

Memorandum

To	Burke Wind, LLC	Pages	3
Subject	Burke County Wind Energy Center Addendum to the Amended Application to the North Dakota Public Service Commission for a Certificate of Site Compatibility Case #: PU-18-344 Grassland Analysis Burke County, North Dakota		
From	AECOM		
Date	January 31, 2019		

Introduction

Burke Wind, LLC (Burke Wind), a wholly owned, indirect subsidiary of NextEra Energy Resources, LLC (NEER), submitted an amended application for a Certificate of Site Compatibility to construct the Burke County Wind Energy Center (Project) in November 2018. The North Dakota Public Service Commission deemed the amended application complete and scheduled a public hearing for March 8, 2019. Since submittal of the amended application, Burke Wind has revised the grassland analysis for the Project. This memorandum will serve as an update to the amended application, specifically portions of Sections 7.14 and 7.16 and Figure 15.

The initial grassland analysis, completed as part of the amended application was completed by Atwell, LLC (Atwell). The grassland analysis identified and documented native prairie and potential Dakota skipper (*Hesperia dacotae*) habitat within the Project Area. The Atwell analysis did not define areas currently and historically used as cropland and hayland as native prairie.

After submission of the amended application in November 2018, the U.S. Fish and Wildlife Service (USFWS) submitted comments on the Project and recommended turbines be sited in existing cropland wherever possible. Although there are no federal or state regulations explicitly protecting grassland, the USFWS and North Dakota Game and Fish Department (NDGFD) have highlighted the significance of grassland with respect to development in this region, with specific emphasis on unbroken grasslands, which contain intact soils. In response, Burke Wind has revised the native prairie analysis to determine how many turbines are located in cropland, grassland that was previously cropland (broken grassland), and grassland that has never been planted or cultivated (unbroken grassland). Hayland was considered unbroken grassland unless there was also evidence of soil cultivation.

AECOM was tasked to reassess land use within the Project Area based on the grassland types described by the USFWS and NDGFD. A comprehensive analysis of GIS data and aerial imagery was conducted to determine land use and the extent of unbroken grassland within the Project Area.

Methods

The desktop land use classification assessment was completed using current and historical Google Earth aerial imagery (Google Earth 2018) and North Dakota statewide historical imagery from 1957-1962, 1995-1998, 2003-2006, 2009, 2010, 2012, and 2014-2017 (ND GIS Hub 2017). Parcels of land were classified based on features such as rock piles indicating extensive mechanized rock clearing; presence and amount of trees and shrubs; field edge changes; absence of scattered rocks; straight

line features indicating plowing, disking, harvesting, or planting; or any other features indicating human disturbance. Land use was grouped into seven different categories and each category was defined as follows:

1. Unbroken Grassland: grassland where the soil has not been disturbed by tilling, construction, or other mechanical methods. Native prairie is considered unbroken grassland as well as areas used as pasture and hayland that haven't been cultivated.
2. Broken Grassland: grassland where the soil has been historically disturbed by tilling, construction, or other mechanical methods.
3. Cropland: parcels of land that are currently being used for agricultural crop production.
4. Tree Rows: deliberately planted tree rows.
5. Forest: native forested areas that were not deliberately planted.
6. Existing infrastructure: residences, farmsteads, oil well pads.

Once land cover features were evaluated, Google Earth and GIS mapping software were used to produce a digital data layer of polygons delineating the land use. The acreages of each respective land use category were calculated, and the Project impact assumptions presented in Table 1-3 of the amended application were used to estimate impacts.

Results

Of the planned 76 turbines and five alternative turbine locations, 69 planned turbines, as well as all five alternative turbines are located in areas classified as either cropland or broken grassland. Seven planned turbines are located within areas classified as unbroken grassland. See **Table 1** below for the land use of each turbine. Overall, 90% of the planned turbines are located within areas classified as either cropland or broken grassland.

The grassland analysis in the amended application determined there were a total of five turbines (turbines 54, 55, 56, 57, and 71) located on native prairie (see Figure 15 of the amended application) and in unbroken grassland (**Figures 1 and 2**). Two additional turbines (turbines 52 and 65) are located on hayland which is also defined as unbroken grassland.

Table 1. Land Use Classification Per Turbine

Turbine Type	Land Use		
	Cropland (Turbine ID)	Broken Grassland (Turbine ID)	Unbroken Grassland (Turbine ID)
Planned Turbine	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 53, 58, 59, 60, 61, 75, 76	41, 62, 63, 64, 66, 67, 68, 69, 70, 72, 73, 74	52, 54, 55, 56, 57, 65, 71
Alternative Turbine	Alt 1, Alt 2, Alt 3, Alt 4, Alt 5	None	None

The desktop analysis concluded that 4,785 acres (21 percent) of the Project Area is classified as unbroken grassland. Based on the current design, the Project will permanently impact approximately 5.8 acres (less than 1 percent of the Project Area) of unbroken grassland. Cropland had the greatest land cover acreage within the Project Area at 31%; similarly, permanent Project impacts are expected to be the greatest to cropland at 35 acres (less than 1 percent of the Project Area).

Unbroken and broken grasslands, as well as turbines, access roads, collection lines, and meteorological tower locations, are presented in **Figures 1** and **2**. **Table 2** summarizes the results of the acreage calculations and impacts assessment for all land cover types.

Table 2. Land Use Classification Desktop Assessment Results

Land Use	Acreage within the Project Area	Percentage of Project Area	Acres Permanently Impacted by Project Infrastructure
Unbroken Grassland	4,785	21%	5.8
Broken Grassland	4,102	18%	17.2
Cropland	7,168	31%	35.0
Tree Rows	137	1%	0.1
Forest	562	2%	0.1
Existing Infrastructure	147	1%	0.0

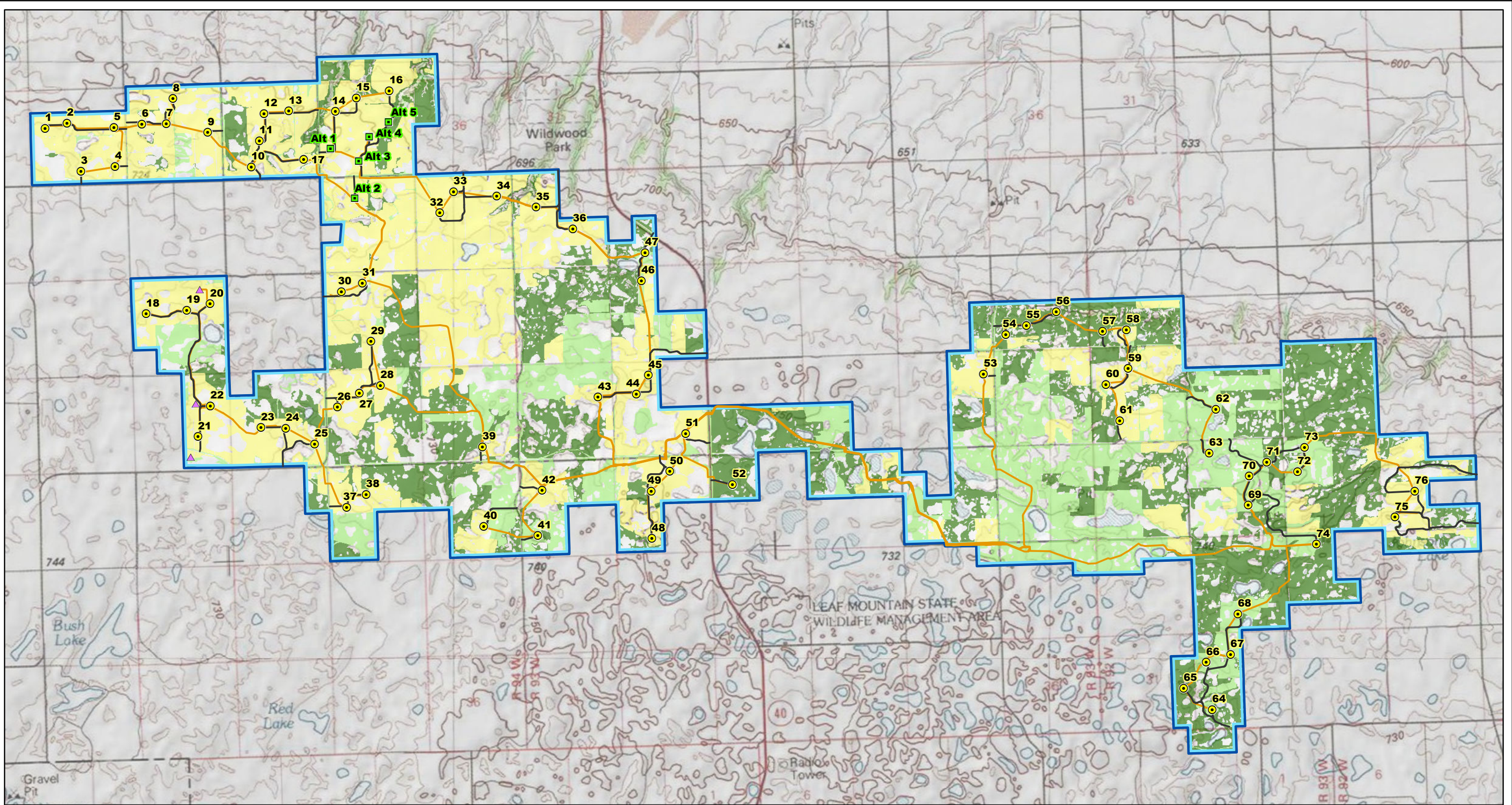
Attachments

- Figure 1. Project Area
- Figure 2. Project Infrastructure

References

Google Earth. 2018. Burke County, North Dakota. Burke County Wind Energy Center Project Area. Accessed December 2018. Available online at: <https://www.google.com/earth/>

ND GIS Hub (North Dakota GIS Hub Data Portal). 2017. Electronic Document. Accessed December 2018. Available online at: <https://gishubdata.nd.gov/>









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
BURKE COUNTY, NORTH DAKOTA

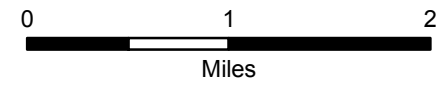
**FIGURE 1
PROJECT AREA**

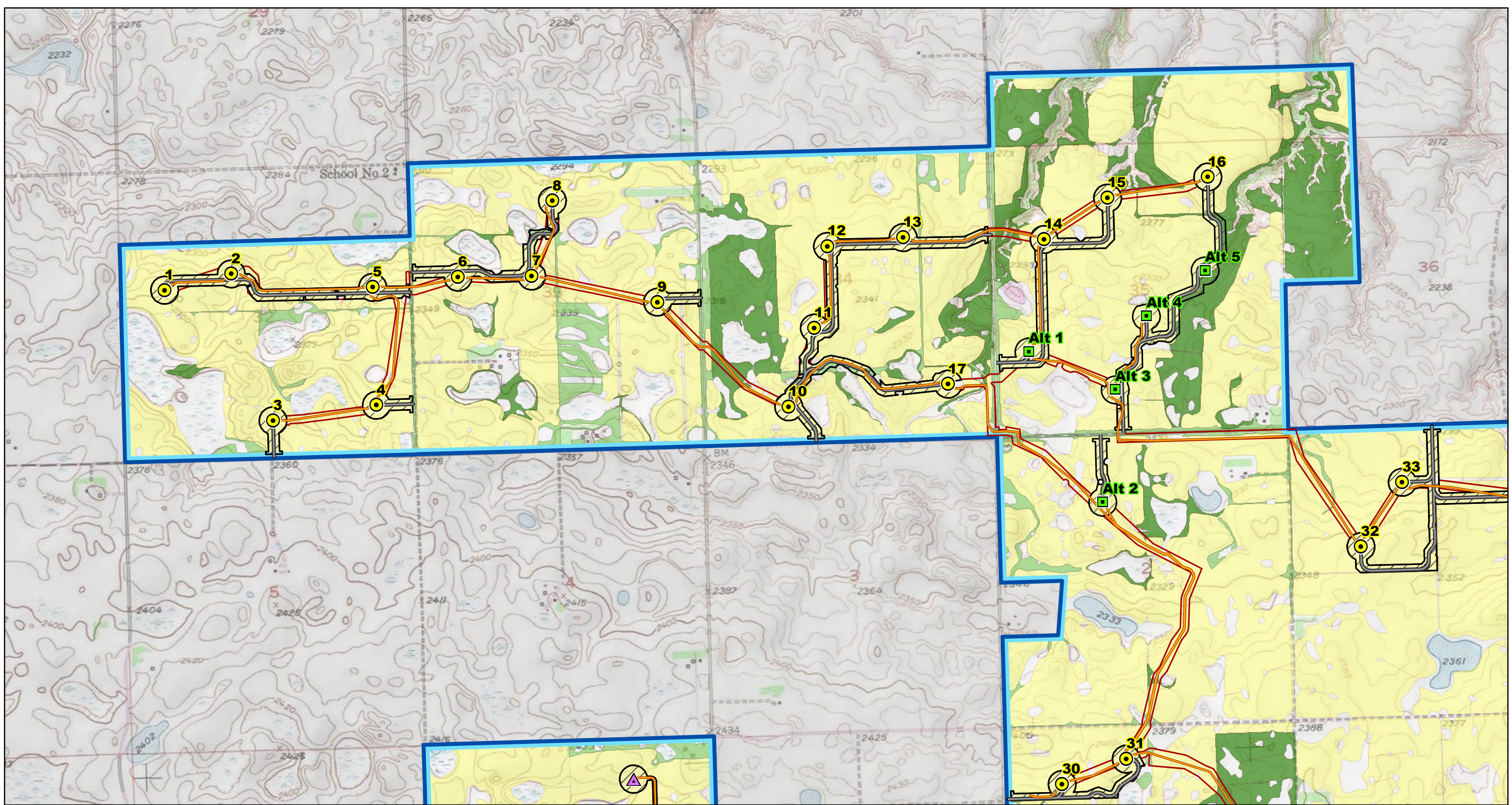
LEGEND

Infrastructure

-  Turbine
-  Alternative Turbine
-  Met Tower
-  Access Road
-  Collection Line
-  Project Area

-  Broken Grassland
-  Unbroken Grassland
-  Cropland
















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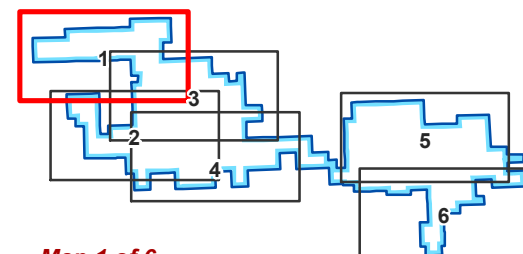
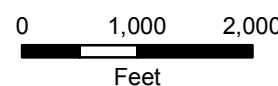
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FIGURE 2 - PROJECT INFRASTRUCTURE

LEGEND

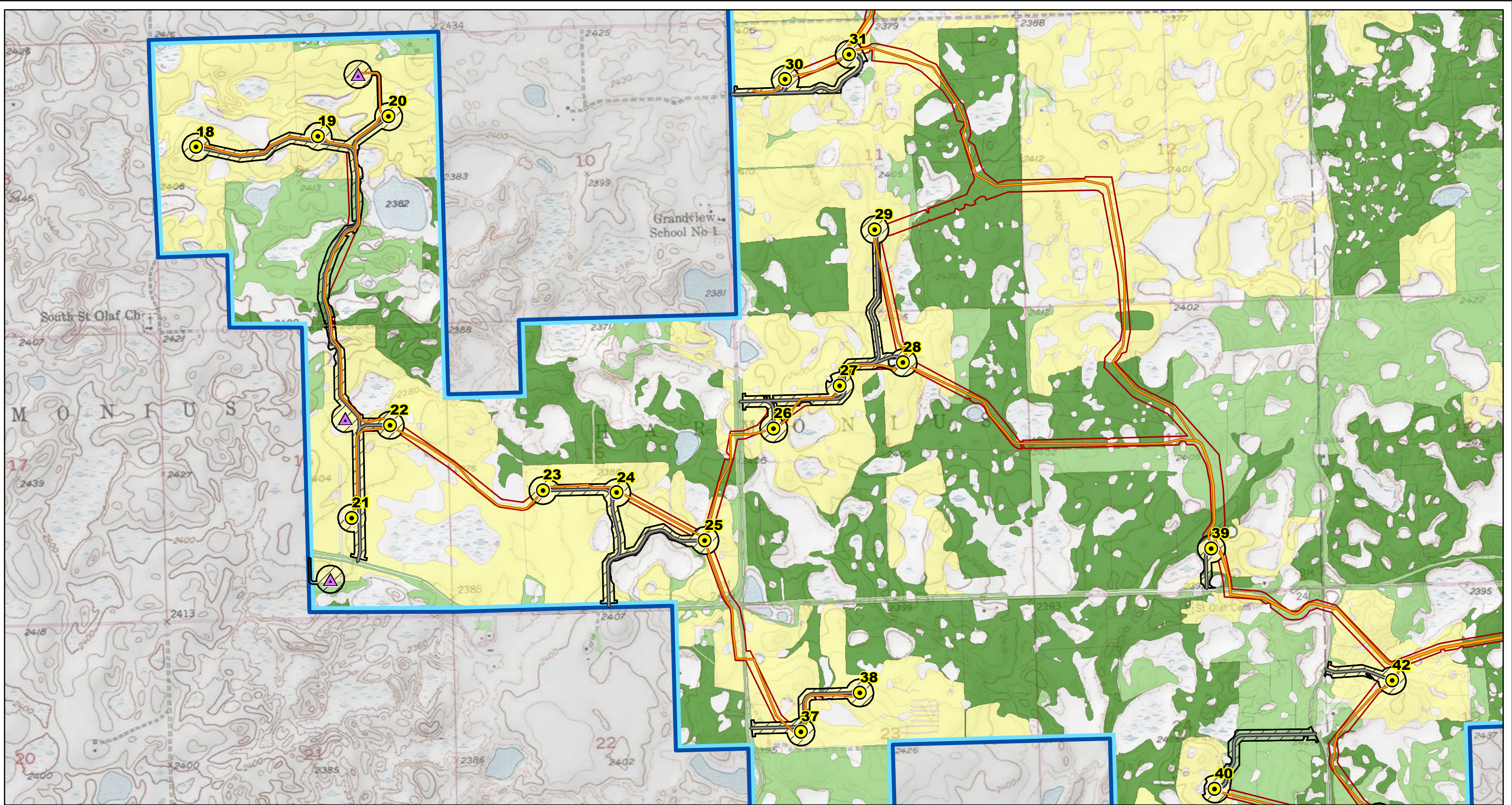
Infrastructure

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-  Construction Easement
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-  Unbroken Grassland
-  Cropland



Map 1 of 6
















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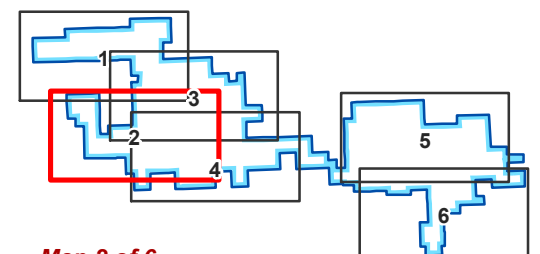
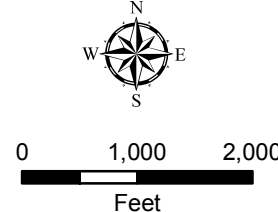
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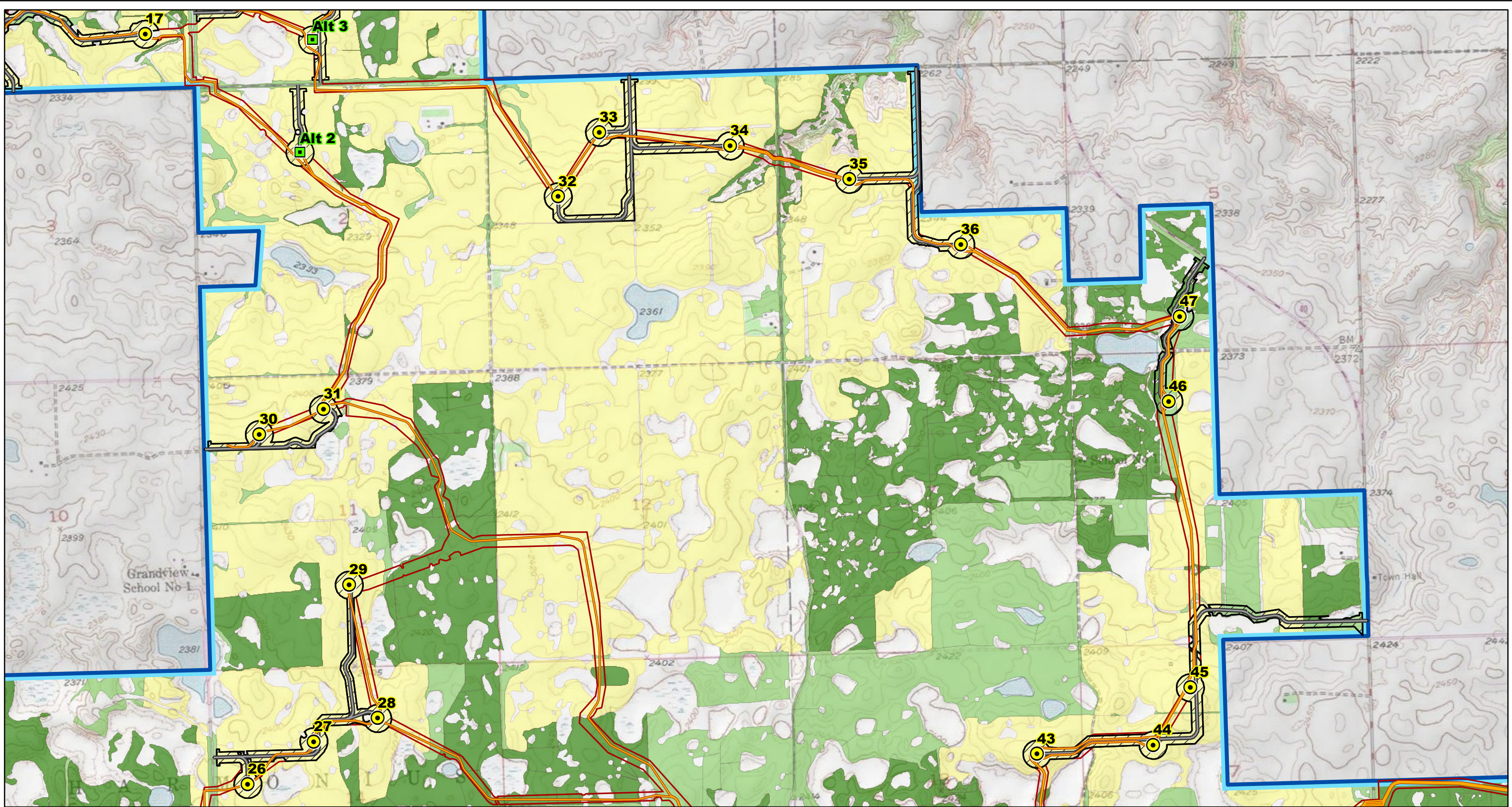
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**BURKE COUNTY
WIND ENERGY CENTER**

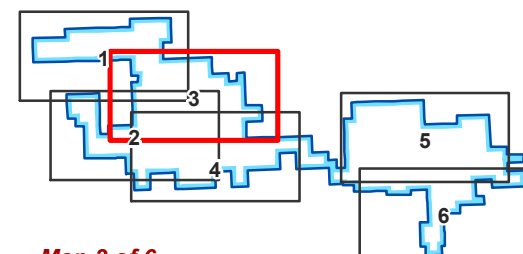
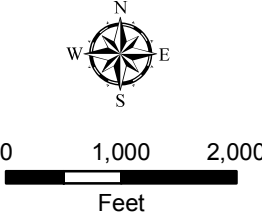
**BURKE COUNTY,
NORTH DAKOTA**

**FIGURE 2 - PROJECT
INFRASTRUCTURE**

LEGEND

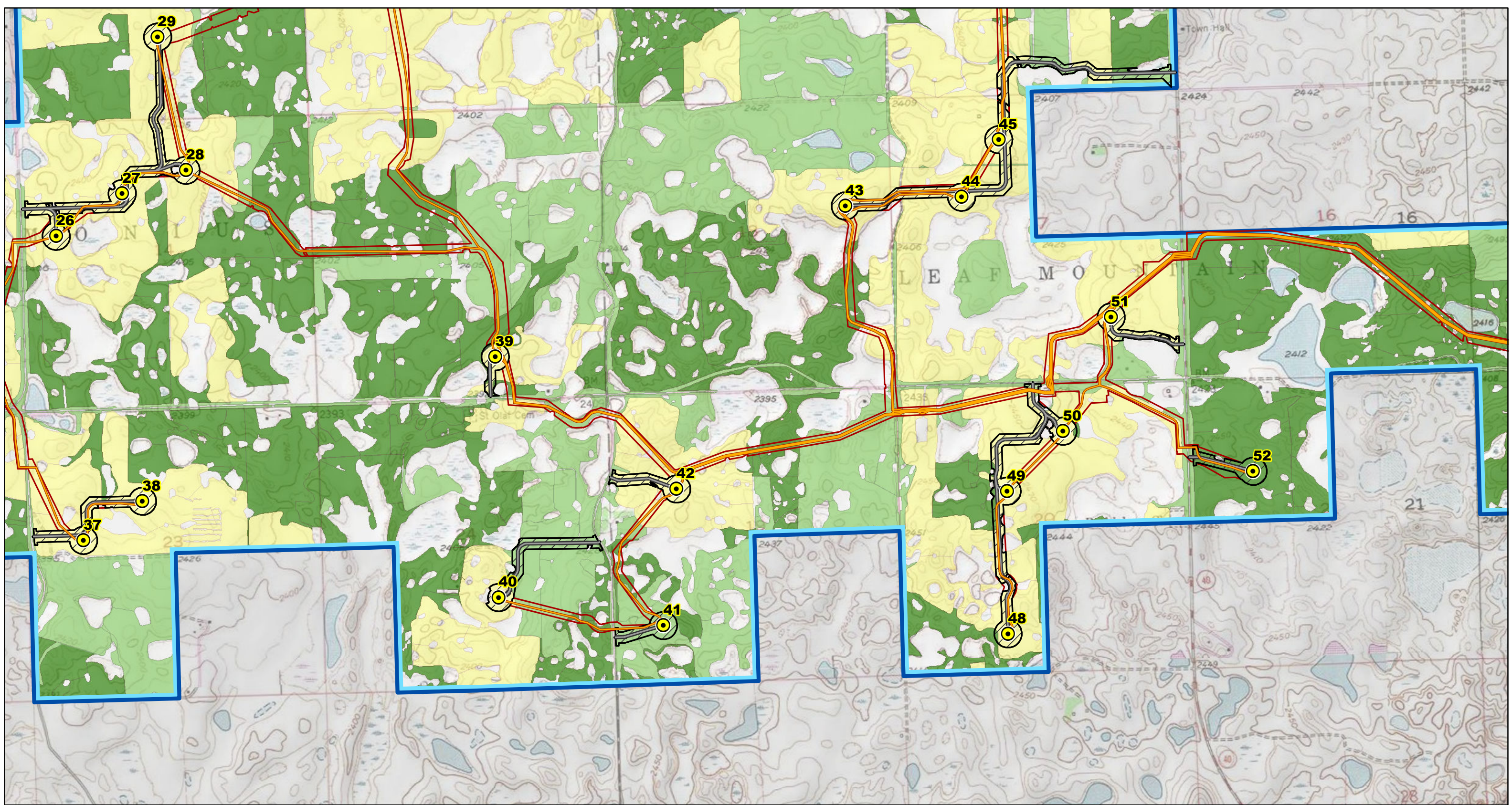
Infrastructure

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Map 3 of 6
















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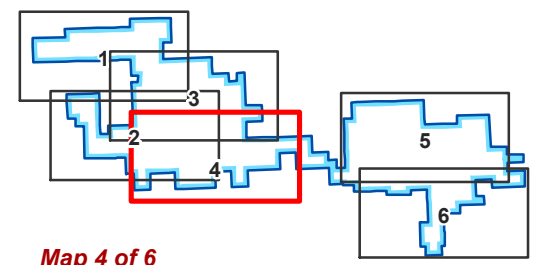
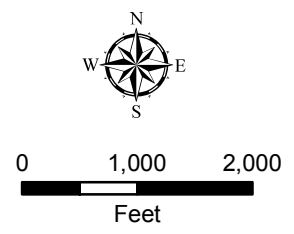
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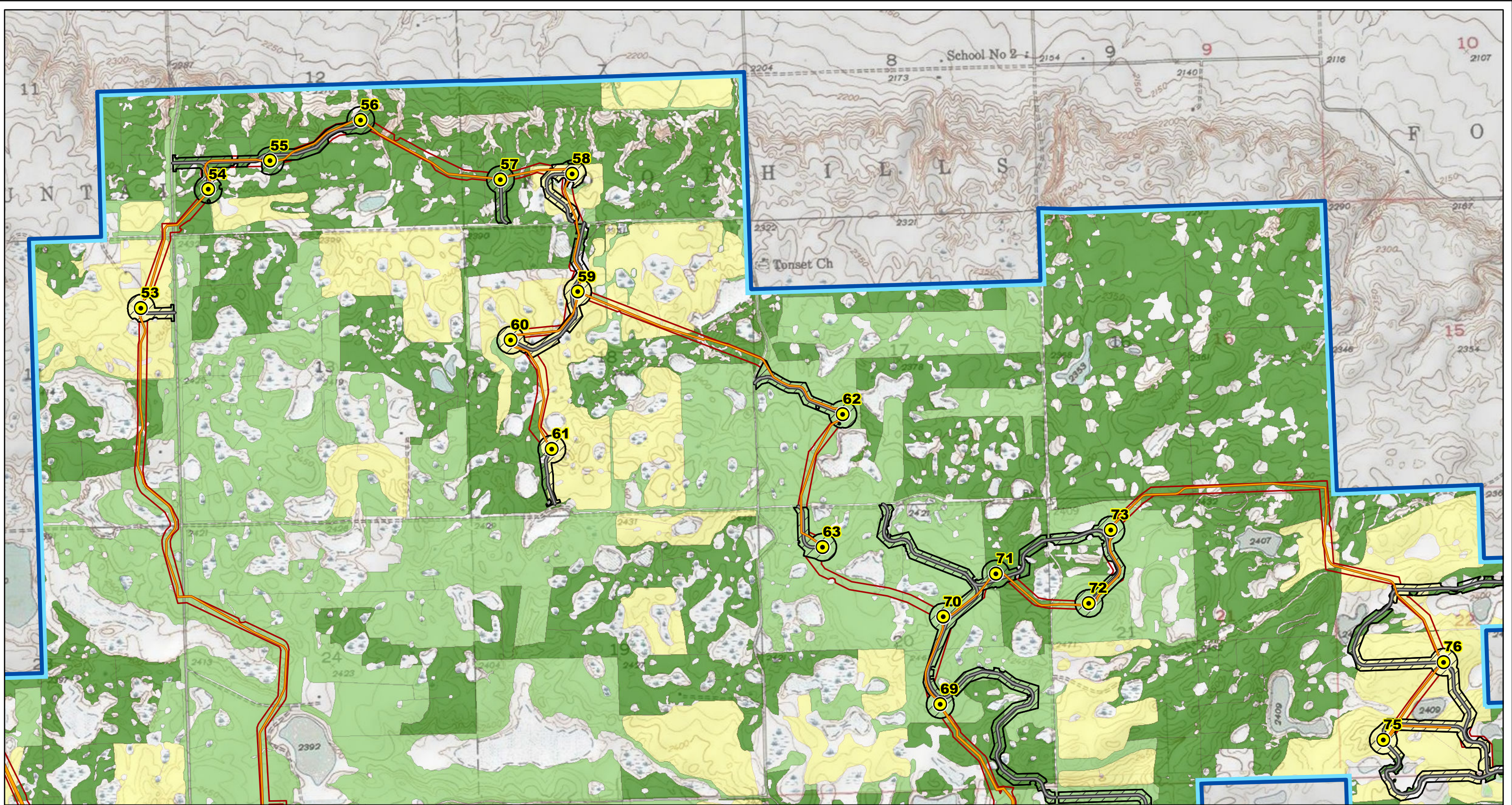
Infrastructure

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







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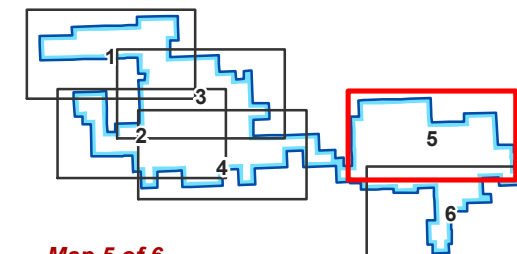
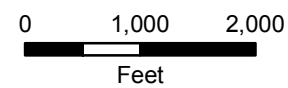
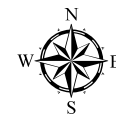
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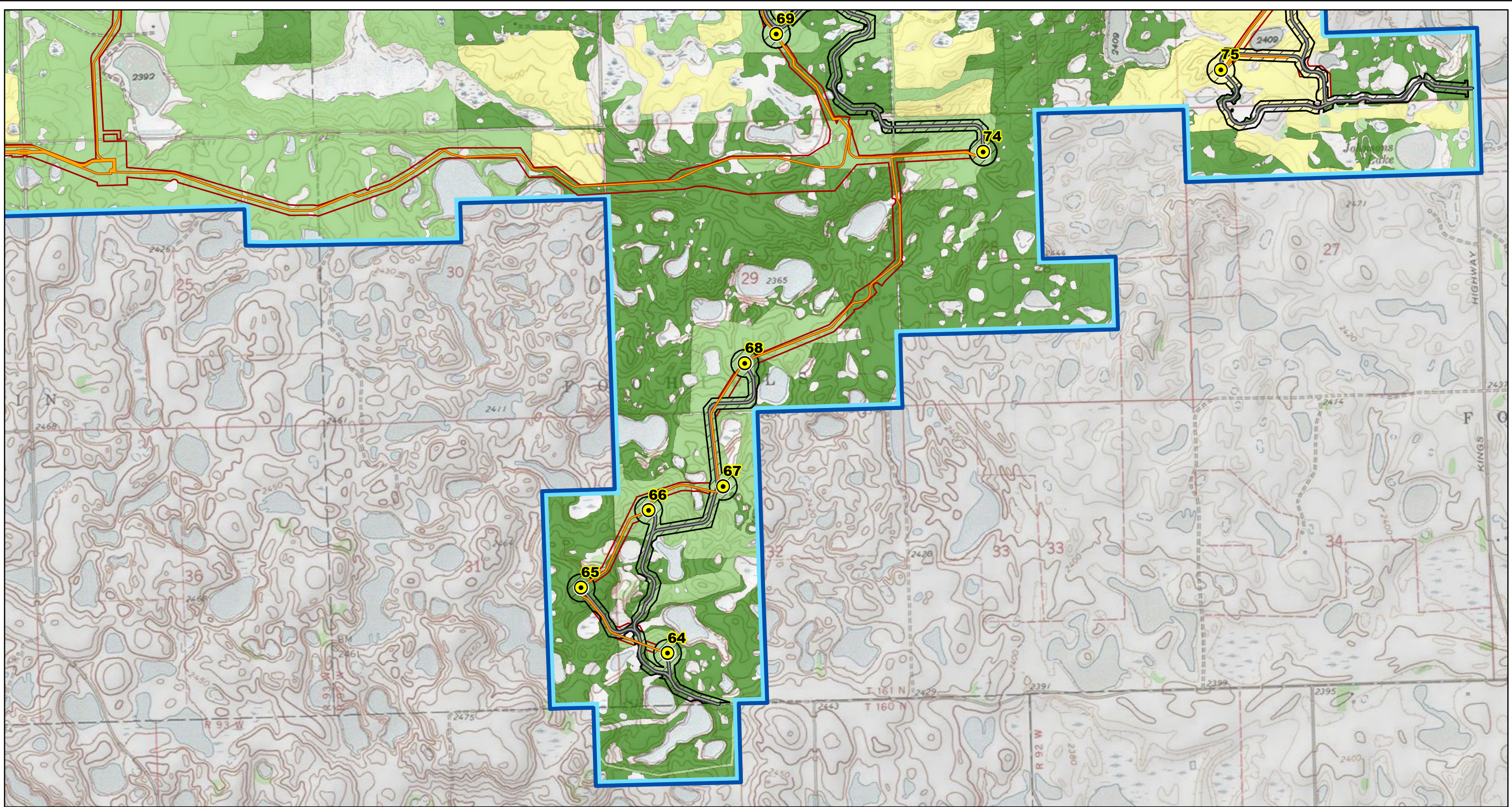
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


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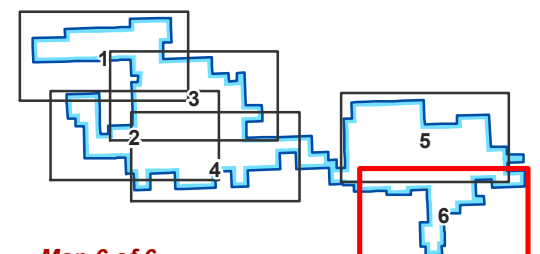
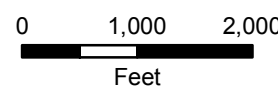
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