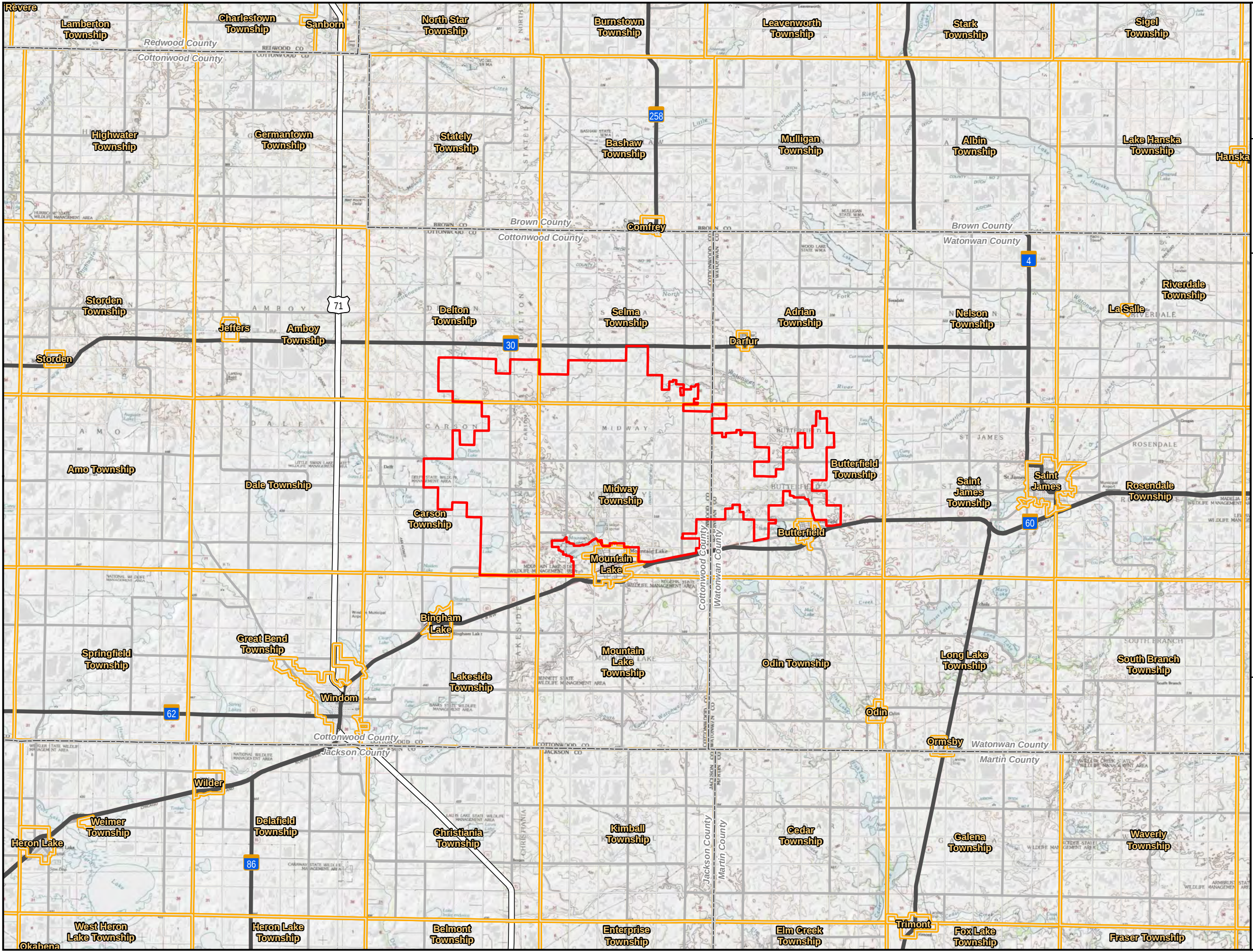
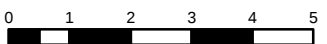


Figures





Cottonwood County Watonwan County Minnesota



0 1 2 3 4 5
Miles

1:200,000



N

Data Source: Apex Energy, US Census, MDOT, USGS

-  Project Area Boundary
-  City/Township
-  County Boundary

Figure 1
Project Location

Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota

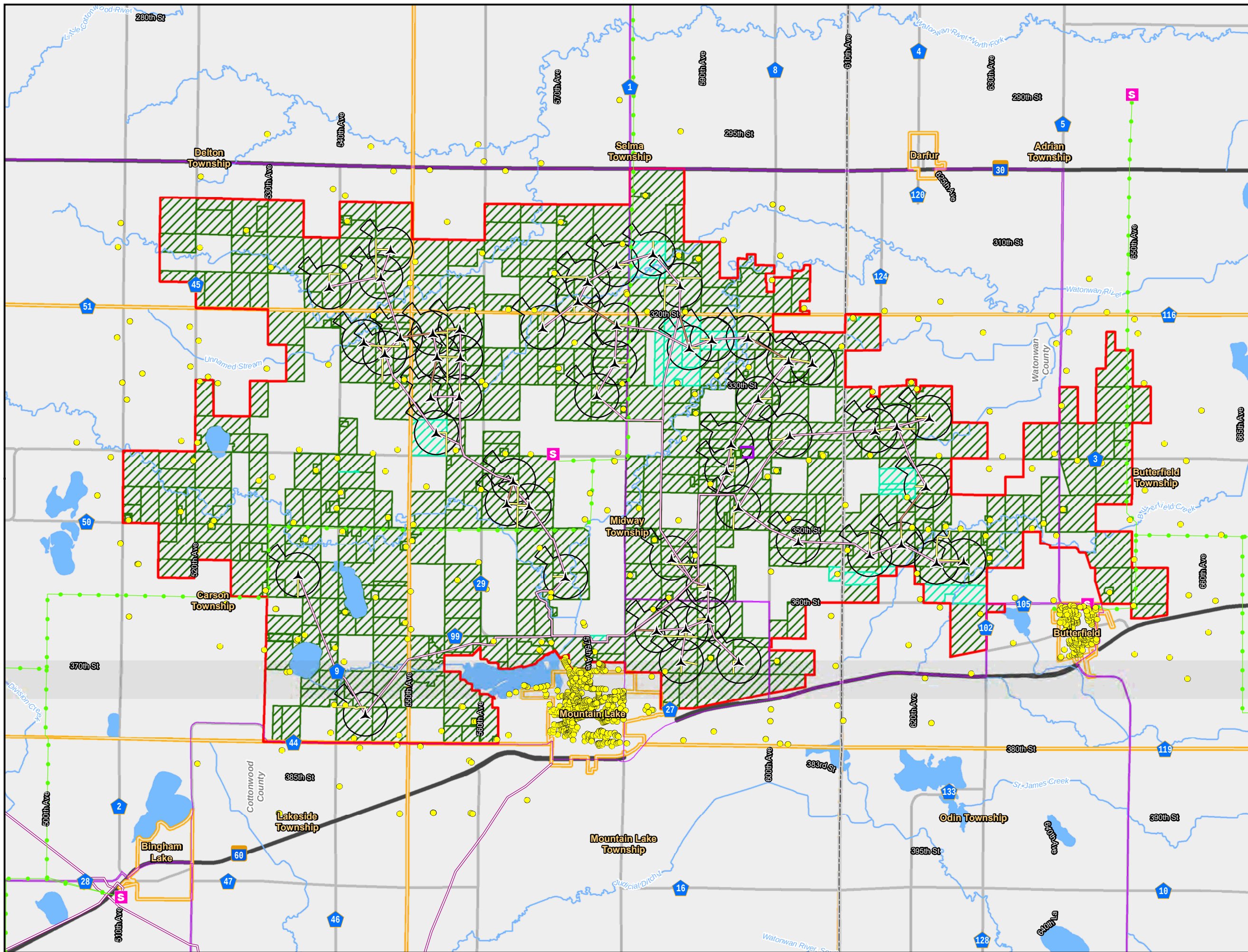


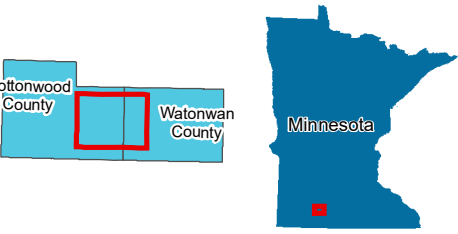
BIG BEND
WIND



merjent.

For Environmental Review Purposes Only





0 1 2
Miles
1:80,000

Data Source: Apex Energy, US Census, MDOT, MDNR

- N163 Proposed Turbine
- Residential Structure (within 1 mile of Project Area Boundary)
- Existing Substation
- Access Road
- Collection Line
- Crane Path
- Existing Transmission Line
- Existing Pipeline
- Snowmobile Trail
- Laydown
- Wind Project Substation
- O&M Area
- Project Area Boundary
- Wind Access Buffer
- Public Water Basin
- Public Water Watercourse
- Participating Parcel
- Pending Participating Parcel
- Shoreland Management Area
- City/Township
- County Boundary

*Turbines not to scale

Figure 2a Turbine Layouts and Constraints Nordex N-163

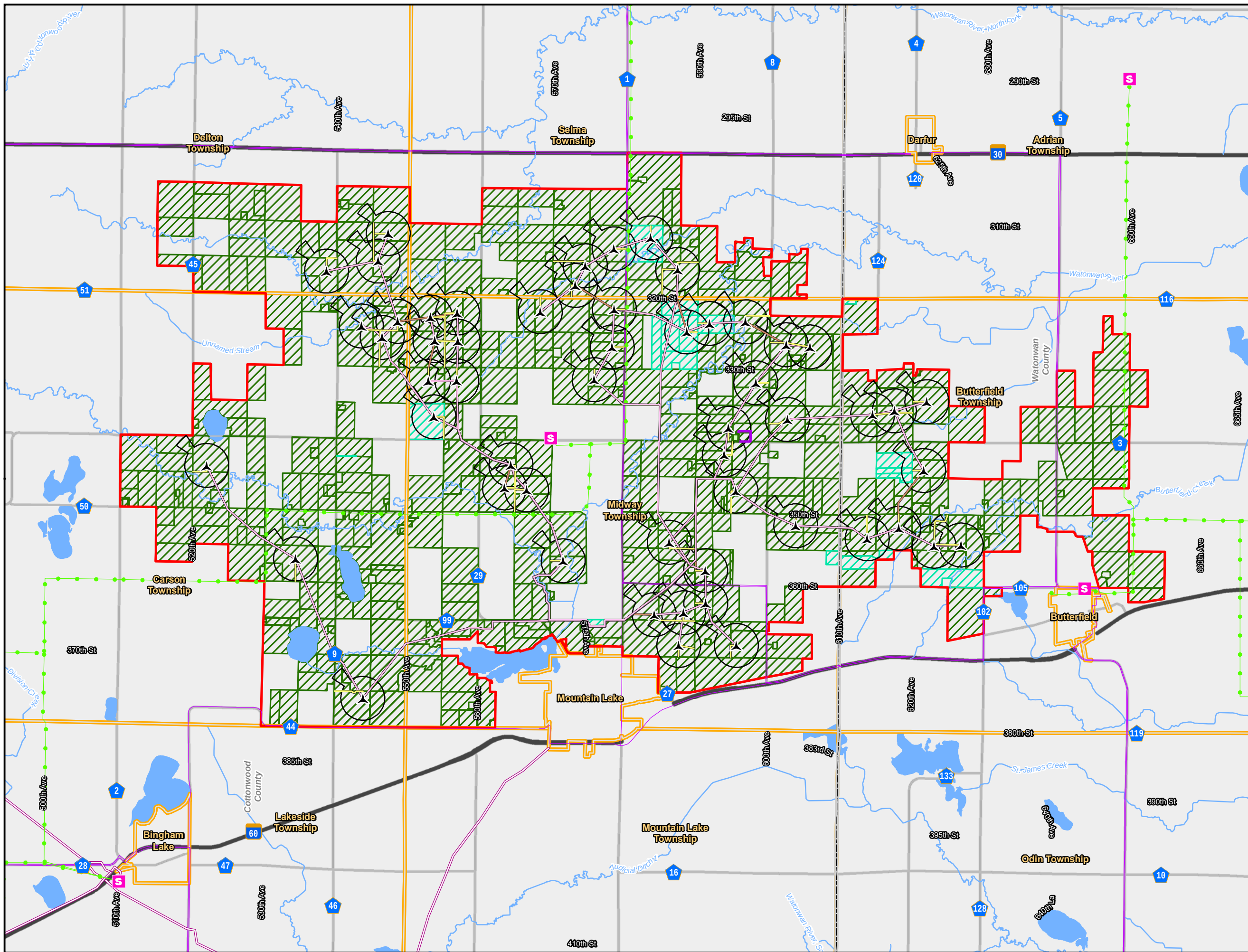
Big Bend Wind Project

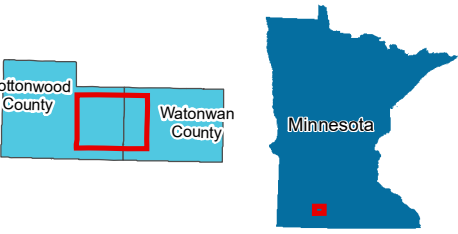
Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only

Date: (9/24/2020) Source: Z:\Clients\A_D\Apex\Big Bend\Sites_Permit\Figures\Fig2a_BB_N163_Turbine_Layout_Constraint.mxd





0 1 2
Miles
1:80,000

Data Source: Apex Energy, US Census, MDOT, MDNR

- V162 Proposed Turbine
- Residential Structure (within 1 mile of Project Area Boundary)
- Existing Substation
- Access Road
- Collection Line
- Crane Path
- Existing Transmission
- Existing Pipeline
- Snowmobile Trail
- Laydown
- Wind Project Substation
- O&M
- Project Area
- Wind Access
- Public Water Basin
- Public Water Watercourse
- Pending Participating Parcel
- Participating Parcel
- Shoreland Management
- City/Township
- County Boundary

*Turbines not to scale

Figure 2b Turbine Layouts and Constraints Vestas V162

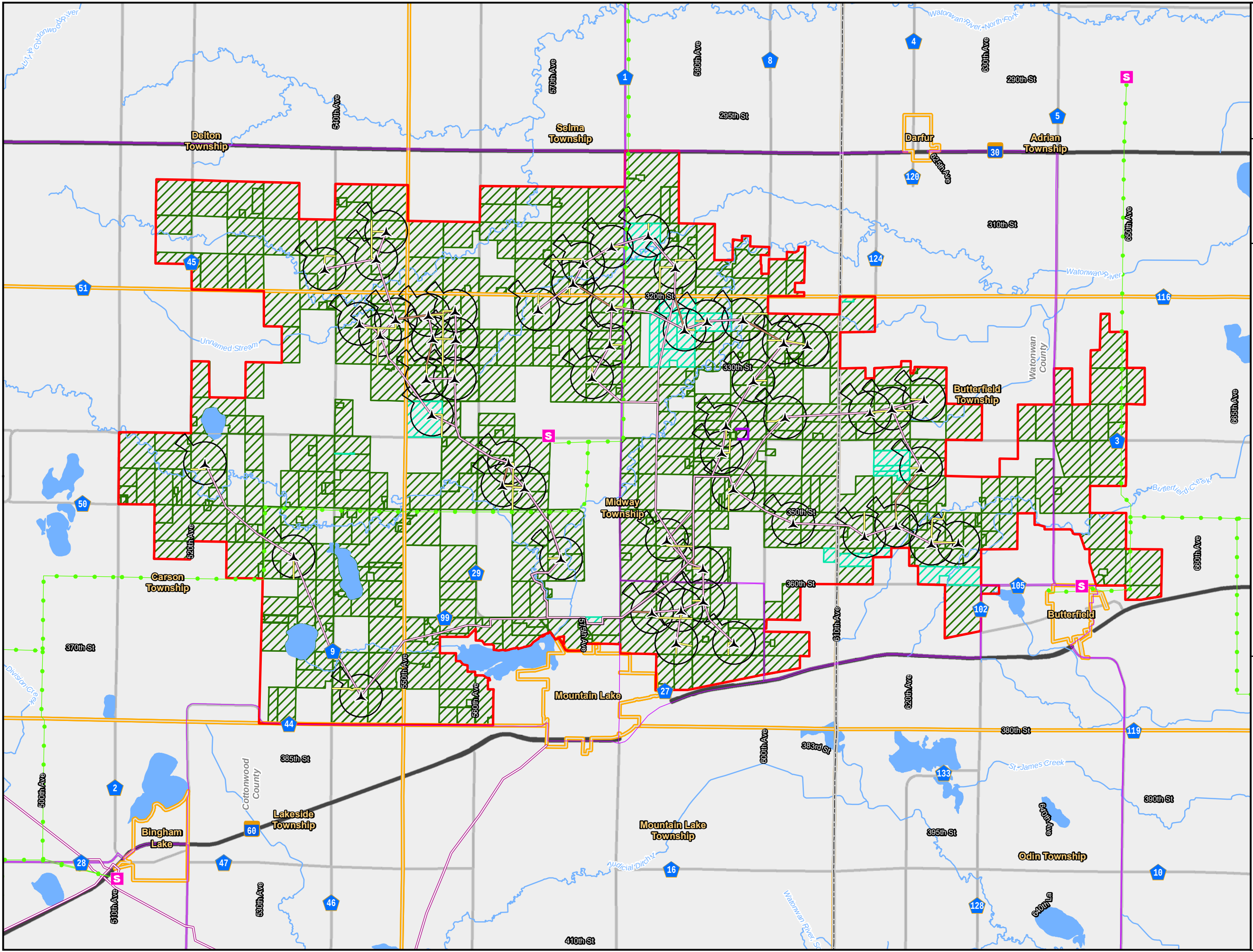
Big Bend Wind Project

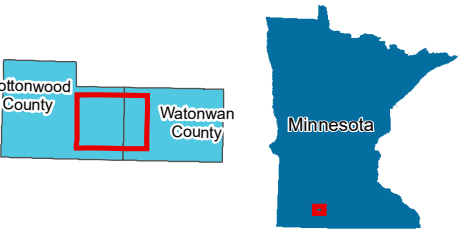
Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only

Date: (9/24/2020) Source: Z:\Clients\Big Bend\Big Bend Wind Project\Map\Map_Figures\Fig2b_BB_V162_Turbine_Layou_Constraints.mxd





0 1 2
Miles
1:80,000

Data Source: Apex Energy, US Census, MDOT, MDNR

- ▲ GE158 Proposed
- Residential Structure (within 1 mile of Project Area Boundary)
- S Existing Substation
- Access Road
- Collection Line
- Crane Path
- Existing Transmission
- Existing Pipeline
- Snowmobile Trail
- Laydown
- Wind Project Substation
- O&M
- Project Area
- Wind Access
- Public Water Basin
- Public Water Watercourse
- Pending Participating Parcel
- Participating Parcel
- Shoreland Management
- City/Township
- County Boundary

*Turbines not to scale

Figure 2c Turbine Layouts and Constraints GE-158

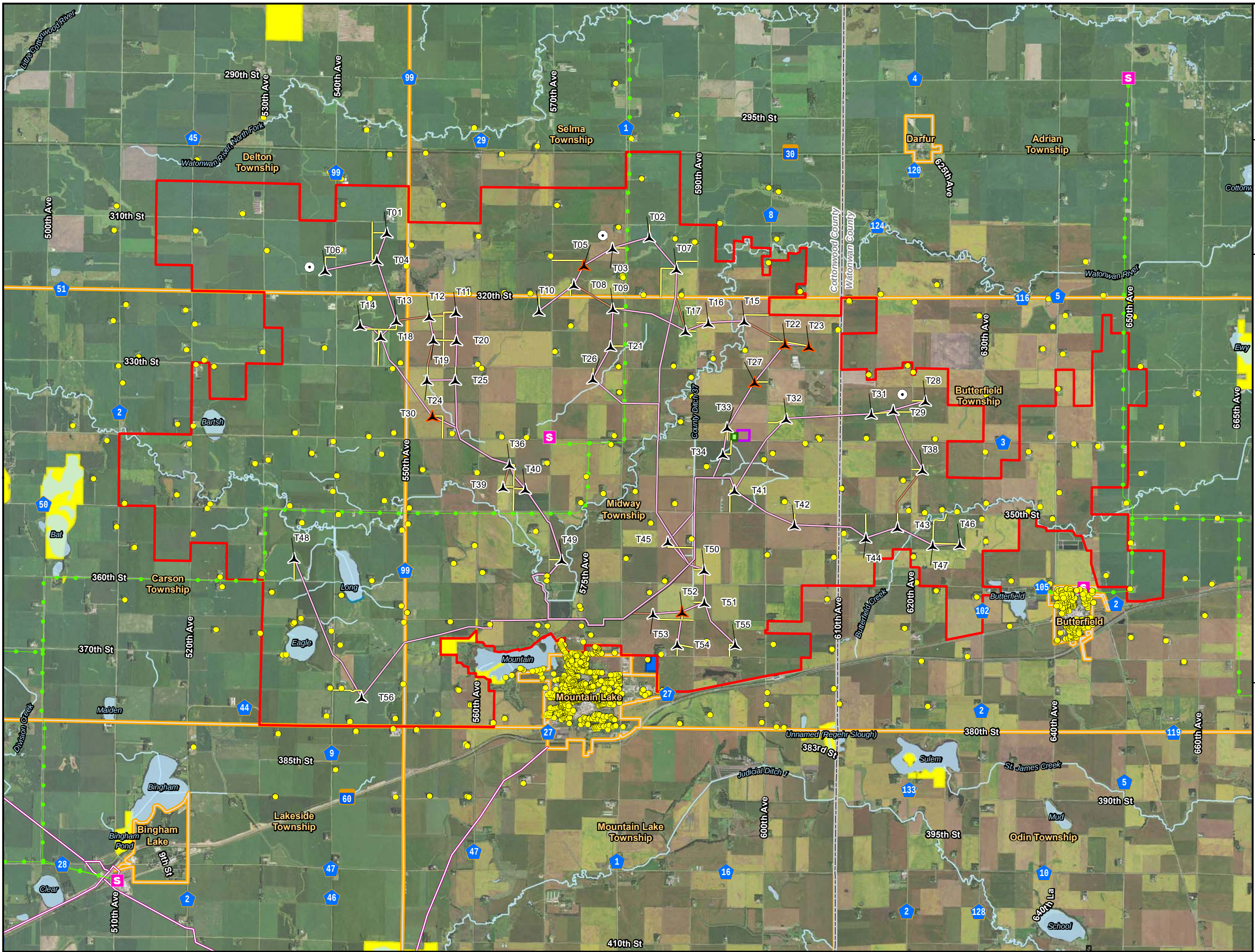
Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only

Date: (9/24/2020) Source: Z:\Clients\VA\pex\Big Bend\Sie_Permit\Figures\Fig2c_BB_GE158_Turbine_Layout_Constraints.mxd





0 1 2
Miles
1:80,000

Data Source: Apex Energy, US Census, MDOT, MNR, PHMSA, USFWS

- ▲ Primary Turbine
- ▲ Spare Turbine
- Met Tower
- Residential Structure (within 1 mile of Project Area Boundary)
- Existing Substation
- Access Road
- Collection Line
- Crane Path
- Existing Transmission Line
- Existing Pipeline
- Laydown
- Wind Project Substation
- O&M Area
- Project Area Boundary
- City/Township
- County Boundary
- Lake, Pond or Reservoir
- River/Stream
- Minnesota Walk-In Hunting Access Sites
- Wildlife Management Area
- Aquatic Management Area
- Waterfowl Production Area

*Turbines not to scale

Figure 3a
Project Area and Facilities
Nordex N-163

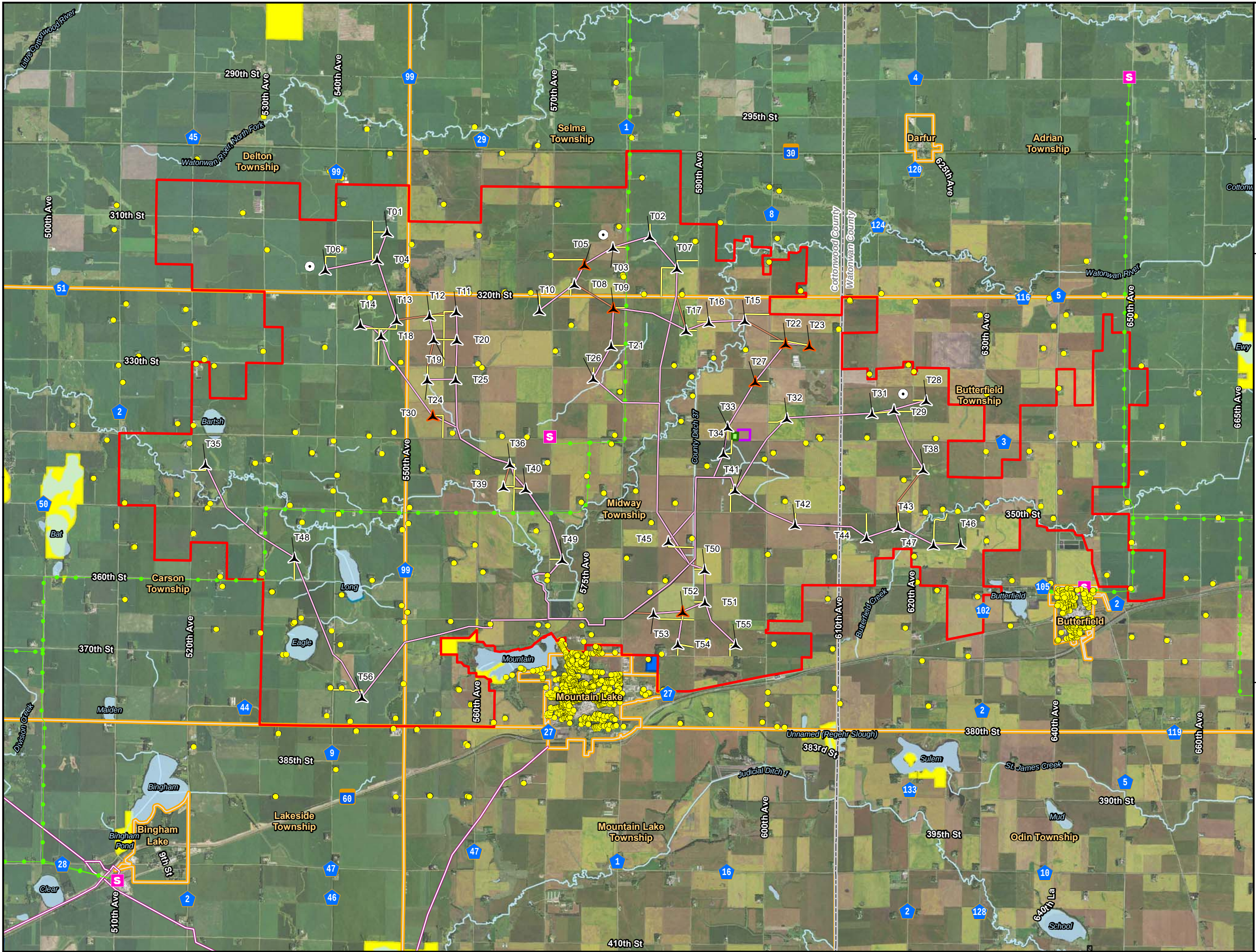
Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only

Date: (9/24/2020) Source: Z:\Clients\VA\Apex\Big Bend\Sites_Permit\Figures\Fig3a_N163_BB_Project_Area_Facilities.mxd





0 1 2
Miles
1:80,000

Data Source: Apex Energy, US Census, MDOT, MNR
PHMSA, USFWS

- ▲ Primary Turbine
- ▲ Spare Turbine
- Met Tower
- Residential Structure (within 1 mile of Project Area Boundary)
- S Existing Substation
- Access Road
- Collection Line
- Crane Path
- Existing Transmission Line
- Existing Pipeline
- Laydown
- Wind Project Substation
- O&M Area
- Project Area Boundary
- City/Township
- County Boundary
- Lake, Pond or Reservoir
- River/Stream
- Minnesota Walk-In Hunting Access Sites
- Wildlife Management Area
- Aquatic Management Area
- Waterfowl Production Area

*Turbines not to scale

Figure 3b

Project Area and Facilities

Vestas V162

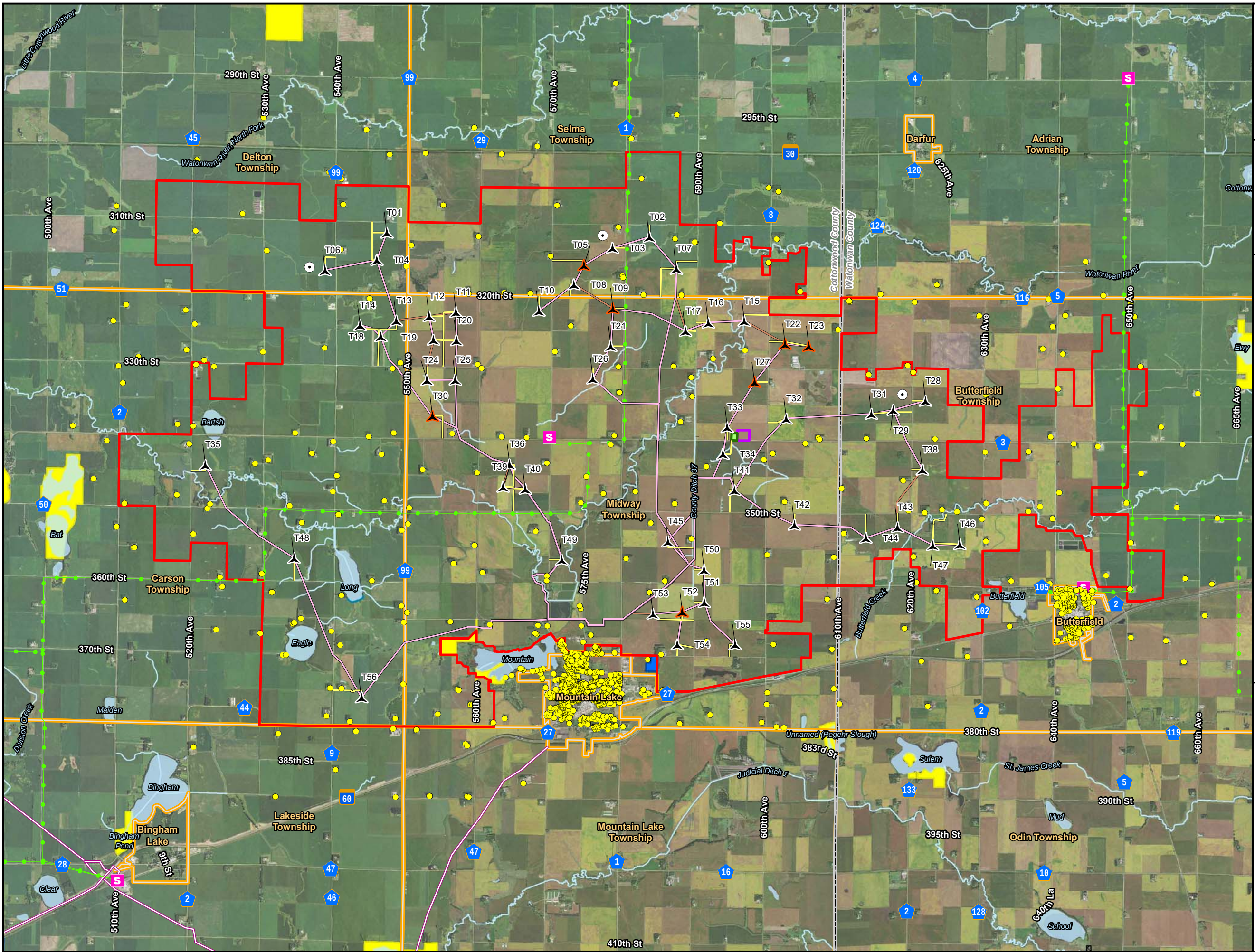
Big Bend Wind Project

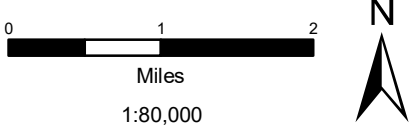
Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only

Date: (9/24/2020) Source: Z:\Clients\VA\Apex\Big Bend\Site_Permit\Figures\Fig3b_V162_BB_Project_Area_Facilities.mxd





0 1 2
Miles
1:80,000

Data Source: Apex Energy, US Census, MDOT, MDNR
PHMSA, USFWS

- Primary Turbine
- Spare Turbine
- Met Tower
- Residential Structure (within 1 mile of Project Area Boundary)
- Existing Substation
- Access Road
- Collection Line
- Crane Path
- Existing Transmission Line
- Existing Pipeline
- Laydown
- Wind Project Substation
- O&M
- Project Area
- City/Township
- County Boundary
- Lake, Pond or Reservoir
- River/Stream
- Minnesota Walk-In Hunting Access Sites
- Wildlife Management
- Aquatic Management
- Waterfowl Production

*Turbines not to scale

Figure 3c

Project Area and Facilities GE-158

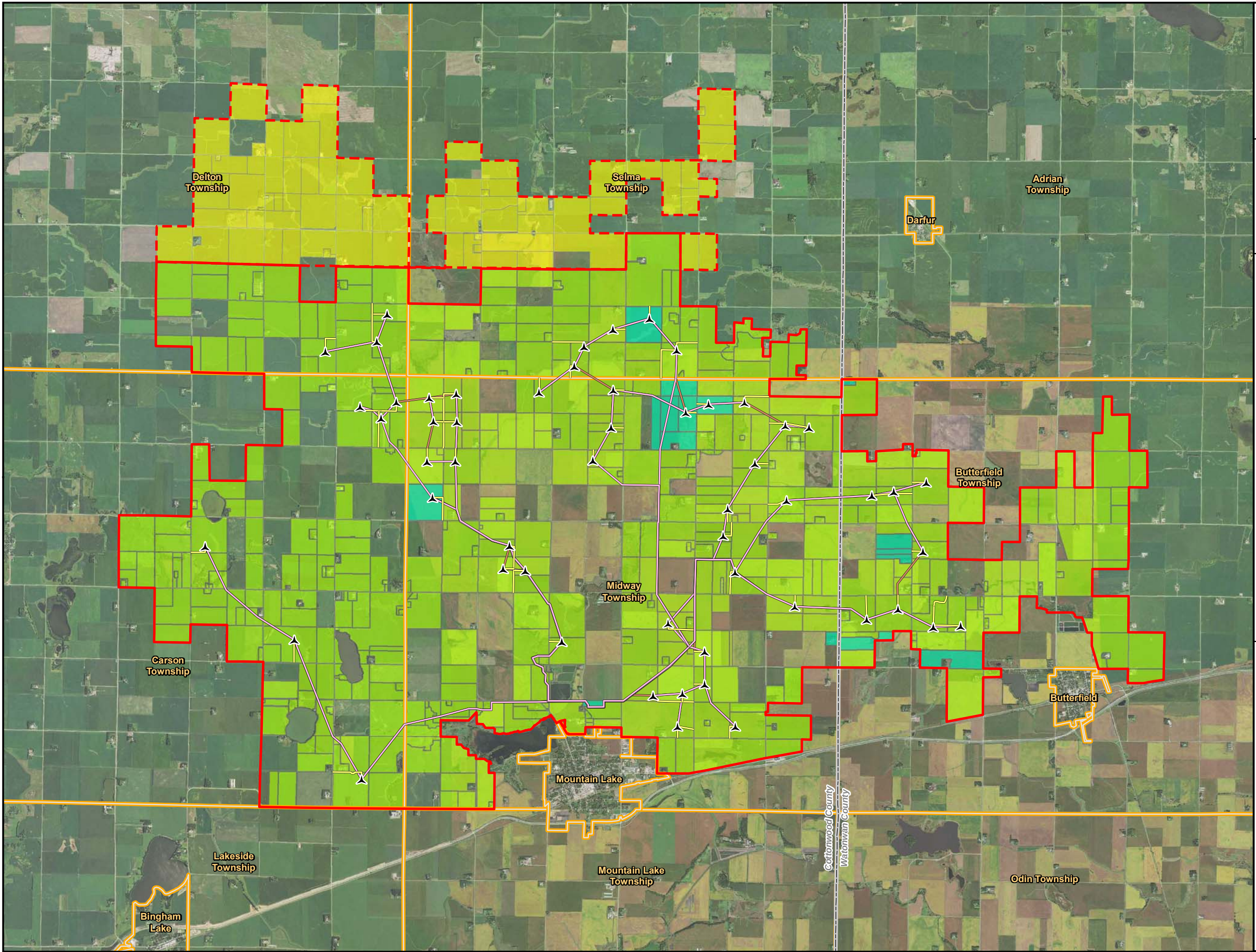
Big Bend Wind Project

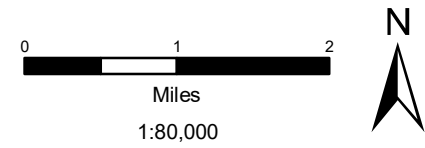
Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only

Date: (9/25/2020) Source: Z:\Clients\VA\pex\big_bend\Site_Permit\Figures\fig3c_GE158_BB_Project_Area_Facilities.mxd





0 1 2
Miles
1:80,000

Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

▲ Proposed Turbine

— Access Road

— Collection Line

— Crane Path

▭ Project Area Boundary

▭ Buffer Zone

▭ Participating Parcel in Buffer Zone

▭ Pending Participating Parcel

▭ Participating Parcel

▭ City/Township

▭ County Boundary

*Turbines not to scale

Figure 4

Land Ownership Turbine Model

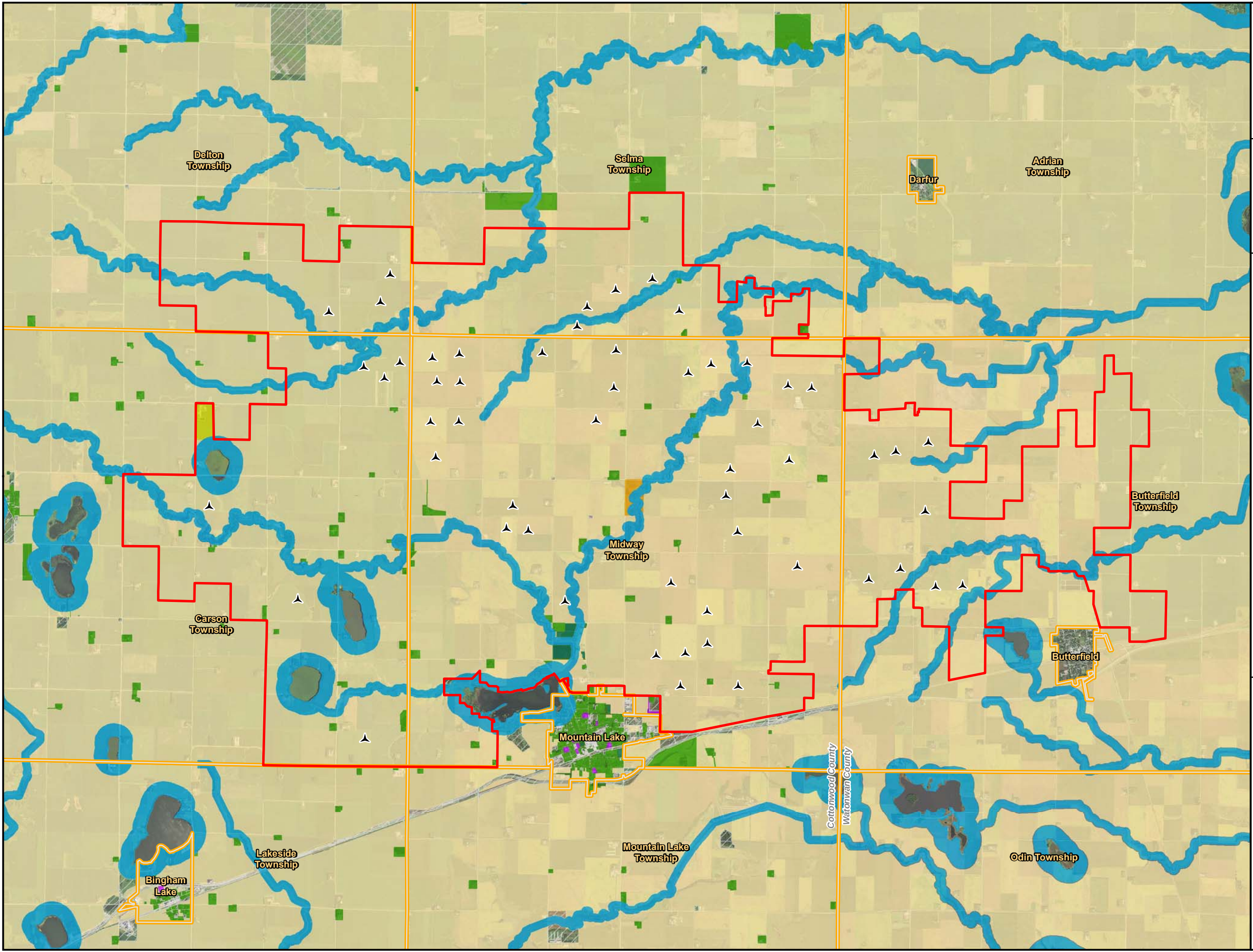
Big Bend Wind Project

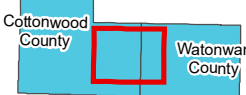
Cottonwood and Watonwan Counties, Minnesota

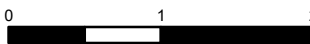


For Environmental Review Purposes Only

Date: (9/24/2020) Source: Z:\Clients\Big Bend\Sites_Permit\Figures\Fig04_BB_Land_Ownership.mxd







Miles
1:80,000



Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

 Proposed Turbine

 Project Area

 City/Township

County Zoning

 2A Farm Entity 1st Tier

 Agricultural

 Church Property: Sanctuary & Educational Facilities

 Municipality Property All

 Residential/Single Unit

 Rural Vacant Land

 Rural Vacant Non-Contiguous

 Shoreline District

 Zoning Outside Project

Figure 5

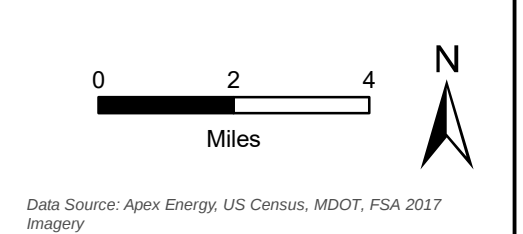
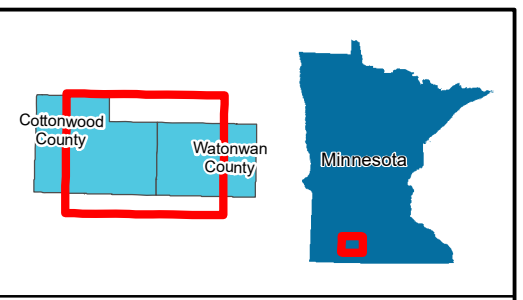
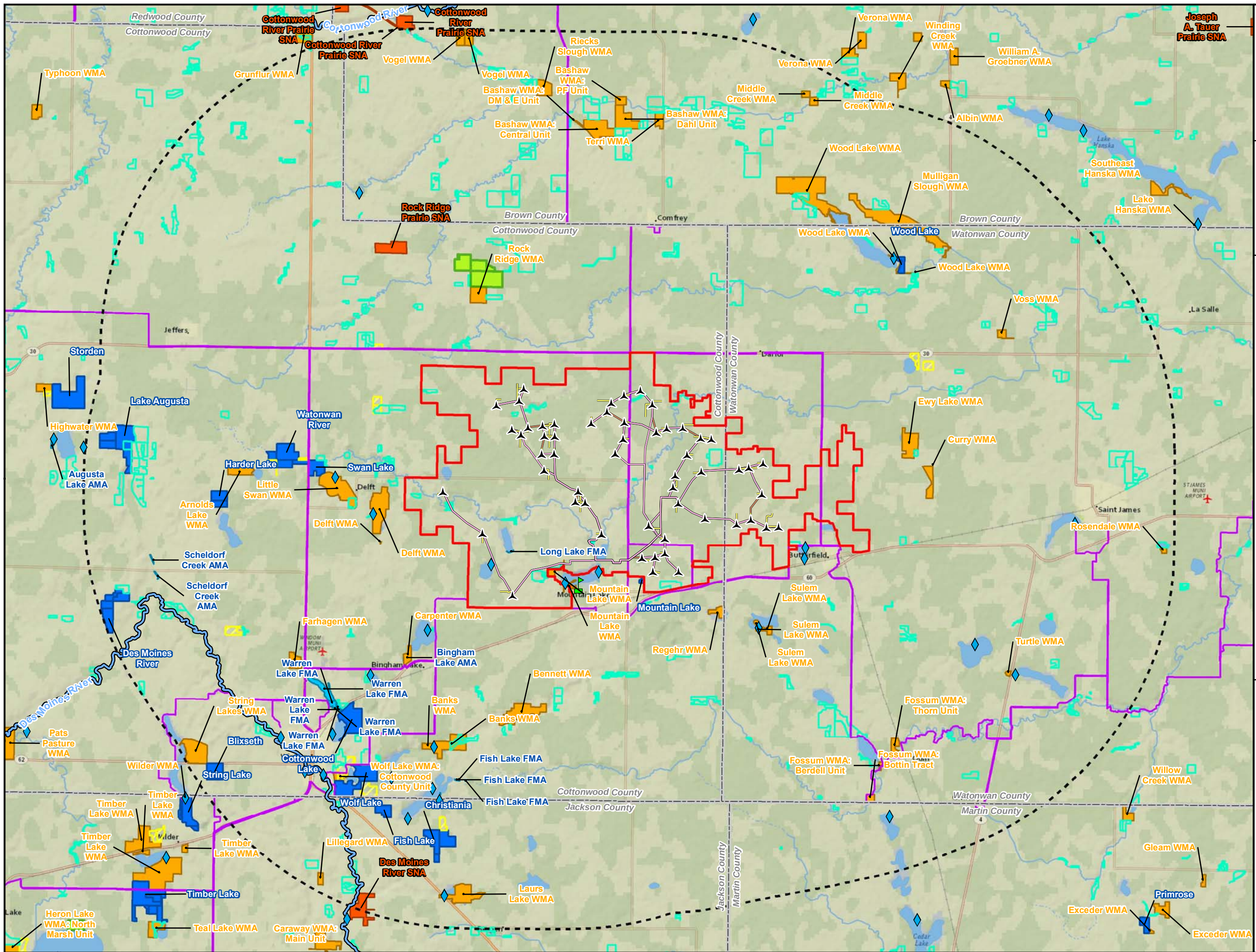
Zoning Map

Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only



Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

- ▲ Proposed Turbine
 - Access Road
 - Collection Line
 - Crane Path
 - Minnesota State Trail
 - Minnesota Water Trail
 - ▭ Project Area Boundary
 - - - 10 Mile Buffer
 - ◆ DNR Water Access Site
 - 🏌️ Mountain Lake Golf Course
 - ▨ US Fish and Wildlife Easement
 - Waterfowl Production Area
 - Wildlife Management Area (WMA)
 - Scientific & Natural Area (SNA)
 - Aquatic Management Area (AMA)
 - ▨ CREP and RIM Easement
 - The Nature Conservancy
 - ▭ County Boundary
- *Turbines not to scale

Figure 6
Public Land Ownership and Recreation

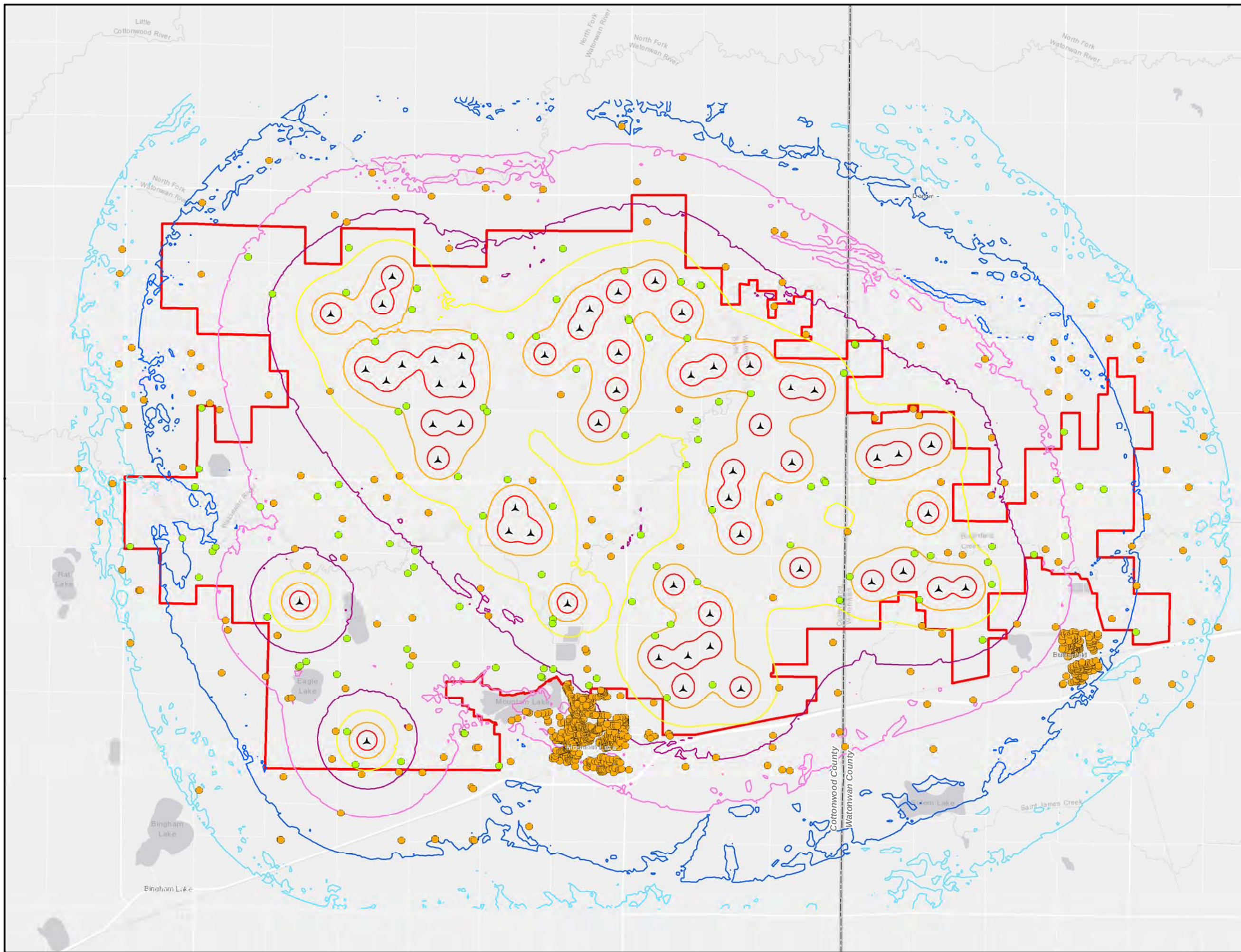
Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only

Date: (9/24/2020) Source: Z:\Clients\VA\Apex\Big Bend\Sites_Permit\Figures\Fig06_BB_Public_Land_and_Recreation.mxd



Cottonwood County Watonwan County Minnesota

0 1 2
Miles
1:80,000

N

Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

▲ N163 Proposed Turbine
□ Project Area Boundary

Participant

- Non-Participating (within 1 mile of Project Area)
- Participating (within 1 mile of Project Area)

Sound Pressure Levels (Turbine Only)

- 20 dBA
- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA

*Turbines not to scale

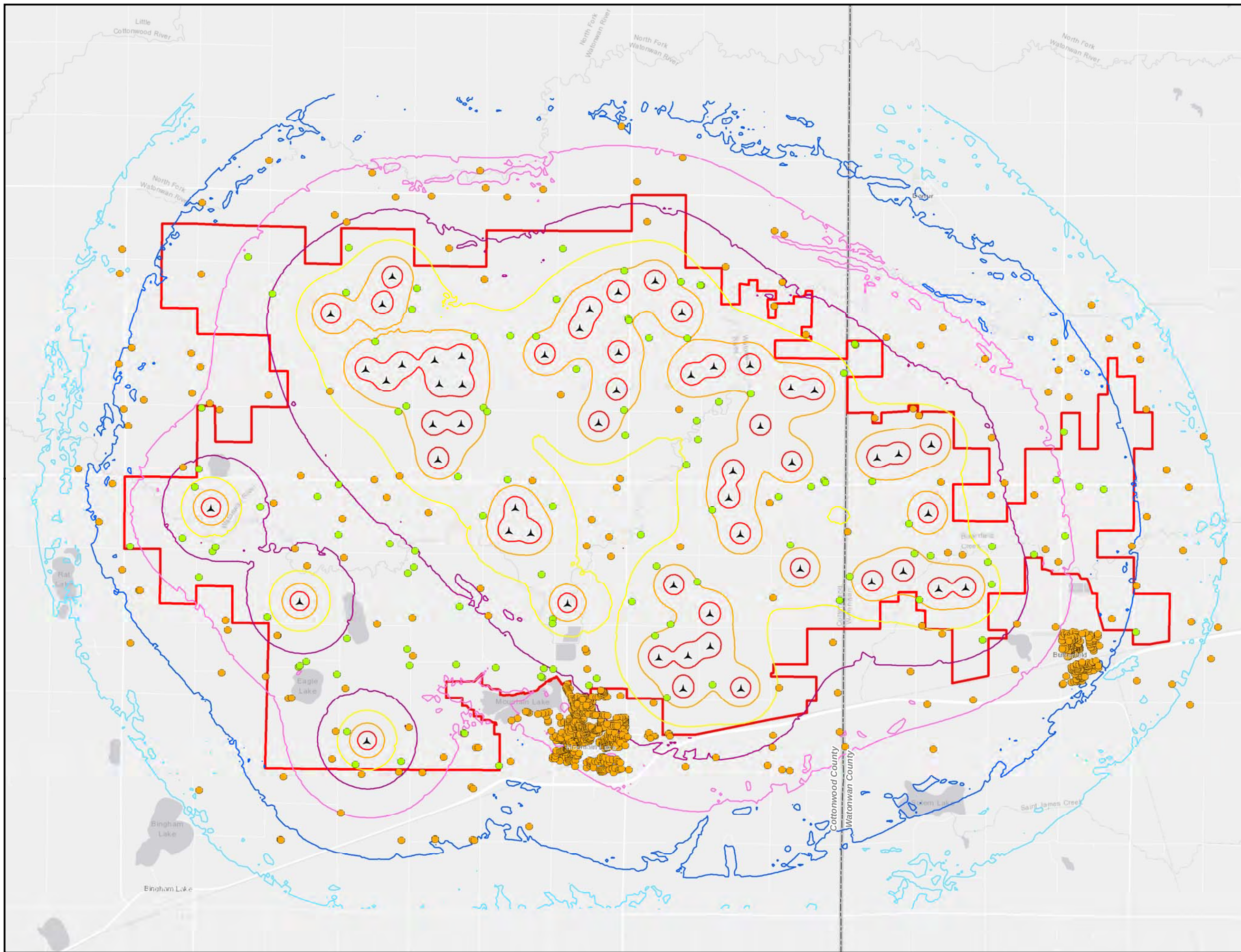
**Figure 7a
Sound/Noise
Nordex N-163**

Big Bend Wind Project

**Cottonwood and Watonwan
Counties, Minnesota**

For Environmental Review Purposes Only

Date: (10/29/2020) Source: Z:\Clients\A_D\Apex\Big_Bend\Site_Permit\Figures\Fig7a_N163_BB_Sound_Noise.mxd



0 1 2
Miles
1:80,000

Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

▲ V162 Proposed Turbine

▭ Project Area Boundary

Participant

- Non-Participating (within 1 mile of Project Area)
- Participating (within 1 mile of Project Area)

Sound Pressure Levels (Turbine Only)

- 20 dBA
- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA

*Turbines not to scale

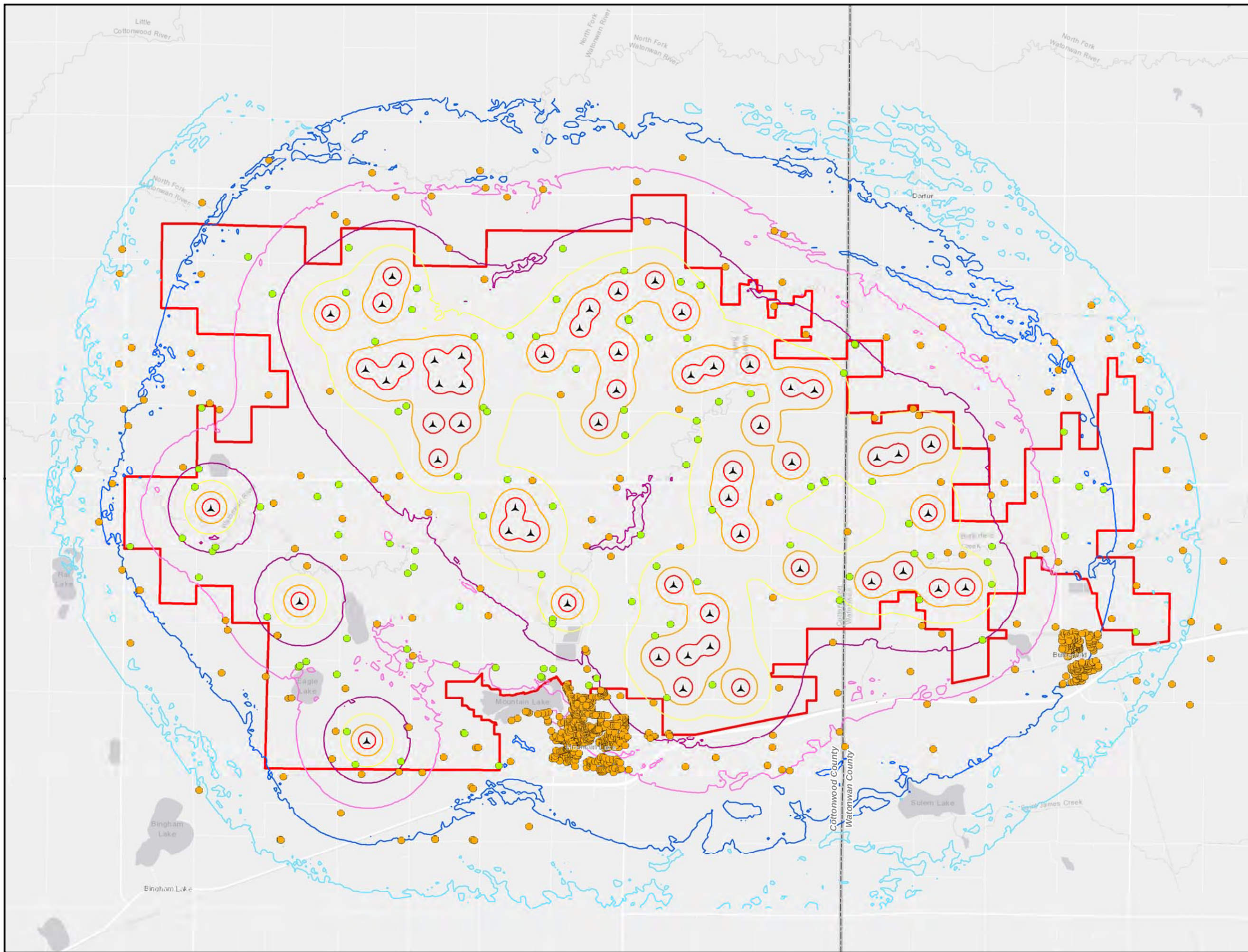
Figure 7b
Sound/Noise
Vestas V162

Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota

For Environmental Review Purposes Only

Source: Z:\Clients\A_DW\Apex\Big_Bend\Site_Permit\Figures\Fig7b_V162_BB_Sound_Noise.mxd Date: (10/29/2020)



Cottonwood County

Watonwan County

Minnesota

0 1 2

Miles

1:80,000

N

Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

▲ GE158 Proposed Turbine

Project Area Boundary

Participant

- Non-Participating (within 1 mile of Project Area)
- Participating (within 1 mile of Project Area)

Sound Pressure Levels (Turbine Only)

- 20 dBA
- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA

*Turbines not to scale

Figure 7c

Sound/Noise

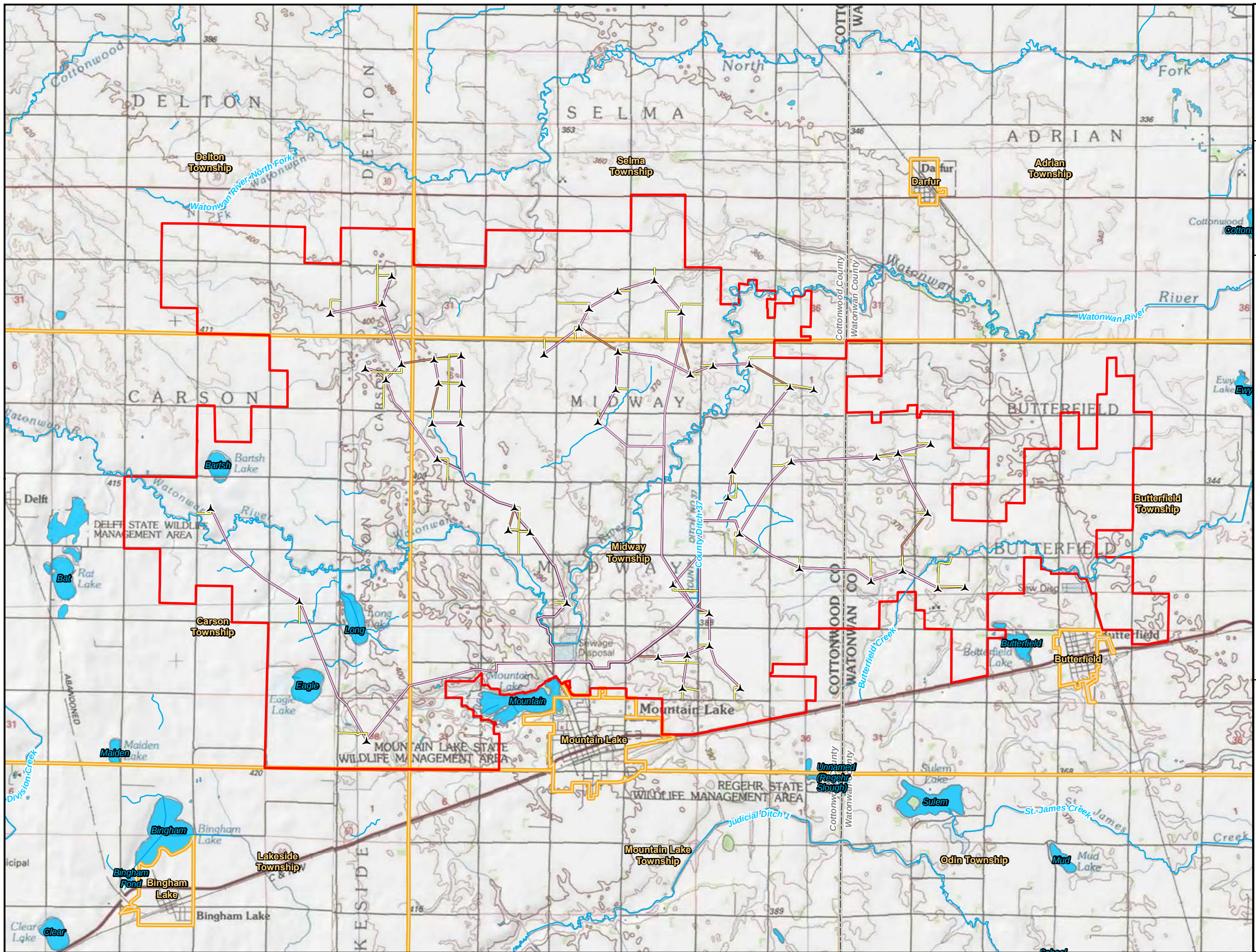
GE-158

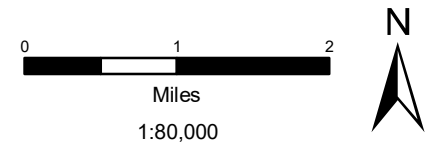
Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota

For Environmental Review Purposes Only

Date: (10/29/2020) Source: Z:\Clients\A_D\Apex\Big_Bend\Site_Permit\Figures\Fig7c_GE158_BB_Sound_Noise.mxd





0 1 2
Miles
1:80,000

North Arrow

Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

- ▲ Proposed Turbine
- Access Road
- Collection Line
- Crane Path
- ▭ Project Area Boundary
- ▭ City/Township
- ▭ County Boundary
- River/Stream
- Lake, Pond, or Reservoir

*Turbines not to scale

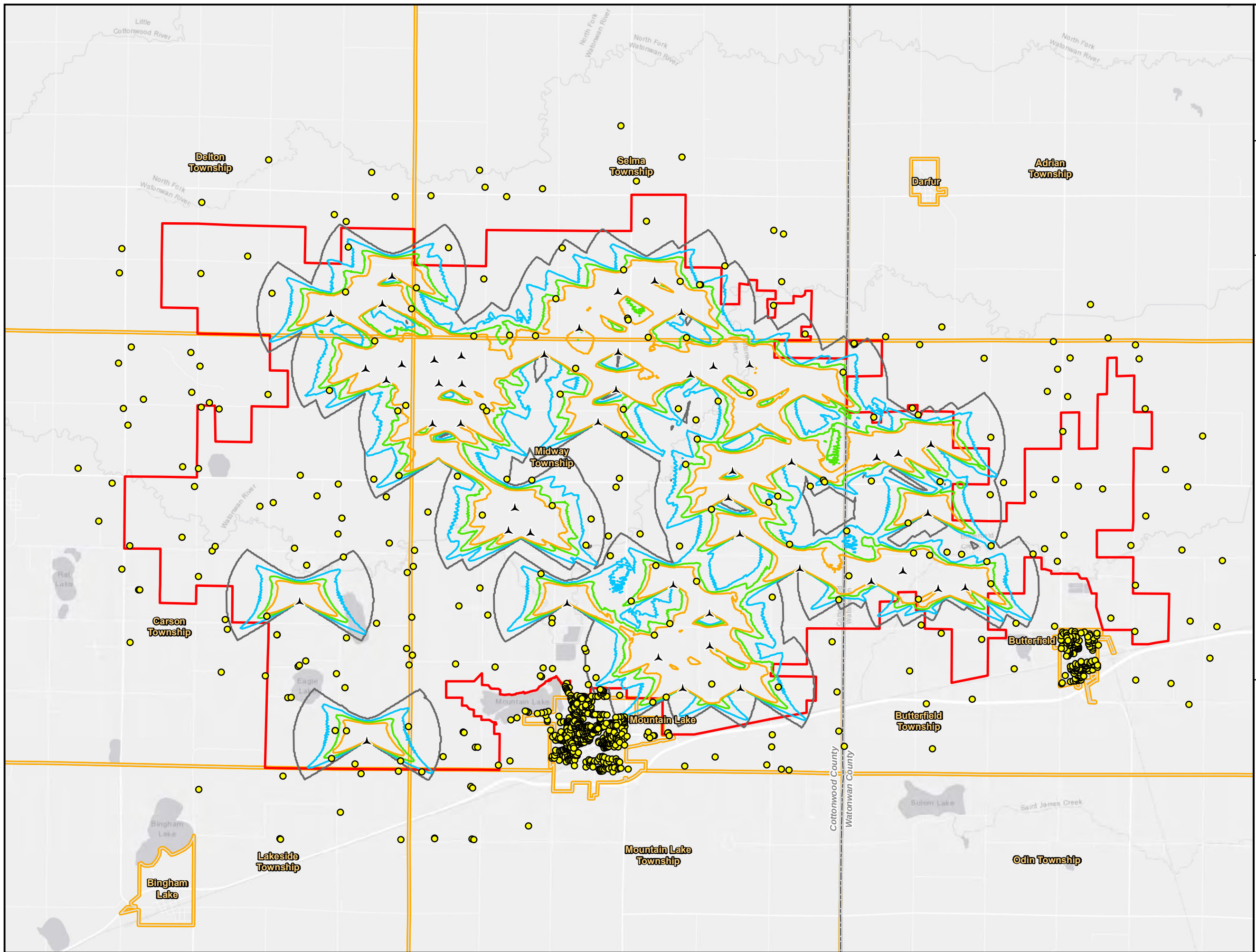
Figure 8
Topographic Map

Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only





Cottonwood County

Watonwan County

Minnesota

0 1 2

Miles

1:80,000

N

Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

▲ N163 Proposed Turbine (Primary)

● Residential Structure (within 1 mile of Project Area)

▭ Project Area Boundary

▭ City/Township

▭ County Boundary

Shadow Hours Per Year

— 0

— 10

— 20

— 30

*Turbines not to scale

Figure 9a

Shadow Flicker

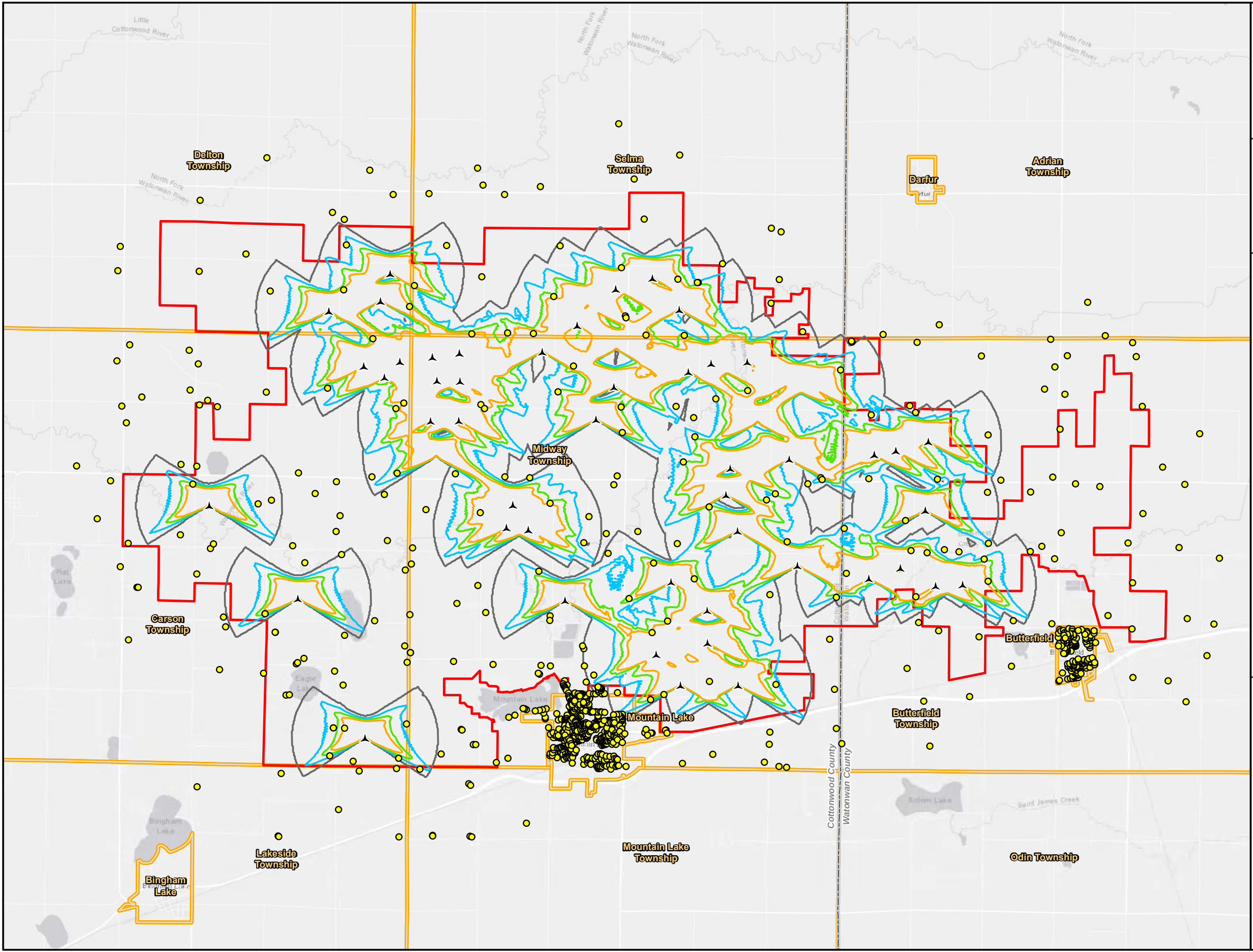
Nordex N-163

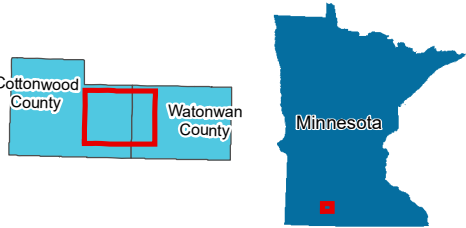
Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only





Cottonwood County
Watonwan County
Minnesota

0 1 2
Miles
1:80,000

N

Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

▲ V162 Proposed Turbine (Primary)

● Residential Structure (within 1 mile of Project Area)

Project Area

City/Township

County Boundary

Shadow Hours Per Year

— 0

— 10

— 20

— 30

*Turbines not to scale

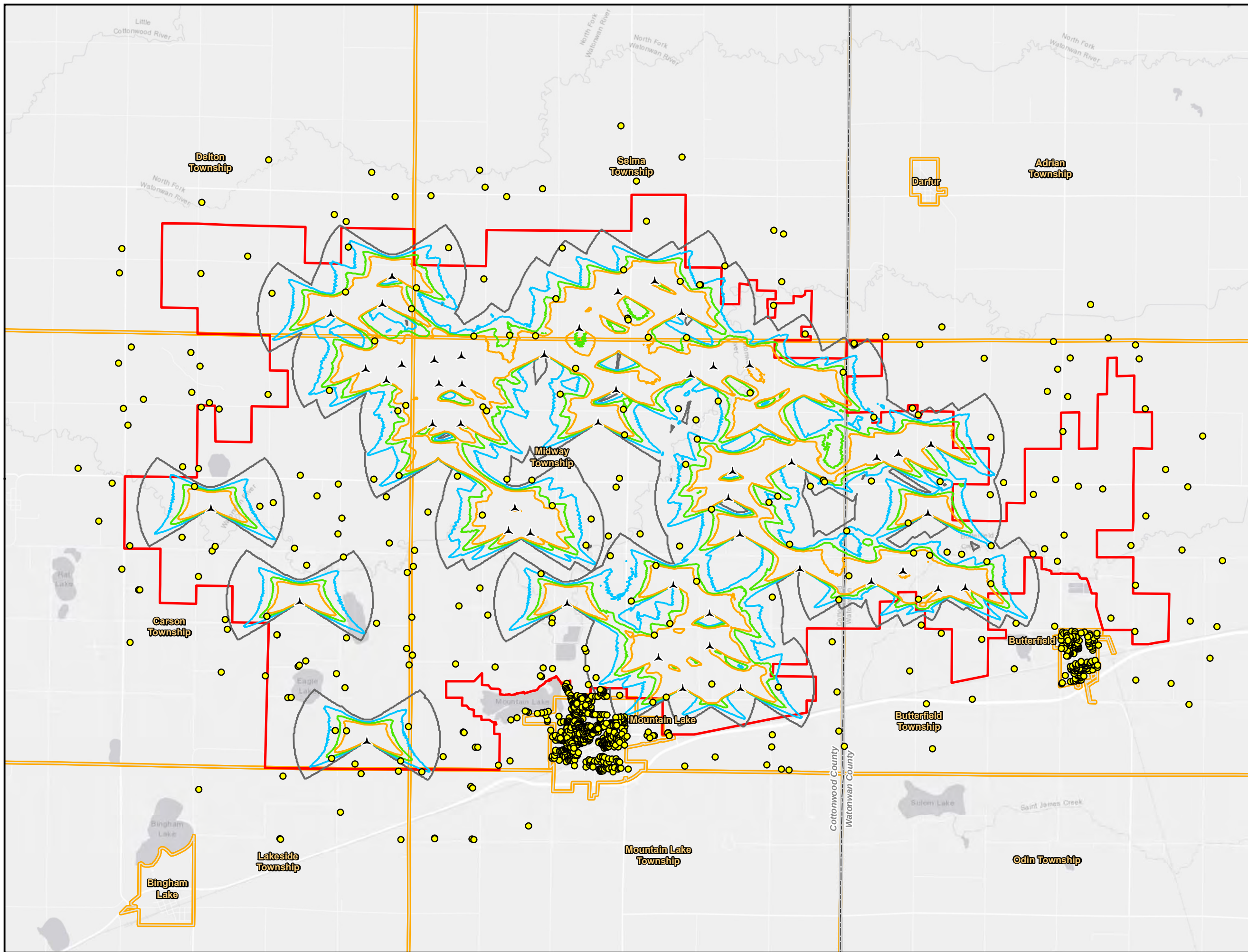
Figure 9b
Shadow Flicker
Vestas V162

Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only



0 1 2
Miles
1:80,000

Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

- ▲ GE158 Proposed Turbine (Primary)
- Residential Structure (within 1 mile of Project Area)
- ▭ Project Area
- ▭ City/Township
- ▭ County Boundary

Shadow Hours Per Year

- 0
- 10
- 20
- 30

*Turbines not to scale

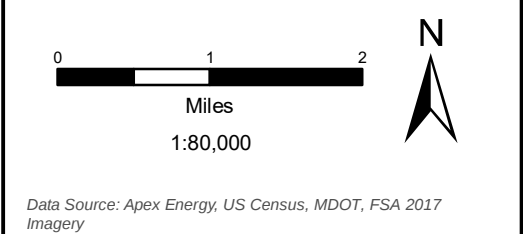
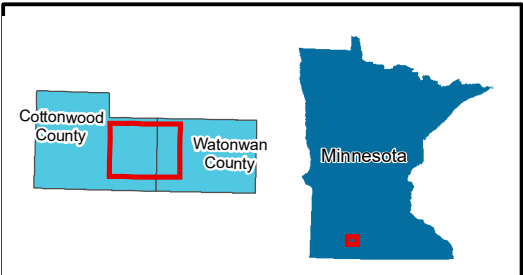
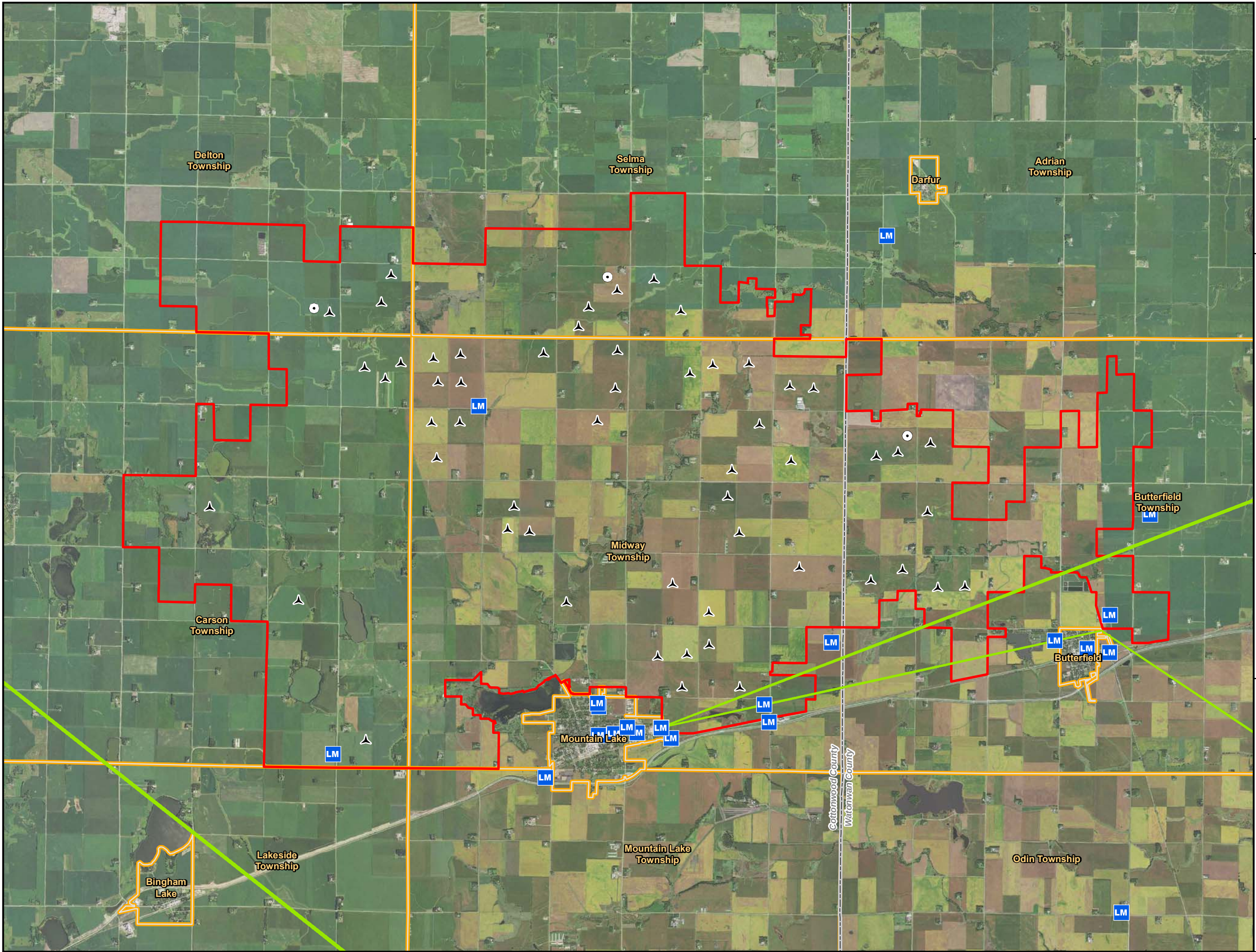
Figure 9c
Shadow Flicker
GE-158

Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota

BIG BEND WIND **merjent.**

For Environmental Review Purposes Only

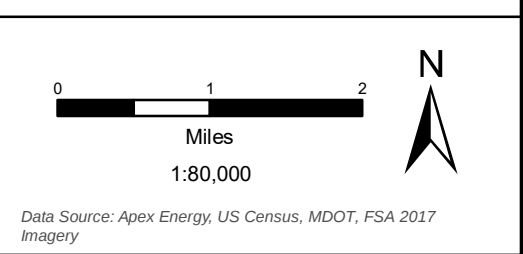
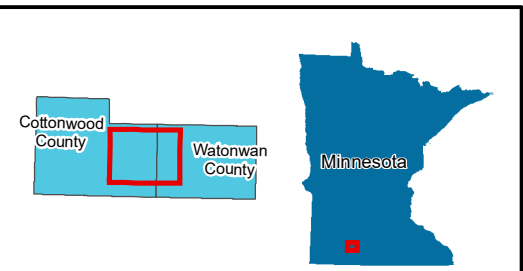
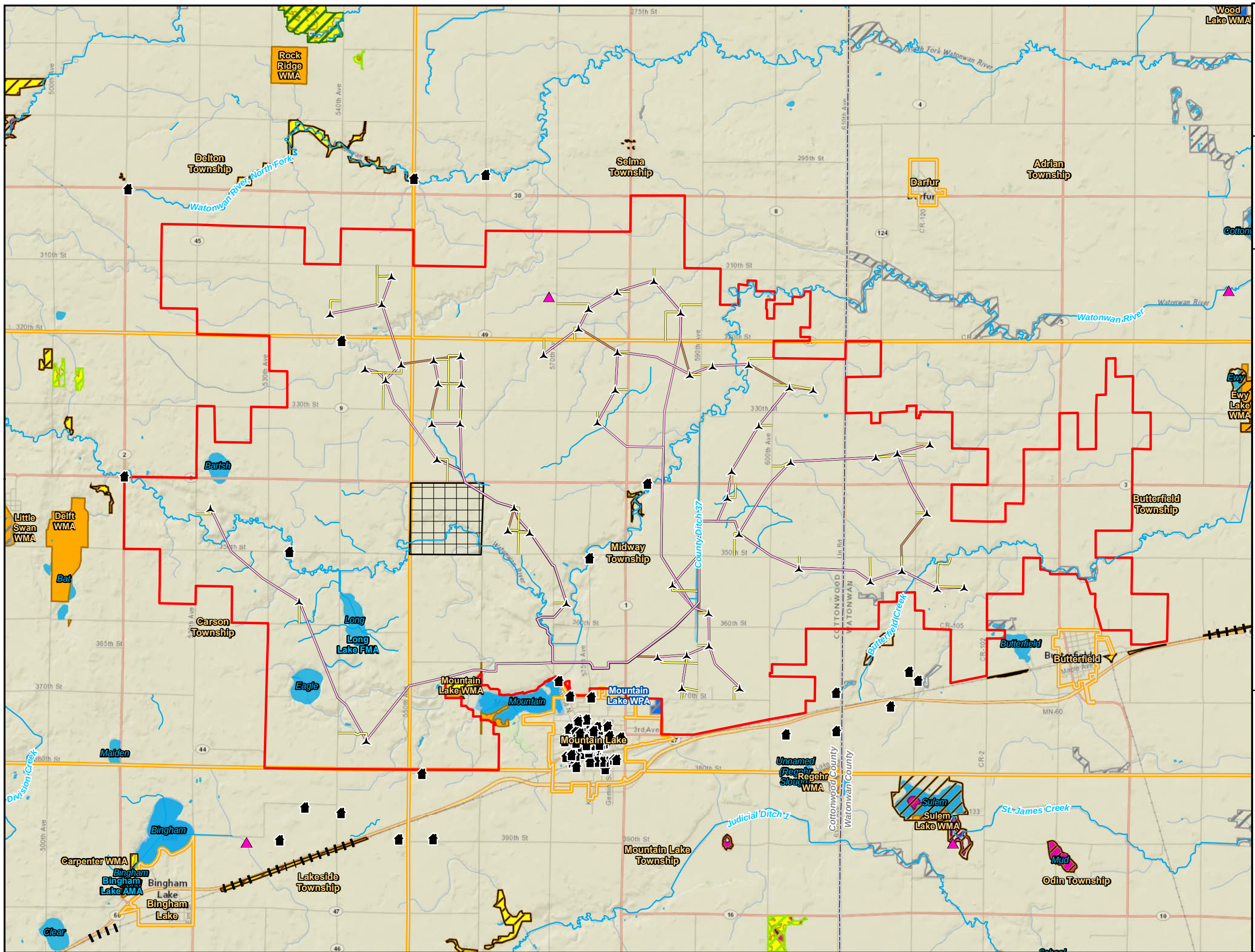


- ▲ Proposed Turbine
 - Met Tower
 - LM Land Mobile
 - Project Area Boundary
 - City/Township
 - County Boundary
 - Microwave Beam Path
- *Turbines not to scale

Figure 10
Microwave Beam Path
Big Bend Wind Project
Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only

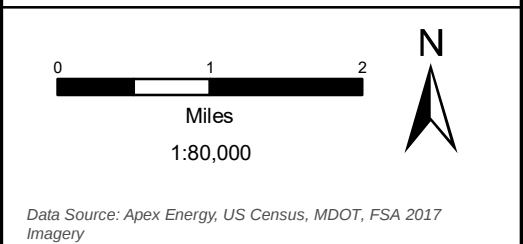
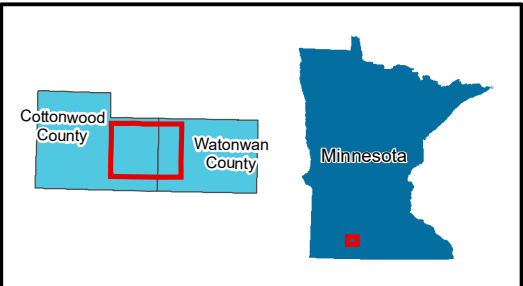
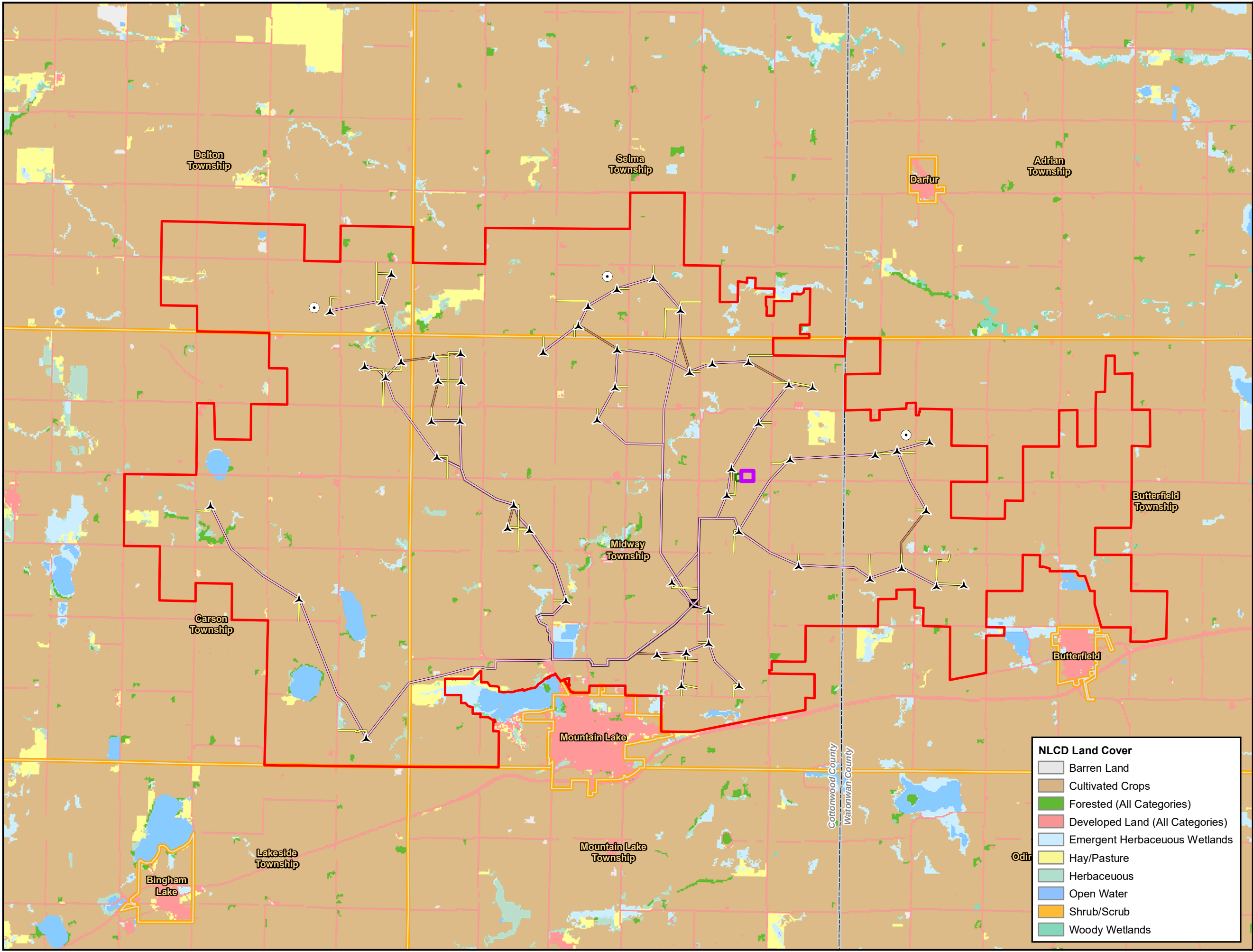


- ▲ Proposed Turbine
 - ▲ Architectural/Historic Resource
 - ▲ Eagle Nest
 - Access Road
 - Collection Line
 - Crane Path
 - ▭ Project Area Boundary
 - River/Stream
 - Lake, Pond or Reservoir
 - ▭ City/Township
 - ▭ County Boundary
 - ▭ Archaeological Site in Section
 - ▭ Railroad ROW Prairie
 - ▭ Native Prairie
 - ▭ Native Plant Community
 - ▭ Wildlife Management Area (WMA)
 - ▭ Waterfowl Production Area (WPA)
 - ▭ Scientific & Natural Area (SNA)
 - ▭ Aquatic Management Area (AMA)
 - Sites of Biodiversity Significance**
 - ▭ Outstanding
 - ▭ High
 - ▭ Moderate
 - ▭ Below
- *Turbines not to scale

Figure 11
Unique Natural Features
Big Bend Wind Project
Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only



Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

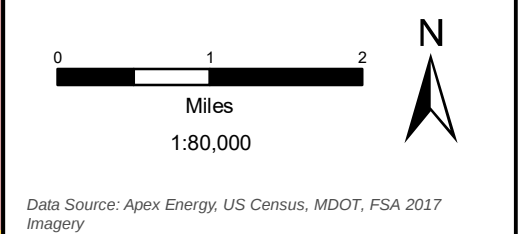
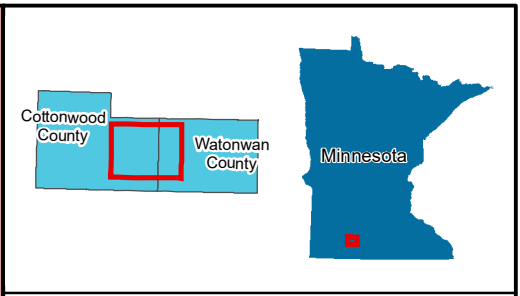
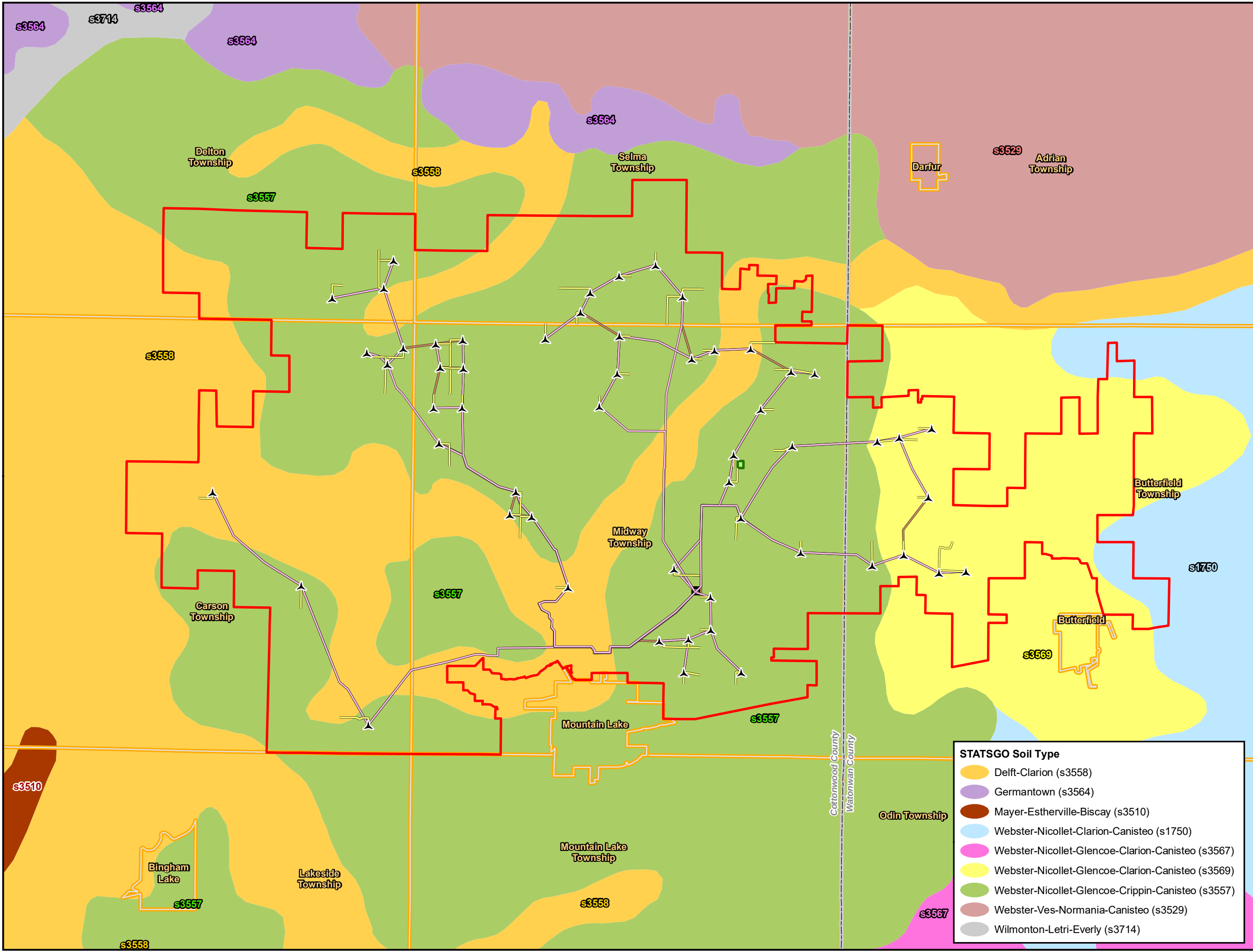
- ▲ Proposed Turbine
 - Met Tower
 - ▭ Project Area Boundary
 - ▭ City/Township
 - ▭ County Boundary
 - Access Road
 - Collection Line
 - Crane Path
 - ▭ Laydown Area
 - ▭ Wind Project Substation
 - ▭ O&M Facility
- *Turbines not to scale

- NLCD Land Cover**
- Barren Land
 - Cultivated Crops
 - Forested (All Categories)
 - Developed Land (All Categories)
 - Emergent Herbaceous Wetlands
 - Hay/Pasture
 - Herbaceous
 - Open Water
 - Shrub/Scrub
 - Woody Wetlands

Figure 12
Land Cover

Big Bend Wind Project
Cottonwood and Watonwan Counties, Minnesota

For Environmental Review Purposes Only



- ▲ Proposed Turbine
 - Access Road
 - Collection Line
 - Crane Path
 - Wind Project Substation
 - O&M Facility
 - Project Area Boundary
 - City/Township
 - County Boundary
- *Turbines not to scale

Figure 13
Soils

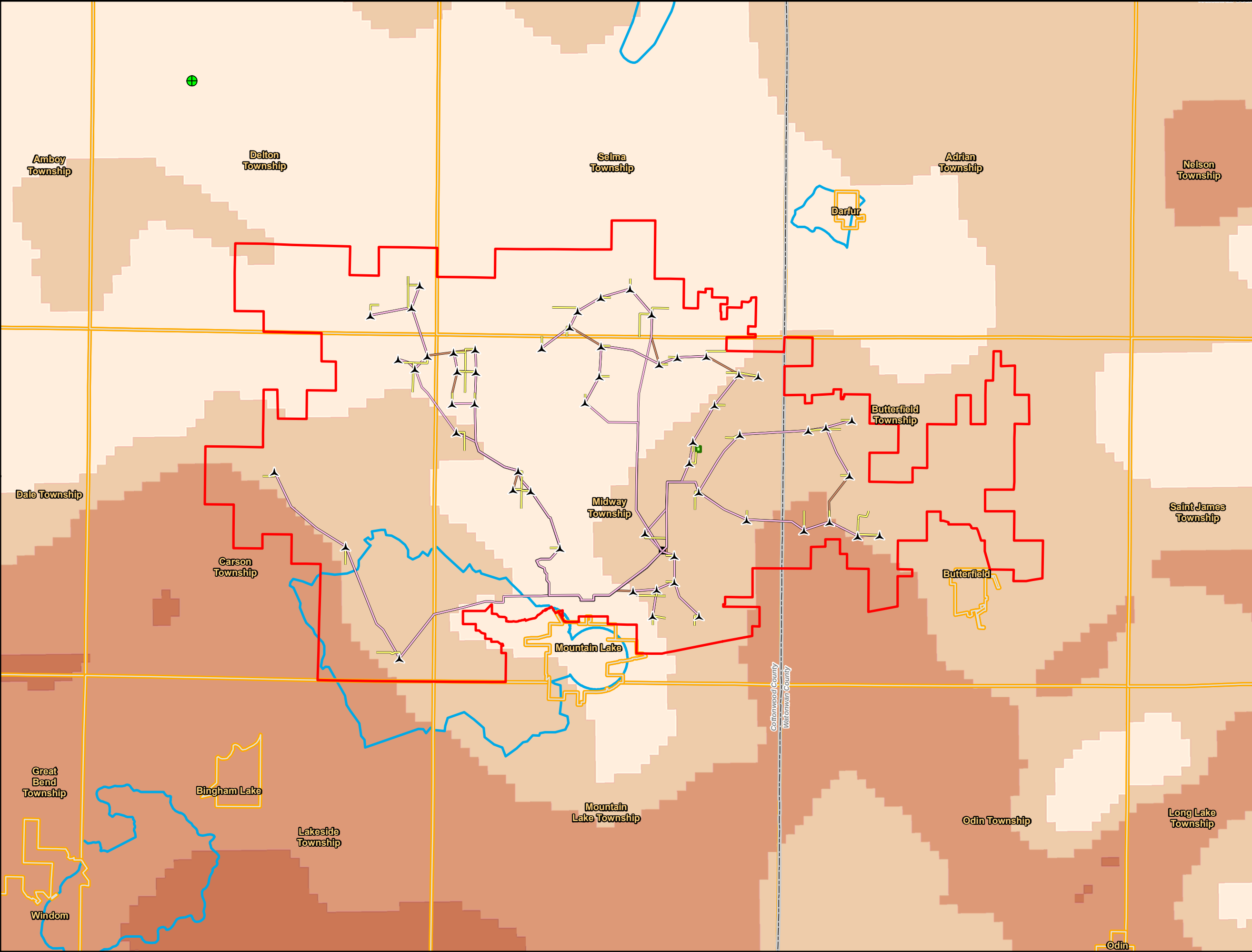
Big Bend Wind Project
Cottonwood and Watonwan
Counties, Minnesota



For Environmental Review Purposes Only

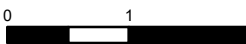
- STATSGO Soil Type**
- Delft-Clarion (s3558)
 - Germantown (s3564)
 - Mayer-Estherville-Biscay (s3510)
 - Webster-Nicollet-Clarion-Canisteo (s1750)
 - Webster-Nicollet-Glencoe-Clarion-Canisteo (s3567)
 - Webster-Nicollet-Glencoe-Clarion-Canisteo (s3569)
 - Webster-Nicollet-Glencoe-Crippin-Canisteo (s3557)
 - Webster-Ves-Normanina-Canisteo (s3529)
 - Wilmonton-Letri-Everly (s3714)

Date: 10/24/2020 Source: Z:\Clients\VA\pex\big_Bend\Site_Permit\Figures\Fig13_BB_Soils.mxd





Cottonwood County Watonwan County



Miles
1:100,000



Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

- Proposed Turbine
- Mining Operation
- Access Road
- Collection Line
- Crane Path
- Wind Project Substation
- O&M Facility
- Project Area Boundary
- Wellhead Protection Area
- City/Township
- County Boundary

Depth to Bedrock (ft)

	0 - 100
	100 - 200
	200 - 300
	300 - 429

*Turbines not to scale

Figure 14
Site Geology and
Depth to Bedrock

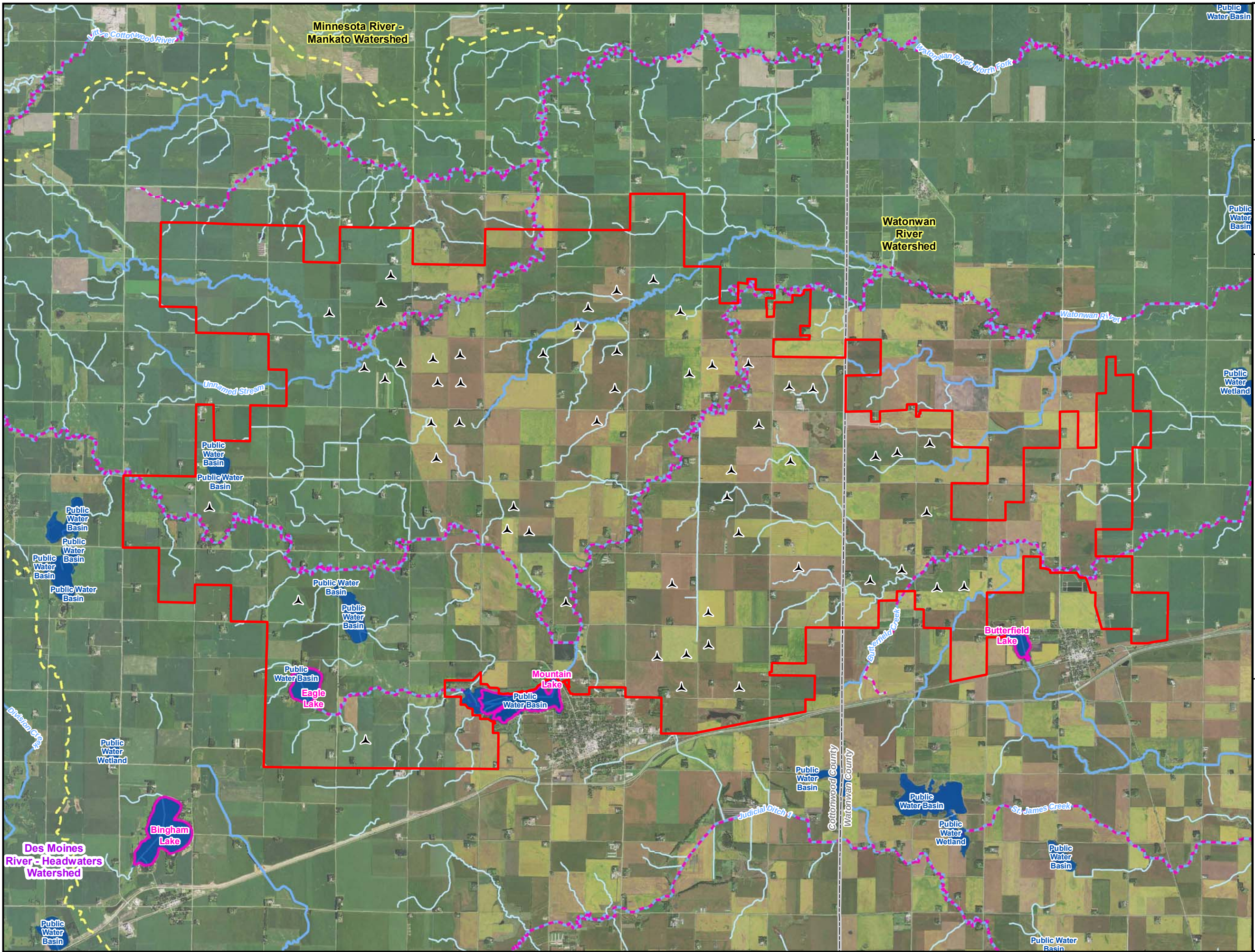
Big Bend Wind Project

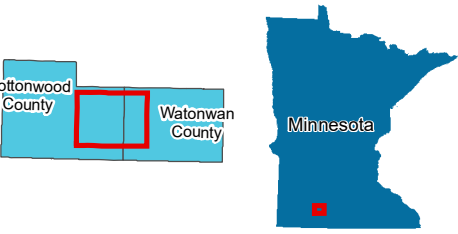
Cottonwood and Watonwan
Counties, Minnesota



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Date: (9/24/2020) Source: Z:\Clients\VA\Apex\Big Bend\Sites_Permit\Figures\Fig14_BB_Geology_Depth_to_Bedrock.mxd





0 1 2
Miles
1:80,000

▲ Proposed Turbine
Project Area Boundary
County Boundary
Impaired Stream
Impaired Lake
24K Stream or Ditch
Public Water Watercourse
Public Water Basin/Wetland
HUC 8 Watershed

*Turbines not to scale

Figure 15
Surface Waters

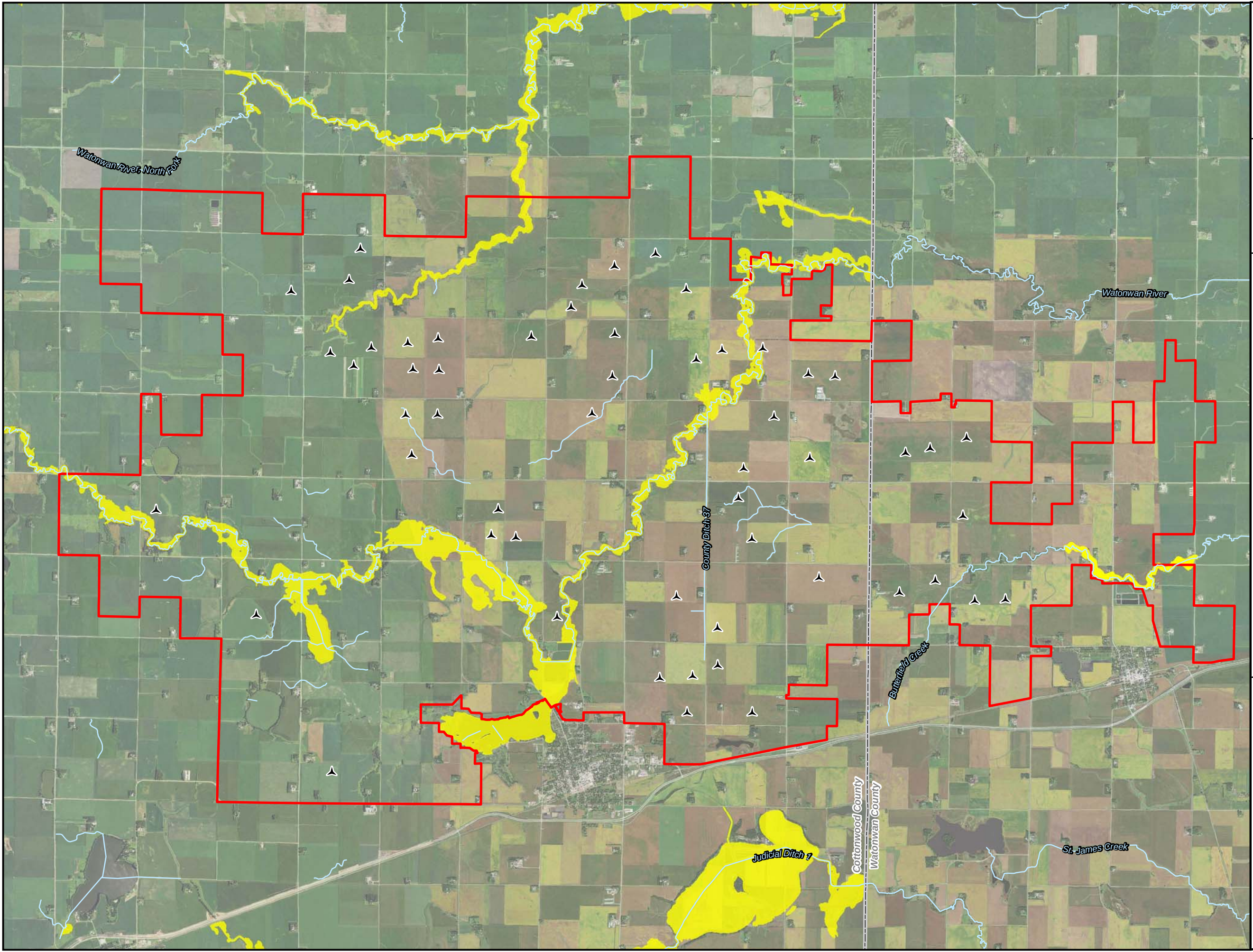
Big Bend Wind Project

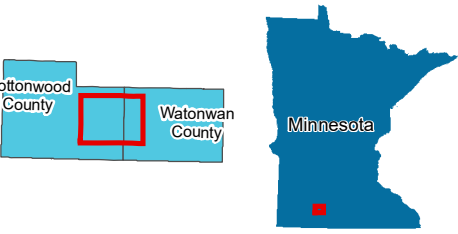
Cottonwood and Watonwan Counties, Minnesota



For Environmental Review Purposes Only

Date: (9/24/2020) Source: Z:\Clients\VA\Big Bend\Sites_Permit\Figures\Fig15_BB_Surface_Waters.mxd





Cottonwood County
Watonwan County
Minnesota

0 1
Miles
1:70,985

N

Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

▲ Proposed Turbine

Project Area Boundary

City/Township

County Boundary

River/Stream

100 Year Floodplain

*Turbines not to scale

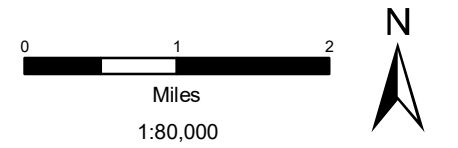
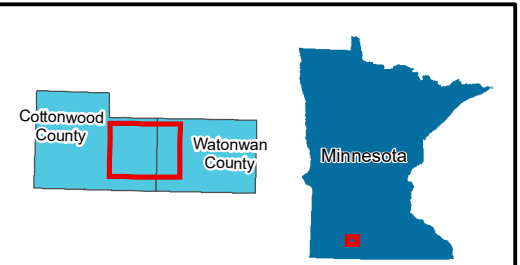
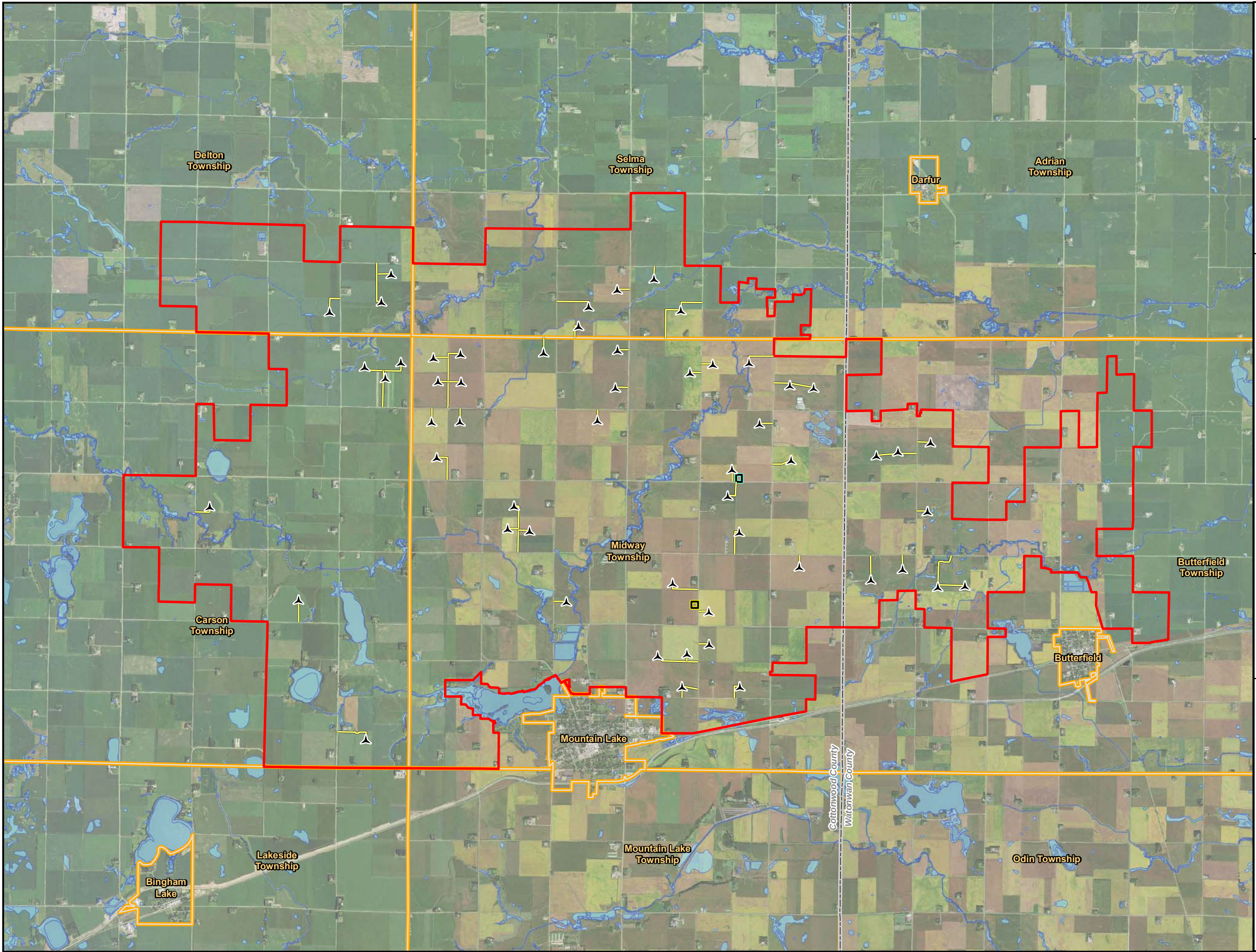
Figure 16
FEMA Floodplain

Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota



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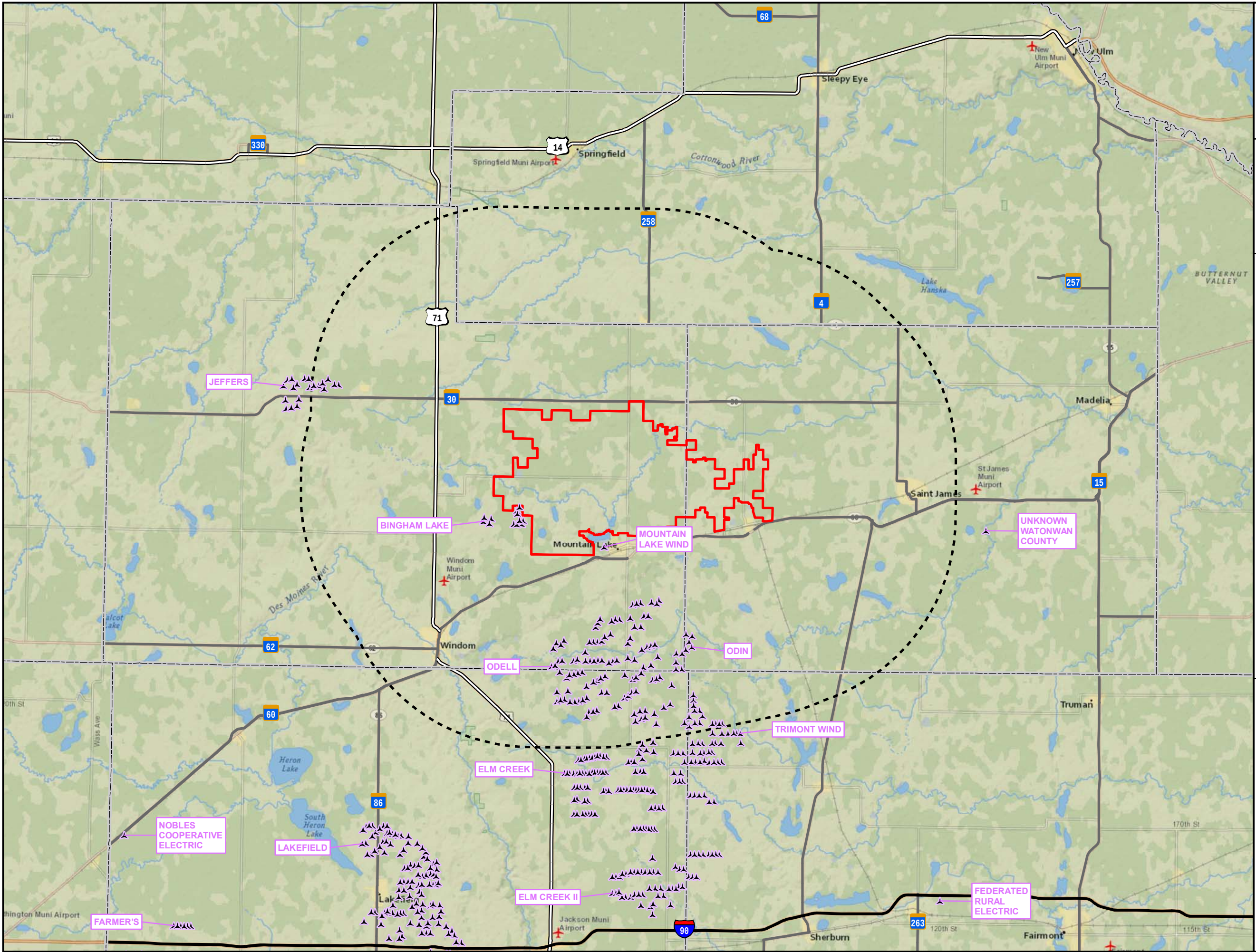
Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

- ▲ Proposed Turbine
- Access Road
- ▭ Collector Substation
- ▭ O&M Facility
- ▭ Project Area Boundary
- ▭ City/Township
- ▭ County Boundary
- ▭ NWI (MNDNR Update)

*Turbines not to scale

Figure 17
Wetlands Inventory
Big Bend Wind Project
Cottonwood and Watonwan
Counties, Minnesota

Date: (9/24/2020) Source: Z:\Clients\A_D\Apex\Big_Bend\Sites_Permit\Figures\Fig17_BB_Wetlands_Inventory.mxd



Cottonwood County
Watonwan County
Minnesota

0 1 2 3 4 5 6 7
Miles
1:300,000

N

Data Source: Apex Energy, US Census, MDOT, FSA 2017 Imagery

- Existing Turbine
- 10-Mile Buffer
- Project Area Boundary
- County Boundary

*Turbines not to scale

Figure 18

Existing Turbine Locations

Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota

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