

Rebuttal Testimony and Schedules

Jack Middleton

**STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION**

In the Matter of the Application of
ITC Midwest LLC for a Certificate of
Need for the Minnesota-Iowa 345 kV
Transmission Line Project in Jackson,
Martin, and Faribault Counties

PUC Docket No. ET6675/CN-12-1053
OAH Docket No. 60-2500-30782

In the Matter of the Application of
ITC Midwest LLC for a Route Permit
for the Minnesota-Iowa 345 kV
Transmission Project and Associated
Facilities in Jackson, Martin, and
Faribault Counties

PUC Docket No. ET6675/TL-12-1337
OAH Docket No. 60-2500-30782

REBUTTAL TESTIMONY OF

JACK MIDDLETON

On Behalf of

ITC MIDWEST LLC

April 25, 2014

Exhibit _____

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1 Minnesota portion of the Minnesota – Iowa 345 kV Transmission Project in
2 Jackson, Martin, and Faribault counties (“Project”).

3
4 **Q. DID YOU REACH ANY GENERAL CONCLUSIONS IN YOUR DIRECT TESTIMONY?**

5 A. Yes. In my direct testimony, I concluded that Modified Route A best
6 balances overall impacts on the environment and human settlement.
7 Should Modified Route A not be selected for the Project, I recommended,
8 in order of preference, Route A then Route B (including Scoping Decision
9 route alternatives M15-R and F3-R, identified in the Draft EIS as CC-1 and
10 HI-3, respectively), over the other routes in the EIS Scoping Decision.

11
12 **Q. IS THERE ANYTHING IN YOUR DIRECT TESTIMONY THAT YOU WOULD LIKE TO**
13 **EXPLAIN FURTHER?**

14 A. I would like to provide further explanation on Modified Route A in two
15 areas of the route. One related to routes near the Des Moines River and
16 another related to the routes near the Blue Earth River immediately south
17 of the Huntley Substation site proposed by ITC Midwest in its Route
18 Permit Application.

19
20 **Q. WHAT WOULD YOU LIKE TO EXPLAIN FURTHER ABOUT MODIFIED ROUTE A**
21 **NEAR THE DES MOINES RIVER?**

22 A. At the Des Moines River, the EIS Scoping Decision included an alignment
23 alternative, J3-A (identified as JA-2 in the Draft EIS), that followed the
24 existing 161 kV line across the river and for approximately 0.6 mile before

1 turning north between field lines. The west-east portion of the existing
2 Lakefield Junction - Fox Lake - Rutland - Winnebago Junction - Winnco
3 ("Lakefield to Border") 161 kV Transmission Line crosses through the
4 center of agricultural fields just east of the Des Moines River. In comments,
5 the Minnesota Department of Natural Resources ("MnDNR") stated a
6 preference for a perpendicular crossing of the river instead of using the
7 existing 161 kV line crossing. ITC Midwest developed Modified Route A in
8 this area to stay within EIS Scoping Decision J1-R with a slight alignment
9 modification. The diagonal portion of Modified Route A west of the Des
10 Moines River was developed to provide the ability to place the Project
11 structures on field lines, and locate the conductors across the fields
12 diagonally. This was done to minimize potential impacts to agricultural
13 operations in this area.

14
15 **Q. WHAT WOULD YOU LIKE TO FURTHER CLARIFY ABOUT MODIFIED ROUTE A**
16 **NEAR THE BLUE EARTH RIVER?**

17 A. Just south of the Huntley Substation site proposed by ITC Midwest, the
18 existing Lakefield to Border 161 kV Transmission Line crosses the Blue
19 Earth River twice. Modified Route A incorporates a variation of EIS
20 Scoping Decision route alternative F1-R (identified at HI-1 in the Draft
21 EIS). F1-R and HI-1 cut diagonally across a field in this area. Modified
22 Route A in the same area was developed to more closely follow the edge of
23 the field line and limit additional potential impacts to agricultural
24 operations while balancing residential proximity concerns and avoidance

1 of the Blue Earth River and riparian corridor in Section 23 of Verona
2 Township.

3

4 **Q. WHAT SCHEDULES ARE ATTACHED TO YOUR REBUTTAL TESTIMONY?**

5 A. Schedule 21: FL-4 and Modified Route A Comparison.

6 Schedule 22: I90-4 and Route A Draft EIS Route Width South of the
7 Proposed Northern Huntley Substation.

8 Schedule 23: EIS B2-HI at Iowa Border.

9 Schedule 24: I-90-R Option 3 and I90-3 Alignment Comparison.

10 Schedule 25: Alternative Southern Huntley Substation Maps with
11 Applicable Routes.

12 Schedule 26: Modified Route A Potential Impact Tables Divided by
13 Lakefield Junction Substation - Huntley Substation and
14 Huntley Substation - Iowa border.

15 Schedule 27: Draft EIS Chapter 6 Charts with Modified Route A.

16 Schedule 28: Map Illustrating I90-2 and Modified Route A near Fox Lake.

17 Schedule 29: Draft EIS Chapter 7 Tables with Modified Route A.

18

19 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY IN THIS**
20 **PROCEEDING?**

21 A. I testify to provide information on Modified Route A in the same format as
22 that presented in Chapter 6 and Chapter 7 of the Draft EIS prepared by
23 EERA to aid the Administrative Law Judge in making his recommendation
24 and the Minnesota Public Utilities Commission ("Commission") in its

1 decision-making process. I also testify to provide information on Draft EIS
2 statements for EERA's consideration as it prepares the Final EIS for the
3 Project.

4
5 **Q. IS MODIFIED ROUTE A REFERENCED IN THE DRAFT EIS?**

6 A. No. However, the Draft EIS evaluates all of the segments that make up
7 Modified Route A.

8
9 **Q. PLEASE EXPLAIN.**

10 A. ITC Midwest's direct testimony supporting Modified Route A was filed on
11 February 24, 2014. The Draft EIS was released a month later on March 21,
12 2014. Modified Route A is a combination of route segments presented in
13 the EIS Scoping Decision. Although the various route segments that make
14 up Modified Route A are all included in some form in the Draft EIS, EERA
15 presented its evaluation of routes based on what I would refer to as
16 "combinations" instead of each individual route segment presented in the
17 EIS Scoping Decision. For example, the Draft EIS evaluates the variation
18 "FL-4" around Fox Lake. FL-4 is a combination of Scoping Decision
19 alternative M5-R for approximately four miles, Route B (approximately
20 three miles), and MR-2 (approximately one mile). In this area, Modified
21 Route A is a combination of Route A for approximately three miles, M5-R
22 for approximately 1.2 miles (plus an additional 0.9 mile when it crosses
23 back to the north side of I-90, Route A, Route B (approximately three
24 miles), and MR-2 (approximately one mile).

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A figure illustrating these routes is provided in **Schedule 21** to my rebuttal testimony. The comparison information I provided in my direct testimony analyzed segments of Modified Route A against the alternatives using the naming conventions in the EIS Scoping Decision. For ease of reference, my rebuttal testimony includes this comparison data using the revised route variation naming conventions in the Draft EIS. Additionally, I provide an augmented relative merits evaluation of Modified Route A using the same evaluation criteria EERA employed in Chapter 7 of the Draft EIS.

II. THE DRAFT EIS

Q. HAVE YOU REVIEWED THE DRAFT EIS?

A. Yes.

Q. DOES THE DRAFT EIS INCLUDE THE SAME NAMING CONVENTION THAT WAS USED IN THE EIS SCOPING DECISION TO IDENTIFY ROUTE AND ALIGNMENT ALTERNATIVES?

A. No. The Draft EIS assigned different names to the Route Alternatives (routes between the Lakefield Junction and Huntley substations and the Huntley Substation and the Iowa border) and Route Variations (possible route options to Route Alternatives) than the route and alignment alternatives presented in the EIS Scoping Decision and sent to landowners in late 2013. The Draft EIS does, however, provide Table 3-1 that relates the

1 Draft EIS nomenclature with the nomenclature used in the EIS Scoping
2 Decision. Instead of evaluating individual route alternatives (*i.e.*, J1-R
3 compared to Route A for the same length, etc.), the Draft EIS creates longer
4 variations that provide suggested combinations of route alternatives (*i.e.*,
5 FL-1 combines M3-R and M4-R). As the Draft EIS recognizes on page 16,
6 there are other possible routing options that may be selected using a
7 combination of the EIS Scoping Decision alternatives. Modified Route A
8 would be one of these other routing options. In EIS Scoping Decision
9 nomenclature, Modified Route A, in order from west to east, combines
10 Route A, J1-R with a portion of J3-A, Route A, M5-R, Route A, Route B,
11 M2-R, Route A, a portion of M8-R, M9-R, Route A, a portion of F1-R, and
12 Route A.

13
14 **Q. DO YOU HAVE ANY GENERAL COMMENTS ON THE DRAFT EIS?**

15 A. EERA undertook a large data evaluation process in its development of the
16 Draft EIS. Based on my review, it provides the analysis required according
17 to the Commission rules for EISs. To provide additional analysis of the
18 alternatives proposed for the Project, the Draft EIS analyzed individual
19 segments proposed during the EIS scoping process and in ITC Midwest's
20 Route Permit Application. The analysis of potential impacts for these
21 variations need to be combined together to provide an end-to-end
22 comparison of Project route alternatives from the Lakefield Junction
23 Substation to the Iowa border. This requires that the associated facilities

1 proposed for each Route Alternative be incorporated for a comprehensive
2 comparison.

3
4 Further, the Draft EIS separates the Project into two segments for its
5 potential impact evaluation in Chapter 6 and Appendix J: (1) the Lakefield
6 Junction Substation to the Huntley Substation and (2) the Huntley
7 Substation to the Iowa border. The Draft EIS also includes evaluations of
8 two Huntley Substation locations. The first location (referred to in the
9 Draft EIS as the "Proposed Huntley Substation" or the "Proposed
10 Northern Huntley Substation" and in the EIS Scoping Decision as
11 "Huntley Substation - Application") is located in Section 14 of Verona
12 Township and is closest to the to-be-decommissioned Winnebago Junction
13 Substation. The second location (referred to in the Draft EIS as the
14 "Alternative Southern Huntley Substation" and in the EIS Scoping
15 Decision as "Huntley Substation - Alternative") is located in Section 2 of Jo
16 Daviess Township. The EIS Scoping Decision stated that the "Alternative
17 Southern Huntley Substation/Huntley Substation - Alternative" site was
18 only an option for EIS Scoping Decision route I-90-R Option 1 and I-90-R
19 Option 2, referred to as I90-5 in the Draft EIS.

20
21 **Q. DO YOU BELIEVE ANY TECHNICAL CORRECTIONS SHOULD BE MADE TO THE**
22 **DRAFT EIS?**

23 **A.** Yes, I do in a several areas that I have summarized as follows:

- 1 • In reviewing the data analysis for the Draft EIS Route Alternatives, it
2 appears the Appendix J potential impact tables only include a route
3 width of approximately 723 feet for I90-4 across the Blue Earth River
4 instead of the 1,000 foot width shown in the EIS Scoping Decision.
5 The Draft EIS also appears to reduce the Route A (A1-HI) width
6 from 1,000 feet as requested by ITC Midwest in its Route Permit
7 Application to 723 feet. The discrepancies in route width are
8 illustrated in **Schedule 22** to my testimony. This should be restored
9 to a 1,000-foot route width in the final EIS and the potential impacts
10 should be updated as necessary in Appendix J or in other locations
11 where this data may appear.
- 12 • In the Draft EIS, the Route B2-HI anticipated right-of-way extends
13 south of the Iowa border. Specifically, the portion of the Route
14 Alternative that would be necessary to connect Route B to the
15 connection point at the Iowa border, appears to not center the
16 anticipated right-of-way on the anticipated alignment and places
17 some of the right-of-way south of the Iowa border. None of the other
18 alternatives considers the right-of-way and potential impacts south
19 of the Iowa border. **Schedule 23** attached to my testimony illustrates
20 this discrepancy. In my opinion, the Final EIS should be revised to
21 correct this error.
- 22 • In reviewing the data analysis for the I90 Route Alternatives, it
23 appears the location of the alignment for I90-3 in the Draft EIS,
24 referred to as I-90-R Option 3 in the EIS Scoping Decision, is in a

1 slightly different location than depicted in the Scoping Decision. The
2 alignment presented in the Draft EIS for I90-3 starts farther to the
3 east in Section 4 of Jo Daviess Township. Continuing north, the Draft
4 EIS I90-3 alignment parallels the I-90-R Option 3 alignment until
5 crossing over to the west side of Section 33 in Verona Township,
6 maximizing its distance from the I-90-R Option 3 alignment
7 presented in the EIS Scoping Decision at approximately 96 feet.

8
9 In addition, the two alignments differ along 160th Street, with the
10 I90-3 Draft EIS alignment remaining on the south side of the road as
11 it turns to head east, while the I-90-R Option 3 alignment crosses to
12 the north side of 160th Street in Section 16 of Verona Township. An
13 example of the difference in alignment is illustrated as **Schedule 24**.
14 The Final EIS should provide an explanation as to why the I90-3
15 alignment differs from the I-90-R Option 3 alignment.

- 16 • In the Draft EIS, Route Alternative A2-H1 and Route Alternative B2-
17 HI denote routes between the Huntley Substation and the Iowa
18 border. Both alternatives originate from the Alternative Southern
19 Huntley Substation/Huntley Substation – Alternative along
20 Interstate 90. These Route Alternatives are intended to only provide
21 an alternate substation location for Draft EIS Route Alternative I90-5
22 Option 1 and Option 2, referred to in the EIS Scoping Decision as I-
23 90-R Option 1 and I-90-R Option 2, rather than functioning as an
24 alternative substation location available for any Huntley to Iowa

1 border route alternative. As noted in the Draft EIS maps, a site at
2 Alternative Southern Huntley Substation/Huntley Substation -
3 Alternative has not been identified and an investigation within
4 Section 2 of Jo Daviess Township would be necessary to locate a 40-
5 acre parcel acceptable for the substation.

6
7 Should either option for I90-5 and the Alternative Huntley
8 Substation be selected for the Project, all of Section 2 should be
9 designated for the substation site to allow for ITC Midwest to
10 identify an appropriate location for the parcel. Based on the final
11 substation site selected for this route alternative, associated facilities
12 may need to be routed in a manner different than the Draft EIS for
13 I90-5 Option 1 and Option 2. Maps illustrating these alternatives are
14 provided with my rebuttal testimony as **Schedule 25**. The Final EIS,
15 specifically the Appendix J tables for A2-HI and B2-HI, should be
16 revised to make it clear that this substation site and these Huntley
17 Substation to Iowa border Route Alternatives are only associated
18 with I90-5 Option 1 and Option 2.

19
20 **Q. YOU MENTIONED THAT THE DRAFT EIS EVALUATES POTENTIAL IMPACT**
21 **DATA IN TWO SEGMENTS. HAS ITC MIDWEST PROVIDED THIS INFORMATION**
22 **FOR MODIFIED ROUTE A?**

23 **A.** Yes, but not in the split-segment format. I included Modified Route A
24 Impact Tables as **Schedule 12** to my direct testimony evaluating the full

1 summary of potential impacts of the Project between the Lakefield
2 Junction Substation and the Iowa border. I have included Impact Tables
3 for Modified Route A divided into the two segments analyzed in the Draft
4 EIS at **Schedule 26** to allow for a more accurate comparison of the split-
5 segment format presented in the Draft EIS.

6
7 **Q. CHAPTER 6 OF THE DRAFT EIS INCLUDES TABLES COMPARING POTENTIAL**
8 **RESOURCE IMPACTS OF THE ROUTES IDENTIFIED. HAVE YOU COMPLETED A**
9 **SIMILAR ANALYSIS OF MODIFIED ROUTE A?**

10 **A.** Yes. After receiving the Draft EIS, we felt it was appropriate to compare
11 the potential resource impacts of Modified Route A in the same format as
12 that presented by EERA for the DEIS route alternatives. Attached to my
13 testimony as **Schedule 27** are the charts presented in Chapter 6 of the Draft
14 EIS updated to include Modified Route A. In **Schedule 27**, I also identify
15 several assumptions that were made in creating these bar charts in the
16 Draft EIS. These assumptions are identified as footnotes to the applicable
17 charts.

18
19 **Q. ARE THERE ANY DATA CONSIDERATIONS THAT NEED TO BE KEPT IN MIND**
20 **WHEN REVIEWING THE CHAPTER 6 BAR CHARTS IN THE DRAFT EIS?**

21 **A.** Yes. In Figure 1 (Draft EIS Figure 6-1) of **Schedule 27** to my rebuttal
22 testimony, the output of Proximity of Homes - Lakefield to Huntley
23 includes an additional home not included in the data used for Modified
24 Route A in my direct testimony, **Schedule 12**. This is a result of the specific

1 location of the data point used to include or omit the house in the
2 proximity count. To include a more conservative estimate for this factor,
3 the home was included in this round of analysis for a total of four homes.
4 The total number of residences for this portion of A-LH, as identified in
5 the Draft EIS is five.

6
7 For evaluations in the Draft EIS of wetland impacts at both Fox Lake and
8 Lake Charlotte, the National Wetland Inventory layer used to obtain acres
9 of forested and non-forested wetlands was unedited and counted the
10 entire water bodies as non-forested wetlands in the case of Draft EIS
11 variations FL-1 and LC-4, respectively. Unless otherwise noted, water
12 bodies are generally removed from the non-forested wetland count in
13 order to provide a more accurate estimate of potential wetland impacts.
14 For the number of Minnesota Biological Survey ("MBS") sites within 1,000
15 feet of the proposed alignment, the Draft EIS did not include the Verona 17
16 site from the MnDNR GIS layer. I understand this is because the site is
17 considered below a minimum biodiversity significance threshold.

18
19 **Q. IS THERE A ROUTE IN THE DRAFT EIS THAT IS SIMILAR TO MODIFIED**
20 **ROUTE A?**

21 **A.** Yes. Between the Lakefield Junction and Huntley substations, I90-2 is most
22 similar to Modified Route A. I90-2 differs from Modified Route A in a few
23 areas: 1) at the Des Moines River, the I90-2 anticipated right-of-way does
24 not incorporate the perpendicular crossing of the Des Moines River, the

1 additional separation from the Des Moines River MBS site, and the
2 alignment proposed on the south side of 820th Street to avoid an identified
3 well located on the north side; 2) at Fox Lake, the I90-2 anticipated right-of-
4 way stays north of I-90, boxing in a residence on 125th Street and then
5 continues east along an existing 69 kV line; 3) I90-2 continues east to State
6 Highway 15 where it turns north, crossing the highway two times before
7 rejoining the existing Lakefield to Border 161 kV Transmission Line.
8 Between the Huntley substation and the Iowa border, I90-2 would use A-
9 HI. At the Blue Earth River, A-HI's anticipated right-of-way does not
10 incorporate the deviation to avoid crossing the river twice just south of the
11 Proposed Huntley Substation/Huntley Substation - Application. A map
12 comparing I90-2 and Modified Route A is included as **Schedule 28** to my
13 testimony.

14
15 **Q. DURING YOUR REVIEW OF I90-2 IN THE DRAFT EIS, DID YOU IDENTIFY ANY**
16 **DISCREPANCIES?**

17 **A.** Yes. Map 3-8 states that immediately south of the Fox Lake Substation, the
18 route would require a double-circuit 345 kV/161 kV transmission line. I90-
19 2 follows an existing 69 kV transmission line from this location to just west
20 of State Highway 15. To accommodate the relocation of the existing
21 Lakefield to Border 161 kV Transmission Line if it is removed from the
22 lakes as discussed in one option for I90-2, co-location with the existing 69
23 kV transmission line, and construction of the 345 kV transmission line,
24 triple-circuit structures would be required in this area. Map 3-8 should be

1 revised to state “begin 161/345 kV triple-circuit with I90-1 or I90-2” at the
2 location immediately south of the Fox Lake Substation in the Final EIS.
3 Any aesthetic evaluations of this portion of I90-1 and I90-2 should also be
4 reevaluated to determine if any revisions are necessary based on a triple-
5 circuit structure instead of a double-circuit structure before the Final EIS is
6 issued.

7
8 **Q. ARE THERE DIFFERENCES IN POTENTIAL IMPACTS BETWEEN MODIFIED**
9 **ROUTE A AND I90-2?**

10 A. Yes. There are differences in potential impacts that should be considered.
11 Modified Route A follows more of the existing 161 kV transmission line
12 around Fox Lake and Lake Charlotte. I90-2 does not follow any portion of
13 the existing Lakefield to Border 161 kV Transmission Line in these areas.
14 The I90-2 anticipated right-of-way crosses through the center of the
15 Krahmer Wildlife Management Area (“WMA”) near I-90 and the I90-2
16 route width also crosses the Fox Lake WMA. With Modified Route A,
17 neither the route width nor right-of-way crosses a WMA. Further,
18 Modified Route A would require triple-circuit 345 kV/161 kV/69 kV
19 structures only in the area south of Fox Lake between the Fox Lake
20 Substation and where the existing 69 kV line turns east in Section 35 of Fox
21 Lake Township and along 160th Street south of Lake Charlotte.
22 Construction along I90-2 would require installing triple-circuit structures
23 in the area south of Fox Lake, plus along I-90 toward Fairmont, through
24 the Krahmer WMA, and south of Buffalo Lake west of State Highway 15.

1 The remainder of the Project along either route would be constructed on
2 double-circuit structures.

3

4 **Q. ARE THERE ANY CONCERNS YOU IDENTIFIED WITH THE I90-2 ANTICIPATED**
5 **ALIGNMENT IN THE DRAFT EIS?**

6 A. Yes. The Draft EIS shows I90-2 primarily following the existing 69 kV
7 transmission line between Fox Lake to a point west of State Highway 15.
8 I90-2 could not likely follow the existing 69 kV line centerline between the
9 Fox Lake Substation and State Highway 15 as it appears there are portions
10 of the existing 69 kV line are located fewer than 10 feet from the I-90
11 Minnesota Department of Transportation right-of-way.

12

13 **Q. ARE THERE ANY NOTABLE SIMILARITIES BETWEEN I90-2 AND MODIFIED**
14 **ROUTE A?**

15 A. Yes. Both I90-2 and Modified Route A would be constructed with an
16 available 161 kV circuit position that would accommodate relocation of the
17 existing Lakefield to Border 161 kV Transmission Line between the Fox
18 Lake Substation and Lake Charlotte. This relocation could occur in the
19 future or as part of this Project.

20

21 **Q. WOULD YOU RECOMMEND ANY MODIFICATIONS TO I90-2?**

22 A. Yes. If I90-2 were selected for the Project, it should include the
23 modifications identified for Modified Route A at the Des Moines

1 River/Jackson Municipal Airport, immediately south of Fox Lake, and at
2 the Blue Earth River south of the Huntley Substation.

3
4 **Q. DOES THE DRAFT EIS INCLUDE OTHER ROUTE COMPARISON DATA YOU**
5 **HAVE REPLICATED TO INCLUDE MODIFIED ROUTE A?**

6 A. Yes. Chapter 7 includes a relative merits analysis. This analysis compares
7 the relative merits of various routing factors identified in the
8 Commission's route rules against the Route Alternatives presented in the
9 Draft EIS. Attached to my rebuttal testimony as **Schedule 29**, I have
10 included my analysis of these various factors for Modified Route A. I have
11 also included information in each table to provide background on how I
12 reached my conclusions.

13
14 **Q. DID YOUR CONCLUSIONS REGARDING THE RELATIVE MERITS OF THE ROUTE**
15 **ALTERNATIVES AND ROUTE VARIATIONS DIFFER FROM THE CONCLUSIONS**
16 **REACHED IN THE DRAFT EIS?**

17 A. Yes.

18
19 **Q. PLEASE EXPLAIN ANY OF YOUR CONCLUSIONS THAT DIFFER FROM THE**
20 **RELATIVE MERITS CONCLUSIONS IN THE DRAFT EIS.**

21 A. There are a total of six relative merits conclusions with which I disagree or
22 would like to provide additional clarification regarding potential impacts.

- 23 • Figure 7-2, I90-1 and I90-2 - Both of these Route Alternatives
24 provide the ability to remove existing transmission lines across Fox

1 Lake and Lake Charlotte, resulting in a reduction in the potential for
2 impacts to avian species that utilize these habitats. The existing 161
3 kV line that crosses both lakes and connects the Fox Lake and
4 Rutland substations could be co-located with the new 345 kV line,
5 reducing the incremental impact on avian species from placing this
6 existing line in a different location.

- 7 • Figure 7-3, JA-2, Land-Based Economies/Agriculture - In my
8 opinion, this should be categorized as “minimal to moderate” not
9 “minimal.” JA-2 crosses through the center of several fields to the
10 north of 820th Street. Other routing options that cross through fields
11 instead of following existing linear features have been categorized as
12 minimal to moderate in Chapter 7.
- 13 • Figure 7-3, JA-2, Use or paralleling of existing ROWs - In my
14 opinion, this should be categorized as minimal to moderate, not
15 minimal. Unlike JA-1 and A-JA, which follow 820th Street in this
16 area, JA-2 crosses through fields. Although it does follow field lines
17 in a few instances, those are not existing rights-of-way, but are what
18 I would consider a different category under the Commission’s
19 routing factors in Rule 7850.4100, Subdivision H.
- 20 • Figure 7-3, JA-1, Natural Environment / Flora and Fauna - In my
21 opinion and based on Map 6-14 of the Draft EIS, JA-1 should be
22 categorized as moderate. JA-1 extends through native plant
23 communities on the west and east side of the Des Moines River in
24 addition to crossing through two National Heritage Information

1 System Rare Natural Features sites (Belmont Bridge Southeast and
2 Belmont 34/35) and through approximately one mile of native plant
3 communities in Sections 33 and 34 of Belmont Township. Due to the
4 extent of these resources in this area, these resources would not be
5 able to be spanned and would require multiple structures within
6 these communities.

- 7 • Figure 7-4, FL-5 and FL-6, Land Based Economies / Agriculture - As
8 with FL-1, FL-5 and FL-6 would replace the existing H-frame
9 structures with single pole structures, resulting in reduced
10 agricultural impacts where these existing structures are located. The
11 Final EIS should discuss these reduced impacts and evaluate if the
12 proper motif has been assigned in Chapter 7.

13
14 **Schedule 29** includes an evaluation of Modified Route A against the
15 routing factors identified in the various Figures included in Chapter 7 of
16 the Draft EIS.

17 18 III. CONCLUSION

19 20 **Q. WHAT IS YOUR ROUTE RECOMMENDATION FOR THE PROJECT?**

21 A. Consistent with my direct testimony, my opinion is that Modified Route A
22 best balances overall impacts on the environment, human settlement, and
23 electrical system reliability. Should Modified Route A not be selected for
24 the Project, I recommend, in order of preference, Route A then Route B

1 (including M15-R and F3-R), over the other routes in the EIS Scoping
2 Decision.

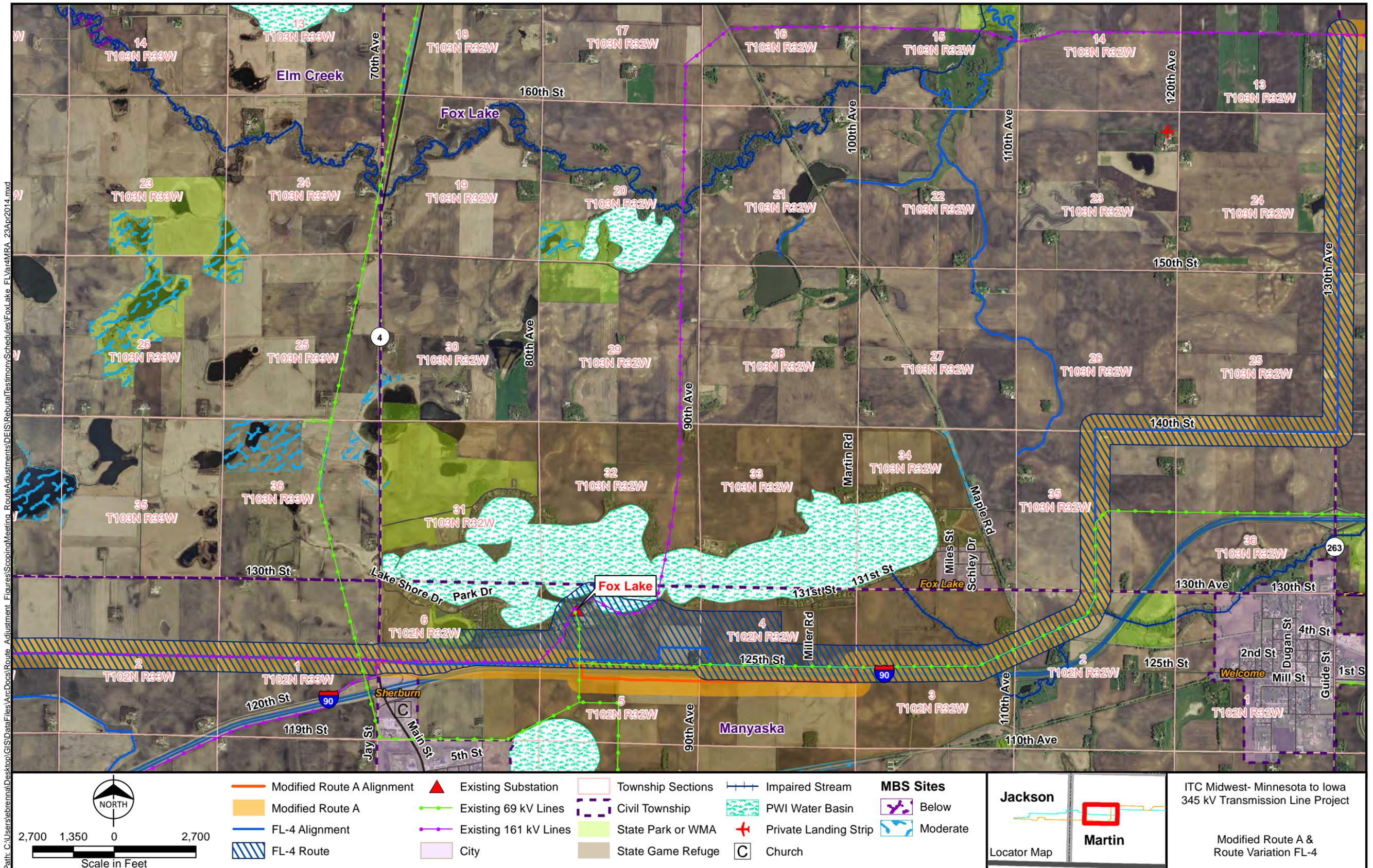
3

4 **Q. DOES THIS CONCLUDE YOUR PREFILED REBUTTAL TESTIMONY?**

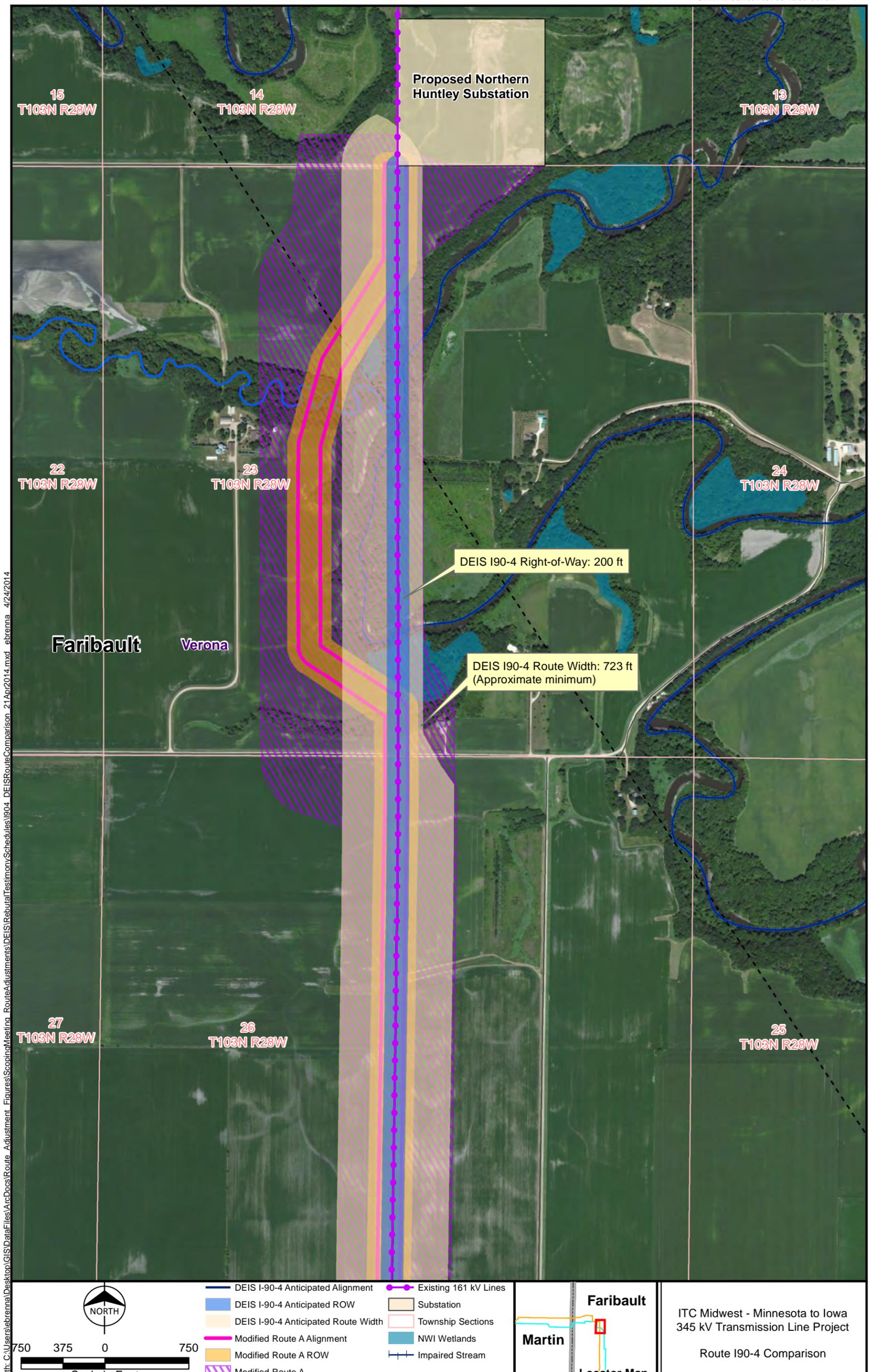
5 A. Yes.

6

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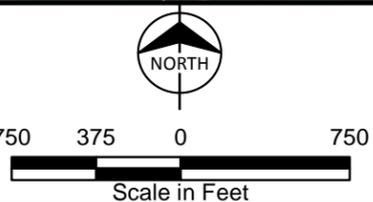
Faribault

Verona

Proposed Northern Huntley Substation

DEIS I90-4 Right-of-Way: 200 ft

DEIS I90-4 Route Width: 723 ft (Approximate minimum)



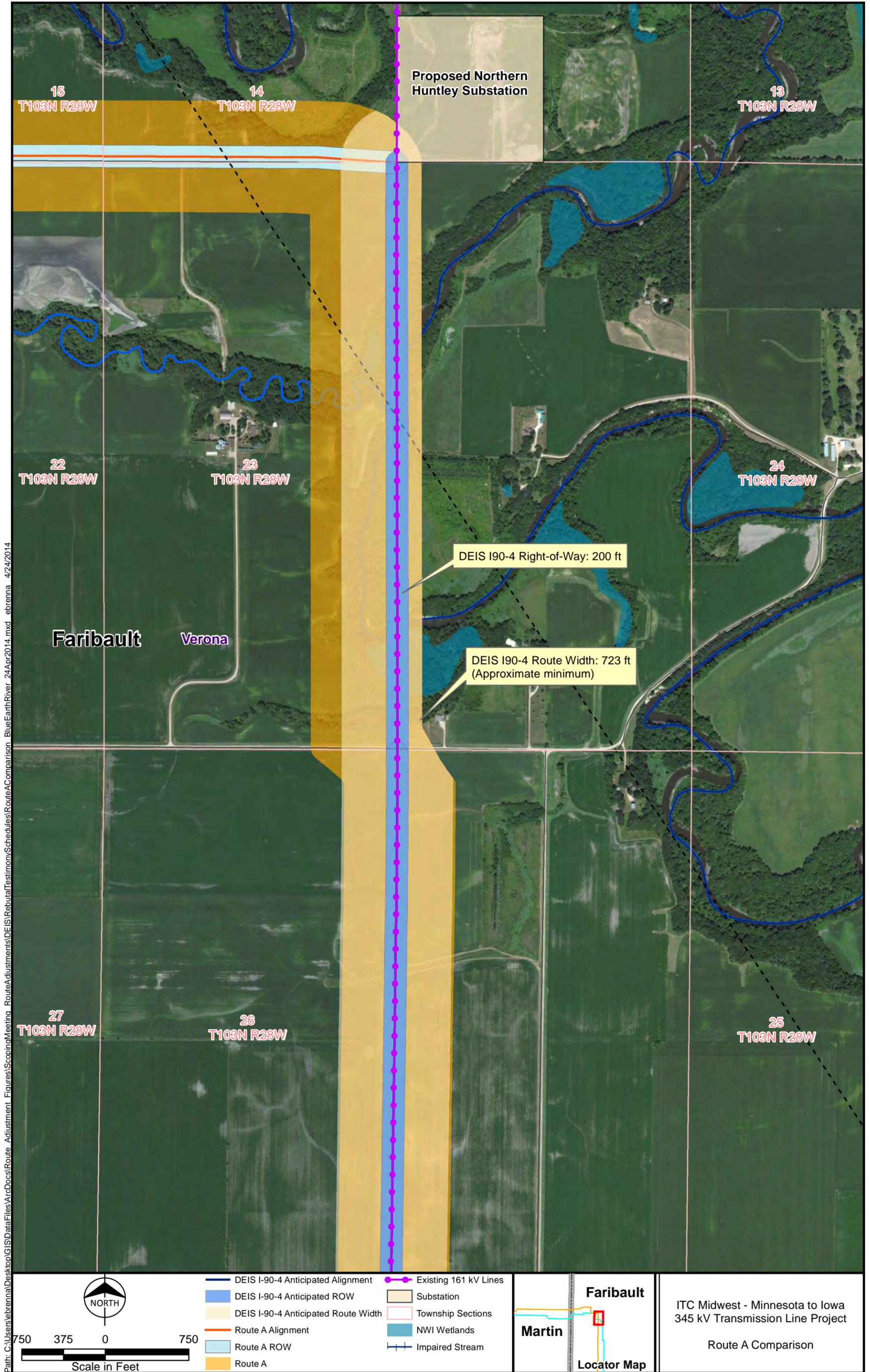
- DEIS I-90-4 Anticipated Alignment
- DEIS I-90-4 Anticipated ROW
- DEIS I-90-4 Anticipated Route Width
- Modified Route A Alignment
- Modified Route A ROW
- Modified Route A
- Existing 161 kV Lines
- Substation
- Township Sections
- NWI Wetlands
- Impaired Stream



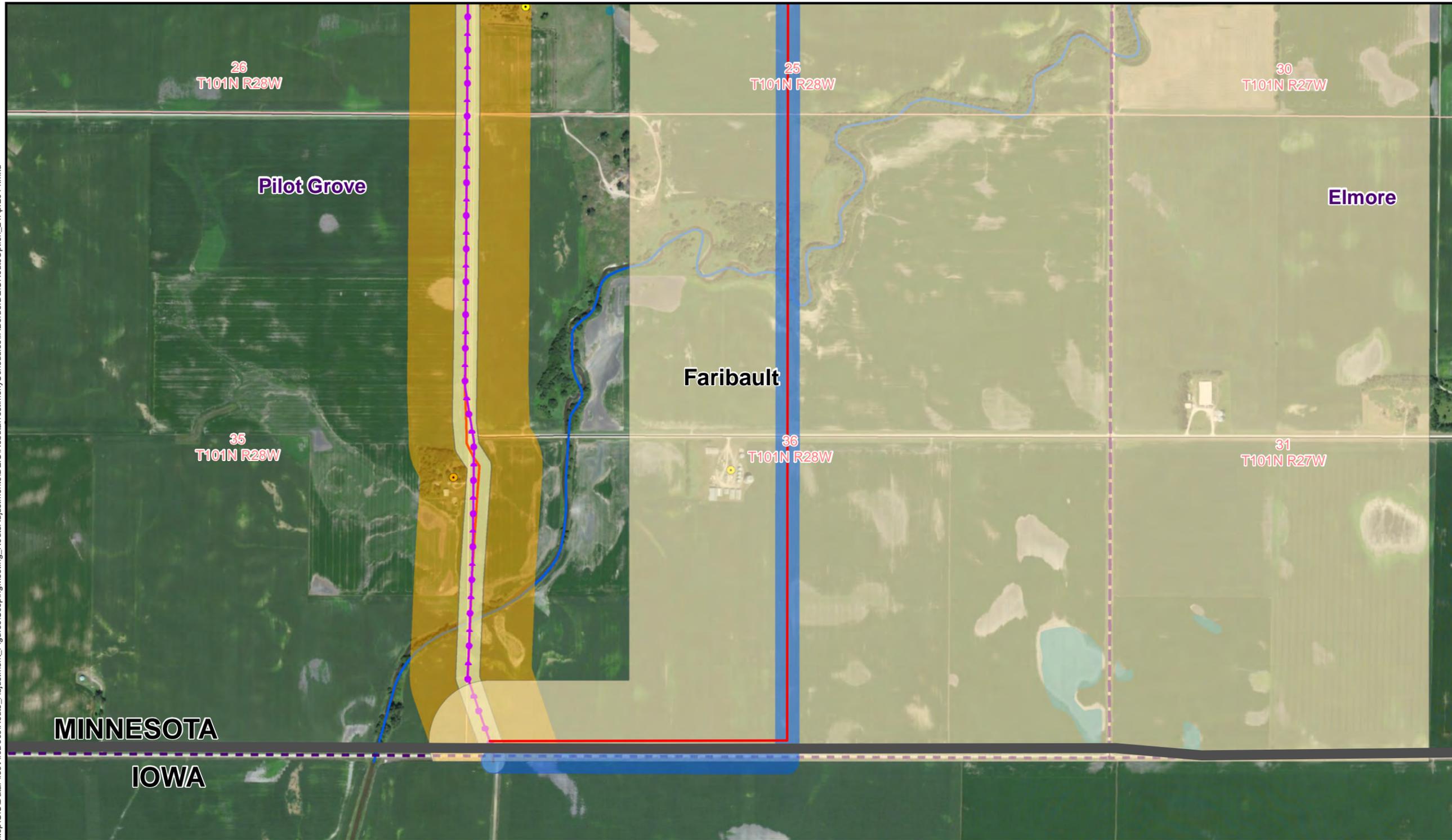
Faribault

ITC Midwest - Minnesota to Iowa
345 kV Transmission Line Project

Route I90-4 Comparison



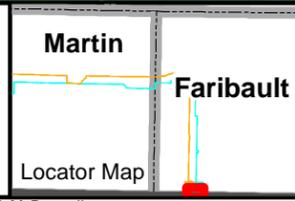
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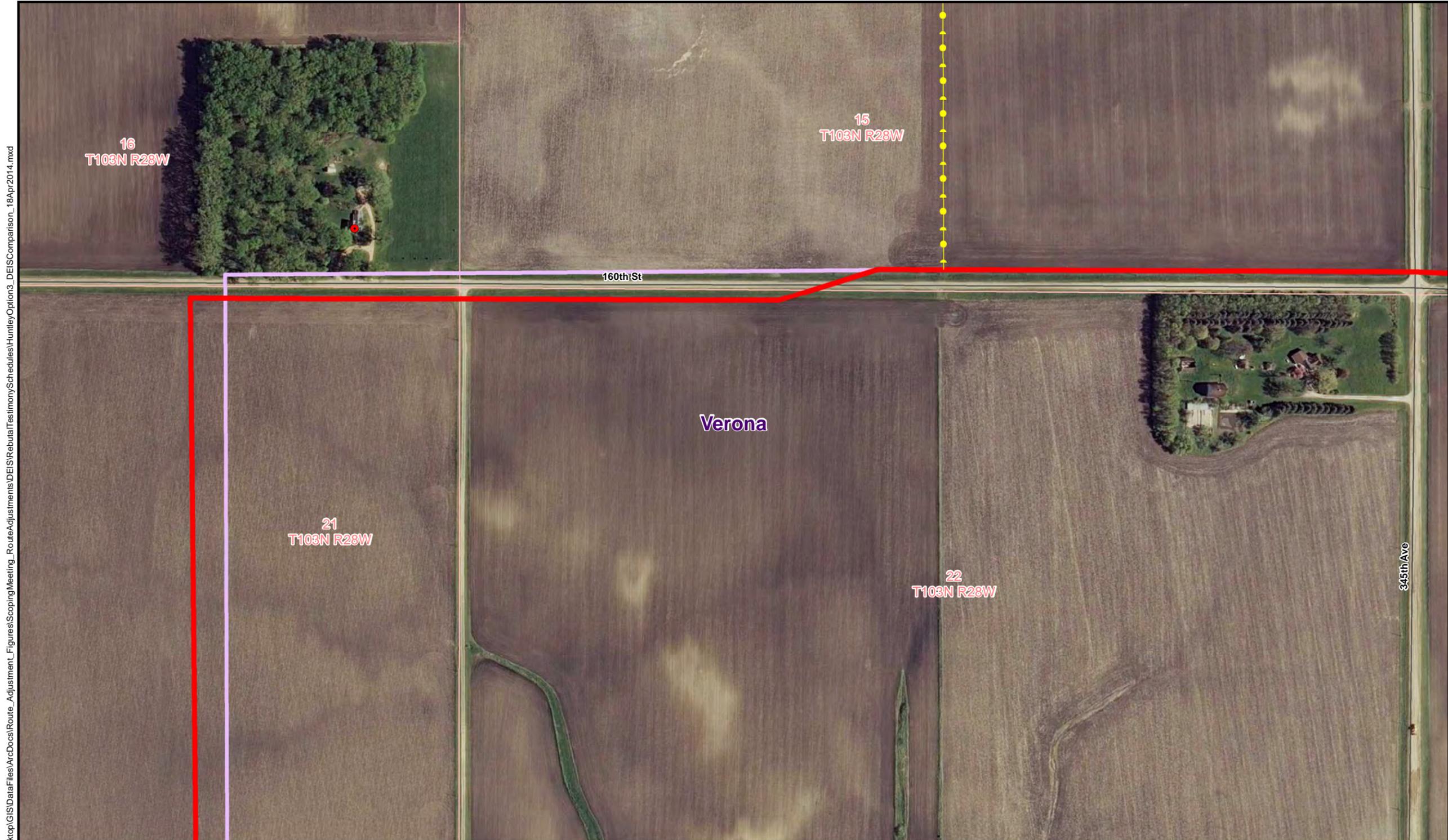
	B2-HI- Anticipated Alignment	Modified Route A	Civil Township	NWI Wetlands	Existing Pipeline
	B2-HI- Anticipated Right-of-Way	Existing 69 kV Lines	Township Sections	WPA	Home 0-75ft
B2-HI- Anticipated Route Width	Existing 161 kV Lines	County Boundary	WRP	PWI Water Wetland	Home 75-150ft
Modified Route A - Alignment	Existing 345 kV Lines	State Boundary	PWI Stream	Moderate	Home 150-300ft
Modified Route A - Right-of-Way	City	State Park or WMA	PWI Water Basin	Impaired Stream	Home 300-500ft



ITC Midwest- Minnesota to Iowa
345 kV Transmission Line Project

DEIS Route B2-HI at Iowa Border

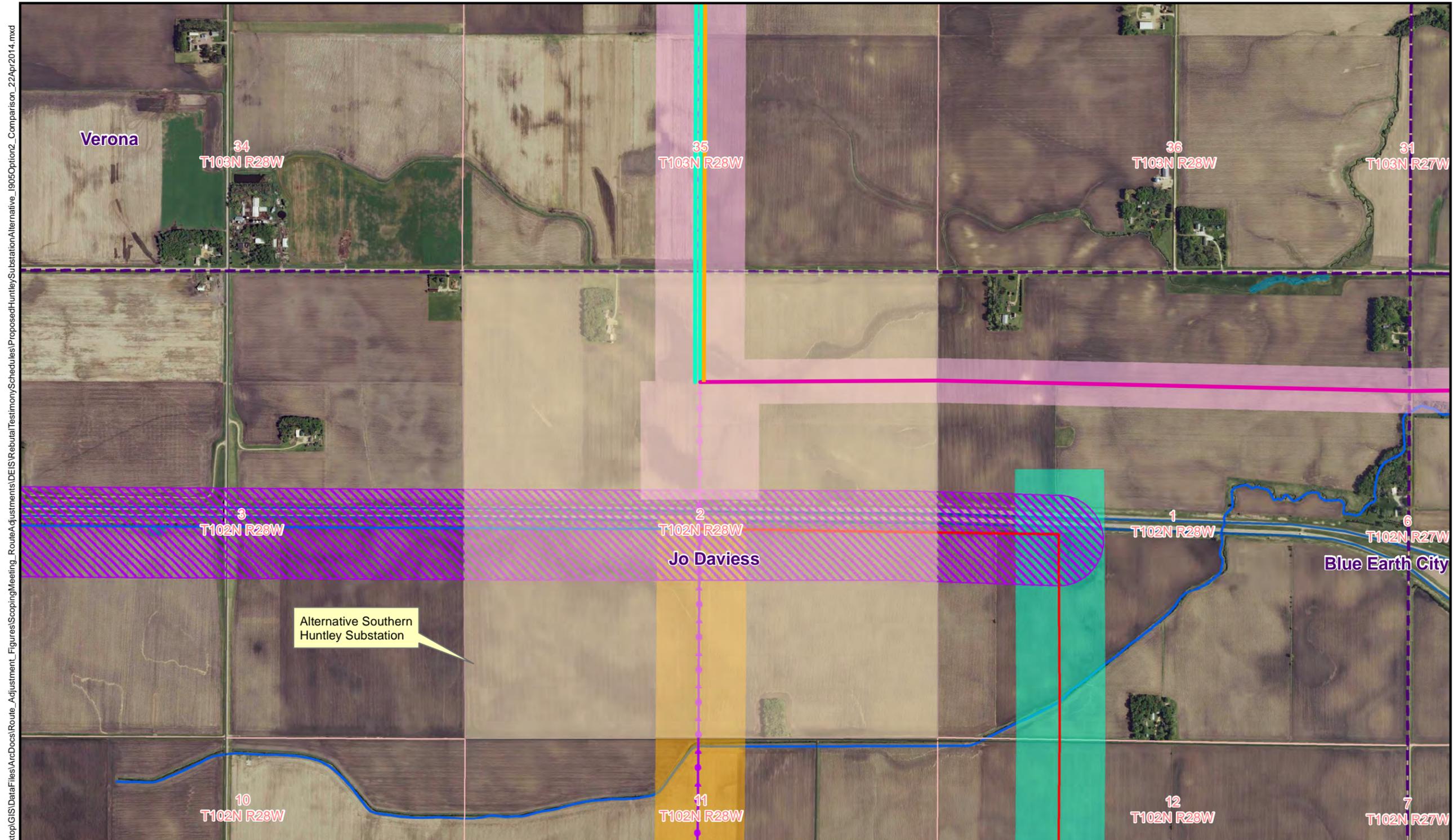
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community; USFWS NWI Wetlands; National Hydrography Dataset; National Flight Data Center; Minnesota DNR; Minnesota Geo GIS; Minnesota DOT; ITC; Burns & McDonnell.



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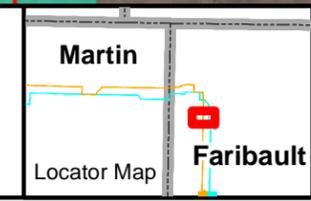
 250 125 0 250 Scale in Feet	[Dashed Purple Box] Civil Township [Red Outline Box] Township Sections	Scoping Distances ● Home 0-75ft ● Home 75-150ft	● Home 150-300ft ● Home 300-500ft	— DEIS 190-3 Anticipated Alignment - - - Associated Facilities- New 161 kV — Scoping Decision 1-90-R Option 3 Alignment	 Martin Faribault Locator Map	ITC Midwest- Minnesota to Iowa 345 kV Transmission Line Project 190-3 Alignment Comparison
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Source: MN Geo 2011 Aerials; Minnesota DNR; Minnesota Geo GIS; Minnesota DOT; ITC; Barr Engineering; Burns & McDonnell.



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<p>Scale in Feet</p>	Alternative Southern Huntley Substation	Double Circuit 69/161kV	Existing 69 kV Lines	State Park or WMA
	A2-HI Anticipated Alignment	New 161 kV	Existing 161 kV Lines	PWI Stream
B2-HI Anticipated Alignment	DEIS A2-HI Route Width	Civil Township	Impaired Stream	Associated Facilities Route Widths
I90-5 Anticipated Alignment	DEIS B2-HI Route Width	Township Sections	Associated Facilities Route Widths	Associated Facilities Route Widths
69kV Built to 161kv Standards	Route Alternative I90-5	Township Sections	Associated Facilities Route Widths	Associated Facilities Route Widths



ITC Midwest- Minnesota to Iowa
345 kV Transmission Line Project

Alternative Southern Huntley
Substation Route Variation
I90-5 Option 2

ITC Midwest- Minnesota to Iowa 345 kV Transmission Line Project
Modified Route A Divided Potential Impacts Table

	MRA-LH	MRA-HI
Impacts		
Length (miles)	56.58	15.71
Number of Angles Greater than 30°	22	13
Cropland in Right-of-Way (acres)	1,228.42	338.21
200ft Right-of-Way Percent Cropland	89.6	88.8
Alignment Length (miles)	56.58	15.71
Route Corridor (acres)	6,897.20	1,948.73
Right-of-Way (acres)	1,371.09	380.73
Corridor Sharing		
Corridor Sharing-Roads (miles)	13.05	3.42
Corridor Sharing- Transmission (miles)	41.91	14.26
Corridor Sharing-Railroad (miles)	0	0
Corridor Sharing-Pipeline (miles)	0	0
No Corridor Sharing (miles)	5.74	1.46
Total Corridor Sharing (miles)	50.84	14.26
Total Corridor Sharing (percent)	89.9	90.8
Homes		
Number of Occupied Homes in Route Corridor	14	9
0-75ft from Alignment Centerline	0	0
75-150ft from Alignment Centerline	2	0
150-300ft from Alignment Centerline	4	4
300-500ft from Alignment Centerline	6	7
0-500ft from Alignment Centerline	12	11
Prime Farmland		
Right-of-Way (acres)	1,371.09	380.73
Prime Farmland within the Right-of-Way (acres)	466.31	107.54
Percent of the 200ft Right-of-Way that Crosses Prime Farmland	34.0	28.2
Prime Farmland if Drained within the Right-of-Way (acres)	729.12	154.95
Percent of 200ft Right-of-Way that Crosses Prime Farmland if Drained	53.2	40.7
Farmland of State Importance within the Right-of-Way (acres)	103.35	74.65
Percent of 200ft Right-of-Way that Crosses Farmland of State Importance	7.5	19.6
Prime Farmland if Protected from Flooding within the Right-of-Way (acres)	10.38	13.22
Percent of 200ft Right-of-Way that Crosses Prime Farmland if Protected from Flooding	0.8	3.5
Right-of-Way Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, Prime Farmland if Protected from Flooding (acres)	1,309.16	350.35
Percent of 200ft Right-of-Way Percent Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, Prime Farmland if Protected from Flooding	95.5	92.0
Gap Land Cover		
Right-of-Way Aquatic Environments (acres)	3.49	0.00
Right-of-Way Cropland (acres)	1,228.42	338.21
Right-of-Way Grassland (acres)	127.85	38.11
Right-of-Way Lowland Deciduous Forest (acres)	3.88	2.24
Right-of-Way Non-Vegetated (acres)	0	0
Right-of-Way Shrubland (acres)	0	0
Right-of-Way Upland Conifer Forest (acres)	0	0
Right-of-Way Upland Deciduous Forest (acres)	7.46	1.91
200ft Right-of-Way Percent of Aquatic Environments	0.3	0.0
200ft Right-of-Way Percent of Cropland	89.6	88.8
200ft Right-of-Way Percent of Grassland	9.3	10.0
200ft Right-of-Way Percent of Lowland Deciduous Forest	0.3	0.6
200ft Right-of-Way Percent of Non-Vegetated	0	0
200ft Right-of-Way Percent of Shrubland	0	0
200ft Right-of-Way Percent of Upland Conifer Forest	0	0
200ft Right-of-Way Percent of Upland Deciduous Forest	0.5	0.5
Wetlands		
Right-of-Way (Acres)	1,371.09	380.73
Total Wetlands within the Right-of-Way (acres)	10.89	1.38
Number of Wetlands Crossed by Route Corridor	48	10
Percent of the 200ft Right-of-Way that Crosses Wetlands	0.8	0.4
Forested Wetlands in Right-of-Way (acres)	0.35	0.93
Number of Forested Wetlands Crossed by Route Corridor	7	5
Percent of the 200ft Right-of-Way that Crosses Forested Wetlands	0.0	0.2
PWI and Shallow Lakes		
Number of Stream and River Crossings by Route Alignment	36	16
Number of PWI Stream Crossings by Route Alignment	19	12
Number of PWI Lakes within Route Corridor	1	0
Number of PWI Wetlands within Route Corridor	1	0
Number of PWI Lakes within 200ft Right-of-Way	1	0
Number of PWI Wetlands within 200ft Right-of-Way	0	0
Number of PWI over 900ft Crossed by Route Alignment	0	0
Length (ft) of PWI over 900ft that are Crossed by the Alignment	0	0
Number of Shallow Lakes within Route Corridor	1	0
Number of Shallow Lakes within 1 mile of Route Corridor	6	0

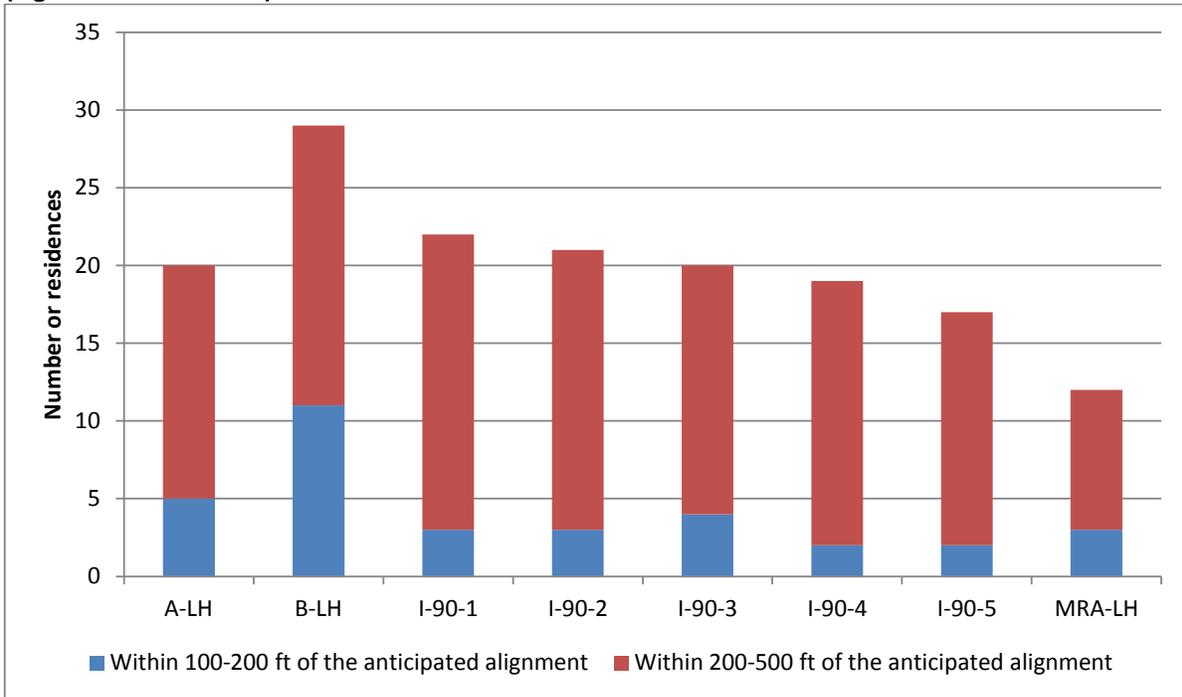
ITC Midwest- Minnesota to Iowa 345 kV Transmission Line Project

Modified Route A Divided Potential Impacts Table

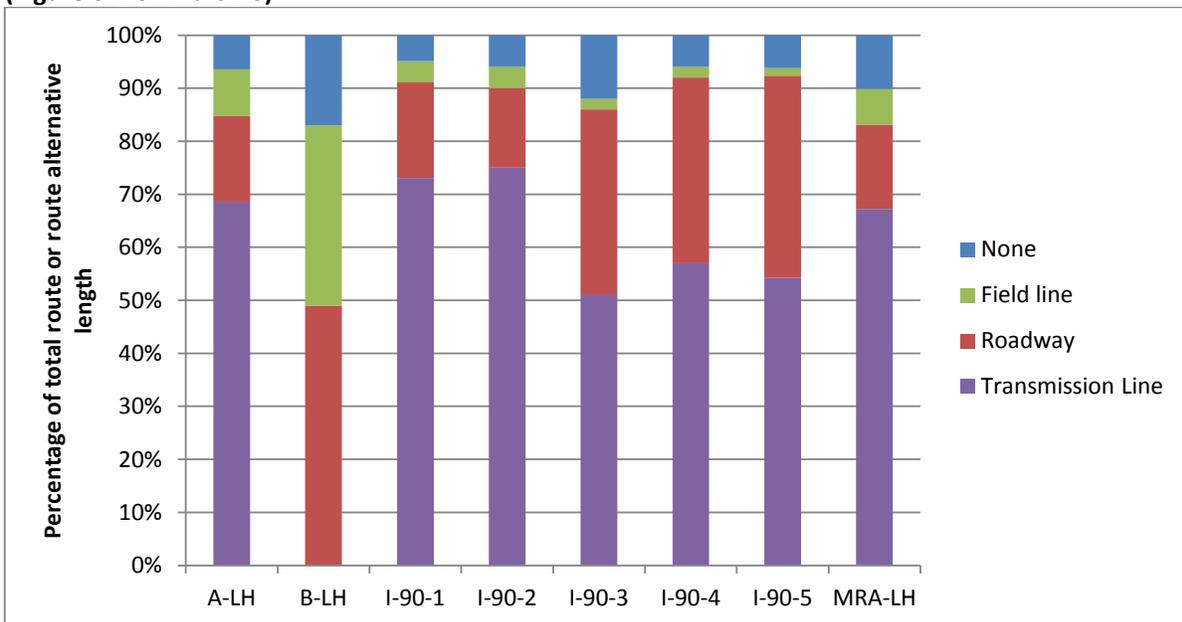
Environmental		
Right-of-Way (Acres)	1,371.09	380.73
Number of MCBS Biodiversity Sites Crossed by Route Corridor	5	1
Number of Metro Significant Resources Areas Crossed by Route Corridor	0	0
Number of WMAs in Route Corridor	0	0
Number of WMAs within 1 mile of Route Corridor	6	0
Number of WMAs within 200ft Right-of-Way	0	0
Number of WMA over 900ft that are Crossed by Right-of-Way	0	0
Lengths (ft) of WMA over 900ft that are Crossed by Right-of-Way	0.00	0.00
Number of SNA within 1 mile of Route Corridor	0	0
Number of WPA within 1 mile of Route Corridor	1	1
Number of State Parks within 1 mile of Route Corridor	0	0
Number of USFWS Lands WRP Easements within 1 mile of Route Corridor	1	0
Number of T & E Species within Route Corridor	1	0
Number of T&E Species within 1 mile of Route Corridor	21	0
Number of Archaeological Sites within 1 mile of Route Corridor	48	21
Number of Historical Sites within 1 mile of Route Corridor	13	5
Number of Alignment Snowmobile Trail Crossings	5	2

Draft EIS Chapter 6.0 Analysis with Modified Route A Included

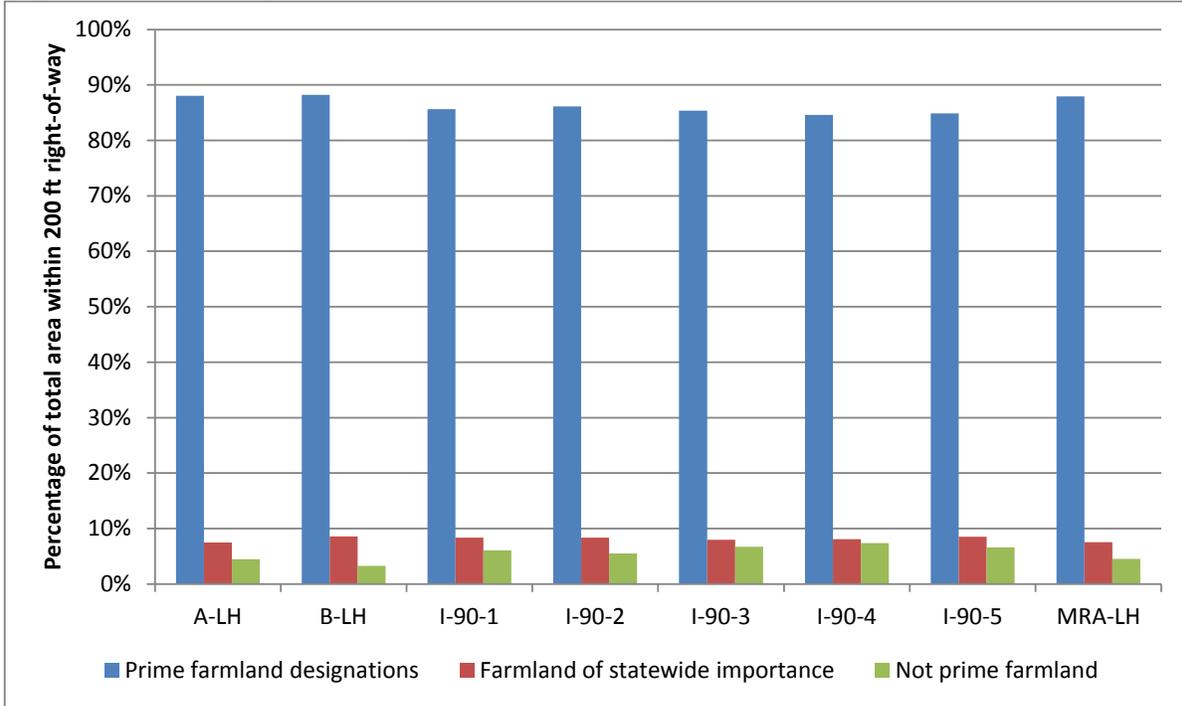
**Figure 1 - Proximity of Homes-Lakefield to Huntley
(Figure 6-1 of Draft EIS)**



**Figure 2 - ROW Sharing-Lakefield to Huntley
(Figure 6-2 of Draft EIS)**



**Figure 3 - Farmland Classification-Lakefield to Huntley
(Figure 6-3 of Draft EIS)**



**Figure 4 - Watercourse Crossings-Lakefield to Huntley
(Figure 6-5 of Draft EIS)**

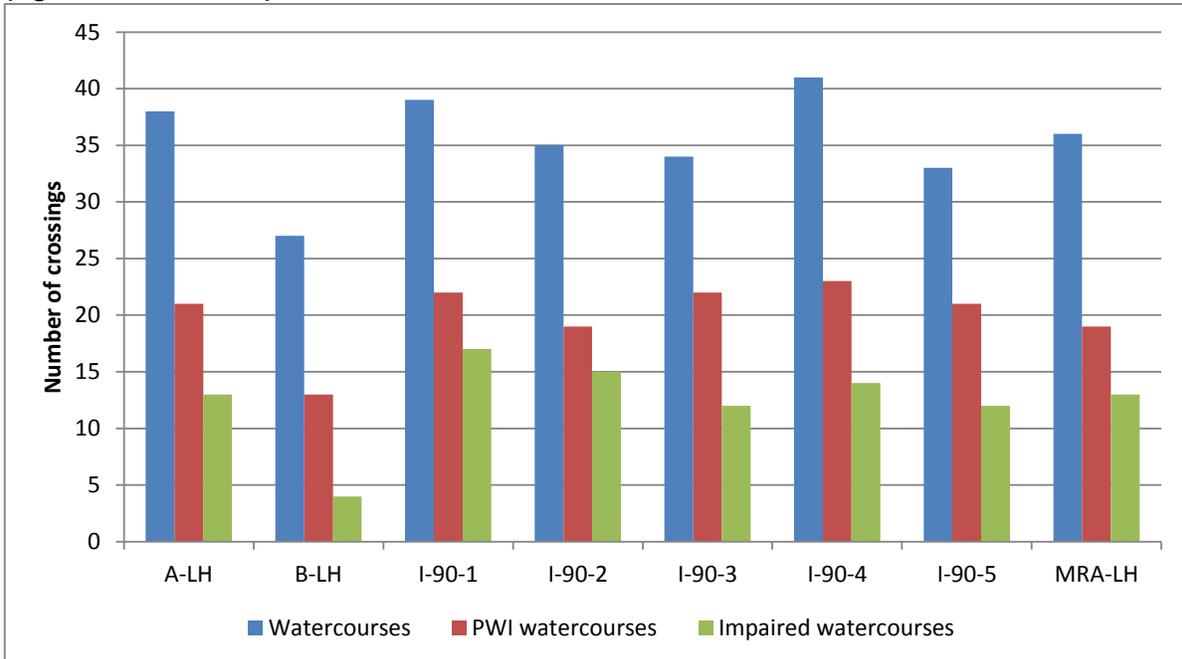


Figure 5 - Wetlands within ROW-Lakefield to Huntley
(Figure 6-7 of Draft EIS)

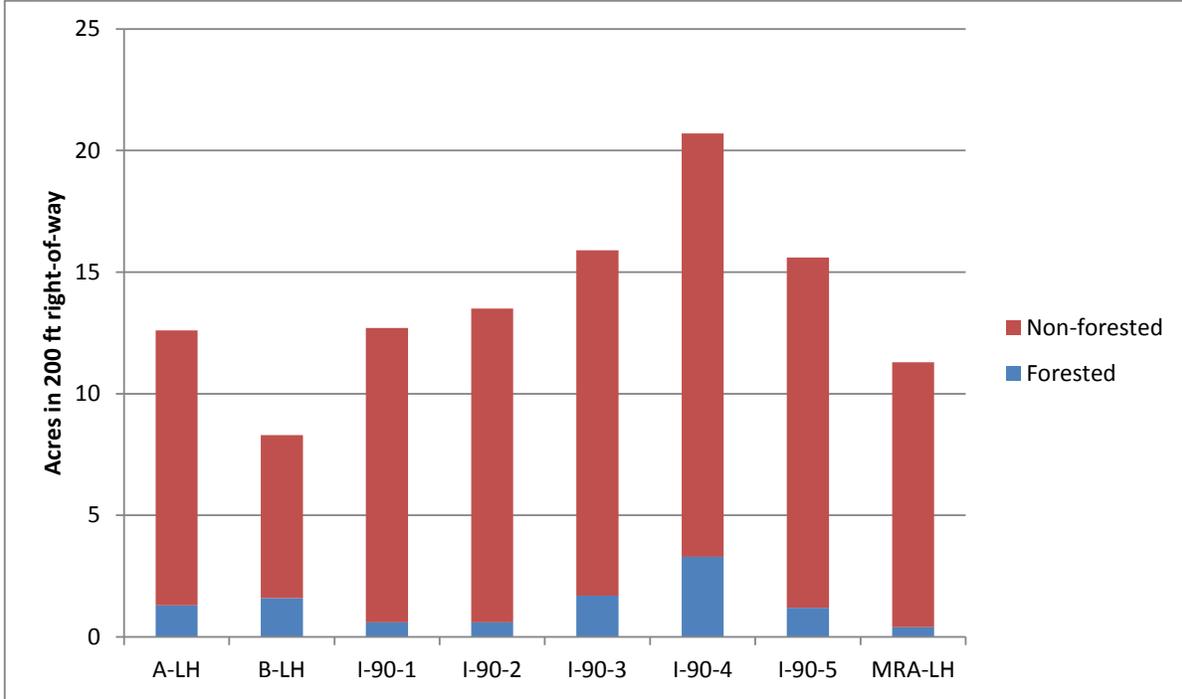
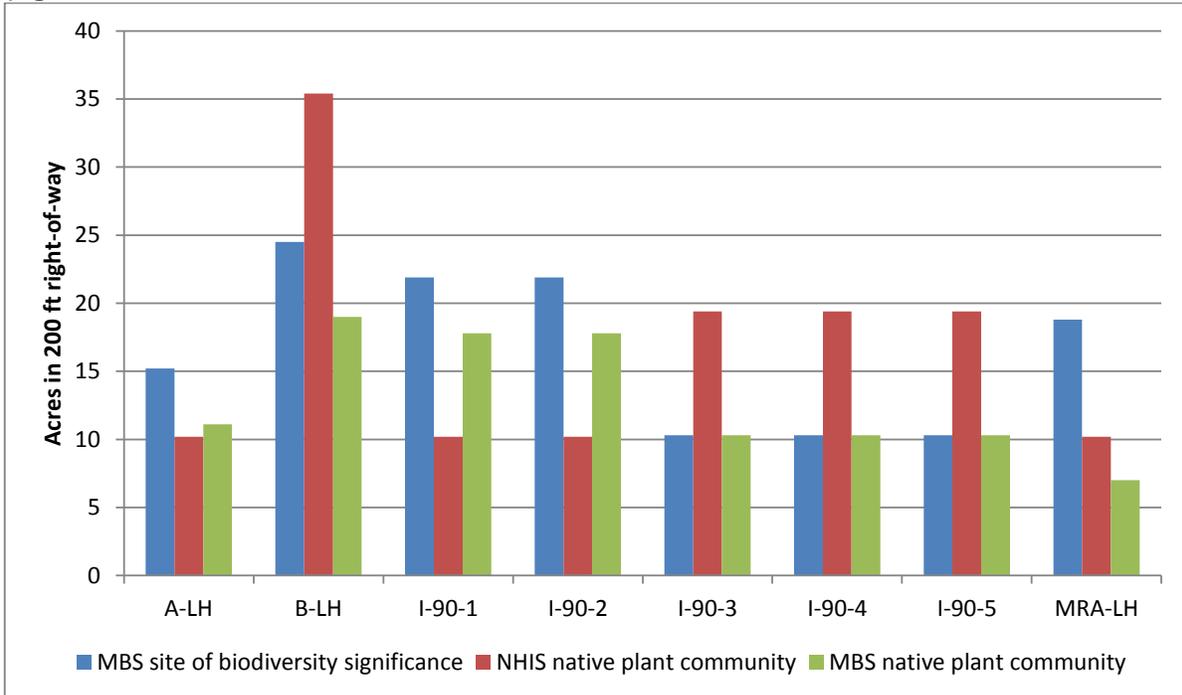
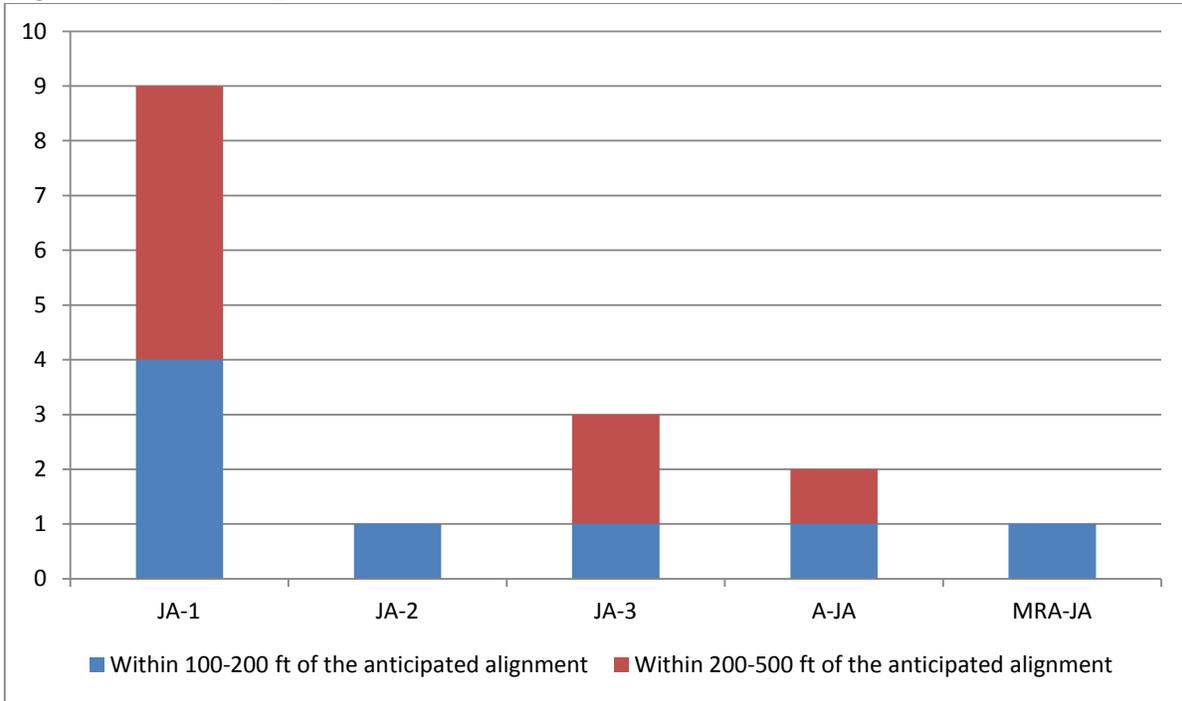


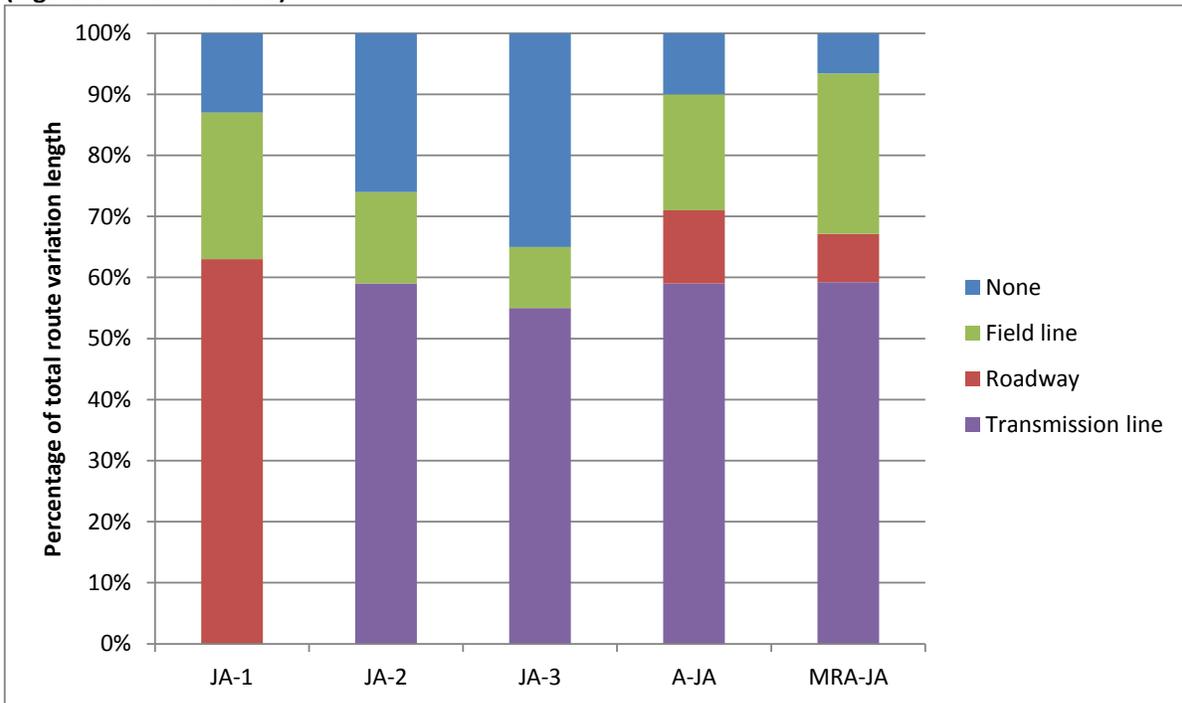
Figure 6 - Rare Plant Communities-Lakefield to Huntley
(Figure 6-9 of Draft EIS)



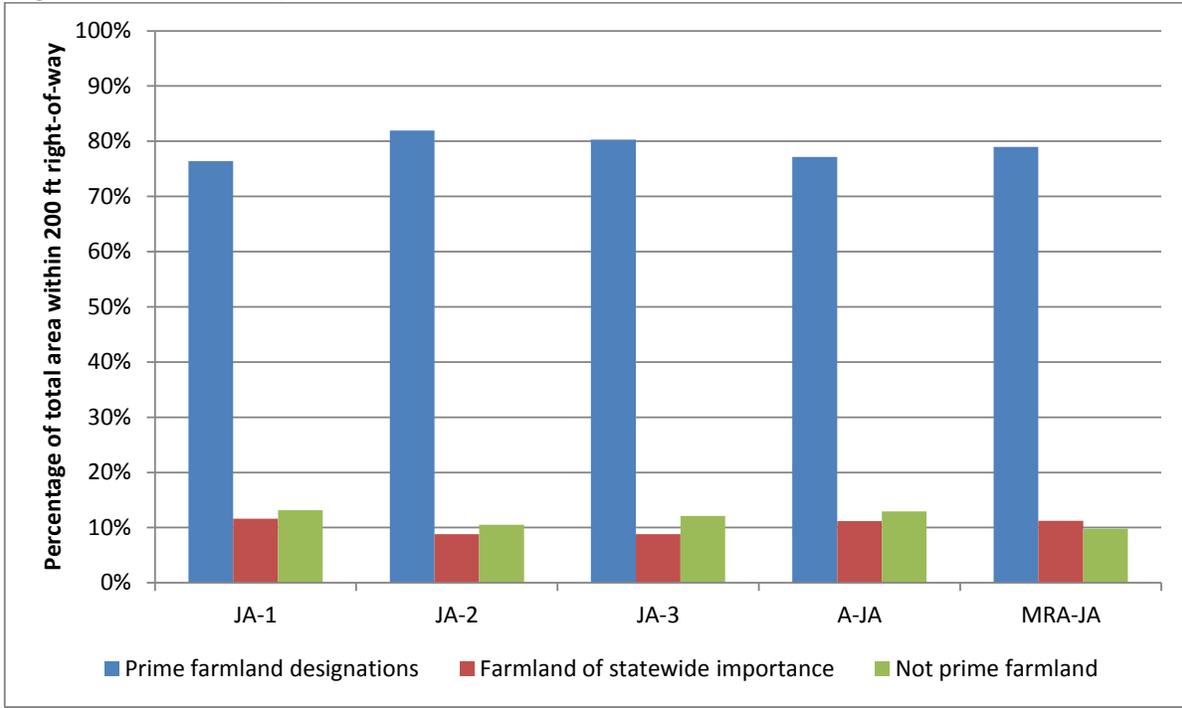
**Figure 7 - Proximity of Homes-Jackson Municipal Airport
(Figure 6-11 of Draft EIS)**



**Figure 8 - ROW Sharing-Jackson Municipal Airport
(Figure 6-12 of Draft EIS)**



**Figure 9 - Farmland Classifications-Jackson Municipal Airport
(Figure 6-13 of Draft EIS)**



**Figure 10 - Watercourse Crossings-Jackson Municipal Airport
(Figure 6-14 of Draft EIS)**

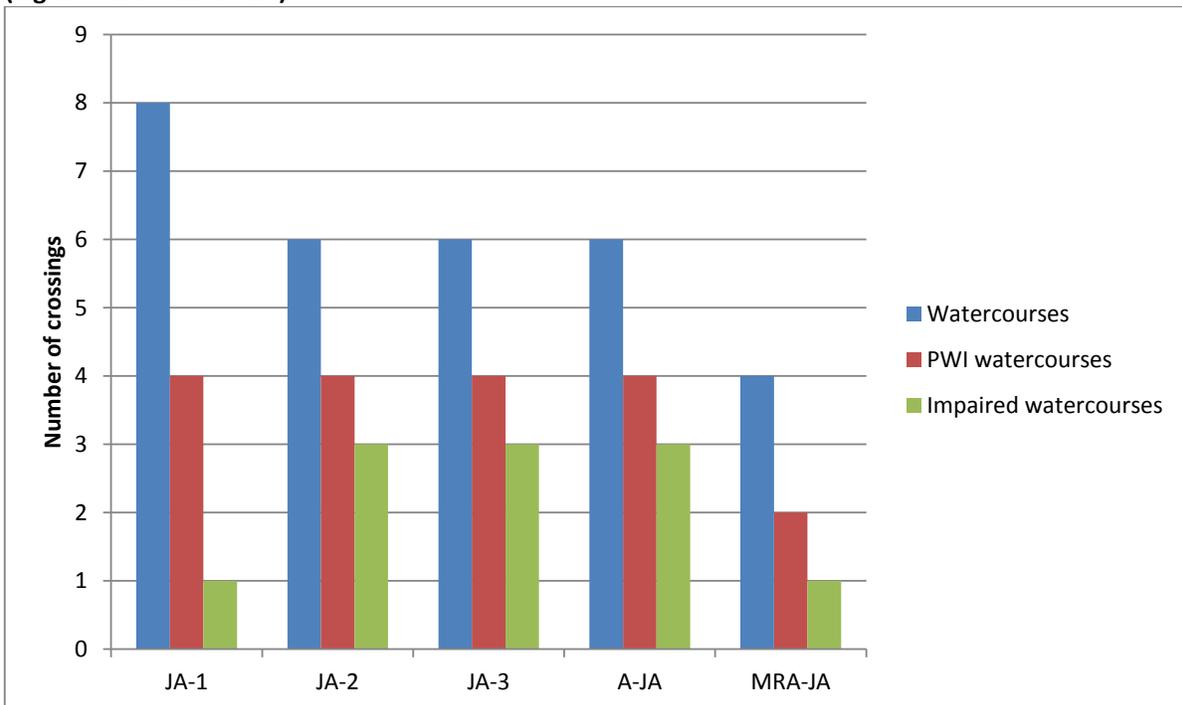
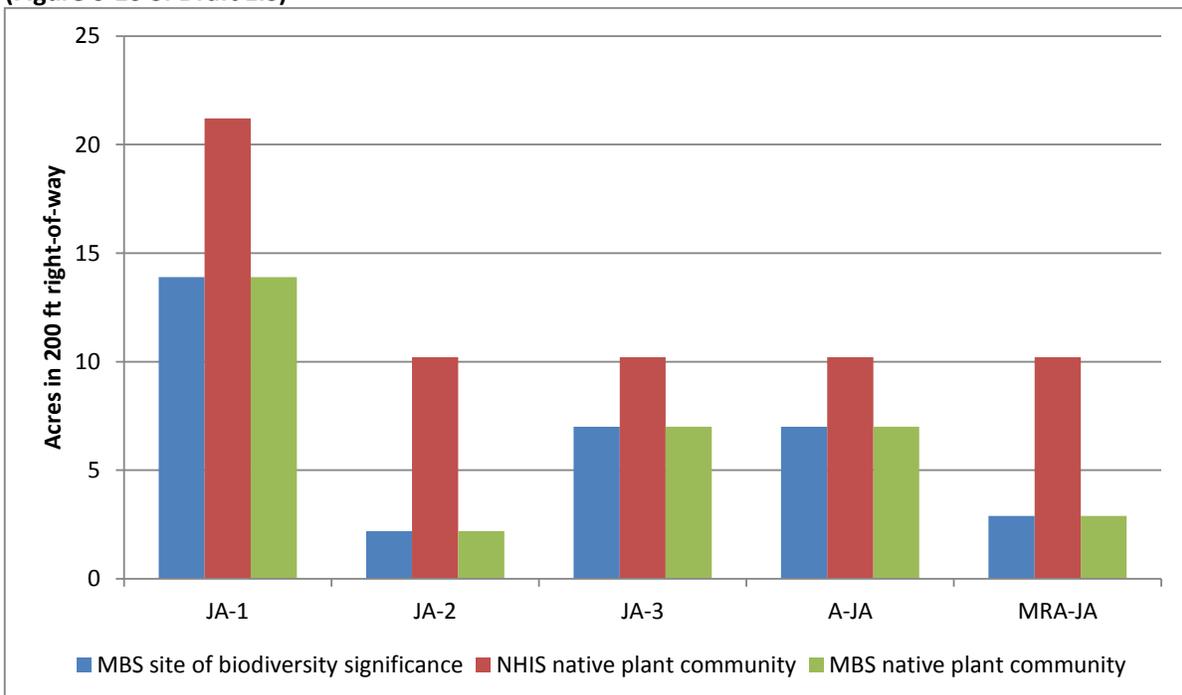


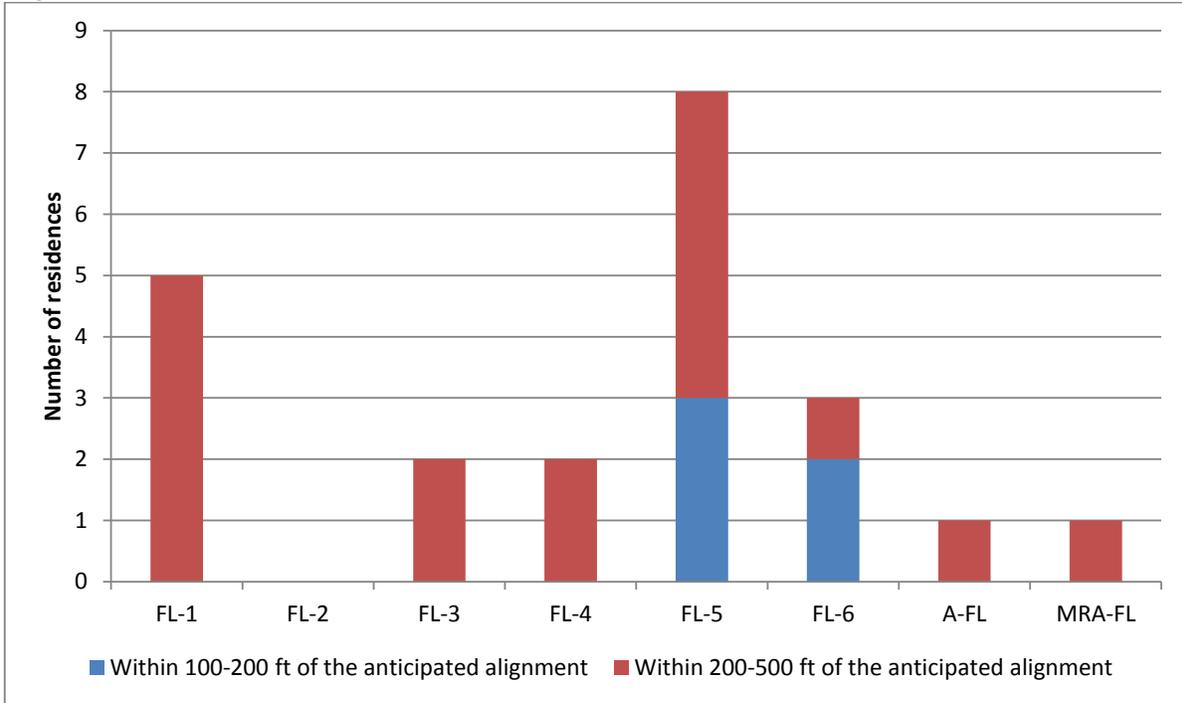
Figure 11 - Wetlands within ROW-Jackson Municipal Airport
(Figure 6-15 of Draft EIS)



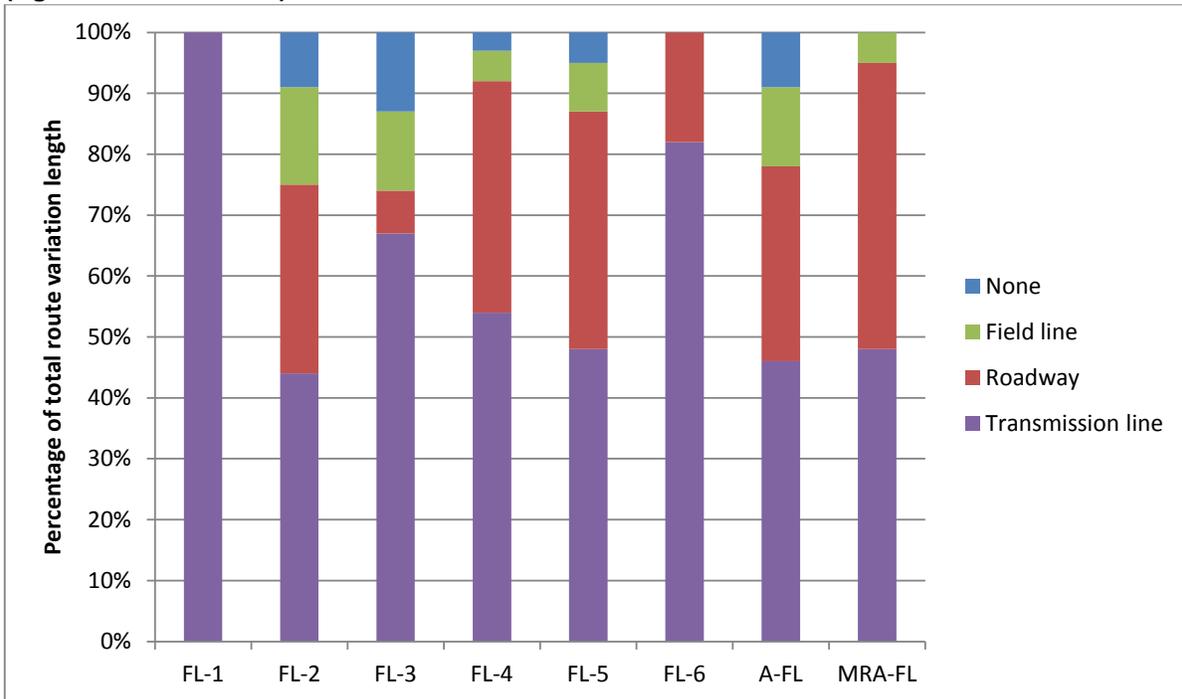
Figure 12 - Rare Plant Communities-Jackson Municipal Airport
(Figure 6-16 of Draft EIS)



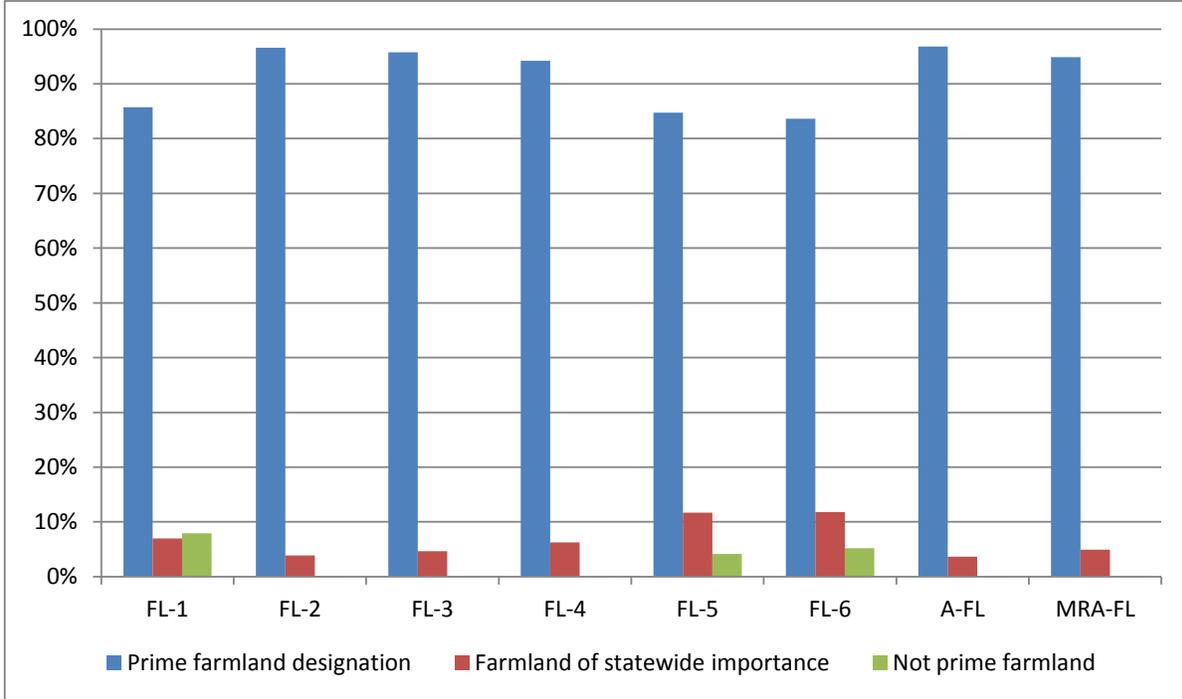
**Figure 13 - Proximity of Homes-Fox Lake
(Figure 6-17 of Draft EIS)**



**Figure 14 - ROW Sharing-Fox Lake
(Figure 6-18 of Draft EIS)**



**Figure 15 - Farmland Classification-Fox Lake
(Figure 6-19 of Draft EIS)**



**Figure 16 - Watercourse Crossings-Fox Lake
(Figure 6-20 of Draft EIS)**

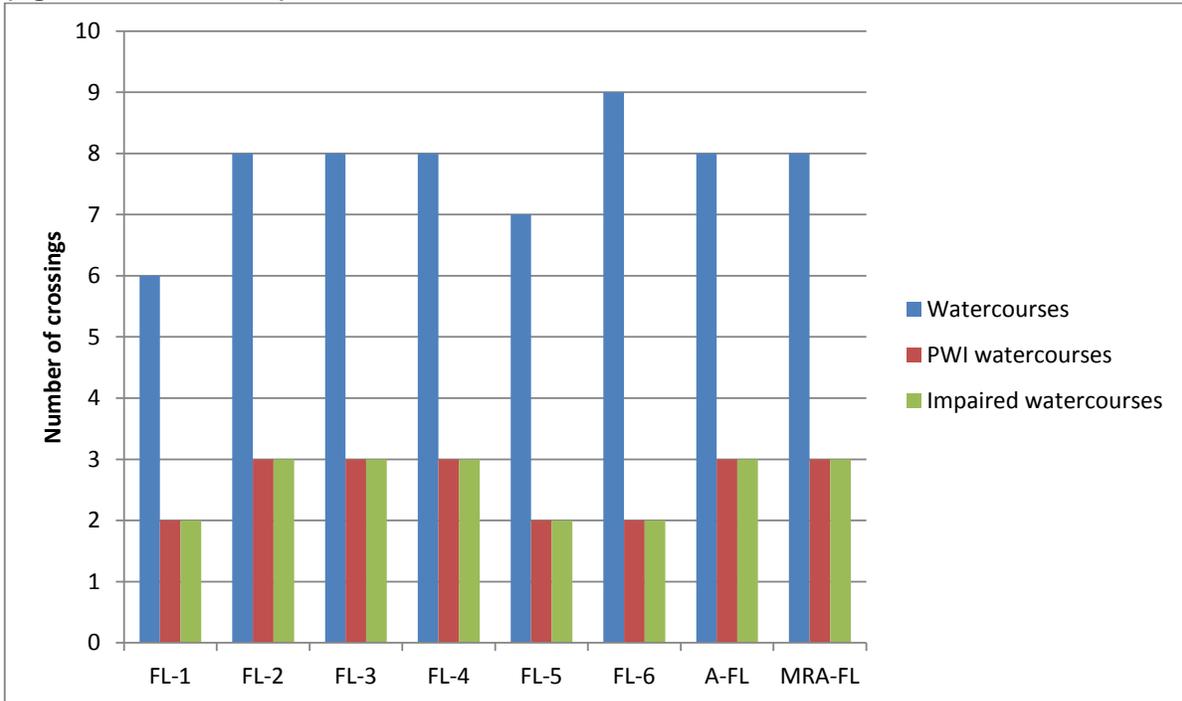
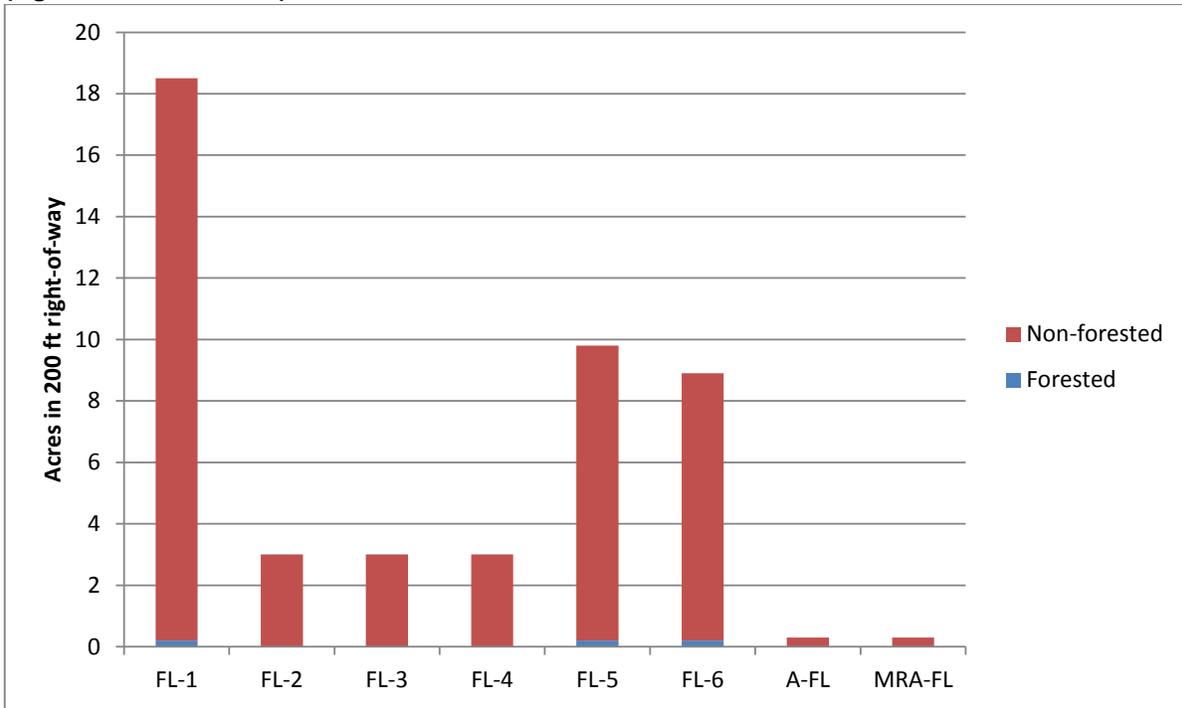


Figure 17 - Wetlands within ROW- Fox Lake*
(Figure 6-21 of Draft EIS)



*FL-1 includes the entire Fox Lake within a 200-foot ROW as a non-forested wetland

Figure 18 - Rare Plant Communities- Fox Lake
(Figure 6-22 of Draft EIS)

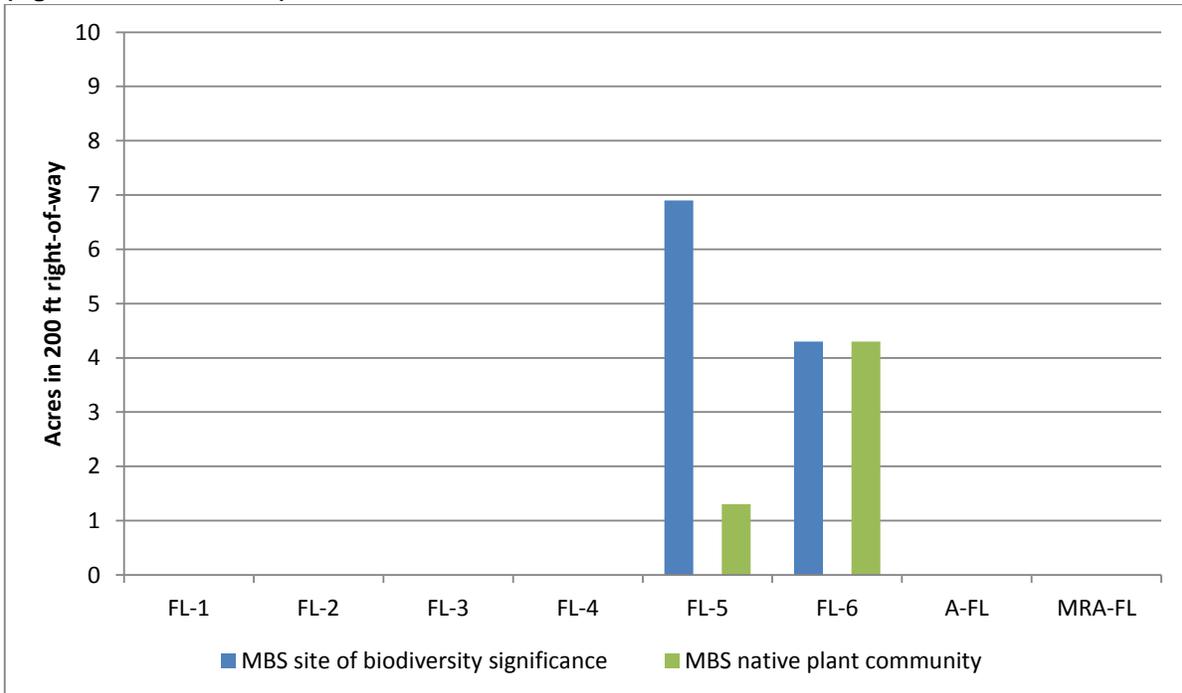


Figure 19 - Proximity of Homes- Lake Charlotte
(Figure 6-23 of Draft EIS)

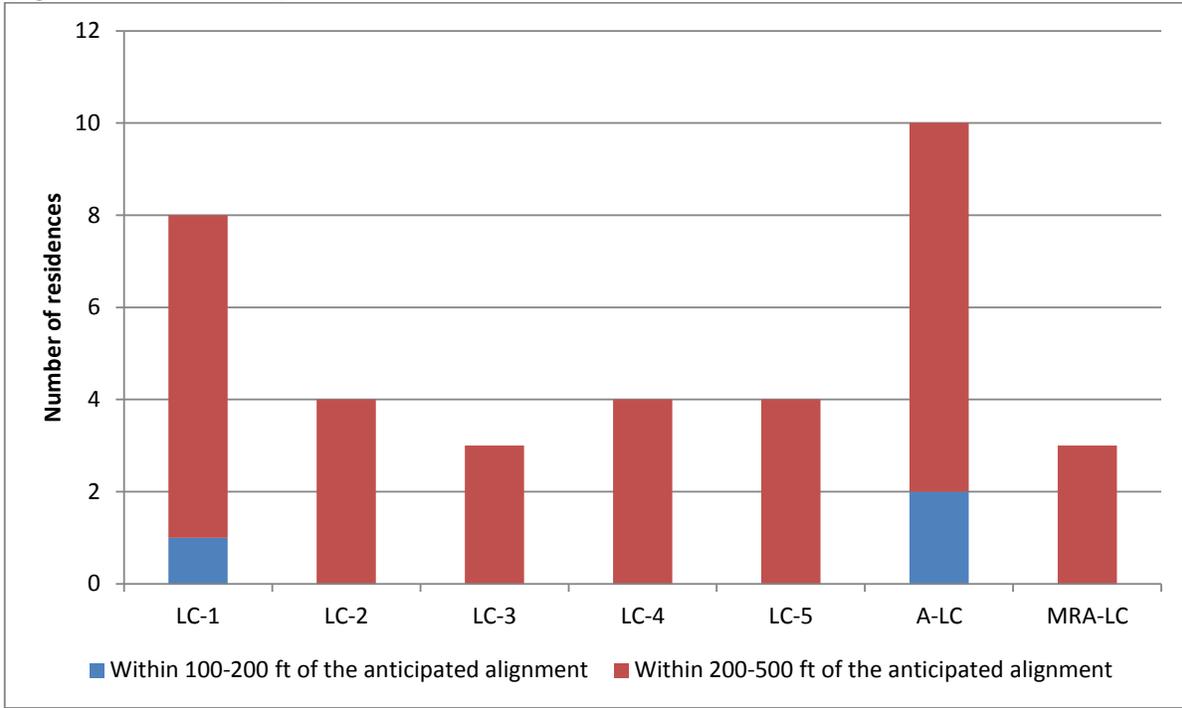


Figure 20 - ROW Sharing- Lake Charlotte
(Figure 6-24 of Draft EIS)

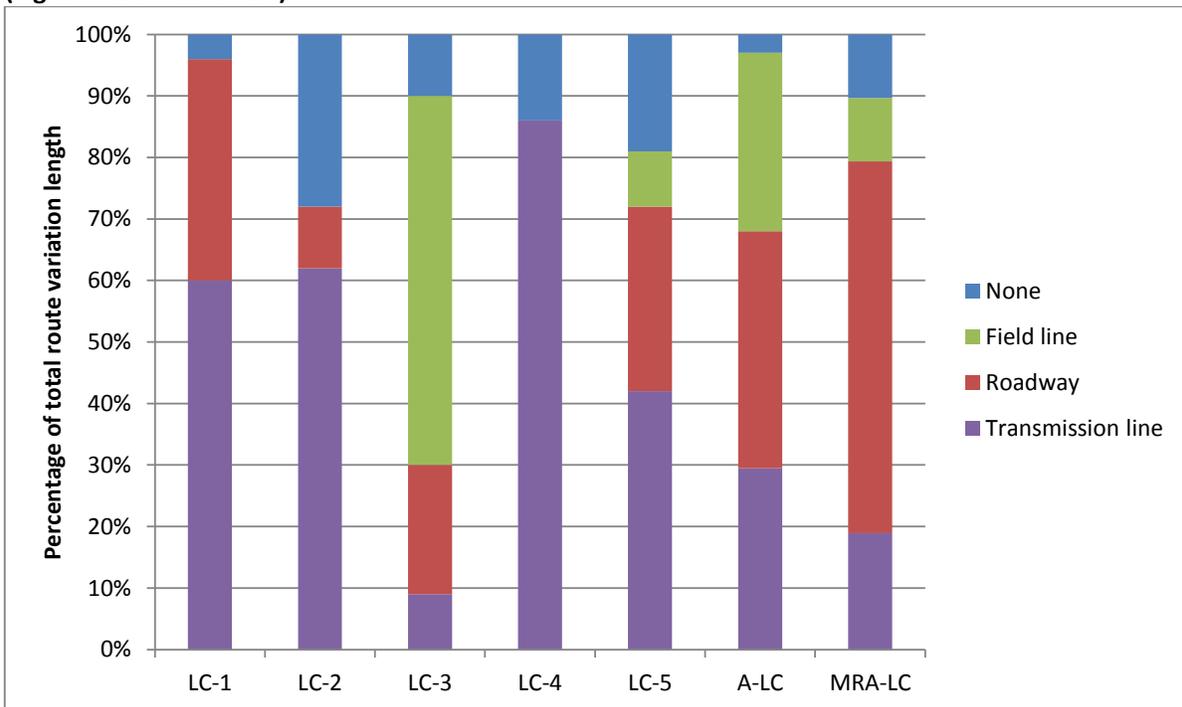


Figure 21 - Farmland Classifications- Lake Charlotte
(Figure 6-25 of Draft EIS)

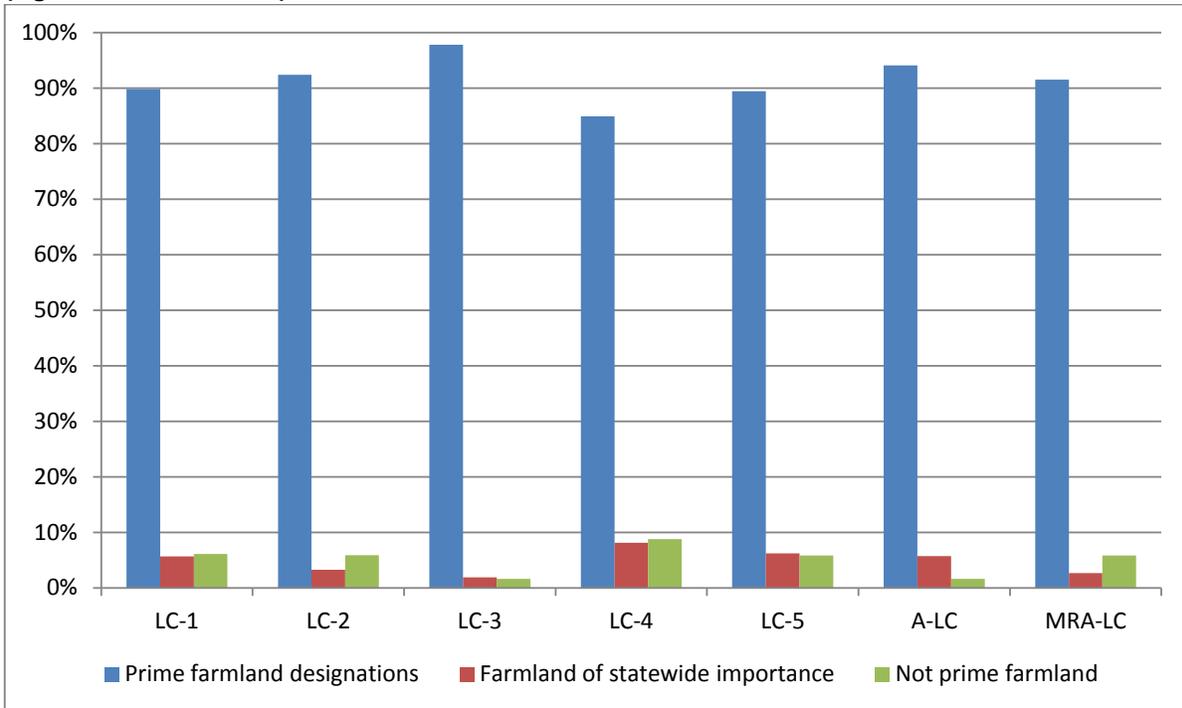


Figure 22 - Watercourse Crossings- Lake Charlotte
(Figure 6-26 of Draft EIS)

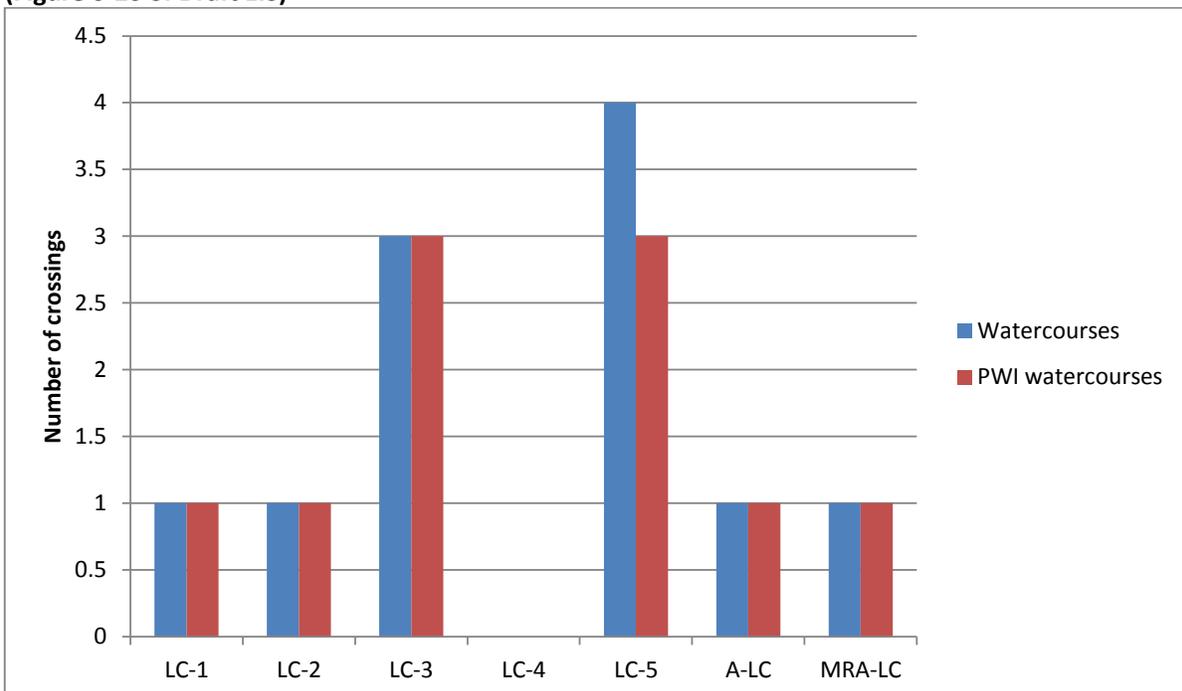
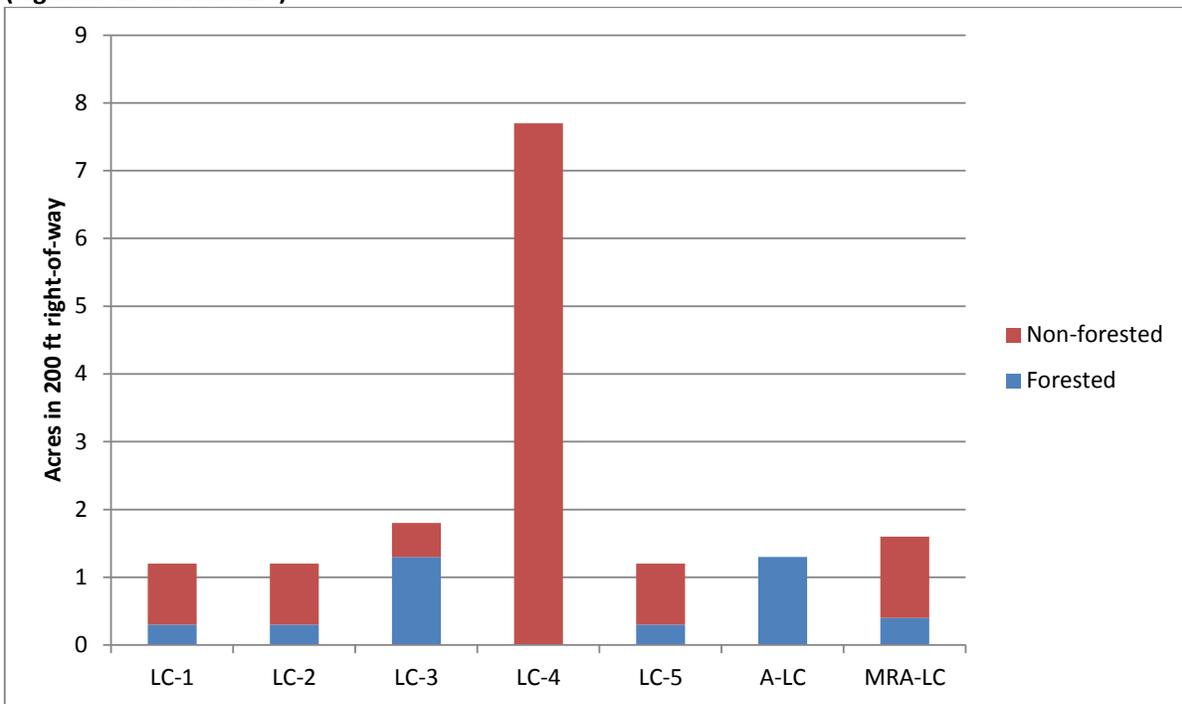
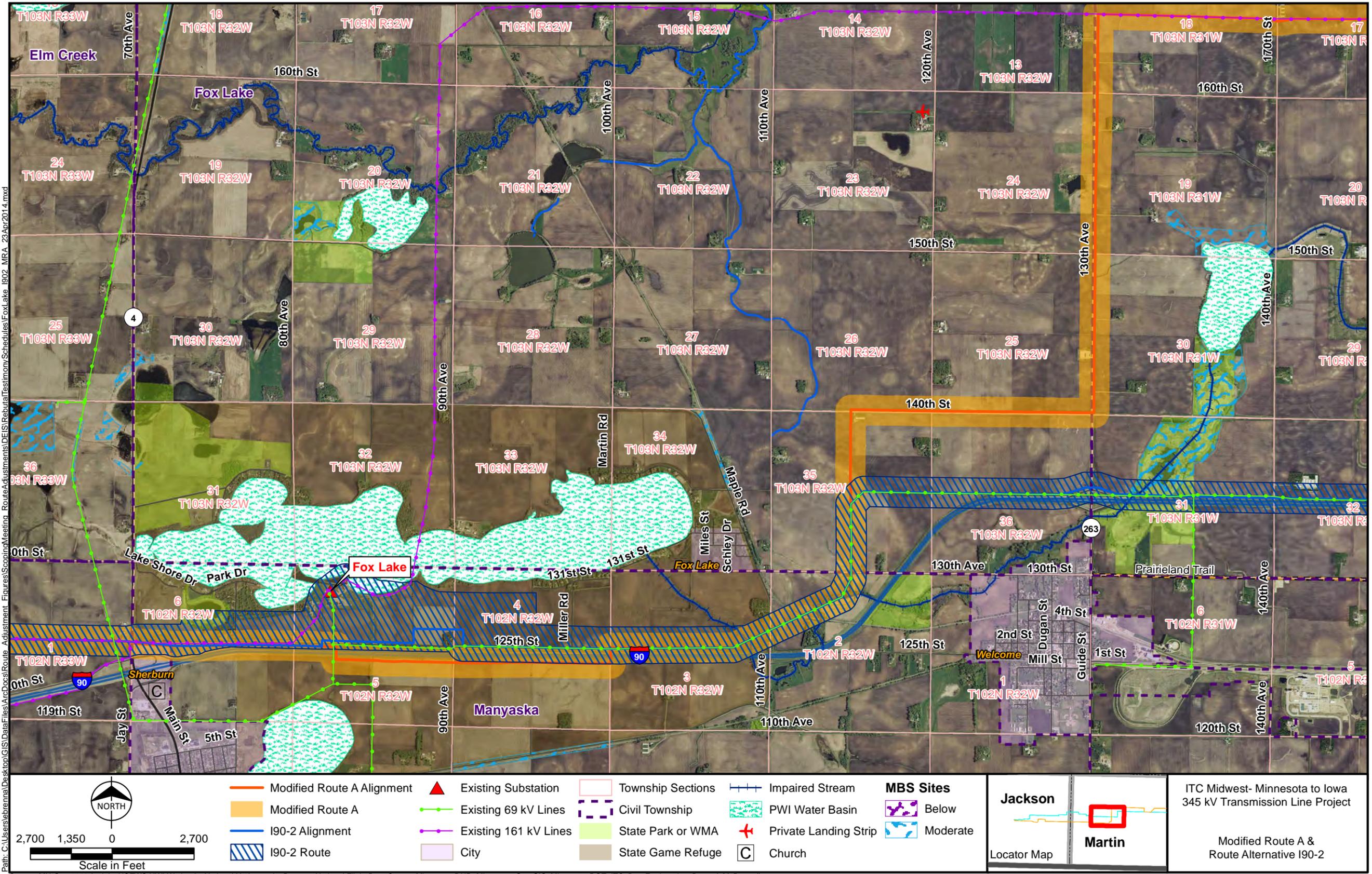


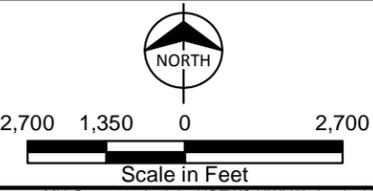
Figure 23 - Wetlands within ROW- Lake Charlotte*
(Figure 6-27 of Draft EIS)



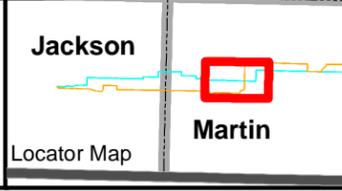
*FL-1 includes the entire Fox Lake within a 200-foot ROW as a non-forested wetland



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- | | | | | |
|----------------------------|-----------------------|-------------------|-----------------------|------------------|
| Modified Route A Alignment | Existing Substation | Township Sections | Impaired Stream | MBS Sites |
| Modified Route A | Existing 69 kV Lines | Civil Township | PWI Water Basin | Below |
| I90-2 Alignment | Existing 161 kV Lines | State Park or WMA | Private Landing Strip | Moderate |
| I90-2 Route | City | State Game Refuge | Church | |



ITC Midwest- Minnesota to Iowa
345 kV Transmission Line Project

Modified Route A &
Route Alternative I90-2

Figure 7-2 Relative Merits of Route Alternatives and Associated Facilities - Lakefield to Huntley

Routing Factor/ Element	A-LH	B-LH	I90-1	I90-2	I90-3	I90-4	I90-5 Option 1	I90-5 Option 2	DEIS Summary	MRA-LH Summary
Human Settlements / Aesthetics	●	■	●	●	▲	●	▲	●	A-LH and I90-2 best utilize existing transmission line ROW. B-LH is near more homes and poorly utilizes existing ROW.	MRA-LH makes use of a comparable amount of total corridor sharing with I90-1 and I90-2. The alternatives along I-90 would have greater corridor sharing with roads than MRA-LH. MRA-LH would impact the fewest residences within 500 feet of the alignment by at least five homes when compared to I90-1 and I90-2. I90-1 and I90-2 would introduce a new transmission corridor along State Highway 15 and portions of I-90 and expand the ROW along I-90 to 200 feet in areas with an existing 161 kV line, such as west of Sherburn. MRA-LH would introduce a new transmission corridor along the south side of I-90 and in Sections 3, 4, and 5 of Fox Lake Township. MRA-LH would rebuild approximately 5.6 miles of 161 kV line to 345 kV/161 kV on double-circuit structures between Fox Lake and Lake Charlotte. MRA-LH would also co-locate approximately four miles of existing 69 kV transmission line on 345 kV/161 kV/69 kV triple-circuit structures, with 2.1 miles along the existing 69 kV centerline. I90-1 and I90-2 would rebuild approximately 13 miles of 69 kV line to 345 kV/161 kV/69 kV on triple-circuit structures between Fox Lake and Lake Charlotte.
Human Settlements / Private Airstrips	■	●	●	●	●	●	●	●	A-LH impacts two private airstrips in Martin County	In comparison to A-LH, MRA-LH does not impact any private airstrips within a half mile of the alignment. There would be no measurable difference between the DEIS route alternatives and MRA-LH with respect to private airstrips.
Land-Based Economies / Agriculture	●	■	▲	●	▲	▲	▲	▲	A-LH uses existing transmission line ROW, which minimizes agricultural impacts. Using I-90 does not mitigate agricultural impacts as well as using transmission line ROW. B-LH proceeds cross country, primarily along roadways and field lines.	MRA-LH would cross fewer new agricultural lands along I-90 compared to the I-90 alternatives, particularly I90-1, I90-3, I90-4, and I90-5, which use a smaller portion of the Route A/existing 161 kV corridor compared to I90-2. One possible configuration for I90-1 and I90-2 would remove approximately 345.9 acres of existing transmission line through agricultural land as a result of removing both lake crossings at Fox Lake and Lake Charlotte. It is unlikely that I90-1, I90-2, I90-3, I90-4, and I90-5 would be able to be constructed along the same centerline as the existing 69 kV transmission line between Fox Lake and Fairmont, MN because of the existing 69 kV transmission line proximity to the MnDOT ROW.
Archaeological and Historic Resources	▲	●	▲	▲	●	▲	●	●	A-LH, I90-1, I90-2 and I90-4 contain known archaeological resources in their ROWs.	As with A-LH, I90-1, I90-2, and I90-4, the route width for MRA-LH contains known archaeological resources in its ROW.

ITC Midwest's DEIS Comment Letter
Attachment A

Schedule 29
Middleton Rebuttal
PUC Docket Nos. ET6675/CN-12-1053 and ET6675/TL-12-1337
OAH Docket No. 60-2500-30782

Routing Factor/ Element	A-LH	B-LH	I90-1	I90-2	I90-3	I90-4	I90-5 Option 1	I90-5 Option 2	DEIS Summary	MRA-LH Summary
Natural Environment / Fauna	▲	▲	▲	▲	▲	▲	▲	▲	All routing options have the potential to would impact avian species through collisions with conductors. Impacts could be mitigated by the use of bird flight diverters near lakes and watercourses.	MRA-LH is not proposed to remove the existing 161 kV crossings at Fox Lake and Lake Charlotte. MRA-LH is, however, proposed to be constructed on 345 kV/161 kV double-circuit and 345 kV/161 kV/69 kV triple-circuit structures, where applicable, to allow relocation of the 161 kV line from the lakes to the new structures if warranted. MRA-LH is proposed to reduce the footprint of the transmission line across the Des Moines River and remove the existing 161 kV line from the Blue Earth River corridor south of the Proposed Northern Huntley Substation, resulting in a reduced potential impact to species that utilize these habitats
Use or Paralleling of Existing ROWs	●	■	●	●	▲	●	▲	●	Route B-LH makes the least use of existing ROW. I90-3 and I90-5 have associated facilities that use existing ROW only in part.	MRA-LH makes use of existing ROWs similar to A-LH. The associated facilities for MRA would follow existing transmission ROWs, although it would be expanded from its current width to a maximum of 250 feet. Associated facilities for I90-5 Option 1 would introduce new transmission ROW through Prescott, Verona, Jo Davies, and Blue Earth townships. Associated facilities for I90-5 Option 2 would result in one new transmission ROW through Blue Earth and Jo Davies townships.
Electrical Systems Reliability	●	●	●	●	●	■	●	■	I90-4 and I90-5 Option 2 negatively impact electrical systems reliability.	MRA-LH would not negatively impact electrical systems reliability.

Figure 7-3 Relative Merits of Route Variations - Jackson Municipal Airport

Routing Factor/ Element	JA-1	JA-2	JA-3	A-JA	Summary	DEIS Issues	MRA-JA Summary
Human Settlements / Aesthetics	■	●	▲	▲	JA-2 is near fewer homes and better utilizes existing transmission line ROW. JA-1 is near the most number of homes, is relatively longer, and would create two transmission line ROWs.	JA-2 crosses through the center of several fields to the north of 820th Street and uses a limited amount of existing transmission line ROW.	MRA-JA would be the shortest variation north of Jackson Municipal Airport (7.6 miles). MRA-JA would use additional span length and pole placement to reduce the presence of transmission line in the southeast corner of Section 3 of Des Moines Township. MRA-JA would increase proximity of the line to a residential well and hog confinement buildings along 820 th Street when compared to A-JA.
Land-Based Economies / Agriculture	▲	●	▲	▲	JA-2 best utilizes existing transmission line ROW. A-JA utilizes roadway ROW but impacts a well and associated animal housing units.		MRA-JA addresses concerns with A-JA regarding the well and housing units. MRA-JA would result in a slight increase in new ROW across agricultural land in Sections 1 and 2 of Des Moines Township to avoid proximity concerns with the Jackson Municipal Airport. MRA-JA has the second smallest acreage of cropland in the right-of-way, behind JA-1.
Natural Environment / Fauna	▲	●	▲	▲	JA-2 is furthest from flora and fauna along the Des Moines River.		MRA-JA responds to MnDNR comments regarding reducing the transmission line footprint though the Des Moines River corridor and accommodating a perpendicular crossing of the Des Moines River.
Use or Paralleling of Existing ROWs	●	●	▲	●	A-JA best utilizes existing ROWs. JA-1 utilizes roadway ROW.		Similar to A-JA, MRA-JA utilizes the existing 161 kV transmission ROW and the roadway ROW along 820 th Street while addressing landowner concerns along this road. MRA-JA maximizes the use of existing ROWs by using these ROWs approximately 67% of its length.

Figure 7-4 Relative Merits of Route Variations - Fox Lake

Routing Factor / Element	FL-1	FL-2	FL-3	FL-4	FL-5	FL-6	A-FL	Summary	MRA-FL Summary
Human Settlements / Aesthetics	●	●	▲	▲	▲	●	▲	FL-2 and A-FL are near relatively fewer homes, but both introduce a new transmission line ROW. FL-1 and FL-6 best utilize existing transmission line and roadway ROW.	With the exception of FL-2, MRA-FL would have the lowest number of residences within the route corridor (one residence) when compared to the other Route Variations. FL-3 and FL-4 would place a new transmission line on three sides of the residence in Section 5 of Fox Lake Township. Both MRA-FL, A-FL, and FL-2 would avoid this residence by placing the new 345 kV transmission line on the south side of I-90. In addition, MRA-FL would remove the existing 69 kV line for a portion of the north side of I-90 and relocate it to the south side, eliminating the presence of the existing transmission line near the residence in Section 5 of Fox Lake Township.
Human Settlements / Private Airstrips	●	■	■	●	●	●	■	FL-2, FL-3 and A-FL impact a private airstrip in Fox Lake Township.	MRA-FL would relocate the transmission line from Section 23 in Fox Lake Township to the east along 130 th Avenue.
Land-Based Economies / Agriculture	●	▲	▲	▲	▲	●	▲	FL-1 and FL-6 best utilize existing ROW, thus minimizing agricultural impacts. Along FL-1, H-frame structures would be replaced with single pole structures.	In order to avoid residential proximity and MnDOT ROW issues to the north, MRA-FL would place a new transmission ROW through agricultural land on the south side of I-90. To provide access to the outside edge of the fields with large equipment, MRA-FL is proposed to be located 100 feet from the MnDOT ROW. East of Fox Lake, MRA-FL would be located primarily along existing transmission and roadway ROW, limiting potential impacts to agricultural activities
Natural Environment / Fauna	▲	▲	▲	▲	▲	▲	▲	Avian impacts could be mitigated for all routing options by the use of bird flight diverters. FL-1 would require specialty structures for crossing Fox Lake; the design of these structures could minimize avian impacts.	MRA-FL would avoid the Four Corners and Fox Lake WMAs and, along with FL-2, would represent the alternative farthest from avian habitat associated with the surrounding WMAs and Fox Lake State Game Refuge, resulting in a decreased likelihood of collision issues for avian species that utilize these habitats.
Use or Paralleling of Existing ROWs	●	▲	▲	▲	▲	●	▲	FL-1 and FL-6 utilize existing transmission line and roadway ROW for their entire lengths.	MRA-FL would result in a new transmission corridor on the south side of I-90, but would utilize existing transmission and roadway ROW east of Fox Lake. MRA-FL would also co-locate the existing 69 kV line currently on the north side of I-90 to the south side with the 345 kV line on 345 kV/161 kV/69 kV triple-circuit structure, creating one transmission ROW.345/161/69 kV line.

Figure 7-5 Relative Merits of Route Variations - Lake Charlotte

Routing Factor / Element	LC-1	LC-2	LC-3	LC-4	LC-5	A-LC	Summary	MRA-LC Summary
Human Settlements / Aesthetics	●	▲	●	●	▲	▲	LC-3 is near relatively fewer homes. LC-1 and LC-4 best utilize existing transmission line and roadway ROW.	As with LC-3, MRA-LC has the fewest residences within the route width (3) compared to the other Lake Charlotte Route Variations. MRA-LC would make use of existing transmission and roadway ROWs along 160 th Street and would co-locate the existing Great River Energy 69 kV line that parallels 160 th Street in Sections 19 and 20 of Rutland Township on 345 kV/161 kV/69 kV triple-circuit structures.
Human Settlements / Private Airstrips	▲	▲	●	▲	●	▲	LC-1, LC-2, LC-4 and A-LC may impact an airstrip in Rutland Township.	As with LC-5 and LC-3, MRA-LC would avoid proximity concerns with the airstrip in Section 18 Rutland Township.
Land-Based Economies / Agriculture	●	▲	▲	●	▲	▲	LC-1 and LC-4 best utilize existing ROW, thus minimizing agricultural impacts. Along LC-4, H-frame structures would be replaced with single pole structures.	MRA-LC would extend through Section 13 of Fraser Township using field lines and extend eastward making use of roadway ROW along 160 th Street for a majority of its length, limiting agricultural impacts compared to those alternatives such as A-LC and LC-3 that would create a new transmission ROW across agricultural land.
Natural Environment / Fauna	▲	▲	▲	▲	▲	▲	Avian impacts could be mitigated for all routing options by the use of bird flight diverters. LC-4 would require specialty structures for crossing Lake Charlotte; the design of these structures could minimize avian impacts.	MRA-LC would likely reduce potential for avian interference compared with LC-4 which crosses the lake. MRA-LC would make use of an existing transmission ROW at the southern edge of Lake Charlotte. MRA-LC would increase the height of structures from the existing 69 kV structures. This may result in potential for additional collision concerns with avian species; this would be minimized through the use of bird diverters along this portion of the line.
Use or Paralleling of Existing ROWs	●	▲	■	●	▲	▲	LC-1 and LC-4 best utilize existing transmission line and roadway ROW. LC-3 shares less than 30 percent of its length with transmission line and roadway ROW.	As with LC-5, MRA-LC would follow existing transmission and roadway ROWs along 160 th Street and the existing Great River Energy 69 kV line that parallels 160 th Street. A small portion would follow a field line between 160 th Street and the existing 161 kV transmission line near State Highway 15.