JOINT APPLICATION FOR

PSCW CERTIFICATE OF AUTHORITY

AND

WDNR UTILITY PERMIT

Y16-Y17

69 KV REBUILD PROJECT

PSCW DOCKET NO. 137-CE-170

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AMERICAN TRANSMISSION COMPANY®

JOINT APPLICATION FOR PSCW CERTIFICATE OF AUTHORITY AND WDNR UTILITY PERMIT

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ACSR	Aluminum Conductor Steel Reinforced
AIS	Agricultural Impact Statement
APE	Area of Potential Effect
ASNRI	Areas of Special Natural Resource Interest
ATC	American Transmission Company
BER	Bureau of Endangered Resources
BMPs	Best Management Practices
CPCN	Certificate of Public Convenience and Necessity
CTH	County Trunk Highway
CWA	Clean Water Act
EAP	Environmental Access Plan
ECP	Erosion Control Plan
EHS	extra high strength
ER	Endangered Resources
EMF	electromagnetic field
FERC	Federal Energy Regulatory Commission
GIS	Geographic Information Systems
GPS	Global Positioning System
IRNA	Isolated Natural Resource Area
ITP	Incidental Take Permit
ft	feet
kA	kilo ampere
kcmil	kilo circular mils
kV	kilovolt
LDC	Local Distribution Company
LIO	Land Information Office
mG	milligauss
MISO	Midcontinent Independent System Operator, Inc.
mm^2	millimeters squared
MTEP	Midwest Transmission Expansion Plan
MW	megawatt

MWh	megawatt-hour
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NRCS	Natural Resources Conservation Service
OATT	Open Access Transmission Tariff
OPGW	optical ground wire
PAL	WDOT Product Acceptability List
PEC	Primary Environmental Corridor
PSCW	Public Service Commission of Wisconsin (Commission)
PSD	Planning Support Document
p.u.	Per Unit
RMS	Root Mean Square
ROW	Right-of-Way
SEC	Secondary Environmental Corridor
SEWRPC	Southeast Wisconsin Regional Planning Commission
STH	State Trunk Highway
TCSB	Temporary clear span bridges
TSD	Transmission Support Document
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WCS	Waukesha–Concord–St. Lawrence 138 kV Rebuild Project
WDOT	Wisconsin Department of Transportation
WDNR	Wisconsin Department of Natural Resources (Department)
WHS	Wisconsin Historical Society
WNHI	Wisconsin Natural Heritage Inventory Database
WPDES	Wisconsin Pollution Discharge Elimination System
WPL	Wisconsin Power and Light Company
WROC	Wisconsin Regional Orthophotography Consortium
WWI	Wisconsin Wetland Inventory

JOINT APPLICATION FOR PSCW CERTIFICATE OF AUTHORITY AND WDNR UTILITY PERMIT

This Joint Application has been prepared in accordance with the Public Service Commission of Wisconsin (PSCW) and Wisconsin Department of Natural Resources (WDNR) *Application Filing Requirements for Transmission Line Projects in Wisconsin*, Version August 2013, and the *Application Filing Requirements for Substation Projects in Wisconsin*, Version August 2013 (together, the Application Filing Requirements).

1.0 PROJECT OVERVIEW

The proposed Project rebuilds and upgrades two existing, single-circuit 69 kV transmission lines predominantly within the existing electric transmission line corridor to address reliability issues associated with the conditions of each line. Line Y16 runs from the existing Dam Heights substation to the existing Portage substation. The segment of Line Y17 that is to be rebuilt runs from the existing Montello substation to the existing Wautoma substation. The proposed rebuilding of these two lines is collectively known as the Y16-Y17 69 kV Rebuild Project (Project). The Project area is shown in **Appendix A**, **Figures 1A-1B**.

If approved by the PSCW and WDNR, construction of the $50.8 million Project is planned to begin in February of 2016 and be complete in December of 2017. The Project will use the existing centerline and ROW for Y17. Y16 will require some new ROW and introduce proposed deviations to the existing centerline, further detailed (to the extent known) in this Joint Application.

1.1 Owners and Investors

American Transmission Company LLC and ATC Management Inc., its corporate manager, known collectively as American Transmission Company ("ATC" or "Applicant"), W234 N2000 Ridgeview Parkway Court, Waukesha, Wisconsin 53188, propose the Project. The Project involves rebuilding approximately 24.7 miles of a 69 kV single-circuit line (Line Y16) from the Dam Heights Substation to the Portage Substation and rebuilding approximately 19.4 miles of a 69 kV single-circuit line (Line Y17) from the Montello Substation to the Wautoma Substation. On Line Y16, substation work will take place at the Dam Heights and Portage substations. On Line Y17, work will take place as part of this Project at the Wautoma substation.[1] The proposed Project will be 100%-owned by ATC.

ATC owns and operates transmission facilities and transacts business as a transmission company with the sole purpose of planning, constructing, operating, and maintaining transmission facilities to provide electric transmission service. ATC is obligated to provide adequate and reliable energy transmission service that meets the needs of all transmission users in the areas it serves and that supports effective competition in energy markets without favoring any market participant.

[1] As discussed in Section 1.5.2, work at the Montello substation will take place as part of a separate ATC project.

1.2 Contractual Agreements

There are no contractual agreements related to this Project between ATC and any developer to construct, finance, lease, use, or own transmission facilities.

1.3 Project Location and End Points

The Project involves the reconstruction of the existing Line Y16 from the Dam Heights Substation in the City of Prairie Du Sac, Sauk County to the Portage Substation in the City of Portage, Columbia County, Wisconsin. The Project also includes the reconstruction of the existing Line Y17 from the Montello Substation in the City of Montello, Marquette County, to the Wautoma Substation in the City of Wautoma, Waushara County, Wisconsin. The Project area is shown in **Appendix A**, **Figures 1A-1B**.

1.4 PSCW Review

Pursuant to the requirements of Wis. Stat. §§ 1.11, 1.12, 196.025, and 196.49, and Wis. Admin. Code chs. PSC 4 and 112, ATC hereby applies to the PSCW for a Certificate of Authority (CA), together with any other authorizations necessary to construct the Project as set forth in further detail below. The Utility Permit Application to the WDNR is discussed in Section 1.6.2.

The Project is categorized as a Type III action pursuant to Wis. Admin. Code § PSC 4.10(1). Information necessary for evaluation of the Project and preparation of an Environmental Assessment, should the evaluation determine that one is necessary, is provided as part of this Joint Application.

By this filing, ATC confirms its understanding that through the pre-application process provided for in Wis. Stat. § 30.025(1m), the WDNR, the PSCW, and ATC have conferred and made a preliminary assessment of the Project's scope and alternatives and have identified potentially interested persons. ATC has also been made aware, in accordance with Wis. Stat. §§ 30.025(1m)(b) & (c), of the information that it is required to provide and the required timing for the information submissions.

1.5 Project Overview and Project Area Information

This Project is an asset renewal project to rebuild Lines Y16 and Y17 based on their condition and reliability issues. The Y16 portion of the Project consists of rebuilding the existing approximate 24-mile, 69 kV single-circuit transmission line from the Dam Heights substation to Portage substation. Concurrent with the Y16 rebuild, approximately 0.6 miles of the existing Y-110 line will be rebuilt where it is double-circuited on shared structures with Y16, just outside the Portage substation.

The Y17 portion of the Project consists of rebuilding approximately 20 miles of the existing Line Y17 from the Montello Substation to the Wautoma Substation. The remainder of Y17 between the Portage substation and the Montello switch structure was rebuilt as part of previous work.

1.5.1 Location of route(s) and associated facilities

Lines Y16 and Y17 are 69 kV single-circuit transmission lines. The route for Y16 follows the existing line corridor and begins at the Dam Heights substation. It heads in a generally northeast direction for approximately 8.4 miles to the Merrimac switch structure. The Merrimac tap (which is not part of the Project) heads directly north for approximately 1.8 miles to the Merrimac substation. The main line continues for approximately 8.4 miles further northeast to the Caledonia switch structure, which taps to the Caledonia substation via a single span. The main line then continues northeast for the remaining 7 miles to the Portage substation, crossing a DNR/US Fish and Wildlife wetland and the Wisconsin River en route.

The portion of Y17 associated with this Project begins at the Montello substation and heads almost due north, interrupted only by a few doglegs and one east-west jog, for approximately 19.4 miles to the Wautoma substation.

A map of the Project area is provided in **Appendix A**, **Figures 1A-1B**.

1.5.2 The footprints of associated facilities

Facility modifications at the Dam Heights, Portage, and Wautoma substations will be contained within the existing footprints. Work at each substation is described in section 2.9.3. Work at the Montello substation has a different need driver and will take place under a separate ATC project.

1.5.3 Generalized Geology, Topography, Land Cover, and Land use

The Project is located within the Central Sand Hills Ecological Landscape region, characterized by a series of glacial moraines and pitted outwash plains. Topography is flat to rolling, and slopes are generally gradual.

Y16 is located within the Southeastern Wisconsin Savanna and Till Plains ecoregion, which supports a mix of agriculture (cropland and dairy operations) and woodland. Crops include forage crops to support the dairy operations and a wide range of truck and specialty crops. Most of the original vegetation has been cleared, with forested areas remaining only on steeper end moraines and in poorly drained depressions. Irregular till plains, end moraines, kettles, and drumlins are common, and wetlands are found throughout the region, especially along end morainal ridges.

Y17 is located in the Central Sand Ridges ecoregion, characterized by pitted glacial outwash with extensive eskers and drumlins, ice contact deposits, rolling ground moraines, and steep end moraines. Nearly level to rolling till plains, lacustrine basins, outwash plains, and rolling to hilly moraines comprise the physiography of this region. The land use/land cover in this ecoregion consists of a mosaic of forests, wetlands and lakes, cropland agriculture, pasture, and dairy operations.

1.5.4 Special or Unique Natural or Cultural Resources

The southern portion of Y16 in Sauk County threads between the Wisconsin River (Lake Wisconsin) to the east, and the former Badger Army Ammunition Plant, the Merrimac Preserve (a Riverland Conservancy property), and the geologically significant Baraboo Hills to the west. In

this same vicinity, Y16 crosses the U.S. Dairy Forage Research Center Farm and five Lake Wisconsin embayments.

Further north, in Columbia County, Line Y16 crosses a corner of the Baraboo Hills Recreation Area. Also in Columbia County, north of Interstate 90/94, Y16 crosses a large floodplain wetland complex associated with the Baraboo and Wisconsin Rivers that includes portions of WDNR's Pine Island Wildlife Area, the US Fish and Wildlife Service (USFWS) Baraboo River Waterfowl Production Area which is also part of the Natural Resource Conservation Service's Wetlands Reserve Program (WRP), and the Leopold-Pine Island Important Bird Area. Line Y17 crosses the West Spring Lake wetlands, the Mecan River, and Lunch Creek in Marquette County and the White River in Waushara County, including an associated WDNR Fishery Area. Each of these waterways crossed by Y17 is a classified trout stream.

There are multiple cultural resources throughout the Project. These are addressed in Section 6.8 and provided in greater detail in **Appendix E**, **Exhibit 1**.

1.5.5 Residential Concentrations and Urban Centers

Segment 1 (Line Y16), which has the highest number of residential units on the Project (see Appendix A, Table 3), begins in the outskirts of the Village of Prairie Du Sac (population approximately 4,000) and skirts the edge of the Village of Merrimac (population approximately 400). In the unincorporated areas in between these two communities lie a number of bays of Lake Wisconsin, along which a number of residences have been established. The highest density residential area on the Project is the city of Portage (population approximately 10,300), which falls within segment 4 of Line Y16. Segment 5 runs along the edge of the residential area of Portage, but being situated along a railroad corridor and having been an existing, multi-line transmission corridor for many years, there are relatively few residences within 300 feet. The northern end of Y17 (segment 7) is located in the City of Wautoma (population approximately 2,200) and has the highest concentration of residences on Y17. The number of residences within 300 feet of the line on Segment 7, however, is less than half the numbers encountered on either segments 1 or 4, because the Project's penetration into only the southernmost outskirts of Wautoma.

The Project also runs through several townships that do not have dense populations.

1.5.6 Transmission Configuration

On both Y16 and Y17, the line will be constructed on steel, single-pole, single-circuit tangent structures with 69 kV high CFO braced post polymer insulators, replacing the existing single-circuit lattice towers (Y16) or single-circuit wood poles (Y17). Some angles will utilize polymer suspension insulators as appropriate for the degree of angle. Structures will be either direct embedded or constructed on different foundation types to be determined during the design phase of the Project. Drawings of typical structures to be used are provided in **Appendix B**, **Figures 1-11**.

1.5.7 Proposed Project Right-of-Way (ROW)

On Y16, the proposed ROW is typically planned to be a combination of 80-foot widths in more open areas, such as agricultural fields. In areas with physical or other width constraints,

easements will typically be 50 feet wide. Final determination of whether each parcel will be 50-foot or 80-foot easement width at each location will be determined as necessary during final design.

On Y17, the proposed ROW is anticipated to be typically 80 feet wide. The existing 80-foot ROW is generally anticipated to be sufficient, with minimal easement work needed for this line.

1.6 Other Agency Correspondence/Permits/Approvals

1.6.1 Agency Correspondence

Copies of official correspondence between ATC and governmental agencies concerning the Project are provided in **Appendix G**. The governmental agencies consulted include the WDNR, USFWS, and the Federal Aviation Administration (FAA).

1.6.2 State and Federal Permits/Approvals Required

All state and federal permits and approvals required for this Project and their status are listed in the table below. Activities affecting navigable waters require permits or approval from the U.S. Army Corps of Engineers (USACE) and the WDNR. The USACE requires a permit under Section 404 of the Clean Water Act (CWA) to place fill into waters of the United States, which includes connected wetlands and tributaries to navigable waters of the United States. Section 10 of the Rivers and Harbors Act prohibits the obstruction or alteration of navigable waters and is also covered under the USACE permitting process. Consultation with the USFWS is required for federally listed species and is further discussed in Sections 6.6 and 9.0. The WDNR permits and approvals are further discussed in Section 8.0.

Federal Agencies			
Agency	**Activity**	**Permit Type**	**Status**
USACE	Wetland Impacts	Section 404 of the Clean Water Act	Pending. Expect receipt after PSCW order. See **Appendix E**.
	Archeological Review	Section 106 National Historic Preservation Act	Pending. Part of Section 404 permit review process. See **Appendix E**, **Exhibit 1**.
	Work over navigable water (Wisconsin River)	Section 10, Rivers and Harbors Act	Pending. Expect receipt after PSCW order. See **Appendix E**.
USFWS	Consultation regarding federally listed species	Section 7, Endangered Species Act	Pending.
	Nest disturbance during migratory bird's active season	Migratory Bird Treaty Act	Application will occur only if unavoidable impacts anticipated.
FAA	Construction of Electric Transmission	FAA 7460	Initial notification made. See **Appendix G, Exhibit 2**.

	Lines Near Airports	(Notification)	Additional notification will be made post-Order.
State Agencies			
Agency	**Activity**	**Permit Type**	**Status**
Department of Transportation (WisDOT)	Road Crossing	Utility Permit DT 1553	Initial contact made. ATC will apply for permit DT 1553 for work on ROW and crossing Highways prior to construction.
	Construction adjacent to, with-in, or co-location with the ROW of State Highways & Roads	Utility Permit DT 1553	
	Oversize Loads or Excessive Weights on Highways	Wis. Stat. ch. 348 Vehicles – Size, Weight and Load; Wis. Stat. § 348.25 - Vehicle Weight and/or Load Permit	Construction has not identified oversize loads or weights. Applicant will apply for necessary permits if conditions change.
Wisconsin Historical Society (WHS)	Rebuild Line	Approval of Archeological Surveys (Wis. Stat. § 44.40 and Section 106 of National Historic Preservation Act)	A Phase 1 Archeological Investigations (**Appendix E**, **Exhibit 1**) was prepared as part of this Application. ATC will coordinate with state historical preservation office prior to construction.
WDNR	See Section 8.0	Utility Permit	Pending. Being applied for with Application to PSCW.

1.6.3 Local Permits

ATC works with all local units of government to assure that the representatives of those units of government affected by ATC's proposed construction projects are informed concerning ATC's proposed construction activities and that ATC is aware of all necessary local permits required for its Project.

This Project may require shoreland/floodplain zoning and erosion control permits from Columbia, Marquette, Sauk, and Waushara Counties, as well as the Cities of Portage and Wautoma and the Village of Merrimac, pending each local jurisdiction's review of Project information. Necessary local permits will be coordinated and applied for after the receipt of the Order.

ATC anticipates that the Project will also require permits and other authorizations governed by local ordinances that involve matters of public safety. Because the ordinances of the local units of government vary, each Project may involve different local permits or authorizations. The

public safety-related permits or authorizations that ATC applies for generally include road crossing permits, road weight limits, noise abatement ordinances, and other similar public safety concerns for which permits or authorizations may be required by local ordinance.

1.6.4 Railroad ROW

Y16 parallels the Canadian Pacific railroad in segment 1, and the Y16/Y-110 double circuit parallels the former Soo Line railroad (now owned by Canadian Pacific) switchyard in the City of Portage in segment 5. Line Y16 crosses these railroads in two locations, once in segment 1 and once in segment 4.

Y17 does not parallel or cross any railroad facilities.

The standard permit application procedure for utility installation will be followed for submittal, approval, and license issuance by the railroads.

1.6.5 Pipeline ROW

The existing and proposed transmission line crosses one pipeline ROW on Y16, which is located in Segment 3 and is owned by Northern Natural Gas. There are two pipeline ROWs on Y17, one in Segment 6 and one in Segment 7. Both ROWs are owned by ANR Pipeline Company.

1.6.6 WisDOT ROWs

The transmission lines cross US Interstates 39, 90, and 94, as well as State Highways 78, 33, 113, and 22. The rebuilt lines will cross these highways at the existing locations.

Segment	Span or Structure	Crossing	Notes
1	36A-37	WisDOT Land	Wires cross land and structures on WisDOT land
1	37-38	WI 78	Wires cross highway and structures on WisDOT land
1	38-39	WisDOT Land	Wires cross land and structures on WisDOT land
1	39-40	WI 78	Wires cross highway
1	45-46	WI 78	Wires cross highway
1	47-49	WI 113	Wires cross highway
1	51	WisDOT Land	Wires cross land and structure on WisDOT land
2	89-90	WI 78	Wires cross highway
2	118-119	WI 78	Wires cross highway
2	127-128	WI 78	Wires cross highway
2	132-133	WI 78	Wires cross highway
3	144-145	WI 78	Wires cross highway
3	152-153	WI 78	Wires cross highway
3	159-159A	I 94	Wires cross highway

Segment	Span or Structure	Crossing	Notes
3	159A	WisDOT Land	Wires cross land and structure on WisDOT land
3	175-176	WI 33	Wires cross highway and structures on WisDOT land
3	176-177	I 39	Wires cross highway
6	462-463	WI 22	Wires cross highway and structures on WisDOT land
7	503-505	WI 22	Wires cross highway
7	665-666	WisDOT Land	Wires cross WisDOT land

1.7 Construction Schedule

ATC anticipates constructing the Project according to the following schedule:

Project Activity	Preliminary Date
Joint PSCW CA and WDNR Utility Permit Application Submittal	May 2014
PSCW CA Approval - Anticipated	September 2014
WDNR Utility Permit Issuance – Anticipated	30 Days after PSCW Order
Start Transmission Line Construction-Y17	February 2016
Start Transmission Line Construction-Y16	February 2017
Start Substation Construction	February 2016
Project In-Service- Both Y16 and Y17	December 2017

ATC has not identified any specific seasonal construction constraints at this time. However, impact avoidance measures that place seasonal constraints on construction at specific locations would be applied, to the extent practicable, should upcoming field surveys result in observed occurrences of rare species and/or if permit conditions require it.

Construction work is anticipated to be performed while using de-energized methodology. ATC does not anticipate any outage constraints that cannot be avoided through planned operational mitigation.

1.8 Project maps

Consistent with the Application Filing Requirements, a set of Project maps is provided in **Appendix A**, **Figures 1** through **7**. The maps showing the proposed route and other Project data are provided on aerial photographs and include Environmental, Parcel, Land Use, and Existing Utility/Infrastructure data. Also included is environmental information required to support WDNR permitting activities. ATC is providing separately to the PSCW, in electronic format on disc, Geographic Information System (GIS) data files supporting the mapping.

1.9 ESRI ArcGIS data files

All Project maps were created using ESRI ArcGIS Version 10. A spreadsheet of each GIS file, including the description of the data, the data source, and the date of when the data was generated or collected is provided as a part of the GIS data disc.

1.10 Mailing lists

All mailing lists are provided in Microsoft Excel format separately on disc.

Project communications with landowners were initially based on property ownership data and related contact information taken from ATC real estate property records associated with the existing transmission line. Because of the dynamic nature of property ownership over time, and the variability of related data from both internal and other sources, landowner contact information over the course of ATC's outreach process may be incomplete or inaccurate. However, efforts are made to "refresh" the applicable property ownership data and related contact information throughout the life of the Project.

Data regarding local officials is available from the applicable counties and municipalities. ATC expects the accuracy of this information to be high but recognizes changes occur in personnel (elected and staff) over time such that no data set can ever be considered 100% accurate.

2.0 PROJECT NEED AND ENGINEERING

The Project is comprised of rebuilding two 69 kV lines: Y16 (between the existing Dam Heights and Portage substations), and the portion of Y17 between the existing Montello and Wautoma substations.

Project Need – 69 kV Y16 rebuild

There are three need drivers for this portion of the Project. The first need driver is asset renewal because of the poor condition of the line. The existing line consists of lattice steel towers with copper conductor that was constructed about 1914.

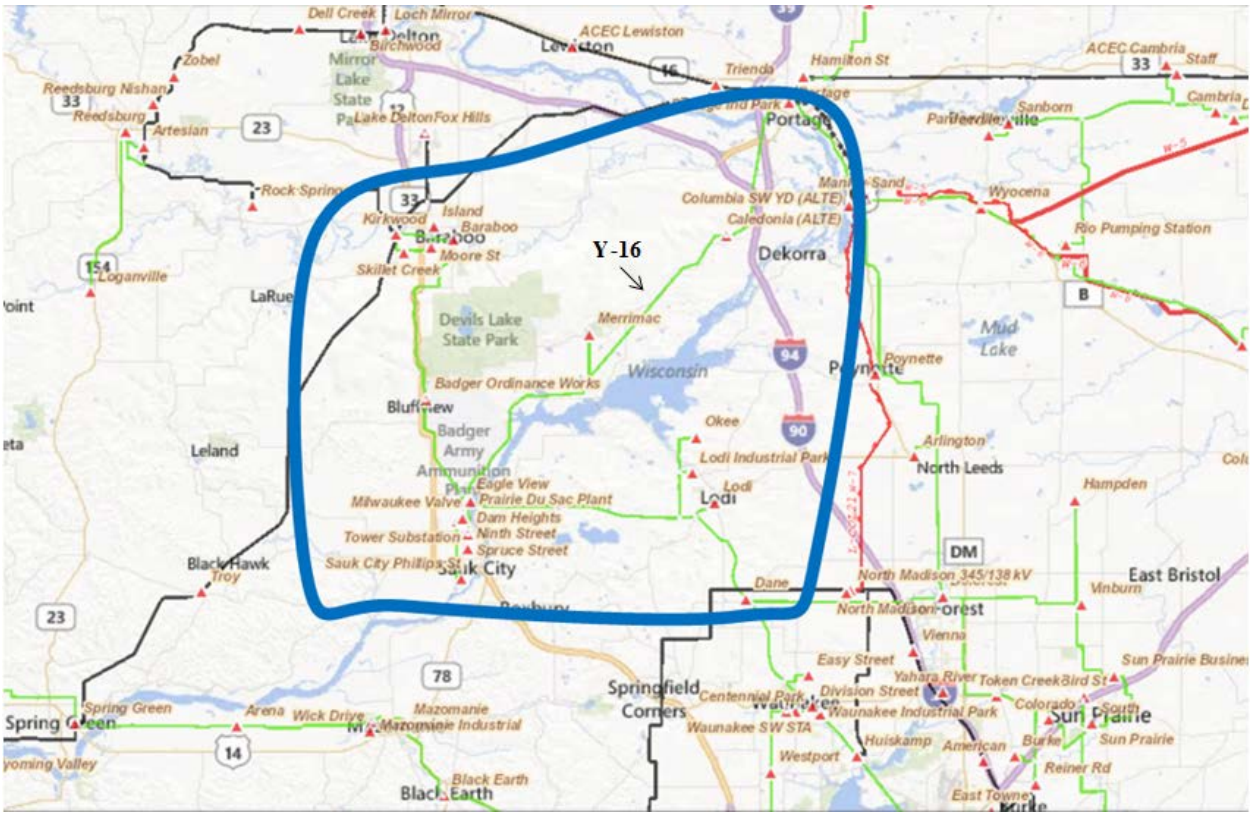
The second need driver for rebuilding the line is reliability performance. Y16 is historically among the top ten most frequently outaged lines in the ATC footprint. The most recent ranking, based upon the past five years of data, has it ranked second in ATC's footprint. The line experienced approximately 23 forced outages between 2009 and 2013, ten of which were weather and lightning related. Another eight outages were avian-related. The majority of the forced outages resulting from weather and avian contacts are caused by the tight phase spacing of the lattice towers. **Appendix C**, **Exhibit 3**, shows forced outage information for Y16 over the past five years, and **Appendix B**, **Exhibit 1** shows pictures of current lattice towers with tight phase spacing.

ATC's analysis demonstrates that a continued need for the line exists (Section 2.4), and the entire line must be rebuilt because of asset renewal needs. Accordingly, ATC performed an analysis to determine the long-term minimum target rating of the line. ATC determined that the line should be designed to be capable of at least 250 Ampere/880 Ampere under normal/emergency conditions for all seasons. The Planning Support Document (PSD, found

in **Appendix C**, **Exhibit 1** of this Joint Application) describes the process used to determine these minimum required target ratings.

The last need driver is ATC's information technology and system protection functions need to have OPGW (24 fibers Optical Ground Wire) available on the Dam Heights – Portage 69 kV line for current and future communication needs. Adding OPGW capability when building the line for asset renewal purposes maximizes efficiencies and reduces Project cost.

Figure 2-1: Planning Study Area for Y16



Project Need – 69 kV Y17 (Montello – Wautoma portion) rebuild

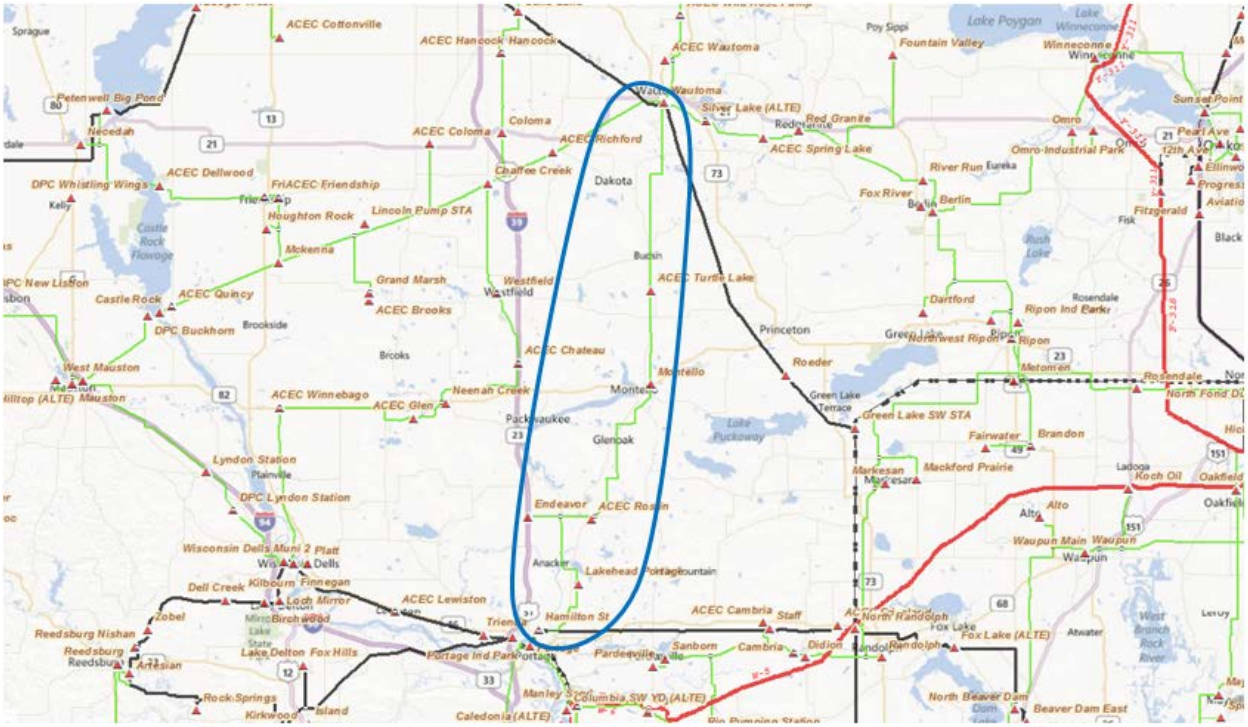
There are two need drivers for this portion of the Project. First, the primary need driver is poor condition and vintage of the line. The existing line Y17 primarily consists of old wishbone construction with copper conductor and a static wire that is in poor condition. A ground line inspection was performed in 2004, and approximately 26% of the poles were classified as either rejected or damaged/decayed. A recent 2011 walking inspection identified split pole tops, rotting cross-arms, woodpecker damage, and leaning poles. **Appendix B**, **Exhibit 2** shows pictures of current structures with wishbone configuration on line Y17.

There is a continued need for the line (Section 2.4), and the entire line must be rebuilt due to asset renewal needs, so ATC performed an analysis to determine the long-term minimum target rating of the line. ATC determined that the line should be designed to be capable of at least 220

Ampere/510 Ampere under normal/emergency conditions for all seasons. The PSD describes the process used to determine these minimum required target ratings.

Second, ATC's information technology and system protection functions must have OPGW available on the Montello – Wautoma line for current and future communication needs. Adding OPGW capability when building the line for asset renewal purposes maximizes efficiencies and reduces Project cost.

Figure 2-2: Planning Study Area for Y17



2.1 Area Load Information

While the need for the Project is driven by asset renewal, ATC needed to identify target ratings for each of the lines being rebuilt by the Project. ATC did this by screening for the highest flows during contingencies within a planning study area associated with each line. The planning study areas ATC identified for each line are shown in the figures above. Each study area is also shown in Appendix C of the PSD for each project. Within the planning study areas, the historical and forecast loads that affect the need to retain the lines and the determination of long-term ratings are shown in Appendix D of each PSD.

2.2 Modeling Information

For each line in the Project, ATC conducted power flow studies to identify a minimum required target rating. These studies required power flow models. The power flow screening analysis for this study was completed using PSS/E version 32 using the AC Contingency Computation function applied to cases described below. As part of the contingency analysis performed in this study, event-based contingencies resulting in the loss of multiple elements were simulated, as

well as the single-element contingencies. Any contingency that resulted in a non-convergent power flow was solved using various manual techniques to provide valid results. These techniques included applying additional solution iterations, locking of switched shunts, and locking of load tap changers. Any contingency that caused limitations to the system during the screening process was then solved manually using more strict solution parameters. For this study, the 2022 summer peak and bias cases, and 2027 summer peak cases from the 2012 10-Year Transmission System Assessment were studied. The Y17 study also included a 2022 summer peak model with an updated load forecast for the Lakehead Portage substation. Because the Project is driven by asset renewal needs, ATC did not conduct any economic benefits studies.

2.3 Transmission System Alternative Studies

ATC considered two options to address the asset renewal needs driving the Project.

2.3.1 Alternative 1

Alternative 1 is the Project proposed in this Joint Application. It covers the required rebuilding needs of the entire Y16 line between Dam Heights and Portage and the Y17 line between Montello and Wautoma based on vintage, condition, safety, and reliability. Alternative 1 addresses ATC minimum required ratings as well as information technology and protection function needs for OPGW. This is the only feasible system alternative for this Project. The minimum required ratings for Y16 are 250/880A (normal/emergency) for all seasons. Minimum required ratings for Y17 are 220/510A (normal/emergency) for all seasons. Sections 3.1.3 of the PSDs for Y16 and Y17 describe how the minimum required ratings were determined.

2.3.2 Option Rejected

ATC also considered and rejected a second option, which would have ATC continue to perform periodic maintenance on the lines as necessary. This alternative is not feasible for these lines due to their condition and vintage. In addition, tight phase spacing issue on the lattice towers of Y16 is not resolved by this alternative, thereby jeopardizing performance and reliability of Y16. Also, these lines do not have the OPGW ATC desires for information technology and system protection function needs. In short, this option would fail to address the identified need drivers.

2.4 No-Build Options

The reasons why ATC rejected no-build options for the lines in the Project are presented below.

2.4.1 69 kV Y16 Rebuild

Under the first no-build option for Y16, ATC would continue to perform periodic maintenance on the existing 100-year-old line as necessary. Y16 is historically among the top ten most frequently outaged lines in the ATC footprint. The majority of the forced outages are weather and avian-related and have been caused by tight phase spacing of the lattice tower. Periodic maintenance of the line will not resolve tight phase spacing on the lattice towers. This will put the line's long-term reliability at risk due to poorer performance compared to rebuilding the line. For this reason, ATC rejected this option.

The second no-build option consists of removing the line. This line serves two Alliant substations, Merrimac and Caledonia. If this line is not retained, then one or more transmission lines would need to be built to serve those substations. The planning study area in **Figure 2-1** is fed by three 69 kV sources at the Dane, Portage, and Kirkwood substations. If Y16 were removed, the area would only be fed by two sources. An outage of one source would put the area and surrounding load at risk of losing electric service for cascading transmission outages. For these reasons, ATC rejected the second no-build option.

2.4.2 69 kV Y17 Rebuild (Montello – Wautoma)

Under the first no-build option for Y17, between Montello and Wautoma substations, ATC would continue to perform periodic maintenance on the line as necessary. This alternative is not feasible because of the condition of the wood poles on line Y17. A ground line inspection performed in 2004 identified 26% of the wood poles as damaged/rejected. A recent 2011 walking inspection identified split pole tops, rotting cross-arms, woodpecker damage, and leaning poles. The physical condition of the line suggests that performance of the line will further deteriorate if not rebuilt. For this reason, ATC rejected this option.

The second no-build option considered removing the Montello to Wautoma section. If the Montello to Wautoma section of Y17 were removed, then four substations would be served radially from Portage, and the Turtle substation would need to be served by a new transmission line. One outage scenario would result in four substations losing electric service for a single transmission line outage. If the outage were a long-term outage, then Alliant would have no way of serving its customers. Based on this scenario, ATC rejected the second no-build option.

2.5 Energy Conservation and Efficiency, and Load Response

Load forecasts provided by the Load Serving Entities for this study area include the energy conservation and efficiency impacts they have accounted for in their resource planning. Reducing load will not remove the asset renewal needs. Section 2.4 describes why the lines cannot be removed.

2.6 Non-Transmission Solutions

No non-transmission solutions will eliminate the asset renewal needs for Y16. Changing the generation dispatch is not a viable solution. The only generation in the planning study area shown in **Figure 2-1** is the hydro units at Prairie du Sac, which are not directly connected to the affected substations and cannot replace Y16. Adding new generation from the Midcontinent Independent System Operator (MISO) generation interconnection queue would not remove the need for the line.

No existing generators could change the flow on Y17. The primary flow on Y17 is to serve the substations on the line and is not significantly affected by flows on the surrounding transmission system. Adding new generation from the MISO generation interconnection queue would not remove the need for the line.

2.7 Market Efficiency Projects

The need for the Project is not based on market efficiency. Therefore, a market efficiency study was not performed.

2.8 Transmission Network Alternatives

As discussed in sections 2.3 and 2.4, the Project is driven by asset renewal needs. No system alternatives to the Project proposed were identified.

2.8.1 Relevant Regional Studies

Construction of other regional projects does not eliminate the need to rebuild the Y16 or Y17 lines due to the condition of the lines.

2.8.2 Provide details of the reliability and performance benefits of each network solution studies, as available.

The existing Y16 and Y17 lines are needed for reliability reasons, as described in Section 2.4.

2.8.3 Supply the electrical losses for each alternative, peak MW and annual GWH estimates.

A transmission system MW loss analysis was conducted for each line discussed in this Joint Application. The analysis can be found in Section 3.2 of the each of the PSD's in **Appendix C**.

2.8.4 Generator Interconnection Studies

This Joint Application does not include a generator interconnection. Therefore, these studies are not applicable.

2.8.5 Distribution Substations

This Joint Application does not include a new distribution substation. Therefore, these studies are not applicable.

2.8.6 Simulation Files

Data files supporting the PSD analyses can be provided separately with appropriate confidentiality agreements in place.

2.9 Local Transmission Level Alternatives

Adding capacitors or using operating guides will not resolve the condition issues associated with the Y16 and Y17 lines. The only option that will resolve the condition issues is rebuilding both of the lines.

2.9.3 Identify and describe any substation facilities

Work is needed to be initiated at Portage, Dam Heights, Wautoma, and Montello Substations to support the Y16 and Y17 transmission line rebuild. The list of substations below identifies the scope of work planned at the appropriate substation.

Portage Substation

At the Portage Substation, the fiber that is being installed on the Y16 transmission line will be routed into the Portage Substation to improve SCADA communications. The Project will include installing a new splice enclosure near the Portage substation and then installing fiber from the splice enclosure to the router located in the control building. Minor relay and protection wiring upgrades are also planned to be completed as part of this Project.

Dam Heights Substation

At the Dam Heights Substation, the fiber that is being installed on the Y16 transmission line will be routed into the substation. The Project will include installing a new splice enclosure near the Dam Heights substation and then installing fiber from the splice enclosure to the router located in the control building. Minor relay and protection wiring upgrades are also planned to be completed as part of this Project.

The Project will also replace two existing 600-amp, 69 kV hookstick switches with new 2000-amp, 69 kV hookstick switches due to the existing switches being insufficiently rated. The associated jumpers to the new disconnect switches will also be replaced with 795 kcmil ACSR "Drake".

Wautoma Substation

At Wautoma Substation, the fiber that is being installed on the Y17 transmission line will be routed into the Wautoma Substation to improve SCADA communications. The Project will include installing a new splice enclosure near the Wautoma substation and then installing fiber from the splice enclosure to the router located in the control building. Minor relay and protection wiring upgrades, along with replacement of the existing RTU package are also planned to be completed as part of the Project.

Montello SS

Work to be done at Montello Substation has a separate need driver, will be completed under a different project, and thus is not part of this Joint Application.

2.10 Regional Transmission Organization Information

This Project is located within the MISO region.

2.10.1 Regional Project Cost Benefit and Cost Allocation

The Project is not a regional project, but it is an asset renewal driven project. Accordingly, ATC has not performed this analysis.

2.10.2 Description of applicable transmission tariffs.

The costs incurred for the construction of the Project will be recovered in accordance with the provisions of the Open Access Transmission and Energy Markets Tariff (OATT) of MISO and the rules and regulations of the Federal Energy Regulatory Commission.

2.10.3 Provide transmission service agreements, if applicable.

ATC provides transmission service under the terms of the MISO OATT.

3.0 MAGNETIC FIELDS

ATC recognizes concerns expressed by stakeholders regarding exposure to transmission line magnetic fields. Along with the energy industry, ATC continues to monitor developments on this issue. While studies of magnetic fields have produced little conclusive data regarding health effects, scientists generally agree that the studies taken as a whole show no consistent association between exposure and health risks.

As demonstrated by the information provided in this document, electromagnetic field (EMF) levels decrease rapidly as distance from the proposed transmission line increases. Recognizing that distance is the principal means of mitigating EMF exposure from transmission lines, ATC proposes transmission line routes and line designs that to the extent practical, increase the distance of the proposed lines from permanently occupied dwellings and other potentially sensitive receptors.

An EMF Study Report, provided as **Appendix D, Exhibit 1**, has been prepared documenting magnetic field calculations performed for the proposed line route and design configurations using the ENVIRO program developed by the Electric Power Research Institute. The EMF Study Report contains the EMF figure locations, a cross-reference table, general drawings, and the magnetic field calculations.

3.1 Magnetic Field Profiles

The configuration of the transmission line within any segment may vary depending on the transmission line, the presence or absence of existing facilities, and other constraints. Cross-reference tables are provided as Table 1 and Table 2 within the EMF Report (provided as **Appendix D, Exhibit 1**), which associates the tables and figures for each existing and proposed segment configuration.

3.2 Routes with Electric Lines

The distribution and transmission facilities along the route are identified in **Appendix D, Exhibit 1**. Magnetic field profiles for these existing lines and the post-construction scenario that incorporates the rebuild are provided as Tables 3 through 10 in the report. Existing underbuilt distribution facilities will be transferred to the new transmission line; however, ATC does not anticipate that additional existing parallel distribution facilities along the transmission line route will be underbuilt with the new overhead transmission line. Additionally, ATC does not anticipate that distribution facilities will be relocated as a result of the Project.

3.3 Routes with multiple adjacent underground circuits

No underground distribution facilities in close proximity to the proposed transmission line will be modified or relocated as a result of the Project.

3.4 Magnetic Field Data Tables

Detailed calculated magnetic field profiles for the Project are provided in Tables 3 through 10 in **Appendix D, Exhibit 1**. Magnetic field levels for the transmission line facilities and distribution facilities at system peak load and under normal load (defined as 80% of system

peak load) for one year post-construction and 10 years post-construction are provided in the report.

Additionally, calculated magnetic field levels for the existing transmission and distribution lines are provided in Tables 3 through 10 in **Appendix D, Exhibit 1**. Calculations were performed for each line segment on the route, using the existing height of the lowest conductor above ground at mid-span for overhead transmission and distribution lines.

The magnetic field levels listed in Tables 3 through 10 in **Appendix D, Exhibit 1**, are the root mean square resultant level at one meter above ground. The conductor and distribution facility phase arrangements are provided in the segment cross-sections provided as Figures 3 through 18 in **Appendix D, Exhibit 1**. The transmission line phase arrangements are based on those currently existing.

As requested in Section 4.0 of the Substation Filing Requirements, the magnetic field readings associated with existing substations are also provided as Figures 19 through 21 in **Appendix D, Exhibit 1**.

3.5 Magnetic Field Model Assumptions

Magnetic field modeling assumptions for each segment configuration are provided in the notes of the EMF calculations in **Appendix D, Exhibit 1**. The following information is provided on each figure:

- Phase ID and angles;
- Pole design diagram including dimensions of pole arms and conductor locations showing conductor horizontal distance from pole and conductor vertical distance from ground at the structure; and
- Height of lowest conductor(s) at mid-span.

4.0 PROJECT COSTS

The following table provides the total project cost expressed in 2017 dollars (in-service year).

Project Cost Category		**Itemized Cost Total Amount**
1. Transmission Line		
A. 69 kV Facilities(Material)	$	10,707,000
B. 69 kV Facilities(Labor)	$	21,980,000
C. Other		13,562,000
Subtotal, Transmission Line	**$**	**46,249,000**
2. Substation(s) Construction		
A. Dam Heights Substation Material	$	35,000
B. Dam Heights Substation Labor	$	116,000

Project Cost Category		**Itemized Cost Total Amount**
C. Dam Heights Substation Other	$	163,000
Dam Heights Substation Subtotal	**$**	**314,000**
A. Portage Substation Material	$	5,000
B. Portage Substation Labor	$	40,000
C. Portage Substation Other	$	138,000
Portage Substation Subtotal	**$**	**183,000**
A. Wautoma Substation Material	$	80,000
B. Wautoma Substation Labor	$	179,000
C. Wautoma Substation Other	$	292,000
Wautoma Substation Subtotal	**$**	**551,000**
Subtotal, Substation	**$**	**1,048,000**
Total Capital Cost	**$**	**47,297,000**
Expense (Operation and Maintenance)	$	62,000
Expense (Pre-Certification)[2]	$	1,218,000
Removal[3]	$	2,198,000
ATC Gross Project Cost	**$**	**50,775,000**
WPL Transfer Cost (Includes Incremental Pole Charge payment to ATC)	$	167,000

5.0 ROUTE INFORMATION

5.1 Factors Considered

The Project involves rebuilding an existing transmission line predominantly on the existing centerline using the existing ROW. No weighting criteria were used, and the siting priorities in Wis. Stat. § 1.12(6) were considered during the selection of the existing centerline as the proposed route.

[2] Includes expenses for preliminary Project design, environmental review, application preparation and processing, and all other expenses for the Project.

[3] Removal cost does not include any salvage value.

5.2 Change To Existing Easements

ATC reviewed the approximately 230 existing easements for Line Y16. The existing easements have a typical width of 50 feet (25 feet on each side of centerline). Additionally, most of the existing easements limit the number of structures and the specific locations for each structure. ATC has determined that for the existing span lengths, based on current design and maintenance standards, a typical width of 80 feet is required for this Project.

Based on the Project scope, ATC will require new easement rights for the entire Y16 line. In areas where physical or vegetation concerns exist, ATC will attempt to design the line to fit within the existing 50-foot ROW by adding additional structures to meet the required codes and ROW width/vegetation standards. In these areas, new easements would be required to allow placement of these additional structures. In more open agricultural areas where there are fewer physical concerns, ATC plans to maintain approximate existing spans and acquire new 80-foot easements.

Although ATC intends to maintain the existing corridor, ATC may propose minor alignment/ structure placement adjustments along the line to reduce unnecessary small angles, provide more clearance to physical constraints, or address environmental or landowner issues. Specific alignment adjustments will be finalized during detailed design when exact feasibility can be determined.

ATC reviewed the approximately 430 existing easements for Line Y17. The existing easements have a width of 80 feet (typically 40 feet on each side of centerline). These 80-foot easements support the planned design and construction of rebuilding the line using the existing centerline. ATC plans to re-span the existing poles and increase span lengths to the maximum allowable that still fit within existing easement limitations. ATC has identified approximately 17 easements that have tree trimming and or removal limitations and will work with the current landowners to remove these restrictions through new easements.

5.3 Route Segments

Y16

The Project ROW is divided into seven segments, five segments on Y16 and two segments on Y17. The proposed length and ROW widths of each segment are shown in **Table 2** of **Appendix A** and are summarized below.

- Segment 1 – From Dam Heights Substation to the Merrimac Tap switch structure, the segment is approximately 8.5 miles long and is planned to have a combination of 50-foot and 80-foot ROW widths. Minor rerouting of the line is expected to occur in this segment, immediately outside of the Dam Heights substation and adjacent to the railroad crossing near existing structure 64, to avoid dwellings.
- Segment 2 – From the Merrimac Tap switch structure to the Caledonia switch structure, the segment is approximately 8.4 miles long and is planned to have a combination of 50-foot and 80-foot ROW widths.

- Segment 3 – From the Caledonia switch structure to Structure 185 (first structure north of the Wisconsin River in Portage), the segment is approximately 5.7 miles long and is planned to typically have a combination of 50-foot and 80-foot ROW widths. Minor rerouting of the line is expected to occur in this segment to accommodate collocation with the Badger-Coulee line adjacent to the I-39/I-90/I-94/WI-78 interchange.
- Segment 4 – From Structure 185 to Structure 20 (the first double-circuit structure with Y-110; Y-110 owns the structure and structure number), the segment is approximately 0.7 miles long and is planned to typically have a 50-foot ROW width.
- Segment 5 – From Structure 20 to the dead-end structure at the Portage substation, the segment is approximately 0.6 miles long and is planned to typically have an 80-foot ROW width.

Y17

- Segment 6 – From Montello Substation to the ACEC Turtle Lake Substation, the segment is approximately 6.1 miles long and is planned to typically have an 80-foot total ROW width.
- Segment 7 – From the ACEC Turtle Lake Substation, the segment is approximately 13.2 miles long and has an 80-foot total ROW width.

5.3.1 Type and dimensions of structure and foundation

Segments 1-5: Y16 Dam Heights to Portage Substation

All of the segments and sub-segments for Y16 will consist of a single-circuit overhead 69 kV line built on monopole steel structures, with the exception of six spans adjacent to the Portage substation where the line double circuits with the Y110 69 kV line. The tangent structures will be either direct-embedded or installed on alternative foundation methods intended to reduce construction impacts and costs. Angle and dead-end structures will be either direct-embedded or will have concrete pier foundations. The existing single-circuit 69 kV lattice frame line will be removed and replaced so as to operate within the proposed ROW. The existing 1/0 copper conductor will be replaced with T2-4/0 ASCR "T2-Penguin" conductor or equivalent using ATC's enhanced 69 kV design for operation at 69 kV. The enhanced or high Critical Flashover (CFO) design means that high CFO insulators will be utilized to improve the lightning performance of the line. 24-fiber OPGW will be added as shield wire. There will be six double-circuit steel poles connecting 69 kV lines Y110 and Y16 to the Portage Substation. Drawings of the expected structure types to be used for the Project are provided in **Appendix B**, **Figures 1 through 11**.

Segment 6-7: Y17 Montello to Wautoma

All of the segments and sub-segments for Y17 will consist of a single-circuit overhead 69 kV line built on monopole steel structures. The tangent structures will be either direct-embedded or installed on alternative foundation methods intended to reduce construction impacts and costs. Angle and dead-end structures will be either direct-embedded with guy wires or will have concrete pier foundations. The existing single-circuit 69 kV wood pole structures will be removed and replaced so as to operate within the proposed ROW. The existing 1/0 copper

conductor will be replaced with T2-4/0 ASCR "T2-Penguin" conductor or equivalent using ATC's enhanced 69 kV design for operation at 69 kV. The enhanced or high CFO design means that high CFO insulators will be utilized to improve the lightning performance of the line. 24-fiber OPGW will be added as shield wire. Drawings of the expected structure types to be used for the Project are provided in **Appendix B**, **Figures 1** through **11**.

5.3.2 Transmission configuration

ATC anticipates that a short segment of the Y16 line adjacent to the I-90/I-94 freeway will be double-circuited with the proposed Badger Coulee transmission line.

5.3.3 Conductor information

Both the proposed Y16 and Y17 transmission lines will be constructed with twisted pair (T2) configurations, retain the existing 69 kV operating voltage, and will utilize 4/0 ACSR "Penguin" conductor. One 24-fiber OPGW will be installed on both Y16 and Y17. For the Y16 spans underbuilt on the proposed Badger-Coulee transmission line, ATC plans to use T2 477 kcmil "Hawk" conductors because of increased span lengths. ATC also plans to use T2 "Hawk" at the Y16 Wisconsin River crossing near Portage.

5.3.4 Existing transmission affected by proposed project.

A 0.6-mile section of Y110 is double-circuited with Y16 and will be rebuilt as part of the Y16 project.

5.3.5 Existing distribution affected by the proposed project.

On Y16 and Y17, distribution facilities and crossings occur along the length of the existing and proposed transmission line.

Y16

Segment 1

One existing structure supports an Alliant distribution line crossing that would be affected by the Project.

Segment 2

No effects are anticipated on the distribution facilities by the Project.

Segment 3

No effects are anticipated on the distribution facilities by the Project.

Segment 4 & 5

In the City of Portage, ATC plans to have Alliant bury some existing overhead crossings to alleviate concerns with construction safety during construction of Y16.

Y17

Segments 6 & 7

Both ACEC and Alliant have stretches of existing underbuild on the transmission structures. In discussion with the LDCs their current plan is to transfer their facilities onto the existing structures. Should the LDCs revise their plans to include burying or upgrading of their facilities, adjustments to ATC's plan will be as necessary during detailed engineering to accommodate their facilities. No other distribution facilities are expected to be impacted at this time.

5.3.6 Shared ROW configuration.

Y16

ATC plans to re-construct the Y16 portion of the Project along the existing Y16 transmission corridor. The facility does run adjacent to and cross road and railroad or other ROWs in some locations throughout the project. This rebuild involves potentially having structure or wire facilities that are placed in, or wires that blow out into, these ROWs. The details of these placements and any applicable permitting requirements or limitations will be determined during detailed design.

Y17

ATC plans to re-construct the Y17 portion of the Project along the existing Y17 transmission corridor. The facility does run adjacent to and cross road or other ROWs in some locations throughout the project. This rebuild involves potentially having structure or wire facilities that are placed in, or wires that blow out into, these road ROWs. The details of these placements and any applicable permitting requirements or limitations will be determined during detailed design.

5.4 Impact Tables

The following route summary and segment impact tables, quantifying the general impacts of constructing the transmission line, are included in **Appendix A**:

- **Table 2** – General Route Impacts
- **Table 3** – Distances of Residential Buildings from ROW Centerline
- **Table 4** – Distances of Schools, Daycare Centers, and Hospitals from ROW Centerline
- **Table 5** – Land Cover
- **Table 6** – Federal, State, Local, and Tribal Lands Excluding Road ROWs
- **Table 7** – Route Impact Summaries

An outline of the methods used to prepare the impact tables, and a summary of the results for the route, are presented below.

In general, the information contained within **Tables 2** through **7** of **Appendix A** was developed from a combination of sources including available reference data, aerial photography and field observations along the route. These sources were utilized to quantify impacts using GIS software.

The reference data utilized to prepare the tables include:

- Digital county tax parcel information obtained from Columbia, Marquette, Sauk, and Waushara counties (November 2013);
- Databases from the State of Wisconsin regarding the locations of schools, daycares, and hospitals;
- WDNR state-managed lands information; and
- Wisconsin Regional Orthophotography Consortium (WROC) and National Agriculture Imagery Program aerial photographs (2010); on-line aerial services from ESRI and Bing; and high-resolution oblique imagery viewed in Pictometry™.

Additional methods used to prepare the tables, and a general summary of results is presented below.

5.4.1 Table 2 – General Route Impacts

The general ROW requirement and ROW sharing characteristics for the route are presented in **Table 2** of **Appendix A**. The Project is broken into seven segments, according to proposed construction spreads, which are reflected in this table. GIS software was used to determine segment lengths for this table.

The type and extent of existing ROW was determined from the following sources in conjunction with aerial photography review and field observations:

- Road: County parcel data and typical road ROW widths were used to determine the width of road ROWs.
- Transmission line: Existing easement widths were determined from a detailed review of easement agreements.

The total ROW width required for the Project for each segment was determined by engineering analysis.

The Project is comprised of two non-contiguous portions, Line Y16 and Line Y17, totaling 43.2 miles. The total ROW area required for the Project is approximately 400 acres, of which approximately 336 acres is shared with other existing corridors (including transmission line, railroad, roadway, and gas pipeline). Therefore, as shown in **Table 2**, 84 percent of the route (by area) is shared with existing ROW.

5.4.2 Table 3 – Distances of Residential Buildings from ROW Centerline

The types of residential buildings (homes and apartments) and the distance of these buildings from the ROW centerline were determined using GIS measurements on aerial photography. Building types were field verified to the extent possible during field investigations. Residential buildings were tallied according to five distance categories from the ROW centerlines: 0–25 feet, 26–50 feet, 51–100 feet, 101–150 feet, and 151–300 feet. Residences are located along every segment of the Project, with the lowest concentrations along segments 2 and 3 of Line Y16 and segment 6 of Line Y17. The highest concentration of residences is along segment 1 of Line Y17.

5.4.3 Table 4 – Distances of Schools, Daycare Centers and Hospitals from ROW Centerline

The number of sensitive receptors (schools, daycare centers, hospitals, and nursing homes) and the distance of these buildings from the Project centerline were determined in a similar fashion as the residential buildings in **Appendix A**, **Table 3**. In addition, the following databases were used to identify these facilities:

- Locations of licensed family and group child care centers were provided by the Wisconsin Department of Children and Families (data accessed 12/30/13);
- Public and private school locations were provided by the Wisconsin Department of Public Instruction (data accessed 12/19/13); and
- Hospital and nursing home locations were provided by the Wisconsin Department of Health Services (data accessed 11/11/13).

Queries of the above-referenced data sources reveal no sensitive receptors within 300 feet of the proposed centerlines of either Lines Y16 or Y17. As directed, individual cells with no receptors are left blank in **Table 4**.

5.4.4 Table 5 – Land Cover

Land cover along the ROW was identified using aerial photography and field observations. These land cover boundaries were digitized into a GIS layer and polygons were identified for each land cover category by clipping the data to correspond to existing shared ROW and new ROW boundaries, respectively. The acreages of each resulting polygon were quantified with GIS software and summed by land cover category and within each type of ROW, respectively, using the land cover categories corresponding to those specified in **Table 5**. Since the existing ROW is already cleared, a column was added to the table to differentiate those portions of the proposed ROW identified as formerly cleared (flanked by forest land outside the ROW) from portions that are currently forested (new ROW, only).

The majority of the land cover within the ROW is crop land along Line Y16 and grassland along Line Y17. The wooded upland and wetland categories specified as ‘already cleared’ are not woodland, per se, because they are cleared periodically in accordance with vegetation management guidelines; yet they cannot be technically classified as Grassland or Non-Wooded Wetland either, as they are characterized by short, woody growth.

5.4.5 Table 6 – Federal, State, Local and Tribal Lands Excluding Road ROWs

County parcel data obtained in November 2013 was used to identify federal, state, local and Tribal lands along the Project ROW. Road ROW was not included in this evaluation.

Privately owned lands that are managed by federal or state entities are also included in **Appendix A**, **Table 6**. State-managed lands were identified from the WDNR’s public lands web site (http://dnrmaps.wi.gov/sl/?Viewer=Public_Access_Lands). Lands with a known federal conservation easement (refer to Section 6.2) were assumed to be federally managed and were included in **Table 6**.

No Tribal lands or Native American reservations are present along the Project ROW. Federally owned (or managed) lands or state-owned (or managed) lands are present within the Project ROW of Line Y16, segments 1, 2, and 3, and segments 6 and 7 of Line Y17 (**Appendix A**, **Table 6**). These parcels primarily occur within existing transmission line corridor. New ROW is required on publicly owned and/or managed land along Line Y16; no additional ROW is required along Y17.

5.4.6 Table 7 – Route Impact Summaries

Appendix A, **Table 7**, summarizes impacts along the Project ROW of both lines. Total ROW acreage, upland acreage, wetland acreage, and residences within 300 feet of the centerline are totaled for each of the two lines comprising the Project. No new analyses were performed for **Appendix A**, **Table 7**; the methodologies are the same as those described within the previous table descriptions.

Line Y16 is 24.0 miles long and requires a ROW width varying from 50 to 80 feet; 70 percent of the area is shared with existing ROW of various types. Line Y17 is 19.3 miles long and requires a total ROW width of 80 feet along its entire length, and 100 percent of the area is shared. There are 183 single-family homes and 74 apartment units (among seven buildings) located within 300 feet of Line Y16; 49 single-family homes and no apartment buildings are located within 300 feet of Line Y17. The details of various upland and wetland land cover types can be found in **Table 7**. The wooded upland and wetland categories specified as 'already cleared' are not woodland, per se, because they are cleared periodically in accordance with vegetation management guidelines; yet they cannot be technically classified as Grassland or Non-Wooded Wetland either, as they are characterized by short, woody growth.

5.5 Construction Impacts

5.5.1 Discuss the proposed construction sequence

Construction of an overhead transmission line requires several different activities at any given location. Section 5.5.2 generally describes the major construction activities and approximate sequence, along with the anticipated impacts associated with each activity.

5.5.2 Describe the construction impacts associated with each phase of construction

The following information generally describes the major construction activities and approximate sequence, along with the anticipated impacts associated with each activity:

- Surveying and staking of ROW – minimal impact, typically completed by a two-person crew travelling by foot, ATV, or pick-up truck.
- Clearing of ROW – ATC anticipates clearing will be necessary to remove woody vegetation that has grown into the ROW since the last maintenance clearing cycle, as well as to provide equipment access and meet current clearance standards. Along Segments 1 through 3 (Y16), minor ROW shifts and widening will require approximately 6 acres of forest clearing (both upland and wetland; as indicated in **Appendix A, Table 5**). The Y17 portion of the Project will be rebuilt on a maintained, cleared ROW; therefore, ATC does not anticipate any new clearing along Y17.

- Temporary staging of poles and other materials along ROW – generally minimal impact. Trucks, loaders, and cranes are needed to unload poles and other materials near each work location.
- Installation of erosion control Best Management Practices (BMPs) – BMPs will be location specific and installed prior to all anticipated ground disturbance. Where unexpected ground disturbance occurs, BMPs will be installed immediately after the disturbance occurs. BMPs will be inspected weekly or after ½-inch rainfall events to ensure proper functionality.
- Foundation installation and/or excavation for direct-embed structures – In general, the excavated holes for each type of foundation will range from three to seven feet in diameter and may be 10 to 45 feet in depth, or greater depending on soil conditions. The method of installation, diameter, and depth of the foundation will vary depending on the soil capability and structure loadings. Excavation is required for all structures whether they are direct-embedded or use reinforced concrete foundations.

  Excess soils from excavations may be spread in the ROW in upland areas and stabilized or hauled to an offsite disposal location, depending on the site conditions (wetlands and waterways) and the property owner's requirements.

  In areas where groundwater seeps into the excavation, or where water is needed to hold the hole during drilling, it may be necessary to dewater the excavation. Depending on site conditions, the water may be discharged to an upland area where it is allowed to re-infiltrate, treated to meet WPDES General Permit conditions and discharged on site, or removed from site via a tank truck for proper treatment and/or disposal. For direct-embedded poles (no concrete foundation required), a hole is excavated to the appropriate depth. The base of the structure is placed into the excavated hole, and the area around the pole is backfilled with clean granular fill.

  For structures requiring a reinforced concrete foundation, the required hole is excavated, and a rebar cage and anchor bolts are placed into the excavation. The excavation is then filled with concrete to a point where the rebar cage and anchor bolts are covered leaving a typical one to two foot reveal of the foundation above grade with exposed threaded anchor bolts. The complete concrete caisson is allowed to cure.
- Construction equipment typically used in transmission line construction is expected to be utilized on this project, including but not limited to: mowers, bucket trucks, line trucks/digger derricks, dump trucks, concrete trucks, backhoes, dozers, drill rigs, cranes, mat trucks, barges or boats and related equipment. Helicopters may also be utilized for various construction activities if they are determined to be more cost effective. Tracked, rubber-tired or other low-ground pressure equipment as well as helicopters may be utilized in some areas to lessen environmental impacts (where needed).
- Structure setting – after the direct-embed base is set or the concrete caisson is cured, the remainder of the steel pole structure (or sections) is mounted to the base. Typical equipment for this phase of construction includes cranes and bucket trucks.

- Wire stringing and clipping – once all of the structures within a wire pull segment are set, the wires are pulled and clipped into place. This requires access to each structure with a bucket truck. Wire set up areas containing reel trailers, wire pullers, and related equipment are located at each end of the wire pull.
- Cleanup and Restoration of ROW – Upon completion of construction, cleanup and site restoration is completed. This includes removing construction mats, temporary clear span bridges (TCSBs), and other material or debris from the ROW, and any necessary seedbed preparation and seeding. Typical equipment for these activities includes mat trucks, bobcats, pickup trucks, and other light duty vehicles.

5.5.3 For unique construction methods

5.5.3.1 The location and reason for the construction method.

In general on the Y16 and Y17 lines, tangent structures will be direct embedded. ATC will explore alternative methods of construction to achieve the embedment of these structures, otherwise referred to as “alternate foundations”. Alternate foundations may be required or desirable in some or all portions of the line based on factors such as soil parameters, environmental impacts, or cost-effectiveness of installation. These alternative foundation types may include micropiles, vibratory caissons, helical piers, or other similar methods. Locations where some or all of these methods will be applied will be determined during design based on further evaluation of the aforementioned parameters.

5.5.3.2 A description of the construction method.

In general, tangent structures will be direct embedded. Alternative foundation types other than direct embedding may be chosen for tangent structures because of construction and access limitations, soil properties, or to meet environmental constraints. These alternative foundation types may include micropiles, vibratory caissons and helical piers. The installation methods for alternative foundation types are described in Section 5.5.2. Angle and dead-end structures may be direct-embedded and guyed or installed on foundations, such as drilled concrete piers, micropiles, vibratory caissons, helical piers or an alternative foundation system based on soil properties and structure loading. The following installation methods will be used:

Direct-Embedded Procedure: For direct-embedded poles (no foundation required), a hole is excavated to the appropriate depth. There may be some situations where the boring hole is collapsing due to soil instability. In these cases, it may be necessary to install a casing into the boring to support the boring sidewalls. Next, crushed stone is added to create a stable base and the end of the structure is placed into the excavated hole. The annulus is backfilled with clean granular fill (typically gravel) to within one foot of the surface. The balance of the excavation is backfilled with native soils. In general, the excavated holes will range from 3 to 4 feet in diameter and 10 to 15 feet in depth.

Shallow bedrock will likely be encountered in some areas. Special drilling methods may be used to remove rock.

Structure Installation: For steel structures, the sections of the structure are assembled and set into place using a crane or helicopter after the foundation has been installed or hole excavated

for a direct-embed structure. The insulator strings may already be in place on these structure sections, or they may be installed just prior to conductor installation. For wood poles, the structures maybe framed on the ground or placed in the direct embedded hole before framing any insulators or hardware.

Conductor Installation: Once the structures are installed and fully assembled, conductor is installed by using the existing conductor and/or pulling lines to pull the wire through blocks (pulleys) mounted at the attachment points. The blocks are installed on the structures—in most instances attached to the structures before the structure are raised—and the conductors are pulled in place using the pulling lines. The conductors are then tensioned according to the design and clipped in (removed from the blocks, placed into clamps and secured).

The method of installation, diameter and depth of the excavation will vary depending on the soil capability and structure loadings. Excavation is required for all structures, whether direct-embedded or requiring a foundation. The depth of the excavated hole (and, therefore, the amount of excavated material) depends on the soil conditions encountered at the proposed structure location.

For structures requiring a concrete pier foundation, the required hole is excavated. Concrete caissons are installed using a rebar cage and anchor bolts and placed into the excavation. The excavation is then filled with concrete to a point where the rebar cage and anchor bolts are covered leaving only the threaded bolts exposed. The complete caisson is allowed to cure to develop necessary design strength. After the caisson is cured, the steel pole structure is mounted to the caisson using the exposed bolts. In general, the excavated holes will range from 6 to 10 feet in diameter and may be 20 to 40 feet in depth.

There may be instances where shallow bedrock will be encountered. These areas will require modifications to the foundation designs by either shortening the footing length and socketing (anchoring) into solid bedrock or anchoring directly into the bedrock. Another option would be removing the rock with special drilling methods.

Alternative foundation types other than direct embedment and drilled concrete piers may be required for tangent, angle and dead-end structures because of construction and access limitations, soil properties, or to meet environmental constraints. The following installation methods describe these alternatives:

Micropile foundations are installed by drilling several small diameter (typically less than 16 inches) composite grout and steel core piles into the ground in a tight cluster. The piles may be fully cased or partially cased and pressure grouted. A sufficient length of each pile is left exposed above ground to install either a concrete or steel pile cap to which the structure is attached.

Vibratory caissons are installed by driving an open ended, large diameter steel tube into the ground with a heavy vibrating hammer. After the caisson has been driven to the desired depth the structure is attached to a welded base plate on the caisson using bolts.

Helical pier foundations are constructed by twisting the narrow, helical shaped, pier into the ground. The top of the pier may be attached directly to the structure using anchor bolts or, if multiple piers are used, a concrete foundation cap may be utilized.

5.6 Staging Areas

ATC has identified six potential construction laydown areas for the Project. A site map of the potential laydown areas is provided in **Appendix A**, **Figure 6**. The proposed laydown areas include quarries and vacant commercial properties. Preliminary environmental reviews did not indicate the presence of waterways or wetlands in or adjacent to these properties, sensitive species or the presence of previous environmental contamination. Further review will be completed prior to construction. These areas were chosen due to the proximity to the Project ROW. Use of multiple laydown areas will reduce the amount of construction traffic on local roads over long distances. If additional staging areas or temporary workspaces are required, ATC will notify the PSCW of these new construction locations and will submit the necessary information to the PSCW prior to establishing any such areas in accordance with Wis. Admin. Code § PSC 112.073.

5.7 Off-ROW Access Roads

5.7.1 Identify those areas along the proposed routes where off-ROW access roads may be required.

Proposed off-ROW access roads that have been identified at this time are depicted in **Appendix A, Figures 3A and 3B**. Proposed off-ROW access is subject to change as conditions change and discussions with landowners progress.

5.7.2 For each route, provide the total length of off-ROW access roads.

The total length of off-ROW access roads proposed at this time is approximately 2 miles for Y16 and approximately 300 feet for Y17.

5.7.3 Discuss the reasons for the necessity for off-ROW access

Proposed off-ROW access roads have been identified for a range of site-specific purposes including avoidance of waterway crossings, steep slopes, wetlands, and other unstable or unsafe portions of the Project ROW, or to replace long traverses along the ROW with a shorter access distance from a given structure or structures to a paved or improved roadway.

5.7.4 Provide quantitative land cover information

All proposed off-ROW access roads identified to date are located along existing local, private, or field roads. Land cover along the field roads consists of ruderal grassland, packed dirt, or gravel. The remaining roads are packed dirt, gravel, or pavement.

5.7.5 If the off-ROW access roads would be modified post-construction, provide details.

At this time it is not anticipated that off-ROW access roads would be modified post-construction, except to restore road condition to pre-construction condition.

6.0 NATURAL RESOURCE IMPACTS

6.1 Agriculture

6.1.1 Type of Farming

Agricultural land uses were identified both by field observations and aerial photography. WROC photography from 2010 was the primary source of aerial photography used. As a supplement, aerial photographs from several recent dates were also viewed in Pictometry™, a licensed imagery-based system that provides high resolution, 2- or 4-way oblique views of the ground surface. Field investigations along the Project route included field surveys completed in May and June 2013, which included direct land cover observations. Fields or other areas with no evidence of recent tillage were not included as agricultural land.

The amount and type of agricultural land along the route is detailed in **Appendix A**, **Table 5**, which includes the following categories as agricultural use: active crop land, pasture, old field (fallow agricultural land), and specialty crops (e.g., tree farms, orchards, cranberry bogs, ginseng). As with other land cover types, agricultural acreage was determined by digitizing with GIS software. Refer to Section 5.4 for a summary of this methodology.

The southern half of Line Y16 (segments 1, 2, and 3) primarily traverses agricultural lands comprised of row crop production of corn and soybeans. Pasture land is a minor component of the ROW. Specialty crops were not observed within the Line Y16 ROW. Row crops and a very small amount of pasture are also present within the Line Y17 ROW, but to a lesser extent than on Line Y16. The Y17 ROW tends to run between, rarely traversing, agricultural fields; resulting in land cover dominated by non-agricultural grassland. However, specialty agriculture consisting of tree farms occurs in three locations along segments 6 and 7, accounting for approximately three acres within the Project ROW (**Appendix A**, **Table 5**).

6.1.2 Agricultural Practices Affected By Project

Based on field observations within the Project area, aerial photograph review and database queries, an inventory of agricultural practices that may be affected by the Project during construction or operational phases was completed (e.g. drainage tiles, irrigation systems, aerial seeding/spraying and organic farming).

No direct evidence of drain tile lines within the Project area was apparent from either aerial photography interpretation or field investigation. However, some areas of farmland contain hydric soils, and some of these areas may be associated with drain tiles. Prior to construction, ATC will work with individual landowners to fine-tune structure locations such that impacts to drain tiles are minimized, to the extent practicable. During construction, matting may also be used to more evenly distribute the weight of heavy equipment, and/or low ground impact construction equipment may be used, should the landowner have specific concerns relative to potential drain tile line damage. Post-construction, ATC will work with the landowners to repair unavoidable damage to drain tiles to pre-construction conditions.

Based on review of a National Organic Program database provided by the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), and the Midwest Organic Services Association, there are no farms falling within the Project ROW that utilize organic

management practices or are certified organic. In addition, no center pivot irrigation systems or aerial seeding / spraying are known to occur along the Project.

6.1.3 Farmland Preservation Program

DATCP and Sauk, Columbia, Marquette, and Waushara Counties were contacted to determine if there are parcels enrolled in the Farmland Preservation Program in the Project area. Based on responses from these entities, ATC has not identified any parcels enrolled in this program along the Project corridor.

Y16 does not intersect any individual farmland preservation agreements. The Project area does run through areas that may be under farmland preservation zoning. The towns of Sumpter and Prairie Du Sac in Sauk County and the town of Caledonia in Columbia County have farmland preservation zoning.

Y17 does not intersect any individual farmland preservation agreements or areas within farmland preservation zoning.

6.1.4 Mitigating Project Impacts In/Near Agricultural Lands

Potential construction-related impacts on agriculture will generally be short-term in nature, and would be limited primarily to crop losses, soil mixing, and/or soil compaction along equipment access routes and around structure installation sites. ATC would mitigate these short-term impacts by providing compensation to producers, and by restoring agricultural lands to the extent practicable. Where appropriate, mitigation techniques such as topsoil replacement and deep tilling will be utilized.

ATC has attempted to minimize long-term impacts associated with constructing the Project across agricultural lands through careful consideration of structure placement outside of cropped fields wherever possible. Approximately 36 acres of proposed new ROW would affect agricultural lands along segments 1, 2, and 3. However, loss of tillable land is expected to be minimized by reducing the number of new structures replacing existing structures in cropped fields, and by utilizing construction impact avoidance/reduction measures.

Upon receipt of the PSCW Order, ATC will coordinate with each agricultural landowner regarding farm operations (e.g., irrigation systems, drainage tiles), locations of farm animals and crops, landowner concerns, and use of access routes wherever possible. Potential impacts to each farm property along the Project will be identified and, where practicable, construction impact minimization measures may be implemented. Site-specific practices would vary according to the activities of the landowner/farm operator, the type of agricultural operation, the susceptibility of site-specific soils to compaction, the degree of construction occurring on the parcel, and the ability to avoid areas of potential concern.

6.1.5 Agricultural Impact Statement

The Project involves rebuilding the existing 69 kV transmission line within the existing ROW and thus does not require an Agricultural Impact Statement. Further, the Project will not involve the actual or potential exercise of eminent domain affecting more than five acres of any farm operation.

6.1.6 Induced Voltage

ATC has identified one confined animal dairy operation and one agricultural building within 300 feet of the proposed centerline on Y16, Segment 1. **Appendix A, Figure 5** shows the location of this dairy operation and agricultural building. ATC has analyzed this information and recommends that no on-farm testing be done because there is not any collocated distribution near the farm operation. Collocated distribution is defined as distribution within 150 feet of the transmission line for a distance of 1,000 feet. WPL and Adams-Columbia Electric Cooperative has approved of this recommendation.

6.2 Conservation Easements

The route only crosses one known conservation easement at segment 3. Title search information has not been completed for the Project. Upon completion of the title search, more information about conservation easements will be known.

Information regarding lands with conservation easement agreements and protected areas was searched from available sources such as: Sauk, Columbia, Marquette, and Waushara counties; the Natural Heritage Land Trust; the National Conservation Easement Database; Natural Resources Conservation Service (NRCS); WDNR, The Nature Conservancy Lands; and the Protected Areas Database of the US regarding private parcels with conservation easements. Based on these sources, known or presumed federal or local conservation easements and protected areas may exist in areas to be affected by construction (see Table 6 for additional information). When the title search is conducted for this Project following issuance of an Order, a comprehensive inventory of conservation easements will take place, and the terms of the easements addressed with the landowners.

The following is a discussion, by route segment, identifying unavoidable properties that are known or presumed to have conservation easements or other types of agreements that restrict land use based on conservation objectives.

6.2.1 Conservation Easements by Segment

The Merrimac Preserve is located within 100 feet of the centerline of Y16 Segment 1 in Sauk County, along State Highway 113. It is owned by the Riverland Conservancy, Inc., which is a private land trust. It is managed to conserve, protect, and restore lands, waters, and natural communities and is therefore presumed to have a conservation easement. However, this land will not be crossed by the transmission route ROW, and therefore no impacts to any such easement would occur.

Segment 2 of Y16 crosses the Baraboo Hills Recreation Area 1 in Columbia County at State Highway 78 and Indian Farm Road. This land is owned by the WDNR and is managed for public nature-based outdoor recreational activities and habitat protection; therefore, it is presumed to be encumbered by a conservation easement. Regardless, measures to minimize the impacts of the Project will be coordinated with the WDNR before and during construction of the proposed rebuild.

In Columbia County between Interstate 90 and the Baraboo River, Y16 Segment 3 crosses the Baraboo River Waterfowl Production Area in the Leopold Wetland Management District. This

property is owned by the USFWS and is managed primarily for wetland restoration and protection. It is also enrolled in the NRCS Wetlands Reserve Program (WRP).

North of the I-39/STH 33 interchange, Segment 3 also crosses the Pine Island Wildlife Area. This parcel is a WDNR Managed Land and is therefore presumed to be encumbered by a conservation easement.

Within the City of Portage, there are two parcels of park land owned by the City that are crossed by the project. One is an undeveloped island in the Wisconsin River, and the other is a developed city park located north of the river between West Pleasant Street and West Prospect Avenue.

Segments 2, 4, and 5 of Y16 do not cross any lands known or presumed to be encumbered with conservation easements.

Segment 6 of Y17 crosses a narrow parcel owned by WDNR that is contiguous with the Comstock Bog Meadow State Natural Area (SNA), but appears to be a different status from the SNA, which is located east of STH 22 at a great distance from the Project.

Segment 7 crosses two WDNR Managed Lands. These areas are the White River Fishery Area-Waushara and the Wautoma Station.

6.2.2 Conservation Easement Details

The title search information has not yet been completed for the Project. Upon issuance of the Order, title searches will be completed. At that time, more information about conservation easements will be known.

6.3 Forested lands

Forested lands were identified and reviewed using aerial photography and observations from fieldwork completed in May and June 2013. Forested lands are defined as areas where mature trees are present forming mostly closed stands (>20% canopy cover and trees with diameter at breast height [DBH] of 6 inches or more). Narrow tree lines (e.g., wooded fence rows) or windbreaks were generally not included as forested cover.

Forest lands occurring within the Project ROW are described below. Forested areas were quantified as part of the impact analysis (Section 5.4), and the resulting acreages are outlined in the Land Cover table (**Appendix A**, **Table 5**).

The following tree size classification system was used: saplings refer to live trees from 1 to 5 inches DBH; pole timber ranges from 5 to 9 inches DBH for softwoods and from 5 to 11 inches DBH for hardwoods; and saw timber is over 9 inches DBH for softwoods, and over 11 inches DBH for hardwoods.

6.3.1 Impacted Woodlands

Most of the Project occurs along existing transmission line ROW that is maintained free of taller-growing woody vegetation. In some areas, however, minor encroachment of tree growth into the ROW may occur towards the end of each maintenance cycle. Segments 1, 2, and 3 on

Line Y16 require additional ROW, which will result in approximately 5.90 acres of total impact to forested land.

With the exception of the short re-route at the beginning of segment 1, the area of forest land being impacted typically occurs along the edge of existing ROW, where the additional ROW is proposed. Generally, this forest land occurs as small to moderately sized areas surrounded by agricultural lands. Most of the forest areas are dominated by pole and small to large timber size trees, typically including oaks (*Quercus spp.*), American elm (*Ulmus americana*), black cherry (*Prunus serotina*), and white and red pine (*Pinus strobus, P. resinosa*). The beginning of segment 1 on Line Y16 consists of saw timber-sized American elm, red cedar (*Juniperus virginiana*), and black walnut (*Juglans nigra*). Most of the forest areas are privately owned; however, some fall within federally owned parcels and railroad ROW. None of the forest areas appear to have a specific use.

Forested areas adjacent to, and occasionally encroaching into the ROW, are typically characterized as Southern Dry-mesic woodland communities dominated by species such as oaks, shagbark hickory (*Carya ovata*), cherry (*Prunus* spp.), maples (*Acer* spp.), red and white pine, red cedar, box elder (*Acer negundo*), and black locust (*Robinia pseudoacacia*). Common buckthorn (*Rhamnus cathartica*) and honeysuckle (*Lonicera* spp.) are dominant species within the understory.

6.3.2 Managed Forest Law (MFL) / Forest Crop Law (FCL) Programs

Line Y16 traverses four quarter-quarter section (40-acre) MFL-enrolled parcels. Three additional quarter-quarter section parcels are located within 300 feet of the centerline. These additional parcels will not be crossed by the Project ROW and thus will not be impacted.

Y17 traverses 25 quarter-quarter section MFL-enrolled parcels. Two additional quarter-quarter section parcels are located within 100 feet of the centerline. These additional parcels will not be crossed by the Line Y17 ROW and thus will not be impacted.

No new impacts to MFL enrolled lands are anticipated as a result of this Project. No properties affected by the Project are identified as part of the FCL program.

6.3.3 Mitigating/Minimizing Construction Impacts In and Around Woodlands

Although ATC maintains the ROW to be free of tall vegetation, this Project may require clearing/trimming of tall vegetation that has encroached within the ROW since the last maintenance cycle. Tall-growing vegetation that may interfere with safe construction and safe and reliable operation of the transmission line will be removed and controlled. Specifically, woody vegetation will be removed as needed within the ROW for construction of the Project and managed through the operational life of the facility. Clearing/trimming of vegetation within the ROW will occur prior to construction activities as allowed by landowner agreements and permit conditions.

ATC will utilize standard vegetation management practices in accordance with the Commission restrictions on oak tree cutting and pruning, as specified in Wis. Admin. Code § PSC 113.0511.

6.4 Wetlands (see section 8.0)

A summary of all wetlands intersecting the routes is presented in **Appendix E**, **Table 9** and shown in **Appendix A**, **Figure 3**. As discussed in Section 8.3, wetlands were identified during field investigations along accessible corridors and/or from review of aerial photographs and other reference material. In addition, access through several wetlands will be required for off-ROW access.

Substation construction for the Project will not impact wetlands.

6.4.1 Wetland Crossings

Numerous wetlands occur within the Project ROW. The following is a summary of the total number of wetlands intersected by the proposed ROW for each segment of the Project. These numbers are derived from the detailed inventory of wetlands presented in **Appendix E**, **Table 9**. Each intersection of a wetland area by the ROW was assigned a corresponding Feature ID and counted as separate crossing, if interrupted by a waterway or uplands, regardless of whether the area is part of a larger wetland unit. As such, any given wetland unit may consist of one or more crossings, depending on its shape relative to the Project ROW and the configuration of waterways within the wetland. With crossings identified in this manner, Line Y16 ROW crosses 28 wetlands, and Line Y17 ROW crosses 43 wetlands, as identified in the Environmental Inventory Table (**Appendix E**, **Table 9**).

The 28 wetlands crossed by Line Y16 occur within each segment as follows:

- Segment 1 – 3 crossings
- Segment 2 – 8 crossings
- Segment 3 – 14 crossings
- Segment 4 – 1 crossing
- Segment 5 – 2 crossings

The 43 wetlands crossed by Line Y17 occur within each segment as follows:

- Segment 6 – 11 crossings
- Segment 7 – 32 crossings

In addition, the off-ROW access routes involve one wetland crossing, located in segment 3.

6.4.2 Structures Within Wetlands

A large proportion of the existing structures are located in wetlands. Based on preliminary design assumptions, approximately 58 of the proposed structures will be located in wetlands, including approximately 33 structures in the Y16 ROW and approximately 25 structures in the Y17 ROW. Of these approximate 58 structures, approximately 20 (17 on Line Y16 and 3 on Line Y17) may be located in wetlands occurring at elevations below the Ordinary High Water Mark (OHWM) of an associated waterway (i.e., Chapter 30 wetlands).These occur within the Baraboo River floodplain in segment 3, adjacent to West Spring Lake in segment 6, and in association with the Lunch Creek headwaters and Pickerel Lake in segment 7.

The estimated number of structures to be placed in wetlands may be subject to adjustment if new issues are identified during detailed design and easement acquisition. Structures occurring in wetlands are shown in **Appendix A**, **Figure 3**. Further detail on each wetland, including the area of wetland impact, is provided in **Appendix E**, **Tables 8** and **9**.

6.4.3 Avoiding / Minimizing Construction Impacts In or Near Wetlands

Through the engineering design of the Project, the use of particular construction techniques, and implementation of BMPs and ATC's standard environmental protection practices, the Project will avoid or minimize wetland impacts to the extent practicable. For example, proposed pole locations have been re-spanned for this Project, which has resulted in a reduction in the number of poles in wetlands. However, because wetlands frequently occur along this ROW, equipment access during construction and pole installation within wetlands cannot be completely avoided.

Disturbance to wetlands for construction access will be minimized by one or more of the following construction techniques: shifting access pathways within the ROW to avoid wetlands located to one side; completing wetland construction during dry or frozen conditions; coordination with USFWS drawdowns in the Aldo Leopold Wetland Reserve; the use of equipment with low ground pressure tires or tracks; placement of construction matting to help minimize soil and vegetation disturbances and distribute axle loads over a larger surface area thereby reducing the bearing pressure on wetland soils; or the use of ice roads. Wetland access routes will involve only temporary impacts.

6.4.4 "Significant" or "High-Quality" Wetlands

Based on field investigations, several "significant" or "high quality" wetlands are present along the Project ROW, as described below.

Within the Y16 ROW, 13 wetlands have been identified (and italicized) in **Appendix E**, **Table 9** as Areas of Special Natural Resource Interest (ASNRI), in accordance with Wis. Admin. Code § NR 1.05. Within the Y17 ROW, 20 such wetlands have been identified as ASNRI. Wetlands are considered ASNRI when they fall within (entirely or in part), or are contiguous with, one or more of the designated special features listed in NR 105 (e.g., trout streams, state wildlife areas or parks, etc.). Additionally, some of these wetlands, particularly extensive floodplain systems such as the Baraboo and Wisconsin River bottomlands, would be considered significant based on their large range of functional values.

Specifically, the most significant wetland areas found within the Project ROW are as follows, by segment:

Segment 2

- 2-W1: Hemi-marsh and sedge meadow

Segment 3

- 3-W1, 3-W3/3-OR-W3, and 3-W4: USFWS' Baraboo River Waterfowl Production Area; diverse hydrologic regime and habitat structure; extensive floodplain wetland system

- 3-W5 through 3-W8: Extensive Baraboo River floodplain wetland system similar to 3-W3 and 3-W4 (privately owned)
- 3-W11 through southern end of W13 and 3-W14: Extensive mix of public and private-owned wetland associated with the Wisconsin River floodplain, a portion of which is part of WDNR's Pine Island Wildlife Area

Segment 4

- 4-W1: a mostly isolated remnant of the formerly extensive and contiguous Wisconsin River floodplain swamp

Segment 6

- 6-W1 and 6-W2: High-quality bog and sedge meadow adjacent to West Spring Lake
- 6-W3: Diverse habitat and native vegetation; part of an extensive and relatively intact natural community

Segment 7

- 7-W1 and 7-W2: Sedge meadow shrub carr remnant associated with the western margin of the Comstock-Germania Bog Important Bird Area
- 7-W6 and 7-W7: Diverse floodplain swamp community associated with the Mecan River
- 7-W13 and 7-W14: Diverse floodplain swamp community associated with the headwaters of Lunch Creek
- 7-W19: Sedge meadow/shallow marsh adjacent to Pickerel Lake (NHI water)
- 7-W22 and 7-W23: Sedge meadow adjacent to the West branch of the White River, an Outstanding Resource Water and Class 1 trout stream
- 7-W24 and 7-W25: Sedge meadow associated with Mud Creek , an Exceptional Resource Water and Class 1 trout stream
- 7-W26 through 7-W30: Sedge meadow/shrub carr associated with the White River, an Exceptional Resource Water, NHI water, and Class 1 trout stream

Segments 1 and 5 have no high quality or significant wetlands.

6.4.4.1 Location of Crossings or Wetland Impacts

The locations of the important wetlands listed in Section 6.4.4 are shown in **Appendix A**, **Figure 3**. Each wetland designation listed in Section 6.4.4 begins with the letter designation of the route segment in which it is located.

6.4.4.2 Wetland Type

For each of the important wetlands listed in Section 6.4.4, the corresponding wetland type is provided immediately following the wetland's Feature ID. In addition, the primary characteristics of each wetland (e.g., dominant species, hydrogeomorphic position, surrounding

land use, etc.) are described in the resource description and working comments columns of **Table 9** in **Appendix E**.

6.4.4.3 Mitigation Methods

The process that was undertaken to avoid and minimize impacts to wetlands, discussed in Section 8.2, includes consideration for minimizing the number of structures spotted within wetlands of relative importance.

During construction, the implementation of BMPs and ATC's standardized environmental protection practices will provide for further avoidance and minimization of wetland impacts. Through careful attention to access routing within the ROW, consideration of off-ROW access, types of equipment used, construction time of year, sedimentation control, and the implementation of other relevant site-specific measures (further described in Section 6.4.3), ATC will mitigate impacts to important wetlands, to the extent practicable in each case. Where necessary to ameliorate minor impacts such as rutting and vegetation disturbance due to equipment operation and mat placement in wetlands, site restoration activities will be implemented, monitored, and remedial measures applied (as necessary) until established revegetation goals are achieved (normally, 80 percent cover).

6.5 Waterbodies/Waterways (see section 8.0)

6.5.1 Proposed Waterway and Waterbody Crossings

A summary of all waterways and open water features (hereafter collectively referred to as "waterways") intersecting the ROW is presented in **Appendix E**, **Table 9** and shown on **Appendix A**, **Figure 3**. The identification of waterways was based on review of the WDNR 24K Hydro layer and field observations along the ROW. Those features with a distinguishable bed and bank were considered to be navigable waterways, regardless of the width or whether identified by the WDNR 24K Hydro GIS layer.

The Project crosses 40 streams and 16 open water features; and of these, 20 waterways within the ROW will require a temporary clear span bridge (TCSB) crossing. In addition, it is anticipated that one of the off-ROW access routes located on segment 2 will require a TCSB crossing, as noted in **Appendix E**, **Table 9**. Substation construction will not impact waterways.

The Y16 ROW crosses 28 waterways and 13 open water features, while the Y17 ROW crosses 12 waterways and three open water features, as identified and summarized in **Appendix E, Table 9**. At this time, ATC anticipates that 17 waterways on Line Y16 and three on Y17 will require TCSB crossings. No equipment will be transported across the remaining waterways; only the ropes pulling wire during the conductor stringing process will be passed across them (CT-4).

Open water features occurring within the Y16 ROW include four crossings of Lake Wisconsin, an impoundment of the Wisconsin River; three ponds; a manmade stormwater basin; a drainage ditch; and four oxbows associated with old channels of the Baraboo River. Of the open water features, five have been identified (and italicized) in **Appendix E**, **Table 9** as ASNRI.

The three open water features within the Y17 ROW consisted of one pond, West Spring Lake, and Pickerel Lake. West Spring Lake and Pickerel Lake have been identified (and italicized) in **Appendix E**, **Table 9** as ASNRI.

Several waterways appear on the WDNR 24K Hydro layer that do not have defined bed and banks, based on field observations. These features are indicated as such in **Appendix E**, **Table 9,** (but not given a unique waterway label) and the interpretation is that these features would likely not be considered navigable. ATC understands the WDNR has final jurisdictional authority over navigability determinations.

6.5.2 Structures Below the Ordinary High-Water Mark (OHWM)

Up to 20 structures (17 on Line Y16 and 3 on Line Y17) may be located in wetlands occurring at elevations below the OHWM of an associated waterway (i.e., Chapter 30 wetlands), though OHWM determinations have not been requested of WDNR. These occur within the Baraboo River floodplain in segment 3, adjacent to West Spring Lake in segment 6, and in association with the Lunch Creek headwaters and Pickerel Lake in segment 7. The waters in which these structures occur are indicated in **Appendix E**, **Table 8**, under the column labeled, "Misc. Structure".

6.5.3 Need and Method for Constructing Crossing(s)

Based on preliminary access routes, up to 21 TCSBs are anticipated to be required. A summary of the waterways proposed to be crossed along the ROW, and their proposed crossing methods, are presented in **Appendix E**, **Table 9**. All proposed crossings are required to allow for safe and efficient construction access along the ROW.

Where necessary and authorized by the WDNR, each TCSB will be placed to avoid in-stream disturbance. The TCSB will consist of construction mats and/or steel I-beam frames, or other similar material, placed above the OHWM on either side to span the stream bank. Preparation for setting the bridge may include minor blading and excavation confined to the minimum area necessary for safe bridge installation. Removal of low-growing trees, shrubs, and other shoreline vegetation will be kept to a minimum. Proper erosion control measures will be implemented and maintained during and after utilization of the temporary crossing. Additional detail regarding waterway crossings is provided in Section 8.0.

6.5.4 Avoiding / Minimizing Construction Impacts In or Near Waterways

The number of potential temporary stream crossings has been minimized in areas where construction can be completed by accessing from the ROW on either side of the stream, from adjacent roads, or by means of other off-ROW access routes. Upon receipt of an Order, ATC and its contractors will work with private landowners to identify alternate access routes to further reduce the use of stream crossings, if possible.

As discussed in Section 6.5.3, the amount of disturbance associated with deployment of the TCSBs will be minimized, and erosion control measures will be implemented, to reduce potential impacts to waterways.

6.5.5 Special Waterways and Mitigation

The WDNR's Surface Water Data Viewer web site was used to identify ASNRI-designated waterways in the Project area (http://dnrmaps.wi.gov/SL/Viewer.html?Viewer=SWDV). Designated waterways crossed by the ROW of Y16 and Y17 are listed, along with their ASNRI designations, in **Appendix E**, **Table 9**.

In addition to the special-status waterways specifically discussed below in Sections 6.5.5.1 and 6.5.5.2, notable ASNRI water resources crossed by the Project include four Lake Wisconsin embayments (1-OW1 through 1-OW4; NHI water, Critical Habitat), the Baraboo River and its associated oxbow lakes (3-R6; NHI water and Sturgeon Area), the Wisconsin River (3-R12, 4-R1, and 4-R; NHI water and Sturgeon Area); West Spring Lake (6-OW1; NHI water), an unnamed tributary to the Mecan River (7-R1; NHI water), and Pickerel Lake (7-OW2, NHI water).

Refer to Section 6.5.4 for procedures to avoid, reduce and mitigate impacts associated with all waterway crossings. In addition, the following provides further methods, based on site-specific information once an order is received, to mitigate potential impacts to designated waterways in the Project area.

Potential direct and indirect impacts to the designated waterways have been minimized during preliminary pole spotting so that structures are located away from designated waterways, where possible. During final design, additional attention will be given to maintaining a suitable distance from the structure to the waterway. In addition, at this point, ATC anticipates that some designated waters may require a TCSB crossing; however, as discussed above, attempts will be made to find alternate access that does not require a bridge crossing.

As previously discussed, an Erosion Control Plan will be prepared after receipt of an order and additional site-specific information is available. BMPs will be employed near waterways during construction to minimize the potential for erosion.

6.5.5.1 Outstanding or Exceptional Resource Waters

There are no waterways within the Y16 ROW designated as an Outstanding Resource Water (ORW) or Exceptional Resource Water (ERW). Within the Y17 ROW, there are two crossings of waterways designated as ORW, and six crossings of waterways designated as ERW:

- Mecan River (7-R2, ORW)
- West Branch White River (7-R4, ORW)
- Mud Creek (7-R5, ERW)
- White River (7-R6 through 7-R10, ERW)

6.5.5.2 Trout Streams

Within the Y16 ROW, there is one crossing of a designated Class III trout stream. Within the Y17 ROW, there are seven crossings of designated Class I trout streams, and two crossings of Class II trout streams. These waterways and their trout stream classifications are:

- Prentice Creek (2-R2, Class III)

- Mecan River (7-R2, Class II)
- West Branch White River (7-R4, Class I)
- Mud Creek (7-R5, Class I)
- White River (7-R6 through 7-R10, Class I)
- Lunch Creek (7-R3, Class II)

6.5.5.3 Wild and Scenic Rivers

Waterways designated as Wild and Scenic Rivers are not present within the Y16 and Y17 ROW.

6.6 Rare species and natural communities (see section 9.0)

6.6.1 Document communication with WDNR and USFWS, as applicable.

An Endangered Resources (ER) review was submitted to the WDNR Bureau of Natural Heritage Conservation (BNHC) in March 2014, and ATC received a response in April 2014. The WDNR's response and redacted and public versions of the ER review are provided as **Appendix G**, **Exhibit 7**. The ER Review summarizes all state-listed rare species, natural communities and other natural features with element occurrence records within one mile of the Project segments for terrestrial and wetland occurrences, and within two miles for aquatic occurrences. See Section 9.0 for further discussion.

The USFWS was contacted in April 2014 regarding federally-listed species. Eight federally-listed species are located within the Project area and include Higgin's eye pearly mussel, sheepnose mussel, snuffbox mussel, Karner blue butterfly, Fassett's locoweed, Mead's milkweed, northern monkshood, and prairie bush clover. Additionally, whooping crane (non-essential experimental population) and northern long-eared bat (proposed as endangered), are also noted within the Project area. Based on anticipated Project construction activities and species habitat requirements, it was concluded that the Project would have "no effect" on the above noted species. This conclusion was confirmed by USFWS in an email message dated April 24, 2014.

6.6.2 Document compliance with WDNR and USFWS direction, as applicable.

For Line Y16, nine endangered species, 21 threatened species, 48 special concern species, and 18 natural communities were queried from the NHI database and are included in the ER Review. Within the vicinity of Y17, one endangered species, six threatened species, 26 special concern species, and 15 natural communities were queried from the NHI database and are also included in the ER review. A number of the rare species and the natural communities have multiple element occurrence records along both Project routes. In addition to providing an inventory of rare species and communities, the ER Review also outlines the required follow-up actions necessary to protect threatened and endangered animal species, as well as the recommended follow-up actions to help conserve rare species, communities, or other natural features that are not legally protected (i.e. special concern animal species; threatened, endangered, and special concern plant species; and natural communities).

Additionally, osprey (*Pandion haliaetus*) nests were identified on nesting platforms on existing structures of the Y16 line. Based on both WDNR data and ATC data, anywhere from 5 to 10

nests have been located on these structures in recent years. Osprey, like all migratory birds, are protected under the Federal Migratory Bird Treaty Act. To avoid impacts to this species, the Applicant will avoid any disturbance during the osprey's nesting season, April 1 – August 15. As appropriate, the Applicant will relocate any nests on existing structures to either the new structures or stand-alone platforms during the non-nesting season.

6.6.3 For each route, discuss concerns and potential impacts to rare species

6.6.3.1 For any WDNR-identified follow up actions that must be taken to comply with endangered species law, discuss how each action or rare species identified would affect the proposed project and the specific segment.

Consultation with WDNR BNHC following the submission of the ER review resulted in required follow-up actions for a number of species. The required species-specific actions will be implemented where threatened and endangered animals are verified to occur, based on species surveys, or where species are assumed to occur based on the presence of suitable habitat along the identified segments. The required follow-up actions, as well as the effects these actions have on the proposed Project, vary by animal group and are summarized in the Certified ER Review (**Appendix E)**. In general, the actions include completing species surveys; implementing time-of-year avoidance periods; installing and maintaining exclusion fencing; avoiding work below the OHWM of certain waterways; implementing erosion/runoff prevention measures; consulting with the WDNR BNHC if a protected species is verified or assumed to be present; and if necessary, altering the Project where a protected species is verified to be present.

Animal species requiring follow-up actions for the Y16 portion of the Project area include four bird species, two snake species, one turtle, two mammals, nine mussels, and five fish species. Table 1 and Figures 3A and 3C of the Y16 ER Review (**Appendix E**, **Exhibit 2** depict areas of the Project where element occurrence records exist for the noted species. For the Y17 portion of the Project area, animal species requiring follow-up actions include one lizard species, one fish species, and one butterfly species. Table 1 and Figure 3A of the ER Review for Y17 (**Appendix E**, **Exhibit 2** depict areas of the Project where element occurrence records exist for the noted species.

If during the course of the Project there is uncertainty regarding actions to avoid impacts or take for some species or in some situations, ATC will coordinate with the WDNR BNHC on appropriate conservation measures. If the Project cannot completely avoid all areas of suitable habitat or take, ATC will work with the WDNR BNHC Incidental Take Coordinator to apply for an Incidental Take Permit for the affected species.

6.6.3.2 For any WDNR-identified recommended actions to help conserve Wisconsin's rare species and high-quality natural communities, discuss which actions would be incorporated into the proposed project.

Within the entire Project Area, numerous rare species and natural communities that are not legally protected or are exempt from protection by the Project were also present. Voluntary conservation actions are recommended to protect four bird species, two snake species, three turtle species, one frog species, two mammals, seven aquatic invertebrates, one mussel, eight

fish species, 24 plant species, 18 natural communities, and one mussel bed occurring within the Y16 Project Area. Table 1 and Figures 3B and 3D of the Y16 ER Review (**Appendix E, Exhibit 2**) depict areas of the Project where element occurrence records exist for each of these species. For the Y17 Project Area, voluntary conservation actions are recommended for five bird species, one turtle species, one mammal species, one aquatic invertebrate, two moth species, three snail species, 15 plant species, and 15 natural communities. Table 1 and Figures 3B and 3C of the Y17 ER Review (**Appendix E, Exhibit 2**) depict areas of the Project where element occurrence records exist for each of these species. In consultation with the WDNR BNHC, the Applicant may voluntarily implement recommended avoidance and impact minimization measures by species or community where they or their suitable habitat are verified to occur.

Recommended avoidance and minimization measures to protect special concern animal species when and where practicable include: voluntary species surveys, adherence to avoidance periods, and use of erosion/runoff prevention practices. Similarly, measures recommended for conserving rare plants include voluntary species surveys, use of exclusion fencing in occupied areas, and use of on-site biological monitors during work activities.

Elements for which no action will need to be taken include one lizard species and one migratory bird concentration site for the Y16 Project area and one migratory bird concentration site within the Y17 Project area.

6.7 Invasive Species (Uplands and Wetlands)

The following summarizes invasive species present along the Project ROW and identifies BMPs to minimize the spread of these species.

6.7.1 Invasive Species/Disease-Causing Organisms

The Project ROW was evaluated for invasive plant species during field investigations completed in May and June, 2013. The general location and composition of dominant invasive species present within the ROW were identified and noted on field maps during wetland delineations and vegetation mapping evaluations.

Invasive plant species were commonly observed along the Y16 ROW. Overall, nine invasive plant species were noted on Line Y16, with six falling into the “Restricted” category of Wis. Admin. Code ch. NR 40 and one species proposed as “Restricted”. Along the Y17 ROW, eight invasive plant species were noted, with seven falling into the “Restricted” category of Wis. Admin. Code Chapter NR 40 and one species proposed as “Restricted”. There were no “Prohibited” species found along either Project route.

Invasive species observed along Y16 include:

- Garlic mustard (*Alliaria petiolata*)
- Crown Vetch (*Coronilla varia*) – proposed “Restricted”
- Olive (*Elaeagnus* spp.)
- Leafy Spurge (*Euphorbia esula*)
- Bell’s honeysuckle (*Lonicera x bella*)

- Wild parsnip (*Pastinaca sativa*)
- Common buckthorn (*Rhamnus cathartica*)
- Glossy buckthorn (*Rhamnus frangula*)
- Cattail species (*Typha angustifolia* and *T. x glauca*)

Invasive species observed along Y17 include:

- Garlic mustard (*Alliaria petiolata*)
- Japanese barberry (*Berberis thunbergii*) – proposed "Restricted"
- Spotted Knapweed (*Centaurea biebersteinii*)
- Bell's honeysuckle (*Lonicera x bella*)
- Common Reed Grass (*Phragmites australis*)
- Common buckthorn (*Rhamnus cathartica*)
- Glossy buckthorn (*Rhamnus frangula*)
- Cattail species (*Typha angustifolia* and *T. x glauca*)

Disease-causing organisms

Oak wilt (*Ceratocystis fagacearum*) is known to occur throughout Columbia, Sauk, Marquette, and Waushara Counties. Numerous large oak trees (*Quercus* spp.) are present along both Y16 and Y17 ROWs. To minimize the spread of oak wilt, ATC will avoid cutting or pruning oak trees during the restricted times outlined in Wis. Admin. Code § PSC 113.051 (April 15 – July 1).

The Y16 Project area falls within the emerald ash borer (*Agrilus planipennis*) quarantine area, which includes all of Sauk County. No portion of the Y17 Project area falls within the emerald ash borer quarantine area. Practices that minimize the spread of this species include avoiding the movement of ash wood products (logs, posts, pulpwood, bark and bark products, slash and chipped wood from tree clearing) and hardwood firewood from emerald ash borer quarantine areas to non-quarantine areas, as per Wis. Admin. Code § ATCP 21.17. If ash trees need to be cleared or trimmed, and the ash wood products cannot be left on-site, alternative plans will be developed to meet the requirements.

Lines Y16 and Y17 are located within the gypsy moth (*Lymantria dispar*) quarantine area, which includes all of Columbia, Sauk, Marquette, and Waushara Counties. Standard practices to avoid the spread of the gypsy moth include inspections and avoiding movement of wood products (logs, posts, pulpwood, bark and bark products, firewood, slash and chipped wood from tree clearing) from gypsy moth quarantine areas to non-quarantine areas, as per Wis. Admin. Code § ATCP 21.10.

6.7.2 Mitigation Methods

BMPs will be used to comply with Wis. Admin. Code NR ch. 40. The use of BMPs will vary throughout the Project ROW based on the degree or severity of the invasive species infestation, and susceptibility of non-infested areas to invasion.

BMPs may include:

- Avoidance through construction timing and alternate access;
- Proper management of construction vehicles and materials (i.e. storage, cleaning);
- Minimizing ground disturbance;
- Placing a barrier between construction vehicles and plants (i.e. construction matting);
- Proper storage and disposal of plant materials; and
- Promoting native regeneration.

6.8 Archeological And Historic Resources

6.8.1 Identify all historic, cultural resources, and archeological sites

A cultural resources sensitivity assessment conducted by Commonwealth Cultural Resources Group, Inc. (CCRG) identified a total of 13 previously reported archaeological and cemetery/burial sites within the area of potential effects (APE) of the Project. In accordance with Wisconsin Stat. §§ 44.40 and 157.70, CCRG recommended archaeological survey of previously reported archaeological sites and cemetery/burial sites in the project APE to assess potential effects to these sites. Phase I archaeological survey of these areas was completed in August, 2013 and April, 2014.

- Site 47SK0127/BSK0373 is a Woodland tradition mound group located near the Wisconsin River in Section 24, T10N/R6E, Sauk County.
- Site 47SK0630 is a prehistoric lithic workshop located on the Badger Army Ammunitions Plant approximately 1,050 ft (320 m) west of Lake Wisconsin in Section 18, T10N/R7E, Sauk County.
- Site 47SK0071/BSK0218 is a multicomponent (Woodland, Late Woodland and Historic Indian) effigy mound site located on a small rise adjacent to a dry creek bed near Honey Creek in Section 5, T10N/R7E, Sauk County.
- Site 47SK0573 is a prehistoric lithic scatter located west of STH 78 in Section 8, T10N/R7E, Sauk County.
- Site 47SK0305/BSK0291 is a Woodland tradition mound group located on a terrace northwest of the Wisconsin River in the village of Merrimac in Section 2, T10N/R7E, Sauk County.
- Site 47CO0284 is a campsite/village of an unknown prehistoric cultural affiliation located immediately east of Cascade Mountain Road, near the center of the I-90/I-94/STH 78 interchange in Section 25, T12N/R8E, Columbia County.
- Site 47CO0207 is a Woodland tradition campsite/village located northeast of STH 78/I-39 and STH 33 interchange in Section 12, T12N/R8E, Columbia County.
- Site 47WS0013 is a Woodland tradition campsite/village located on a rise north of Pickerel Lake in Section 22, T18N/R10E, Waushara County

- Site 47SK0683/BSK0370 is a Late Woodland stage linear mound located on either the south shore of the central inlet or the north shore of the southern inlet of Wiegand's Bay on the Wisconsin River in Section 8, T10N/R7E, Sauk County
- Site 47SK0560 consists of the remains of a historic gas station formerly located along State Highway (STH) 78. The site is west of STH 78 and on the south side of a marshland extension of Weigand's Bay in Section 8, T10N/R7E
- Site 47SK0682/BSK0369 is a Late Woodland stage linear mound located on either the north or south shore of the central inlet of Wiegand's Bay on the Wisconsin River in Section 8, T10N/R7E, Sauk County
- Site 47SK0091/BSK0234 is a Woodland tradition mound group located on the former farm of Eli Schneider in Section 24, T11N/R7E, Sauk County
- Site 47WS0012 is a campsite/village of unknown prehistoric cultural affiliation located on a sand hill south of a stream neat the confluence of two streams that form the White River, south of Wautoma in Section 10, T18N/R10E, Waushara County

6.8.2 How the proposed project may affect the resource.

Survey results indicate that the proposed project will not have an effect on historic properties (NRHP-eligible archaeological resources), and no additional testing of the proposed project area, as currently designed, is recommended. These results notwithstanding, all burials on private and non-federal public lands in Wisconsin are protected from disturbance under Wis. Stat. § 157.70; therefore, CCRG recommends monitoring by a "qualified archaeologist" as specified under Wis. Stat. § 157.70 (1)(i) and Wis. Admin. Code § HS 2.04(6) of all ground disturbing activities within the areas of the six (6) cemetery/burial sites 47SK0127/BSK0373, 47SK0071/BSK0218, 47SK0305/BSK0291, 47SK0683/BSK0370, 47SK0682/BSK0369, and 47SK0091/BSK0234, in the project area.

6.8.3 How the route or construction practices could be modified to reduce or eliminate any potential effect on the resource.

As stated in Section 6.8.2, CCRG recommends monitoring by a "qualified archaeologist" as specified under Wis. Stat. § 157.70 (1)(i) and Wis. Admin. Code § HS 2.04 (6) of all ground disturbing activities within the areas of the six (6) cemetery/burial sites 47SK0127/BSK0373, 47SK0071/BSK0218, 47SK0305/BSK0291, 47SK0683/BSK0370, 47SK0682/BSK0369, and 47SK0091/BSK0234, in the project area.

6.8.4 Submit all qualified archeologists' reports and official correspondence with the WHS.

The archeologists' report and SHPO correspondence are located in **Appendix E, Exhibit 1** and **Appendix G, Exhibit 5**, respectively.

6.9 Restoration

The need for and approach to site restoration and re-vegetation will be based on the degree of disturbance caused by construction activities and the ecological setting of each site, and will reflect and satisfy the requirements of the property owner. If construction can be accomplished without creating appreciable soil disturbance, restoration may not require active re-vegetation efforts. Restoration activities will be implemented following the completion of construction activities. These activities will begin as soon as practical and as allowed by seasonal conditions.

6.9.1 Proposed Revegetation

ATC will develop a restoration plan for disturbed sites based on the level of ground disturbance and the site setting. In some cases, re-growth of vegetation in disturbed areas may be allowed to occur without supplemental seeding. In cases where there is no sign of re-growth of pre-existing vegetation species in the first month of the subsequent growing season, an assessment will be made and if necessary, an appropriate seed mix will be procured and properly applied. ATC will monitor the sites that are seeded to ensure adequate growth occurs.

The restoration and re-vegetation methods for wetland areas are described in Section 8.1.4 below.

6.9.2 Restoration Monitoring

During active construction, ATC or its representatives will inspect re-vegetation and restoration activities in accordance with Wis. Admin. Code ch. NR 216 and the WPDES general permit conditions. Written documentation of the inspections will be maintained and corrective measures taken, if necessary.

Restoration will be dependent on post-construction site conditions and landowner concerns. Restoration monitoring will focus on wetlands, waterway crossings, and areas where special site-specific erosion controls were implemented. Disturbed areas will be monitored until 70% re-vegetation has occurred.

6.9.3 Invasive Species Monitoring and Management

The invasive species located along the Project ROW and the BMPs to avoid the spread of invasive species are discussed in Section 6.7.

7.0 COMMUNITY IMPACTS

7.1 Communication With Potentially Affected Public

In late Spring 2014, a letter was mailed to landowners who were identified as owning property crossed by or adjacent to the Y16-Y17 Project as well as local officials in each of the counties and municipalities that are crossed by the line. The letter briefly outlined the scope of the Project, the reason for the Project, preliminary data-gathering activities, and a high-level schedule. In addition, the letter provided contact information for an ATC local relations representative. These documents are provided in **Appendix F**, **Exhibits 1 and 2**. There were no formal public meetings held for this Project. Additional communication with landowners will occur as needed to provided construction and access information.

7.2 Community Issues

ATC is not aware of any concerns raised by groups or potentially impacted communities.

7.3 Land use plans

Existing land use plans are provided in **Appendix A**, **Figure 8**. Land use plans were collected electronically from county and regional planning resources.

7.4 Residential And Urban Areas

7.4.1 Anticipated Impacts To Residential/Urban Neighborhoods And Communities

The Project has a total of 232 homes located within 300 feet of the centerline (**Appendix A, Table 3**). 7 apartment buildings (74 units) were identified within 300 feet of the ROW centerline. There are no schools, daycare centers or hospitals located within 300 feet of the centerline of the Project (**Appendix A, Table 4**).

Anticipated impacts to residential/urban neighborhoods and the planned mitigation are described below:

Noise

Most truck and equipment noise will be from 7:00 am to 6:00 pm, Monday through Friday. This is the time period that most trucks will leave the designated show-up yard each day.

When undertaking construction activities around those residences, ATC and its contractor will be cognizant of the residents.

Dust

ATC and its contractor will be performing drilling operations for the installation of the transmission structures, and will not be creating large spoil piles in relation to this work. Dust impacts will be minimized in the densely populated residential areas. In addition, ATC and its contractor will clean up daily any dirt or mud that may be tracked onto roadways by our equipment.

Duration of Construction

Construction is anticipated to begin in February of 2016 and end approximately December of 2017.

Time-of-day Construction

ATC and its contractor plan to work ten hours per day, Monday through Friday. Planned start time is planned to begin at 7:00 am and end at 5:30 pm. A portion of this Project work is scheduled to be performed during the winter months, and during that period, daylight will directly affect the work hours for the Project. Weekend work is also a possibility.

Road Congestion

Construction vehicles will use public roads for the purpose of accessing the ATC ROW. There may be occasions when ATC and its contractor will need to park vehicles on roads during our

scheduled construction hours. ATC and its contractor will minimize the number of vehicles and the amount of time they need to be parked on roads.

Impacts to Driveways

The only driveways ATC and its contractor anticipate using are driveways where we will receive specific landowner permissions to travel them or park equipment. This would apply primarily to driveways in suburban areas. For the purpose of completing our work, we do not anticipate requiring the use of driveways for structure. In addition, while working in these areas, ATC and its contractor will ensure we do not block any residential driveways with any equipment.

7.5 Aesthetic impacts

No photo simulations for the Project are being provided as a part of this Joint Application as no public-valued view sheds were identified. No scenic roads were identified within the Project area.

7.6 Parks and recreation areas

There are no parks or recreation areas or trails that will be impacted by the proposed Project.

7.7 Airports

7.7.1 Location

There are four airports that are located within three miles of the Project's centerline:

Airport Name	Distance from Centerline	Type/Use	City
Sauk-Prairie Airport	1.5 miles	Private	Prairie Du Sac, WI
Portage Municipal Airport	0.5 miles	Public	Portage, WI
Snow Crest Ranch Airport	2.0 miles	Private	Montello, WI
Wautoma Municipal Airport	0.4 miles	Public	Wautoma, WI

7.7.2 Description

- The Sauk-Prairie Airport is a privately-owned airport near Prairie Du Sac, Wisconsin. The latitude/longitude of the airstrip is 43°18'07"N and 89°45'22"W at an elevation of 831 feet and the asphalt-paved runway is approximately 2,936 feet in length.
- The Portage Municipal Airport is a publicly-owned airport near Portage, Wisconsin. The latitude/longitude of the airstrip is 43°33'20"N and 89°28'58"W at an elevation of 822 feet. It has two asphalt-paved runways: the north/south runway is approximately 3,768 feet in length and the east/west runway is approximately 2,559 feet in length.
- The Snow Crest Ranch Airport is a privately-owned airport near Montello, Wisconsin. The latitude/longitude of the airstrip is 43°49'46"N and 89°20'49"W at an elevation of 810 feet and the asphalt-paved runway is approximately 3,115 feet in length.

- The Wautoma Municipal Airport is a publicly-owned airport near Wautoma, Wisconsin. The latitude/longitude of the airstrip is 44°02'19"N and 89°17'59"W at an elevation of 856 feet. The north/south asphalt-paved runway is approximately 3,300 feet in length and the east/west turf runway is approximately 2,334 feet in length.

7.7.3 Potential For Impact To Aircraft Safety

ATC does not anticipate any impacts to aircraft safety since the new line will be rebuilt on the existing centerline and the new structure heights are proposed to be less than applicable Height Limit Zoning Ordinance (HLZO) requirements.

7.7.4 Identify potential construction limitations and permit issues.

All proposed structures within the three-mile limit of the airports listed are less than the height limit zoning requirements. However, there are a number of structures that exceed the FAA's filing criteria per its "Notice Criteria Tool." ATC will make the necessary filings with the FAA after the final design of the transmission line has been completed. Preliminary filings with the FAA have been made in preparation for this filing, and a summary of the information filed with the FAA is provided in **Appendix G, Exhibit 2.** The proposed transmission structures and cranes for installation of structures will require FAA notification prior to construction.

7.7.5 Documentation of consultation with the WisDOT Bureau of Aeronautics and the FAA.

Documentation of the initial FAA submittals that were done April 15, 2013, is provided in **Appendix G, Exhibit 2**. ATC plans to obtain necessary Tall Structures Permit(s) prior to construction from the FAA and inform the WisDOT Bureau of Aeronautics. Necessary notifications will be issued during construction.

7.8 Communication Towers

There are four communication towers located within one mile of the proposed Y16 line:

- A 180 ft lattice tower is located approximately 0.8 miles north of the centerline.
- A 270 ft lattice tower is located approximately 0.6 miles west of the centerline.
- A 200 ft monopole is located approximately 0.4 miles east of the Portage Substation.
- A 170 ft monopole is located approximately 0.4 miles east of the Portage Substation.

There are two communication towers located within one mile of the proposed Y17 line.

- A 260 ft lattice tower is located approximately 0.6 miles west of the Montello Substation.
- A 200 ft lattice tower is located approximately 0.9 miles north-east of the Wautoma Substation.

ATC does not anticipate that the Project will cause interference to the function of the identified communication towers near either line.

7.9 Community income from high-voltage transmission impact fees

This section does not apply to this Project because the proposed facilities are designed for operation at less than 345 kV.

8.0 WDNR PERMITS AND APPROVAL S FOR IMPACTS TO WATERWAYS AND WETLANDS

A WDNR Utility Permit will be required for this Project. The WDNR permits required for construction of the facilities proposed in this Joint Application include:

- Chapter 30 Permit to place temporary clear span bridges and related structures in or adjacent to navigable waters, pursuant to Wis. Stat. § 30.123 and Wis. Admin. Code ch. 320;
- Chapter 30 Permit to place Miscellaneous Structures within navigable waterways, pursuant to Wis. Stat. § 30.12 and Wis. Admin. Code ch. 329;
- Wetland fill permit to discharge fill in wetlands, pursuant to Wis. Stat. § 281.36 and Wis. Admin. Code chs. NR 103 & 299;
- The need for a WPDES Storm Water Discharge Permit pursuant to Wis. Stat. ch. 283 and Wis. Admin. Code ch. NR 216 will be evaluated prior to construction and ATC will apply to the WDNR for the permit if deemed necessary;
- Incidental Take Permit pursuant to Wis. Stat. ch. 29.604, if the need for that permit is identified by WDNR; and
- Any other applicable permit which is required, if the need for that permit is identified by WDNR.

The documentation required by WDNR to review the Project in consideration of the above-referenced permits is provided in this section of the Joint Application, in **Appendix A, Figures 3A and 3B**, and in **Appendix E, Exhibit 3** and **Tables 8** and **9**.

Temporary Clear Span Bridges (TCSB)

TCSB crossings will be required at 17 waterways along the Y16 ROW and one waterway along off-ROW access roads for Y16. In addition, TCSBs are needed for three waterways along Y17 as described in Section 6.5 and **Appendix E, Tables 8** and **9**, and shown on **Appendix A, Figures 3A and 3B**. These crossings require approval by the WDNR under Wis. Stat. § 30.123. All 21 waterways meet the standards and conditions for TCSB crossings in Wis. Admin. Code § NR 320.06. The Wis. Admin. Code § NR 320.04 indicates that bridges spanning navigable waterways shall maintain a clearance of not less than five feet. Due to the nature of the waterways that require a bridge, ATC requests a waiver of the five foot clearance requirement. Each TCSB will be installed above the ordinary high water mark and on the top of the bank. As described in NR § 320.04(3), the streams requiring bridges for this Project fall under the following waiver requirements:

- The waterways likely have little or no navigation or snowmobile use;

- The waterways are not anticipated to have navigational use other than lightweight craft;
- ATC will provide a portage over or around the bridges or culverts; and
- The reduced clearance would not be detrimental to the public interest.

The approximate channel dimensions of the waterways along the Project are provided in **Appendix E, Table 9**.

Miscellaneous Structures

Up to 17 existing transmission line structures along Y16 and three along Y17, which will be removed and replaced during construction, occur in wetlands that are likely to be below the OHWM of adjacent or nearby waters (Ch. 30 wetlands). It has not been determined if these structures will be completely removed, cut flush to the ground surface or cut at a depth below the ground surface. Due to the proximity of these structures to the waterway, cutting them at a depth below the ground surface or completely removing them may result in a temporary deposit of soil below the OHWM of this waterway, which would require approval under Wis. Stat. § 30.12. The approximate area of impact should not exceed a total of about 40 square feet for each new structure; temporary disturbance at each existing structure could be as much as 100 square feet, depending on the removal method. Soil temporarily displaced during structure removal will be replaced to match the existing ground surface. Appropriate erosion control BMPs, which will be specified in the Erosion Control Plan, will be implemented to minimize impacts to the waterway. During final design, some of the replacement structures may be re-located relative to the corresponding waterway to either minimize work below the OHWM or to avoid areas of open water.

Grading on the Banks of Navigable Waterways

At this time there are no access roads or work areas anticipated to require the quantity of grading on the banks of a navigable waterway that would trigger the need for a permit pursuant to Wis. Stat. § 30.19. The need for this permit will be evaluated prior to construction and ATC will apply to the WDNR for the permit if deemed necessary.

Discharges to Wetlands

Transmission structures to be placed in wetlands are summarized in Section 6.4. The proposed locations are specified and enumerated in Appendix E, Tables 8 and 9 and the wetlands are shown on the Environmental Features Map provided as Appendix A, Figures 3A and 3B. A small amount of soil may be temporarily displaced in wetlands at these locations during removal of the existing poles. The ground surface will be restored to match existing grade after pole removal. Placement of fill in wetlands, including the temporary fill resulting from protective matting placement, may require approval under Section 404 of the CWA from the USACE, and utility general permit from the WDNR under Section 401 of the CWA, Wis. Stat. §§ 281.15, 281.31, and 281.36, and Wis. Admin. Code ch. NR 299.

8.1 WDNR Tables for Wetland and Waterways

Table 8 (WDNR Wetland/Waterway Impact Location Table) and **Table 9** (WDNR Waterway/Wetland Environmental Inventory Table) are both included in **Appendix E**.

8.2 Wetland Practicable Alternatives Analysis (Wis. Admin. Code ch. NR 103)

ATC performed a Wetlands Alternative Analysis relevant to the replacement of the existing structures with new structures. Three alternatives were examined to remedy the reliability and design issues associated with these transmission lines: No Build, Relocate and Redesign/Rebuild. The "No Build" option was eliminated because the failure to replace the faulty structures may lead to eventual line failure. For additional information regarding the Project need, please refer to Section 2.0. Relocating the lines is not an option due to the fact that both Y16 and Y17 have existed within their current ROW for many years; however, relocation was considered along several short segments of Y16 including where the transmission line traverses the Pine Island Wildlife Area. Moving the line east to share the I-39 corridor was considered in this area; however, this option was removed from consideration due to comments received from USFWS. Agency representatives opined that relocating the existing line would result in additional new impacts to environmental resources including wetlands, waterways, and federal easements. Therefore, the "Redesign/Rebuild" option was chosen. This option provides the greatest avoidance of additional new impacts to environmental resources, while addressing the issues with line reliability and design.

For wetland impacts that cannot be avoided, see Section 6.4.3 for a discussion regarding mitigating construction impacts in wetlands.

8.3 Wetland Delineations

The Applicants' environmental consultant, Stantec Consulting Services Inc., completed wetland delineations in the field along the ROW. Wetland delineations were completed from May through June of 2013, using the methods outlined in the USACE Wetland Delineation Manual (USACE 1987), subsequent guidance documents (USACE 1991, 1992), Guidelines for Submitting Wetland Delineations in Wisconsin to the St. Paul District Corps of Engineers (USACE 1996), and the Northcentral/Northeast Regional Supplements to the 1987 Manual. The wetland boundaries were mapped using a Global Positioning System unit (sub-meter accuracy).

Field access was limited to the existing ROW (ATC and public ROW) along the routes. For areas that were inaccessible (e.g., in the case of multiple river crossings, new ROW), the wetland boundaries were conservatively estimated from field observations and by interpretation of aerial photographs (2010 Wisconsin Regional Orthophotography Consortium photos and 2012/2013 photos viewed in Pictometry™), soil survey information, WWI maps, and additional wetland signatures identified from the WDNR's Surface Water Data Viewer – Wetlands and Wetland Indicators. Remotely identified wetland boundaries were digitized into a GIS system.

Wetlands identified during field investigation are shown on the Environmental Features map provided as **Appendix A, Figures 3A and 3B**. The Wetland Delineation Report is included in **Appendix E, Exhibit 4**.

8.4 Wetland and Waterway Crossings

The Environmental Features map is provided in **Appendix A, Figures 3A and 3B**. These figures depict the structure locations, waterways, field and aerial delineated wetlands, construction access, and proposed temporary bridge locations.

9.0 ENDANGERED, THREATENED, SPECIAL CONCERN SPECIES AND NATURAL COMMUNITIES

As noted in Section 6.6, an ER Review has been completed and submitted, and a public version is provided in **Appendix E**, **Exhibit 2**.

9.1 WDNR-ER Review

An ER Review was submitted to WDNR BNHC in March 2014. ATC received a response on April 1, 2014. Due to confidentiality requirements for NHI data, a redacted version of the ER Review is included in **Appendix E**, **Exhibit 2**.

9.2 Submit maps and/or data files showing NHI occurrences.

The ER Review includes all NHI element occurrence records based on a WDNR query of the WNHI database dated January 21, 2014 and provided to the Applicant. The NHI data and maps are provided in the confidential filing of the ER Review.

The ER review recommended that ATC complete follow-up actions to assess the Project impacts to listed species. These actions included coordination with the USFWS to address federally-listed species and habitat assessments.

9.3 Submit Survey Results

In-field habitat characterization of the entire Project corridor was conducted from May – June, 2013. Habitat assessment results are summarized by line and segment in **Appendix E**, **Table 9**. The results will be used in consultation with the WDNR to follow-up on required and recommended actions identified in the ER Review. Biological surveys and refined habitat assessments, if necessary, will be conducted in consultation and coordination with the WDNR, and the results will be provided upon completion.

The USFWS was contacted in April 2014 regarding federally-listed species. Eight federally-listed species are located within the Project area and include Higgin's eye pearly mussel, sheepnose mussel, snuffbox mussel, Karner blue butterfly, Fassett's locoweed, Mead's milkweed, northern monkshood, and prairie bush clover. Additionally, whooping crane (non-essential experimental population) and northern long-eared bat (proposed as endangered), are also noted within the Project area. Based on anticipated Project construction activities and species habitat requirements, it was concluded that the Project would have "no effect" on the above noted species. This conclusion was confirmed by USFWS in an email message dated April 24, 2014.