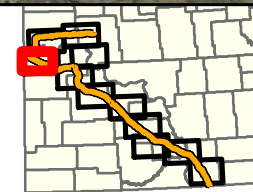
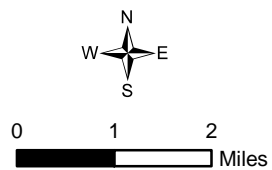
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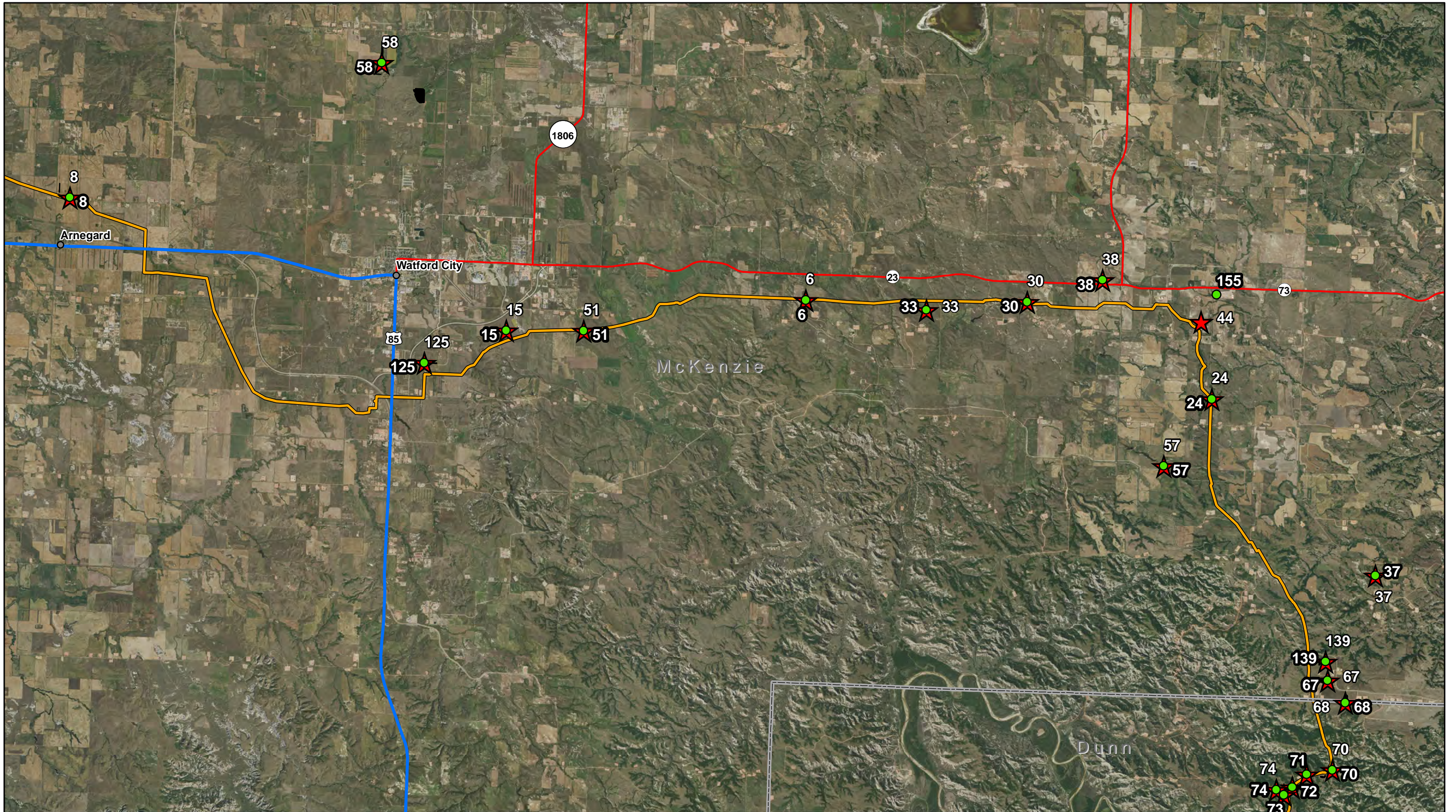
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Dakota Access Pipeline
Tree and Shrub Planting Locations

Map: 4

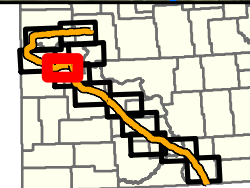
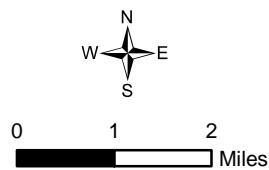
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Tree and Shrub Planting Locations

Map: 5

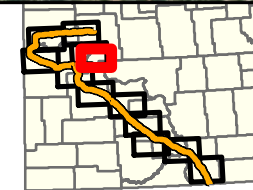
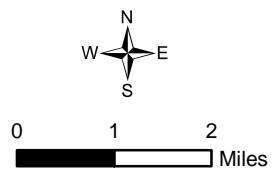
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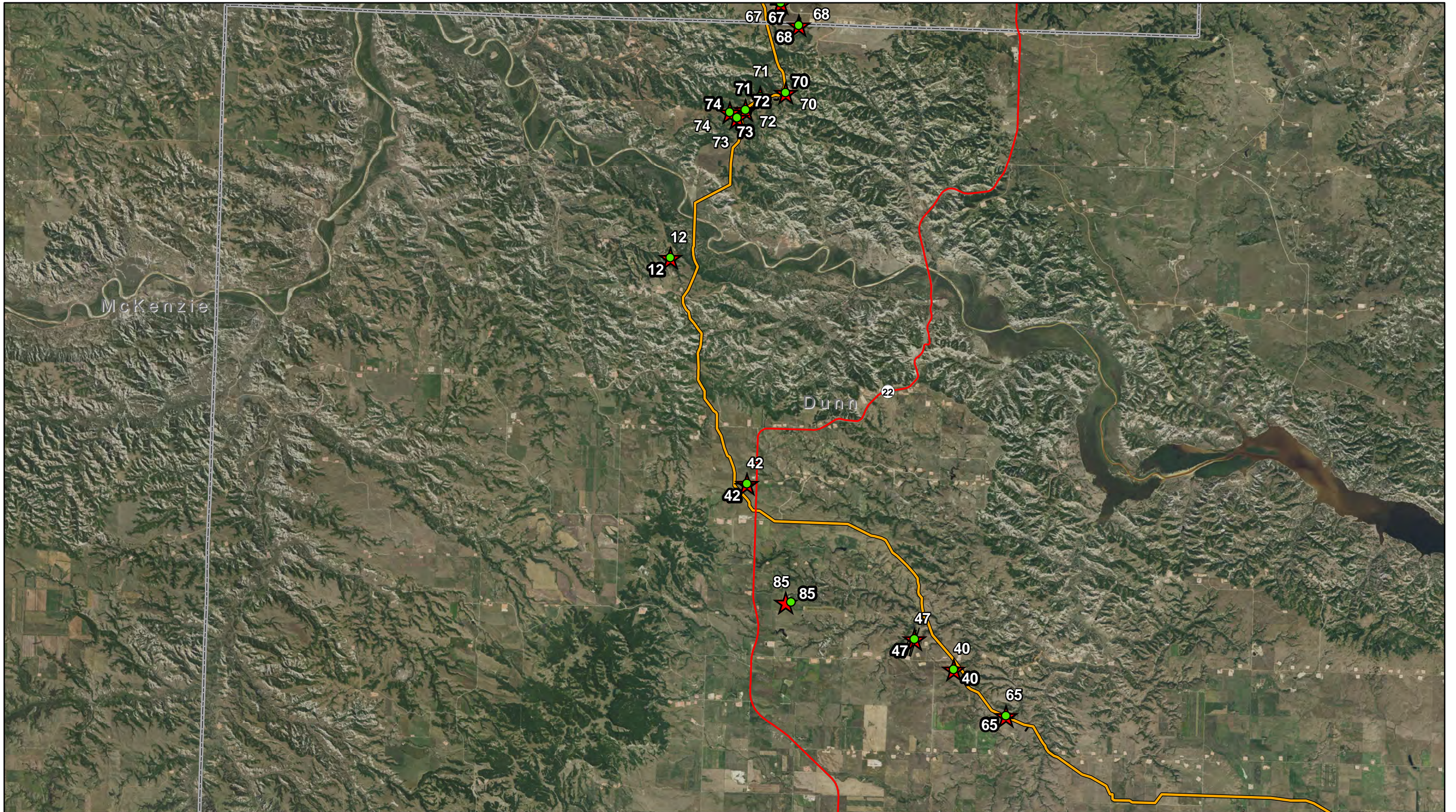
Energy Transfer Partners, L.P.

Dakota Access Pipeline
Tree and Shrub Planting Locations

Map: 6

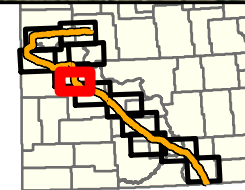
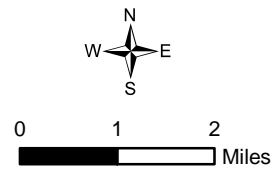
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Date: 9/24/2018



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Aerial Imagery: NAIP 2017

- 2018 Planting Locations
- ★ 2017 Planting Locations
- Pipeline
- State Highway

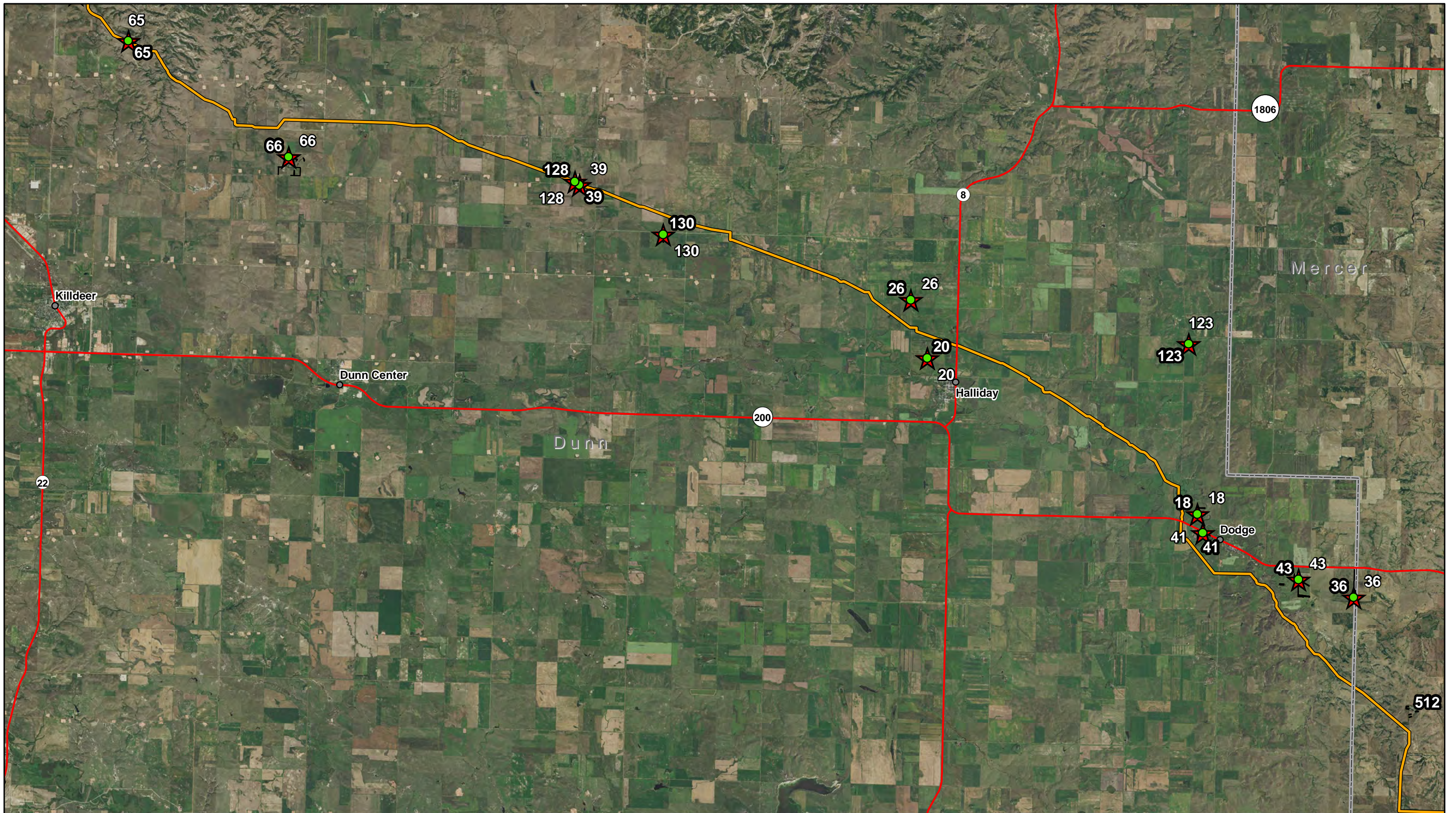
Energy Transfer Partners, L.P.

Dakota Access Pipeline
Tree and Shrub Planting Locations

Map: 7

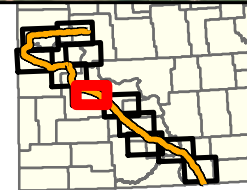
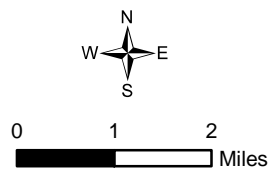
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Aerial Imagery: NAIP 2017

- 2018 Planting Locations
- ★ 2017 Planting Locations
- Pipeline
- State Highway

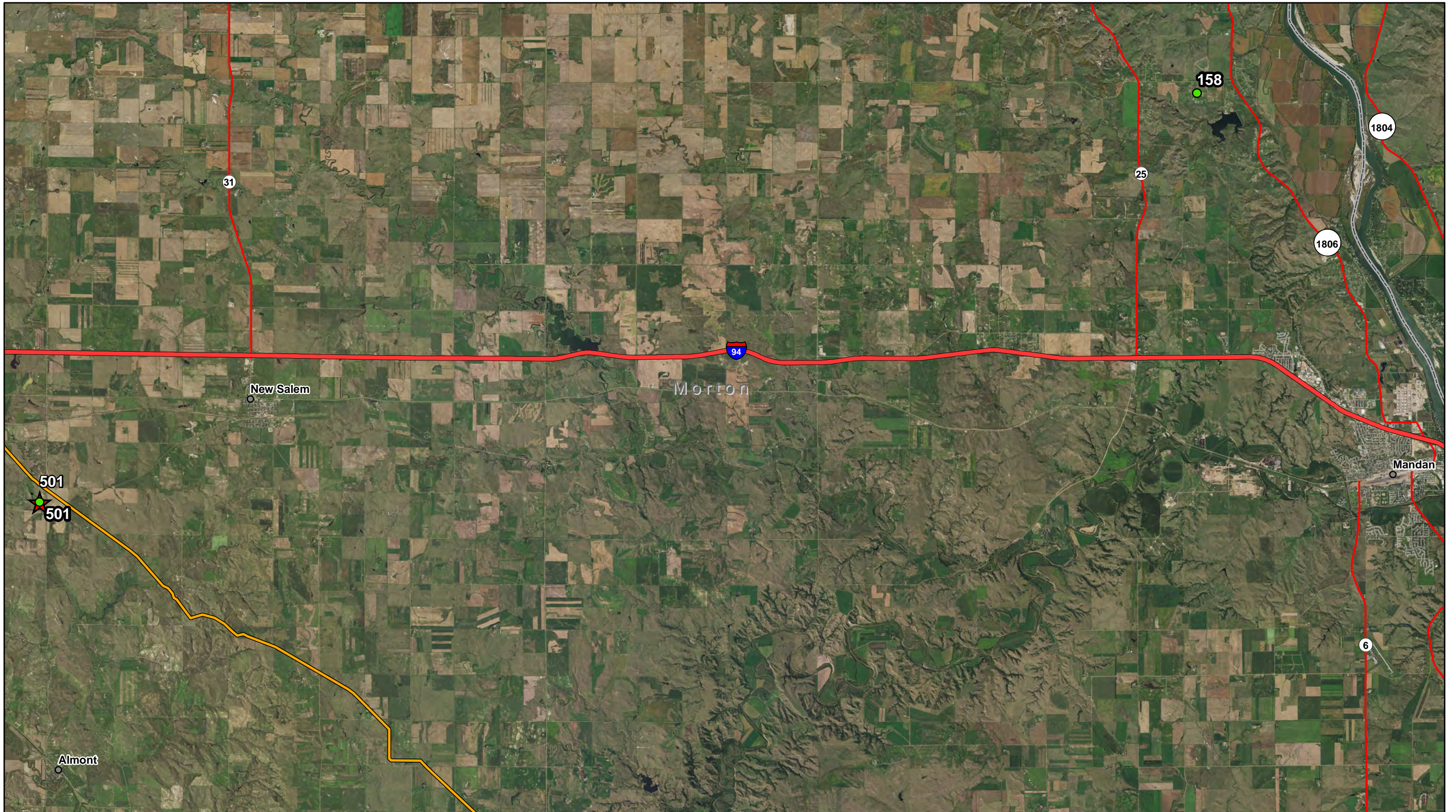
Energy Transfer Partners, L.P.

Dakota Access Pipeline
Tree and Shrub Planting Locations

Map: 8

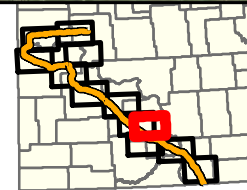
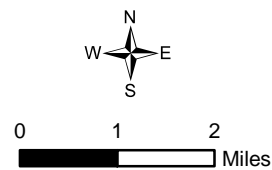
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Aerial Imagery: NAIP 2017

- 2018 Planting Locations
- ★ 2017 Planting Locations
- Pipeline
- Interstate
- State Highway

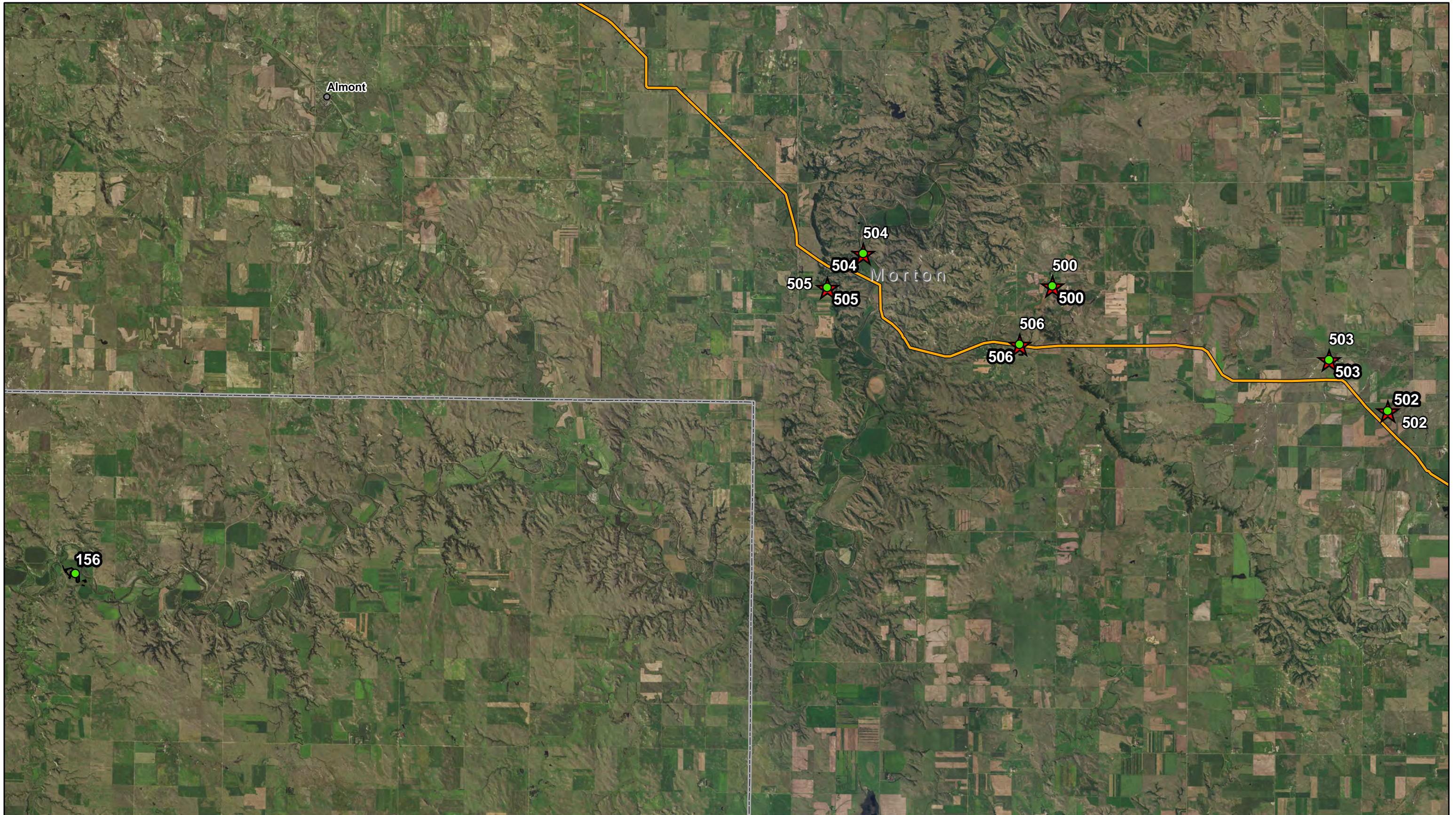
Energy Transfer Partners, L.P.

Dakota Access Pipeline
Tree and Shrub Planting Locations

Map: 9

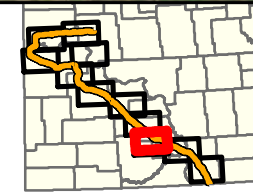
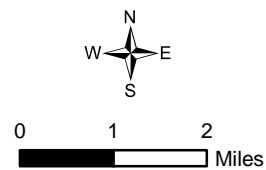
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Aerial Imagery: NAIP 2017

- 2018 Planting Locations — Pipeline
- ★ 2017 Planting Locations

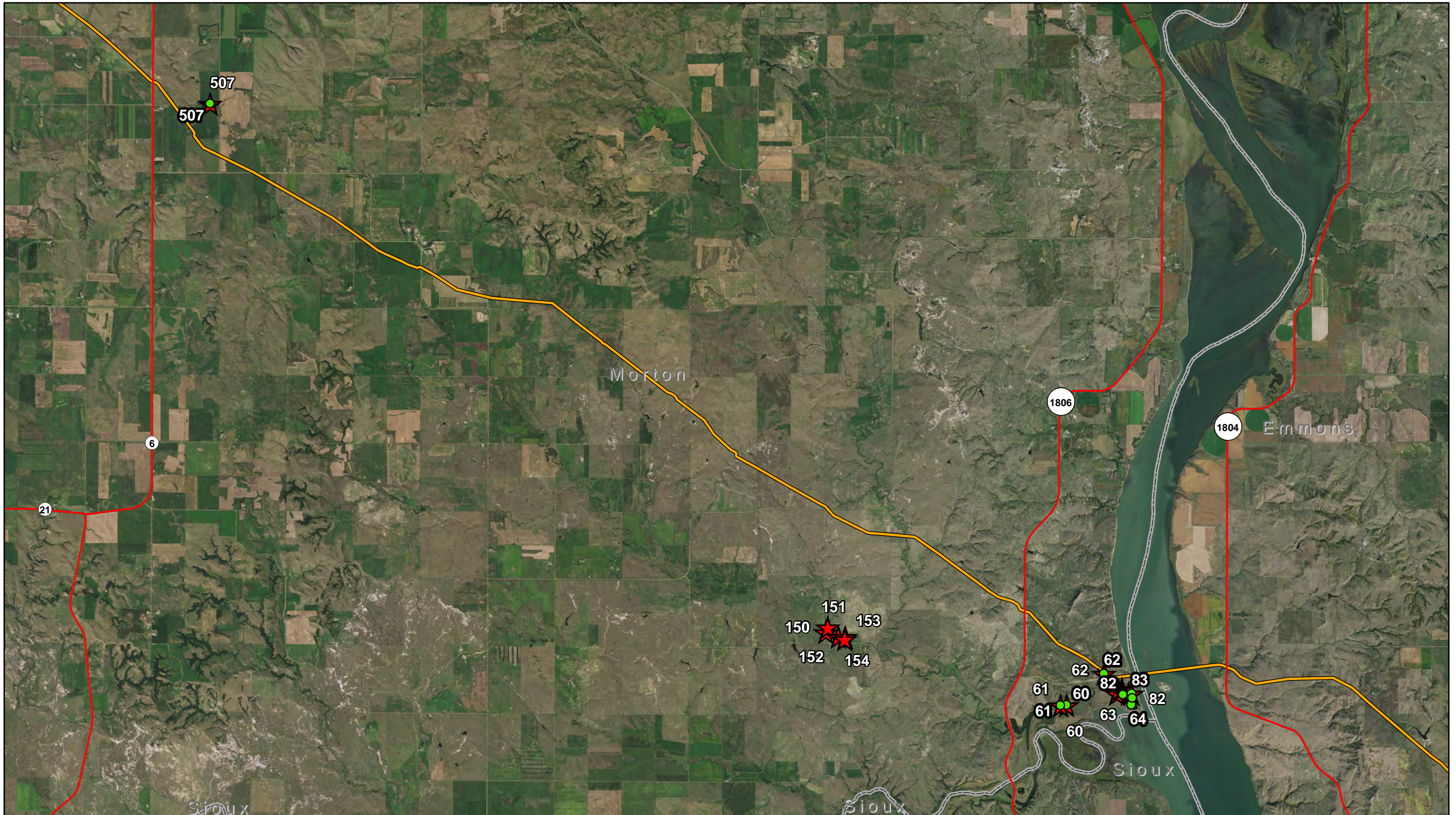
Energy Transfer Partners, L.P.

Dakota Access Pipeline
Tree and Shrub Planting Locations

Map: 10

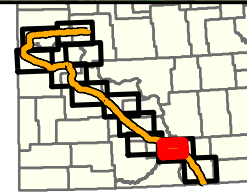
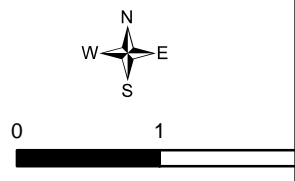
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Aerial Imagery: NAIP 2017

- 2018 Planting Locations
- ★ 2017 Planting Locations
- Pipeline
- State Highway

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Dakota Access Pipeline
Tree and Shrub Planting Locations

Map: 11

1:85,000

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