FEIS ID #124

**Langan, Matthew (COMM)**

**From:** Mark Lenway [marklenway@gmail.com]
**Sent:** Thursday, April 28, 2011 8:01 PM
**To:** Langan, Matthew (COMM)
**Subject:** PUC Docket #E002/TL-09-1448

Mr. Langan,

124A I'm Mark Lenway. I'm from Kenyon, Minnesota at 44755 50th Avenue, Holden Township, in Goodhue County. My wife and I bought this 233 acre property in 2006. We looked for 15 years before we found what we wanted. This acreage has 131 tillable. The rest is oak savanna with a small creek and 5 designated wetland areas. We love it. If the route taken is other than the Highway 52 corridor, our property would be dissected west to east AND north to south. The north to south segment would go right over our house. We, and the flora and fauna, don't want, don't need, and would be the lesser if the line came over our habitat. Thank you.

Regards, Mark Lenway

1

**124A.**

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

FEIS ID #125

Cornerstone BAPTIST CHURCH

RECEIVED MAY 3 2011 MAILROOM

113 2nd Street SW, Pine Island, MN 55963 ♦ 507/356-4306
www.cornerstonebaptistchurch.info

April 28, 2011

Matt Langan
State Permit Manager
Minnesota Office of Energy Security
85-7th Place East, Suite 500
St. Paul, MN 55101-2198

Mr. Langan,

I am writing concerning the CAPXX2020 power line project on US Hwy 52 south of Pine Island. Our congregation recently built a new church immediately bordering Highway 52 on a seven acre plot of land. The Southwest corner of our parking lot is about 50' away from the highway, perched above/overlooking the highway. We are concerned about stray voltage in the parking lot used for children's ministry carnivals and other kids' activities such as skateboarding and basketball. We are also concerned about future limitations to constructing future phases of the church building due to rights of influence or easements.

125A

125B

In the grand scheme of things, we know that our church's lone concerns are of little consequence. But we are writing as just one small voice among many in an area slated for future development called "Elk Run." We hope our comments to you are helpful in making your decision. Please consider taking the towers in a westerly direction north of our city. This would avoid our area of development in favor of rural and undeveloped areas.

125C

Our congregation has consented to my writing of this letter. So I am speaking on behalf of the membership of Cornerstone Baptist Church.

Sincerely,

Tony Lillie
Chairman of Deacons
Cornerstone Baptist Church

**125A.**
See Section 7.1 of the EIS.

**125B.**
Stray voltage would not affect children using the parking lot to play on. Likewise, the weight of available evidence indicates that magnetic fields do not pose a health threat particularly at the levels modeled in this area due to the proposed transmission line. Regarding the potential for structures affecting the church expansion plans, that is a possibility if this route is selected, but any conflict with transmission structures could be minimized by working closely with the utilities on pole placement in the area.

**125C.**
Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

FEIS ID #126

Matt Langan
State Permit Manager
Minnesota Office of Energy Security
85-7th Place East, Ste 500
St. Paul, MN 55101-2198

28 APR 11

Dear Mr. Langan,

Re: comment on CAPXX2020.

126A I wish to file an objection to the proposed routing of the 161 KV power line traveling down 210 Ave to US Hwy 52, and then SE to Olmsted County Rd 31.

I own property along both sides of 210 Ave. as shown on the enclosed map. I live on the West side of 210, and own the property that extends down to Hwy 52.

The use of the land for the power line further divides my property, and hinders development of the commercially viable use of the property along the area fronting US Hwy 52.

126B I have included a map showing a possible routing that would preclude the incursion, and division of my property, that would most certainly diminish the future value of my property. This route is also preferred by other land owners adjacent to my property, and according to the Pine Island future land use map, minimizes conflict on land use..

I have spoken to several of the contiguous land owners, who will also suffer substantial value loss, as well as the aesthetic damage to our properties due to the towers required.

126C Please reconsider the Northern route that is shown on the map, as Exhibit A.

The proposed future land use shows that the area along MN Hwy 52 is Commercial use and residential, and Healthy Living Facility..

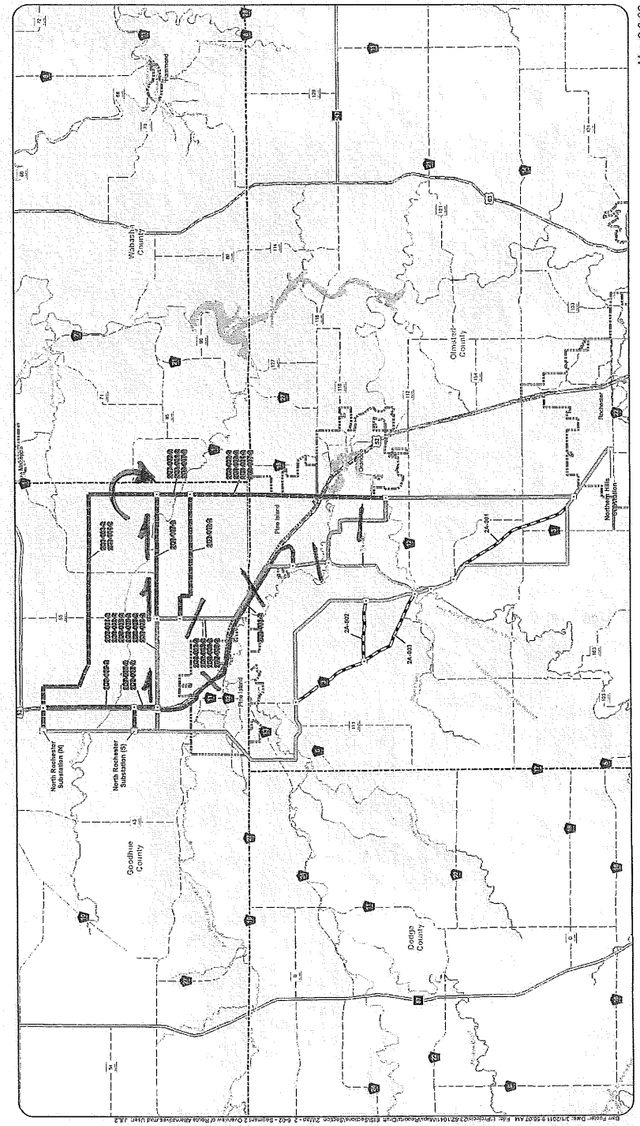
Sincerely yours,

J Grafton Love, Jr. aka:Tony Love
51525 North 210 Ave.
Pine Island, MN 55963

Phone 507-319-8818

Cc: Attorney.
City Of Pine Island.
Other involved land owners.

EXHIBIT A




Combine 161 KV & 345 KV Along this Route.
Eliminate This Route & combine with N along marked Route.

FEIS ID #126

**126A.**
Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

**126B.**
See Section 7.2 of the EIS.

**126C.**
Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

FEIS ID #127

office of energy security

85 7th Place East, Suite 500, St. Paul, MN 55101-2198
main: 651.296.4026 tty: 651.296.2860 fax: 651.297.7891
www.commerce.state.mn.us

## PUBLIC COMMENT SHEET

### CapX Hampton-Rochester-La Crosse Transmission Line Project

**PUC Docket Number: E002/TL-09-1448**

**Name:** DUC LUU **Representing:** LAND OWNER

**Address:** 4695 SUMMIT POINTE PL NW ROCHESTER, MN 55901 **Email:** LUUD55@YAHOO.COM

**Comments:**

127A WE DON'T WANT THIS TRANSMISSION LINE GOES THROUGH OUR COMMUNITY & OUR HOUSE BACKYARD. PLEASE CONSIDER ANOTHER ROUTE. THANKS FOR YOUR CONSIDERATION.

IT IS 2P-002 ALTERNATIVE ROUTE THAT RUNS ALONG 65th ST NW.

**Please submit comments by 4:30pm, April 29, 2011 to:**

Matthew Langan
Minnesota Dept. of Commerce
85 7th Place East
Suite 500
St. Paul, MN 55101-2198

Email: matthew.langan@state.mn.us
Phone: 651-296-2096
Fax: 651-297-7891

**127A.**
Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

FEIS ID #128

office of energy security

85 7th Place East, Suite 500, St. Paul, MN 55101-2198
main: 651.296.4026 tty: 651.296.2860 fax: 651.297.7891
www.commerce.state.mn.us

## PUBLIC COMMENT SHEET

### CapX Hampton-Rochester-La Crosse Transmission Line Project

**PUC Docket Number: E002/TL-09-1448**

**Name:** Eldon + Brenda Malwitz

**Representing:**

**Address:** 10852 40th Ave NE Elgin Mn. 55932

**Email:** malwitz.brenda@mayo.edu

**Comments:**

128A We strongly encourage you to consider the close proximity, the southern most route (through Oronoco + Farmington township (just north of ~~to~~ Whitebridge Rd. + Hwy 247) is to the city of Rochester. The growth in + around this area is + will continue to become increasingly more populated. Health risks to humans living near high voltage lines needs to be fully + honestly addressed as a MAJOR CONCERN of this project, and the treat or potential threat it has on human health + life, especially children. HUMAN LIFE Should be your top priority.

E 002/TL-09-1448

**Please submit comments by 4:30pm, April 29, 2011 to:**

Matthew Langan
Minnesota Dept. of Commerce
85 7th Place East
Suite 500
St. Paul, MN 55101-2198

Email: matthew.langan@state.mn.us
Phone: 651-296-2096
Fax: 651-297-7891

**128A.**

See Section 7.1 of the EIS. Your objection/preference of the specified route is noted. Your comment is now part of the record in this matter by its inclusion in this EIS, and will be submitted to the Office of Administrative Hearings (OAH) and Commission for consideration.

FEIS ID #129

April 27th

Matthew Langan
Minnesota Department of Commerce
85 7th Place East
Suite 500
St. Paul, MN 55101-2198

Re: CapX Hampton-Rochester-La Crosse Transmission Line Project
Reference #: PUC Docket Number: E002/TL-09-1448
Formal Objection by property owner, Edward A. Manthei
Ed Manthei Property ID # R39.029.0800

Dear Mr. Langan,

Please consider this letter a formal objection to a portion of the above mentioned energy project plan.

129A We are landowners in Pine Island, with our property being adjacent to Hwy 52. The current "345V Preferred plan" for the transmission lines will affect our parcel of land and we respectfully request that one of the alternate routes be chosen.

Our objections are based on the following:

- The land is currently being used for agricultural use, however, we recognize that the highest and best use of the land longer term is for commercial/industrial use
- To that end, we have already had a Minnesota engineering firm, Loucks & Associates, create two different commercial/industrial site concepts for the parcel of land, we had the land annexed into the city in preparation for development and we are in the process of requesting re-zoning of the land to commercial/industrial
- There will be an additional benefit for the city if the land is developed as commercial/industrial as they will have a higher tax basis from which to draw
- Additionally, the Minnesota Department of Transportation has a plan to change the highway layout and these changes will also impact our property - an interchange as well as access roads will need to be placed on the property

129B

If the 345V Preferred plan were to be chosen, the amount of land required for the placement of the transmission lines, as well as the setback area required for the easement, would be detrimental to the property in the following ways:

- It would limit the Minnesota Department of Transportation's ability to adjust the road and access as would be best suited for their needs
- Developing the property as a commercial/industrial site will clearly benefit the city of Pine Island by attracting **new business/companies, bringing additional employment to the area and add increased tax revenue.** We are concerned that putting any transmission lines on the property will damage our future ability to develop in the following ways:
    - Loss of the land area needed for the easement decreases the amount of development for buildings, parking sites and warehouse space

129B (cont)

- Additionally, we fear that companies may shy away from developing on a site because employees may express concerns about the health issues caused by exposure to high energy power lines

As we wish to maximize the availability of and flexibility of use for the land, for both the MN DOT as well as the plan to develop a commercial/industrial site, we again respectfully request that an alternate route for the transmission lines, one that does not impact our property, be chosen.

Should you have any questions, please feel free to contact us at:

Ed and Linda Manthei
807 Northland Lane
Rochester, MN 55906

ljmanthei@yahoo.com
Phone: 507-288-2594
Mobile: 507-273-7792

Sincerely,
Edward A. Manthei

FEIS ID #129

**129A.**

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

**129B.**

See Section 7.4 of the EIS.

FEIS ID #130

April 27th

RECEIVED
APR 29 2011

Matthew Langan
Minnesota Department of Commerce
85 7th Place East
Suite 500
St. Paul, MN 55101-2198

Re: CapX Hampton-Rochester-La Crosse Transmission Line Project
Reference #: PUC Docket Number: E002/TL-09-1448
Formal Objection by property owner, Edward A. Manthei
Ed Manthei Property ID # R39.029.0800

Dear Mr. Langan,

Please consider this letter a formal objection to a portion of the above mentioned energy project plan.

130A We are landowners in Pine Island, with our property being adjacent to Hwy 52. The current "345V Preferred plan" for the transmission lines will affect our parcel of land and we respectfully request that one of the alternate routes be chosen.

Our objections are based on the following:

- The land is currently being used for agricultural use, however, we recognize that the highest and best use of the land longer term is for commercial/industrial use
- To that end, we have already had a Minnesota engineering firm, Loucks & Associates, create two different commercial/industrial site concepts for the parcel of land, we had the land annexed into the city in preparation for development and we are in the process of requesting re-zoning of the land to commercial/industrial
- There will be an additional benefit for the city if the land is developed as commercial/industrial as they will have a higher tax basis from which to draw
- Additionally, the Minnesota Department of Transportation has a plan to change the highway layout and these changes will also impact our property - an interchange as well as access roads will need to be placed on the property

130B If the 345V Preferred plan were to be chosen, the amount of land required for the placement of the transmission lines, as well as the setback area required for the easement, would be detrimental to the property in the following ways:

- It would limit the Minnesota Department of Transportation's ability to adjust the road and access as would be best suited for their needs
- Developing the property as a commercial/industrial site will clearly benefit the city of Pine Island by attracting **new business/companies, bringing additional employment to the area and add increased tax revenue.** We are concerned that putting any transmission lines on the property will damage our future ability to develop in the following ways:
    - Loss of the land area needed for the easement decreases the amount of development for buildings, parking sites and warehouse space
    - Additionally, we fear that companies may shy away from developing on a site because employees may express concerns about the health issues caused by exposure to high energy power lines

130B (cont)

As we wish to maximize the availability of and flexibility of use for the land, for both the MN DOT as well as the plan to develop a commercial/industrial site, we again respectfully request that an alternate route for the transmission lines, one that does not impact our property, be chosen.

Should you have any questions, please feel free to contact us at:

Ed and Linda Manthei
807 Northland Lane
Rochester, MN 55906

ljmanthei@yahoo.com
Phone: 507-288-2594
Mobile: 507-273-7792

Sincerely,
Edward A. Manthei

FEIS ID #130

**130A.**

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

**130B.**

See Section 7.2 of the EIS.

FEIS ID #131

**Langan, Matthew (COMM)**

**From:** Angela Marketon [amarketon1@yahoo.com]
**Sent:** Friday, April 29, 2011 8:05 PM
**To:** Langan, Matthew (COMM)
**Cc:** amarketon1@yahoo.com
**Subject:** Public Comment Sheet: CapX Hampton-Rochester-LaCrosse Transmission Line Project PUC Docket Number: E002/TL-09-1448

Matthew Langan
Matthew.Langan@state.mn.us
Minnesota Dept. Of Commerce
85 7th Place East, Suite 500
St. Paul, MN 55101-2198

Dear Mr. Langan,

I am writing to voice my concern regarding the proposal to place a transmission line near my home in Wabasha County.

131A Human health statistics show power lines placed in/around a highly populated area have a negative impact on personal health. There is substantial evidence that exposure to extra-low frequency magnetic fields of an average intensity doubles the risk of a child contracting leukemia. There is very good evidence that even momentary exposure to ELF fields a woman will have a spontaneous abortion within the first 10 weeks of pregnancy. There is also evidence that these fields are associated with other diseases. The very latest research suggests that pregnant women should *never* venture anywhere near a transmission power line, for even momentary exposure to high magnetic fields sharply enhances the risk of a miscarriage. They should avoid even driving under a transmission power line. In addition, those utilizing pace makers or automatic defibrillators should similarly avoid even momentarily venturing near transmission power lines as exposure can cause misfire of these devices. I have a 15 month old daughter who enjoys being outside, I do not want her exposed to these elements. Likewise the decision to expand my family should be mine, not a Power-line Companies.

There is extremely strong evidence finding a relationship between ELF magnetic fields and childhood leukemia. This relationship has been a matter of scientific inquiry since 1979. Sixteen out of nineteen studies conducted since 1995 are now viewed as identifying a statistically significant relationship between magnetic fields and the increase in a child's risk of contracting that disease.

There is strong evidence linking ELF magnetic fields and Alzheimer's and Lou Gehrig's disease (ALS).

There is substantial evidence linking ELF magnetic fields and breast cancer and strong evidence linking magnetic fields and the suppression of the therapeutic effects of the anti-cancer drug, tamoxifin.

131B Environmental contamination with Bald Eagles being electrocuted each year by landing on high voltage wires. Habitat destruction and human related disturbance of wintering and nesting eagles is continuing. Land use changes and activities that adversely alter historical/traditional roost sites.

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131B (cont) Intensive grazing of roosting and nesting tree areas can prohibit the natural regeneration of tree groves that would ensure future use of these sites. Power line erection often require tree removal along banks and streams, which may eliminate valuable feeding and loafing perches. Reduced or altered river flows as a result of diversions and dams can severely affect the ability of the aquatic system to attract wintering waterfowl or to support an adequate fishery for nesting or wintering eagles. The proposed power line route travels through the Richard J Dorer Memorial Hardwood State Forest, a primary habitat for Bald Eagles. Transmission power lines emit two types of fields, electric and magnetic. Together they are called electro-magnetic fields, EMF. Magnetic fields are known to interact with animal tissues, and are therefore potentially dangerous.

131C Trout stream - The Department of Natural Resources dictates that 150' clear cut must be observed in order for local trout streams to be stocked. The erection of the transmission line near my home would mean the end of trout fishing in this area.

131D I feel strongly that the proposed alternative route which passes through Zumbro Township would be a much better option for the transmission line.

Respectfully submitted,
Angela S. Marketon Representing myself Angela S. Marketon
35000 568th Street
Rochester, MN 55906
Wabasha County

2

FEIS ID #131

**131A.**
Your comment and provided study are part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and PUC for consideration.

**131B.**
See Section 7.7 of the EIS.

**131C.**
See Sections 7.8 and 8.3.4.8 of the EIS.

**131D.**
Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

FEIS ID #132

**Langan, Matthew (COMM)**

**From:** Greg Marketon [gmarketon1@yahoo.com]
**Sent:** Friday, April 29, 2011 10:30 PM
**To:** Langan, Matthew (COMM)
**Subject:** CapX Power Line in Zumbro Township

Please say NO to the Northern Alternate Route in Zumbro Township...
132A I would hate to see any destruction to the Richard J. Dorer Hardwood State Forest like the proposed 150' clear cutting would inflict. Having lived here since 1996 I have truly enjoyed watching the Bald Eagles as their population has began to
132B 132C ise. I also enjoy fishing in the Trout Stream that goes through the proposed north alternate route.

Thank you for your time and consideration in this matter,

*Greg Marketon*

*35000 568th Street*

*Rochester, MN 55906*

*Zumbro Township*

*507-421-6889*

1

**132A.**

See Section 8.3.4.7 of the EIS.

**132B.**

See Section 7.7 of the EIS.

**132C.**

See Section 7.8 of the EIS.

FEIS ID #133

**Langan, Matthew (COMM)**

**From:** Angela Marketon [amarketon1@yahoo.com]
**Sent:** Saturday, April 30, 2011 10:49 AM
**To:** Langan, Matthew (COMM)
**Cc:** amarketon1@yahoo.com; Greg Marketon
**Subject:** Fw: Public Comment Sheet: CapX Hampton-Rochester-LaCrosse Transmission Line Project PUC Docket Number: E002/TL-09-1448

Mr. Langan,

133A This is my second attempt at sending this to you. I received notice my first attempt failed.

Angela Marketon

----- Forwarded Message ----
**From:** Angela Marketon <amarketon1@yahoo.com>
**To:** Matthew.langan@state.mn.us
**Cc:** amarketon1@yahoo.com
**Sent:** Fri, April 29, 2011 8:05:13 PM
**Subject:** Public Comment Sheet: CapX Hampton-Rochester-LaCrosse Transmission Line Project PUC Docket Number: E002/TL-09-1448

Matthew Langan
Matthew.Langan@state.mn.us
Minnesota Dept. Of Commerce
85 7th Place East, Suite 500
St. Paul, MN 55101-2198

Dear Mr. Langan,

I am writing to voice my concern regarding the proposal to place a transmission line near my home in Wabasha County.

133A Human health statistics show power lines placed in/around a highly populated area have a negative impact on personal health. There is substantial evidence that exposure to extra-low frequency magnetic fields of an average intensity doubles the risk of a child contracting leukemia. There is very good evidence that even momentary exposure to ELF fields a woman will have a spontaneous abortion within the first 10 weeks of pregnancy. There is also evidence that these fields are associated with other diseases. The very latest research suggests that pregnant women should *never* venture anywhere near a transmission power line, for even momentary exposure to high magnetic fields sharply enhances the risk of a miscarriage. They should avoid even driving under a transmission power line. In addition, those utilizing pace makers or automatic defibrillators should similarly avoid even momentarily venturing near transmission power lines as exposure can cause misfire of these devices. I have a 15 month old daughter who enjoys being outside, I do not want her exposed to these elements. Likewise the decision to expand my family should be mine, not a Power-line Companies.

There is extremely strong evidence finding a relationship between ELF magnetic fields and childhood leukemia. This relationship has been a matter of scientific inquiry since 1979. Sixteen out of

1

133A (cont) nineteen studies conducted since 1995 are now viewed as identifying a statistically significant relationship between magnetic fields and the increase in a child's risk of contracting that disease.

There is strong evidence linking ELF magnetic fields and Alzheimer's and Lou Gehrig's disease (ALS).

There is substantial evidence linking ELF magnetic fields and breast cancer and strong evidence linking magnetic fields and the suppression of the therapeutic effects of the anti-cancer drug, tamoxifin.

133B Environmental contamination with Bald Eagles being electrocuted each year by landing on high voltage wires. Habitat destruction and human related disturbance of wintering and nesting eagles is continuing. Land use changes and activities that adversely alter historical/traditional roost sites. Intensive grazing of roosting and nesting tree areas can prohibit the natural regeneration of tree groves that would ensure future use of these sites. Power line erection often require tree removal along banks and streams, which may eliminate valuable feeding and loafing perches. Reduced or altered river flows as a result of diversions and dams can severely affect the ability of the aquatic system to attract wintering waterfowl or to support an adequate fishery for nesting or wintering eagles. The proposed power line route travels through the Richard J Dorer Memorial Hardwood State Forest, a primary habitat for Bald Eagles. Transmission power lines emit two types of fields, electric and magnetic. Together they are called electro-magnetic fields, EMF. Magnetic fields are known to interact with animal tissues, and are therefore potentially dangerous.

133C Trout stream - The Department of Natural Resources dictates that 150' clear cut must be observed in order for local trout streams to be stocked. The erection of the transmission line near my home would mean the end of trout fishing in this area.

133D I feel strongly that the proposed route and **NOT** the alternate route which passes through Zumbro Township would be a much better option for the transmission line.

Respectfully submitted,
Angela S. Marketon Representing myself Angela S. Marketon
35000 568th Street
Rochester, MN 55906
Wabasha County

2

FEIS ID #133

**133A.**
**Your comment and provided study are part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and PUC for consideration.**

**133B.**
See Section 7.7 of the EIS.

**133C.**
See Sections 7.8 and 8.3.4.8 of the EIS.

**133D.**
Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

FEIS ID #134

office of energy security

85 7th Place East, Suite 500, St. Paul, MN 55101-2198
main: 651.296.4026 tty: 651.296.2860 fax: 651.297.7891
www.commerce.state.mn.us

## PUBLIC COMMENT SHEET

### CapX Hampton-Rochester-La Crosse Transmission Line Project

**PUC Docket Number: E002/TL-09-1448**

**Name:** Vaughn Mathis

**Representing:** 65TH St. NW Grap

**Address:** 4575 Summit Pointe Pl. NW, Rochester, MN 55901

**Email:**

**Comments:**

134A We DO NOT want and are not in favor of having the transmission line running on 65TH St NW. We are not in favor of having it in our backyard,

134B it will not be a pleasant thing to look at and will reduce the value of our

134C home to have the power lines running right in the middle of the neighborhood. Please consider other options NOT through our neighborhood!

**Please submit comments by 4:30pm, April 29, 2011 to:**

Matthew Langan
Minnesota Dept. of Commerce
85 7th Place East
Suite 500
St. Paul, MN 55101-2198

Email: matthew.langan@state.mn.us
Phone: 651-296-2096
Fax: 651-297-7891

**134A.**
Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

**134B.**
See Section 7.3.1 of the EIS.

**134C.**
See Section 7.2 of the EIS.

FEIS ID #135

**Langan, Matthew (COMM)**

**From:** apache@web.lmic.state.mn.us
**Sent:** Tuesday, April 26, 2011 12:42 PM
**To:** Langan, Matthew (COMM)
**Subject:** Maxwell Tue Apr 26 12:41:33 2011 E002/TL-09-1448

This public comment has been sent via the form at:
www.energyfacilities.puc.state.mn.us/publicComments.html

You are receiving it because you are listed as the contact for this project.

Project Name: Hampton to Rochester to La Crosse 345kV and 161kV Transmission Line

Docket number: E002/TL-09-1448

User Name: Diane Maxwell

County: Douglas County

City: Omaha

Email: dianem@ldmlaw.com

Phone: 402-255-3557

135A Impact: My niece and her family live next to 65th street and b/c of the increased health risks associated with magnetic fields including but not limited to increased rates of cancer, leukemia and brain tumors, I am petitioning the committee to use alternatives other than 2P-002.

Mitigation:

Submission date: Tue Apr 26 12:41:33 2011

This information has also been entered into a centralized database for future analysis.

For questions about the database or the functioning of this tool, contact:

Andrew Koebrick
andrew.koebrick@state.mn.us

1

**135A.**

See Section 7.1 of the EIS.

FEIS ID #136

office of energy security

85 7th Place East, Suite 500, St. Paul, MN 55101-2198
main: 651.296.4026 tty: 651.296.2860 fax: 651.297.7891
www.commerce.state.mn.us

## PUBLIC COMMENT SHEET

## CapX Hampton-Rochester-La Crosse Transmission Line Project

**PUC Docket Number: E002/TL-09-1448**

**Name:** Daniel & Meredith McBroom

**Representing:** 65th St NW

**Address:** 4437 Genevieve Pl NW
Rochester, MN 55901

**Email:** dmmcbroom@gmail.com

**Comments:**

136 I do not want the powerline running along 65th St NW. This is

136B a residental area and this would greatly reduce the scenic beauty of our home.

**Please submit comments by 4:30pm, April 29, 2011 to:**

Matthew Langan
Minnesota Dept. of Commerce
85 7th Place East
Suite 500
St. Paul, MN 55101-2198

Email: matthew.langan@state.mn.us
Phone: 651-296-2096
Fax: 651-297-7891

**136A.**

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

**136B.**

See Section 7.3.1 of the EIS.

FEIS ID #137

## Capx2020 Environmental Impact Statement-Our concerns

4-12-2011

Reference PUC Docket No. TL-09-1448

We find it incomplete in two areas and feel one area needs to be revised.

137A

1. Section 7.3.2 Noise. There is no mention of the noise generated as a result of wind. Wind will make a noise when it blows across the lines and pole structures. This power line is due south of our home and sits on high point in the area. Why isn't this addressed in the statement? Please include information on this issue in the final document.

137B

2. Section 7.2 Property values. Soon our beautiful country estate will be up for sale. The decision was made prior to any knowledge about the proposed power line. Concerns over value, perceived or real, **will** be a factor in the sale of our property and reduce our proceeds. We see nothing in the statement addressing this. It's bad enough we can't answer questions regarding actual power line location, easement price and time line among other things that potential buyers ask. It appears this plan has no monetary plan to compensate people in our position. If there is compensation for this situation it should be included. If not we would like it mentioned and explained as such.

137C

3. We find the surveys used in Property Value Research, section 7.2.2 to be bias, and often without merit for our area. Locations surveyed were Los Angeles, Montreal, Portland, Vancouver, Seattle and numerous "sub-divisions". Hardly apples to apples. We would like to see these surveys removed from the document as they are incomparable to SE Minnesota.

Daniel & Jane McCann
55743 299th Ave
Millville MN 55957

**137A.**

The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

**137B.**

Currently, while utilities pay for the ROW easement, there is no additional requirement that utilities compensate property owners for any overall reduction in property values do to a new transmission line.

**137C.**

It is true that the studies cited were not done in Southeastern Minnesota. However, the studies cited in the EIS are generally applicable. Also, the cost and time to actually complete such a study for this particular area for this Project would not be justified due to timeline constraints; the results would not likely resolve the issue and would not be essential to a reasoned decision between alternatives since all routes would be affected similarly.

FEIS ID #138

office of energy security

85 7th Place East, Suite 500, St. Paul, MN 55101-2198
main: 651.296.4026 tty: 651.296.2860 fax: 651.297.7891
www.commerce.state.mn.us

## PUBLIC COMMENT SHEET

## CapX Hampton-Rochester-La Crosse Transmission Line Project

**PUC Docket Number: E002/TL-09-1448**

**Name:** Joe McGrath

**Representing:**

**Address:** 35730 10th Ave Dennison MN

**Email:**

**Comments:**

138A

Warsaw Township
Section 8

INDIAN MOUNDS noted

**Please submit comments by 4:30pm, April 29, 2011 to:**

Matthew Langan
Minnesota Dept. of Commerce
85 7th Place East
Suite 500
St. Paul, MN 55101-2198

Email: matthew.langan@state.mn.us
Phone: 651-296-2096
Fax: 651-297-7891

**138A.**

The location of Indian Mounds in Section 8 of Warsaaw Township is noted but was not confirmed in the review of the State Historic Preservation Office records. See Section 7.10.2 of the EIS for further discussion on additional review of cultural resources prior to construction.

FEIS ID #139

**STATE OF MINNESOTA**
**OFFICE OF ADMINISTRATIVE HEARINGS**
**FOR THE PUBLIC UTILITIES COMMISSION**

In the Matter of the Route Permit Application by Xcel Energy, Dairyland Power Cooperative, Souther Minnesota Municpal Power Agency, Rochester Public Utilities , and WPPI Energy for a 345 kV Transmission Line from Hampton, Minnesota, to Rochester, Minnesota, to La Crosse, Wisconsin

OAH DOCKET NO. 3-2500-21181-2
PUC DOCKET NO. E002/TL-09-1448

## AFFIDAVIT OF BRUCE McKAY, P.E.

Bruce McKay, P.E., after affirming or being duly sworn on oath, states and deposes as follows:

1. My name is Bruce McKay. I am an electrical engineer, and licensed Professional Engineer, in the state of Minnesota.

2. My experience is primarily in the areas of industrial power distribution and industrial automation and control. I have 16 years experience in these areas as a licensed Master Electrician, followed by 14 years as a licensed Professional Engineer to date.

3. I am a landowner near Henderson, MN, and therefore am not directly affected by the proposed Hampton-Rochester-La Crosse 345 kV Transmission Project.

4. I have participated in CapX2020 Task Force meetings held in Henderson, attended one day of PUC hearings in St. Paul, and attended, including making comments and submitting statements, all but one of the Public Hearings held in the Le Sueur-Henderson area over the last few years.

5. Attached as Exhibit A is a true and correct copy of the CapX2020 Engineering, Design, Construction, and Operational Characteristics, Section 3.1.1 Hampton-Rochester-La Crosse 345 kV Transmission Line, found on page 3-3 of the January 15, 2010, Route Permit Application for the Hampton-Rochester-La Crosse 345 kV Transmission Project, wherein it states that "Two 954 Aluminum Conductor Steel Supported (ACSS) conductors will be used per phase."

6. Attached as Exhibit B is a true and correct copy of Direct Testimony of Larry L. Schedin, Attachment J, showing various conductor specifications, including:

   a. In the chart on page 3, Summer Thermal Ratings for a Twin bundled 954 kcm 54/19 ACSS, 345 KV, of 3700 amps and 2211 MVA.
   b. In the chart on page 5, Winter Thermal Ratings for a Twin bundled 954 kcm 54/7 ACSS, 345 KV, of 4064 amps and 2428 MVA.
   c. For the purposes of this Affidavit, I am using the Summer Ratings, but it should be noted that Winter Ratings are approximately an additional 9.8% higher than the Summer Ratings.

139A

7. The first purpose of this statement is to point out the fact that the CapX2020 Magnetic Field tables and charts that I've been able to find in Hampton-Rochester-La Crosse 345 kV Transmission Project documents all fail to address the full potential Magnetic Field along the transmission lines. Each table and chart that I've seen displays Magnetic Field data calculated from estimated Peak and estimated Average System Conditions (Current (Amps)) rather than from transmission line design capacities. An example of such a table is presented in the attached Exhibit C, a true and correct copy of the CapX2020 Engineering, Design, Construction, and Operational Characteristics, Table 3.6-2: Calculated Magnetic Fields (mG) for Proposed 345 kV Transmission Line Designs (3.28 Feet Aboveground), found on pages 3-28 and 3-29 of the January 15, 2010, Route Permit Application for the Hampton-Rochester-La Crosse 345 kV Transmission Project.

139B

8. The second purpose of this statement is to point out the fact that a table such as Exhibit C underestimates the Magnetic Field that would be created if the transmission line was utilized to its full potential capacity, or to 80% of its full potential capacity. The attached Exhibit D is a true and correct copy of "McKay Magnetic Field Calculations" which presents an example of Magnetic Field calculations based on estimated transmission line currents as compared to Magnetic Field calculations based on future potential (design) transmission line currents.

   a. By following through STEPS 1, 2, 3-Single Circuit, and 4-Single Circuit in Exhibit D, you can see that with one Circuit in Service, for 2015 PEAK, the Calculated PEAK MAGNETIC FIELDS increase by 1323% and for 2015 AVERAGE, the Calculated AVERAGE MAGNETIC FIELDS increase by 1323% when design capacities are used for the calculations rather than using estimated load currents.
   b. By following through STEPS 1, 2, 3-Double Circuit, and 4-Double Circuit in Exhibit D, you can see that with two Circuits in Service, for 2015 PEAK, the Calculated PEAK MAGNETIC FIELDS increase by 2646% and for 2015 AVERAGE, the Calculated AVERAGE MAGNETIC FIELDS increase by 2646% when design capacities are used for the calculations rather than using estimated load currents.
   c. Please Note: Exhibit D is presented as a conceptual example. Actual design capacities and associated Magnetic Field calculations would need to be and should be provided by the Applicants.

139C

9. The third purpose of this statement is to stress that right-of-way widths to protect the health and safety of those along the proposed transmission line need to be based on Calculated Magnetic Field's derived from design capacities, NOT on Calculated Magnetic Field's derived from estimated transmission line currents. A right-of-way based on the Applicant's low transmission line current estimates does not sufficiently protect people near the transmission lines.

10. Please feel free to contact me with any comments or questions you have.

FEIS ID #139

Further your affiant sayeth naught.

Dated: April 20, 2011

Bruce McKay, PE
e-mail: bmckay.aces@gmail.com
cell: 612-386-5983

Signed and sworn to before me this
20 day of April, 2011.

Notary Public

WERNER H. GIESEN
Notary Public
State of Minnesota
My Commission Expires
January 31, 2015

3

# EXHIBIT A

## Line Configurations and Specifications

Hampton-LaCrosse Application

Section 3 Project Description

p. 3-3

### 3.1.1 Hampton–Rochester–La Crosse 345 kV Transmission Line

For the Project's proposed 345 kV line, the Applicant proposes primarily to use single-pole, self-weathering steel, double-circuit capable structures. Self-weathering steel alloys were developed to eliminate the need for painting and are commonly used by the Applicant and throughout the industry. The steel alloy develops a stable, rust-like appearance (dark reddish-brown color) when exposed to the weather for several years. The wetting and drying cycles cause rust to form a protective layer on its surface, preventing further rusting. The layer develops and regenerates continuously when subjected to the influence of the weather.

These single-pole steel structures would range from 130 to 175 feet in height. Spans could range from 600 to 1,000 feet, but would typically be 700 to 1,000 feet. In some areas, only one circuit would be strung and the other side of the pole would be available for adding a second circuit in the future, when conditions warrant. In other areas, the unused side of the 345/345 kV structure would be used to carry a lower voltage line on the second set of arms until a second 345 kV circuit is needed. Tubular steel pole structures are typically placed on large pier foundations of cast-in-place, reinforced concrete.

Two 954 Aluminum Conductor Steel Supported (ACSS) conductors will be used per phase. One or two shield wires will be used to protect the conductors from lightning strikes. One of these shield wires will incorporate fiber optic to facilitate relay control communications between substations and between substations, utility offices such as control centers. Fiber optics will be used only for utility purposes.

Figure 3.1-1 depicts a representative double-circuit 345 kV single pole structure.

The Mississippi River presents unique considerations that will require the use of multiple-circuit, specialty structures. A portion of this crossing is on Upper Mississippi River Wildlife Refuge lands managed by the USFWS. A Special Use Permit will be required to cross the Refuge and the Applicant will work closely with the USFWS to identify the most appropriate structure design.

An existing double-circuit transmission line crosses the Mississippi River and Refuge at the Project's proposed crossing location. The existing line crosses approximately 0.5 mile of Refuge lands and includes two structures on Refuge property. The line is constructed on a 180-foot-wide permitted ROW. An area approximately 125 feet wide and 1,900 feet long is maintained cleared of trees. The two main river crossing structures are 180 feet tall.



# EXHIBIT B

## Amps and MVA for Line Configurations and Specifications

Direct Testimony of Larry L. Schedin, Attachment J
CapX 2020 Certificate of Need
PUC Docket E002, ET2/CN-06-1115

FEIS ID #139



☐ **Non Public Document – Contains Trade Secret Data**
☐ **Public Document – Trade Secret Data Excised**
☒ **Public Document**

Xcel Energy
Docket No.: E002, ET2/CN-06-1115
Response To: Elizabeth Goodpaster and Mary Marrow MCEA/Wind on the Wires — Information Request No. 3
Date Received: March 27, 2008

Question:

With reference to the Application Volume I, Sec. 2.4 (pages 2.9) entitled "Transmission Line Characteristics" and Applicants' response to DOC/OES Information Rquest No. 2, please provide thermal MVA ratings, surge impedance loadings (SIL), MVA and thermal ampere capacity ratings (amplacities) under summer normal, summer emergency, winter normal and winter emergency conditions for the following conductors and voltages:

(a) Single 795ACSR, 115 KV
(b) Single 795 ACSS, 115 KV
(c) Twin bundled 795 ACSR, 115 KV
(d) Twin bundled 795 ACSS, 115 KV
(e) Single 954 ACSS, 115 KV
(f) Single 795 ACSS, 161 KV
(g) Single 954 ACSS, 161 KV
(h) Single 795 ACSR, 230 KV
(i) Single 795 ACSS, 230 KV
(j) Single 954 ACSS, 230 KV
(k) Twin bundled 795 ACSR, 345 KV
(l) Twin bundled 954 ACSS, 345 KV
(m) Triple bundled 954 ACSS, 500 KV
(n) Triple bundled conductor as used on the Forbes – Chisago 500 KV line

In your response, please define the conditions for summer normal, summer emergency, winter normal and winter emergency conditions (ambient temp, wind speed, degree rise, allowable sag. etc.), and specify the regulatory authority setting the foregoing standards and the reference to applicable rules.





Response:

The thermal ratings of the requested conductors and voltages are noted in the table below. Conductor ratings are based on the "IEEE Standard for calculation of Bare Overhead Conductor Temperature and Ampacity Under Steady-State Conditions," ANSI/IEEE Standard 738. Alcoa SAG10 Ratekit was used to calculate conductor ratings.

A regulatory authority does not set the conductor steady state thermal rating variables. The CapX2020 Member Utilities Transmission Line Standards Committee ("Committee") developed the conductor steady state thermal rating variables for summer ratings based upon member utilities' standard of practice..

The summer steady state thermal rating variables are as follows:

- Conductor orientation relative to north: 90 degrees
- Atmosphere: Clear
- Air Temperature: 40 degrees C for Summer
- Wind Speed: 2 ft/sec
- Wind angle relative to conductor: 90 degrees
- Elevation above sea level: 1000 ft
- Latitude: 45 degrees N
- Date: July 8
- Solar time: 12 hours
- Coefficient of emissivity: 0.7
- Coefficient of absorption: 0.9
- 200 degrees C maximum operating temperature for ACSS
- 100 degrees C maximum operating temperature for ACSR

The Committee defined the Emergency Line Rating as equal to the steady state thermal rating.

The Committee specified that conductors meet minimum clearances to ground based upon voltage and nature of surface under the conductor (*i.e.*, roads, interstate highway, railroads, etc.). The minimum specified clearances were chosen to assure that the final constructed lines meet or exceed the National Electrical Safety Code ("NESC") minimum clearances. Conductor sags are to be calculated based upon conductor size, conductor temperature, span length, design tension, structure heights and loading conditions. Vertical clearances shall be applied to the greatest sag resulting from either the maximum operating temperature of 200°C (for the ACSS

conductor) and 100°C (for the ACSR conductor) or the maximum loaded condition (ice plus wind).

| **Conductor** | **Summer Thermal Ampacity Rating** | **Summer Thermal MVA Rating** |
|---|---|---|
| Single 795 kcm 26/7 ACSR, 115 KV | 965 amps | 192 MVA |
| Single 795 kcm 26/7 ACSS, 115 KV | 1655 amps | 330 MVA |
| Twin bundled 795 kcm 26/7 ACSR, 115 KV | 1930 amps | 384 MVA |
| Twin bundled 795 kcm 26/7 ACSS, 115 KV | 3310 amps | 659 MVA |
| Single 954 kcm 54/19 ACSS, 115 KV | 1850 amps | 368 MVA |
| Single 795 kcm 26/7 ACSS, 161 KV | 1655 amps | 462 MVA |
| Single 954 kcm 54/19 ACSS, 161 KV | 1850 amps | 516 MVA |
| Single 795 kcm 26/7 ACSR, 230 KV | 965 amps | 384 MVA |
| Single 795 kcm 26/7 ACSS, 230 KV | 1655 amps | 659 MVA |
| Single 954 kcm 54/19 ACSS, 230 KV | 1850 amps | 737 MVA |
| Twin bundled 795 kcm 26/7 ACSR, 345 KV | 1930 amps | 1153 MVA |
| Twin bundled 954 kcm 54/19 ACSS, 345 KV | 3700 amps | 2211 MVA |
| Triple bundled 954 kcm 54/19 ACSS, 500 KV | 5550 amps | 4806 MVA |
| Triple bundled conductor as used on the Forbes – Chisago 500 KV line (Triple bundled 1192.5 kcm 45/7 ACSR) | 3648 amps | 3159 MVA |

The Committee did not develop steady state thermal rating variables for winter ratings. Xcel Energy – NSP Operating Territory uses 0°C for the winter rating air temperature for calculating the rating during the winter operating season of November 1 to April 30. The April 30 date produces the lowest allowable line rating of the winter rating period, so it is used in the following table. The April 30 date and 0°C air temperature were used in conjunction with the other steady state thermal





rating variables developed by the Committee to develop the following winter rating table.

The winter steady state thermal rating variables used for the following Xcel Energy – NSP Operating Territory/ CAPX2020 Member Utilities Transmission Line Standards Committee rating table are as follows:

- Conductor orientation relative to north: 90 degrees
- Atmosphere: Clear
- Air Temperature: 0 degrees C for Winter
- Wind Speed: 2 ft/sec
- Wind angle relative to conductor: 90 degrees
- Elevation above sea level: 1000 ft
- Latitude: 45 degrees N
- Date: April 30
- Solar time: 12 hours
- Coefficient of emissivity: 0.7
- Coefficient of absorption: 0.9
- 200 degrees C maximum operating temperature for ACSS
- 100 degrees C maximum operating temperature for ACSR

| **Conductor** | **Winter (April 30) Thermal Ampacity Rating** | **Winter (April 30) Thermal MVA Rating** |
|---|---|---|
| Single 795 kcm 26/7 ACSR, 115 KV | 1286 amps | 256 MVA |
| Single 795 kcm 26/7 ACSS, 115 KV | 1819 amps | 362 MVA |
| Twin bundled 795 kcm 26/7 ACSR, 115 KV | 2572 amps | 512 MVA |
| Twin bundled 795 kcm 26/7 ACSS, 115 KV | 3638 amps | 725 MVA |
| Single 954 kcm 54/7 ACSS, 115 KV | 2032 amps | 405 MVA |
| Single 795 kcm 26/7 ACSS, 161 KV | 1819 amps | 507 MVA |
| Single 954 kcm 54/7 ACSS, 161 KV | 2032 amps | 567 MVA |
| Single 795 kcm 26/7 ACSR, 230 KV | 1286 amps | 512 MVA |

| Conductor | Winter (April 30) Thermal Ampacity Rating | Winter (April 30) Thermal MVA Rating |
|---|---|---|
| Single 795 kcm 26/7 ACSS, 230 KV | 1819 amps | 725 MVA |
| Single 954 kcm 54/7 ACSS, 230 KV | 2032 amps | 809 MVA |
| Twin bundled 795 kcm 26/7 ACSR, 345 KV | 2572 amps | 1537 MVA |
| Twin bundled 954 kcm 54/7 ACSS, 345 KV | 4064 amps | 2428 MVA |
| Triple bundled 954 kcm 54/7 ACSS, 500 KV | 6096 amps | 5279 MVA |
| Triple bundled conductor as used on the Forbes – Chisago 500 KV line (Triple bundled 1192.5 kcm 45/7 ACSR) | 4875 amps | 4222 MVA |

**Surge Impedance**

The following table shows typical ranges of surge impedances found on the CapX2020 member systems. Designs for the proposed CapX2020 transmission lines are not far enough along to provide more accurate surge impedances for these lines.

| Conductor Configuration | Surge Impedance |
|---|---|
| Single Bundled Conductor – 115, 161 & 230 KV Configurations a, b, f & h | 350 – 375 Ohms |
| Twin bundled Conductor - 115 KV Configurations c & d | 250 - 300 Ohms |
| Twin bundled Conductor - 345 KV Configurations k & l | 270 –285 Ohms |
| Triple bundled Conductor - 500 kV Configuration n | 250 – 300 Ohms |
| Configurations e, g, i, j and m | Not Used |





Response By: Brad Hill/David K. Olson
Title: Principal Specialty Engineer
Department: Transmission Engineering/Substation Engineering
Company: Xcel Energy
Telephone: 612-330-6826/612-330-5909
Date: April 21, 2008

2157846v1

FEIS ID #139

# EXHIBIT C

## Applicant Magnetic Field Calculations

Table 3.6-2: Calculated Magnetic Fields for Proposed 345kV Transmission Line Designs

Hampton-LaCrosse Project RoutingApplication p. 3-28 - 3-29



**Table 3.6-2:**
**Calculated Magnetic Fields (mG) for Proposed 345 kV Transmission Line Designs (3.28 Feet Aboveground)**

| Structure Type | Geographical Segment | System Condition | Current (amps) | -300 | -200 | -100 | -75 | -50 | 0 | 50 | 75 | 100 | 200 | 300 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single- Pole Davit Arm 345/345 kV Double-Circuit with one Circuit In Service | Preferred Route: Hampton to Cannon Falls; Non-US-52 segments Zumbrota area to North Rochester | 2015 Peak | 140 A | 0.38 | 0.79 | 2.35 | 3.41 | 5.24 | 13.58 | 9.64 | 5.88 | 3.77 | 1.04 | 0.46 |
| | | 2015 Average | 112 A | 0.30 | 0.63 | 1.88 | 2.73 | 4.19 | 10.87 | 7.71 | 4.71 | 3.01 | 0.83 | 0.37 |
| | Alternate Route: Hampton to North Rochester | 2025 Peak | 132 A | 0.36 | 0.74 | 2.22 | 3.22 | 4.94 | 12.81 | 9.09 | 5.55 | 3.55 | 0.98 | 0.43 |
| | | 2025 Average | 106 A | 0.29 | 0.60 | 1.78 | 2.58 | 3.97 | 10.29 | 7.30 | 4.45 | 2.85 | 0.79 | 0.35 |
| Single-Pole Davit Arm 345/345 kV with 69 kV Underbuild with 1 Active 345 kV Circuit | Preferred Route: US-52 segments Cannon Falls to Zumbrota area | 2015 Peak | 140/325 | 0.74 | 1.65 | 6.20 | 10.42 | 20.73 | 70.89 | 8.50 | 3.77 | 2.51 | 1.01 | 0.52 |
| | | 2015 Average | 112/260 | 0.59 | 1.32 | 4.96 | 8.33 | 16.58 | 56.71 | 6.80 | 3.02 | 2.01 | 0.81 | 0.41 |
| | | 2025 Peak | 132/328 | 0.73 | 1.62 | 6.14 | 10.36 | 20.71 | 71.85 | 8.89 | 3.92 | 2.54 | 0.99 | 0.50 |
| | | 2025 Average | 106/262 | 0.58 | 1.30 | 4.91 | 8.28 | 16.55 | 57.37 | 7.09 | 3.12 | 2.03 | 0.79 | 0.40 |
| Single-Pole Davit Arm 345/345 kV Double-Circuit with one Circuit in Service | N. Rochester to Alma | 2015 Peak | 403 A | 1.12 | 2.33 | 6.97 | 10.11 | 15.54 | 40.27 | 28.58 | 17.44 | 11.17 | 3.09 | 1.35 |
| | | 2015 Average | 322 A | 0.87 | 1.81 | 5.41 | 7.85 | 12.06 | 31.24 | 22.17 | 13.53 | 8.67 | 2.40 | 1.05 |
| | | 2025 Peak | 415 A | 1.12 | 2.33 | 6.97 | 10.11 | 15.54 | 40.27 | 28.58 | 17.44 | 11.17 | 3.09 | 1.35 |
| | | 2025 Average | 332 A | 0.90 | 1.87 | 5.57 | 8.09 | 12.43 | 32.21 | 22.86 | 13.95 | 8.94 | 2.47 | 1.08 |

**Table 3.6-2:**
**Calculated Magnetic Fields (mG) for Proposed 345 kV Transmission Line Designs (3.28 Feet Aboveground)**

| Structure Type | Geographical Segment | System Condition | Current (amps) | -300 | -200 | -100 | -75 | -50 | 0 | 50 | 75 | 100 | 200 | 300 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single-Pole Davit Arm 161 kV Single-Circuit | N. Rochester to Northern Hills | 2015 Peak | 95 A | 0.20 | 0.43 | 1.50 | 2.42 | 4.39 | 14.29 | 5.41 | 2.79 | 1.65 | 0.42 | 0.18 |
| | | 2015 Average | 76 A | 0.16 | 0.34 | 1.20 | 1.94 | 3.51 | 11.43 | 4.33 | 2.23 | 1.32 | 0.33 | 0.14 |
| | | 2015 Peak | 96 A | 0.20 | 0.43 | 1.52 | 2.45 | 4.43 | 14.44 | 5.47 | 2.82 | 1.66 | 0.42 | 0.18 |
| | | 2015 Average | 77 A | 0.16 | 0.34 | 1.22 | 1.96 | 3.56 | 11.58 | 4.38 | 2.26 | 1.33 | 0.34 | 0.15 |



# EXHIBIT D

## McKay Magnetic Field Calculations

Calculated Magnetic Field Tables for Proposed 345 kV Transmission Line Designs

FILE: Exhibit D- CALCULATED MAGNETIC FIELD TABLES 110417 1129.xls SHEET: milligauss TABLES 4/20/2011, 11:56 AM

STEP 1

THIS TABLE CONTAINS THE COLUMN HEADINGS AND DATA FROM THE TOP ENTRY IN THE TABLE FROM EXHIBIT C

TABLE 3.6-2:
Calculated Magnetic Fields (mG) for Proposed 345 kV Transmission Line Designs (3.28 Feet Aboveground)

| STRUCTURE TYPE | GEOGRAPHICAL SEGMENT | SYSTEM CONDITION | CURRENT (AMPS) | -300' | -200' | -100' | -75' | -50' | 0' | 50' | 75' | 100' | 200' | 300' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SINGLE- POLE | PREFERRED ROUTE: | 2015 PEAK | 140.00 | 0.38 | 0.79 | 2.35 | 3.41 | 5.24 | 13.58 | 9.64 | 5.88 | 3.77 | 1.04 | 0.46 |
| DAVIT ARM | HAMPTON TO | 2015 AVERAGE | 112.00 | 0.30 | 0.63 | 1.88 | 2.73 | 4.19 | 10.87 | 7.71 | 4.71 | 3.01 | 0.83 | 0.37 |
| 345/345 kV DOUBLE- | CANNON FALLS; | | | | | | | | | | | | | |
| CIRCUIT WITH ONE CIRCUIT | NON-US-52 | | | | | | | | | | | | | |
| IN SERVICE | SEGMENTS | | | | | | | | | | | | | |
| | ZUMBROTA AREA TO | | | | | | | | | | | | | |
| | NORTH ROCHESTER | | | | | | | | | | | | | |
| | ALTERNATE ROUTE: | | | | | | | | | | | | | |
| | HAMPTON TO NORTH | | | | | | | | | | | | | |
| | ROCHESTER | | | | | | | | | | | | | |

STEP 2

MVA CALCULATED FROM THE CURRENTS IN TABLE 3.6-2:

345.00 kV
140.00 Amps PEAK ESTIMATED
1.73 3 Phase
83.56 MVA PEAK CALCULATED

345.00 kV
112.00 Amps AVERAGE ESTIMATED
1.73 3 Phase
66.85 MVA AVERAGE CALCULATED

STEP 4- SINGLE CIRCUIT

THIS TABLE CONTAINS DATA SCALED FROM THE TABLE IN STEP 1 USING CURRENTS CALCULATED IN STEP 3- SINGLE CIRCUIT

TABLE 3.6-2 SCALED for SINGLE CIRCUIT DESIGN CAPACITY:
Calculated Magnetic Fields (mG) for Proposed 345 kV Transmission Line Designs (3.28 Feet Aboveground)

| STRUCTURE TYPE | GEOGRAPHICAL SEGMENT | SYSTEM CONDITION | CURRENT (AMPS) | -300' | -200' | -100' | -75' | -50' | 0' | 50' | 75' | 100' | 200' | 300' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SINGLE- POLE | PREFERRED ROUTE: | 2015 PEAK | 1852.22 | 5.03 | 10.45 | 31.09 | 45.11 | 69.33 | 179.67 | 127.54 | 77.79 | 49.88 | 13.76 | 6.09 |
| DAVIT ARM | HAMPTON TO | 2015 AVERAGE | 1481.78 | 3.97 | 8.34 | 24.87 | 36.12 | 55.43 | 143.81 | 102.00 | 62.31 | 39.82 | 10.98 | 4.90 |
| 345/345 kV DOUBLE- | CANNON FALLS; | | | | | | | | | | | | | |
| CIRCUIT WITH ONE CIRCUIT | NON-US-52 | | | | | | | | | | | | | |
| IN SERVICE | SEGMENTS | | | | | | | | | | | | | |
| | ZUMBROTA AREA TO | | | | | | | | | | | | | |
| | NORTH ROCHESTER | | | | | | | | | | | | | |
| | ALTERNATE ROUTE: | | | | | | | | | | | | | |
| | HAMPTON TO NORTH | | | | | | | | | | | | | |
| | ROCHESTER | | | | | | | | | | | | | |

STEP 3- SINGLE CIRCUIT

CURRENT CALCULATED FROM SINGLE CIRCUIT MVA DESIGN CAPACITY:

1105.50 *MVA PEAK DESIGN
345.00 kV
1.73 3 Phase
1852.22 Amps PEAK CALCULATED

884.40 **MVA AVERAGE DESIGN
345.00 kV
1.73 3 Phase
1481.78 Amps AVERAGE CALCULATED

STEP 4- DOUBLE CIRCUIT

THIS TABLE CONTAINS DATA SCALED FROM THE TABLE IN STEP 1 USING CURRENTS CALCULATED IN STEP 3- DOUBLE CIRCUIT

TABLE 3.6-2 SCALED for DOUBLE CIRCUIT DESIGN CAPACITY:
Calculated Magnetic Fields (mG) for Proposed 345 kV Transmission Line Designs (3.28 Feet Aboveground)

| STRUCTURE TYPE | GEOGRAPHICAL SEGMENT | SYSTEM CONDITION | CURRENT (AMPS) | -300' | -200' | -100' | -75' | -50' | 0' | 50' | 75' | 100' | 200' | 300' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SINGLE- POLE | PREFERRED ROUTE: | 2015 PEAK | 3704.45 | 10.05 | 20.90 | 62.18 | 90.23 | 138.65 | 359.33 | 255.08 | 155.59 | 99.76 | 27.52 | 12.17 |
| DAVIT ARM | HAMPTON TO | 2015 AVERAGE | 2963.89 | 7.94 | 16.67 | 49.75 | 72.24 | 110.88 | 287.66 | 204.03 | 124.64 | 79.65 | 21.96 | 9.79 |
| 345/345 kV DOUBLE- | CANNON FALLS; | | | | | | | | | | | | | |
| CIRCUIT WITH ONE CIRCUIT | NON-US-52 | | | | | | | | | | | | | |
| IN SERVICE | SEGMENTS | | | | | | | | | | | | | |
| | ZUMBROTA AREA TO | | | | | | | | | | | | | |
| | NORTH ROCHESTER | | | | | | | | | | | | | |
| | ALTERNATE ROUTE: | | | | | | | | | | | | | |
| | HAMPTON TO NORTH | | | | | | | | | | | | | |
| | ROCHESTER | | | | | | | | | | | | | |

STEP 3- DOUBLE CIRCUIT

CURRENT CALCULATED FROM DOUBLE CIRCUIT MVA DESIGN CAPACITY:

2211.00 *MVA PEAK DESIGN
345.00 kV
1.73 3 Phase
3704.45 Amps PEAK CALCULATED

1769.00 **MVA AVERAGE DESIGN
345.00 kV
1.73 3 Phase
2963.89 Amps AVERAGE CALCULATED

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FILE: Exhibit D- CALCULATED MAGNETIC FIELD TABLES 110417 1129.xls SHEET: milligauss TABLES 4/20/2011, 11:56 AM

NOTES:
1. MVA = (kV * Amps * 1.73) /1000
2. Amps = (MVA * 1000) / (kV * 1.73)
3. For a given physical and electrical configuration, milligauss at one location is proportional to current (Amps) (for example, double the current and the milligauss level also doubles).
4. For a given physical and electrical configuration and constant current, the milligauss level changes as the inverse square of the distance from away from the source (for example, move 2 times as far away and the milligauss level decreases to 1/4 of what it was).

*. MVA PEAK DESIGN CAPACITY IS FROM A COMBINATION OF THE DATA PRESENTED IN EXHIBITS A, B, AND C.

**. MVA AVERAGE DESIGN CAPACITY WAS CHOSEN TO BE ABOUT 80% OF PEAK DESIGN CAPACITY

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**139A.**
Based on Amanda King's direct testimony, the applicant considered potential flows on the 345 kV line facilities that could occur under the highest anticipated loading conditions at some point in the future. High line loading conditions could occur during off-peak demand periods if significant generation were to be located in the area and if there were an unplanned outage of a major Twin Cities 345 kV transmission source such as Byron—Prairie Island or King—Eau Claire. These off-peak demand periods generally occur for about six hours per day. Based on this scenario, planning engineers determined that the highest flow that could reasonably be expected to occur on the facilities would be on the North Rochester—Mississippi River segment of the line; flows on the Hampton—North Rochester segment would be lower. The North Rochester—Mississippi River segment could potentially experience approximately 600 MVA for short periods of time. Planning engineers also assessed whether there was a scenario could result in flows higher than 600 MVA. Planning engineers determined that assuming load levels above 600 MVA would not be a reasonable assumption given the limited local generation that may develop in the area.

Levels above 600 MVA were not considered in the Hampton – Rochester – La Crosse 345 kV Project as they were in the Fargo - St. Cloud 345kV Project because a key difference between the projects is the impact of generation connections on anticipated load flows. It is likely that smaller generator projects would interconnect with the electrical system in the Hampton – Rochester – La Crosse 345 kV Project area. In contrast, larger generators are expected to interconnect with the electrical system on the north end of the Fargo Project area. In the Fargo case, planning engineers estimated the highest loading levels that might occur on the line at some point in the future, considering a hypothetical high generation scenario where several thousands of megawatts (> 4,000 MW) of new generation is developed in North Dakota, South Dakota and Manitoba. Under this scenario, in any year, loading values of 600 MVA and 1,500 MVA would only potentially occur on the Fargo 345 kV line for up to six hours per day, for up to several days in a row.

It's also important to note that there is a network of bulk transmission lines in Minnesota that is set up like a hub and spoke where major facilities connect to the 345 kV ring around the Twin Cities. Generally, flows head from the west and the north toward the Twin Cities, the state's largest load center, and then move east and south. In the Twin Cities, power is drawn down from the lines to meet customer demand. Therefore, load flows "out" of the Twin Cities is lower than load flows headed "in" to the Twin Cities. Due to this general load flow and the lack of large generators in southeast Minnesota, load flows on the Hampton – Rochester – La Crosse line will be lower than those on the Fargo line.

**139B.**
Based on Amanda King's direct testimony, the applicant considered potential flows on the 345 kV line facilities that could occur under the highest anticipated loading conditions at some point in the future. High line loading conditions could occur during off-peak demand periods if significant generation were to be located in the area and if there were an unplanned outage of a major Twin Cities 345 kV transmission source such as Byron—Prairie Island or King—Eau Claire. These off-peak demand periods generally occur for about six hours per day. Based on this scenario, planning engineers determined that the highest flow that could reasonably be expected to occur on the facilities would be on the North Rochester—Mississippi River segment of the line; flows on the Hampton—North Rochester segment would be lower. The North Rochester—Mississippi River segment could potentially experience approximately 600 MVA for short periods of time. Planning engineers also assessed whether there was a scenario could result in flows higher than 600 MVA. Planning engineers determined that assuming load levels above 600 MVA would not be a reasonable assumption given the limited local generation that may develop in the area.

Levels above 600 MVA were not considered in the Hampton – Rochester – La Crosse 345 kV Project as they were in the Fargo - St. Cloud 345kV Project because a key difference between the projects is the impact of generation connections on anticipated load flows. It is likely that smaller generator projects would interconnect with the electrical system in the Hampton – Rochester – La Crosse 345 kV Project area. In contrast, larger generators are expected to interconnect with the electrical system on the north end of the Fargo Project area. In the Fargo case, planning engineers estimated the highest loading levels that might occur on the line at some point in the future, considering a hypothetical high generation scenario where several thousands of megawatts (> 4,000 MW) of new generation is developed in North Dakota, South Dakota and Manitoba. Under this scenario, in any year, loading values of 600 MVA and 1,500 MVA would only potentially occur on the Fargo 345 kV line for up to six hours per day, for up to several days in a row.

It's also important to note that there is a network of bulk transmission lines in Minnesota that is set up like a hub and spoke where major facilities connect to the 345 kV ring around the Twin Cities. Generally, flows head from the west and the north toward the Twin Cities, the state's largest load center, and then move east and south. In the Twin Cities, power is drawn down from the lines to meet customer demand. Therefore, load flows "out" of the Twin Cities is lower than load flows headed "in" to the Twin Cities. Due to this general load flow and the lack of large generators in southeast Minnesota, load flows on the Hampton – Rochester – La Crosse line will be lower than those on the Fargo line.

**139C.**
Based on Amanda King's direct testimony, the applicant considered potential flows on the 345 kV line facilities that could occur under the highest anticipated loading conditions at some point in the future. High line loading conditions could occur during off-peak demand periods if significant generation were to be located in the area and if there were an unplanned outage of a major Twin Cities 345 kV transmission source such as Byron—Prairie Island or King—Eau Claire. These off-peak demand periods generally occur for about six hours per day. Based on this scenario, planning engineers determined that the highest flow that could reasonably be expected to occur on the facilities would be on the North Rochester—Mississippi River segment of the line; flows on the Hampton—North Rochester segment would be lower. The North Rochester—Mississippi River segment could potentially experience approximately 600 MVA for short periods of time. Planning engineers also assessed whether there was a scenario could result in flows higher

FEIS ID #139

than 600 MVA. Planning engineers determined that assuming load levels above 600 MVA would not be a reasonable assumption given the limited local generation that may develop in the area.

Levels above 600 MVA were not considered in the Hampton – Rochester – La Crosse 345 kV Project as they were in the Fargo - St. Cloud 345kV Project because a key difference between the projects is the impact of generation connections on anticipated load flows. It is likely that smaller generator projects would interconnect with the electrical system in the Hampton – Rochester – La Crosse 345 kV Project area. In contrast, larger generators are expected to interconnect with the electrical system on the north end of the Fargo Project area. In the Fargo case, planning engineers estimated the highest loading levels that might occur on the line at some point in the future, considering a hypothetical high generation scenario where several thousands of megawatts (> 4,000 MW) of new generation is developed in North Dakota, South Dakota and Manitoba. Under this scenario, in any year, loading values of 600 MVA and 1,500 MVA would only potentially occur on the Fargo 345 kV line for up to six hours per day, for up to several days in a row.

It's also important to note that there is a network of bulk transmission lines in Minnesota that is set up like a hub and spoke where major facilities connect to the 345 kV ring around the Twin Cities. Generally, flows head from the west and the north toward the Twin Cities, the state's largest load center, and then move east and south. In the Twin Cities, power is drawn down from the lines to meet customer demand. Therefore, load flows "out" of the Twin Cities is lower than load flows headed "in" to the Twin Cities. Due to this general load flow and the lack of large generators in southeast Minnesota, load flows on the Hampton – Rochester – La Crosse line will be lower than those on the Fargo line.

FEIS ID #140



April 27, 2011

To whom it concerns,

140A Our property is on the alternate route and we would like to express our concerns.
At this time our property does not have any overhead power lines or roads through it and
if the alternate gets chosen, the landscape will change greatly. We sit on our deck and
Watch the bald eagles fly over and do aerial dance routinely. Would they still come?
140B There is an abundant wildlife variety also that I would be concerned about. Deer, turkey,
bobcat, mountain lion, pheasants, songbirds, etc. Wildflowers are also very prevalent
that I believe would be destroyed.. I have never seen Indian paintbrush on any other
140C property other than 1 area on our property. I am including a copy of our Woodland
140D Stewardship Plan that we are planning on carrying out for many years. A large amount of
our timber would be destroyed.

140E Please make sure that this line is necessary before it gets built at all. No matter where
you build it, lots of lives are going to be affected. We are very concerned about the health
140F effects on people and wildlife from the magnetic fields. Property values and going to be
140G affected more than you have estimated. If there was a line through land I was interested
in, it would be a complete turn off. Not interested.

140H This whole project seems to be working backwards. Where and what is going to happen
to the power once it gets to Wisconsin? Let's figure that out first.

Sincerely,
Sarah & Raleigh Mehrkens
Sarah Mehrkens



Stewardship FOREST

## WOODLAND STEWARDSHIP PLAN

Prepared for:

Raleigh and Sarah Mehrkens
34538 660th Street
Lake City, MN 55041
507-251-0913, 507-259-6585
zumbrofallsvet@embargmail.com

Legal Description of Property:
W1/2SW1/4 Section 20; Part of S1/2NW1/4 south of river, part of SW1/4NE1/4 west of river, SE1/4SW1/4 north of river Section 21; all in Township 109 North, Range 13 West Wabasha County, Minnesota.
Ownership 174 acres
116 acres - Stewardship Plan
84 areas - Class 2c
97 acres - Sustainable Forestry Incentives Act (SFIA)
File No.

Prepared by:

Randy Mell
Forestry Associates
404 E Jefferson
Caledonia, MN 55921
1-507-458-6886
or
DNR Forestry, Lake City Office
1801 South Oak Street
Lake City, MN 55041
651-345-3216

April 6, 2010

**Minnesota Forest Stewardship Program**

**Landowner identified these forest stewardship goals:**

- Forest management to produce high quality hardwood veneer and sawlog products.
- Improve desirable hardwood tree regeneration and overall forest health.
- Enhance outdoor recreational opportunities.
- Provide habitat for wildlife. Focus efforts on White Tailed Deer, Wild Turkey, and Ruffed Grouse.
- Maintain native Oak savannah prairie.
- Enhance water quality in Zumbro River.
- Reduce river bank and soil erosion.
- Control invasive species.

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**Regional Landscape Description:**

Your property is located in the rugged blufflands region of Minnesota, in the extreme southeastern corner of the state. Historically this area was not affected by any of the major glacial formations that covered Minnesota. The relatively level sedimentary rocks of the region were once part of a plateau, known as the Paleozoic Plateau (see enclosed map of Minnesota Ecological regions or subsections for additional information on nearby regional landscapes). Over the last 10,000 years the landscape has become highly eroded by streams and river tributaries of the Mississippi, such as the Cannon, Root, Whitewater, and Zumbro rivers and their predecessors. Much of the area is covered by loess (lō'es, lēs, lūs), a buff to gray windblown deposit of fine-grain, calcareous silt or clay.

The property is typical of a southern mesic hardwood stand. Steep bluffland slopes and flat ridge tops are the main geological features. Valleys formed through dissected bedrock terrain and are covered by silty loess with alluvial debris and braided stream channels. These features dominate the site. Knowledge of the ecological landscape region or subsection is vital to the long-term management of the site, as your property is just one of many properties over the much larger landscape mosaic.

**Interaction with Adjacent Properties:**

For the purpose of sustainable long-term management, you will need to consider your future management activities carefully in regards to their impact on both your forestlands and the lands of your adjacent neighbors. The adjacent landowner properties are similar in composition to your own: a mixture of hardwood forested slopes, small grasslands, agriculture, residential structures and outbuildings, and edge or transition areas in between.

Your primary management goals are growing timber for sawlogs and veneer, and hardwood timber stand improvement of your younger stands of trees, enhance recreational opportunities, maintenance of the native prairie, water quality, and control of invasive species. The cost of these activities can be reduced if you are able to combine efforts with your neighbors activities. This would increase the acres to be done so a vendor may choose to lower his cost to get more acres of management under contract. This type of cooperation between woodland owners can reduce costs and be very rewarding.

As you can see, your management efforts are one part of a larger landscape use pattern that surrounds your property. Active land use (agriculture, highway maintenance, rural residential development, etc.) will continue to dominate the landscape. By examining the strategies and results of both your management and the land management of others around you, current and future management strategies may be improved.

**Property Description:**

The majority of your property has the Zumbro River running to the north and east of your woodlands. The river will have seasonal changes in the volume of water flowing that will require you to manage the woodlands when they are at risk of flooding. Flood waters can carry away pesticides, fertilizers, harvest slash and debris, cause soil erosion and cause damage downstream. Management requiring these activities should be done well in advance of any flood waters. The steep river banks will protect your property from all but the most extreme flooding. The steeper blufflands and hillsides are growing Oak, Black Walnut, Hickory, Maple, Hackberry, Cherry, Pine, Elm, Boxelder, and Cottonwood. The soils in





areas where bedrock is not present, are deep and fertile and will grow high quality hardwoods and pine. In most areas these trees have good quality and density and with the addition of some timely thinning and pruning of lower branches the woodland will produce high quality veneer and sawlog timber products in the future. Desirable trees such as Oak and Hickory will provide critical cover and food for wildlife. Small acreage of agricultural fields are currently being tilled and sometimes the crops are left for wildlife food plots, or provide seasonal grazing of horses.

**Natural Heritage Information:**

There were no noted endangered, threatened, or species of concern noted during the visits conducted on the property. However, the possibility of such species being present on the site or on adjacent properties still exists. A check of the Natural Heritage and Non-game Database determined no specific listings for your property or immediate surroundings. The region is home to several rare, threatened, and at risk species such as the timber rattlesnake, butternut trees, bald eagles, Louisiana waterthrush, wood turtles, and more.

**Cultural Heritage Information:**

The legal description of your property was compared to the state archeological database maintained by the Minnesota State Historic Preservation Office. No cultural sites have been documented on your property. The old farm house site down by the river does not qualify as a cultural area but it will provide many hours of exploring opportunities. You can learn many things about how the past owners lived by what was discarded around the old building site. If you have any questions or are interested in further information about the cultural heritage resources database, contact Mike Magner-DNR forest Archeologist @ 218-327-4449 (ext. 243) or mike.magner@dnr.state.mn.us.

**Site History:**

Your property has an interesting history of use. Before the area was settled by the Europeans the native American tribes used these areas for hunting grounds and summer encampments. Later Europeans arrived to hunt and trap wild game primarily along the rivers and creeks. Soon more people arrived and the land was converted to farm lands and pasture. Settlement by the Europeans removed wildfires from the landscape. Up until this time wildfires had raced across the prairies to the west and during dry seasons traveled far into the valley and steep bluffs. These fires killed trees and brush and the land grew back into vast tall grass prairies. All that changed when wildfires were suppressed by the European settlers because of the devastating effects. With fire being suppressed trees grew and led to the Oak woodlands that dominate the steep bluffland slopes.

After European settlement, your property was a mixture of tillable fields and grass pasture. The steep slopes slowly grew into mature Oak forests. The Oak have been harvested several times in the past. After the harvest of these large Oak trees large areas of the forest floor was flooded with sunlight. Young Oak, Hickory, Black Walnut, Hackberry, Basswood, Ash, Cherry, Elm, Aspen, and Boxelder started to grow. This is your forest today.

At present, there is limited livestock grazing in the pasture by the cabin site and the lower pasture in the river valley floor. Your woodland vegetation is being heavily browsed by deer and Oak trees are receiving the most browsing damage. The over mature Oak woodlands have evidence of a root rotting fungi called Shoestring Root Rot (*Armillariellia mellea*). Dutch Elm's Disease is present and has killed most of the older Elm and has now been actively killing younger smaller diameter Elm trees.

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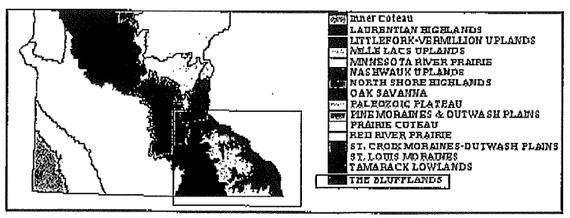
## Landscape Level: Blufflands Subsection

### DISCUSSION

The Blufflands Subsection of southeastern Minnesota is dominated by the Mississippi River, and characterized by bluff prairies, steep bluffs, and stream valleys up to 600 feet deep. Numerous cold-water trout streams tributaries feed into rivers like the Root and Whitewater. Rich hardwood forests in the valleys and lowlands accompany these waterways. As a result of the terrain there are relatively few lakes or large bodies of water.

The most prominent use of land in the area is agriculture, which occurs on former oak savannah and prairie land. Forestry is another important land use, as well as outdoor recreation use, with significant amounts of public land along river corridors.




### CLIMATE

Annual normal precipitation ranges from 29 inches in the western portion to 34 inches in the southeast (Midwest Climate Center 1992). Growing season precipitation ranges from roughly 11 to 16 inches and growing season length ranges from 136 to 156 days.

### LANDFORMS

The area is a loess-capped plateau, deeply dissected by river valleys. The greatest relief occurs along the Mississippi River, where relief is up to 600 feet. In the east, loess lies directly on bedrock. In the southeast, loess overlies red clayey residuum that was formed directly from limestone or sandstone. Paleozoic sedimentary rocks are exposed in valley walls, but are generally mantled with colluvium or loess. Underlying glacial till along the western edge of the subsection, where loess is several feet thick, controls topography. As glacial drift thins to the east, topography is largely bedrock controlled (Dept. of Soil Science, Univ. of Minnesota 1973). Sinkholes are common in the southwestern portion of the subsection.





### HYDROLOGY

There are no natural lakes in this subsection. There are however numerous coldwater trout streams the flow into the major river systems. The Zumbro River lies adjacent to your property. To ensure high quality water, proper handling of man-made chemicals and materials should be observed at all times. Major rivers include the Mississippi (which forms the eastern boundary), Root, Whitewater, and Cannon.

### PRESETTLEMENT VEGETATION

Tall grass prairie and Burr Oak Savannah were major vegetation types on ridge tops and dry upper slopes. Red Oak, White Oak, Shagbark Hickory, Basswood forests were present on wetter slopes, and Red Oak, Basswood, Black Walnut forests in protected valleys. Prairie was restricted primarily to broader ridge tops and step slopes, where fires could spread, but also occurred on steep slopes with south or southwest aspect.

### NATURAL DISTURBANCE

Fire was important in upland prairie and oak-dominated communities. Recent records of tornados and ice storms indicate that they also locally impact forest vegetation.

### PRESENT VEGETATION AND LAND USE

About 30% of this subsection is cropped, 20% is in pasture, and 50% is in woodland (Dept. of Soil Science, Univ. of Minnesota 1973). In Minnesota, Wheeler et al. (1985) found species characteristic of oak openings and barrens to be abundant (based on herbarium collections) although most remaining areas of openings and barrens are small. People are finding good recreational opportunities in this subsection.

### CONSERVATION CONCERNS

A major concern is groundwater quality. The groundwater has high amounts of nitrates and phosphates. These pollutants are mainly the result of agricultural activities. There are numerous high quality coldwater trout streams in the subsection that are threatened. Many neighbors are working to ensure their quality for future generations. Soil erosion control is another conservation concern, as are rare, threatened, or at risk species known to occur in the subsection.

### SOILS INFORMATION:

Soil is a mixture of both mineral and organic materials that forms the basis for all vegetative growth on the landscape. Proper care of the soil on your property will ensure future productivity of your woodland. Maintaining healthy vegetation on the relatively steep slopes can also reduce the potential for soil erosion.
When considering ATV or other recreation vehicle trail construction, please consider the characteristics of the soils on your property and plan your trail development accordingly.

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The following list of soil types are defined on the wooded portion of your property by the Soil Conservation Service soil survey of 1959:

- **N640G La Crescent, flaggy Frontenac-Rock Outcrop Complex**- steep slopes of 45-90 %. Consists of silty and loamy sediments over loamy colluviums, well drained. Soil is not flooded or ponded. Dolomite columns of bedrock are exposed.
- **N574D2 Downs-Hersey Complex**- Slopes are 18-25%, soil is windblown loess.
- **FaE Fayette Silt Loam**- Slopes 18-15%, soil is a windblown loess to a depth of 12-36 inches.
- **PaB Plainfield Fine Sand**- Slopes are 2-6% , sands are river deposits, they are very deep and excessively dry .
- **Ts Sandy Terrace Escarpments**- These sandy soils have slopes between 20-50%. They are river deposited sands and are not very stable when vegetation is removed and very susceptible to erosion.
- **Zb Zumbro Loamy Fine Sand**- Occasionally flooded slopes 0-2%, soils are river deposited alluvium.
- **FaD2 Fayette Silt Loam**-loess, occurs on uplands, deep as 20 feet, moderately eroded, well drained, on 12-18% slopes, these are susceptible to erosion because of their loose, fine texture.
- **Fcf Fayette Silt Loam**-similar characteristics to FaD2, occurs in valleys, on 25-35% slopes

## INSECTS AND DISEASE:

There are numerous insect and disease concerns across the central hardwoods landscape in Minnesota today, and new threats are expected in the future. A few of the most common insect and disease concerns in your area are oak wilt, butternut canker, and two-lined chestnut borer. Potential future threats may include emerald ash borer and gypsy moth.

At no time during the site visit did I note any evidence of harmful insect activity or the presence of diseases in your stand. There was evidence of some mechanical damage from wind damage.

Stress in trees is due to a variety of factors; only some of them are in your control. Three of the most important factors in tree stress are climate, soils, and tree species. You can't be expected to control the first two, but in the future you may be able to exert a bit more control over the third. By managing your woodland for species suitable to the site you can help ensure greater quality and vigor in the trees you grow. In hardwood management the value is in **quality**, not quantity or volume.

Towards that end, I will be recommending a series of treatments on your site to reduce stress on potential crop trees, like black walnut, by eliminating some of the competition for water, light, and soil nutrients. This will also mean pruning to improve form and quality of the potential crop trees. Safe and effective techniques for accomplishing these recommendations without compromising the quality of the leave trees will also be discussed.

In the Woodland Stewardship manual in your binder you will find **Forest Health** page 91 is rich in information on the biological, mechanical, and chemical threats to the health of your woodlands. Reference other sections of your Woodland Stewardship manual, such as **Woodland Improvement Practices** page 45, to learn more about management practices that enhance your woodlands.





## TYPE DESCRIPTIONS AND MANAGEMENT RECOMMENDATIONS:

**MATURE OAK**
**COVER TYPE NUMBER: 1**

**Species Description: Mature Mixed Oak 25 acres**
This is an Oak sawlog cover type growing on rolling to steep land. Groups of large mature mixed Oak (Red Oak, White Oak, Burr Oak, Black Oak) are scattered throughout. These mature Oak average 120 years old and have a volume of 4200 board feet per acre with a height of 68 feet and an average diameter of 18 inches. These Oak are declining in health and are subject to wind and ice damage. Smaller diameter Hard Maple, Birch, American Elm, Aspen, Hickory, and Basswood trees are also growing throughout with a combined volume of 1500 board feet per acre with an average height of 55 feet and 14 inches in diameter and an average age of 80 years. The site quality is 53 (based on a range of 0-100, 0 being the worst site for Oak and 100 being the best). The Oak trees are poor in merchantable quality but aid regeneration of the area by producing an abundance of acorns every 3-5 years. The predominate Oak species is Red and White Oak. There is very little understory development.
Before settlement this area was open tall grass prairie. When the area was settled in the 1850's the prairie was converted to agricultural tillage. As years passed the trees surrounding the field began to sprout and grow in the field. When livestock grazing was removed, trees soon reoccupied the area.

The objective of this cover type is to maintain a strong Oak component far into the future. This will provide acorns and cover for wildlife populations and valuable timber.

**Recommended Management Activities:**
As mature Oak lose vigor, conduct a salvage harvest before they lose their merchantability. Trees that have at least one 8'8" log have a 10 inch diameter at the small end, are straight, and relatively free of rot are merchantable. Select and mark the poorest quality trees for removal. The removal of these large trees will increase the sunlight to the forest floor and aid the growth of the small desirable trees. Leave 3-5 large Oak per acre for wildlife trees. The trees with the largest crowns produce the most acorns. Leave White Oak over other Oak species when possible. White Oak acorns are favored by wild life over acorns of other Oak species. Contact a qualified, professional forester to outline the harvest areas and to calibrate timber volume estimates.
After the removal of these large trees, cut small damaged residual Oak trees off at the ground line. Many will re-sprout from their roots. To influence growth of the desirable young trees growing within the brush layer, locate the Oak, Hickory, and Cherry and remove the competing vegetation around them. Remove all vegetation directly over the top of the selected tree. Then continue to clear vegetation on at least three sides around the tree, so that there is at least 3-4 feet of clear space between trees.

**Other Management Options:**
In areas that do not have any Oak, Hickory, and Cherry regeneration you may decide to plant these species. Plant these trees under the large trees one year before harvest. When the trees are removed the sunlight will reach the forest floor and release them to grow. Planting trees in areas where none exist will expand the area producing valuable tree species. If you are interested in planting additional trees you can find information on planting techniques and seedling sources in Chapter 4 Planting of your Woodland Stewardship manual. Red Oak, White, Burr Oak, Walnut seedlings are available at rates of $64 for 100, $160 for 500, and $320 for 1000 seedlings (MN DNR 2010 Seedling prices, all species and rates available at http://www.dnr.state.mn.us/forestry/nurseries/pricelist.html). Cherry and Hickory can be located from other private tree nurseries.

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**OAK AND MIXED HARDWOODS SMALL DIAMETER POLES**
**COVER TYPE NUMBER: 2**

**Species Description: Oak and Mixed Hardwood Small Poles 14 acres**
This type also has a variety of hardwood trees growing on steep rocky land. The species growing are Black Oak, Black Walnut, Hard Maple, Hackberry, Ash, Basswood, American Elm , and Boxelder with an average diameter of 6-14 inches. The average age is 75 years. Some older large diameter Black Oak and Walnut trees are scattered in clumps throughout the type. The general tree form is good. Average volume is 1400 board feet per acre with 10 cords per acre , average height of 52 feet. The trees are generally healthy and growing well. The site quality is 45 (based on a range of 0-100, 0 being the worst site and 100 being the best). Mixed Oak species and Basswood are the predominate trees in the type. The young small diameter trees are of good quality. There is a poor shrub layer growing to a height of 2-3 feet. There are Hard Maple, American Elm, Basswood, Birch, Walnut, and Aspen reproducing (10-150 trees per acre).

The objective of this cover type is to produce quality sawlogs & veneer, and enhance wildlife cover. Recreation trail opportunities are very good. Enhance the native prairies.

**Recommended Management Activities:**
This type has great potential of being financially valuable in the future. It has the potential of producing sawlogs and veneer products. The density of trees per acre is high. Monitor Black Walnut for health, as trees start to decline, mark them for harvest and salvage their value. Oak and Basswood throughout this type should also be monitor for health and harvest trees before they die. Secondly, a practice of releasing the best growing small diameter trees (Walnut, Oak, Hard Maple, Basswood, and Hackberry) is recommended. Select the best trees to grow using a spacing of 20 feet between trees and release them from competing trees of poorer form. These will be your crop trees of the future. After releasing the crop trees, the trees with good straight healthy stems should have their lower branches removed. Prune live and dead branches less than 3 inches in diameter up to 17 feet or one half their height. Prune up to a maximum of 150 trees per acre. This will allow high quality wood to be formed on these trees. Harvest or remove large diameter trees that lean or are slowing losing vigor or lose their crowns in wind storms. Partial funding may be available through Federal or State cost-share programs.
Brush out and maintain a hiking path through the type.
Construct fire breaks around the prairie remnants and periodically burn them to remove encroaching woody vegetation. Allowing the fire to burn into the adjacent woodlands will increase the size of the prairies.

**LOWLAND HARDWOODS**
**COVER TYPE NUMBER: 3**

**Species Description: Lowland Hardwoods Sawlogs 12 acres**
This woodland grows on level to steep river banks adjacent to the Zumbro River. The trees growing here have adapted to the moist river deposited soils. The trees present are Boxelder, Silver Maple, Hard Maple, Elm, Willow, Hackberry, Silver Maple, and Black Walnut. This cover type is evenly aged with most trees approximately the same age although there are scattered clumps of older large diameter Boxelder, Elm, and Cottonwood along the river banks. The average age of the trees is 40 years and have a volume of 800 board feet per acre and 7 cords per acre with a height of 50 feet and an average diameter of 10 inches. The Elm species have been badly damaged by Dutch Elm's Disease, but a few individual

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trees remain alive. The site quality is 65 (based on a range of 0-100, 0 being the worst site for Black Walnut and 100 being the best). The Elm and Willow trees are poor in merchantable quality but the Black Walnut, Hard and Silver Maple, and Hackberry are well formed and growing well. During the growing season the forest floor has a dense herbaceous cover growing at times to 5-6 feet tall. There is very little tree regeneration occurring under this dense vegetation. There are native prairie remnants growing on the south facing escarpments in the southern portion of this type.

The objective of this cover type is to maintain a healthy hardwood forest that protects the valley soils from erosion during flood events. Black Walnut, Hard Maple, and Silver Maple will be cultivated for veneer and high quality sawlogs.

**Recommended Management Activities:**
Focus woodland management on releasing from completion and pruning the Black Walnut, Hackberry, and Silver Maple. As trees become over mature, conduct a salvage harvest before they lose their merchantability, be especially aware of any Walnut losing vigor. Trees that have at least one 8'8" log have a 10 inch diameter at the small end, are straight, and relatively free of rot are merchantable. The individual removal of these large trees will increase the sunlight to the forest floor and aid the growth of the small desirable trees growing in the understory. Leave 3-5 large hardwood( not Walnut) trees for wildlife den trees. Contact a qualified, professional forester to outline which individual trees need to be removed and calibrate timber volume estimates.
After the removal of these large trees, locate desirable young Hard and Silver Maple, Walnut, and Basswood. Remove the competing vegetation around them. Remove all vegetation directly over the top of the selected tree. Then continue to clear vegetation on at least three sides around the tree, so that there is at least 3-4 feet of clear space between trees.
All Walnut and Silver Maple trees with straight stem should be pruned, removing the dead and live branches to 17 feet or one half their height. Vines growing on desirable trees should be removed.

**Other Management Options:**
In dry soil areas that are 0.1-2 acres in size and have sunlight reaching the forest floor can be hand planted with Black Walnut. Planting trees in areas where none exist will expand the area producing valuable Walnut trees. If you are interested in planting additional trees you can find information on planting techniques and seedling sources in chapter 4 Planting of your Woodland Stewardship manual. Black Walnut seedlings are available at rates of $64 for 100, $160 for 500, and $320 for 1000 seedlings (MN DNR 2010 Seedling prices, all species and rates available at http://www.dnr.state.mn.us/forestry/nurseries/pricelist.html).

**OPEN GRASSLANDS**
**COVER TYPE NUMBER 4**

**Description: Abandoned Agricultural Field 8 acres**
This is a dry sandy field that is used occasionally as a spring pasture for horses. The old original farm house is still standing.

**Recommended Management Activities:**
Continue to leave in dense grass cover. Graze only in the early spring until May 15 then remove the horses. Grazing in this way will mimic the effects of fire and historic wildlife grazing.