

Pillsbury-Fargo Transmission Line Construction Inspection Report

Minnkota Power Cooperative, Inc.

Prepared for:

**NORTH DAKOTA
PUBLIC SERVICE COMMISSION**
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Executive Summary

The North Dakota Public Service Commission (PSC) retained Wenck Associates, Inc. (Wenck) to complete a construction inspection of the Pillsbury-Fargo Transmission Line, constructed in Barnes and Cass Counties, ND by Minnkota Power Cooperative, Inc. (Minnkota) in 2008. The purpose of the construction inspection was to ensure the project was constructed in compliance with the siting laws and rules and the applicable PSC Order for the Project. Prior to the construction inspection, Wenck reviewed all Project documents to identify those which required site verification.

The Site was visually inspected on August 24, 2011 by Wenck, accompanied by a Minnkota representative. Overall, the Project was very well-maintained and in good condition. It appeared to have been constructed as planned with numerous efforts to minimize impacts. However, there were several non-critical issues that may need to be resolved for the Project to be considered complete and in full compliance. Wenck recommends the PSC request the following from the company: 1) written documentation of several particular aspects of project implementation identified during the document review, 2) installation of erosion control structures at the Pillsbury Substation entrance and monitoring until stabilized, 3) fulfillment of the “Tree and Shrub Mitigation Specifications”, including submission of the 2011 annual tree/shrub replacement report and continued survival monitoring for three years, 4) provision of the final hardcopy, electronic copy, and GIS file as-built drawings, and 5) written explanation of how bird deterrent placement was determined along the route, specifically in relation to high avian use areas and proximity to wetlands. The PSC will need to decide whether these recommendations are necessary to fulfill Project obligations. Wenck expects any follow-up action taken by Minnkota to address these particular issues can be corroborated in writing and will not require a further site visit, though it may be suitable to complete a field check of erosional areas and any additional tree and shrub mitigation plantings once installed.

1.0 Background

1.1 INTRODUCTION

The Pillsbury-Fargo Generation Outlet Project (Project) was completed in 2008 in Barnes and Cass Counties, North Dakota (**Figure 1**). The Project is operated by Minnkota Power Cooperative, Inc. (Minnkota). The Project comprises a 61.1-mile long, 230 kV transmission line, beginning at a new substation near Pillsbury, North Dakota and extending to the Maple River substation near West Fargo, North Dakota. The Project is under the jurisdiction of the North Dakota Public Service Commission (PSC), which issued its Findings of Fact, Conclusions of Law, and Order in Case No. PU-08-48 on June 6, 2008, granting Certificate of Corridor Compatibility No. 105 and Route Permit No. 115 for the Project and a Supplemental Findings of Fact, Conclusions of Law, and Order on July 14, 2008, granting First Amended Route Permit No. 115.

1.2 PURPOSE AND SCOPE OF INSPECTION

The North Dakota Energy Conversion and Transmission Facility Act (North Dakota Century Code Chapter 49-22) authorizes the Public Service Commission to determine that the location, construction, and operation of jurisdictional energy conversion and transmission facilities will produce minimal adverse effects on the environment and the welfare of citizens of North Dakota. Construction inspections ensure the project is constructed in compliance with the siting laws and rules and the applicable Commission Findings of Fact, Conclusions of Law, and Order (Order).

The North Dakota PSC retained Wenck Associates, Inc. (Wenck) to complete a construction inspection of the Pillsbury-Fargo Transmission Line Project. The inspection process included a review of the Siting Plan, Order, and other applicable documents to determine Project-specific siting and construction requirements; a site visit and inspection of facilities; documentation of

compliance; and a report summarizing findings. This report includes, but is not limited to, documentation of site visit observations, documentation of compliance deficiencies, and a summary of issues that should be addressed for the Project to be considered complete and in full compliance.

2.0 Document Review

2.1 METHODS

Wenck reviewed North Dakota siting laws and rules, the Applications for the Certificate of Corridor Compatibility and Route Permit (Application), and the Order for the Project to identify what Project-specific documentation was required for compliance. Wenck then reviewed Project documents in the PSC Online Case Search (ND PSC 2011) to identify those siting laws and rules and Application and Order assertions that already had written verification, those which still required documentation, and those which required physical site verification.

2.2 FINDINGS

The following table includes a list of components of the Project that were asserted in the Application and Order which could be documented post-construction to verify compliance with siting laws and rules and the Order for the Project (**Table 1**), via either written documentation or physical site verification. If Wenck found written documentation in the online PSC files for a particular Project component, this is marked in the second column of the table. If physical site verification was possible, this was marked in the third column and that particular component was verified during the site inspection (Section 3.0).

Several components of the Project were asserted in the Application or proposed construction but have no written documentation showing that they were indeed implemented or constructed as planned, and physical site verification is not applicable. *This includes all items listed in Table 1 which have shaded boxes in the second column*, indicating written verification is possible and appropriate, but it is lacking from current files. The PSC should request written verification from Minnkota for these items, to show the Project is in full compliance.

Table 1. Pillsbury-Fargo Transmission Line Project Document Review Summary

Description of Project Component/Assertion	Written Verification in	
	PSC Files*	Site Verification
National Electric Safety Code Compliance		
Commission approval of route changes	X	
Portion of route parallel to 345 kV line: mirrored placement (same height, spacing, parallel) except around wetlands		X
No exclusion areas identified on route or alternative reroute	X	
Waivers from residents within 500ft	only 1 on file	
Cultural resources avoided on route and alternative reroute	X	X
Woodland loss minimized on route and alternative reroute		X
Wetlands avoided or spanned, Corps Permit obtained and followed for those impacted		X
No impact on Policy Criteria on route or alternative reroute	X	
Avian impacts minimized by bird-safe designs, mirroring of structures parallel to 345 kV structures, use of suspension insulation on H-frames		X
Pre-Construction conference record	X	
Permits/Approvals from other agencies		
Intent to start construction notice	X	
Weekly construction reports	X	
Construction according to Application and safety requirements		
Reports of presence of threatened, endangered species or bald or golden eagles, if applicable		
Reports of cultural, archeological, historical resources found, if applicable		
Restoration of pre-existing roads, lanes, temporary roads		X
Reclamation and clean-up continuous with construction	X	
Reclamation/reseeding according to NRCS or landowner		X
Compliance with "Tree and Shrub Mitigation Specifications"	X	X
Woodland crossing width limited to 125ft		X
Reclamation and maintenance throughout life of facility		X
Mitigation of television & radio interference		
Repair/replace all fences and gates, if applicable		X
As-built drawings and GIS within 90 days after construction		
Rare and unique natural resources avoided by spanning	X	X
NDGF requests: protect wetlands, maintain drainage, no construction in Sheyenne and Maple Rivers April 15-June 1, erosion control near streams, minimize woodland impacts, reseed with native species	X	X
USFWS requests: design according to current guidelines, avoid wetland easements, defer construction post-July 15, avoid wetland fill, install erosion control, reseed with native species, replant trees 2:1, mark line within 1 mile of wetlands, avoid native prairie	X	X
NDPR requests: avoid LWCF recreational lands, avoid species of concern and significant ecological communities, reseed with native species		X
NDHD requests: minimize fugitive dust, degradation of waterways, storm water management, noise		X
Aeronautics Commission requests: search of private airports, FAA consultation completed under Form 7460 (receipt of study results needed)		
Compensation for landowners for crops and impacts to CRP status		
Irrigated land avoided (avoidance area).		X

*Note: Shaded boxes indicate documentation is lacking and site verification is not applicable.

3.0 Site Inspection

3.1 METHODS

Kevin Magstadt, P.E. and Sara Simmers of Wenck visited the Project area on August 24, 2011. Randy Dahl, Minnkota Employee, accompanied Wenck staff during the site visit and assisted with navigation, pointed out problem areas, and answered questions.

The site was inspected visually along portions of the transmission line route by accessing as many points as feasible where the line crossed roads. Some features were accessed by walking within the transmission line right-of-way to the crossing of the feature. The survey began at the west end of the transmission line west of Pillsbury, ND in Section 7 of Township 143N, Range 56W in Barnes County and followed the line to its east end at the Maple River Substation in Section 28, Township 140N, Range 49W in Cass County. Digital photographs (Canon Power Shot SD1300 IS, 12 megapixel) were taken showing typical Project infrastructure and documenting problem areas (**Appendix A**). Geographic coordinates were recorded at observation points or potential problem areas using a handheld Global Positioning System (GPS) (Garmin GPSMAP 60CSx; <10m accuracy; NAD83 datum) (**Figure 1; Appendix B**).

3.2 OBSERVATIONS & FINDINGS

3.2.1 Engineering/Construction/Design & Soils

The following aspects pertaining to engineering, construction, or design of Project infrastructure were inspected at the site.

- *Portion of Route Parallel to 345kV Line: Mirror Existing Placements except Around Wetlands.* Wenck observed the portion of the line where it paralleled the 345kV line. This portion was to the northwest of West Fargo on the eastern end of the line, about ¼ mile to the north, but parallel to, 52nd Ave, (**Appendix A, Photos 21-25; Appendix**

B, Points 453-458). The H-frame structures of both lines appeared to directly mirror each other in height and spacing as required. There were no obvious areas where the lines diverged from a mirrored placement.

- *Roads Restored to Previous Use.* The Application stated no permanent access roads would be constructed for the Project, but that temporary roads would be needed to access pole locations. It stated that when temporary roads were constructed they would be limited to 20ft width and would be located within farmed land. During the site visit, Wenck did not observe any remaining temporary roads or unreclaimed areas. Wenck noted that all minimum maintenance roads, county roads and highways within the Project area appeared to be in good condition and properly maintained (**Appendix A, Photos 11, 13, 15-16; Appendix B**).
- *On-going Reclamation and Maintenance.* The Application stated routine inspections and maintenance would be conducted along the line, including periodic removal of vegetation interfering with operation of the line. Wenck did not observe any areas of exposed soil remaining from construction activity or the on-going operation of the Project that were in need of reclamation. In general, the route of the transmission line through agricultural fields where soils may have been disturbed was indistinguishable from the adjacent soils, topography, and crops. Substations, poles, and wires all appeared to be properly maintained (**Appendix A**). All poles were upright. There were no locations where vegetation was in close proximity to the lines. One area of minor concern was the approach at the entrance to the Pillsbury substation. A small intermittent drainage ran underneath the approach and there was some erosion of exposed soils in the drainage (**Appendix A, Photo 4; Appendix B, Point 418**). Minnkota reported the approach had been washed out this past spring and had been re-constructed (Randy Dahl, pers. comm., 2011). Wenck did not observe any erosion or sediment control structures in place at this location which would help to minimize future wash-outs.

- *Fences/Gates Repaired/Replaced.* Minnkota reported that there were no locations where fences or gates were removed for the Project. Wenck did not observe any fences or gates missing which would have been impacted by construction.
- *As-built Drawings and GIS Files.* In preparation for the site visit, Minnkota provided Wenck an unsealed copy of as-built drawings for the Project, dated June 6, 2008. Minnkota had submitted this same set of drawings (dated June 6, 2008) to the PSC on July 2, 2008 (ND PSC 2011, Docket #70). Wenck verified during the inspection that the Project had been constructed according to these drawings. However, this set of drawings does not include minor changes made and approved throughout construction of the Project (ND PSC 2011, PU-08-48). The Order states Minnkota should provide a hardcopy, electronic copy, and ESRI GIS files of the final as-built plan and profile drawings of the Project within 3 months of completion. According to weekly reports, the Project was completed in November 2008. To date, final as-builts have not been submitted for the Project (ND PSC 2011). Wenck also suggests that the final submitted copy of the as-builts be signed and sealed by a registered engineer.
- *NDHD (ND Health Dept.) Requests: Minimize Fugitive Dust, Degradation of Waterways, Manage Storm Water and Noise.* The Application described measures that would be taken to fulfill the above requests. Wenck did not observe any disturbances of waterways or major erosion or sediment deposition problems due to the line. Dust and noise had presumably been minimized during construction of the Project. Current noise from the transmission line is very minor and only present in very close proximity to the line. It appeared all the above measures were followed.
- *Irrigated Land Avoided.* The Application for the Project stated two parcels with active irrigation would be avoided by changing the route. Wenck confirmed during the site visit that no irrigated lands were impacted by the transmission line.

3.2.2 Natural Resources (Wildlife, Wetlands, Vegetation)

The following requirements pertaining to natural resources, including wildlife, wetlands, and vegetation, were inspected at the Project site.

- *Woodland Loss Minimized on Route.* The Application stated impacts to native and planted woodlands would be minimized and any removed trees or shrubs would be replaced at a 2:1 ratio and monitored for five years. The Order for the Project allowed a 125ft maximum clearing width and it appeared Minnkota followed this specification. Wenck observed both natural and planted areas where trees had been cleared for the Project (**Appendix A, Photos 10, 26**). Overall, it appeared clearing of woodlands for the Project had been done only where necessary.
- *Wetlands Avoided or Spanned. Corp of Engineers Permit Obtained and Followed for Those Impacted.* Minnkota anticipated numerous wetlands along the route. They were to be avoided by pole placement and spanning, or if over 1000ft in length were to be avoided by the route. The Application stated any permanent filling or impacts within jurisdictional wetlands would be mitigated according to Corps requirements under Nationwide Permit 12. A wetland delineation report was submitted for the Project (“Biological Assessment and Wetland Delineation Report, Pillsbury to Fargo Generation Outlet Project, May 20, 2008, McCain and Associates”) which tallied 61 non-farmed wetlands and numerous additional wetlands that had NWI designations but were cultivated for agriculture and were isolated basins not considered jurisdictional. No wetlands were found on proposed laydown areas. A further survey reported two additional wetlands along a reroute (“Supplement to the Biological Assessment and Wetland Delineation Report, Pillsbury to Fargo Generation Outlet Project, Rush River Reroute, June 3, 2008, McCain and Associates”). Wenck observed several wetlands which were avoided by pole placement or spanning, but also several which were not avoided and had poles within the wetland boundaries (**Appendix A, Photos 8, 14-16, 28; Appendix B, Points 431-433, 452, 459**). No correspondence with the Corps was provided by Minnkota in PSC documents (ND PSC 2011), however Nationwide Permit 12 covers the construction of utility lines and

stipulates the following: that activity does not result in the loss of >0.5 acres of waters of the United States; no change in pre-construction contours; replacement of trench excavation material in less than 3 months; no placement of excavated material in flow of current; and stabilization of slopes and banks. The Application stated BMPs would be used during construction and operation of the transmission line to protect wetlands including containing excavated material, protecting exposed soils, stabilizing restored material and revegetating disturbed areas. Wenck did not observe any remaining evidence of erosion or sediment control materials during the site visit, but it appeared the above stipulations and measures were followed since there was no evidence of permanently disturbed or impacted wetlands or wetland vegetation. Wenck confirmed that there were no surface facilities installed in wetlands along the route and there were no permanently drained or filled wetlands. The transmission line also avoided impacts to river and stream channels by spanning, including the Maple, Rush, and Sheyenne Rivers (**Appendix A, Photos 20, 26; Appendix B, Points 452, 459**).

- *Avian Impacts Minimized by Bird-Safe Designs, Mirroring Structures, H-frame Suspension Insulation.* The Application identified avian mortality as a concern with construction of the transmission line. The following measures mitigation measures were outlined in the Application to be used when practicable to minimize impact on birds: use of H-frame structures; suspension insulators with 84in clearance; design according to “2006 Suggested Practices for Avian Protection on Power Lines”; marking shield wires in high use areas (within one mile of wetlands); pre-construction surveys for wetlands, native prairie, and woodlands; avoid or minimize disturbance of wetlands/drainages; replacement of unavoidable wetland loss with functionally equivalent wetlands; installation of erosion control measures; replacement of trees and shrubs removed at 2:1 ratio; soil and water conservation/BMPs; revegetation of non-cropland and pasture; control of noxious weeds. Though the majority of the transmission line consisted of monopoles, Wenck observed the use of H-frame structures along the portion of the route paralleling the 345kV transmission line; the 230kV poles mirrored the 345kV poles and the H-frames had suspension insulation

with required clearance (**Appendix A, Photos 21-25**). Wenck also confirmed the marking of shield wires with bird deterrents, though difficult to see in the photos (**Appendix A, Photos 5, 10-11**). The placement of markers in relation to high use areas was unclear. Because of the prevalence of wetlands in the area, it appeared the decision to mark the line was not based solely on a one-mile proximity to wetlands; however there were some areas where wetlands were uncommon and cropland was more prevalent where bird markers were not used (**Appendix B, Observation Notes**). The use of bird deterrents needs further documentation and indication on maps of the route. Minnkota submitted documentation of pre-construction surveys of wetlands, native prairie, and woodlands for the Project, which appeared to be avoided when possible (“Biological Assessment and Wetland Delineation Report, Pillsbury to Fargo Generation Outlet Project, May 20, 2008, McCain and Associates”, “Supplement to the Biological Assessment and Wetland Delineation Report, Pillsbury to Fargo Generation Outlet Project, Rush River Reroute, June 3, 2008, McCain and Associates”, “Tree and Shrub Inventory, McCain and Associates, March 19, 2009”). The remaining avian impact mitigation measures are discussed elsewhere in Section 3 of this report.

- *Reclamation/Reseeding According to NRCS or Landowner, if applicable.* The Application stated disturbances would be limited to a 100ft x 100ft area around poles and that disturbed areas would be restored to original conditions in accordance with landowner requests. Reclamation activities anticipated were installing erosion control measures, disposing of debris, restoring temporary facilities (staging, lay down areas, roads) by disking to relieve compaction, leveling or filling tire ruts, and reseeding non-cultivated areas per USFWS and NRCS recommendations. Wenck did not observe any remaining evidence of reclamation activities and the route was in good condition, which indicates the above measures were followed. The majority of the Project area was within cropland which does not require reseeding after construction. Areas of natural vegetation adjacent to waterways and wetlands were either avoided by spanning or if impacted were allowed to naturally revegetate (**Appendix A, Photos 8, 14-16, 20, 26, 28**). The pre-construction survey did not identify any native

prairie to be reseeded, but did note non-cultivated areas including CRP fields and pasture consisting of non-native species (“Biological Assessment and Wetland Delineation Report, Pillsbury to Fargo Generation Outlet Project, May 20, 2008, McCain and Associates”, “Supplement to the Biological Assessment and Wetland Delineation Report, Pillsbury to Fargo Generation Outlet Project, Rush River Reroute, June 3, 2008, McCain and Associates”). Wenck did not observe any of these non-cultivated areas during the site visit.

- *Compliance with “Tree and Shrub Mitigation Specifications”*. Several documents have been submitted by Minnkota which fulfill many of the required specifications (ND PSC 2011, PU-08-48). Trees and shrubs were inventoried according to the specifications; filed reports include “Pillsbury-Fargo Generation Outlet Project, Supplement to Tree and Shrub Inventory Plan, August 12, 2008” (Docket # 99) and “Tree and Shrub Inventory, McCain and Associates, March 19, 2009” which estimated 10,039 trees/shrubs to be removed (Docket #139). Presumably trees and shrubs were cleared according to specifications, except that 125ft wide minimal clearing was allowed rather than the typical 50ft width. No reports were submitted with differences in the number of cleared trees/shrubs compared to the number inventoried. Wenck observed areas where trees had been cleared for the Project (**Appendix A, Photos 10, 26**). At least in the area of Sheyenne River crossing, it appeared the width of tree/shrub clearing had actually been less than 125ft (**Photo 26**). A Tree/Shrub Replacement Plan was filed for the Project July 14, 2009 (Docket #139) which followed specifications and was approved. There was also an initial report submitted October 28, 2010 which included 2010 survival of trees planted in 2009, a summary of additional trees planted in 2010, and an estimate of the remaining trees to be planted in 2011 (Docket #147). Wenck observed one of the 2009 tree plantings (**Appendix A, Photo 18**). Minnkota submitted directly to Wenck in October 2011 a set of 2009, 2010, and 2011 Soil Conservation District Planting Plans for several landowners for the Project. It included plans for 2011 plantings totaling 1366 trees/shrubs. The 2010 and 2011 plans did not indicate a planting date or list the actual number of trees/shrubs planted, so it is not clear whether these plans were

implemented. Wenck suggested to Minnkota that they summarize this information in a report and submit as required directly to the PSC. To date, updated planting reports and 2011 survival data has not been submitted for the Project (ND PSC 2011).

- *Woodland Crossing Width Reduced to 125ft, Leaving Mature Shrubs and Trees Where Practical.* The Application stated impacts to native and planted woodlands would be minimized. The Order for the Project allowed a 125ft maximum clearing width and it appeared Minnkota followed this specification. Wenck observed both natural and planted areas where trees had been cleared for the Project (**Appendix A, Photos 10, 26**). At least in the area of the Sheyenne River crossing, it appeared the width of tree/shrub clearing had actually been less than 125ft (**Photo 26**); however no reports were submitted with differences in the number of actual cleared trees/shrubs compared to the number estimated in the inventory. Overall, it appeared clearing of woodlands for the Project had been done only where necessary.
- *Rare and Unique Natural Resources Avoided.* Historic locations of potentially sensitive wet prairie communities and eight species of concern were identified by the ND Parks and Recreation Department (NDPR) and historic sightings of the Dakota skipper butterfly on native prairie were noted by the US Fish & Wildlife Service (USFWS) near the Project area. The Application stated habitat surveys would be completed prior to construction and if wet prairie or remnant native prairie communities were found, they would be spanned to avoid impact. Minnkota submitted documentation of pre-construction surveys for species and habitats of concern (“Biological Assessment and Wetland Delineation Report, Pillsbury to Fargo Generation Outlet Project, May 20, 2008, McCain and Associates”, “Supplement to the Biological Assessment and Wetland Delineation Report, Pillsbury to Fargo Generation Outlet Project, Rush River Reroute, June 3, 2008, McCain and Associates”). The surveys found no native prairie on the route, documented that the area of cordgrass wet prairie identified by the NDPR had been converted to agriculture, and found no habitat available for Wolf’s spikerush or the Prairie skink. Wenck confirmed there was no potential habitat for species of concern along the

route. The six other species of concern were riverine and Wenck confirmed waterways were spanned which avoided impact to these species (**Appendix A, Photos 20, 26**).

- *NDGF (ND Game & Fish Dept.) Requests: Protect Wetlands, Maintain Existing Drainage, No Construction in Sheyenne and Maple Rivers April 15-June 1, Erosion Control near Streams, Minimize Woodland Impacts, Re-seed with Native Species.* As discussed in above sections, various measures outlined in the Application for the Project addressed these NDGF concerns and Wenck observed that the measures appeared to have been implemented to minimize potential impacts. Timing of construction was not discussed in other sections, but weekly construction reports indicated construction of the line did not begin until June 6, 2008, which would have avoided the spawning season in the rivers, should any sediment or erosion due to working on the banks of waterways have occurred (ND PSC 2011, PU-08-48).
- *USFWS (US Fish & Wildlife Service) Requests: Design According to Current Guidelines, Avoid Wetland Easements, Defer Construction Post-July 15, Avoid Wetland Fill, Install Erosion Control, Re-seed with Native Species, Replant Trees 2:1, Mark Line within 1 Mile of Wetlands, Avoid Native Prairie.* Several of these concerns were discussed previously in this report, including design, wetland fill, erosion control, re-seeding, tree replacement, marking the line near wetlands, and avoiding native prairie. Wenck verified that measures described in the Application to address these issues were indeed implemented. USFWS requests not previously addressed were to avoid wetland easements and to defer construction past July 15. The Application for the Project stated USFWS easement lands, USFWS WPAs, and NDGF WMAs would be avoided by the route. Wenck verified during the site visit that these areas, identified on Exclusion/Avoidance Area maps, were indeed avoided. Weekly construction reports indicated construction of the line began June 6, 2008, which was before the July 15 date the USFWS suggested (ND PSC 2011, PU-08-48). Though Minnkota did not comply with this request, numerous other measures were taken to minimize the impact of the transmission line to wildlife and wetlands, and it

appeared the company attempted to implement as many of the USFWS suggested measures as was feasible.

- *NDPR (ND Parks & Recreation Dept.) Requests: Avoid LWCF Recreational Lands, Avoid Species of Concern and Significant Ecological Communities, Re-seed with Native Species.* Avoidance of species and concern and reseeding with native prairie were addressed above in previous sections and verified by Wenck. The Application for the Project showed on Exclusion/Avoidance area maps that LWCF recreational lands would be avoided by the route; this was confirmed by Wenck during the site visit.

3.2.3 Cultural Resources

The following aspects pertaining to cultural resources were inspected at the Project site.

- *Cultural Resources Avoided.* An initial Class I Literature Review identified 15 cultural resource sites and ten cultural resource site leads found near the project route. Two of the cultural resource sites were determined eligible to the National Register of Historic Places, the remainder warranted no further consideration and this Project activity was unlikely to impact them. The two eligible sites were both bridges located outside the project route, but which would likely be used during construction. Minnkota stated they would ensure weight limitations on the bridges would be heeded by construction personnel. Presumably this assertion was followed. Additional surveys specifically for this Project and associated reroutes resulted in one new cultural resource site and confirmed that previously identified unevaluated or significant sites would not be impacted (“Class I Literature Search, Class II Reconnaissance and Class III Intensive Cultural Resources Inventory, HDR Engineering, May 20, 2008”, “Rush River Transmission Line for the Minnkota Power Cooperative, Inc., Class II and III Cultural Resource Inventories, Earthworks, June 2008”). The new site, 32CS5071, was a historic cultural material scatter within a plowed field and was recommended not eligible for listing and did not require avoidance. The reports generally recommended that “Inventory Resource” locations

be avoided by construction activities. Wenck did not observe any cultural resource locations which would have been impacted by construction of the transmission line. ND SHPO concurred with the findings of all reports (ND PSC 2011, Docket #53, #65, #77).

4.0 Issues to Resolve and Recommendations

4.1 WRITTEN VERIFICATION OF PROJECT IMPLEMENTATION

As noted in Section 2.0, several components of the Project were asserted in the plans or proposed during construction, but have not been documented with the PSC. Many of these components could be verified easily with copies of final construction reports or ongoing reports from the local operations office – any type of written documentation showing that the Project was indeed implemented or constructed as planned, or that particular impacts have not occurred. Wenck recommends that the PSC requests from Minnkota the list of items which, according to our review of the PSC files, have not been documented in writing. This would include all items listed in Table 1 which have shaded boxes in the second column (Section 2.0). The PSC may be able to verify some of the items/issues from other records it has available.

4.2 PILLSBURY SUBSTATION APPROACH

The approach at the entrance to the Pillsbury substation crossed an intermittent drainage which showed some signs of erosion (Section 3.2.1). Apparently the approach had been recently reconstructed but no erosion or sediment control structures were observed. Wenck recommends preventing future wash-outs by installation of BMPs or revegetation. This location should be monitored until erosion is stabilized.

4.3 TREE & SHRUB REPLACEMENT

A Tree/Shrub Replacement Plan was filed for the Project and Wenck confirmed plantings reported for 2009. Though planned for the Project, additional 2010 and 2011 plantings have not been documented with the PSC. Wenck recommends that the PSC request submission of the annual tree/shrub replacement report (typically required in October of each year) to include

confirmation of 2010 and 2011 plantings and survival information for 2009 and 2010 plantings. All plantings will require survival monitoring for three years following planting for fulfillment of the Order.

4.4 AS-BUILTS

Though Minnkota had submitted an interim set of plan and profile as-built drawings for the Project to the PSC, the company has not submitted the final hardcopy, electronic copy, and ESRI GIS files of the final as-built drawings as required by the Order within 3 months of completion of the Project. Wenck also suggests that the final submitted copy of the as-builts be signed and sealed by a registered engineer.

4.5 BIRD DETERRENT PLACEMENT

Though shield wires were marked with bird deterrents along many sections of the transmission line, it was unclear how decisions for marker placement were determined. Because of the well-studied potential for avian mortality from collision with transmission lines and the management and concern of these impacts by the USFWS, Wenck suggests clear documentation be obtained from Minnkota which explains rationale for the placement of markers for this Project, particularly how the placement relates to high avian use areas and proximity to wetlands.

5.0 Conclusion

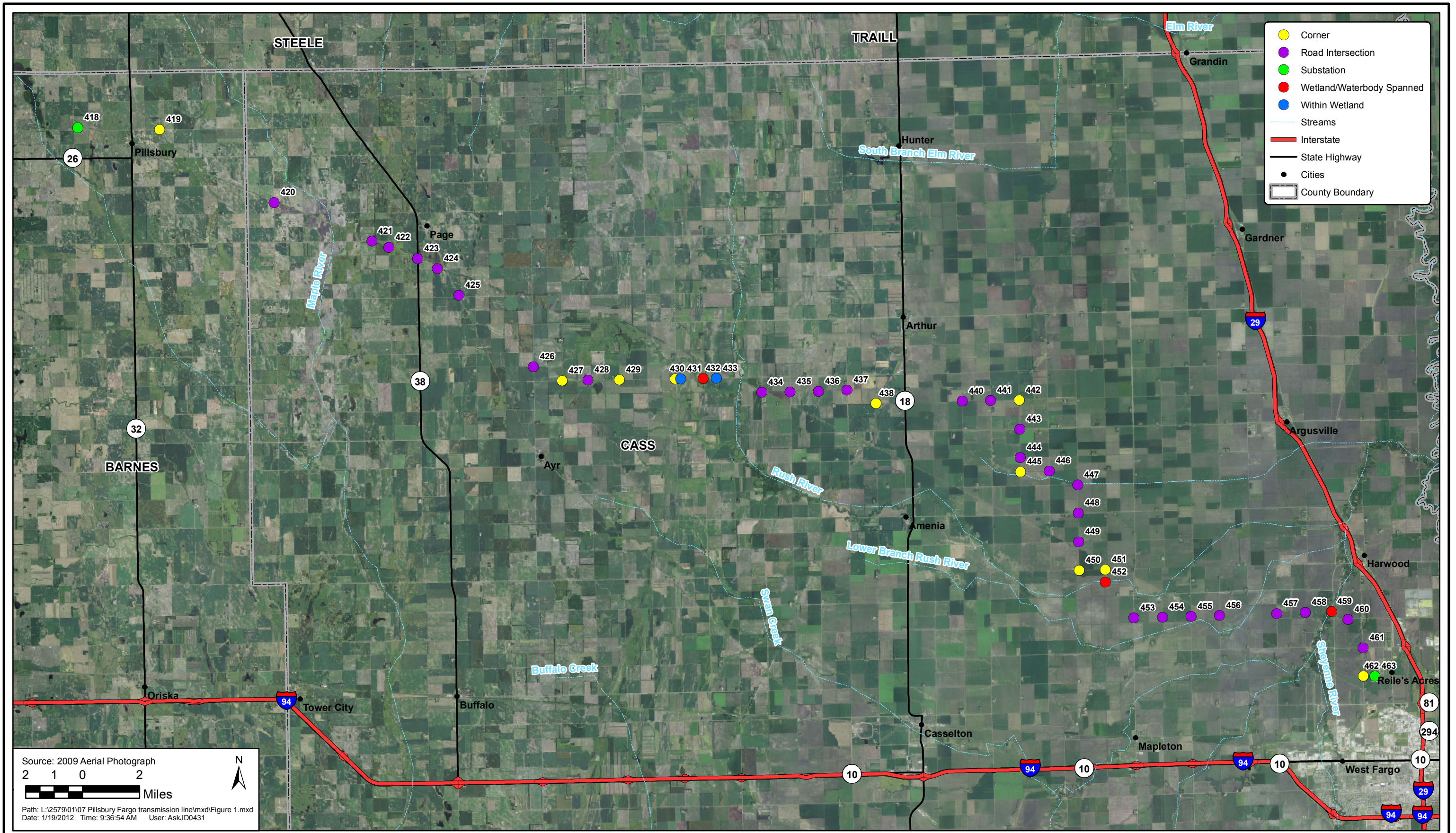
Overall, the Project appeared to have been constructed as designed with minimal impacts to the surrounding natural or human environment. The Project site was well-maintained and in good condition. However, Wenck observed several issues that may need to be resolved before the Project is considered complete and in full compliance. This includes provision of written documentation of particular aspects of project implementation, erosion control at the Pillsbury Substation entrance, continued documentation of tree and shrub replacement, provision of final as-built drawings, and a summary of how bird deterrent locations were chosen along the route. None of these are critical issues, but they should be reviewed by the PSC to determine what the company should comply with. It should be noted that the Minnkota representative was easy to work with during the construction inspection process. He was fully transparent and answered any questions we had during the survey.

6.0 References

Dahl, Randy. 2011. Minnkota Employee. Personal Communication: discussion during site visit.

North Dakota Public Service Commission (ND PSC). 2011. Online Case Search. Available from: http://www.psc.nd.gov/database/company_case_list.php. Accessed December 29, 2011.

Figures



North Dakota Public Service Commission
 Site Overview and Field Observations Map


 Engineers - Scientists
 Business Professionals
 www.wenck.com

Wenck
 301 1st Street NE
 Mandan, ND 58554-3370
 701-751-3370

JAN 2012
 Figure 1

Appendix A



Photo 1. Direction: North. Entrance to the new Pillsbury Substation at the west end of the transmission line, about two miles west of the town of Pillsbury in the SW ¼ of Section 7, Township 143N, Range 56W, Barnes County, North Dakota.

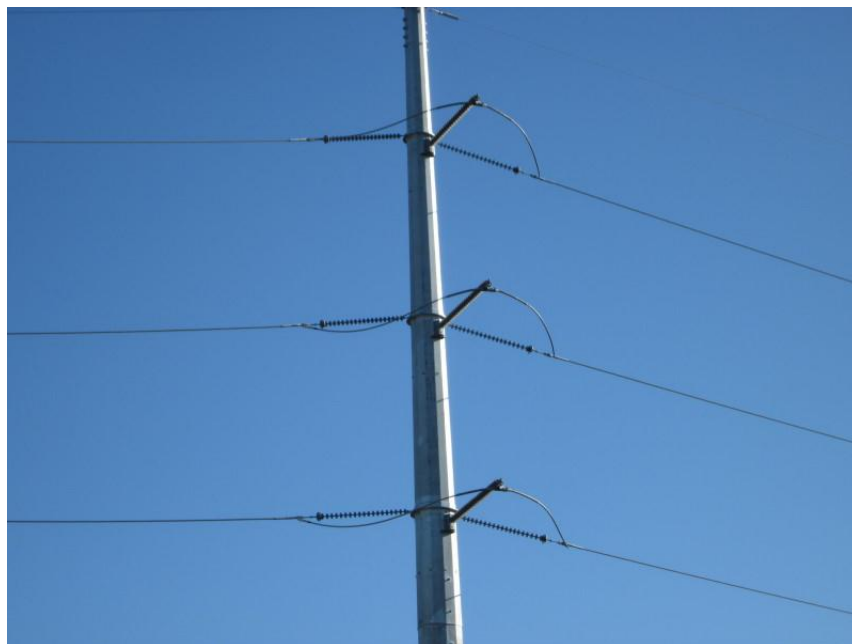


Photo 2. Direction: Northeast. First pole outside of the substation showing close-up of attachment of wires to the monopole structure. Monopoles were all self-supporting with no guy wires. Poles outside of substation fences and where the line changed directions had concrete footings, otherwise they were buried directly.



Photo 3. Direction: East. East from the Pillsbury substation where the transmission line paralleled a railroad.



Photo 4. Direction: East. Intermittent drainage exiting underneath the approach for the Pillsbury substation entrance. According to Minnkota, the approach had been washed out and had to be reconstructed this past spring. There were no erosion control structures evident.

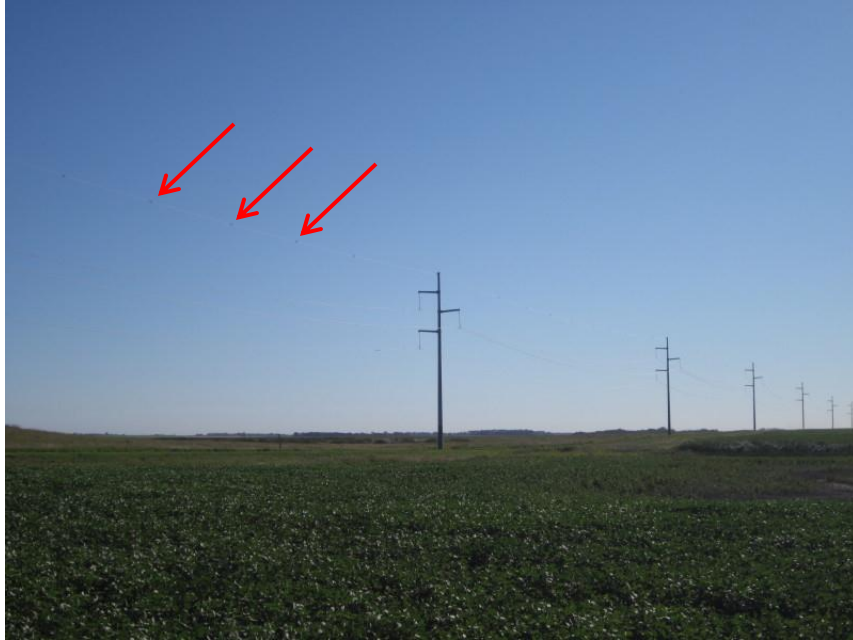


Photo 5. Direction: Northeast. Transmission line along 14th Street to the north of Pillsbury. There were bird deterrents on the top wire of this portion of the line (indicated by red arrows in photo, difficult to see against sky in background).



Photo 6. Direction: Northeast. Corner pole where transmission line turned from east to south at the intersection of 14th St and 129th Ave east of Pillsbury.



Photo 7. Close-up of pole in Photo 6 showing concrete footing of base, which is how all corner poles were constructed.



Photo 8. Direction: Northwest. Intersection of 133rd Ave and route of transmission line, looking to the northwest, where the line paralleled a railroad to the southeast of Pillsbury. Note the pole near the edge of a temporary wetland.



Photo 9. Direction: Southeast. Intersection of 133rd Ave and route of transmission line, looking to the southeast, where the line paralleled a railroad to the southeast of Pillsbury.



Photo 10. Direction: Northwest. Intersection of 18th St and route of transmission line, to the west of the town of Page. The line continued to parallel a railroad. There were bird deterrents in both directions on this portion of the line (indicated by red arrows in photo, difficult to see against sky in background).



Photo 11. Direction: Southeast. Intersection of Highway 38 and route of transmission line, to the south of the town of Page. The line continued to parallel a railroad. There were bird deterrents in both directions on this portion of the line.



Photo 12. Direction: Northeast. Corner post at intersection of 143rd Ave and 23rd St. The line paralleled the west side of 143rd Ave to the north of this point (left-center of photo), then crossed 143rd Ave going east to parallel the north side of 23rd St.



Photo 13. Direction: East. Transmission line along 23rd St, running parallel on its north side, then crossing it and continuing parallel on its south side (shown on distant right of photo).



Photo 14. Direction: Southeast. Example of transmission line pole in the midst of a wetland, of which there were several noted along the route. Because of the past several wet years, the poles may not have been within wetland boundaries at the time of construction. However poles within wetland boundaries during construction of the line would have been covered under the Corps Nationwide Permit 12 for utility lines.



Photo 15. Direction: West. Example of wider spacing between poles to span the large wetland on the south side of the road (23rd St between 147th Ave and 148th Ave).



Photo 16. Direction: West. Example of more poles within margin of wetland.



Photo 17. Direction: South. Example of pole in ditch on the edge of a field.



Photo 18. Direction: West. Intersection of transmission line with 153rd Ave. Note planted tree/shrub rows on right which was one of the replacement plantings for the Project. This was located through the center of Section 33, T142N, R52W and appeared to be in good condition.



Photo 19. Direction: West. Transmission line where it paralleled 24th St for several miles. 24th St was a sectionline which had portions with no roads and portions with minimum maintenance two-track roads. This portion of the route primarily spanned active cropland.



Photo 20. Direction: South. Transmission line crossing of the channelized Rush River along 162nd Ave to the south of its intersection with 30th St. The line spanned the channel and avoided disturbance of the waterway.



Photo 21. Direction: West. One mile in distance is where the line turned from north-south along 162nd Ave to east-west, about one-fourth of a mile north of, but parallel to, 32nd St. At the corner described, the use of monopoles shifted to the use of H-frame structures. Note the 345 kV line parallel to the 230 kV line to the north (on right in photo).



Photo 22. Direction: East. Intersection of transmission line with 163rd Ave, just to the north of 32nd St. There was cropland in both directions and no bird deterrents on the line.

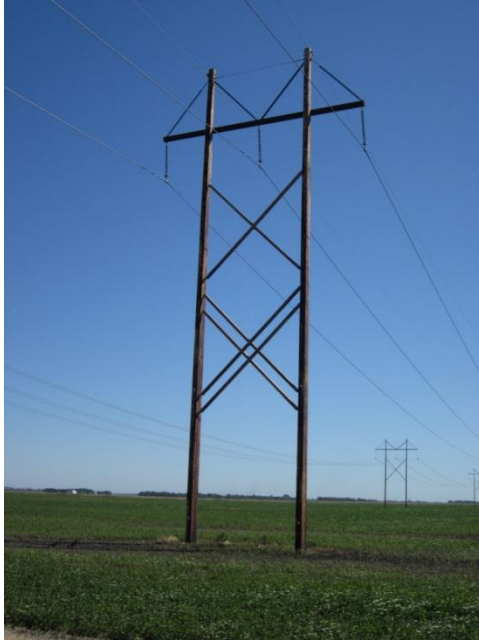


Photo 23. Direction: Northeast. Close-up view of H-frame structure on the 230 kV transmission line. The structures were laminated poles and had suspension insulation with required clearance.



Photo 24. Direction: West. Intersection of transmission line with 81st St, just to the north of 52nd Ave, northwest of the city of West Fargo. The large orange balls on the line were presumably there for aircraft safety purposes.



Photo 25. Direction: East. Intersection of transmission line with 81st St, just to the north of 52nd Ave, northwest of the city of West Fargo. Note the switch from H-frame structures to monopoles about ½ mile before the crossing of the Sheyenne River, which is indicated by the dense trees in the distance.



Photo 26. Direction: West. Crossing of the Sheyenne River northwest of West Fargo. At this point both the 230 kV line and the 345 kV line run together on the same structure (pole in foreground). Note there has been bank erosion on the Sheyenne due to spring flooding.



Photo 27. Direction: East. To the east of the crossing of the Sheyenne River, the 230 kV line runs back on a monopole structure (on right of photo), then to two H-frame structures (on left of photo), then back to monopoles. Note the trees in the photo appear to be close to the wires but this was due to the angle of the photo; they were not in need of clearing away from the line.



Photo 28. Direction: Southeast. Pole in midst of a wetland too large to span.



Photo 29. Direction: West. Monopole at end of transmission line as it entered the Maple River substation. The last portion of the line paralleled the south side of 32nd Ave to the west of the substation.



Photo 30. Direction: South. Entrance to Maple River Substation north of West Fargo. This was the east end of the 230 kV transmission line.

Appendix B

Appendix B. Field Observation Points (GPS Coordinates)

Point	Feature	Northing (m)*	Easting (m)*	Observation Notes
418	Substation	5229422.53	588550.27	Pillsbury Substation, west end of transmission line. Location of washout under approach at entrance. Bird deterrents on line to east of substation.
419	Corner	5229319.64	593174.70	Corner pole at intersection of 14th St and 129th Ave.
420	Road Intersection	5225190.45	599644.41	Intersection of line with 133rd Ave, parallel to railroad.
421	Road Intersection	5223018.98	605173.27	Intersection of line with 18th St, parallel to railroad. Bird deterrents in both directions.
422	Road Intersection	5222660.33	606140.56	Intersection of line with 137th Ave, parallel to railroad.
423	Road Intersection	5222028.63	607761.65	Intersection of line with Highway 38, parallel to railroad. Bird deterrents in both directions.
424	Road Intersection	5221452.20	608878.73	Intersection of line with 19th St. Bird deterrents in both directions.
425	Road Intersection	5219951.39	610083.23	Intersection of line with 20th St, parallel to railroad. Bird deterrents end.
426	Road Intersection	5215904.99	614305.50	Intersection of line with 142nd Ave. Cropland and no bird deterrents in either direction.
427	Corner	5215124.86	615920.17	Corner pole at intersection of 23rd St and 143rd Ave. Bird deterrents began.
428	Road Intersection	5215147.01	617385.37	Line parallel to 23rd St. Bird deterrents ended.
429	Corner	5215166.31	619154.60	Corner at intersection of 23rd St and 145th Ave. Line turns south.
430	Corner	5215216.67	622316.60	Corner at intersection of line with 145th Ave. Line turns back north toward 23rd St. No bird deterrents.
431	Within Wetland	5215223.28	622612.76	Pole within wetland boundaries.
432	Wetland/Waterbody Spanned	5215247.56	623893.49	Wider spacing of poles to span large wetland.
433	Within Wetland	5215264.86	624636.99	Pole within wetland boundaries.
434	Road Intersection	5214473.39	627211.64	Intersection of line with 150th Ave. Cropland and no bird deterrents in either direction.
435	Road Intersection	5214484.59	628802.41	Intersection of line with 151st Ave. Cropland and no bird deterrents in either direction.
436	Road Intersection	5214523.50	630415.04	Intersection of line with 152nd Ave. Cropland and no bird deterrents in either direction.
437	Road Intersection	5214597.90	632023.75	Intersection of line with 153rd Ave. Cropland and no bird deterrents in either direction. Location of one 2009 tree planting.
438	Corner	5213832.29	633655.40	Corner at intersection of 24th St and 154th Ave. Line turns from south to east following section line.
439	Road Intersection	5213868.58	635282.27	Intersection of line with Highway 18 and railroad. Cropland and no bird deterrents in either direction.
440	Road Intersection	5213971.94	638549.67	Crossing of 157th Ave at intersection with 24th St, both section lines (minimum maintenance roads).
441	Road Intersection	5214001.09	640139.69	Crossing of 158th Ave (gravel) at intersection with 24th St (section line).
442	Corner	5214021.42	641754.93	Corner at intersection of 24th St and 159th Ave. Line turns from east to south.
443	Road Intersection	5212383.14	641789.62	Crossing of 25th St (paved) at intersection with 159th Ave. Cropland and no bird deterrents in either direction.
444	Road Intersection	5210776.09	641816.82	Crossing of 26th St (section line) at intersection with 159th Ave. Line crosses from west to east ditch.
445	Corner	5209972.31	641829.06	Corner where line turns east from 159th Ave halfway between 26th St and 27th St. Cropland and no bird deterrents in either direction.
446	Road Intersection	5210015.28	643449.44	Intersection of line with 160th Ave.
447	Road Intersection	5209237.37	645066.08	Crossing of 27th St (gravel) at intersection with 161st Ave (gravel). Cropland and no bird deterrents in either direction.
448	Road Intersection	5207630.67	645100.24	Crossing of 28th St at intersection with 161st Ave.
449	Road Intersection	5206014.15	645126.70	Crossing of 29th St at intersection with 161st Ave. Cropland and no bird deterrents in either direction.

Point	Feature	Northing (m)*	Easting (m)*	Observation Notes
450	Corner	5204408.90	645153.88	Corner at intersection of 30th St and 161st Ave. Cropland and no bird deterrents in either direction.
451	Corner	5204441.31	646631.21	Corner at intersection of 30th St and 162nd Ave.
452	Wetland/Waterbody Spanned	5203735.72	646632.75	Crossing of channelized Rush River.
453	Road Intersection	5201710.35	648231.05	Intersection of line with 163rd Ave, to the north of and parallel to 32nd St. Line on H-frame structures. Cropland and no bird deterrents in either direction.
454	Road Intersection	5201751.65	649854.62	Intersection of line with 164th Ave, to the north of and parallel to 32nd St. Line on H-frame structures. Cropland and no bird deterrents in either direction.
455	Road Intersection	5201791.77	651468.40	Intersection of line with 165th Ave, to the north of and parallel to 32nd St. Line on H-frame structures.
456	Road Intersection	5201855.15	653082.71	Intersection of line with 166th Ave, to the north of and parallel to 32nd St. Line on H-frame structures.
457	Road Intersection	5201946.56	656307.69	Intersection of line with 93rd St, to the north of and parallel to 52nd Ave. Line on H-frame structures. Cropland and no bird deterrents in either direction.
458	Road Intersection	5202029.35	657923.54	Intersection of line with 81st St, to the north of and parallel to 52nd Ave. West from 81st St were large orange balls on line. East from 81st St the line went from H-frame structures to monopoles at about half mile from river crossing.
459	Wetland/Waterbody Spanned	5202072.51	659408.19	Crossing of Sheyenne River. Bank erosion from flooding. Both lines ran on one pole at crossing.
460	Road Intersection	5201631.70	660342.38	Intersection of line with 52nd Ave.
461	Road Intersection	5200015.36	661189.51	Crossing of 40th Ave at intersection with 57th St.
462	Corner	5198431.84	661216.45	Corner at intersection of 32nd Ave and 57th St.
463	Substation	5198428.46	661861.51	Maple River Substation, east end of transmission line.

*Northing/Easting are in Universal Transverse Mercator Coordinate System.