

BURKE COUNTY WIND ENERGY CENTER AND TRANSMISSION LINE DAKOTA SKIPPER ASSESSMENT REPORT

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PREPARED FOR

Burke Wind, LLC

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**BURKE COUNTY WIND ENERGY CENTER
AND TRANSMISSION LINE
DAKOTA SKIPPER ASSESSMENT REPORT**

Prepared for

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) conducted an assessment to identify potential Dakota skipper (*Hesperia dacotae*) suitable habitat for Burke Wind, LLC's (Burke Wind's), Burke County Wind Energy Center wind resource assessment (WRA) area, its associated transmission line, and a proposed substation. The WRA and proposed substation are located in Burke County, North Dakota, and the transmission line is located in Burke and Mountrail Counties, North Dakota. The assessment included the completion of a desktop analysis for potential suitable habitat and subsequent qualitative habitat field surveys for the WRA proposed infrastructure buffers and corridors, transmission line corridor, and the proposed substation location (Survey Area).

The purpose of the desktop analysis was to identify potential habitat for the Dakota skipper that could be refined during field surveys. The purpose of the qualitative habitat field surveys was to refine the potential habitat areas identified during desktop analysis and field-verify suitable habitat for the Dakota skipper. The field surveys included three separate field sessions for the WRA proposed infrastructure buffers and corridors: two field sessions for the transmission line corridor, and one field session for the proposed substation location. The proposed WRA infrastructure layout was adjusted between field sessions to reduce impacts to the Dakota skipper and other sensitive resources, resulting in some field surveyed areas no longer being within the final proposed infrastructure boundary.

This report records the results of the desktop analysis and qualitative habitat field surveys. All desktop analysis and qualitative habitat field surveys were completed using the WRA proposed infrastructure buffers and corridors and associated transmission line corridor boundaries, as provided by Burke Wind to SWCA.

The Dakota skipper larval and adult foraging habitats are recognized by the U.S. Fish and Wildlife Service (USFWS) as occurring in undisturbed native prairie but also include those areas that may be invaded by Kentucky bluegrass (*Poa pratensis*) (USFWS 2016). Suitable habitat for Dakota skipper includes two types: Type A and Type B (Royer et al. 2014; USFWS 2016, 2018).

Type A habitat is found in low-lying, wet mesic prairie with little topographic relief and occurs on near-shore glacial lake deposits. Although Type A habitats vary throughout the growing season during Dakota skipper's flight period, three plant species are almost always present and blooming: prairie lily (*Lilium philadelphicum*), bluebell bellflower (*Campanula rotundifolia*), and mountain death camas (smooth camas; *Zigadenus elegans*), the latter appears to be an especially strong indicator of Type A habitat in North Dakota. Plants that are important as nectar sources for Type A habitats appear to vary geographically, but black-eyed Susan (*Rudbeckia hirta*) is significant throughout the range of this habitat type. Later in the season, common forbs in bloom in Type A habitat include Rocky Mountain blazing star (*Liatris ligulistylis*), Canada goldenrod (*Solidago canadensis*), strict blue-eyed grass (*Sisyrinchium montanum*), common goldstar (yellow star grass; *Hypoxis hirsuta*), and black-eyed Susan. Type A habitats also contain small patches of dry-mesic prairie inhabited by Dakota skippers. Stiff sunflower (*Helianthus pauciflorus* ssp. *pauciflorus*) and candle anemone (*Anemone cylindrica*) are typical in these dry-mesic habitats; purple coneflower (*Echinacea angustifolia*), which is an indicator of Type B habitats, may be present, but it is rare in these dry-mesic inclusions. Big bluestem (*Andropogon gerardii*) and little bluestem (*Schizachyrium scoparium*) are typically the dominant grasses in North Dakota Type A habitats. Indiangrass (*Sorghastrum nutans*) may also be present. Dakota skipper adults are typically encountered in pre-floral stands of these grass species, where they are associated with the forb species described above.

Type B habitat occurs primarily on rolling terrain over gravelly glacial moraine deposits and is dominated by big bluestem, little bluestem, and needle or porcupine grasses (*Hesperostipa* spp.), and often invaded by Kentucky bluegrass. In a western North Dakota variant of Type B habitats, western wheatgrass

(*Pascopyrum smithii*) is also typical. As in Type A habitats, bluebell bellflower and prairie lily are present in Type B habitats, but they support more extensive stands of purple coneflower, prairie coneflower (*Ratibida columnifera*), and common gaillardia (blanketflower; *Gaillardia aristata*). Type B habitat typically supports a high diversity and abundance of native forbs, including purple coneflower, purple prairie clover (*Dalea purpurea*), white prairie clover (*D. candida*), yellow sundrops (*Calylophus serrulatus*), prairie groundsel (*Packera plattensis*), groundplum milkvetch (*Astragalus crassicaarpus*), eastern pasqueflower (*Pulsatilla patens*), old man's whiskers (prairie smoke; *Geum triflorum*), western silver aster (*Symphotrichum sericeum*), dotted blazing star (*Liatris punctata*), tall blazing star (*L. aspera*), meadow zizia (heartleaf golden Alexanders; *Zizia aptera*), blanket flower (*Gaillardia* sp.), prairie sagewort (*Artemisia frigida*), and leadplant (*Amorpha canescens*).

The Dakota skipper flight period is 2 to 4 weeks long, with year-to-year variability due to the weather and forb flowering times that occurs between mid-June and mid-July. Plants that are nectar sources for the Dakota skipper provide water and nutrients for adult Dakota skippers during their flight period (USFWS 2016). Flowering forbs must be present in sufficient quantity and near suitable larval habitat to provide reliable sources of nectar for adults during their flight period.

During the flight period, eggs are laid on broadleaf plants (McCabe 1981) and grasses (Dana 1991). The eggs hatch after incubating for 7 to 20 days, and the larvae then crawl to the bases of grass plants where they form shelters at or below the ground surface (Dana 1991). At night, they emerge from their shelters to forage. For growth and survival, larvae rely on native grasses such as little bluestem, big bluestem, sideoats grama (*Bouteloua curtipendula*), Indiangrass, and prairie dropseed (*Sporobolus heterolepis*) (USFWS 2016). Dakota skippers have six to seven larval stages (instars). They overwinter in their ground-level or subsurface shelters during either the fourth or fifth instar and resume feeding the following spring. One generation of Dakota skippers is completed per year.

2 METHODOLOGY

2.1 Desktop Analysis

For the desktop analysis, the presence of potential undisturbed native prairie was evaluated using geographic information system (GIS) layers and aerial imagery interpretation. All areas mapped in available, existing GIS layers as cultivated, forest, wetland, open water, or disturbed (e.g., roads, farmsteads, and towns) were removed from the potential habitat layer. During aerial imagery interpretation, any area that showed evidence of disturbance (e.g., cultivation) was removed from the potential habitat layer. LANDFIRE 30-meter resolution data (LANDFIRE 2017) were used to eliminate unsuitable habitat types. Aerial imagery interpretation was completed by an SWCA habitat biologist experienced with Dakota skipper habitat, with oversight and review completed by Mr. Jake Powell, an SWCA senior ecologist who holds an USFWS Dakota skipper scientific recovery permit (Permit No. TE64070B-1), using 2016 aerial imagery from the U.S. Department of Agriculture Farm Service Agency Aerial Photography Field Office. The imagery provided guidance for determining whether a parcel of land was disturbed (e.g., agricultural land, infrastructure, and farmsteads) and, if so, the habitat parcel was eliminated from the dataset. The USFWS National Wetlands Inventory (USFWS 2017) was also used during the results review.

The entire proposed WRA and a large assessment corridor along the proposed transmission line were analyzed during the desktop analysis to determine where potential habitat and unsuitable habitat (for the Dakota skipper) were located. The desktop analysis resulted in GIS layers that identified potential and unsuitable habitat within the (described in Section 3 and shown on the maps in Appendix A). Areas that

were identified as unsuitable habitat in the desktop results were not carried forward for qualitative habitat field surveys.

2.2 Qualitative Habitat Field Surveys

SWCA completed Dakota skipper qualitative habitat field surveys during five field sessions. These surveys were conducted to verify and refine the desktop results in areas where proposed infrastructure was located within potential habitat (Survey Area). Table 1 identifies the time and survey area for those field sessions.

Table 1. Field Survey Sessions

Field Session Dates	Survey Area
September 7–13, 2017	WRA proposed infrastructure buffers and corridors
February 8, 2018	Proposed substation location
March 30–June 1, 2018	WRA proposed infrastructure buffers and corridors
June 11–13, 2018	Transmission line corridor
August 20–23, 2018	WRA proposed infrastructure buffers and corridors and transmission line corridor
October 16, 2018	WRA construction corridor reroutes to avoid suitable habitat
December 3, 2018	WRA crane path turns at county road junctions

The survey area included a 400-foot buffer surrounding each proposed turbine location, a 200-foot buffer on proposed access roads and collector lines, and a 150-foot buffer on the proposed transmission line. Burke Wind asked SWCA to assess the entirety of four state of North Dakota parcels because the locations of the associated turbines were not finalized at the time of the survey. Those state land parcels are as follows: Section 16, Township (T) 161 North (N), Range (R) 92 West (W), Northwest 1/4, Section 16, T161N, R93W, Section 36, T162N, R92W, and Section 36, T161N, R91W.

Full pedestrian surveys of the survey areas were conducted. SWCA field biologists experienced with Dakota skipper habitat assessed the survey area for suitable Dakota skipper habitat, as identified by the USFWS and published literature (Royer et al. 2014; USFWS 2016, 2018) (see the suitable habitat descriptions in the Introduction). Mr. Powell was responsible for quality control and oversight of the field teams. The results of the qualitative habitat field surveys are described in Section 3 and shown in the maps in Appendix A.

3 RESULTS

All survey results are shown on the maps in Appendix A. Those maps identify whether an area is unsuitable (either as determined during the desktop analysis or as recorded during field surveys) or suitable habitat for the Dakota skipper.

3.1 Desktop Analysis

A desktop analysis was completed to identify grassland areas that could potentially be Dakota skipper habitat. Areas determined to be unsuitable during the desktop analysis were excluded from further review. These unsuitable areas consist of cultivated areas, existing roads, livestock working facilities, open water

and wetlands, residence areas, and oil and gas or other facilities with ground disturbance. Grassland areas identified as potential habitat were carried forward for qualitative habitat field surveys.

3.2 Qualitative Habitat Field Surveys

3.2.1 WRA and Transmission Line

Approximately 2,497 acres within the WRA proposed infrastructure buffers and corridors and approximately 903 acres within the transmission line corridor of potential habitat, as determined during the desktop analysis, were surveyed during the qualitative habitat field surveys. Approximately 105 acres of suitable habitat were field verified in the WRA survey area and 86 acres of suitable habitat were field verified in the transmission line survey area. The maps in Appendix A show the location of the suitable habitat polygons identified during the field surveys.

All of the suitable habitat polygons identified within the WRA survey area were small and isolated, with the exception of the state of North Dakota section, located at Section 16, T161N, R92W. The state of North Dakota section (Section 16, T161N, R92W) contains scattered suitable adult Dakota skipper foraging habitat throughout the parcel, however there is no suitable habitat along the proposed collector line location on the southern boundary of this section. The lack of suitable habitat along this collector line route is due to the presence of non-native grass species which have encroached from adjacent land parcels. Seven other polygons of suitable habitat were identified during the surveys, in addition to those in the state of North Dakota section. The suitable habitat identified in all locations contained purple coneflower, with occasional prairie coneflower and little bluestem. Figures 1 and 2 show representative examples of suitable habitat in the WRA survey area.

The suitable habitat polygons on the transmission line survey area were primarily concentrated toward the southern end of the survey corridor. The suitable habitat consisted of purple coneflower, with the occasional presence of prairie coneflower and native thistles (*Cirsium* spp.). Some scattered little bluestem was present in some areas. The dominant species at all of these locations was Kentucky bluegrass, with smooth brome (*Bromus inermis*) and western snowberry (*Symphoricarpus occidentalis*) present in some areas as well.

The suitable habitat in all areas consisted of small parcels that were generally fragmented from other suitable habitat areas. Most of the suitable habitat identified was comprised of adult nectar species. None of the polygons would likely be viable as larval habitat due to a lack of abundant little bluestem or other bunchgrasses used by Dakota skipper larvae, and the habitat was located in dry areas that would not be conducive to larval survival. The suitable habitat identified meets the criteria for suitable habitat, but they appear to have low viability for population maintenance.

The survey areas were generally dominated by nonnative species, primarily Kentucky bluegrass and smooth brome. Sandier areas had extensive wolf willow (silverberry; *Elaeagnus commutata*) populations. Low native plant species diversity exists in the unsuitable areas.



Figure 1. Suitable Dakota skipper adult foraging habitat within the WRA survey area, view facing east. Purple coneflower can be seen in the photograph.



Figure 2. Suitable Dakota skipper habitat within the survey area. Purple coneflower and small areas of little bluestem are present in the photograph.

3.2.2 Proposed Substation

The proposed footprint of a substation that would be located on 92nd Street Northwest, Burke County, North Dakota. The footprint was surveyed for the presence of Dakota skipper habitat on February 8, 2018, by Mr. Powell, who conducted a full pedestrian survey. This assessment was conducted during winter conditions, with approximately 2 to 6 inches of snow present on the survey area. However, the standing vegetation was not snow covered and had no evidence of livestock grazing utilization; therefore, most of the plant species were identifiable. The dominant grasses on the hayed areas were identifiable by vegetative characteristics. Figures 3 and 4 show photographs of the field site during the surveys.

Approximately 40% of the site showed evidence of hay cutting during the 2017 growing season. Haying can indicate that the ground has been plowed at some point and no longer contains potential as a native prairie area; however, native prairie can also be hayed. No evidence of recent plowing or other ground disturbance (soil profile disruption) was observed. Due to frozen ground conditions, SWCA was not able to dig a soil pit to confirm the presence of a plow layer. The entire survey area (hayed and non-hayed) was dominated by the nonnative grass species smooth brome and intermediate wheatgrass (*Thinopyrum intermedium*).

In addition to smooth brome and intermediate wheatgrass, timothy (*Phleum pratense*), Kentucky bluegrass, and western dock (*Rumex occidentalis*) were interspersed in the low topographic areas of the site. A few Canada thistle (*Cirsium arvense*) patches were present. Some alfalfa (*Medicago sativa*) was present in small amounts throughout the site. Less than 20 stems of Flodman's thistle (*Cirsium flodmanii*) were present at the site. Small populations of American licorice (*Glycyrrhiza lepidota*), goldenrod (*Solidago* sp.), and western snowberry were observed along the county road (92nd Street Northwest). Two residual forbs, with small stems and shallow roots, which appeared to be annuals, were present in small amounts; these two forbs were not identifiable. No evidence of residual purple coneflower, prairie coneflower, or other primary Dakota skipper nectar species were observed.

The site was dominated by cool-season, nonnative grass species. The only Dakota skipper nectar species present were the few stems of Flodman's thistle. With the lack of grazing and low snow cover, residual stems of Dakota skipper nectar species, such as purple coneflower and prairie coneflower, should be identifiable if the species were present; however, none were observed. Based on these survey results, it appears that no Dakota skipper habitat is present. For better refinement of this winter condition qualitative assessment, another site assessment during the growing season would be required.



Figure 3. Substation site along south side of county road, view facing east. Photograph taken on February 8, 2018.



Figure 4. View facing east from center of substation site. Photograph taken on February 8, 2018.

4 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

Burke Wind will implement the measures bulleted below to remove and/or reduce impacts to the Dakota skipper to the greatest extent possible. There are no known occurrences of Dakota skipper within the townships where the WRA and transmission line will be constructed (USFWS 2018; Lotts and Naberhaus 2017). The closest documented occurrence is over 5 miles away from the WRA area and over 10 miles from the proposed transmission line. With the limited flight of this species and the low presence and density of suitable habitat in the area there is little to no likelihood of impacts to Dakota skipper populations.

- No construction will occur in suitable habitat during the adult flight period, from June 18 through July 18.
- All proposed construction in the WRA will bore under or route around suitable habitat within the construction easement.
- No power poles will be placed or other ground disturbing activities conducted within suitable habitat areas within the transmission line corridor.
- Sediment fencing will be installed at the boundary of the suitable habitat within the WRA construction easement and transmission line corridor to restrict vehicle travel, avoid construction sedimentation impacts, and reduce dust.
- High visibility fencing will be installed at the boundary of the suitable habitat within the WRA construction easement and transmission line corridor to provide construction personnel with clear boundaries of the no impact area. This fencing would be installed in conjunction with the sediment fencing.
- The construction contractor will be provided with maps and details of the Dakota skipper suitable habitat locations and avoidance, minimization, and mitigation measures to highlight the importance of following those measures and avoiding impacts.

5 SUMMARY

- A desktop analysis was completed to determine where potential habitat occurs within the WRA and Transmission Corridor. Unsuitable habitat was excluded from further review and potential habitat was carried forward for qualitative field habitat surveys.
- Qualitative field habitat surveys were completed to determine the suitability (suitable or unsuitable) of the potential habitat for the Dakota skipper. Multiple sessions of habitat surveys were conducted to account for changes in the WRA siting and transmission line reroutes to avoid sensitive resources, including Dakota skipper suitable habitat.
- Qualitative field habitat surveys were conducted on approximately 3,400 acres of potential habitat.
- 191 acres of suitable habitat were identified during the habitat surveys.

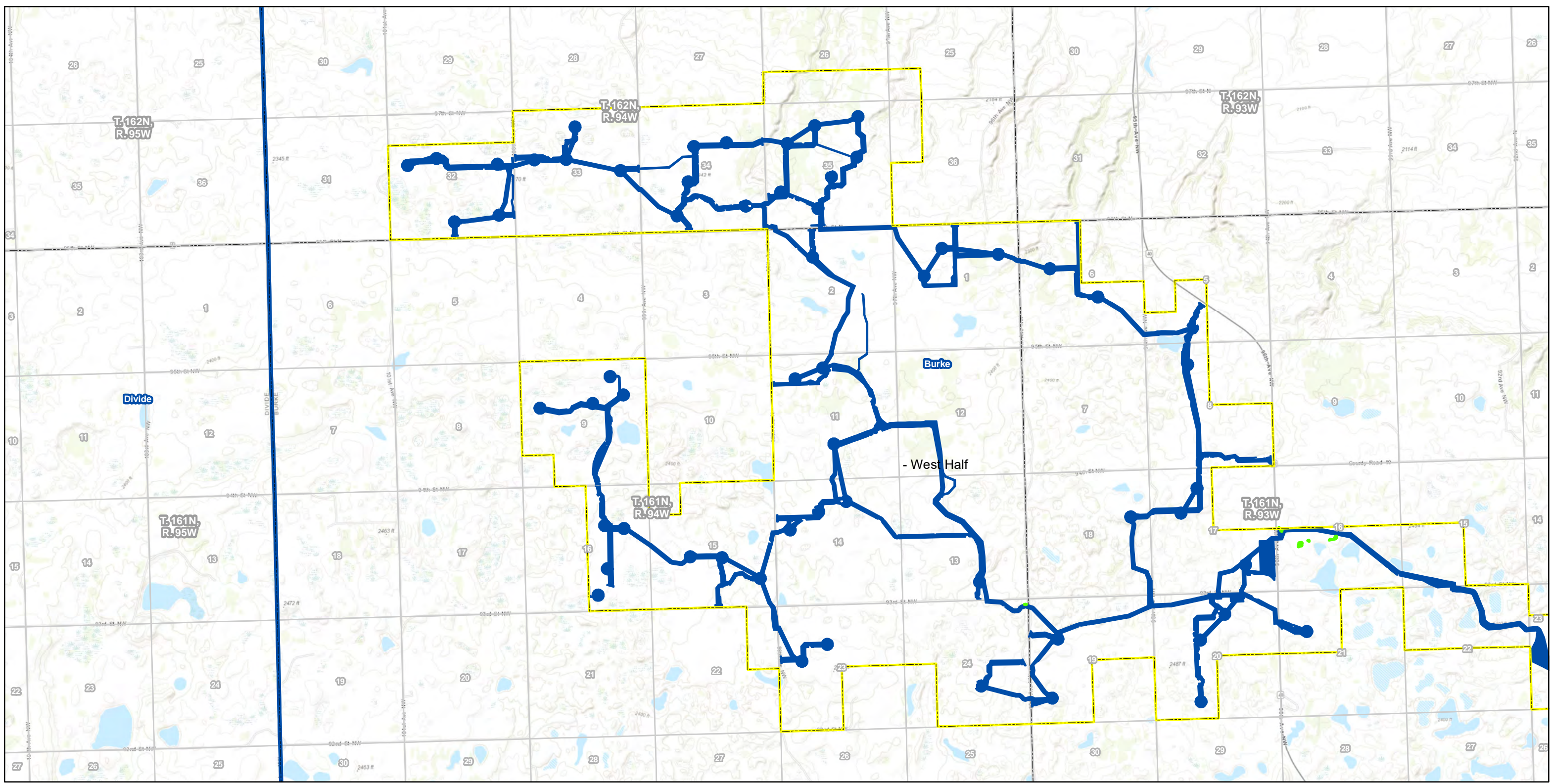
- Avoidance, minimization, and mitigation measures will be implemented to reduce the likelihood of impacts to Dakota skipper populations. The implementation of the measures in Section 4 would eliminate the impacts to suitable habitat or any larval individuals. Impacts to adult individuals are unlikely and unanticipated due to the implementation of the measures in Section 4, lack of known populations of Dakota skipper within flight range of the WRA and transmission line, and the suitable habitat present in these areas being mostly small disjoint parcels that are most likely unviable for population maintenance.

6 LITERATURE CITED

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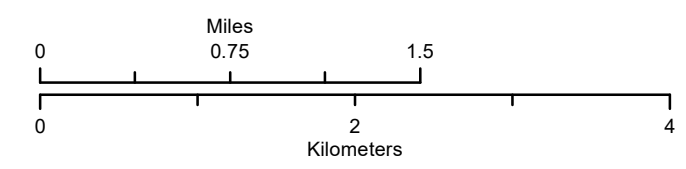
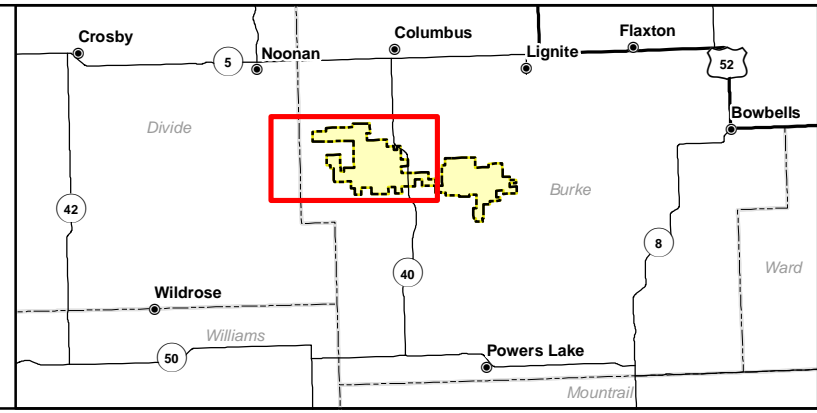
APPENDIX A

Maps



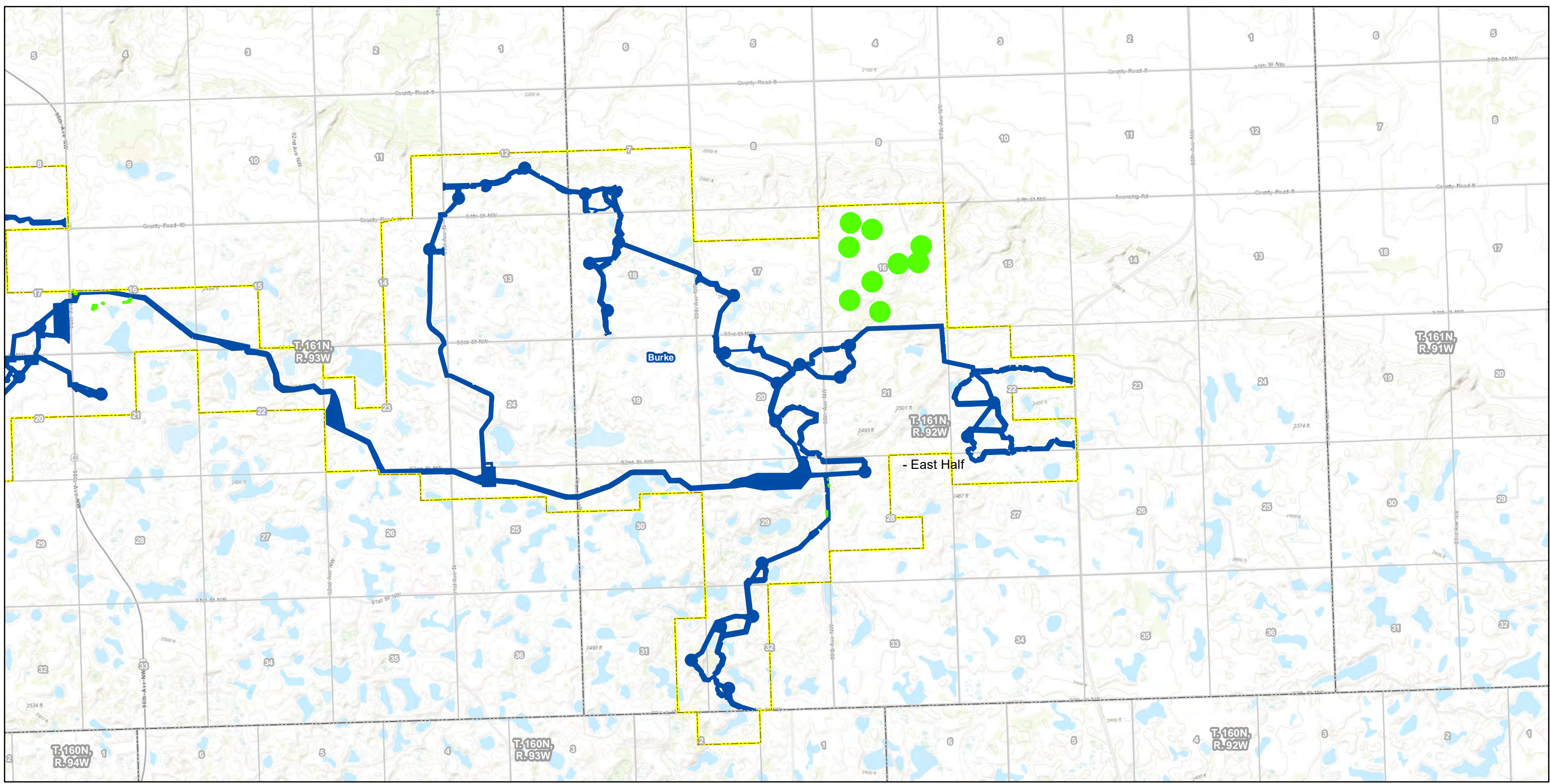
Burke County Wind Energy Center - West Half

- Suitable Habitat
- Proposed Construction Easement
- Wind Energy Center WRA
- Township/Range Boundary
- Section Boundary
- County Boundary



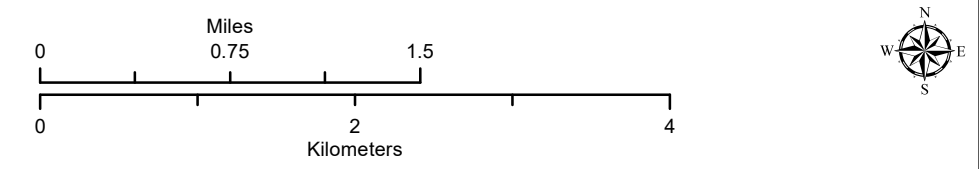
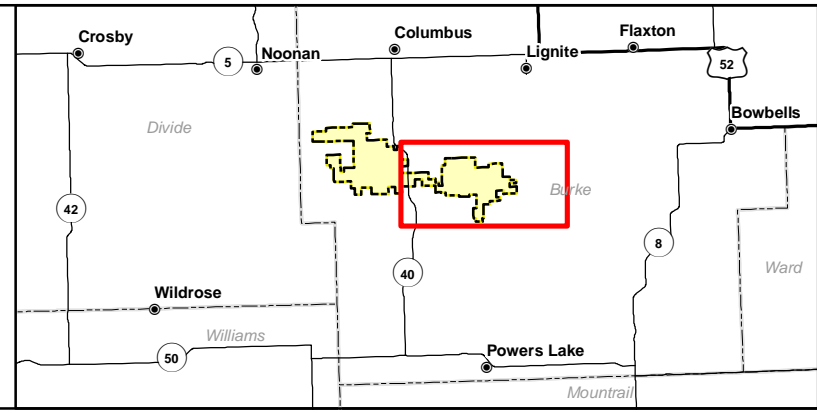
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 Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N



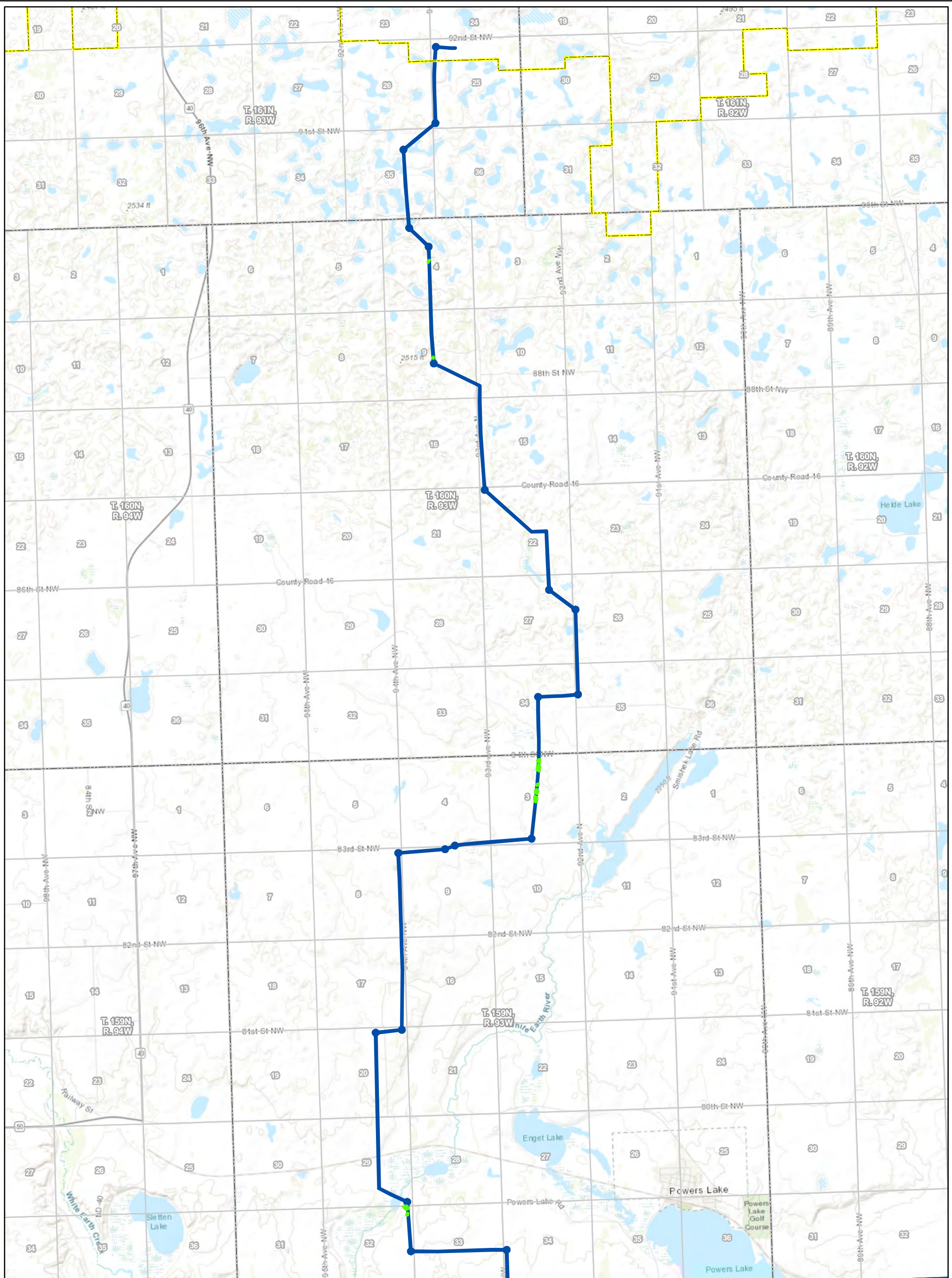
Burke County Wind Energy Center - East Half

- Suitable Habitat
- Proposed Construction Easement
- Wind Energy Center WRA
- Township/Range Boundary
- Section Boundary
- County Boundary



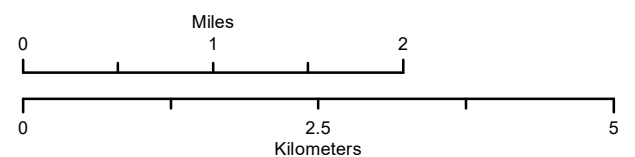
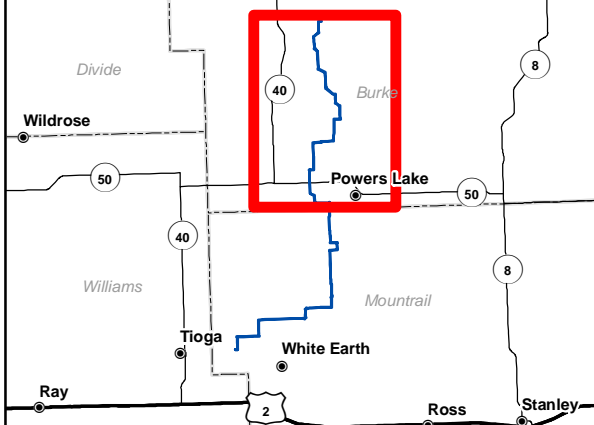
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 Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N



Burke County Wind Transmission Line - North Half

- Suitable Habitat
- Proposed Construction Easement
- Wind Energy Center WRA
- County Boundary
- Township/Range Boundary
- Section Boundary

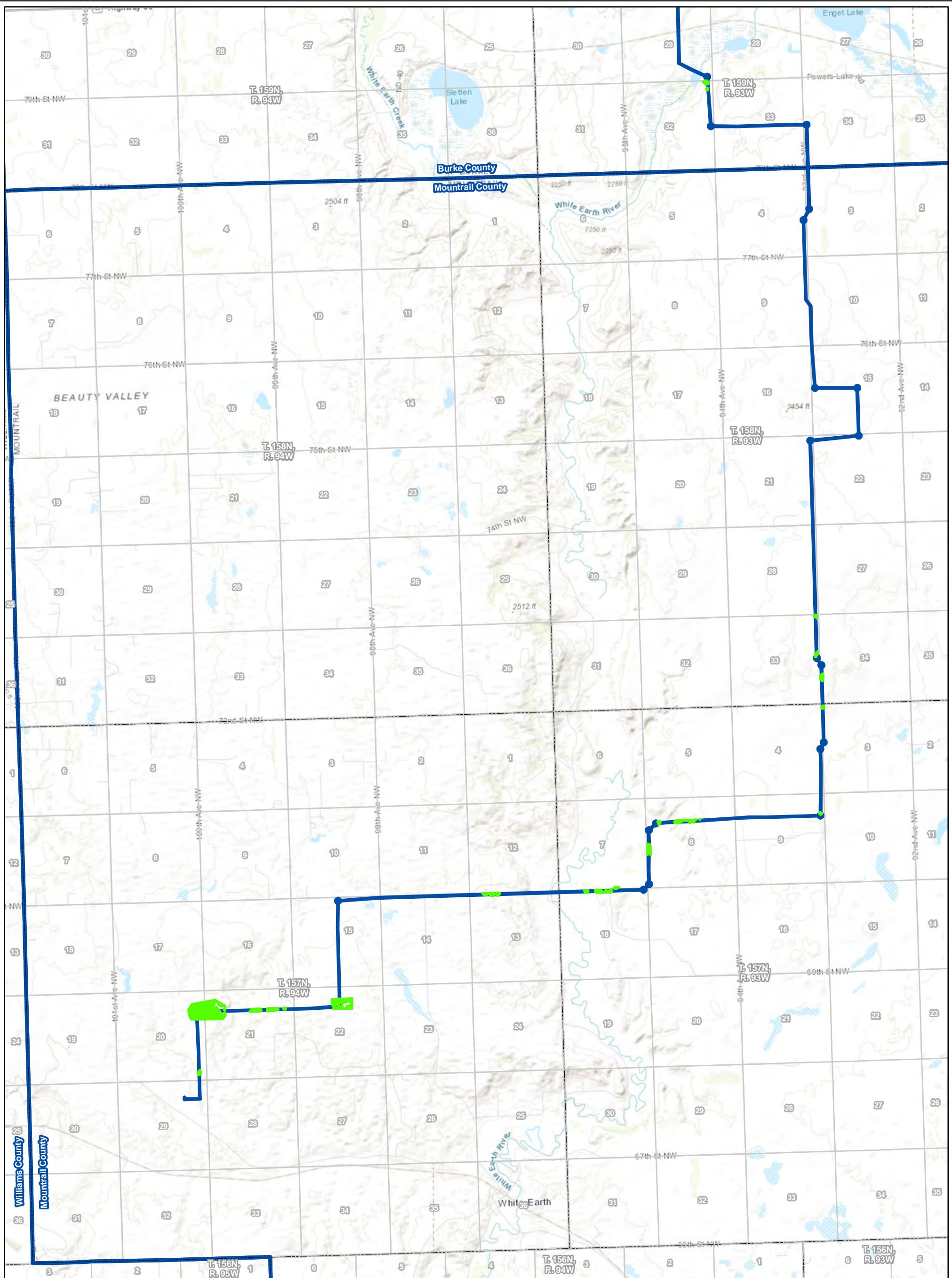


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 Burke and Mountrail Counties, North Dakota



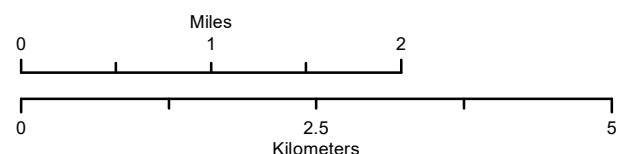
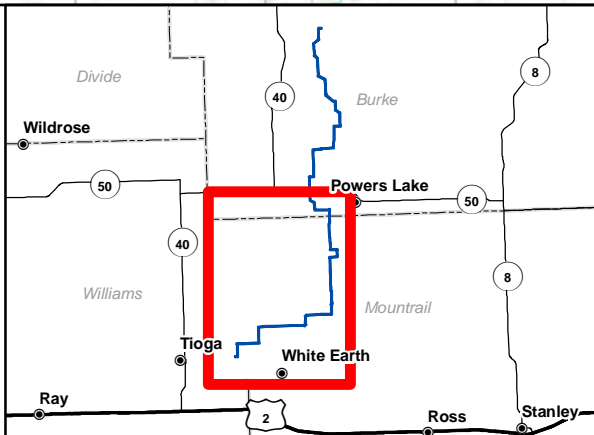
Projection: NAD 1983 UTM Zone 13N





Burke County Wind Transmission Line - South Half

- Suitable Habitat
- Proposed Construction Easement
- Wind Energy Center WRA
- County Boundary
- Township/Range Boundary
- Section Boundary

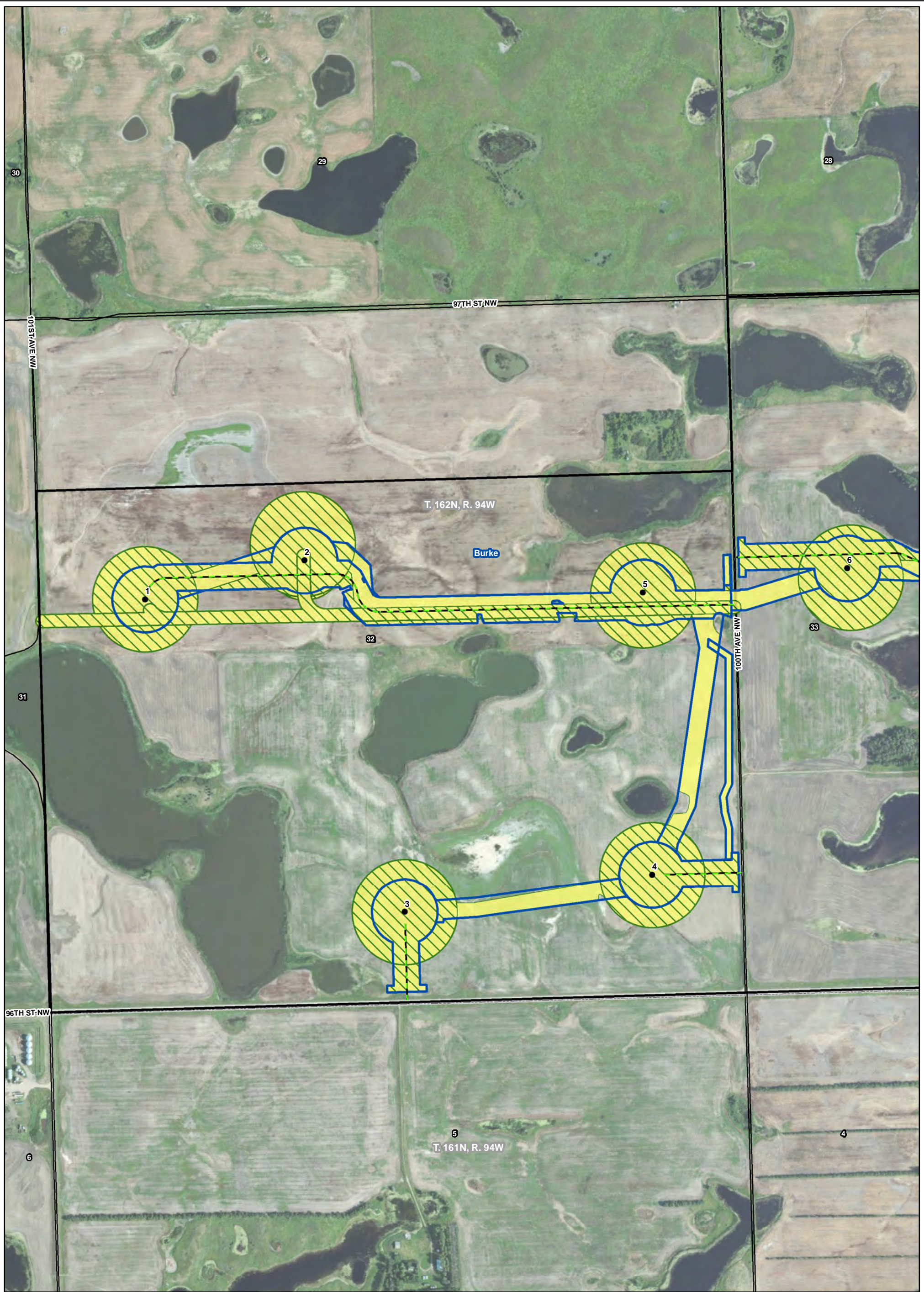


Base Map: Topographic Map
 Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
 Burke and Mountrail Counties, North Dakota



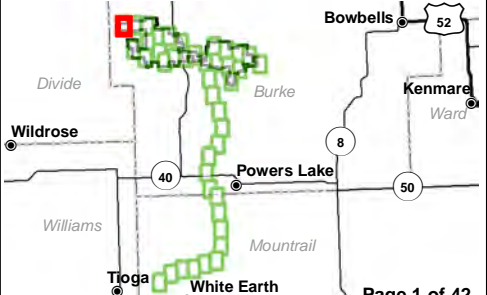
Projection: NAD 1983 UTM Zone 13N





Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

● Proposed Turbine Location (Updated January 21, 2019)	■ Suitable Habitat - Habitat Surveys	▭ Township/Range Boundary
— Proposed Transmission Line (Updated August 8, 2018)	▨ Unsuitable Habitat - Habitat Surveys	▭ Section Boundary
— Proposed Service Road (Updated January 21, 2019)	▨ Unsuitable Habitat - Desktop Analysis	▭ County Boundary
— Existing Road	▭ 150 ft wide Transmission Line Corridor	▭ Boundary
▭ Wind Energy Center WRA		
▭ Proposed Construction Easement		



0 0.15 0.3 Miles
0 0.15 0.3 Kilometers

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Quadrangle: Columbus SW (1981)

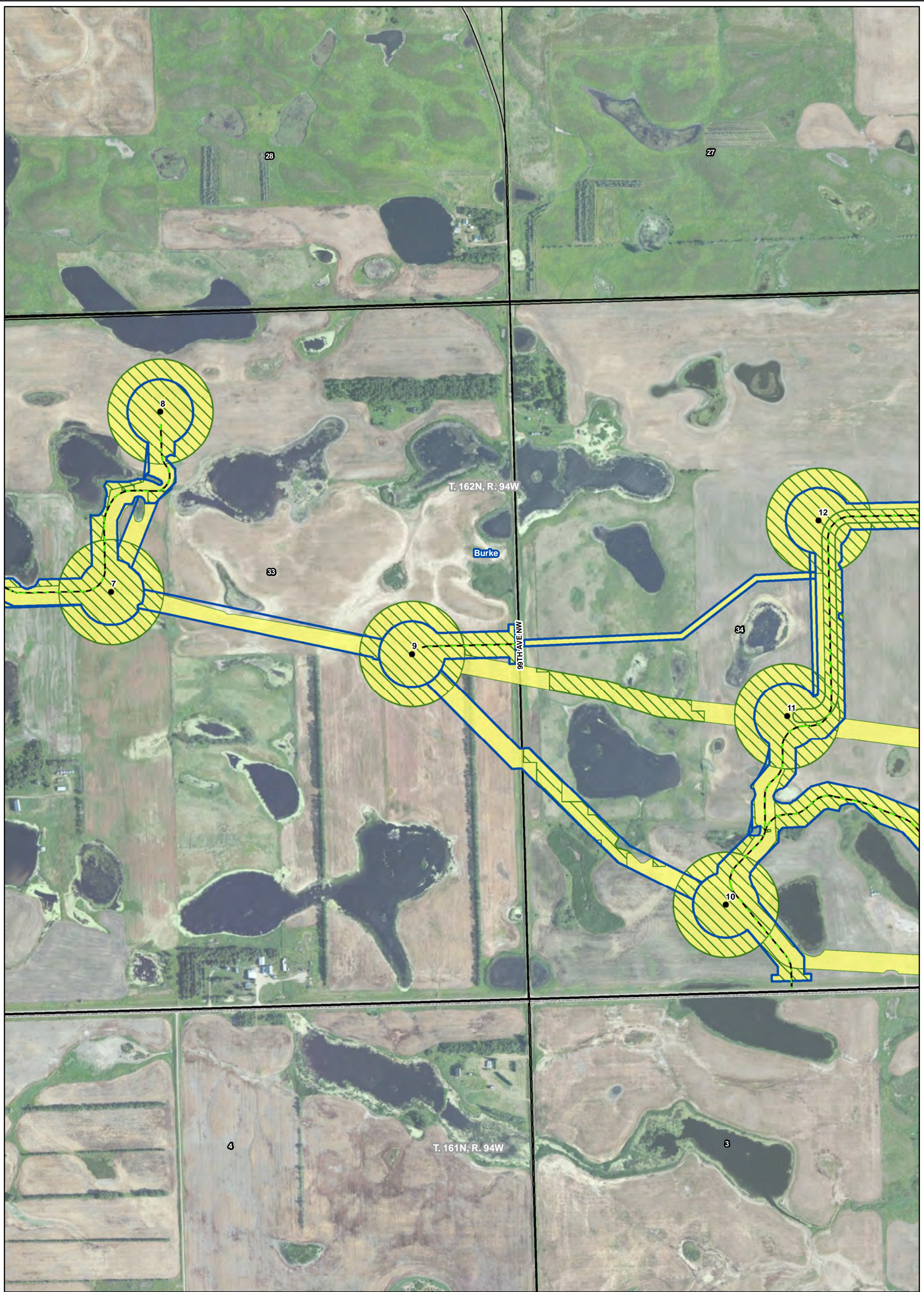
Township/Range: T162N, R94W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

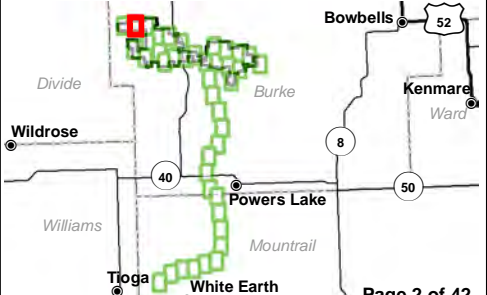
Date: 1/25/2019





Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

- Proposed Turbine Location: (Updated January 21, 2019)
- Proposed Transmission Line: (Updated August 8, 2018)
- Proposed Service Road: (Updated January 21, 2019)
- Existing Road
- Wind Energy Center WRA
- Proposed Construction Easement
- Suitable Habitat - Habitat Surveys
- Unsuitable Habitat - Habitat Surveys
- Unsuitable Habitat - Desktop Analysis
- 150 ft wide Transmission Line Corridor
- Township/Range Boundary
- Section Boundary
- County Boundary
- Boundary



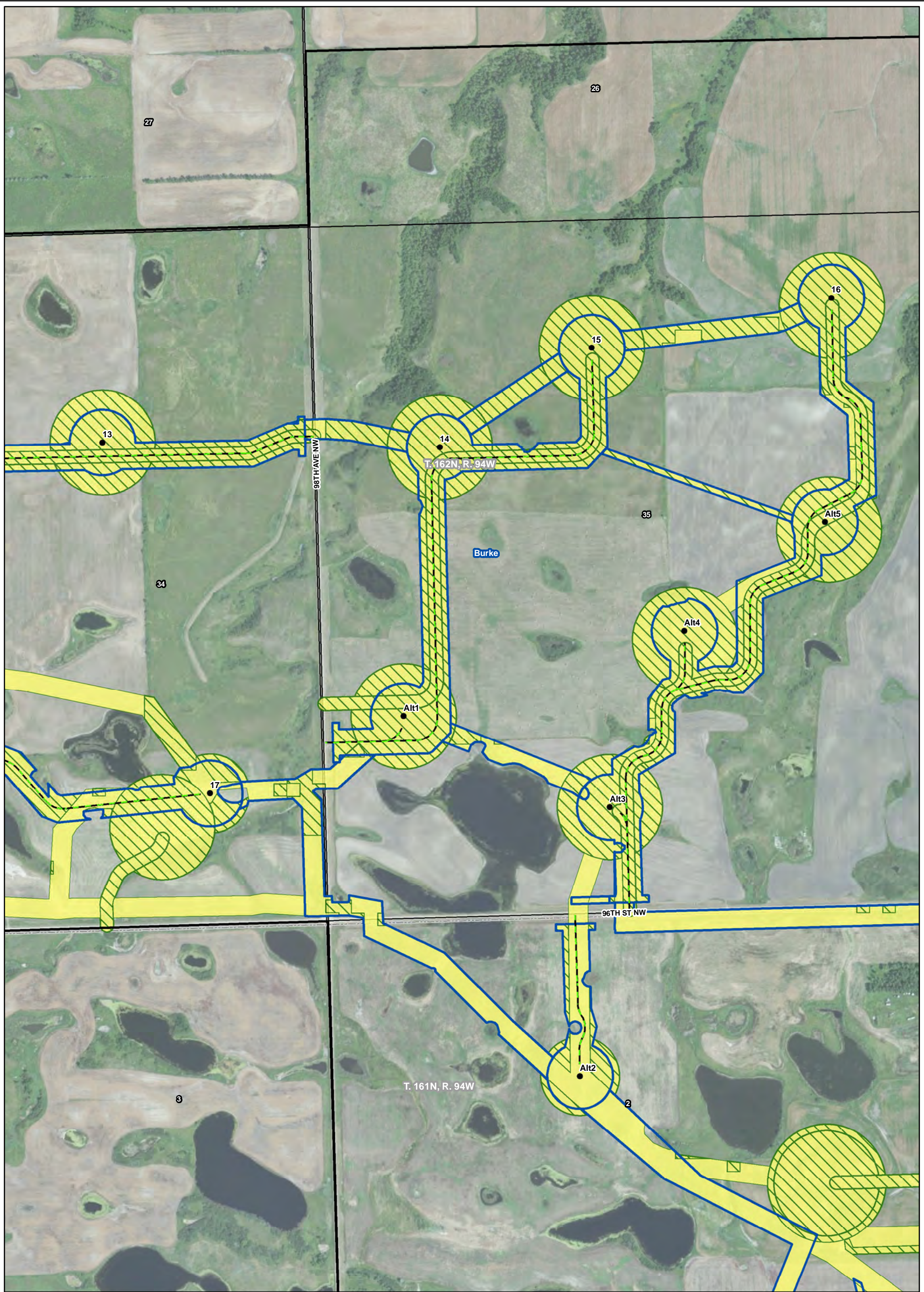
0 0.15 0.3 Miles
0 0.15 0.3 Kilometers

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Quadrangle: Columbus SW (1981), Columbus SE (1981)
Township/Range: T162N, R94W

Burke County, North Dakota
Projection: NAD 1983 UTM Zone 13N

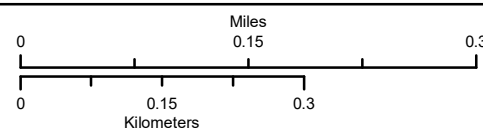
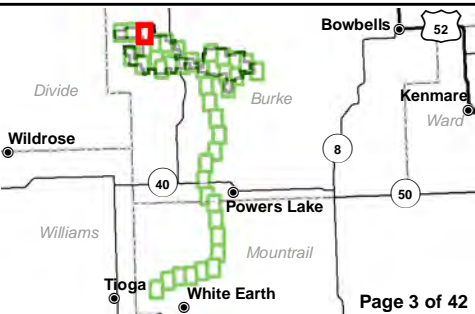
Page 2 of 42

Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

- Proposed Turbine Location: (Updated January 21, 2019)
- Proposed Transmission Line: (Updated August 8, 2018)
- Proposed Service Road: (Updated January 21, 2019)
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- Wind Energy Center WRA
- Proposed Construction Easement
- Suitable Habitat - Habitat Surveys
- Unsuitable Habitat - Habitat Surveys
- Unsuitable Habitat - Desktop Analysis
- 150 ft wide Transmission Line Corridor
- Township/Range Boundary
- Section Boundary
- County Boundary
- County Boundary



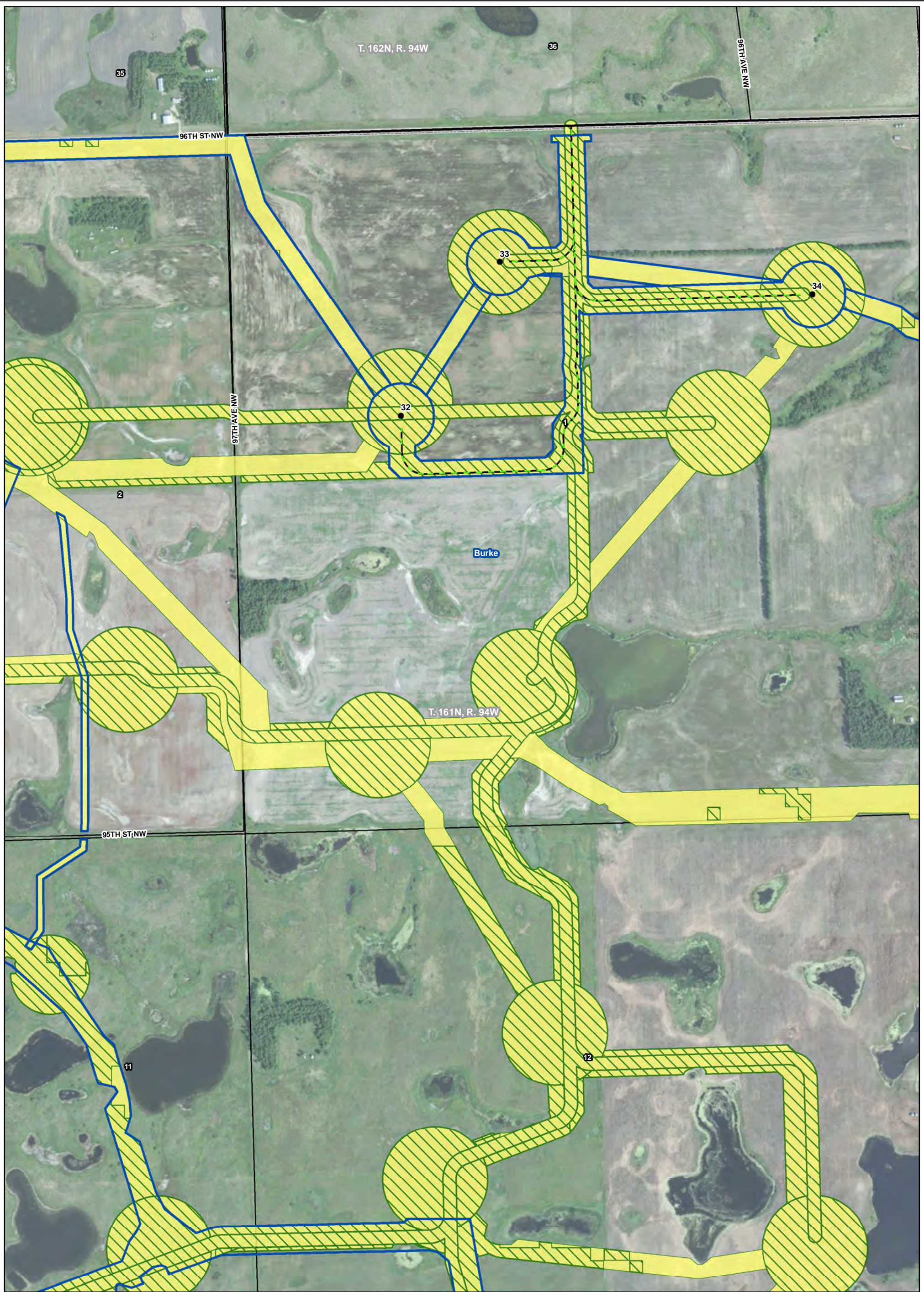
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 Quadrangle: Columbus SE (1981)

Township/Range: T162N, R94W & T161N, R94W
 Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

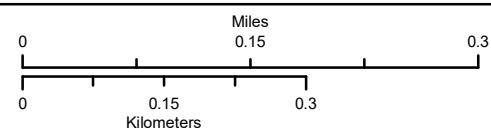
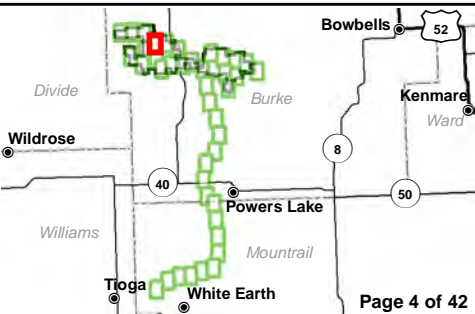


Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Columbus SE (1981)

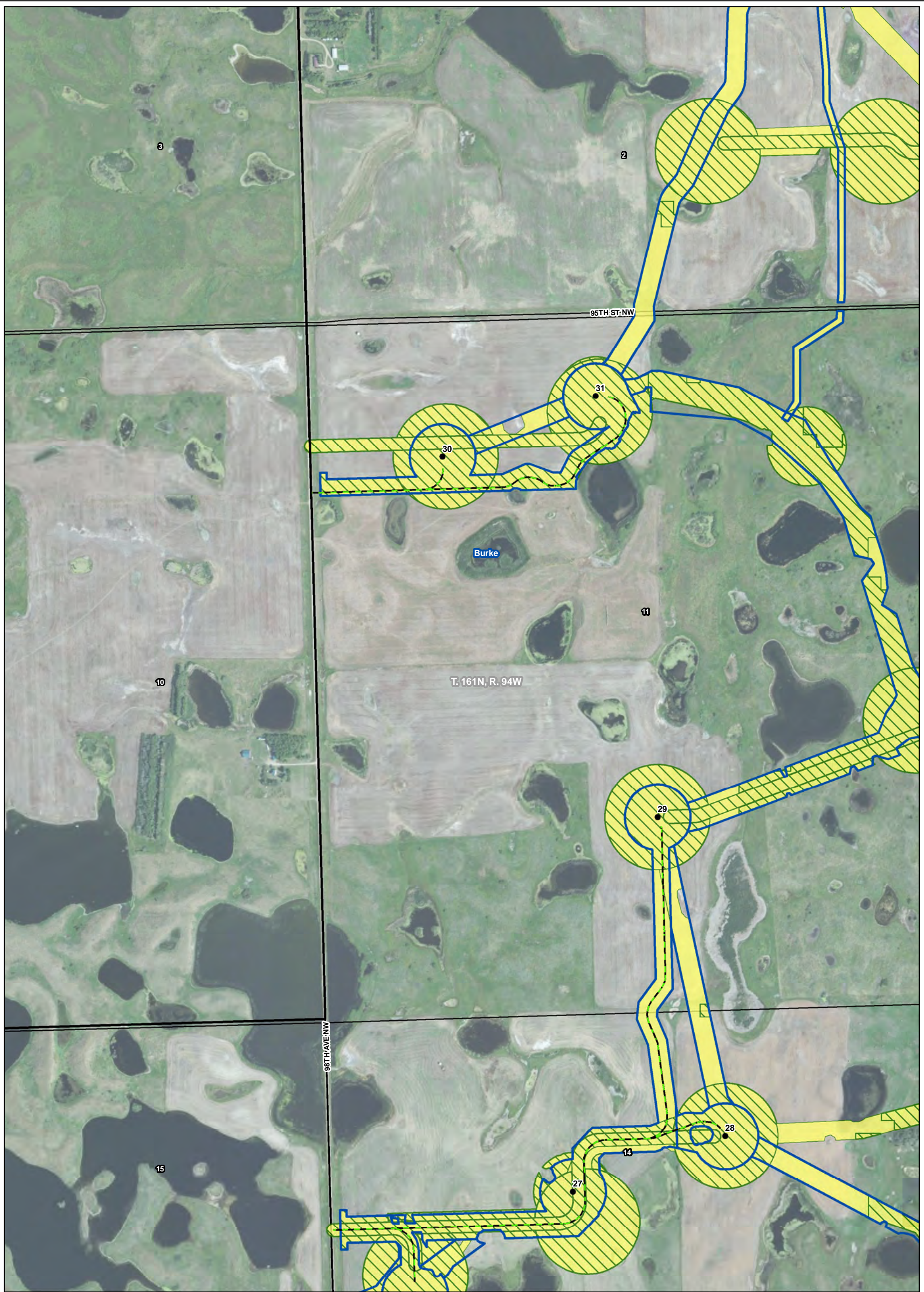
Township/Range: T161N, R94W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

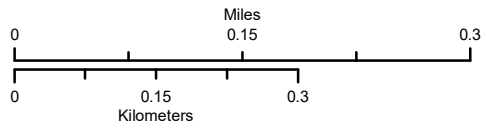
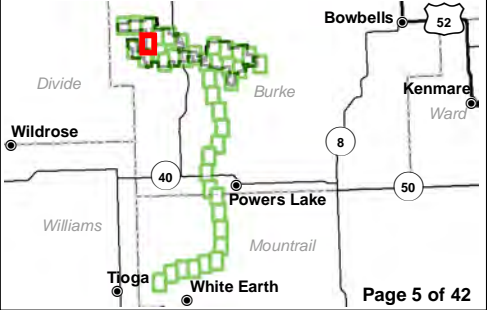


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Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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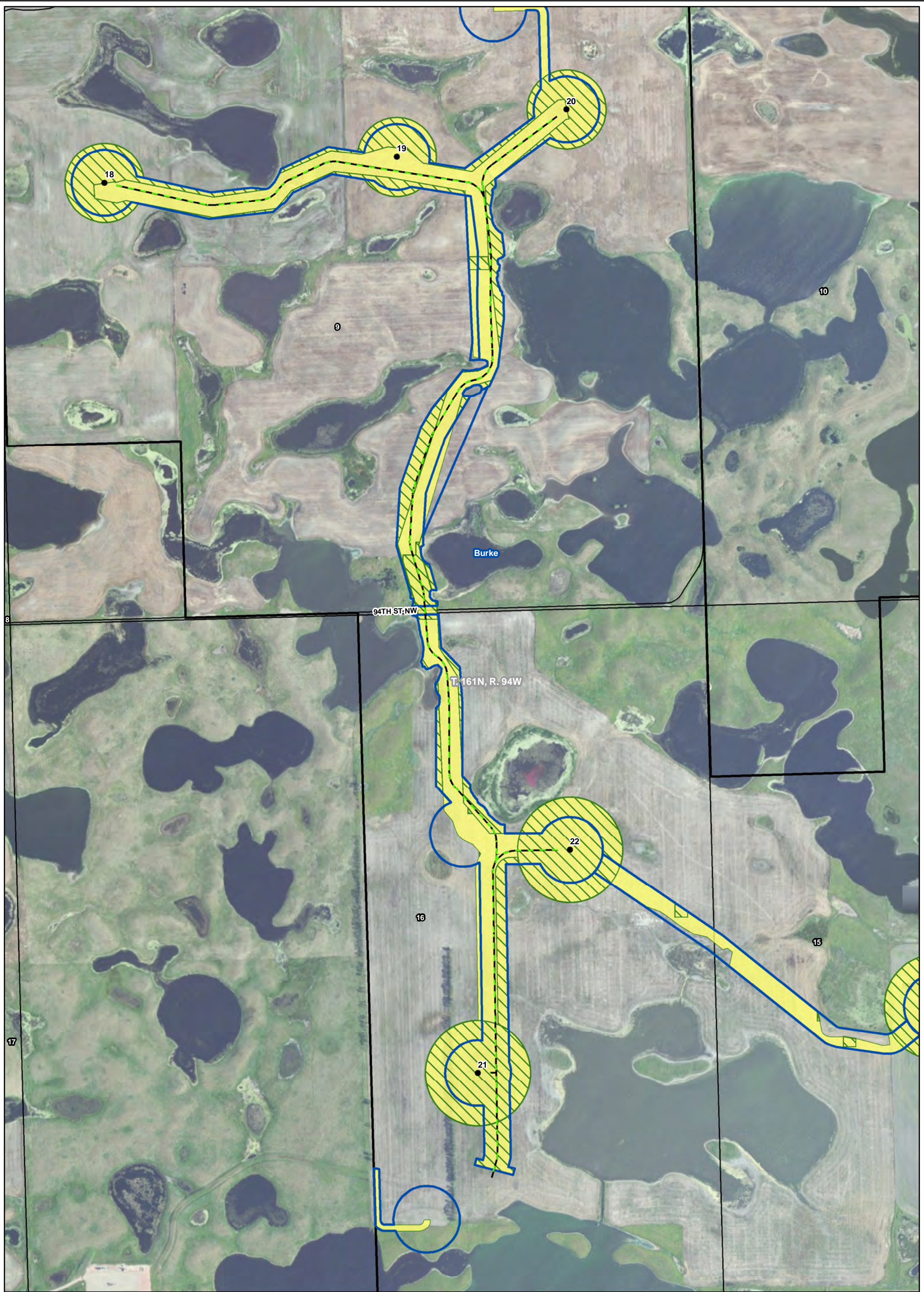
Township/Range: T161N, R94W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N



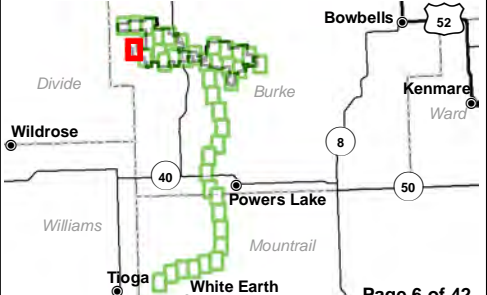
Date: 1/25/2019



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SWCA
ENVIRONMENTAL CONSULTANTS



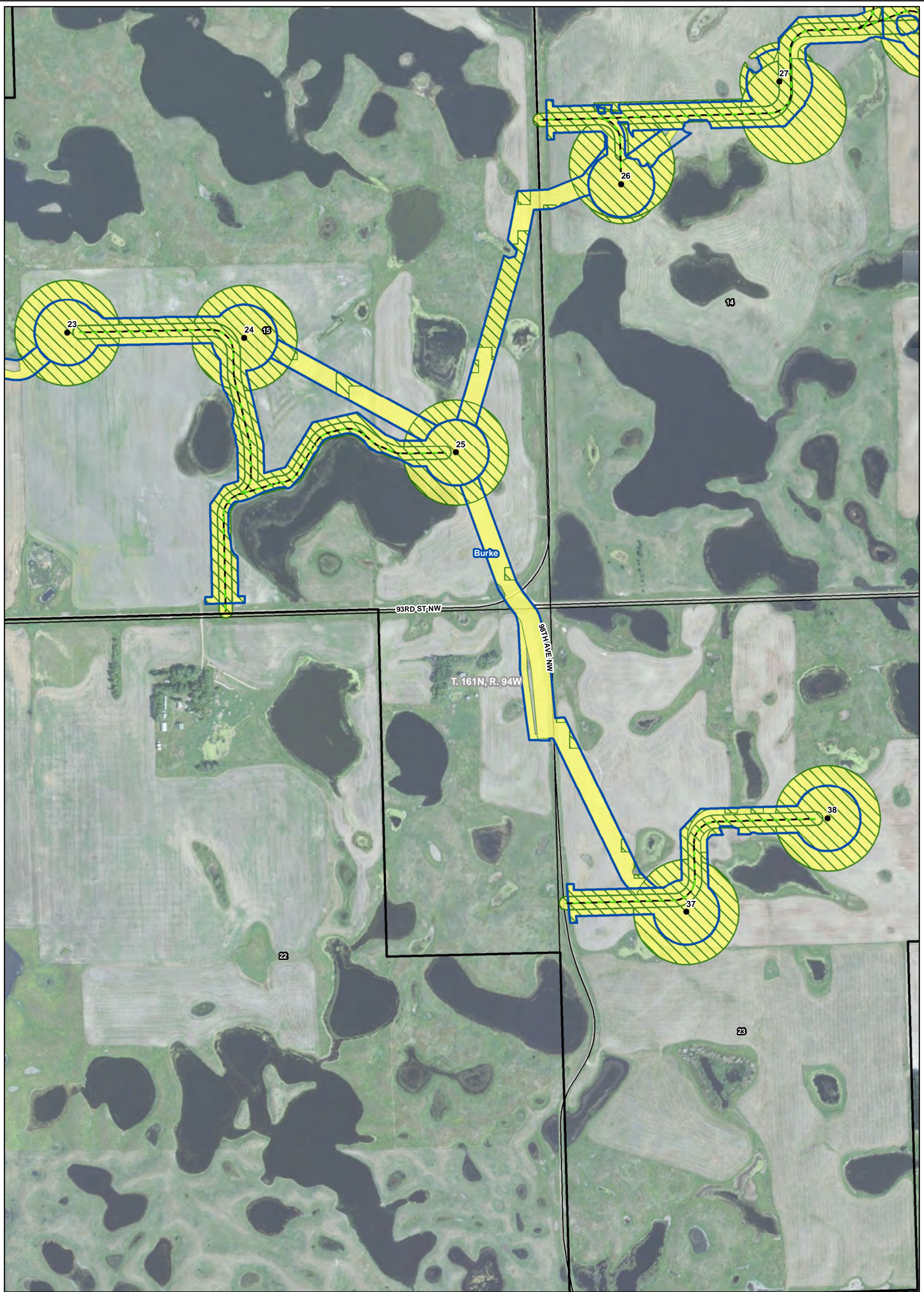
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Miles

0 0.15 0.3
Kilometers

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Quadrangle: Columbus SW (1981), Columbus SE (1981)
Township/Range: T161N, R94W

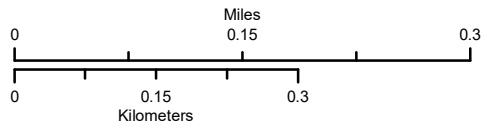
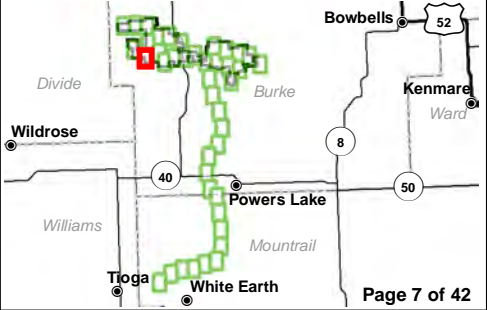
Burke County, North Dakota
Projection: NAD 1983 UTM Zone 13N

Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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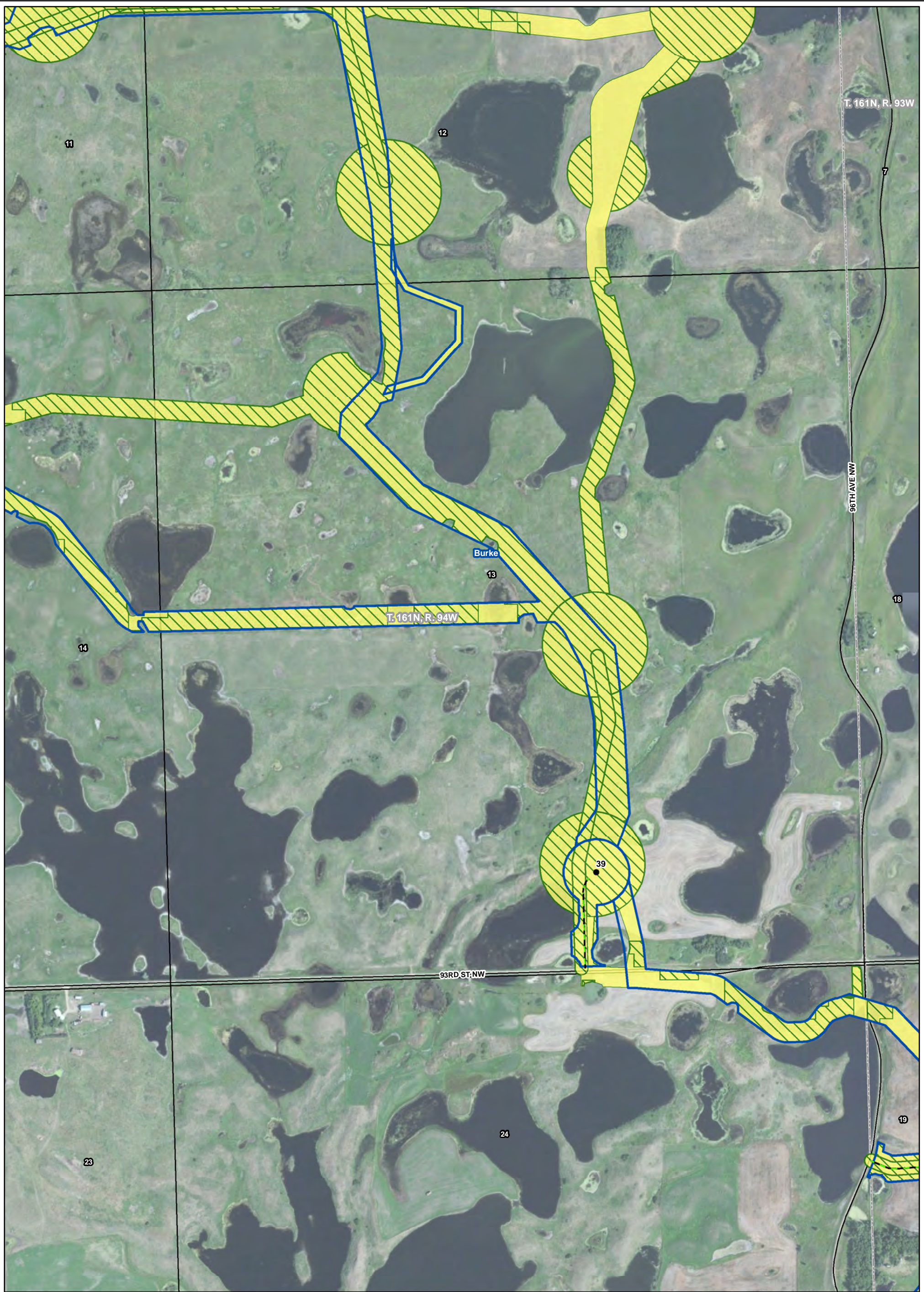
Township/Range: T161N, R94W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

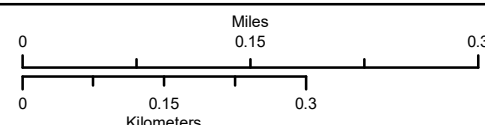
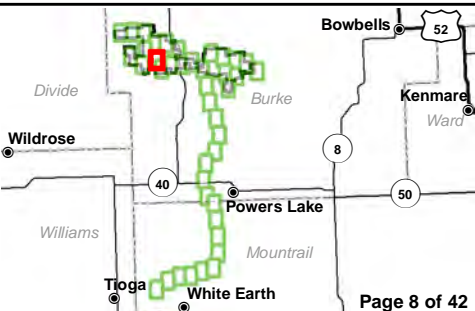


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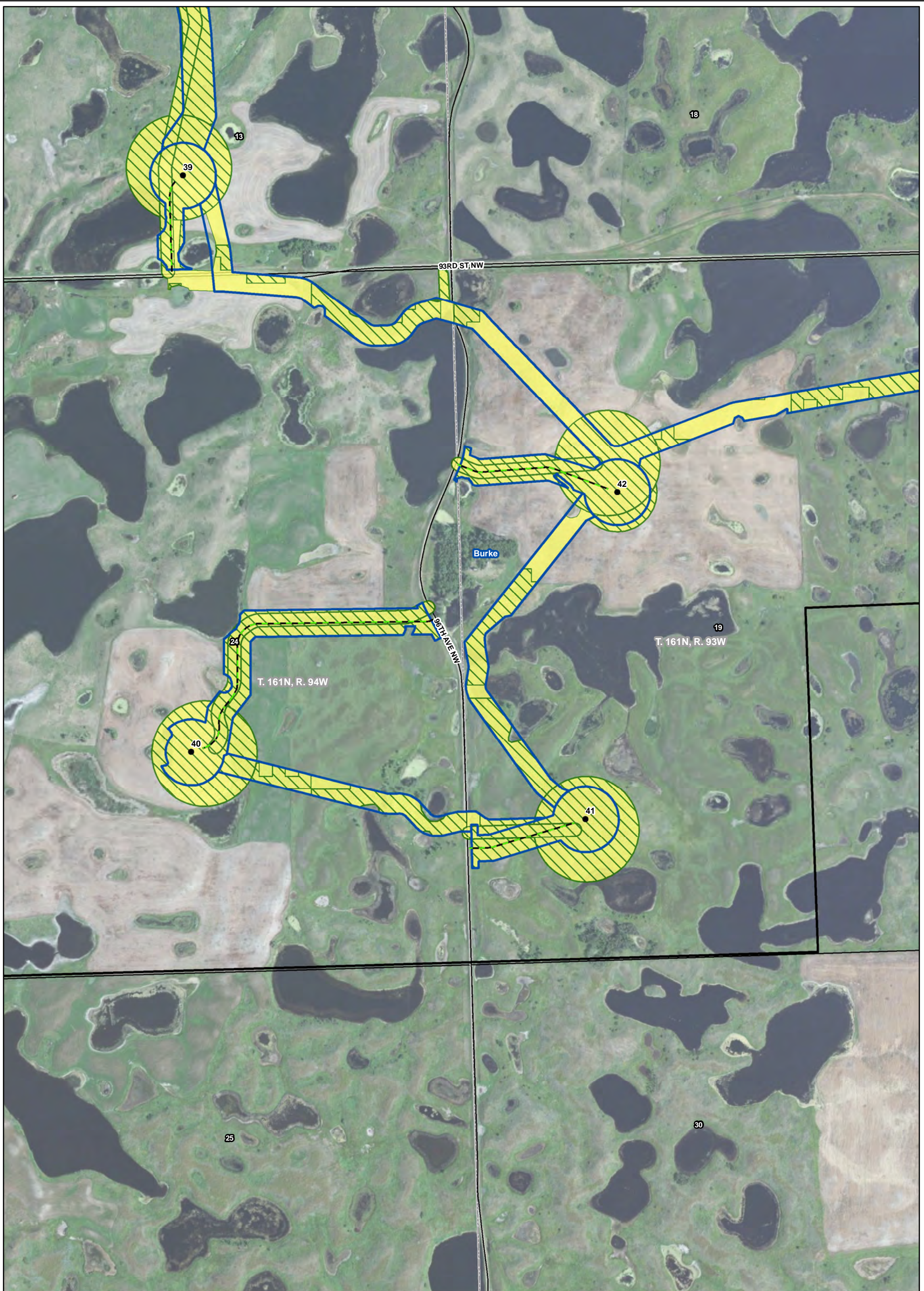
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Township/Range: T161N, R94W & T161N, R93W
 Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

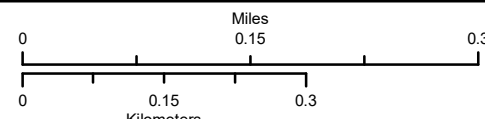
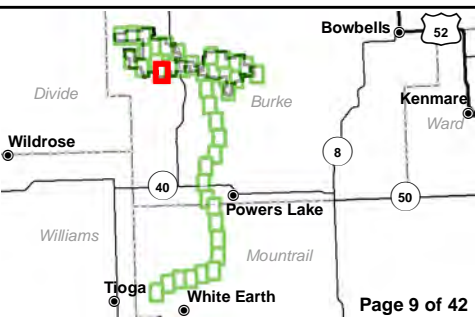


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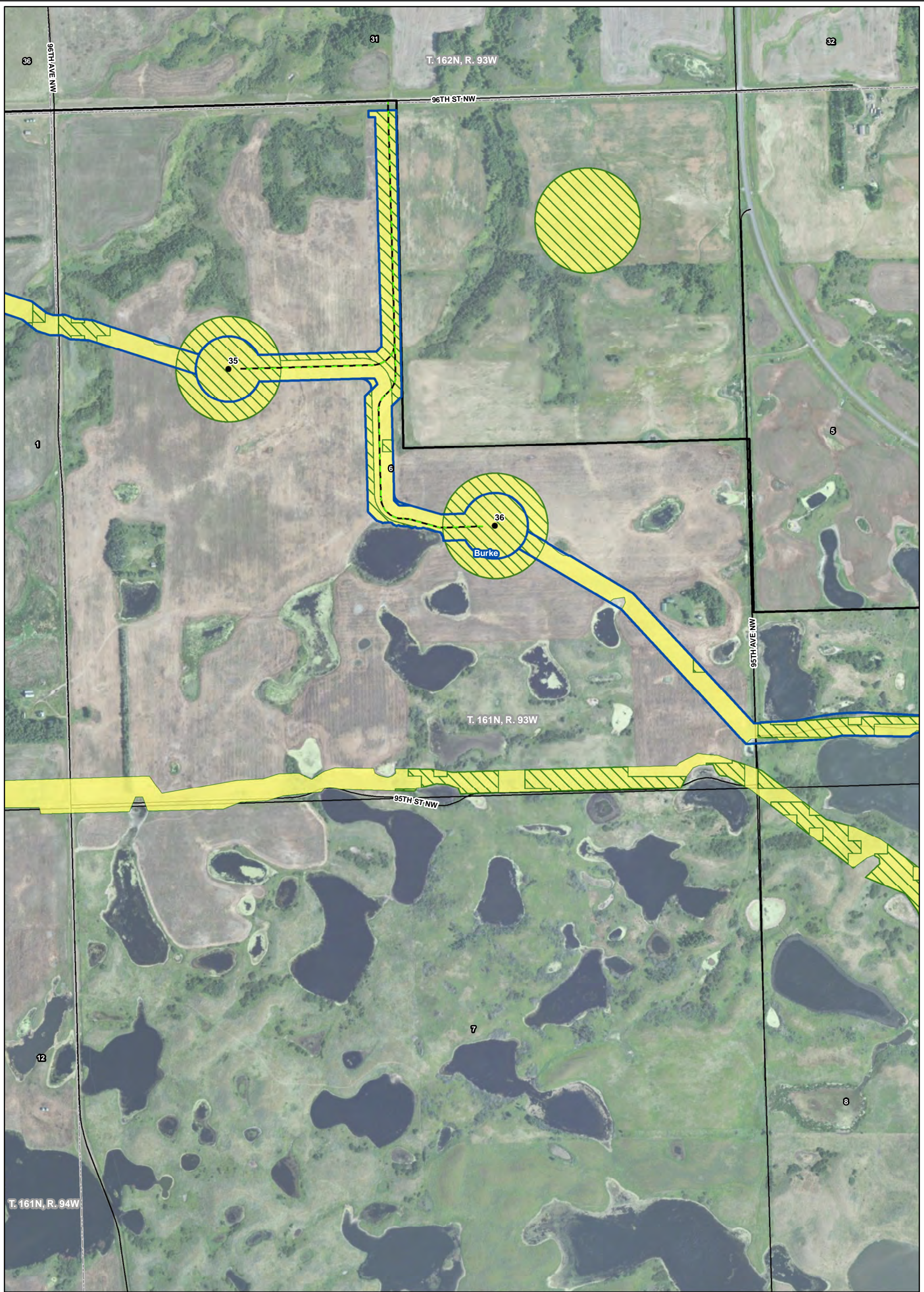
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Township/Range: T161N, R94W & T161N, R93W
 Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N



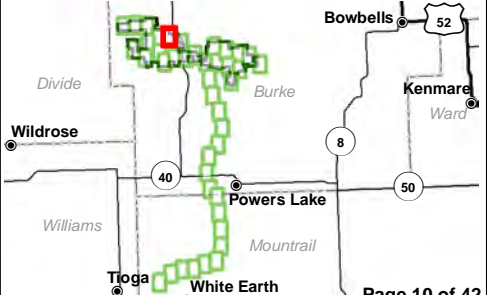
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SWCA
ENVIRONMENTAL CONSULTANTS



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Miles

0 0.15 0.3
Kilometers

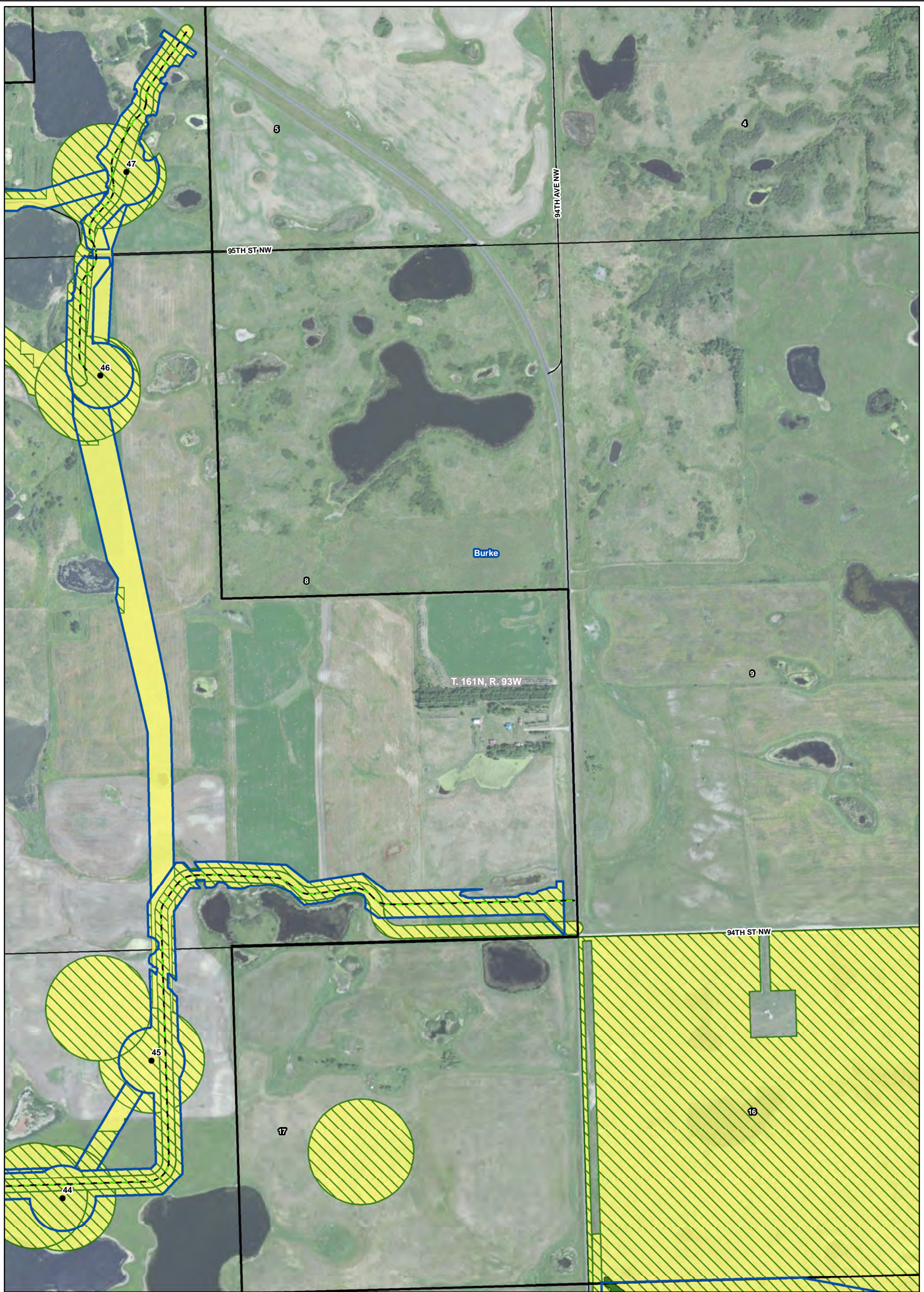
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Quadrangle: Columbus SE (1981)

Township/Range: T161N, R94W & T161N, R93W
Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

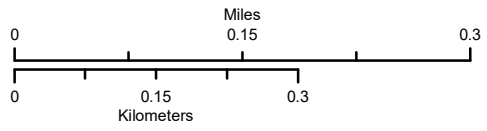
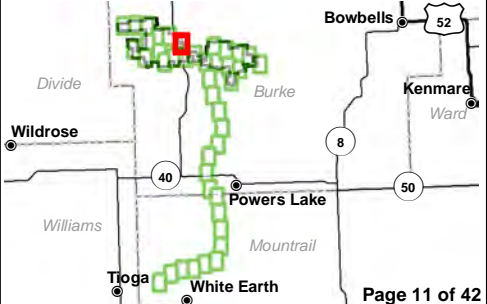
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Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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 Quadrangle: Columbus SE (1981)

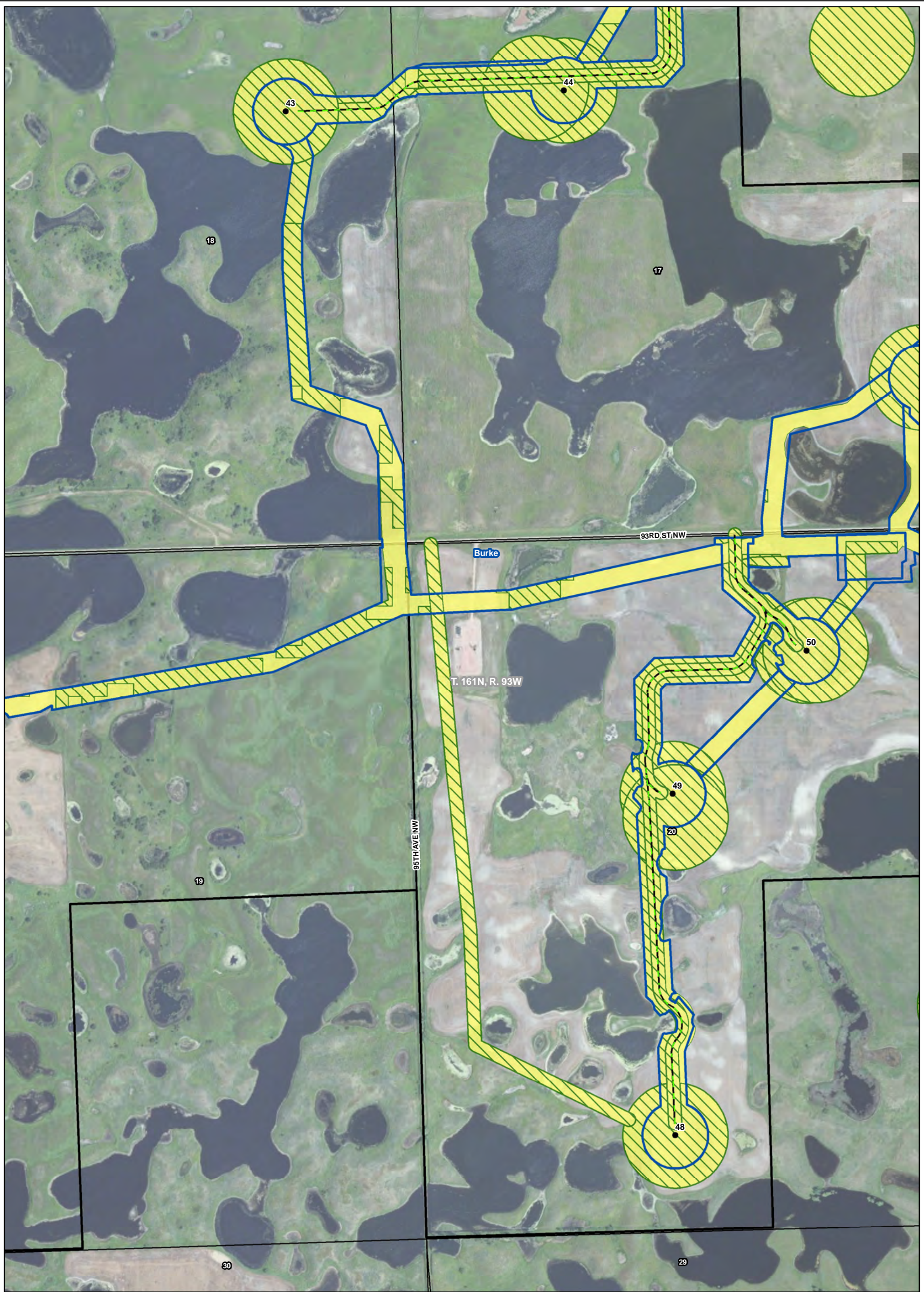
Township/Range: T161N, R93W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

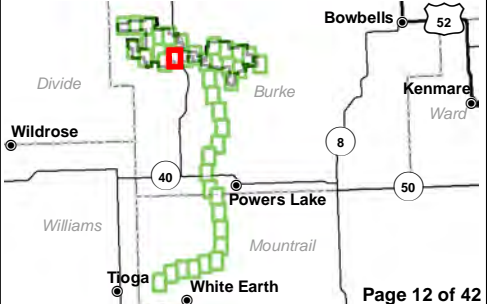


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Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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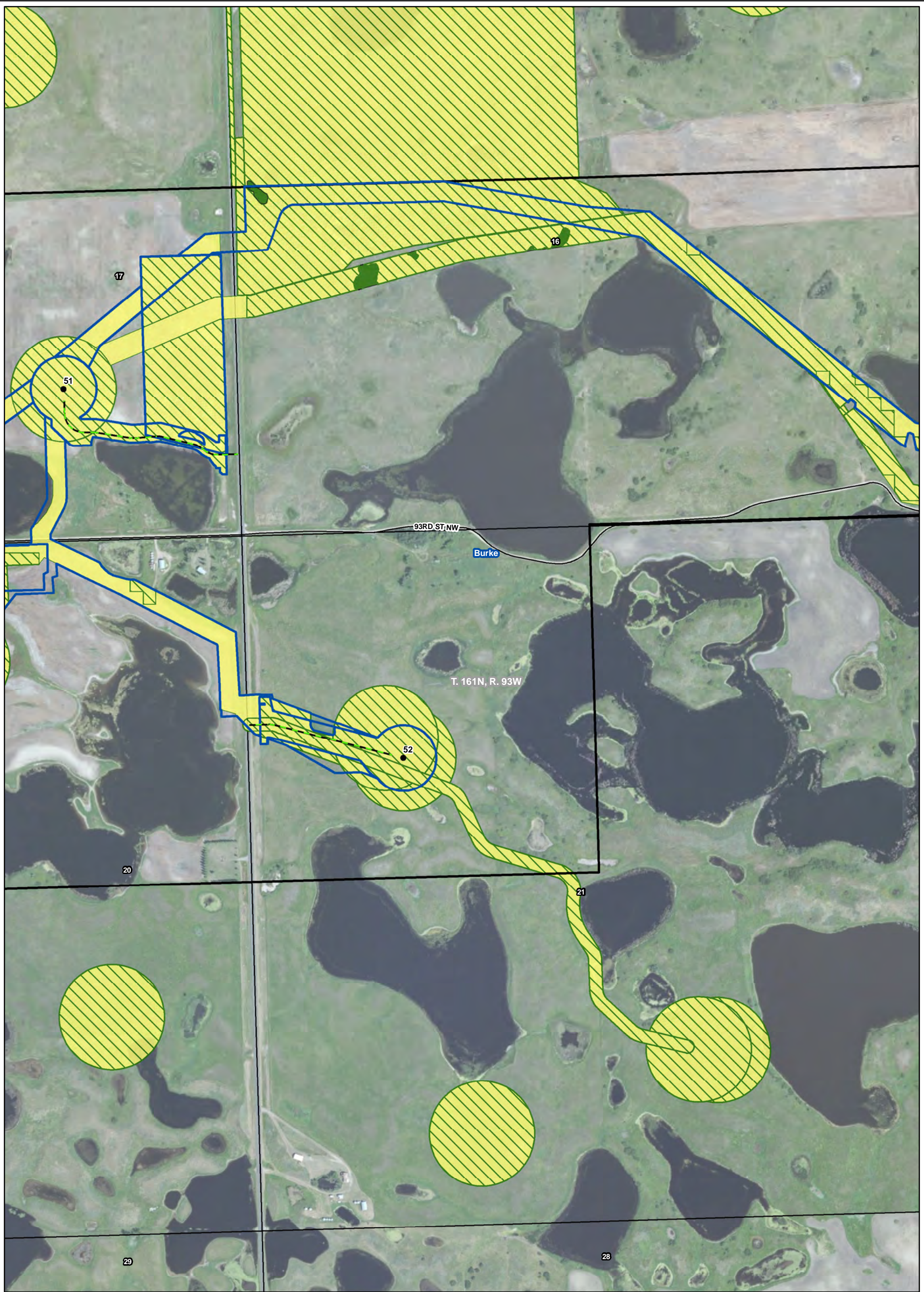
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Quadrangle: Columbus SE (1981)

Township/Range: T161N, R93W
Burke County, North Dakota
Projection: NAD 1983 UTM Zone 13N

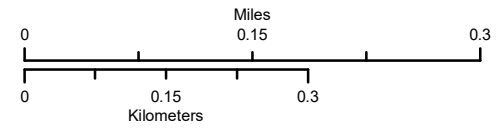
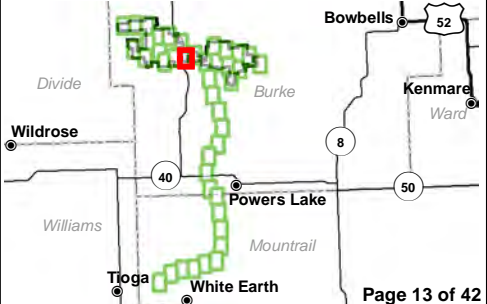
Page 12 of 42

Date: 1/25/2019

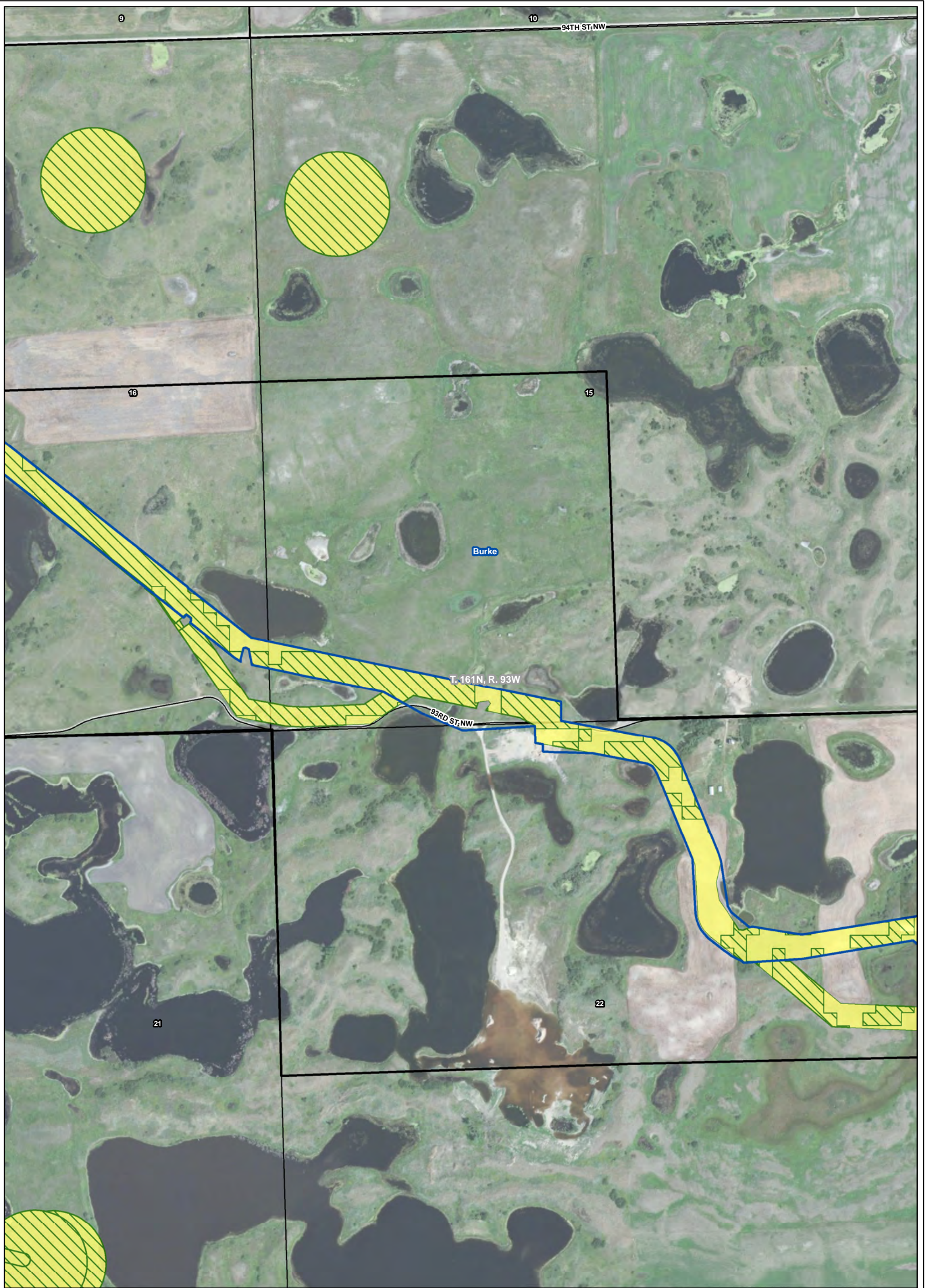


Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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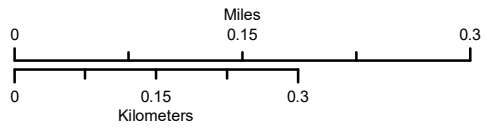
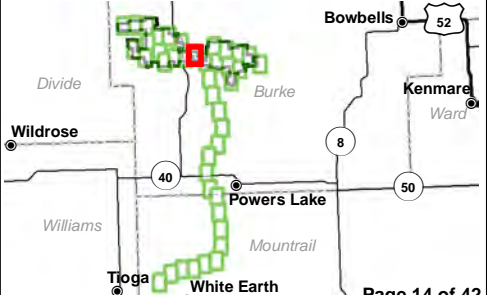


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Columbus SE (1981), Beaver Lake (1991)
 Township/Range: T161N, R93W



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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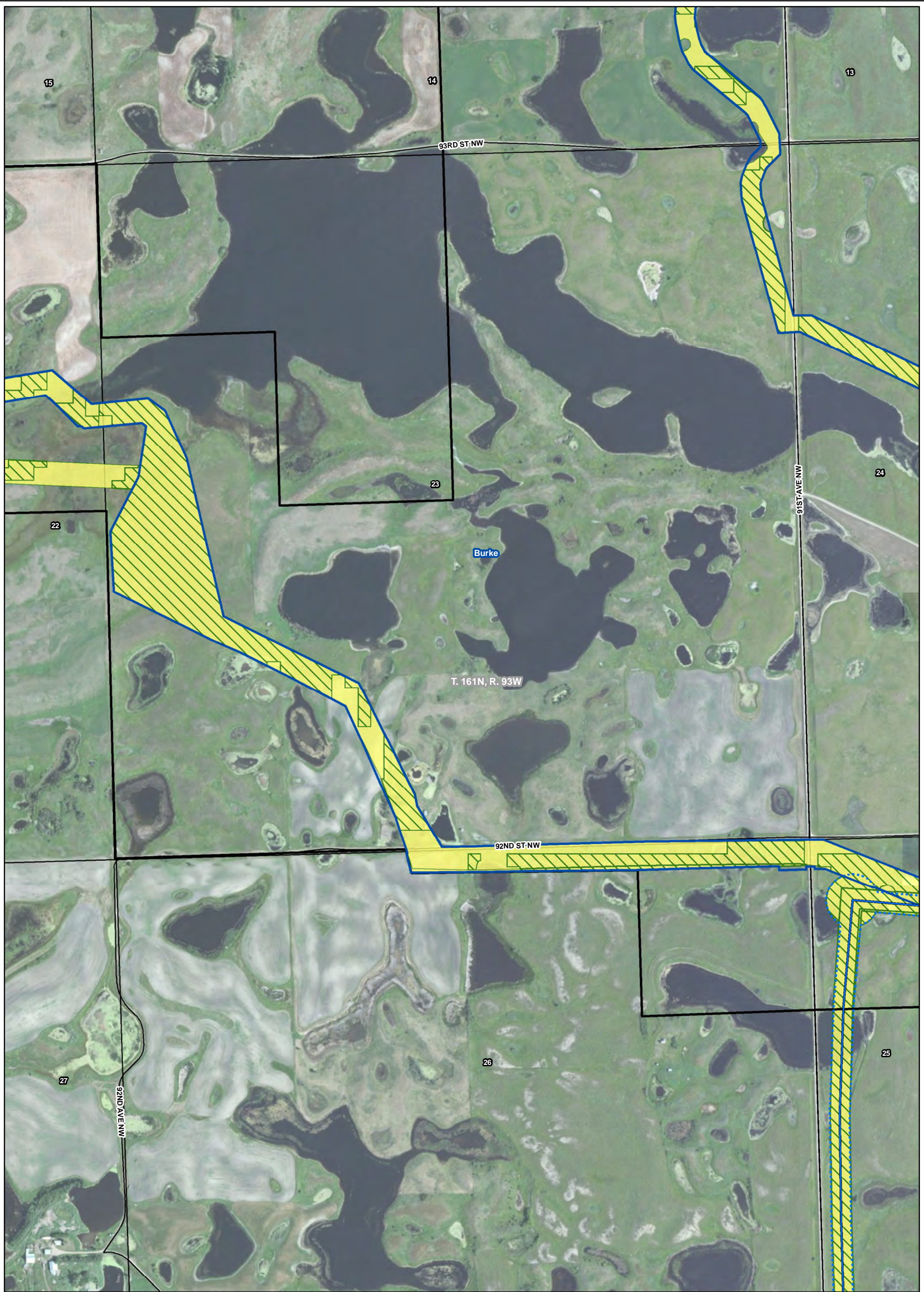
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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 Township/Range: T161N, R93W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N



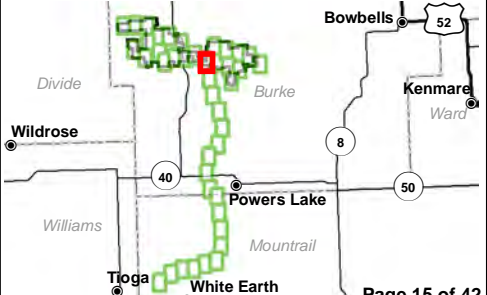
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Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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SWCA
ENVIRONMENTAL CONSULTANTS



0 0.15 0.3
Miles

0 0.15 0.3
Kilometers

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Quadrangle: Beaver Lake (1991), Grubb Lake (1974)
Township/Range: T161N, R93W

Burke County, North Dakota
Projection: NAD 1983 UTM Zone 13N

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Date: 1/25/2019

T. 161N, R. 92W

7

11

12

56

55

54

Burke

T. 161N, R. 93W

94TH ST, NW

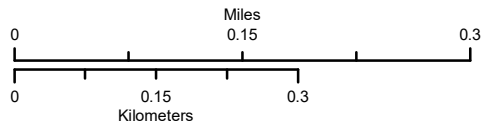
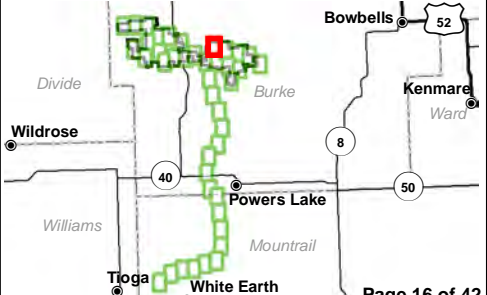
91ST AVE, NW

18

13

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community Quadrangle: Beaver Lake (1991)

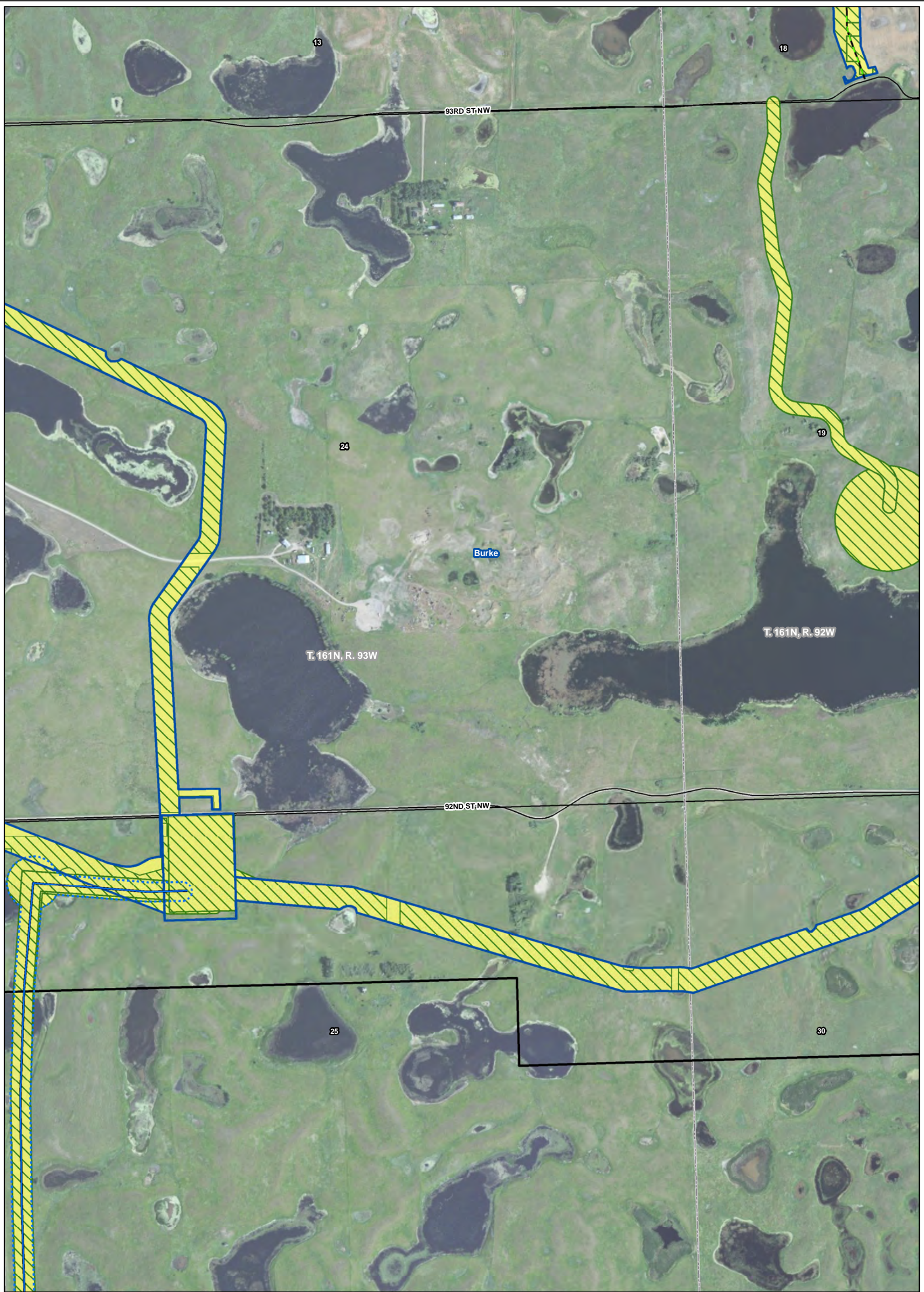
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Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

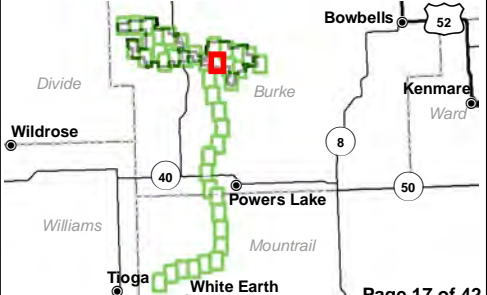


Date: 1/25/2019



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Miles

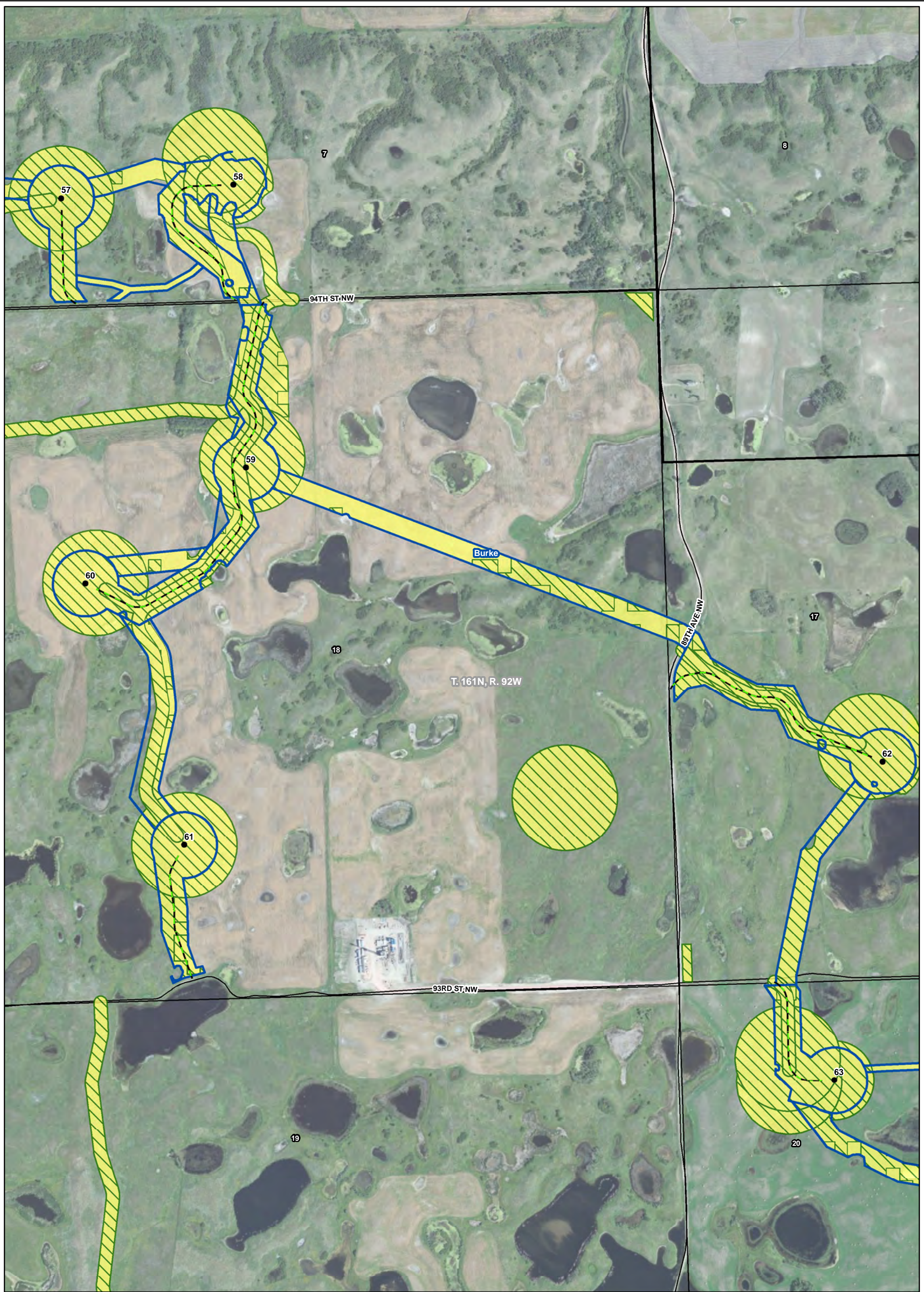
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Beaver Lake (1991), Grubb Lake (1974)
 Township/Range: T161N, R93W & T161N, R92W
 Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

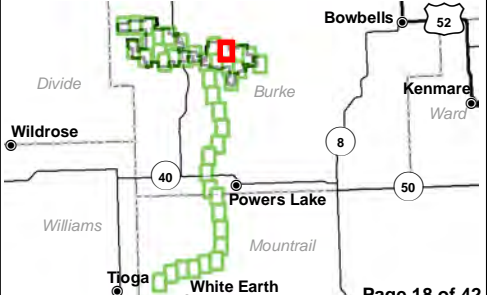
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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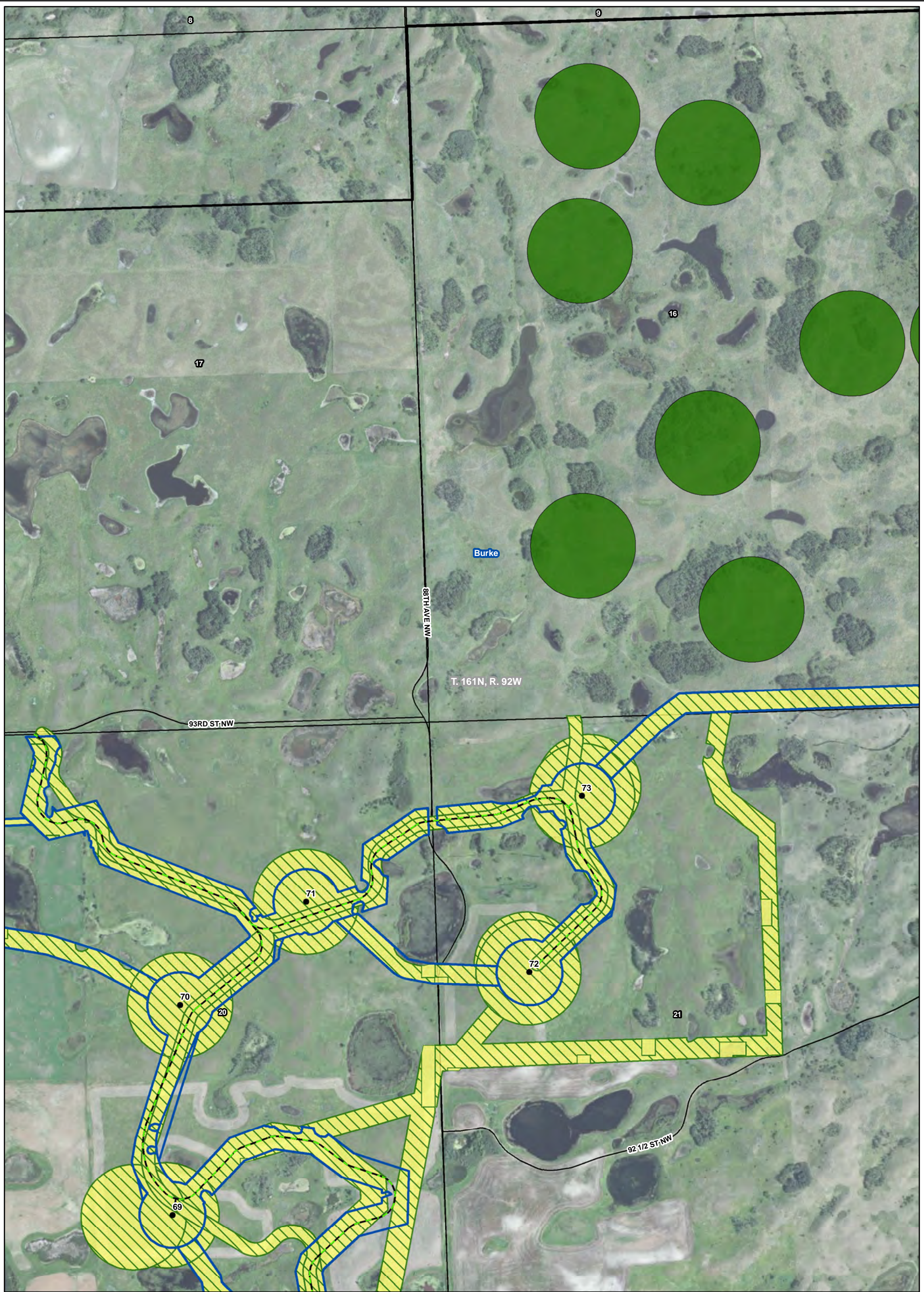
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Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

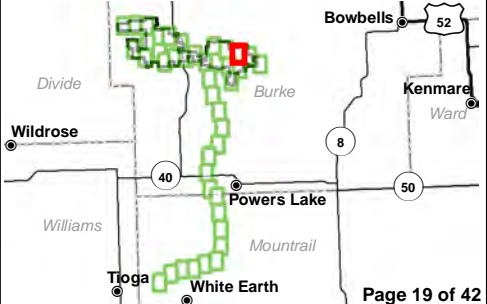
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- Unsuitable Habitat - Habitat Surveys
- Unsuitable Habitat - Desktop Analysis
- 150 ft wide Transmission Line Corridor
- Township/Range Boundary
- Section Boundary
- County Boundary
- County Boundary

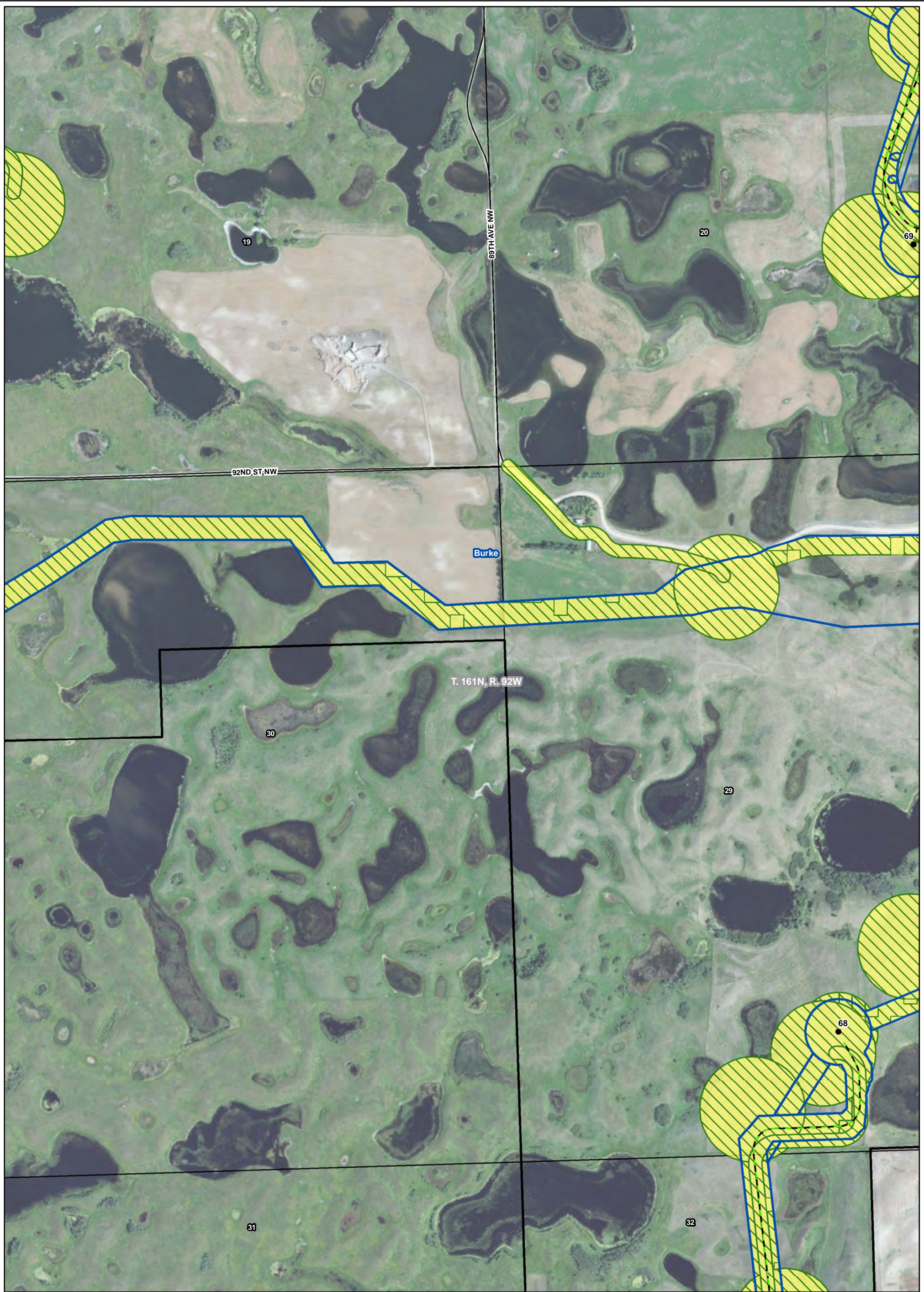


0 0.15 0.3 Miles
0 0.15 0.3 Kilometers

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Quadrangle: Beaver Lake (1991), Rennie Lake (1991)
Township/Range: T161N, R92W

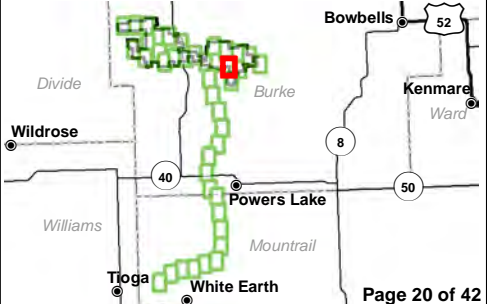
Burke County, North Dakota
Projection: NAD 1983 UTM Zone 13N

Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

- Proposed Turbine Location: (Updated January 21, 2019)
- Proposed Transmission Line: (Updated August 8, 2018)
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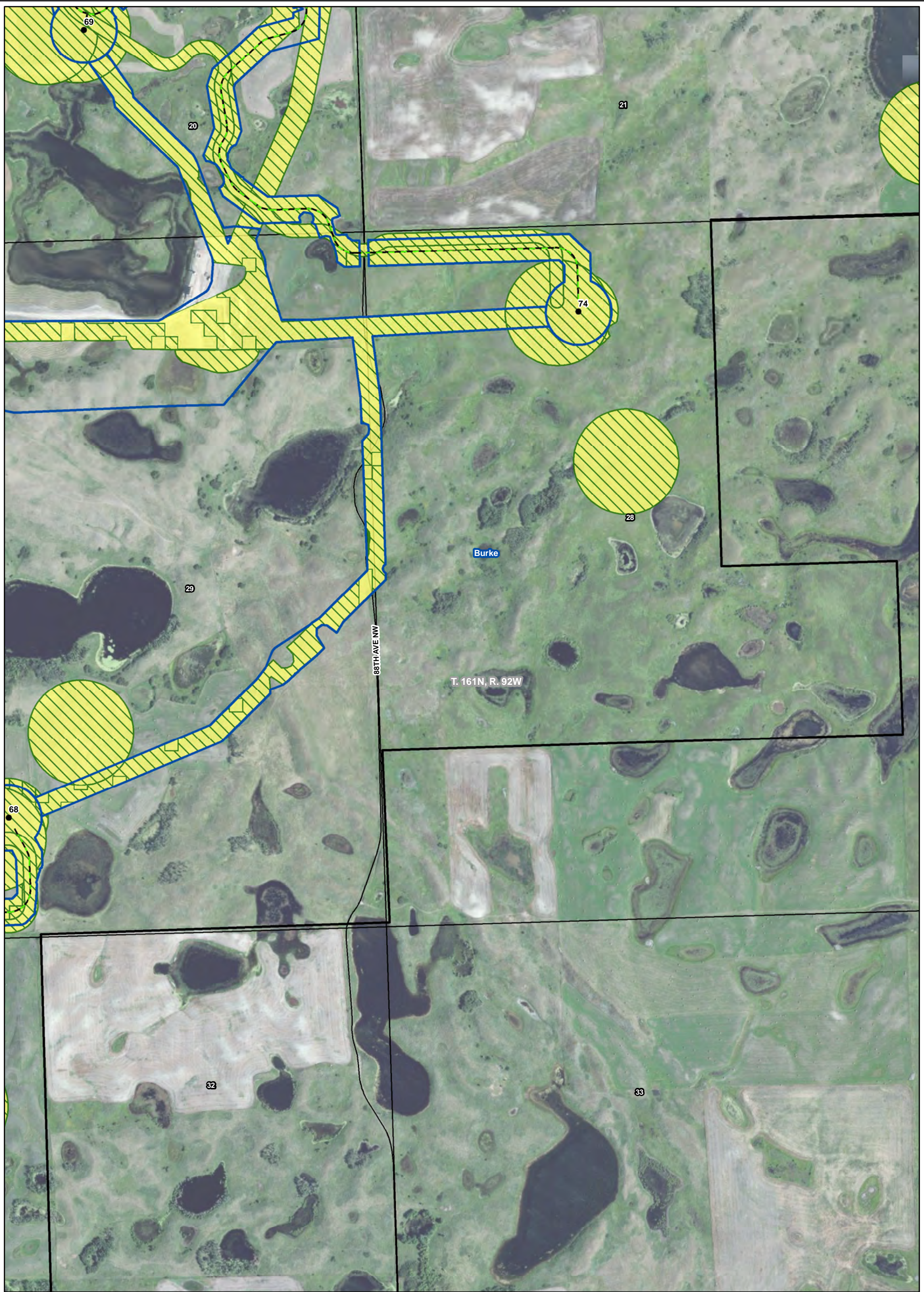
0 0.15 0.3 Miles
0 0.15 0.3 Kilometers

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Quadrangle: Beaver Lake (1991), Grubb Lake (1974)
Township/Range: T161N, R92W

Burke County, North Dakota
Projection: NAD 1983 UTM Zone 13N

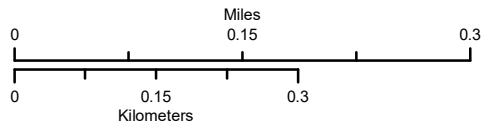
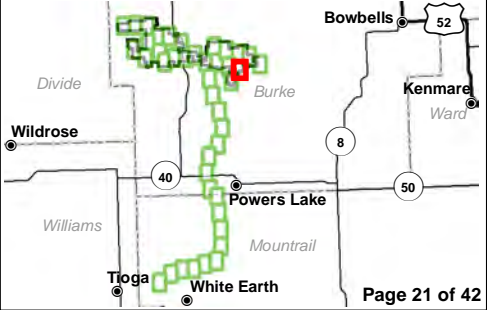
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Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

- Proposed Turbine Location (Updated January 21, 2019)
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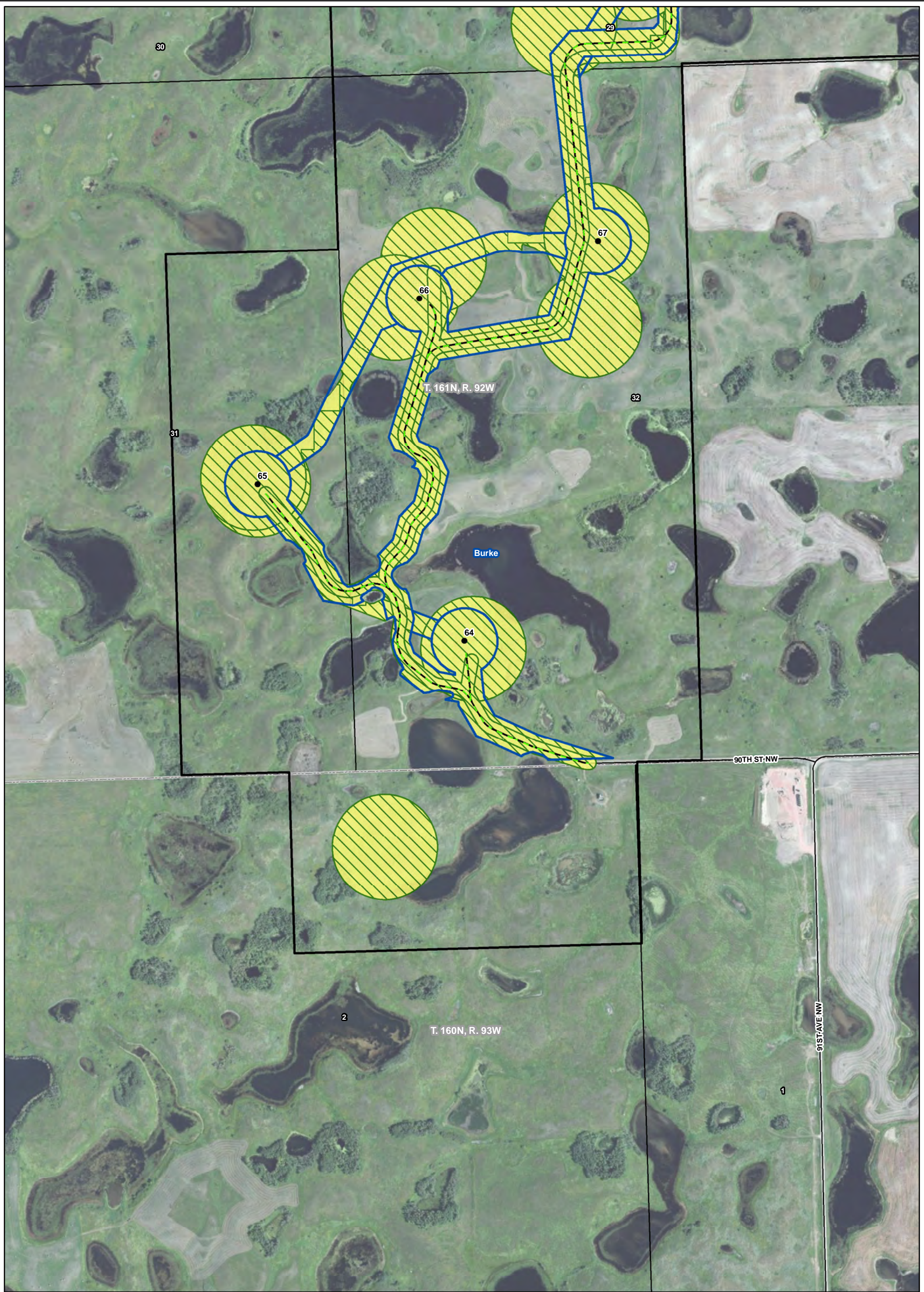


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Beaver Lake (1991), Grubb Lake (1974)
 Township/Range: T161N, R92W

Burke County, North Dakota
 Projection: NAD 1983 UTM Zone 13N

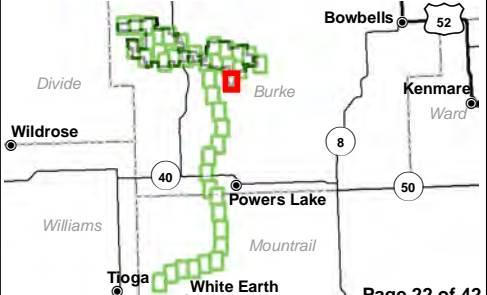


Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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0 0.15 0.3
Miles

0 0.15 0.3
Kilometers

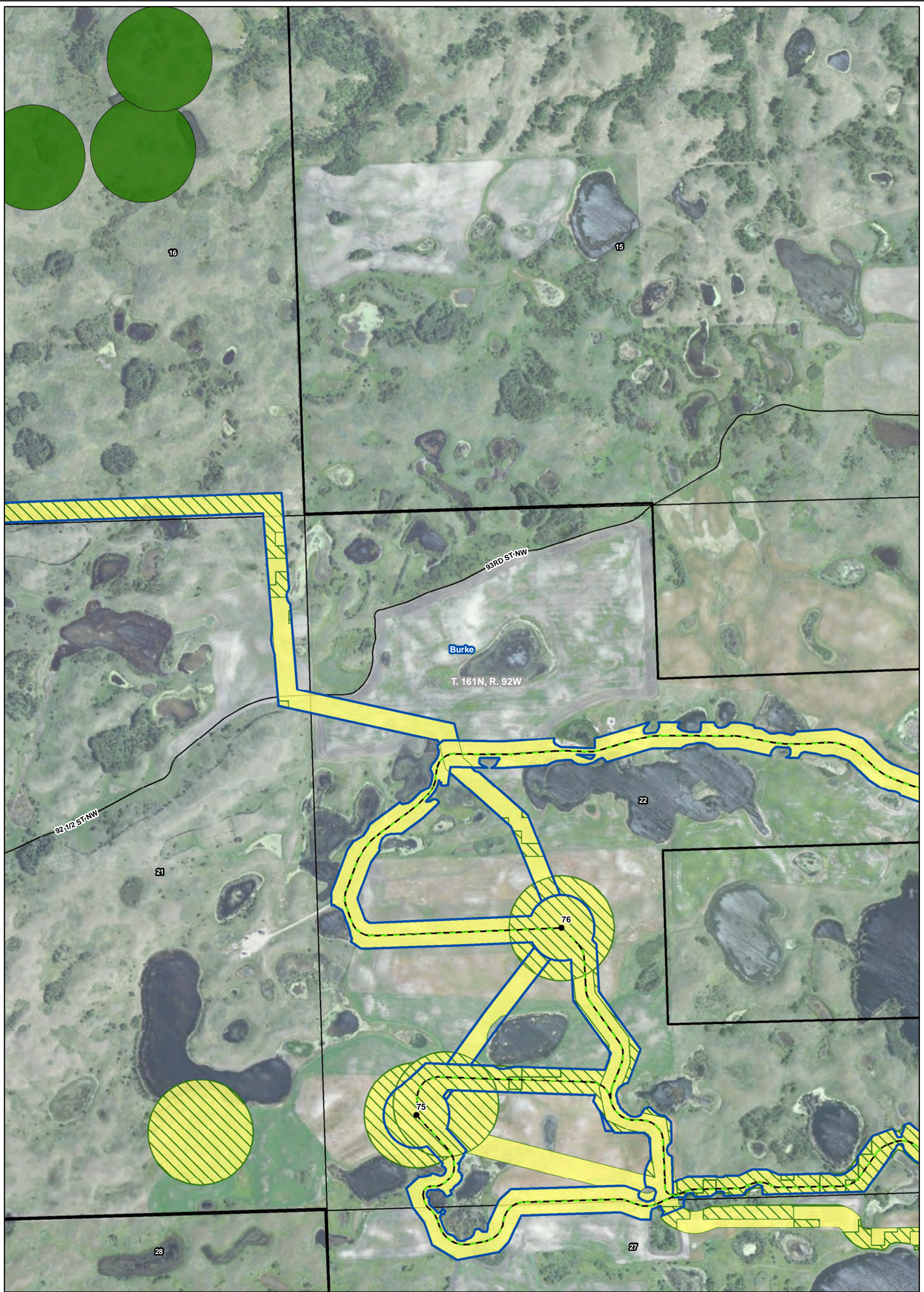
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Quadrangle: Grubb Lake (1974)

Township/Range: T161N, R92W

Burke County, North Dakota

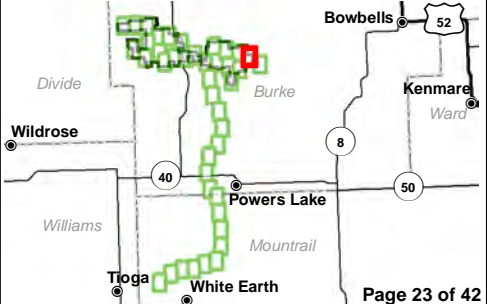
Projection: NAD 1983 UTM Zone 13N

Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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0 0.15 0.3 Miles
0 0.15 0.3 Kilometers

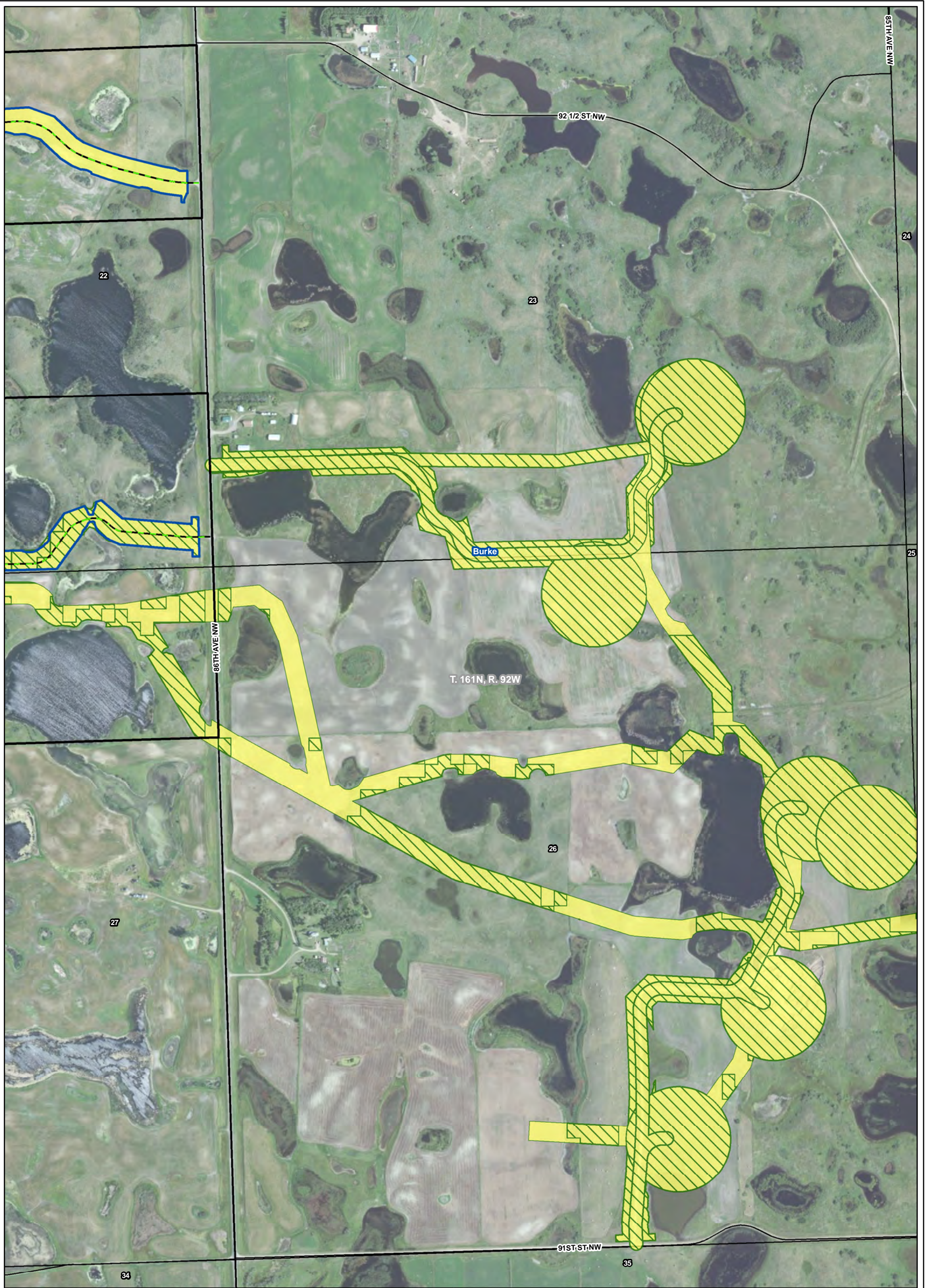
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Quadrangle: Rennie Lake (1991)

Township/Range: T161N, R92W

Burke County, North Dakota

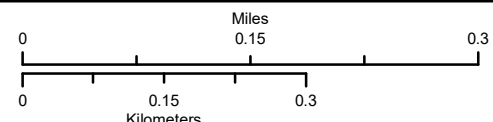
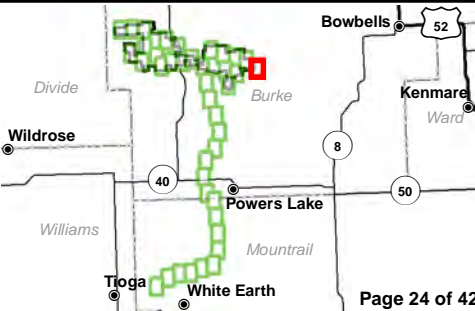
Projection: NAD 1983 UTM Zone 13N

Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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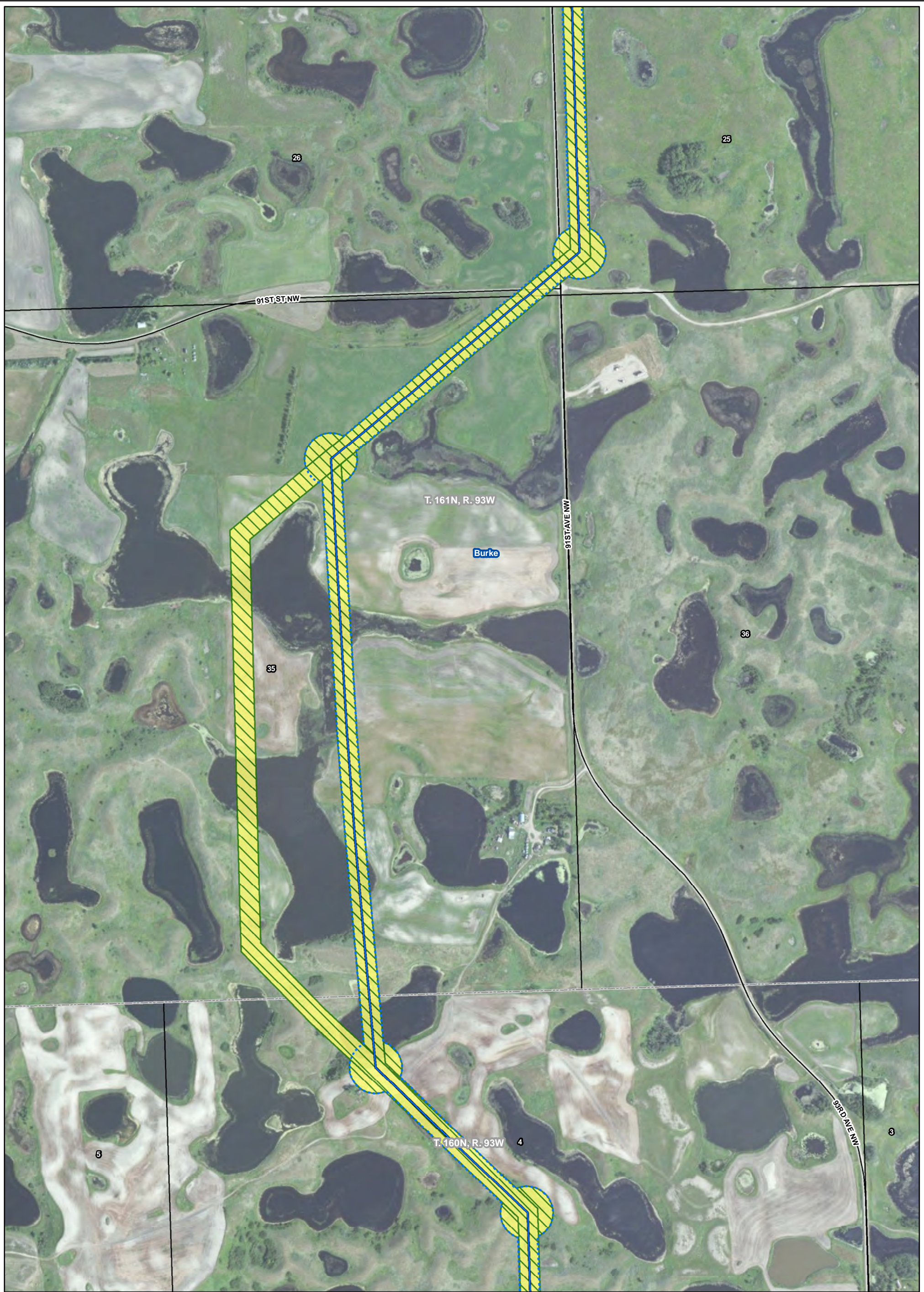


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Rennie Lake (1991), Helde Lake (1974)
 Township/Range: T161N, R92W

Burke County, North Dakota
 Projection: NAD 1983 UTM Zone 13N

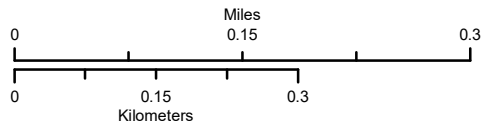
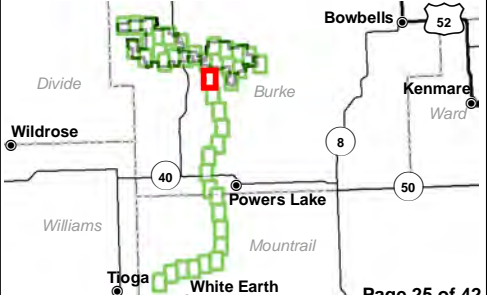


Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Grubb Lake (1974)

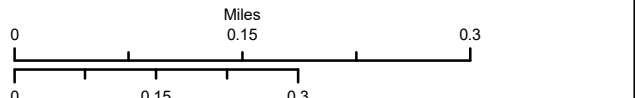
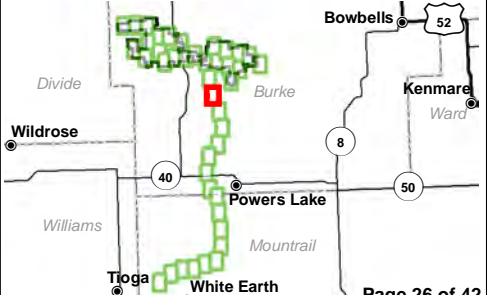
Township/Range: T161N, R93W & T160N, R93W
 Burke County, North Dakota





Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

- Proposed Turbine Location: (Updated January 21, 2019)
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Grubb Lake (1974)

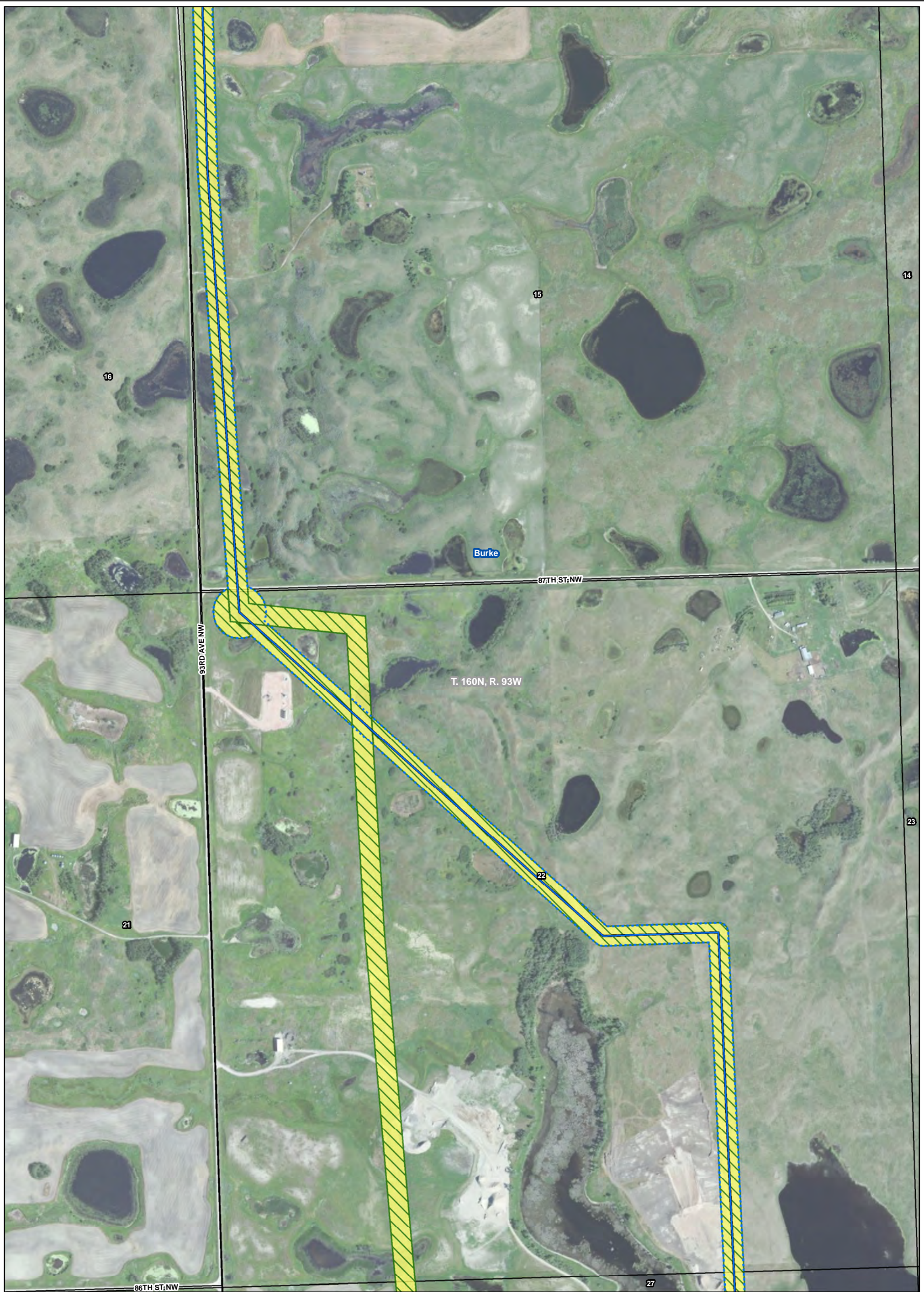
Township/Range: T160N, R93W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

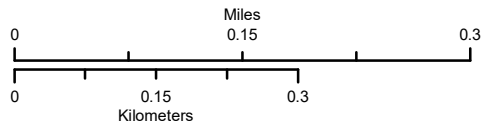
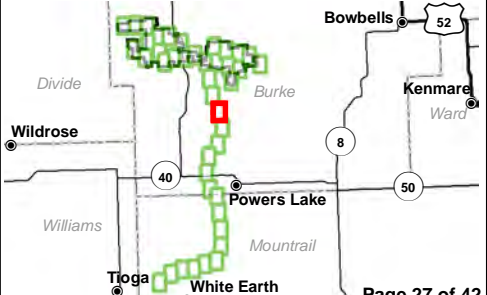


Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Grubb Lake (1974)

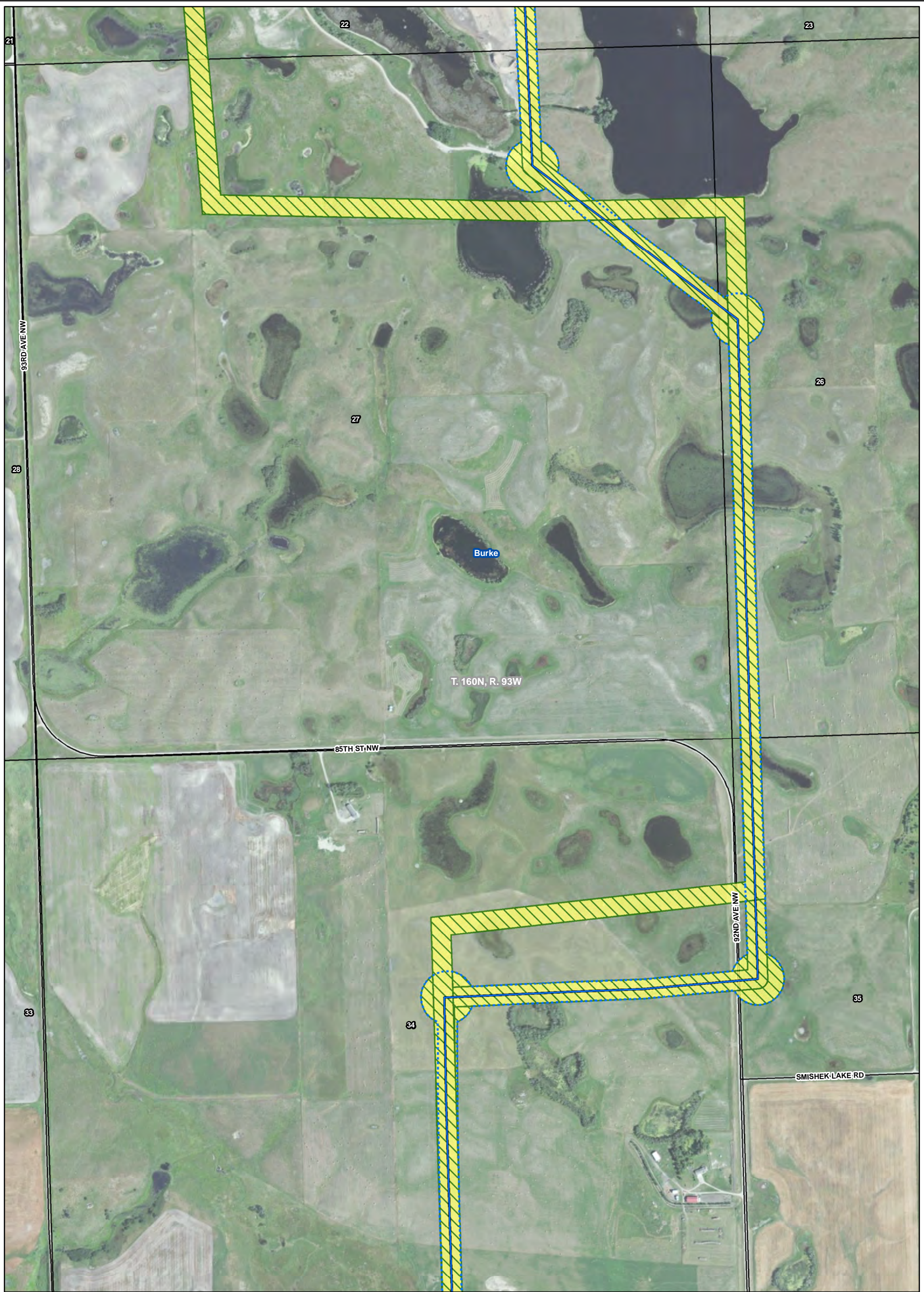
Township/Range: T160N, R93W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

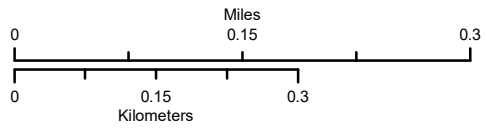
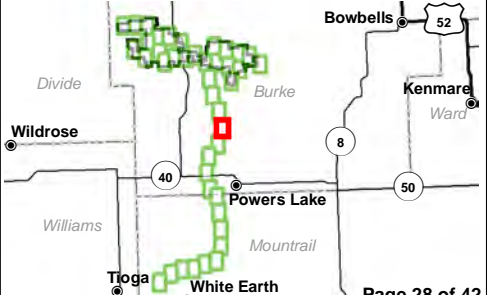


Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Grubb Lake (1974)

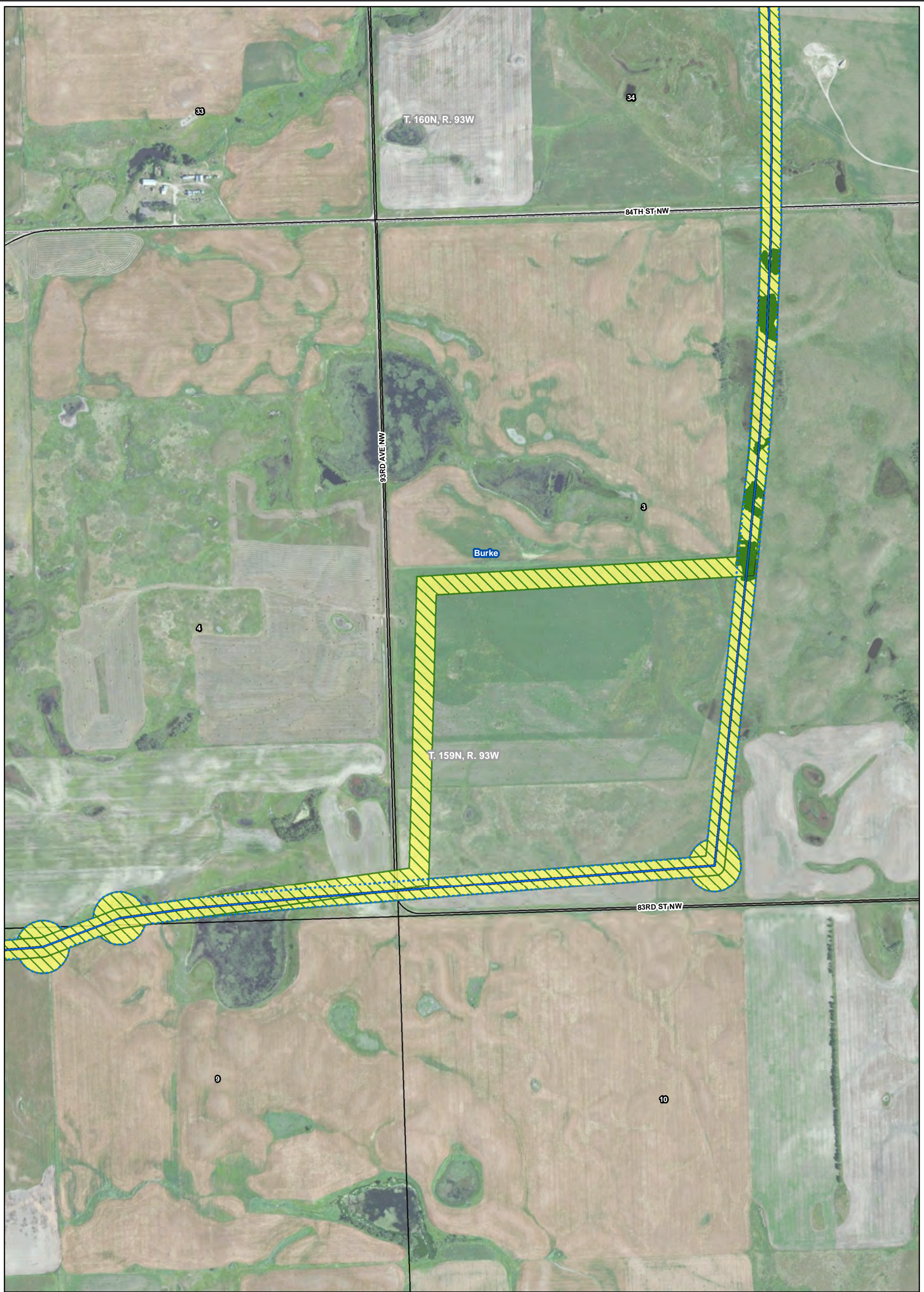
Township/Range: T160N, R93W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

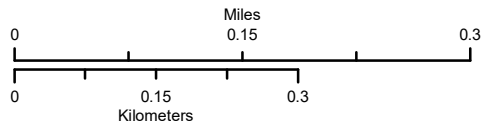
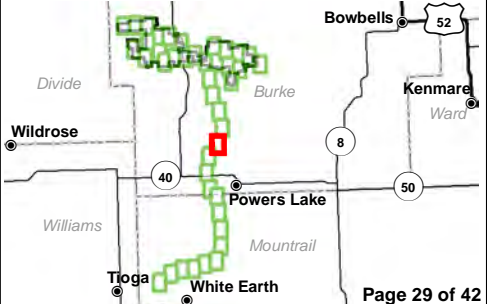


Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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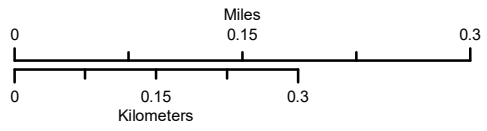
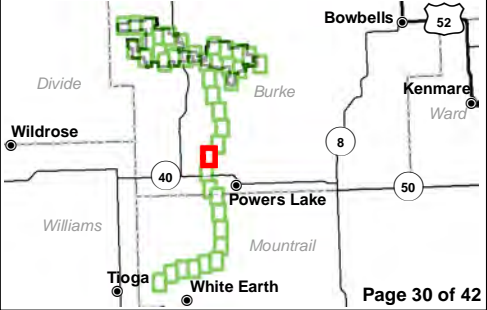
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Grubb Lake (1974), Powers Lake (1977)
 Township/Range: T160N, R93W & T159N, R93W
 Burke County, North Dakota





Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

- Proposed Turbine Location: (Updated January 21, 2019)
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Powers Lake (1977)

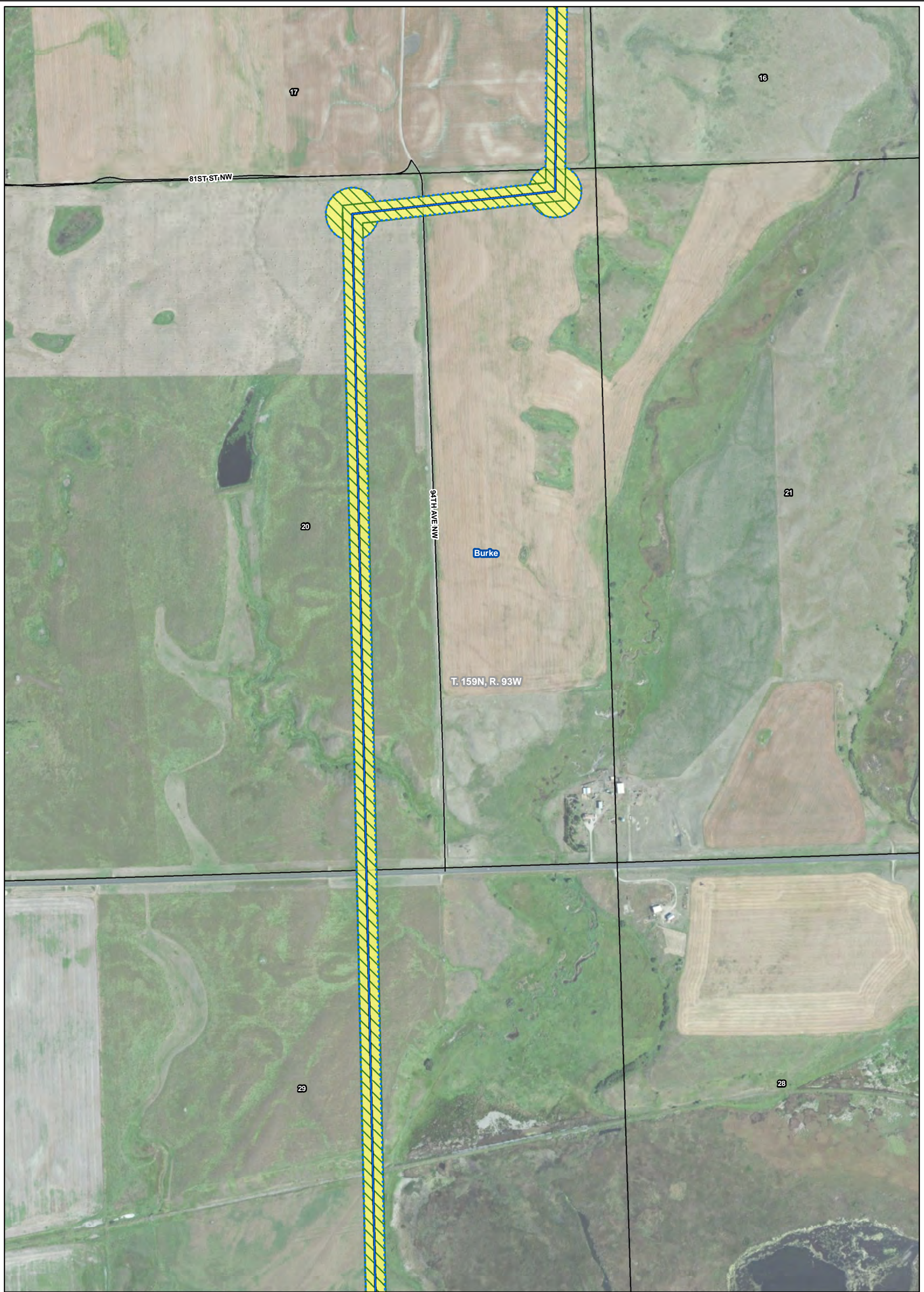
Township/Range: T159N, R93W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

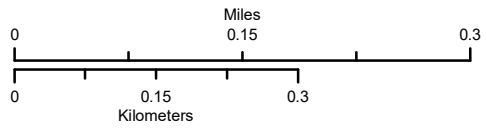
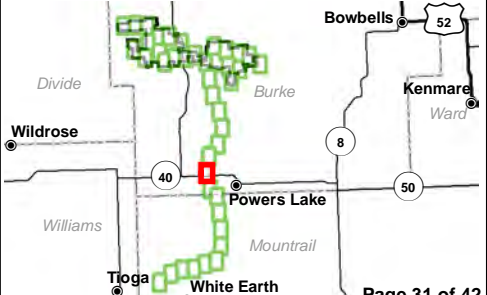


Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Powers Lake (1977)

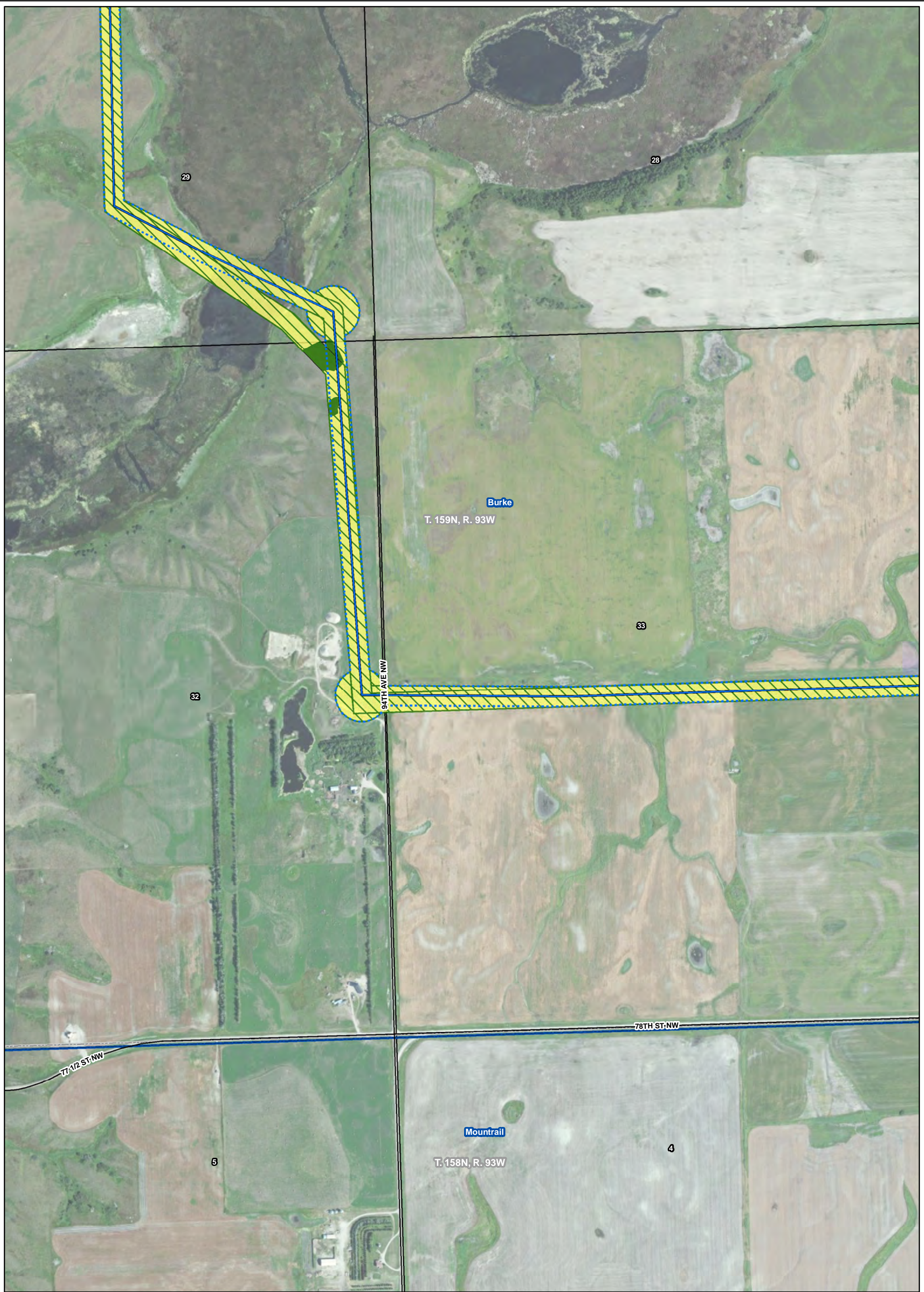
Township/Range: T159N, R93W

Burke County, North Dakota

Projection: NAD 1983 UTM Zone 13N

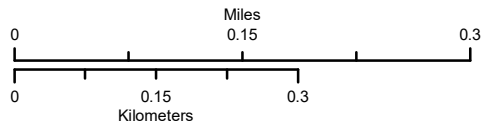
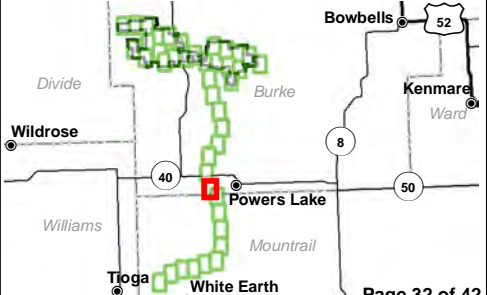


Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Powers Lake (1977)

Township/Range: T159N, R93W

Burke and Mountrail Counties, North Dakota

Projection: NAD 1983 UTM Zone 13N

Date: 1/25/2019

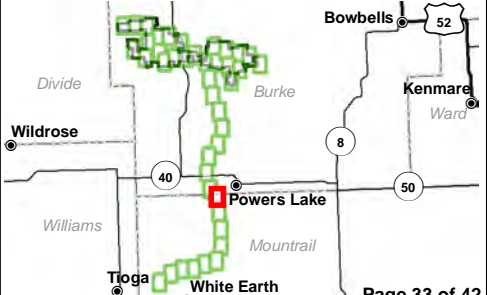




Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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SWCA
ENVIRONMENTAL CONSULTANTS



0 0.15 0.3
Miles

0 0.15 0.3
Kilometers

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Quadrangle: Powers Lake (1977)

Township/Range: T159N, R93W & T158N, R93W
Burke and Mountrail Counties, North Dakota

Projection: NAD 1983 UTM Zone 13N

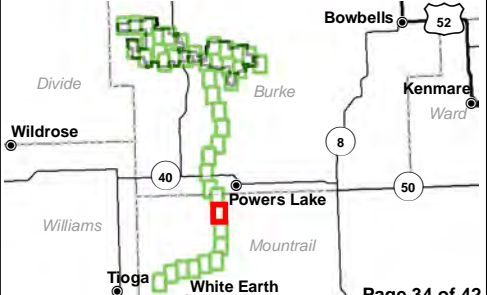
Date: 1/25/2019

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Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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0 0.15 0.3
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Quadrangle: Powers Lake (1977)

Township/Range: T158N, R93W

Mountrail County, North Dakota

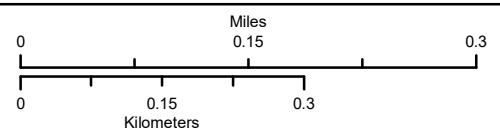
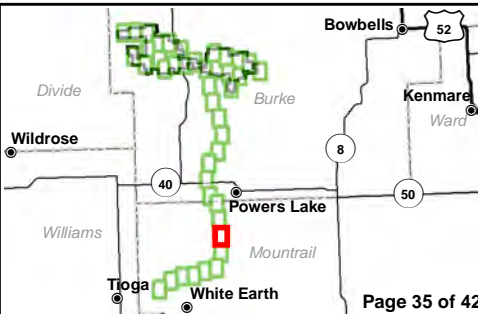
Projection: NAD 1983 UTM Zone 13N

Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Powers Lake (1977), Ross NW (1991)
 Township/Range: T158N, R93W

Mountrail County, North Dakota

Projection: NAD 1983 UTM Zone 13N

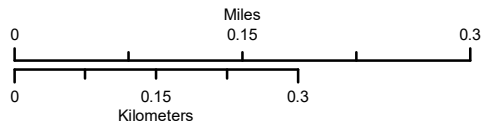
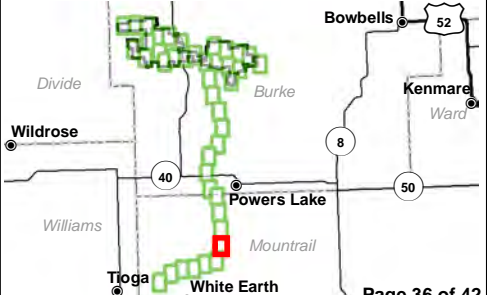
Date: 1/25/2019





Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Ross NW (1991)

Township/Range: T158N, R93W & T157N, R93W
 Mountrail County, North Dakota

Page 36 of 42 Projection: NAD 1983 UTM Zone 13N

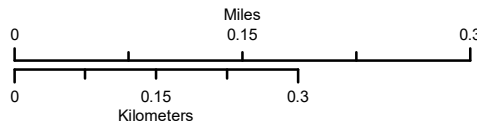
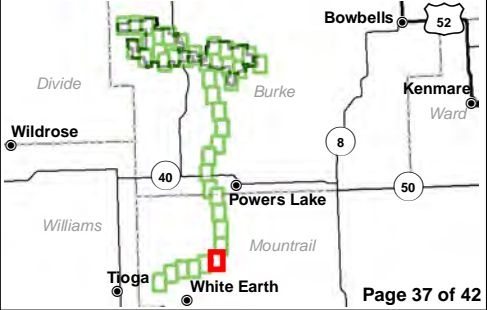


Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

- Proposed Turbine Location: (Updated January 21, 2019)
- Proposed Transmission Line: (Updated August 8, 2018)
- Proposed Service Road: (Updated January 21, 2019)
- Existing Road
- Wind Energy Center WRA
- Proposed Construction Easement
- Suitable Habitat - Habitat Surveys
- Unsuitable Habitat - Habitat Surveys
- Unsuitable Habitat - Desktop Analysis
- 150 ft wide Transmission Line Corridor
- Township/Range Boundary
- Section Boundary
- County Boundary
- County Boundary



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Ross NW (1991)

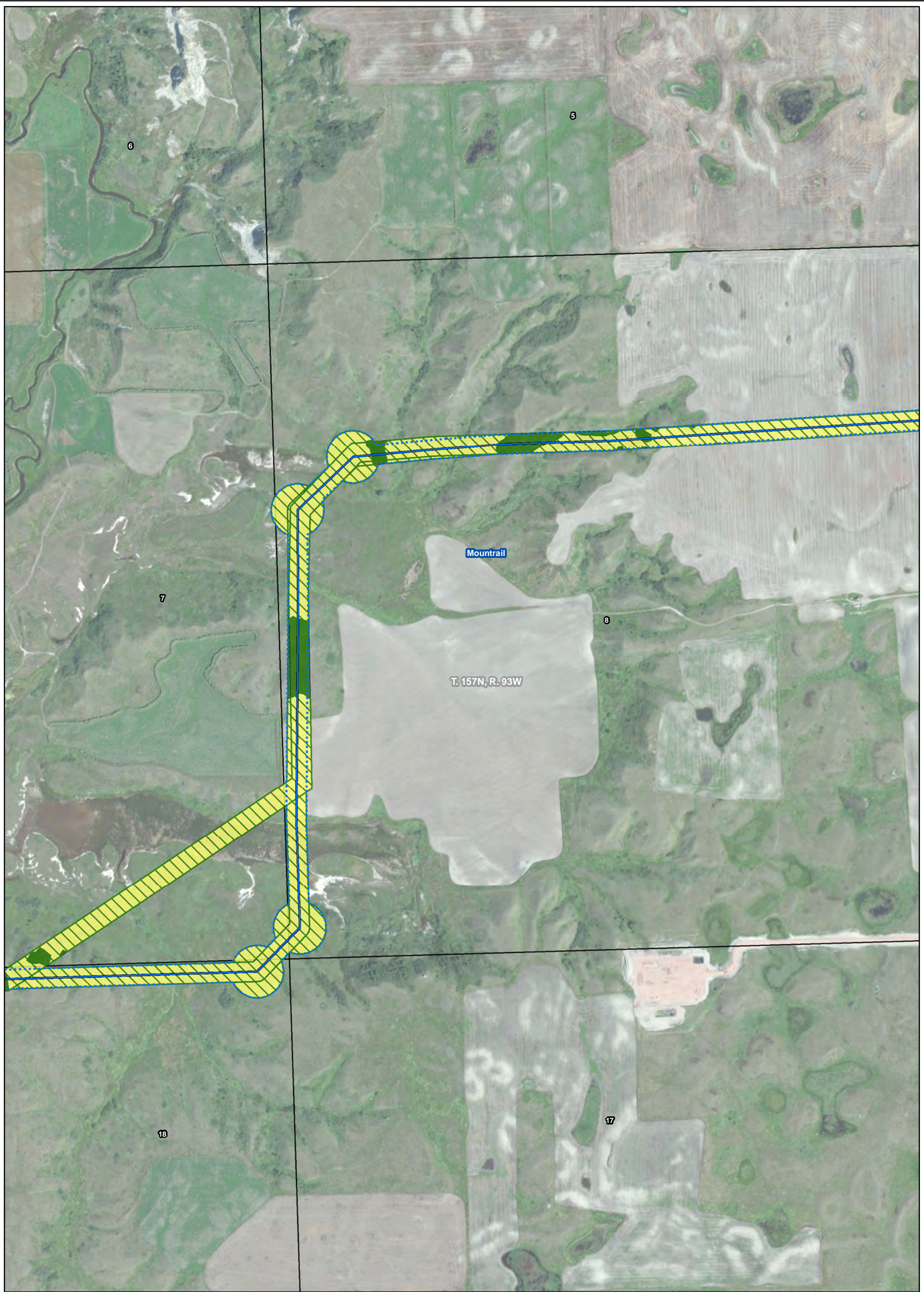
Township/Range: T157N, R93W

Mountrail County, North Dakota

Projection: NAD 1983 UTM Zone 13N

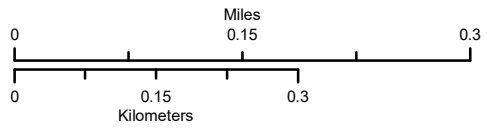
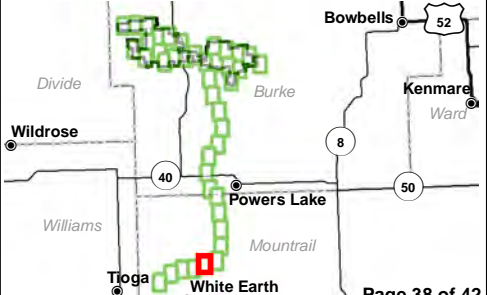


Date: 1/25/2019



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Township/Range: T157N, R93W

Mountrail County, North Dakota

Projection: NAD 1983 UTM Zone 13N

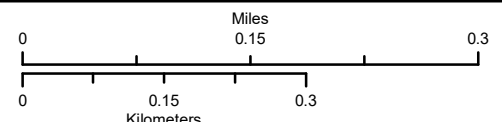
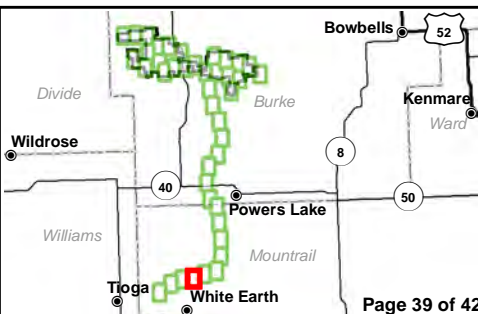


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Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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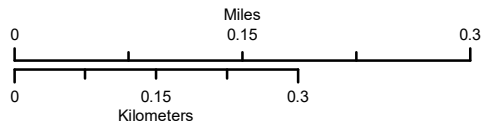
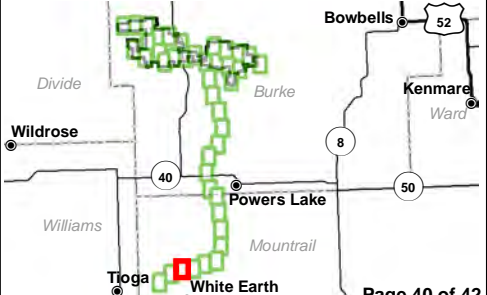


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: Ross NW (1991), White Earth (1991)
 Township/Range: T157N, R93W & T157N, R94W
 Mountrail County, North Dakota
 Projection: NAD 1983 UTM Zone 13N
 Date: 1/25/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

- Proposed Turbine Location: (Updated January 21, 2019)
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- ▭ Township/Range Boundary
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Quadrangle: White Earth (1991)

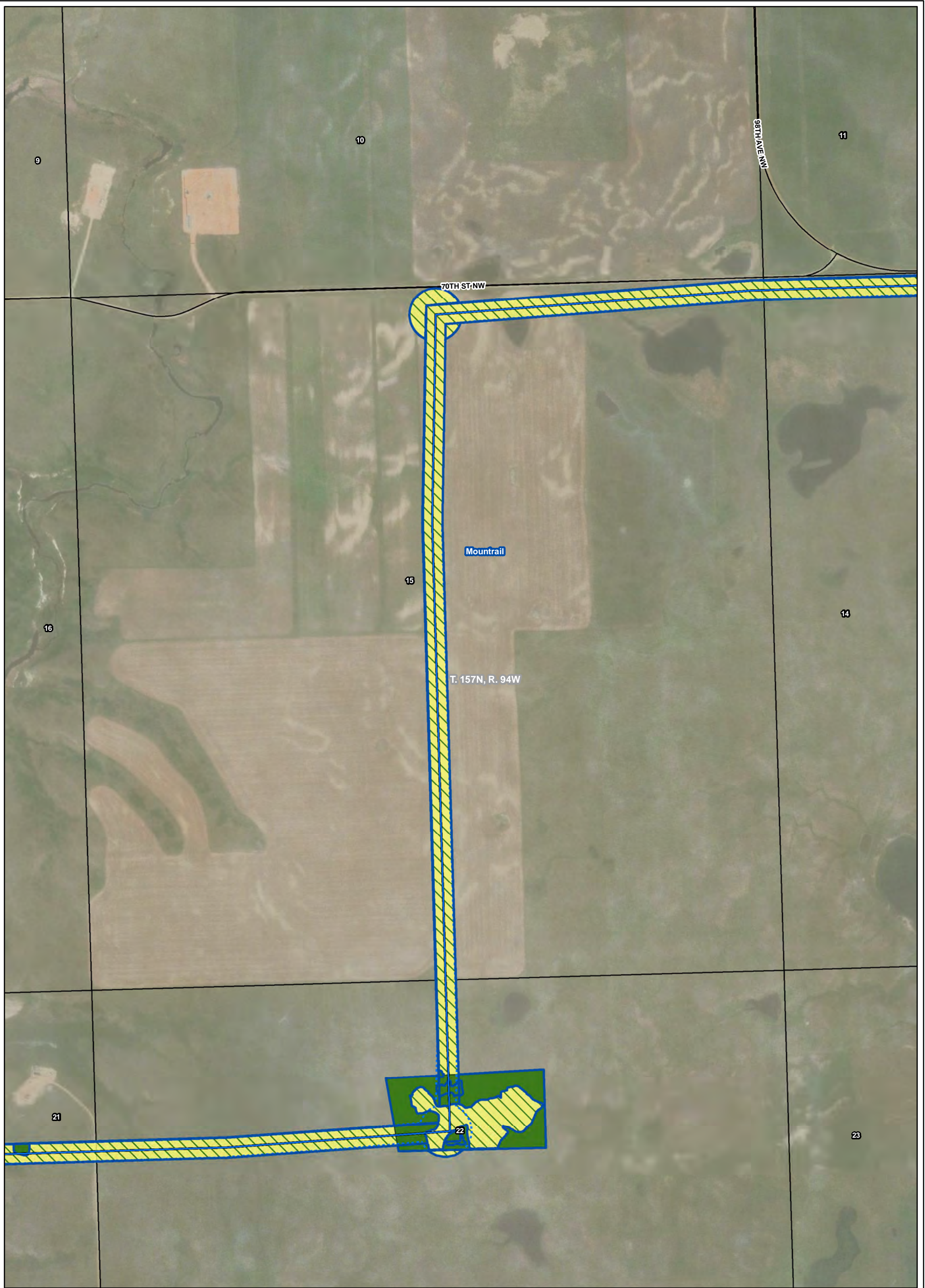
Township/Range: T157N, R94W

Mountrail County, North Dakota

Projection: NAD 1983 UTM Zone 13N

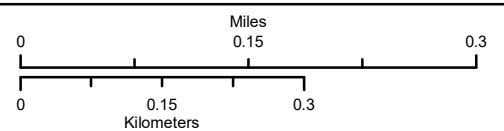
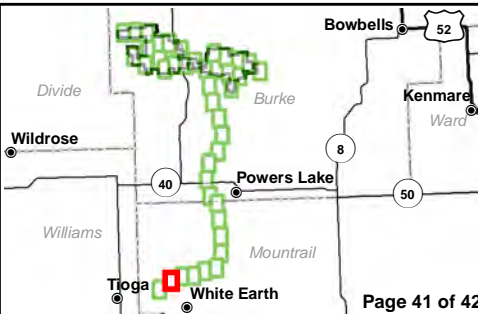
Date: 1/25/2019





Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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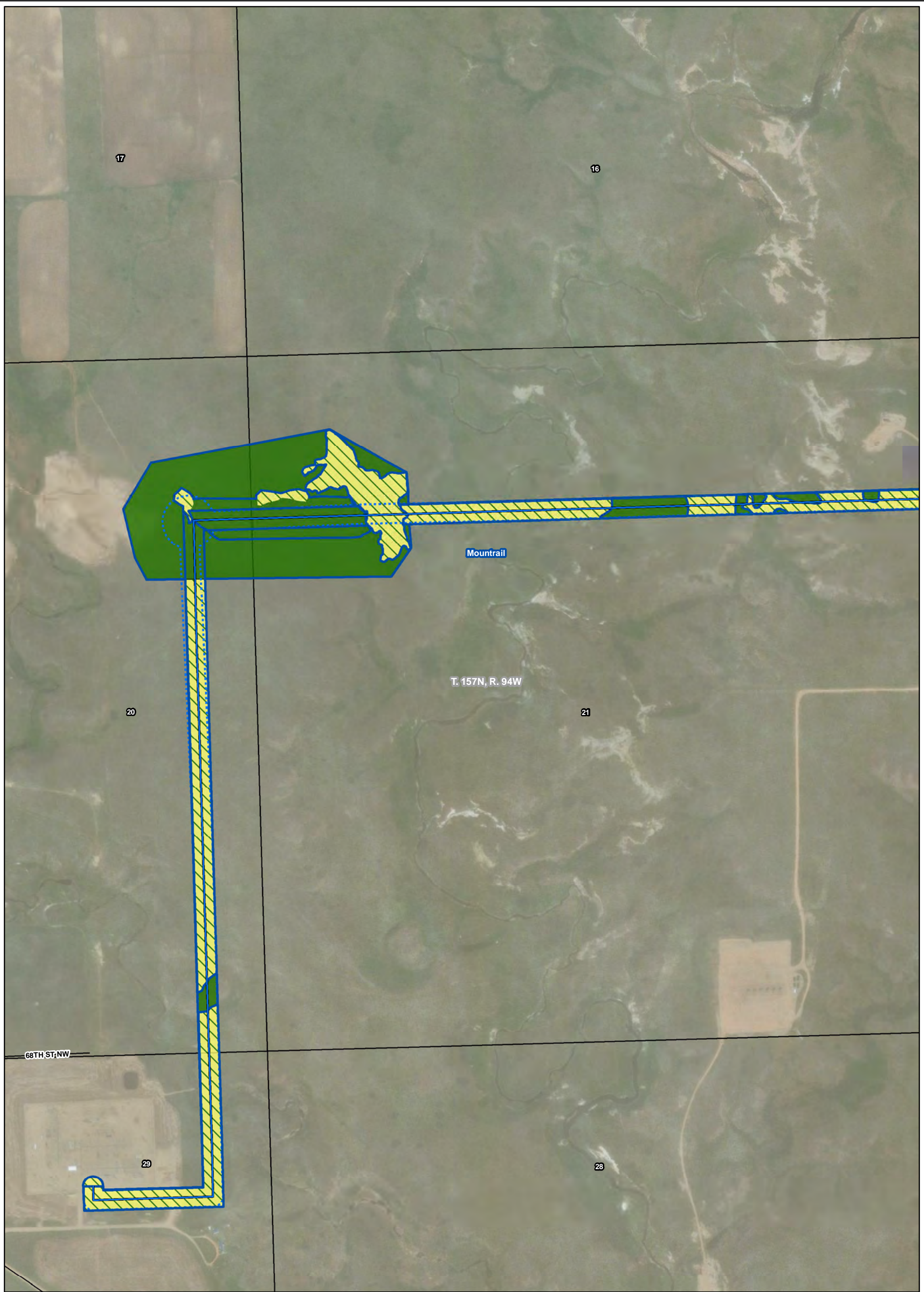
Township/Range: T157N, R94W

Mountrail County, North Dakota

Projection: NAD 1983 UTM Zone 13N

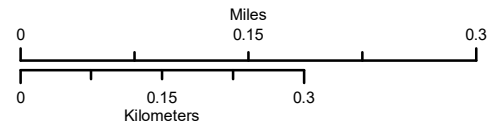
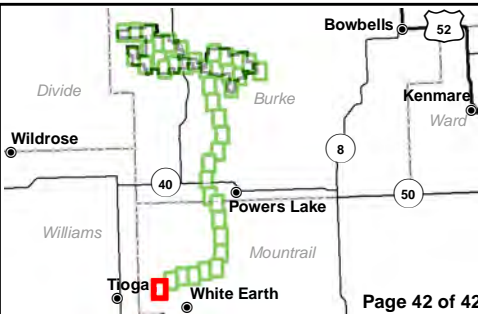


Date: 2/5/2019



Burke County Wind Energy Center and Transmission Line Dakota Skipper Assessment

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Township/Range: T157N, R94W

Mountrail County, North Dakota

Projection: NAD 1983 UTM Zone 13N



Date: 2/5/2019