4.1 UNAVOIDABLE ADVERSE IMPACTS

During construction of the Proposal, there would be temporary unavoidable adverse impacts on the existing flora and fauna, soil, and traffic in those locations where construction would occur adjacent to an existing roadway. Some of these impacts may occur, on a lesser scale, during maintenance of the Proposal. Longer-term, non-temporary adverse impacts related to operation and maintenance of the Proposal include loss of forested areas, including forested wetlands, within the ROW; loss of soil and habitat at new substations and substation expansions; visual impacts; impacts to migratory birds from collisions with the lines; and potential impacts to property values.

4.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA requires that environmental analysis include identification of "…any irreversible and irretrievable commitments of resources which would be involved in the Proposal should it be implemented."[168] Neither NEPA nor its implementing regulations define "irreversible and irretrievable." However, an irreversible and irretrievable commitment would generally be one that cannot be changed once it is made. This section describes irreversible and irretrievable commitments of resources associated with the implementation of the Proposal.

4.2.1 Land Resources

The Proposal will require the commitment of approximately 89 total acres of land for the substation and pole footprints.[169] While it is possible that these structures, roads and related facilities could be removed and the natural landscape renewed, this is unlikely to happen in the foreseeable future.

4.2.2 Water Resources

Construction of the Proposal will require a stormwater discharge permit and a CWA Section 404 permit for discharge of fill to approximately 0.2 acre of wetland. However, once constructed, the Proposal will not result in discharges to water resources or withdrawals from water resources. Topographic changes will be minimal.

[168] 40 CFR 1502.16

[169] Assuming an average 500-foot span between poles and 200 sq. ft. per pole with two new substations requiring 40 acres each and one upgrade to an existing substation requiring 0.5 acre.

Thus, the Proposal is not expected to result in irreversible or irretrievable impacts to water resources.

4.2.3 Biological Resources

The Proposal may result in the loss of some forests and forested wetlands. While these are not irreplaceable, replacing them will take a significant amount of time.

4.2.4 Natural and Mineral Resources

The Proposal will use concrete, steel, wire, asphalt, insulator material, plastic and other resources that are unlikely to be re-used. However, once built, the Proposal will not consume raw materials.

4.3 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

NEPA requires consideration of the relationship between the short-term uses of the environment and the long-term productivity associated with a Proposal. This involves the consideration of whether a Proposal is sacrificing a resource value that might benefit the environment in the long term, or some short-term value to the sponsor or the public. In the context of the short-term uses of the environment associated with the operation of the facility and the long-term impairment of environmental resources as they have been analyzed in this EIS, “short-term” refers to the period of time encompassing the life span of the transmission lines and their associated facilities to the period of time encompassing the disassembly of the line and facilities and subsequent restoration and rehabilitation activities. “Long-term” refers to that period of time following restoration and rehabilitation activities, during which consequent impacts from the Proposal still affect the environment.

The proposed short-term uses of the environment associated with the Proposal are the development of approximately 89 acres of land (the sum of the pole foundations and the new or modified substation areas) and the loss of ROW to certain land uses. In most cases, this additional ROW can continue to be used for its current purposes of agriculture and utility; however, some other areas, such as forested areas, areas with

buildings, or areas that could have been used for other construction, will be converted during the lifetime of the Proposal.

The projected period before natural conditions return to an approximate pre-Proposal status within the Proposal area would depend on the affected resource. Most ROW and substation areas could immediately be used for other purposes; for example, the viewshed and any impacts to it caused by lines and poles would be immediately restored. However, the restoration of some resources, such as forests, would require decades.

4.4 CUMULATIVE IMPACTS ANALYSIS

CEQ regulations define cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other action. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."[170] Also, cumulative impacts are those "which when viewed with other reasonably foreseeable or proposed agency actions have cumulatively significant impacts."[171] This section discusses the cumulative impacts that are associated with the Proposal.

Cumulative impacts occur when the effects of an action are added to the effects of other actions occurring in a specific geographic area and timeframe. The cumulative impact analysis follows CEQ's guidelines: Considering Cumulative Effects under the National Environmental Policy Act (CEQ, 1997). The steps associated with the analysis include requirements that the assessor:

- Specify the class of actions for which effects are to be analyzed.
- Designate the appropriate time and space domain in which the relevant actions occur.
- Identify and characterize the resources to be assessed.
- Determine the magnitude of effects on the receptors and whether those effects are accumulating.

[170] 40 CFR 1508.7
[171] 40 CFR 1508.25(a)(2)

The cumulative impacts analysis presented in this Section is resource-specific. The temporal and spatial boundaries used for the cumulative impacts analysis are specific to each resource area. For those resources where the spatial boundary is defined as the Proposal area, this includes the 1,000-foot wide route identified for each Route and Segment Alternative. For those resources where the temporal boundary is defined as the lifetime of the Proposal, this is estimated to be 50 years. If the Proposal is not expected to result in direct or indirect impacts on a resource, then that resource was eliminated from the cumulative impacts evaluation.

4.4.1 Past, Present and Reasonably Foreseeable Future Actions

Past, present, and reasonably foreseeable future actions relevant to the cumulative impact analysis are discussed below.

4.4.1.1 Land Use and Land Cover Changes

Land cover in the Proposal area has changed dramatically since the time before settlement, with most of these changes, in terms of land area impacted, occurring in the 19th century. During that time, the forests were cleared and land suitable for agricultural use was converted to be used as such. In pre-settlement Minnesota, most of what is now rolling agricultural land was prairie and savanna (oak openings and barrens). Only a few isolated remnants remain. There were forested strips along the Mississippi River and other major rivers (MDNR 2011). The Wisconsin parts of the Proposal area were primarily oak forests, oak openings, barrens, and “brush,” with a few prairie areas (WDNR as presented by Great Lakes Ecological Assessment, n.d.). Nearly all the forests in the area were clear-cut, primarily in the late 19th century (WDNR 2001b).

While the specific crops vary, and total acreage changes from year to year, the total cropland in the U.S. in recent times is about the same as it was 100 years ago (USDA ERS 2007a). In 2006, the most recent year for which data is available, the total agricultural land used for crops in the U.S. was 330 million acres - the same as it was in 1910, the first year USDA began tracking. Peaks occurred in the early 1930s, in the few years just after World War II, and in the early 1980s, when the area of cropland used for crops reached over 380 million acres (USDA ERS 2007a). USDA expects total agricultural acreages for major crops to increase by approximately 0.3% between 2009

and 2020, its current longest-term projection period (USDA 2011 Table 18). The return of some CRP lands to agricultural production is expected to result in an increase in arable land used for further cropland (USDA 2011 Table 18). This return of CRP land has been stipulated by the Food, Conservation, and Energy Act of 2008 (2008 Farm Act)[172] to provide additional cropland to meet future agricultural demands; the cap on CRP land was reduced from 39.2 million acres to 32 million acres beginning October 1, 2009. Enrollment as of September 2008 was 34.7 million acres (USDA ERS 2009). In 2007 there were 1.4 and 0.5 million acres of CRP land in Minnesota and Wisconsin, respectively, with the first CRP land established in 1985 (NRCS 2009 Table 2).

In Wisconsin, the total area of forested land has been increasing since 1935, "mostly due to the conversion of marginal agricultural land back to forests" (WDNR 2001a). Forest land increased by approximately 190,000 acres in Minnesota (1% increase) and by 340,000 acres in Wisconsin (2% increase) from 1982 to 2007 (NRCS 2009 Table 2). Nationwide, forested land increased by 20% between 1945 and 2002. Forest-use land (forest land used for harvesting timber or grazing) increased by 8% between 1945 and 2002, and land with forest cover that is not forest-use land increased by 345% during the same time period. Forested land excluded from forest-use includes protected land in parks and preserves, among other special uses (USDA ERS 2007b, 2007c).

Nationwide, areas of wetlands were essentially unchanged from 1997 to 2007, within the margin of error of the data (NRCS 2009).

The area of urban and suburban land that has developed with buildings, roads, and other infrastructures has increased since the mid-20th century in the U.S. For example, Rochester expanded in area by 463% from 1950 to 1990 (Soule 2006 pp. 93-94). Developed land in Minnesota and Wisconsin increased by 40% and 38%, respectively, from 1982 to 2007, with an increase of approximately 680,000 acres in Minnesota and 750,000 acres in Wisconsin (NRCS 2009 Table 1). The developed land resulted primarily from conversion of farmland (cropland and pastureland) (NRCS 2009 Table 1). While development is occurring primarily at the expense of agricultural land, due to the amount of agricultural land being several orders of magnitude greater than the amount

[172] Pub. L. 110-234

of developed land, large percentage increases in developed land represent very small decreases in agricultural land, as a percent of total agricultural land.

Based on population projections in the Proposal area and projected small decreases in household size in Wisconsin (Egan-Robertson et al. 2004, p. 1), development is expected to continue. Projected 2000-2030 population increases for the Minnesota counties within the Proposal area are: Dakota, 36%; Goodhue, 25%; Olmsted, 48% and Wabasha, 16% (MnGeo 2011). In the Wisconsin part of the Proposal area, the population of parts of Buffalo County is expected to increase between 20 and 30% between 2000 and 2030, and the population of parts of Trempealeau County is expected to increase by 30% or more within the same timeframe (Egan-Robertson et al. 2004, p. 21).

Floodplains and riparian zones along the Mississippi were greatly impacted with the construction of locks and dams on the river, which changed the free-flowing stream into a series of pools.

4.4.1.2 Roadway Projects

Minnesota Projects

The Minnesota DOT (MnDOT) has a long-range plan to develop US-52 as a fully access controlled freeway facility between the Twin Cities and Rochester (MnDOT 2002). “Fully access controlled” means that the roadway can be accessed only at interchanges. “Freeway” means that there are no stop signs or traffic signals. An Interstate highway is an example of a freeway. On a freeway system, all intersecting roadways must be at a different elevation than the freeway – they must be “grade-separated.”

The ROW along US-52 is the proposed alignment for part of the Route 1P. MnDOT’s plan is shown in Figure 4-1. Two of these projects and a third project in Rochester are summarized below.

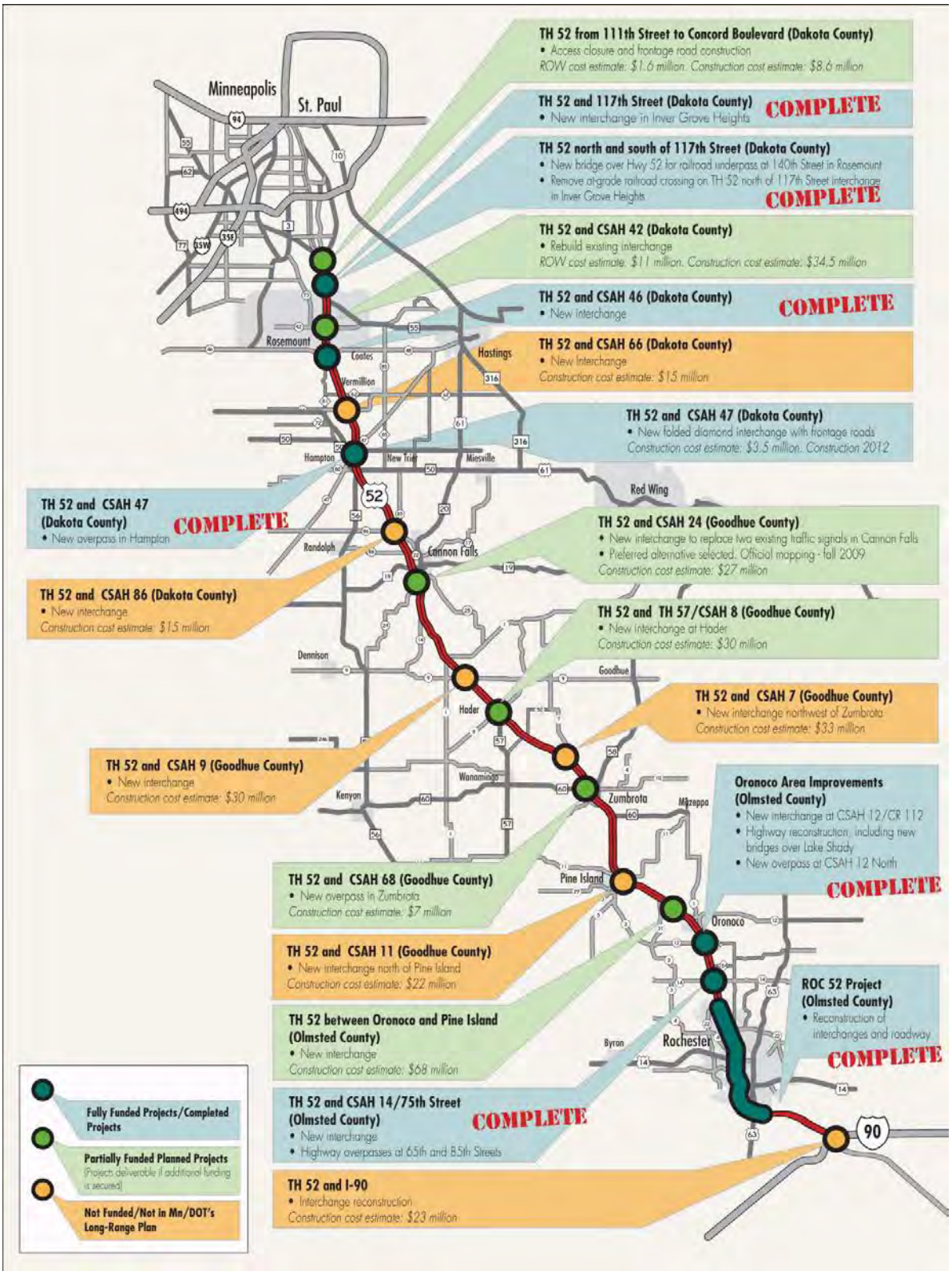

Figure 4-1: MnDOT US-52 Long-Term Plan.
Source: Highway 52 Freeway Partnership 2009

US-52 and County Highway 24, Cannon Falls – The purpose of this project is to improve mobility, safety, traffic operations and connectivity at the intersection of US-52 and County Highway 24 at Cannon Falls. It would also make progress toward MnDOT's goal of upgrading U.S. 51 to freeway standards from Rochester to the Twin Cities. MnDOT's preferred alternative includes the following components:

- Removal of signalized intersections at north and south County Highway 24.
- Closure of existing residential and commercial accesses along US 52.
- Construction of a grade-separated interchange at approximately 324th Street.
- Construction of an overpass at 315th Street.
- West and east frontage roads parallel to US-52.
- 10-foot off-road trails along west and east frontage roads.

This project would be along the portion of US-52 where the Applicants' proposed alternative is located. According to the MnDOT website, the study is complete, but funding is not currently available (MnDOT 2010).

Elk Run Interchange – This project includes a new interchange on US-52 at Pine Island in Olmsted County, the re-alignment of Olmsted County Road 12 and the elimination of 18 highway access points on US-52 between Pine Island and Oronoco. A schematic of the proposed project is shown in Figure 4-2. This project is under construction and scheduled to be finished in 2012 (MnDOT 2011a).[173] Routes 2P and 2P-001 would be affected by this project.

[173] This project is shown as partially funded on the map used for Figure 4-1, which is dated 2009 and is available on MnDOT's website as of June 2011.

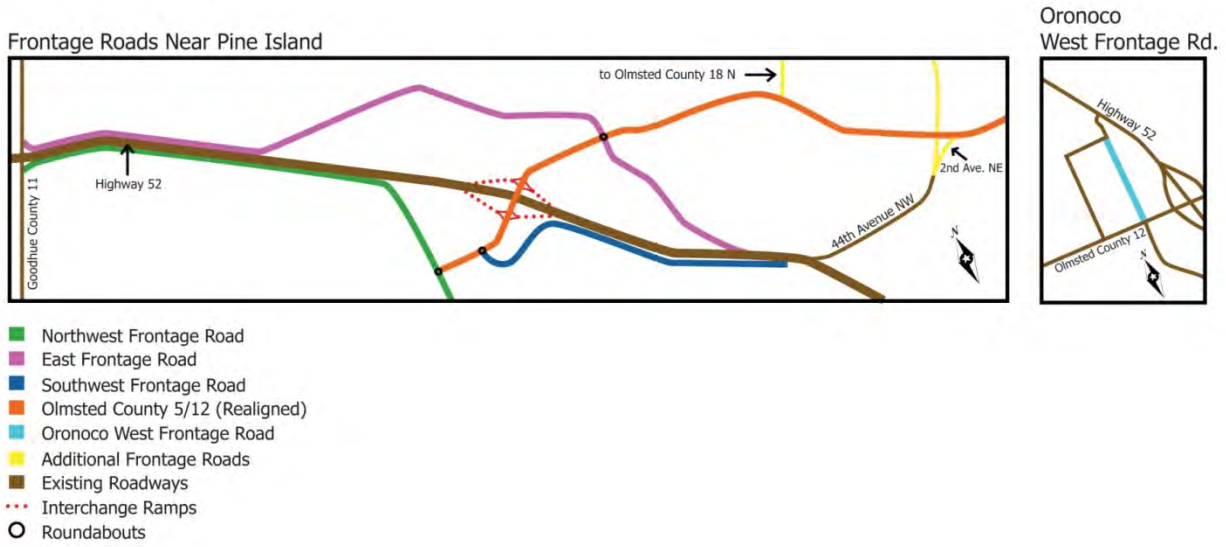

Figure 4-2: Plan for Elk Run Interchange.
Source: MnDOT 2011b

Northern Rochester Transportation Study – This study, which includes an area along US-52 just north of the Northern Hills Substation, was completed by MnDOT and the City of Rochester. Some of the alignment alternatives under consideration would be in the area of this study. Proposed components include:

- Interchange at US-52 and 65th Street, with construction to begin in 2012.
- Improvements to 55th Street within the US-52/55th Street interchange area, with construction proposed in 2013.
- Other related projects phased over the next 25 years, including improvements to 55th Street and reconstruction of 65th Street (City of Rochester 2011).

Wisconsin Projects

The Wisconsin Department of Transportation (WisDOT) currently has no projects or plans in Buffalo or Trempealeau Counties (WisDOT 2011a). In La Crosse County, the WisDOT completed a study (the South La Crosse Transportation Study) in 2005 for roadway improvements that would be located just south of the Proposal area (WisDOT 2005). The work would include improvements to US-14/61 and WI-35. As of June 14, 2011, there was no construction activity on this project, and no updated plans beyond 2005.

4.4.1.3 Transmission Line and Wind Energy Projects

There are over 150,000 miles of transmission lines in the U.S. in the 230-765 kV range (DOE 2002, p. 3). There are currently 53,203 miles within MISO, ranging from 69 to 500 kV (MISO 2010a). In its 2010 transmission expansion plan (MTEP), MISO identifies several hundred transmission improvement projects recommended for approval by its board, including approximately 2,400 miles of upgraded line or line on existing ROW and 1,700 miles of new line (MISO 2010a, Appendix A). Most are planned for completion over the next few years. Additionally, Appendix B lists projects that have been reviewed by MISO staff for need and effectiveness, and lists approximately 1,800 miles of upgrades/lines on existing ROW and 24,000 miles of new lines (MISO 2010a, Appendix B). Many of these lines are conceptual, although a small percentage of them are planned. Finally, in Appendix C, projects listed are either conceptual or new to the planning process, and have not undergone thorough review, including approximately 2,600 miles of upgrades/lines on existing ROW and 13,000 miles of new lines are in the conceptual stage (MISO 2010a, Appendix C). **The routes for ATC's Badger-Coulee 345 kV project, which is approximately 150 miles long and would extend from near Holmen to near Madison, Wisconsin, are currently being evaluated.**

Wind energy projects were minimal in 1990, currently comprise approximately 41,400 MW of capacity, and, in EIA's reference case, are expected to more than double between 2008 and 2035 (AWEA 2011a, EIA 2011).

Minnesota ranks fourth in the U.S. for most installed wind capacity and has 2,485 MW currently online, with 20,010 MW in the queue, and large additional potential (AWEA 2011b). Minnesota currently obtains approximately 10% of its power from wind, and with the 25% RPS requirement, many more wind installations are expected (AWEA 2011b). Minnesota's greatest wind capacity is in southwest Minnesota, with other substantial resources in the southeast. More than half the state (from the northwest to the southeast) has suitable resources for commercial production (NREL 2010a, 2010c). Compared to Minnesota, Wisconsin has much less wind energy potential (NREL 2010c, 2010d).

4.4.2 Cumulative Impacts by Resource

4.4.2.1 Soils and Geology

The Proposal would disturb surface soils through site clearing, grading, and excavation activities at structure locations; during the pulling and tensioning of sites and setup areas; and during the transport of crews, machinery, materials, and equipment over access routes (primarily along the transmission ROW). The majority of impacted acreage would be temporary in nature, primarily due to equipment access. Depending upon the alternative, up to approximately 89 acres would undergo long-term impacts due to the installation of pole structures and substation facilities. Long-term impacts include the loss of use of soils in those specific locations used for pole structures and substation facilities. The spatial boundary for the cumulative effects analysis is defined as the Minnesota and Wisconsin counties within which the Proposal is located. The temporal boundary for the cumulative effects analysis is defined as the lifetime of the Proposal.

The impacts from the Proposal would contribute to the cumulative impacts on soil from other past, present, and reasonably foreseeable future activities in the area. Past activities include urban and suburban development and associated infrastructure, which has resulted in millions of acres of soil impacts. Other present activities contributing to soil impacts include on-going development, including roadway projects (hundreds of acres of impact). Reasonably foreseeable activities contributing to soil impacts in the area include future urban and suburban development and roadways, in particular the US-52 roadway work. Hundreds of acres of soil impacts could be expected from these activities in the future. Future transmission line and wind energy projects would make small contributions to cumulative soil impacts.

The Proposal is not expected to have geologic impacts; therefore, cumulative impacts to geologic resources are not considered.

4.4.2.2 Water Resources

During construction of the Proposal, the potential for temporary impacts to surface water exists as a result of erosion from exposed areas of soil during construction (as described in Section 4.3.2.1 above) and subsequent transport in runoff to streams and

other surface water bodies. Erosion and runoff could result in increases in the volumes of both sediment and dissolved solid load in surrounding surface water bodies. These impacts will be minimized by the relatively small areas of exposed soil over the length of the Proposal, and by the implementation of SWPPPs, including the use of BMPs during construction. No other impacts to surface water would be expected. Aside from the placement of a few poles in the Mississippi River (in an existing ROW where poles are already located), there will be no direct impacts on surface water bodies, as all water bodies will be spanned. The spatial boundary for the cumulative impact analysis of surface water includes watersheds with the Proposal area. The temporal boundary for the cumulative effects analysis is defined as the lifetime of the Proposal.

Because cropland covers much more land than any other use of land in the U.S., and because growing crops requires at least some exposure of soil, agriculture is the major contributor of sediment and dissolved solids to surface water. Recent trends in no-till and reduced-till farming have helped reduce these impacts. In the watersheds within the Proposal area, while Proposal construction has the potential to contribute to the cumulative impacts on surface water, the impacts would not be expected to be discernible. Post-construction impacts on surface water would not be expected.

The Proposal will require crossing floodplains; however, the impacts would be limited to the poles and would be negligible in terms of impacts to floodplain values, except in cases where trees within the floodplain would need to be cleared. These impacts would be added to the cumulative impacts from floodplain changes, from past activities such as lock and dam construction, bridge construction, and conversion to farmland. At least some of the transmission lines expected to be constructed in the foreseeable future would be expected to have similar floodplain impacts, which would contribute to the cumulative impacts. At the Mississippi River, two or three poles would need to be placed in the floodway. FEMA limits cumulative impacts on floodway by requiring a demonstration that any proposed construction in the floodway, in combination with other foreseeable construction, will not cause a rise in flood elevations. While the poles are so small that they would not be expected to have an impact, a potential effect on flood elevations would need to be addressed.

The Proposal is not expected to have impacts on groundwater; therefore, cumulative impacts to groundwater are not considered.

4.4.2.3 Air Quality

As discussed in Section 3.3, the Proposal will result in limited air emissions. During construction, there will be some fugitive dust and exhaust emissions from construction equipment. Potential air quality impacts from operation are primarily associated with the production of small amounts of ozone and nitrogen dioxide in the air surrounding transmission line conductors and the potential release of small amounts of sulfur hexafluoride (SF_6) - a powerful greenhouse gas - during operation and maintenance of certain electrical substation equipment.

Through its air permitting process under the Clean Air Act, the USEPA has established procedures for evaluating the cumulative impacts of stationary emissions sources on the National Ambient Air Quality Standards (NAAQS), which are protective of human health and the environment. Because of its *de minimis* stationary emissions, the Proposal would not require an air permit under the Clean Air Act, and would therefore be expected to contribute negligibly to cumulative air quality impacts, both in terms of greenhouse gases (SF_6 in equipment) and other regulated pollutants. In terms of overall mobile emissions, vehicle exhaust and fugitive dust emissions from the construction and maintenance of the Proposal are minimal enough that they would not need to be specifically included in a transportation conformity plan for mobile sources,[174] even if the Proposal was in a non-attainment area. The mobile sources associated with the Proposal would conform to current and future regulatory requirements for their manufacture, maintenance, operation, and fueling; all of which would restrict the potential emissions from those mobile sources.

4.4.2.4 Biological Resources

Planned roadway expansion and urban/suburban expansion will add to the cumulative impacts on upland forest loss and fragmentation and potentially grassland resources. However, other trends suggest that forested land may continue to increase despite

[174] A transportation conformity plan is a required plan in areas of nonattainment that demonstrates that transportation improvements conform to the overall plan for achieving NAAQS under the Clean Air Act.

these impacts, as well as that wetlands will remain generally constant in terms of overall area, or may increase slightly. **Regarding wetlands, large losses have occurred in the past. However, based on available data, and as a result of regulations requiring mitigation for impacts, wetland areas in the U.S. were unchanged from 1997 to 2007. While more recent data is not available, it is likely that wetland areas have not declined since 2007, and that this situation will continue into the future (assuming existing laws and regulations remain in place). The maximum possible total permanent wetland impacts from the Proposal are approximately 0.2 acre (an area approximately 93 feet square), and will be mitigated. Based on current trends, the minimal impacts from the Proposal, and the mitigation that will be done, the Proposal is not expected to contribute to any cumulative wetland loss.**

Future wind farms, towers, and transmission lines will add to the cumulative impact of structures on birds in flight. **However, as discussed in Section 3.5.2.4, the Proposal is not expected to have any detectable impacts on any bird populations. Thus, its contribution to cumulative impacts is speculative. APLIC reports that "most researchers agree that [transmission line] collisions are not a significant source of mortality for thriving populations of birds" (APLIC 1994). While collision losses can be biologically significant to threatened or endangered species (APLIC 1994), no threatened or endangered bird species would be affected by the Proposal.**

4.4.2.5 Land Resources

Public lands generally have legal protection from encroachment and are little affected by development. Continuing development is likely to occur primarily at the expense of farm land. The Proposal will add incrementally to this on-going pressure on agricultural land.

4.4.2.6 Visual Resources

The Proposal contributes to the visual intrusion of buildings, highways, other structures, wind farms, transmission lines and communication towers. This increase in constructed visual elements is expected to increase. The impacts are generally incremental, as few

areas have no visual intrusion of man-made structures. **Some locations, such as the Village of Holmen in Wisconsin, may be affected by both the Proposal and the Badger-Coulee Line (if it is constructed).**

4.4.2.7 Transportation

Other transmission projects will likely affect highways, as there will continue to be pressure to use existing corridors for new projects. This will require increased coordination with DOTs and local road authorities.

4.4.2.8 Historic/Cultural Resources

Any development may adversely impact historic and cultural resources. Minimal impact on historic or cultural resources is expected, and therefore the contribution to cumulative impacts is expected to be negligible. The requirement for federal projects will ensure that those result in preservation of cultural resources.

4.4.2.9 Public Health and Safety

The Proposal is not expected to have adverse impacts on public health and safety, and therefore will not contribute to cumulative impacts in this area.

4.4.2.10 Socioeconomic Impacts

Reductions in property values and agricultural impacts from construction of the Proposal are generally expected to be offset by the easement payments made to landowners. However, some property owners not immediately adjacent to the Proposal may experience some decrease in property value. **Decreases in property value can result in decreases in revenue for the taxing authority. The Village of Holmen will be affected by both the Proposal and the Badger-Coulee 345-kV line (if it is constructed).** Many things outside a landowner's control may contribute to the value of his/her property and thus to the cumulative economic impact; for example, broad global, national and local economic trends and effects of other nearby development.