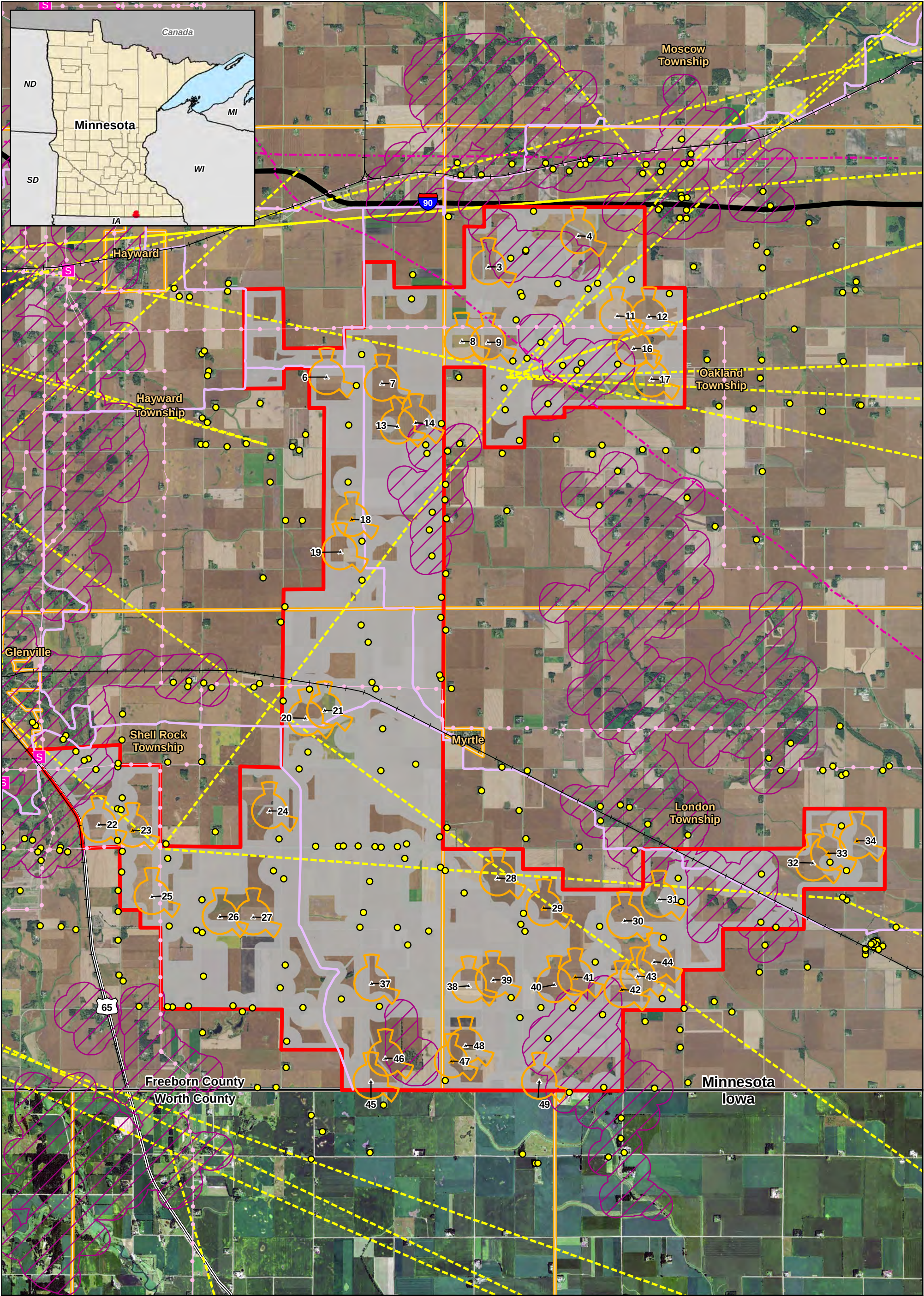


## Figures











00.51

Miles

1 inch = 1 miles



Imagery Source: 2015 Color FSA

Data Source: Invenery, MN DNR, MN DOT, Census, NPMS, Comseach

For Environmental Review Purposes Only

Figure 2

Turbine Layout and Constraints

Freeborn Wind Farm

Freeborn County, MN

 Vestas V110-2.0\*

 Vestas V116-2.0\*

 Existing Substation

 Residential Structure

 Project Boundary

 3x5 Wind Access Buffer

 Setbacks

 1,000 ft NLEB Habitat Buffer

 Existing Transmission Line

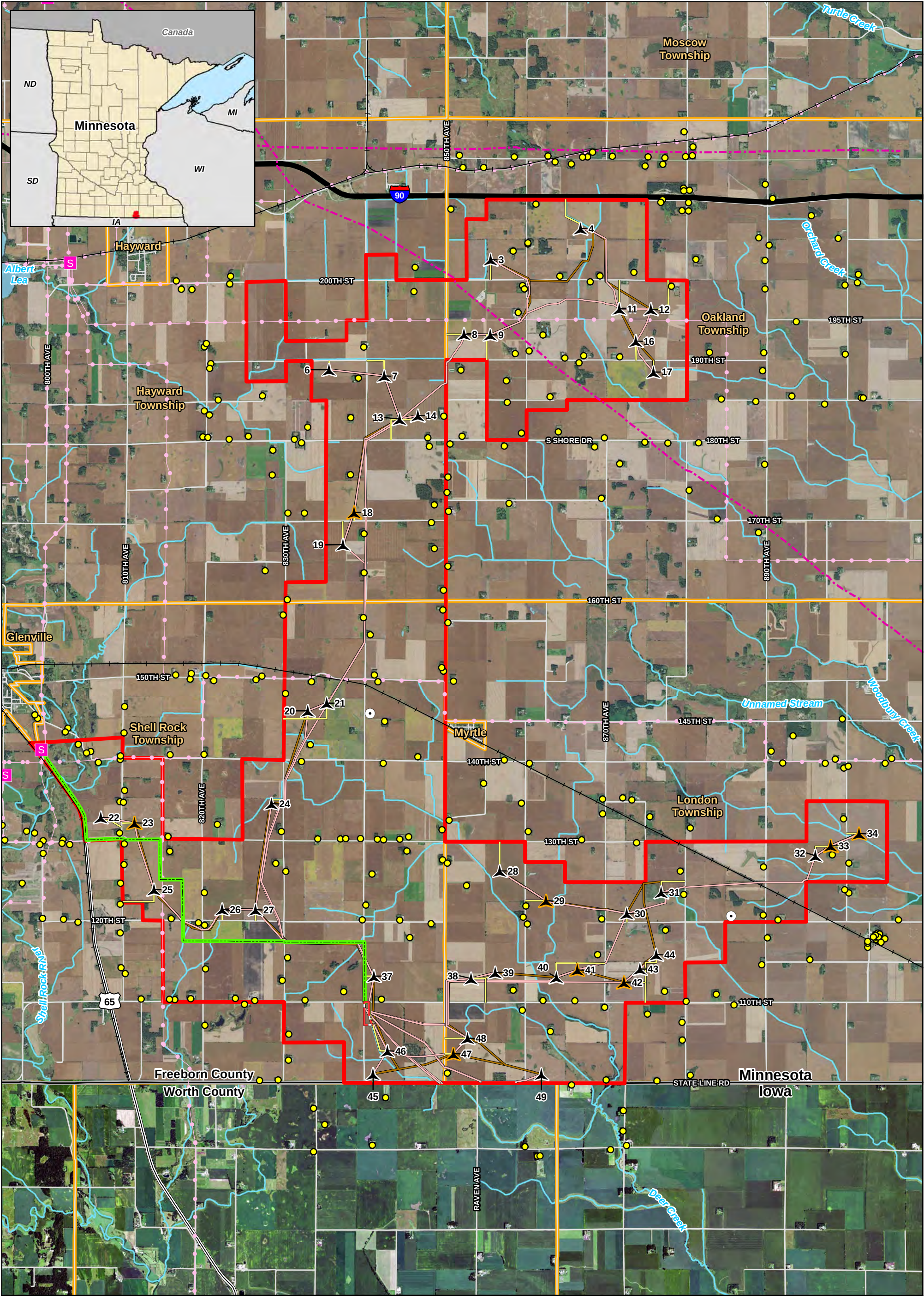
 Existing Pipeline

 Snowmobile Trail

 Microwave Beam Path

\* Turbine Symbol Drawn to Scale







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Miles

1 inch = 1 miles

Imagery Source: 2015 Color FSA

Data Source: Invenergy, MN DNR, MN DOT, NPMS, Census

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Figure 3

Project Area and Facilities

Freeborn Wind Farm

Freeborn County, MN

 Vestas V110-2.0

 Vestas V116-2.0

 Residential Structure

 Permanent Met Tower

 Project Boundary

 O&M and Project Substation

 River/Stream

 Lake, Pond or Reservoir

 Existing Substation

 Existing Pipeline

 Existing Transmission Line

 Access Road

 Collection Line

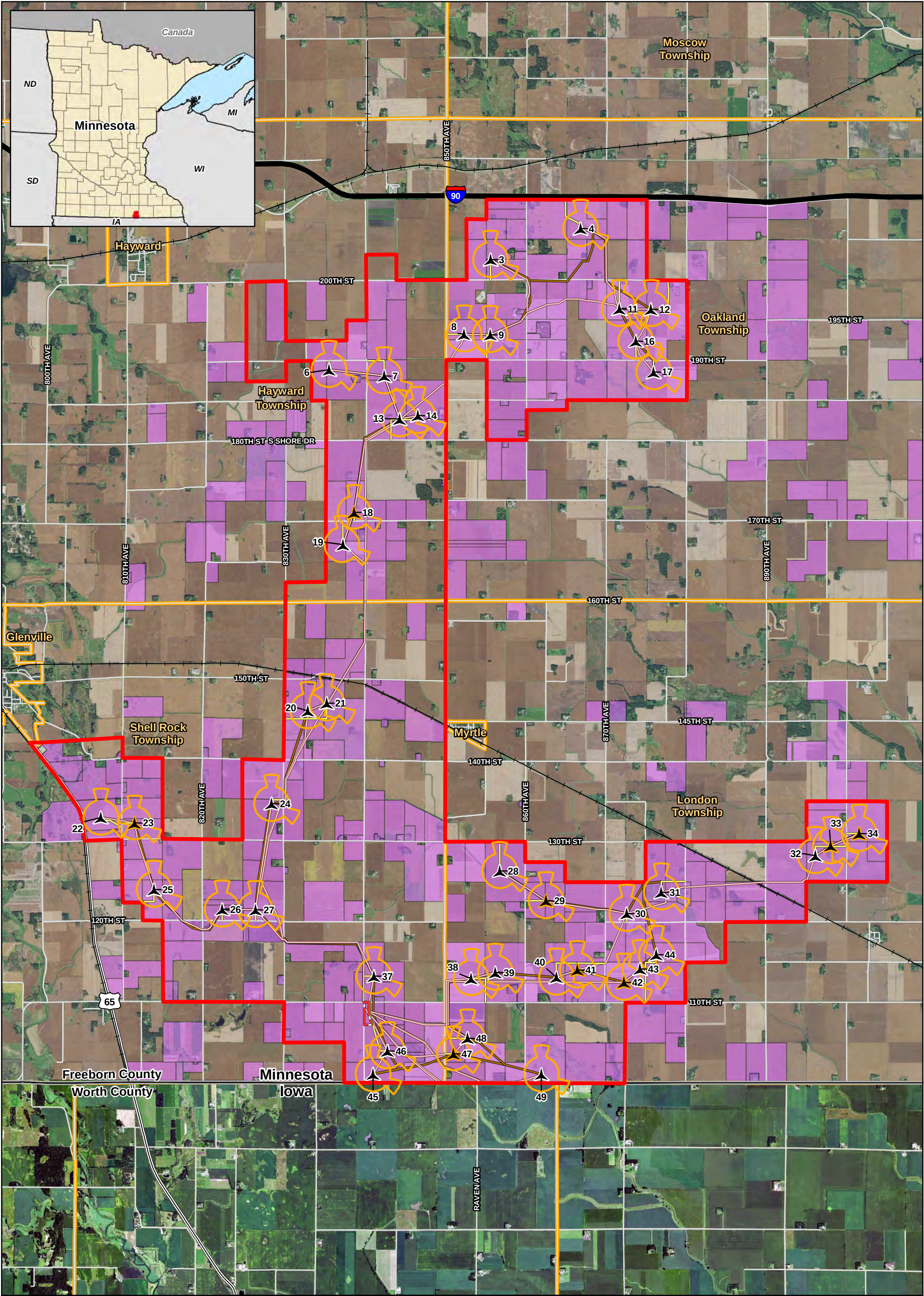
 Crane Path

 Proposed Transmission Line

Source: Z:\Clients\Invenergy\Freeborn\_Wind\_Farm\_Project\Permitting\State\FUC\_Site\_PermitMapping\Utilities\_V110\Figure\_3\_Project\_Area\_Facilities.mxd

Date: (6/5/2017)







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Miles

1 inch = 1 miles

Imagery Source: 2015 Color FSA

Data Source: Invenergy, MN DNR, USFWS, Census

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Figure 4

Land Ownership

Freeborn Wind Farm

Freeborn County, MN

 Vestas V110-2.0

 Vestas V116-2.0

 Project Boundary

 O&M and Project Substation

 3x5 Wind Access Buffer

 Access Road

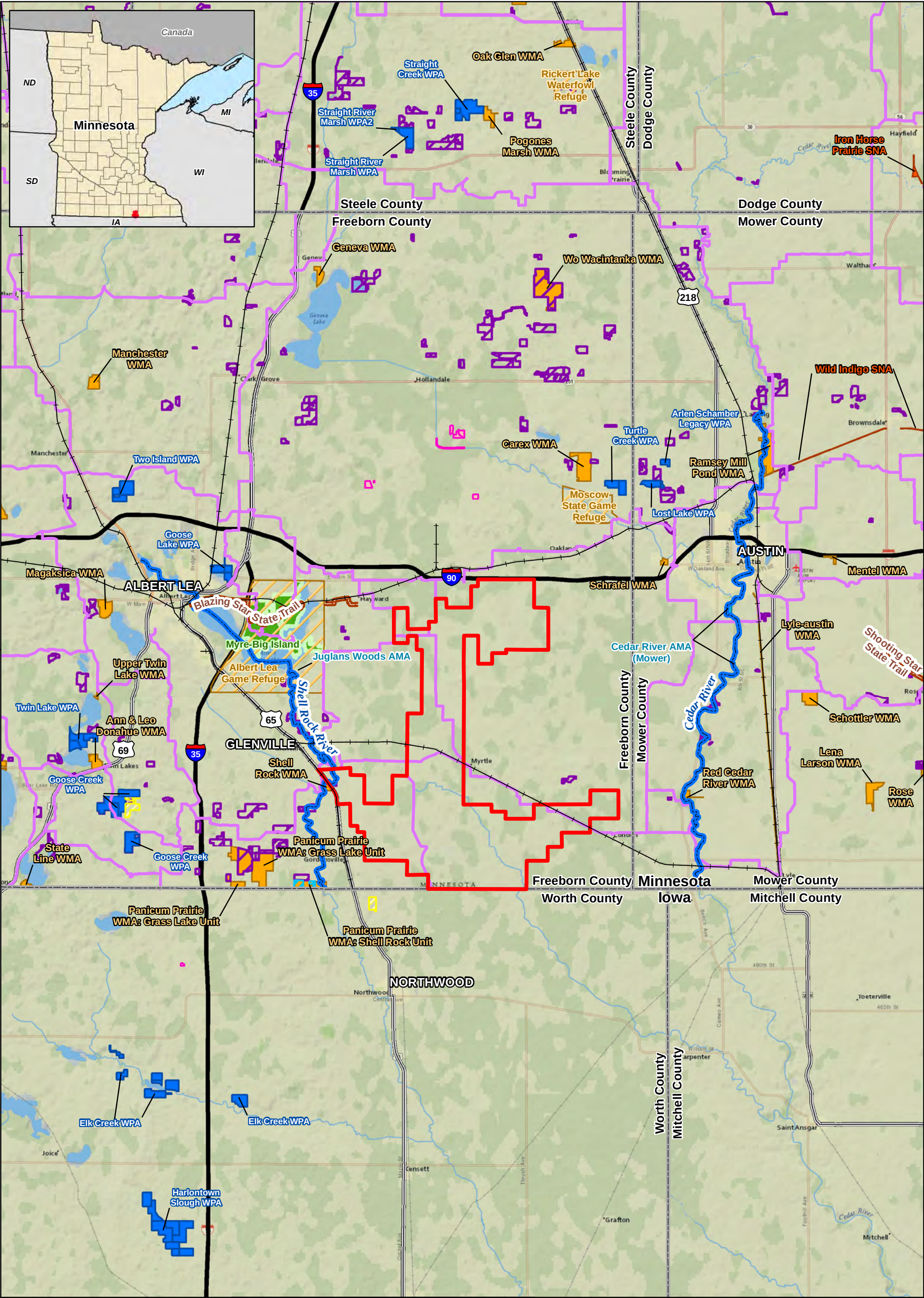
 Collection Line

 Crane Path

Site Control Status

 Participant







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Miles

1 inch = 3 miles

Imagery Source: National Geographic World Map

Data Source: Invenergy, MN DNR, MN DOT, MN BWSR, USFWS, Census

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Figure 5

Public Land Ownership and Recreation

Freeborn Wind Farm

Freeborn County, MN

Project Boundary

Minnesota State Trails (MS 85.015)

Minnesota Water Trails

Snowmobile Trail

State Game Refuge

Minnesota State Park

Reinvest in Minnesota (RIM)

Wildlife Management Area (WMA)

Scientific & Natural Area (SNA)

Aquatic Management Area (AMA)

**Federal Interest**

Farm Service Agency

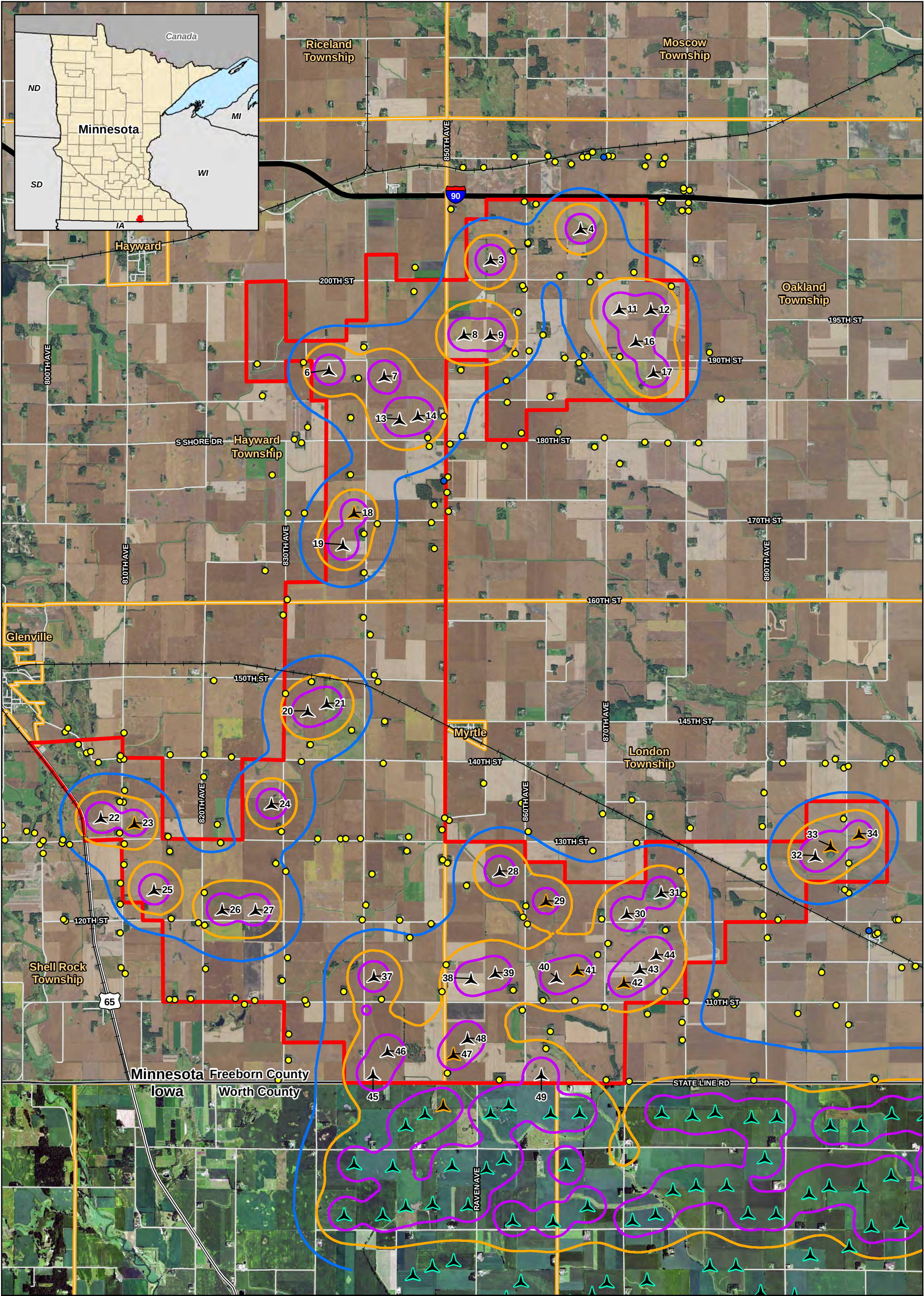
Grassland Easement

Waterfowl Production Area

Wetland Easement

Date: (6/1/2017) Source: Z:\Client\Invenergy\Freeborn\_Wind\_Farm\_Project\Permitting\State\PUC\_Site\_Permit\Map\Map\Freeborn\_V11b\Figure\_5\_Public\_Land\_and\_Recreation.mxd







0 0.5 1 Miles  
1 inch = 1 miles

Imagery Source: 2015 Color FSA  
Data Source: Invenergy, MN DOT, Census  
For Environmental Review Purposes Only

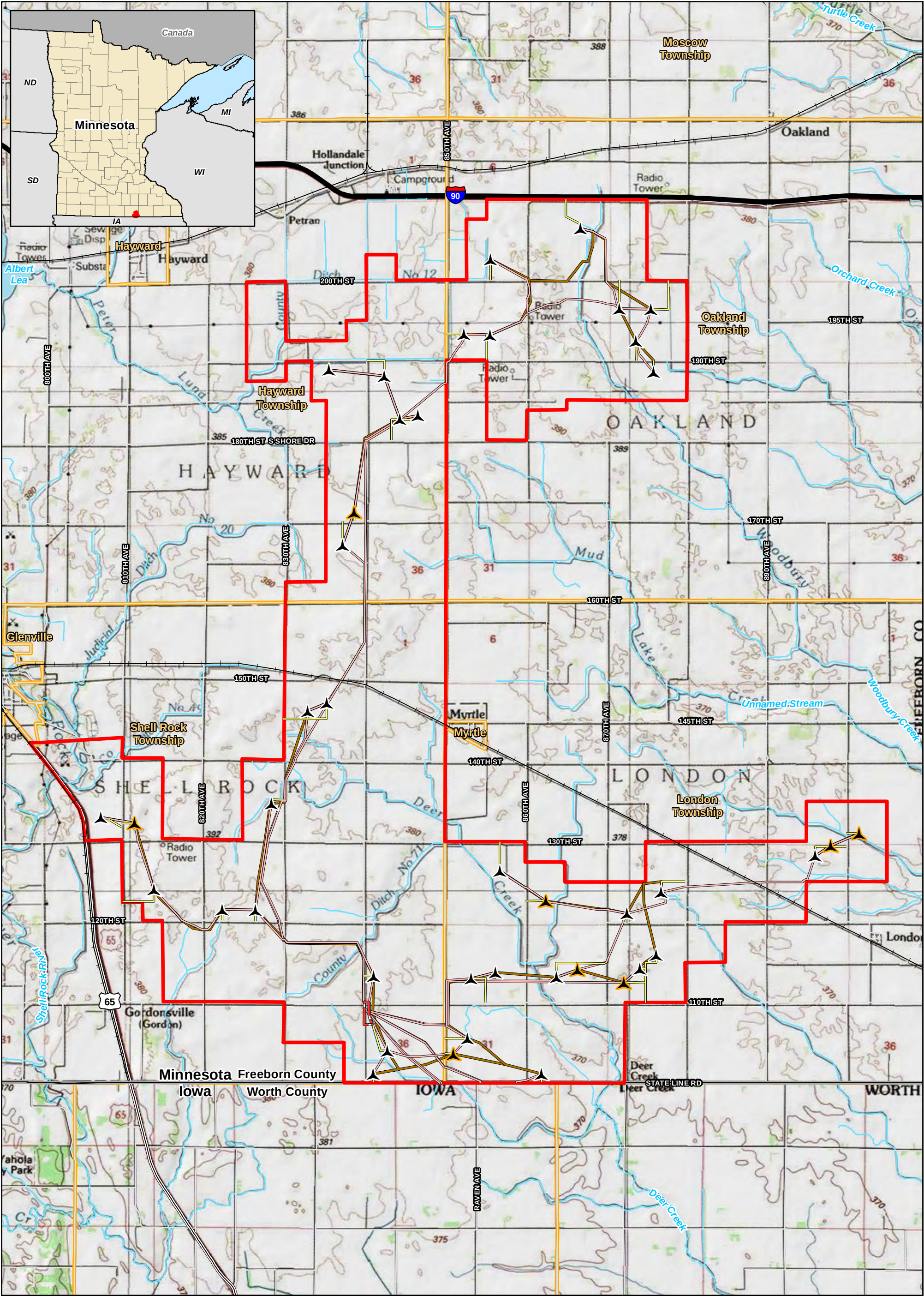


**Figure 6  
Sound/Noise**

**Freeborn Wind Farm  
Freeborn County, MN**

- |                                                                                       |                               |                                                                                       |                      |
|---------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|----------------------|
|  | Vestas V110-2.0               |  | Noise Level Contours |
|  | Vestas V116-2.0               |  |                      |
|  | Modeled Iowa Turbine Location |  |                      |
|  | NAC-1 Receptor                |                                                                                       |                      |
|  | NAC-2 Receptor                |                                                                                       |                      |
|  | Project Boundary              |                                                                                       |                      |







00.51

Miles

1 inch = 1 miles



Imagery Source: 2013 USA Topo

Data Source: Invenergy, MN DNR, MN DOT, Census

For Environmental Review Purposes Only

Figure 7

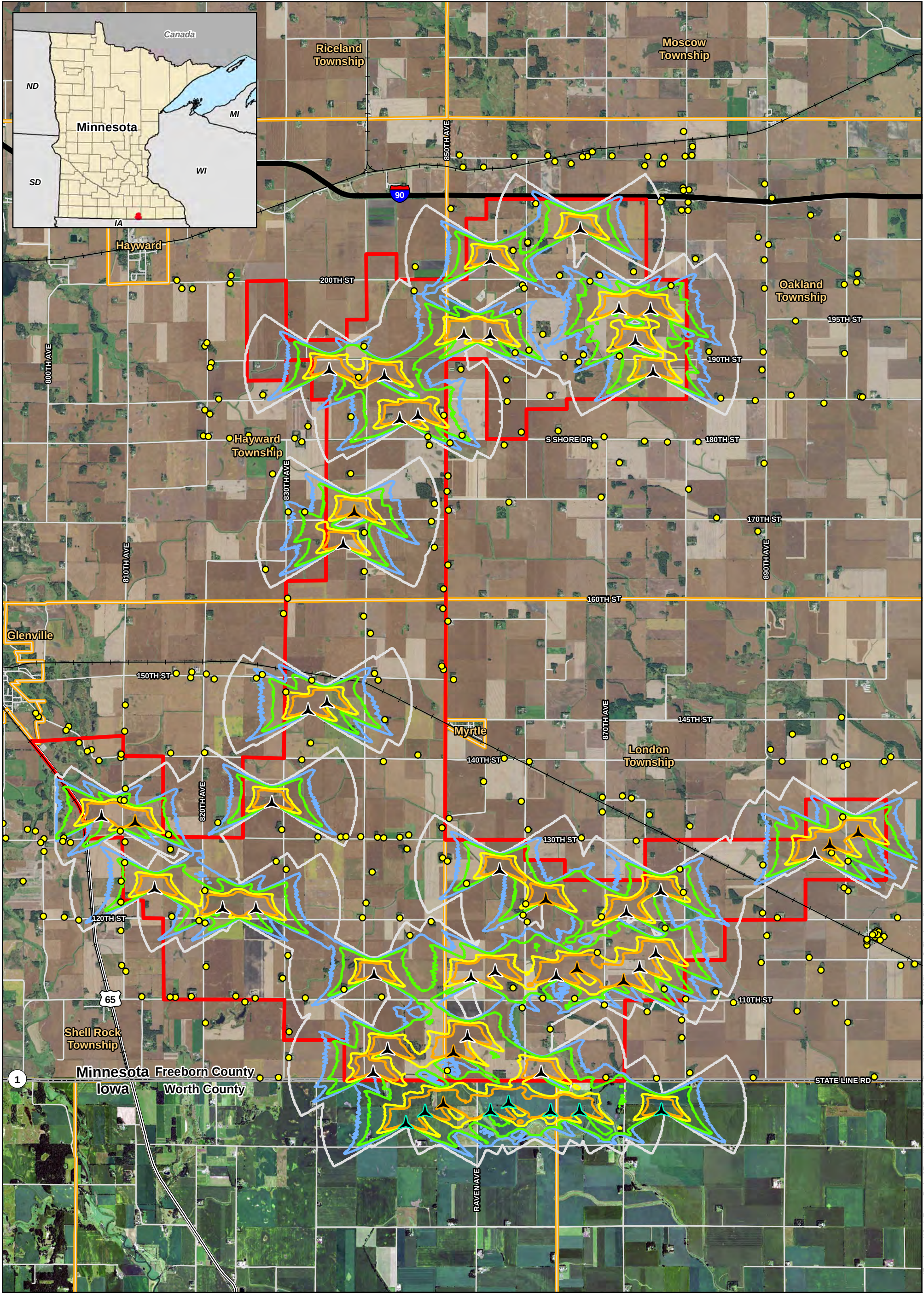
Topographic Map

Freeborn Wind Farm

Freeborn County, MN

- |                                                                                       |                            |                                                                                       |                         |
|---------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------|-------------------------|
|  | Vestas V110-2.0            |  | Collection Line         |
|  | Vestas V116-2.0            |  | Crane Path              |
|  | Project Boundary           |  | River/Stream            |
|  | O&M and Project Substation |  | Lake, Pond or Reservoir |
|  | Access Road                |                                                                                       |                         |





0 0.5 1  
Miles  
1 inch = 1 miles



Imagery Source: 2015 Color FSA  
Data Source: Invergent, MN DOT, Census  
For Environmental Review Purposes Only

Figure 8  
Shadow Flicker

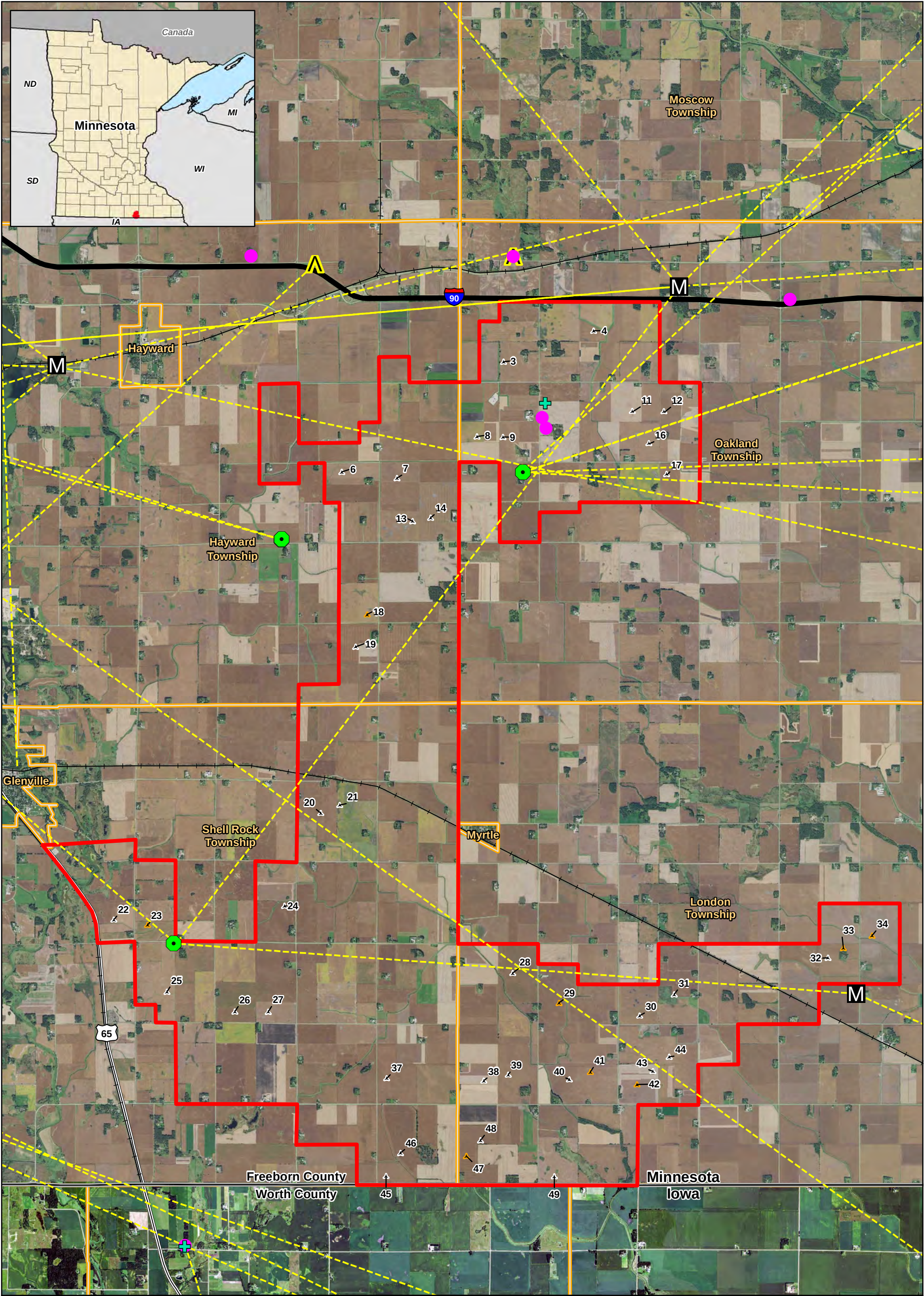
Freeborn Wind Farm  
Freeborn County, MN

- Vestas V110-2.0
- Vestas V116-2.0
- Modeled Iowa Turbine Location
- Residential Structure
- Project Boundary

Shadow Hours Per Year

- 0
- 5
- 10
- 30
- 50







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Miles

1 inch = 1 miles



Imagery Source: 2015 Color FSA

Data Source: Invenergy, MN DOT, Comsearch, Census

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Figure 9

Microwave Beam Paths

Freeborn Wind Farm

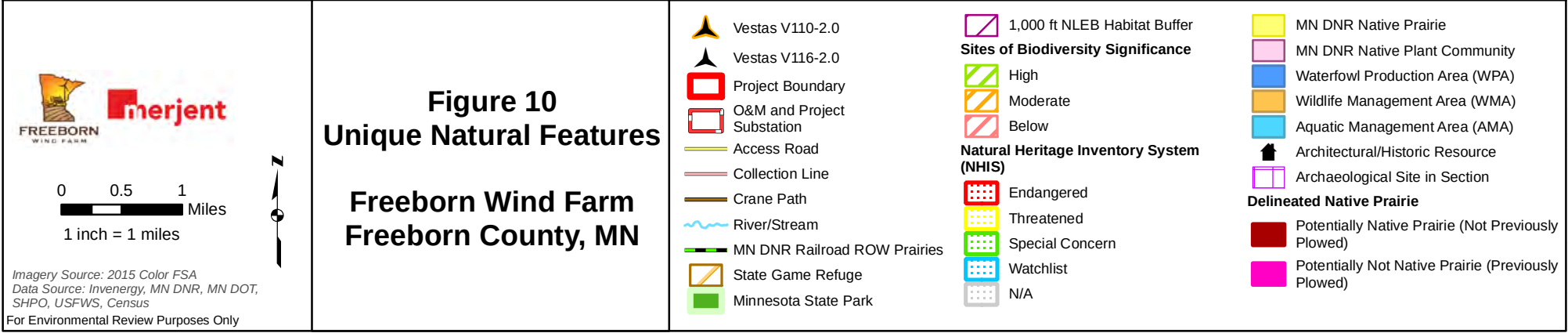
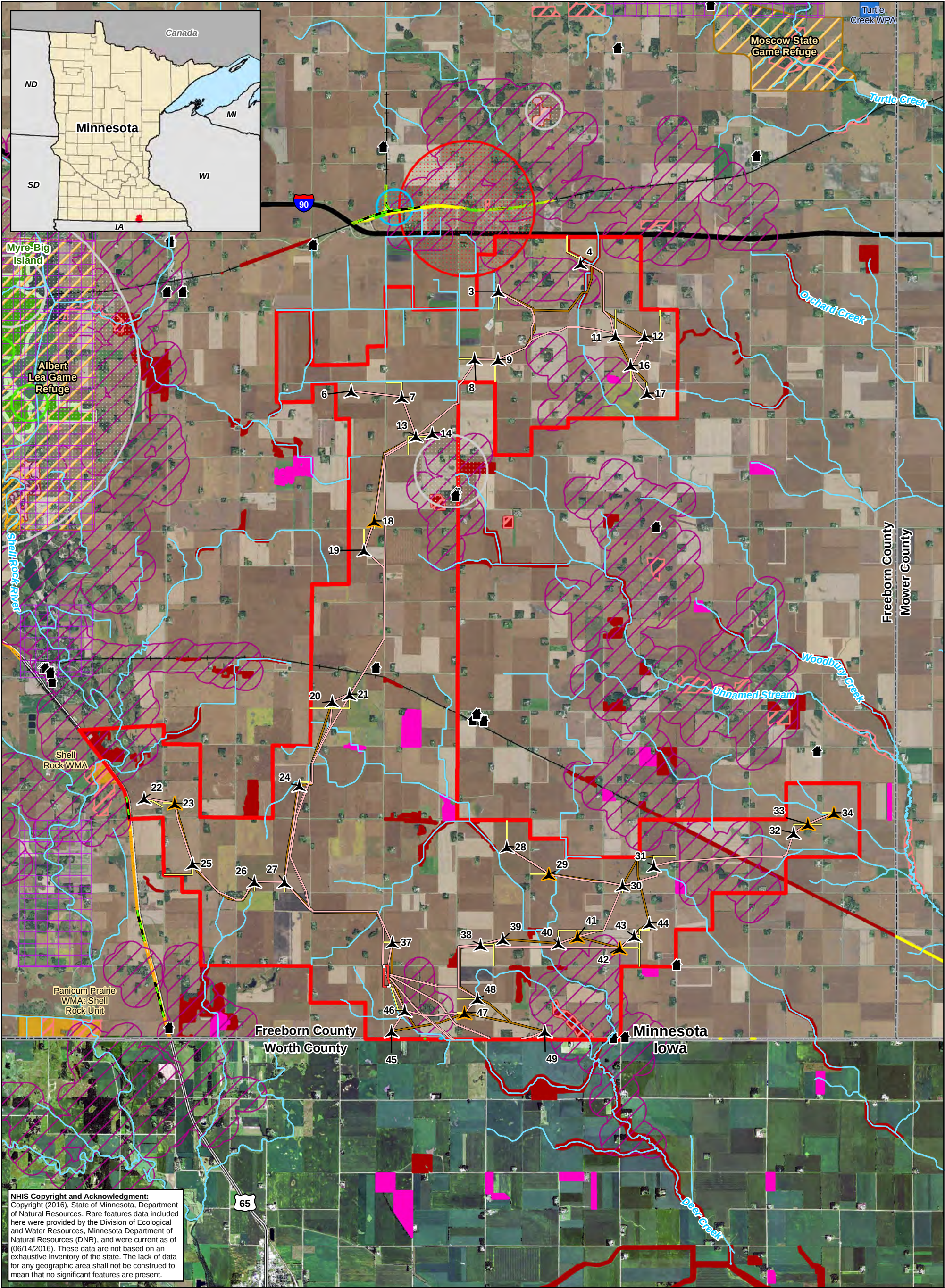
Freeborn County, MN

|                                                                                       |                     |                                                                                       |                              |
|---------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------|------------------------------|
|  | Vestas V110-2.0*    |  | Communication Tower          |
|  | Vestas V116-2.0*    |  | Microwave Tower/<br>FM Tower |
|  | Project Boundary    |  | Microwave Tower              |
|  | County Boundary     |  | Mobile Cell Tower            |
|  | Microwave Beam Path |                                                                                       |                              |
|  | FM Tower            |                                                                                       |                              |

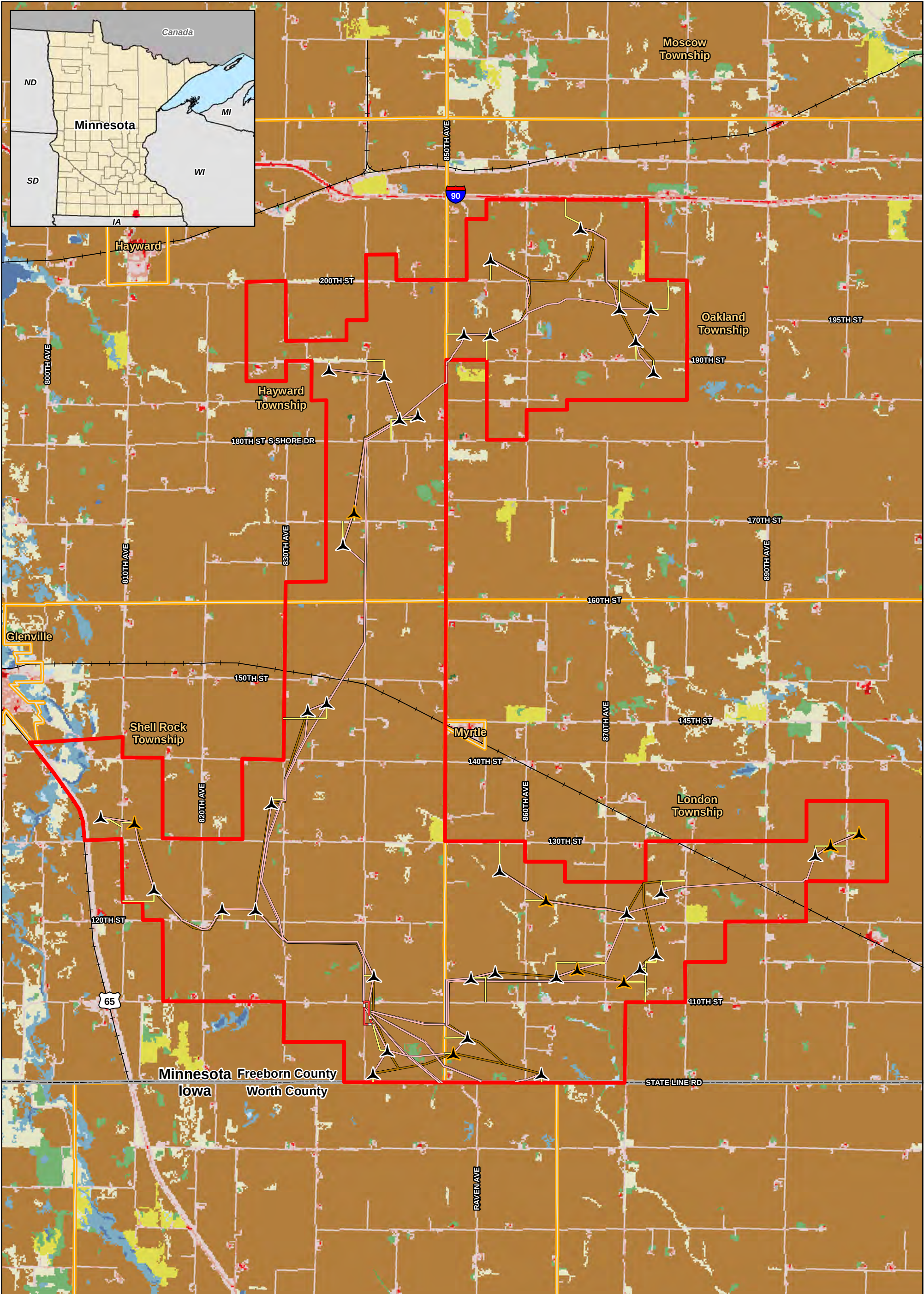
\* Turbine Symbol Drawn to Scale

Source: Z:\Clients\Invenergy\Freeborn\_Wind\_Farm\_Project\Permitting\State\PUC\_Site\_PermitMapping\VESIAS\_V116\Figure\_9\_Microwave\_Beam\_Path.mxd Date: (6/5/2017)











00.51

Miles

1 inch = 1 miles



Data Source: Invenergy, MN DOT, NLCD, Census

For Environmental Review Purposes Only

**Figure 11**  
**Land Cover**

**Freeborn Wind Farm**  
**Freeborn County, MN**



Vestas V110-2.0



Vestas V116-2.0



Project Boundary



O&M and Project Substation



Access Road



Collection Line



Crane Path

**NLCD Land Cover**



Open Water



Developed, Open Space



Developed, Low Intensity



Developed, Medium Intensity



Developed, High Intensity



Barren Land



Deciduous Forest



Evergreen Forest



Grassland/Herbaceous



Hay/Pasture



Cultivated Crops

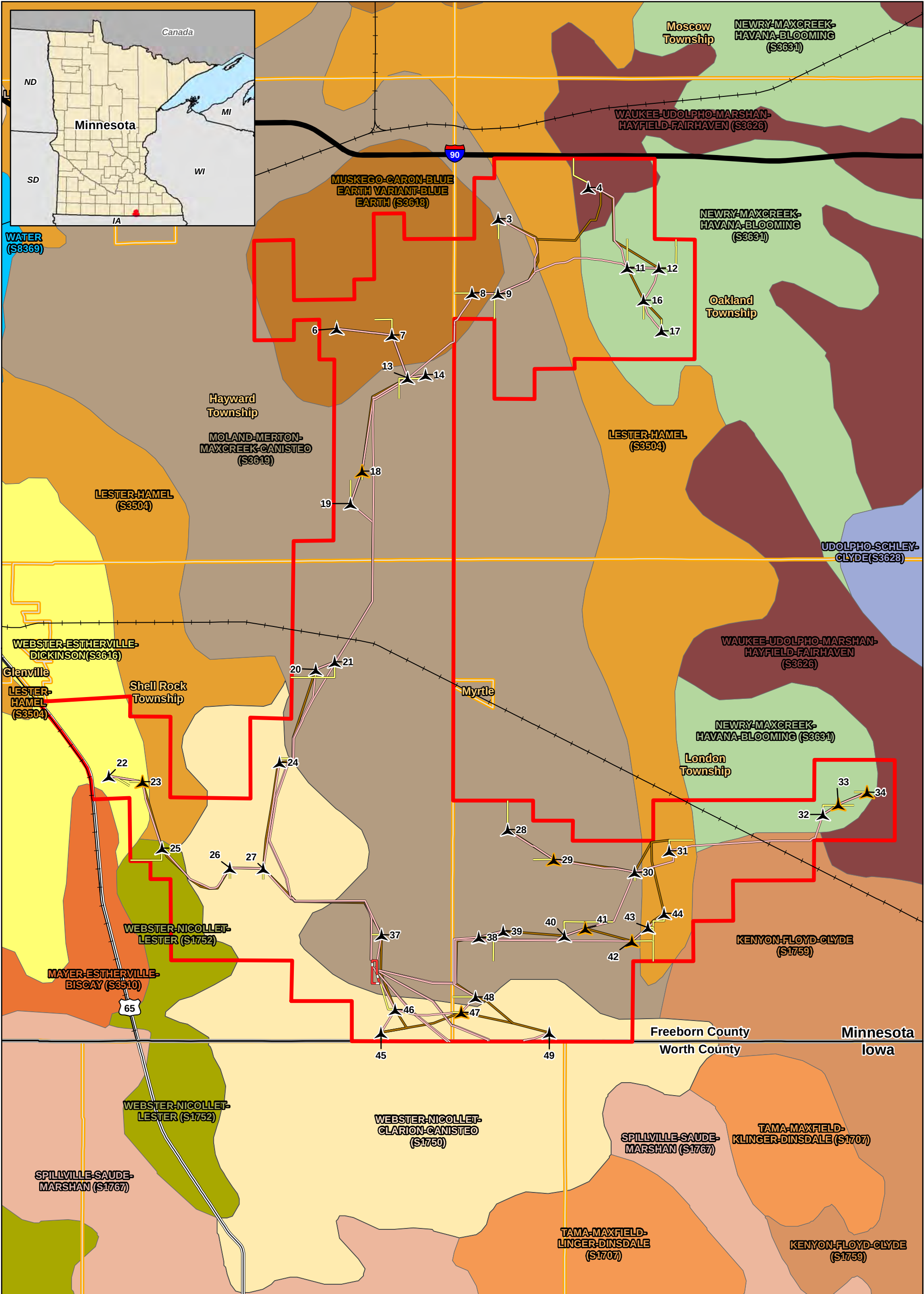


Woody Wetlands



Emergent Herbaceous Wetlands







00.51

Miles

1 inch = 1 miles

↑

↓

Data Source: Invenergy, MN DOT, SSURGO, Census  
For Environmental Review Purposes Only

Figure 12

Soils

Freeborn Wind Farm

Freeborn County, MN



Vestas V110-2.0



Vestas V116-2.0



Project Boundary



O&M and Project Substation



Access Road



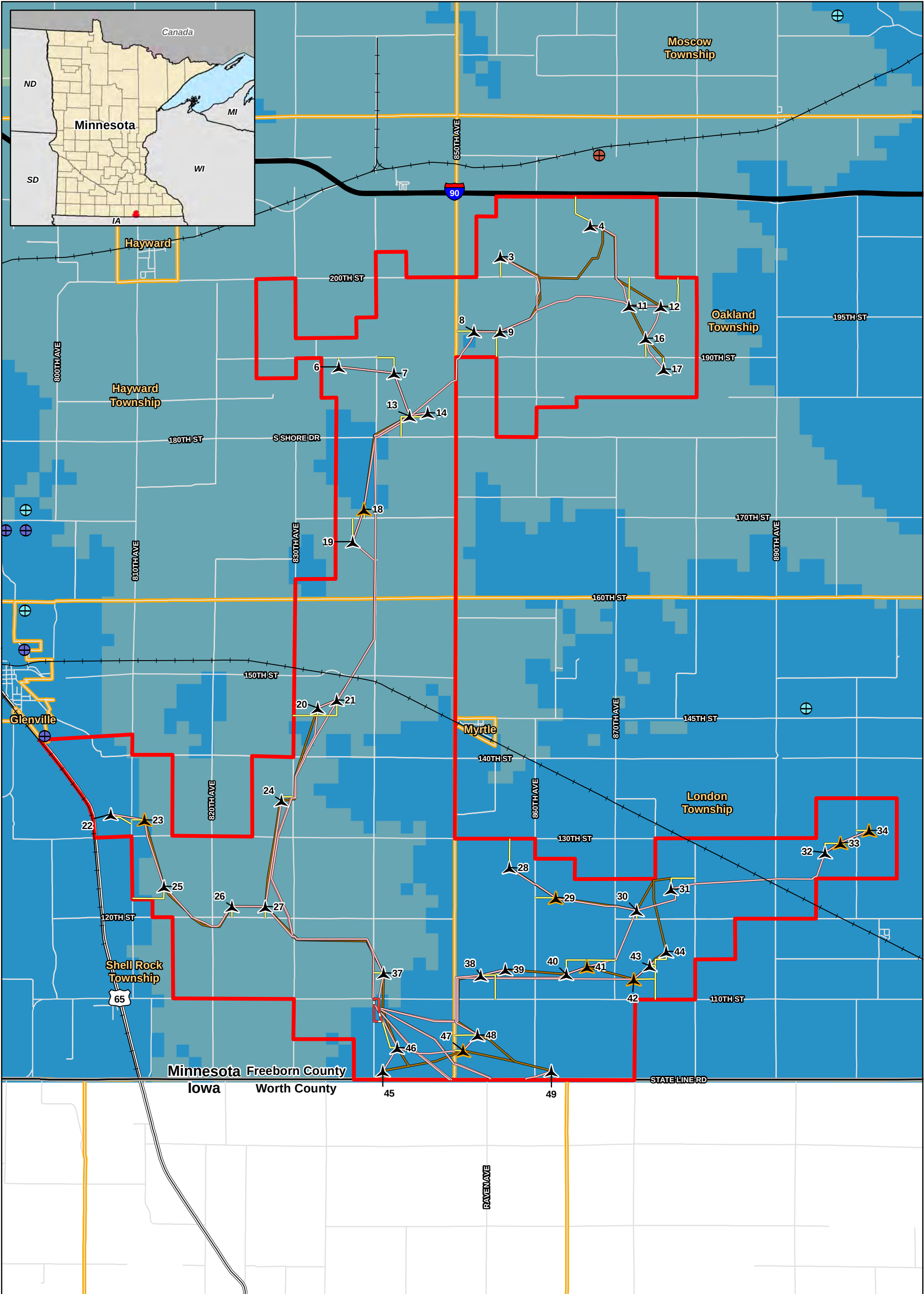
Collection Line



Crane Path

Source: Z:\Clients\Invenergy\Freeborn\_Wind\_Farm\_Project\Permitting\State\PUC\_Site\_PermittMapping\Vestas\_V116\Figure\_12\_Soils.mxd  
Document Path: Date: (6/5/2017)







00.51

Miles

1 inch = 1 miles



Figure 13

Site Geology and

Depth to Bedrock

Freeborn Wind Farm

Freeborn County, MN

 Vestas V110-2.0

 Vestas V116-2.0

 Project Boundary

 O&M and Project Substation

 Access Road

 Collection Line

 Crane Path

Gravel Pits

 Commercial Aggregate

 Aggregate Pit (Other)

 Aggregate Pit (Prospected)

Depth to Bedrock (feet)

 0 - 100

 100 - 200

 200 - 300

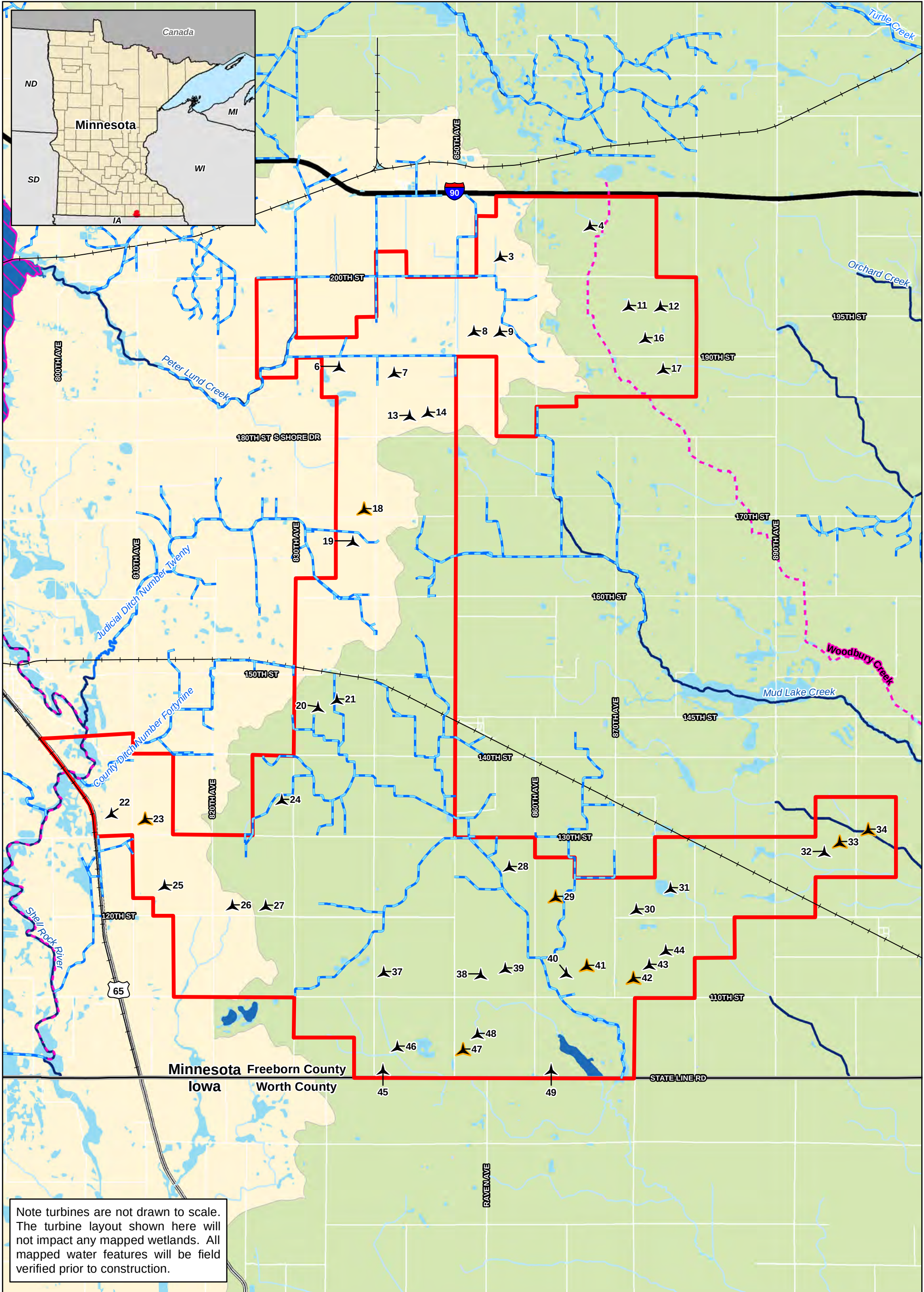
Data Source: Invenergy, MGS, MN DOT, Census

For Environmental Review Purposes Only

Document Path: Date: (6/5/2017)

Source: Z:\Clients\Univenergy\Freeborn\_Wind\_Farm\_Project\Permitting\State\PUC\_Site\_PermitMapping\Vestas\_V116\Figure\_13\_Site\_Geology\_and\_Depth\_to\_Bedrock.mxd







00.51

Miles

1 inch = 1 miles

North Arrow

Data Source: Invenergy, MN DNR, USGS, MN DOT, MN PCA, Census, Freeborn County

For Environmental Review Purposes Only

**Figure 14**  
**Surface Waters**

**Freeborn Wind Farm**  
**Freeborn County, MN**

 Vestas V110-2.0

 Vestas V116-2.0

 Project Boundary

 Impaired Stream

 Impaired Lakes

 Stream or Ditch

 NWI Wetland

 County and Judicial Ditch

**Public Waters Inventory**

 Public Ditch/Altered Natural Watercourse

 Public Water Watercourse

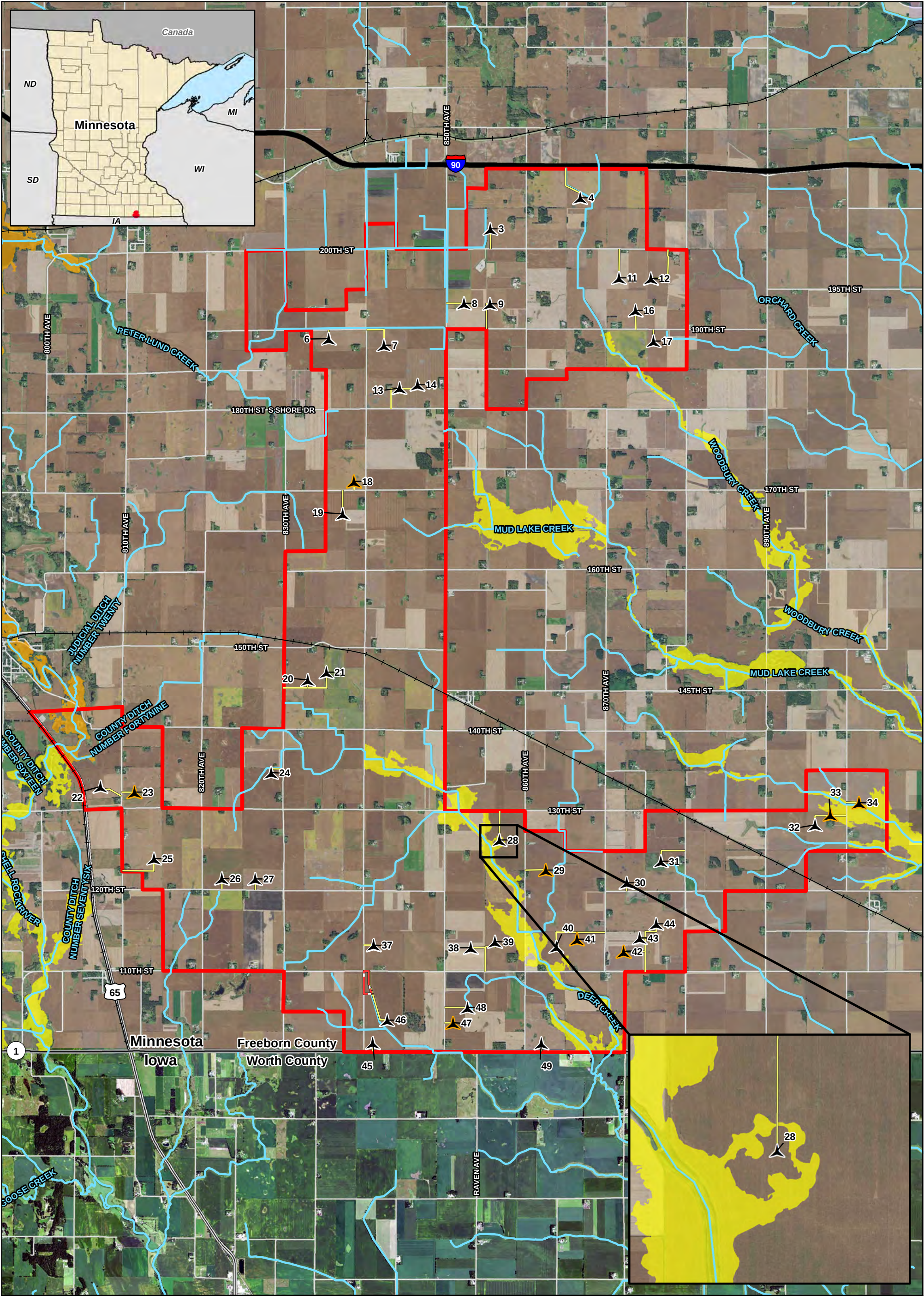
 Public Water Wetland

**HUC 8**

 Shell Rock Watershed

 Upper Cedar Watershed







00.51

Miles

1 inch = 1 miles

Imagery Source: 2015 Color FSA

Data Source: Invenergy, MN DOT, USGS, FEMA, Census

For Environmental Review Purposes Only

Figure 15  
FEMA Floodplains

Freeborn Wind Farm  
Freeborn County, MN

 Vestas V110-2.0

 Vestas V116-2.0

 Project Boundary

 O&M and Project Substation

 Access Road

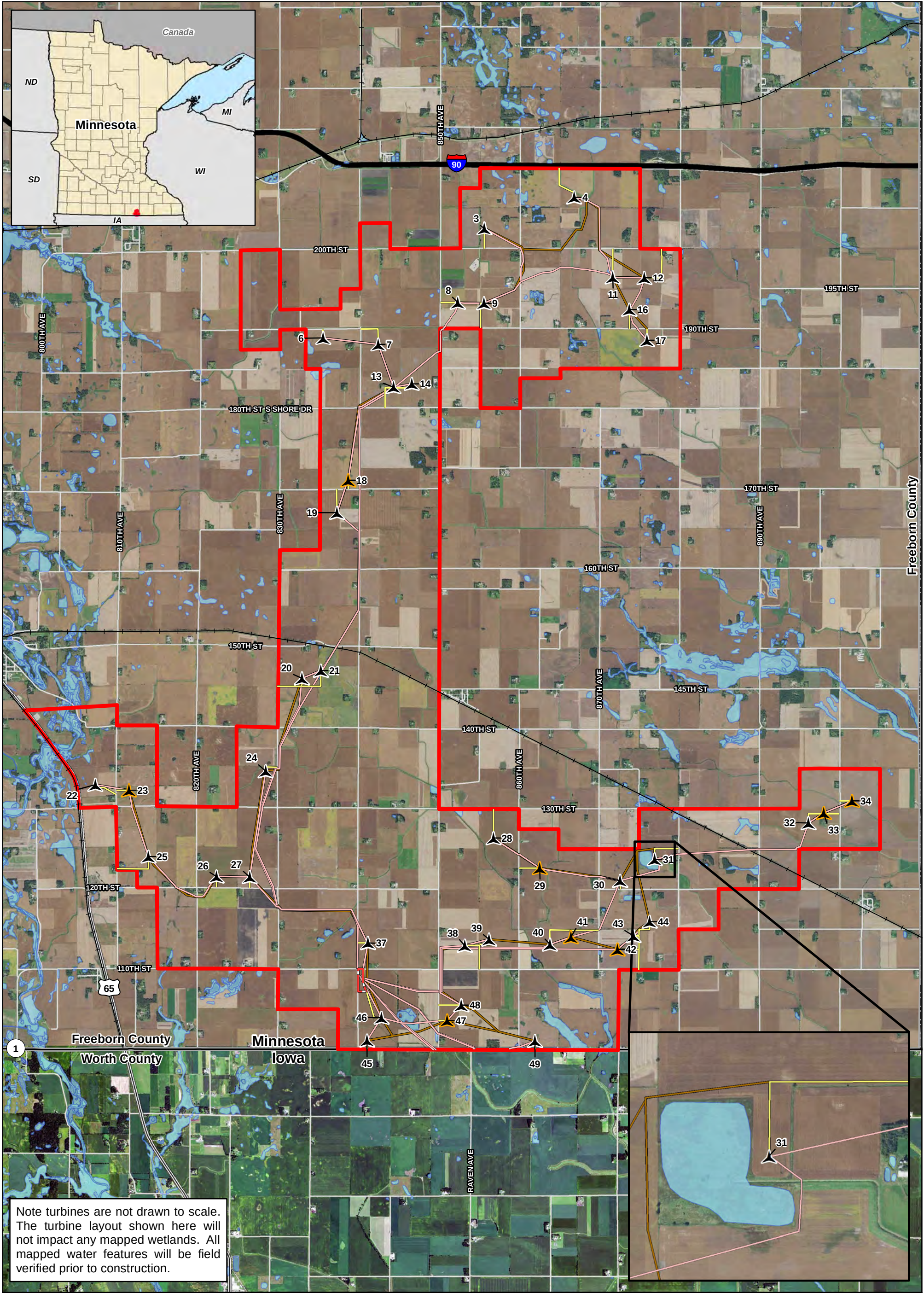
 Stream or Ditch

FEMA Floodzone

 Zone A

 Zone AE







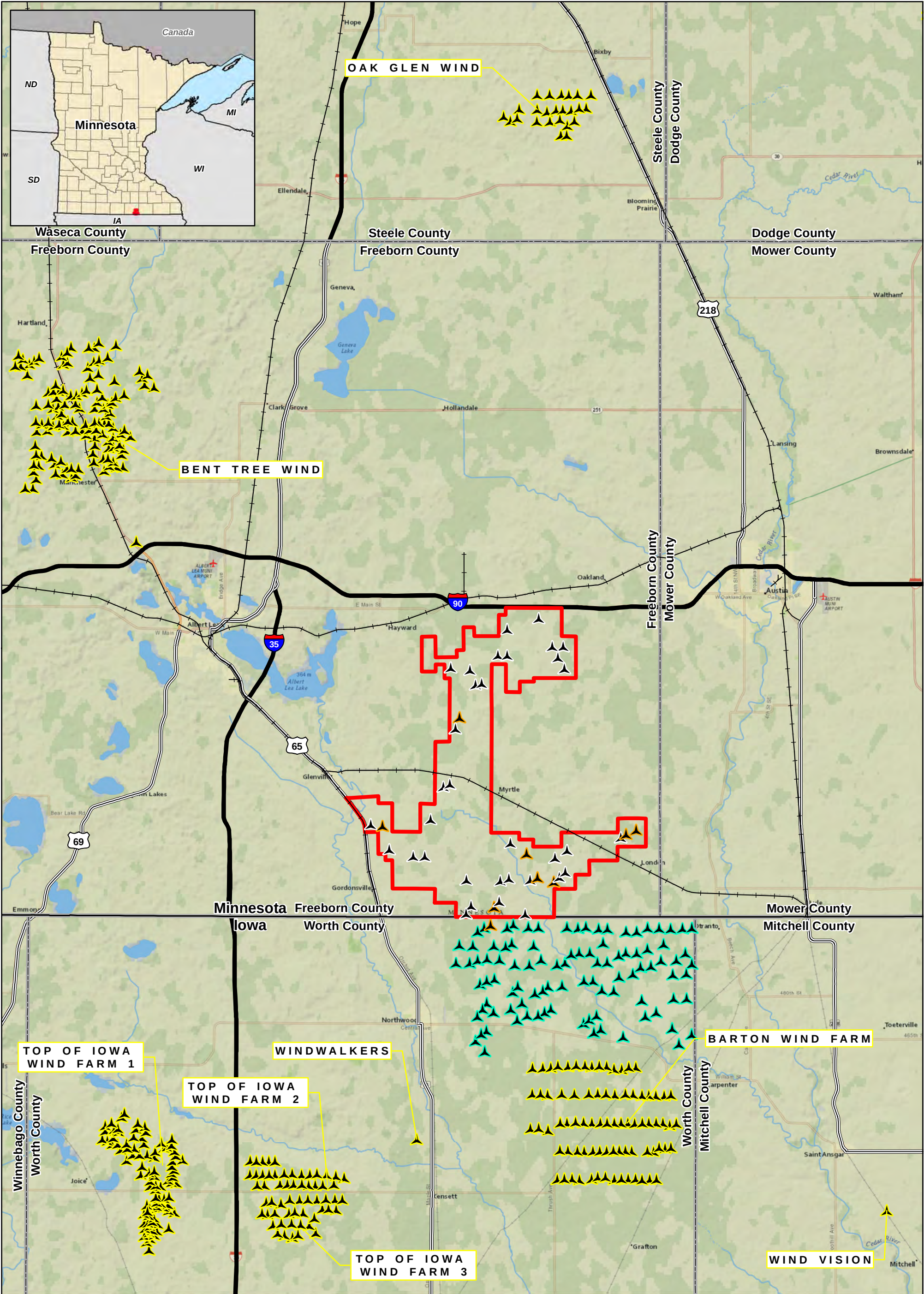
0 0.5 1 Miles  
1 inch = 1 miles

Imagery Source: 2015 Color FSA  
Data Source: Invenergy, MN DNR, MN DOT, Census  
For Environmental Review Purposes Only

**Figure 16**  
**Wetlands Inventory**  
**Freeborn Wind Farm**  
**Freeborn County, MN**

-  Vestas V110-2.0  
 Vestas V116-2.0  
 Project Boundary  
 O&M and Project Substation  
 Access Road  
 Collection Line
-  Crane Path  
 NWI Wetland







0 1.5 3 Miles  
1 inch = 3 miles

Imagery Source: National Geographic World Map  
Data Source: Invenergy, MN DOT, USGS, Census  
For Environmental Review Purposes Only

**Figure 17**  
**Existing Turbine Locations**

**Freeborn Wind Farm**  
**Freeborn County, MN**

-  Vestas V110-2.0
-  Vestas V116-2.0
-  Preliminary Freeborn Wind Iowa Turbine
-  Existing Turbine
-  Project Boundary (MN)
-  County Boundary