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September 10, 2012

VIA U.S. Mail

Mr. Darrell Nitschke
Executive Secretary
North Dakota Public Service Commission
600 E. Boulevard Ave., Dept. 408
Bismarck, ND 58505-0480

RE: Bison 1B Wind Project Bison 2 Wind Project
 Oliver/Morton Counties Oliver/Morton Counties
 Siting Application Siting Application
 Case No. PU-09-151 Case No. PU-11-57

and

Minnesota Power's Application for a Corridor Certificate and a
Route Permit for a 230kV HVTL in Oliver and Morton counties,
Case No. PU-09-587

Dear Mr. Nitschke:

Enclosed please find an original and 10 copies of Minnesota Power's 2012 Tree
and Shrub Survival Report relating to the above-referenced cases.

Please let me know if you have any questions.

Yours truly,

David R. Moeller

kl
Enc.
c: Dan McCourtney, Minnesota Power

80 PU-09-587 Filed 09/10/2012 Pages: 67
 Minnesota Power 2012 Tree and Shrub Survival Report
 Allete, Inc.
 David Moeller

100 PU-11-57 Filed 09/10/2012 Pages: 67
 Minnesota Power 2012 Tree and Shrub Survival Report
 Allete, Inc.
 David Moeller

166 PU-09-151 Filed 09/10/2012 Pages: 67
 Minnesota Power 2012 Tree and Shrub Survival Report
 Allete, Inc.
 David Moeller

Minnesota Power 2012 Tree and Shrub Survival Report

For Bison 1 (PU-09-151), For Bison 2 (PU-11-57) and 230kV HVTL (PU-09-587)





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Tree and Shrub Survival Report- Bison 1, 2 & 230kV Transmission line

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Appendix B- 2012 Survival Survey Results

- **Planting #1**
- **Planting #2**





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Tree and Shrub Survival Report- Bison 1, 2 & 230kV Transmission line

Minnesota Power 2012 Tree and Shrub Survival Report



Case # PU-09-151, PU-09-587 and PU-11-57

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Introduction

In 2010 Minnesota Power (an ALLETE Company) constructed the first phase (Phase 1A) of its Bison 1, 81.8 MW wind project facility. A 21 mile 230kV transmission line was also built to connect the Bison 1 wind project to an existing substation (the Square Butte Substation).

In 2011 Minnesota Power completed construction of the second phase (Phase 1B) of its Bison 1, 81.8 MW wind project facility. In addition, Minnesota Power constructed its Bison 2, 105 MW Facility.

During the construction of these facilities some trees and shrubs were disturbed. In keeping with the Certificate of Site Compatibility for the Bison 1 and Bison 2 projects, as well as the Certificate of Corridor Compatibility for the 230kV transmission line, Minnesota Power developed Tree and Shrub Mitigation Plans. These mitigation plans facilitated replacement of trees and shrubs that were disturbed during construction and minimized any associated environmental impacts (Appendix A).

The mitigation tree and shrub species were required to be planted at a ratio of 2:1, per North Dakota Public Service Commission (ND PSC) order, for every stem removed during construction. The stems planted were required to have 75% survival at three years post planting. The following is Minnesota Power’s 2012 Survival Report for Bison 1A, 1B, 2 and the associated 230kV transmission line.

Survival Report

Mitigation plantings for Bison 1A and the 230kV transmission line were performed at the same time and comprised the same planting effort (Planting 1). Bison 1B and Bison 2 mitigation plantings were combined in a separate planting effort (Planting 2). For purposes of discussion, these two planting efforts will be referred to as Planting 1 and Planting 2. Previous survival reports can be found in Appendix B.

Table 1-1 outlines the corresponding survival check and percent survival for Planting #1.

(Table 1-1) **Planting #1**- Bison 1A & 230kV line

2011 Survival Check	Stems Planted for 2:1 Ratio	Stems Observed	Percent Survival
Tree/Tall Shrub Species	118	162	137%
Low Shrub Species	752	954	127%
2012 Survival Check			
	Stems Planted for 2:1 Ratio	Stems Observed	Percent Survival
Tree/Tall Shrub Species	118	122	103%
Low Shrub Species	752	234	31%
*an additional mitigation planting is required for low shrub species			





Table 1-2 outlines the corresponding survival check and percent survival for Planting #2.

(Table 1-2) **Planting #2** - Bison 1B & Bison 2

2012 Survival Check	Stems Planted for 2:1 Ratio	Stems Observed	Percent Survival
Tree/Tall Shrub Species	16	59	369%
Low Shrub Species	n/a	n/a	n/a

Survey Results

After reviewing the 2012 Survival Reports, Planting 1 has maintained an adequate Tree/Tall Shrub survival ratio. However, Low Shrub species are not meeting the required ND SPC survival ratio. A portion of the planting area was accidentally harvested for hay in 2011, which accounts for the poor survival numbers of the Low Shrub species.

As a result, Minnesota Power will replant additional Low Shrub species to meet the ND PSC required 2:1 ratio and maintain 75% survival 3 years post planting. Minnesota Power had originally planted snowberry for its Planting 1 effort however, after consulting with local NRCS professionals, it was determined that snowberry was not suited for the soil types that the mitigation stems were planted on. As a result, Minnesota Power’s additional mitigation planting effort will be replacing those stems with Common Lilac and Western Sandcherry. Actual stem counts will be closer to 3:1 rather than the 2:1 ratio required by the ND PSC: 514 Common Lilac and 493 Sand Cherry are scheduled to be planted in 2013. These plantings will occur at Minnesota Power’s alternative mitigation site located in T140N-R86W-Section 4.

Minnesota Power’s Planting 2 has maintained an adequate Tree/Tall Shrub survival ratio. No low shrub species are associated with Planting #2. No replanting activities are planned at this time.

Minnesota Power has received approval from the ND PSC for its Bison 3 Tree and Shrub Mitigation Plan. The Bison 3 mitigation plan will be planted along with the Low Shrub replanting effort from Planting 1 and will comprise Minnesota Power’s Planting 3 effort. Planting 3 is scheduled for the spring of 2013.

Conclusion

Tree/Tall shrub species have maintained adequate survival ratios for Planting 1 and Planting 2. No Tree/Tall shrub replanting activities have been scheduled at this time.

Low shrub species have not maintained adequate survival ratios for Planting 1 and will be replanted to replace the stems lost to mortality. Minnesota Power will be planting replacement Low Shrub species for Planting 1 in 2013, along with the Bison 3 tree and





shrub mitigation effort, Planting 3 (the Bison 3 mitigation plan has already been approved by the ND PSC).

Table 1-2 outlines survival results for each planting effort with the corresponding year

(Table 1-2)

	2011	2012	2013
Planting 1	Tall Tree/Shrub- Adequate Low Shrub- Adequate	Tall Tree/Shrub- Adequate Low Shrub- Inadequate (Replanted)	To Be Determined
Planting 2	N/A	Tall Tree/Shrub- Adequate Low Shrub- N/A	To Be Determined
Planting 3	N/A	N/A	To Be Determined

The third and potentially final survival check for Planting 1 Trees/Tall Shrubs is scheduled for the fall of 2013. The second survival check for Planting 2 is scheduled for the fall of 2013. The proposed Planting 3 survival check will be performed in the fall of 2013 as well. Any additional mitigation activities that may result from these checks will be covered in Minnesota Power’s 2013 Tree and Shrub Survival Report.



Appendix A

-Minnesota Power's Tree and Shrub Mitigation Plans

Minnesota Power Tree and Shrub Mitigation Plan

For Bison 1A (PU-09-151) and 230 kV HVTL (PU-09-587)



A WIND ENERGY INITIATIVE OF MINNESOTA POWER IN NORTH DAKOTA



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Tree and Shrub Mitigation Plan- Bison 1A & 230kV Transmission line

Minnesota Power Tree and Shrub Mitigation Plan

AN ALLETE COMPANY



Case # PU-09-151 and PU-09-587

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Introduction

In 2010 Minnesota Power (an Allete company) constructed the first phase of their Bison 1 81.8 MW wind project facility. A 230kV transmission line was also built to connect the Bison 1 wind project to an existing substation (the Square Butte Substation). During the construction of these two facilities some trees and shrubs were disturbed. In keeping with the Certificate of Site Compatibility for the Bison 1 wind project facility as well as the Certificate of Corridor Compatibility for the 230kV transmission line, Minnesota Power has developed a Tree and Shrub Mitigation Plan. This mitigation plan will facilitate the replacement of the trees and shrubs that were disturbed during construction and will minimize any associated environmental impacts.

Number and Variety of Trees

Table 1-1 shows the total number of trees and shrubs that were disturbed during construction of the 230kV high voltage transmission line. These numbers were determined by a consultant Minnesota Power hired to perform preconstruction and post construction vegetation surveys. The species have been organized into section-township-range. The consultant was KDK Consulting and the surveys were performed by Kelly Krabenhof- Certified Professional Range Management. The transmission line tree and shrub numbers are as follows:

Table 1-1 Stems Disturbed (by Species) Along Transmission Line For Bison 1

Common Name	Scientific Name	Sec. 32 T142N, R83W	Sec. 30 T142N, R83W	Sec. 31 T142N, R83W	Sec. 35 T142N, R84W	Sec. 34 T142N, R84W
Trees						
Northern Hawthorn	<i>Crataegus rotundifolia</i>				5	8
Green Ash	<i>Fraxinus pennsylvanica</i>				13	2
Shrubs						
Chokecherry	<i>Prunus virginiana</i>				7	1
Bristly Gooseberry	<i>Ribes setosum</i>					5
Buffaloberry	<i>Shepherdia argentea</i>		4			8
Western Snowberry	<i>Symphoricarpos occidentalis</i>	50	10	47		
Shrubs						
Chokecherry	<i>Prunus virginiana</i>			5		
Western Snowberry	<i>Symphoricarpos occidentalis</i>	24	32		213	



Table 1-2 shows the total number of trees that were removed during construction of the first phase of the Bison 1 wind project facility. These numbers were determined by a consultant Minnesota Power hired to perform preconstruction and post construction site surveys. The consultant was KDK Consulting and the surveys were performed by Kelly Krabenhof- Certified Professional Range Management. The Bison 1 wind project facility numbers are as follows:

Table 1-2 Woody Species Observed Within Phase 1A Easement Boundary for the Bison 1 Wind Project

Common Name	Scientific Name	Sec 10 T140N, R86W
Trees		
Peach-leaved Willow	<i>Salix amygdaloides</i>	1
TOTAL		1

Mitigation Plan

Following the requirements in both the Certificate of Site Compatibility for the Bison 1 wind project facility as well as the Certificate of Corridor Compatibility for the 230kV transmission line, Minnesota Power will replace disturbed trees and shrubs. The trees and shrubs disturbed during construction are required to be replaced at a minimum ratio of 2:1. However, the actual planting will be at a ratio closer to 3:1 to account for mortality associated with any planting/re-vegetation effort.

All disturbed tree and shrub species will be replaced by the same species or similar species. In two instances similar species have been prescribed to substitute the original. Northern Hawthorn will be replaced with Arnold Hawthorn and Bristly Gooseberry will be replaced by Black Currant as recommended by the Oliver County Soil Conservation District. This is in following with the guidelines given by the North Dakota Public Service Commission in their Tree and Shrub Mitigation Specifications.

The tree and shrub species were planted in May of 2011. Minnesota Power used KDK Consulting for the planting activities. The use of a professional planting contractor helps ensure high survival of the desired/mitigated species.

Upon completion of mitigation activities the planting sites will then be monitored for three years to ensure that there has been a 75% survival rate based on a 2:1 planting regime. Survival surveys will occur in the fall of each year and will be used to determine if any additional mitigation activities will be required.

Proposed Number, Variety, Type

Table 1-3 lists the original species that were disturbed during construction, the number of species disturbed and the number of mitigation stems that will be planted. Again, these planting numbers are based on a 3:1 planting ratio however the percent survival will be



determined assuming a 2:1 planting ratio. These numbers are for both the 230kV high voltage transmission line as well as first phase of the Bison 1 wind project facility.

Table 1-3 # Stems Disturbed (by Species) Along Transmission Line and For Bison 1 Wind Project

Common Name	Scientific Name		
Trees		# Species Removed	# Species to Plant*
Northern Hawthorn**	<i>Crataegus rotundifolia</i>	13	39
Green Ash	<i>Fraxinus pennsylvanica</i>	15	45
Peach-leaved Willow	<i>Salix amygdaloides</i>	1	3
Shrubs			
Chokecherry	<i>Prunus virginiana</i>	13	39
Bristly Gooseberry***	<i>Ribes setosum</i>	5	15
Buffaloberry	<i>Shepherdia argentea</i>	12	36
Western Snowberry	<i>Symphoricarpos occidentalis</i>	376	1128

*The # of species to plant was estimated using a 3:1 ratio.

** Northern Hawthorn will be replaced with Arnold Hawthorn as recommended by the Oliver County Soil Conservation District.

*** Bristly Gooseberry will be replaced with Black Currant as recommended by the Oliver County Soil conservation district.

Location and Date of Replacements

In an effort to maintain customer satisfaction, project acceptance and a high standard of public relations, Minnesota Power has developed an alternative site for the mitigation plantings to occur if requested by land owners. Land owners have their choice to have mitigation activities occur either on their ownership or on Minnesota Power’s alternative site. Due to the kind of species that are to be planted, most affected land owners prefer mitigation (planting) activities to not occur on their ownership and have opted for Minnesota Power’s alternative site.

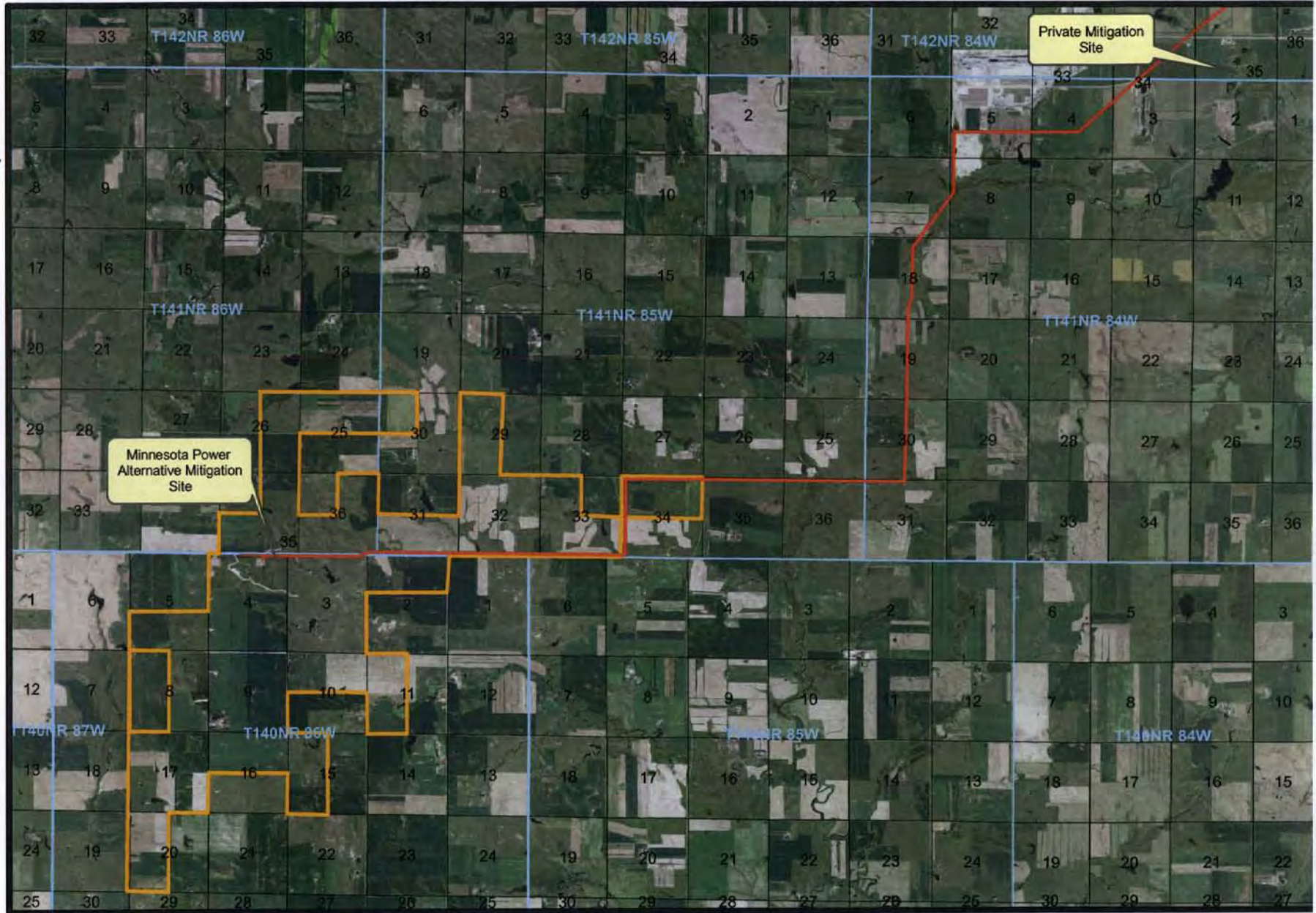
The Minnesota Power alternate site is located in Morton County in Section 10 - Township 140N - Range 86W. Eight of the nine affected landowners choose Minnesota Power’s alternative location for the mitigation activities, one of the nine affected landowners choose to have the mitigation activities take place on their ownership in Section 35- Township 142N – Range 84W and one of the nine landowners BNI Coal (an Allele Company) will perform additional mitigation plantings on their ownership as well as the associated plantings at Minnesota Power’s alternative site. See Attached Figure #1 for mitigation site location information.

Mitigation Site Locations (Figure 1)



- Legend**
- 230 Kv Transmission Line
 - Bison 1 Project Boundary
 - PLSS Townships
 - PLSS Sections

0 0.375 0.75 1.5 Miles



Appendix A
Alternative Mitigation Location Agreements

Alternative Mitigation Location Agreement

Callen Doll, whose property is located at Section 34 Township 141N-Range 85W, CONSENTOR, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTOR personal property.

The CONSENTOR understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities performed on the CONSENTOR personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTOR

NAME HERE Callen H. Doll

COUNTY OF Oliver.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802

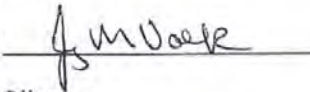
Alternative Mitigation Location Agreement

Jay Volk a representative of BNI Coal, whose property is located in Section 34-Township 142N-Range 84W, CONSENTOR, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTOR personal property.

The CONSENTOR understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities performed on the CONSENTOR personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTOR

NAME HERE



COUNTY OF Oliver.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802

**BNI Coal, Ltd. also notes that all trees disturbed during the construction of the power line within their mining permits will also be replaced within the existing tree plantings that were disturbed. This will be done regardless of this agreement in fulfillment of BNI Coals reclamation plans set forth in their mining permits.*

Alternative Mitigation Location Agreement

Lyle and Karen Mosbrucker, whose property is located at Section 18 Township 141N-Range 84W, CONSENTORS, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTORS personal property.

The CONSENTORS understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities performed on the CONSENTORS personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTORS

NAME HERE Lyle Mosbrucker NAME HERE Karen Mosbrucker

COUNTY OF Oliver.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802

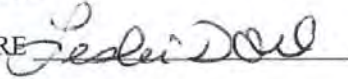
Alternative Mitigation Location Agreement

Leslie and Jacqueline Doll, whose property is located at Section 10 Township 140N-Range 86W, CONSENTORS, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTORS personal property.

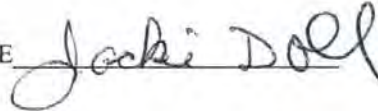
The CONSENTORS understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities performed on the CONSENTORS personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTORS

NAME HERE



NAME HERE



COUNTY OF Morton.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802

Alternative Mitigation Location Agreement

Robert Reinke, whose property is located in Section 31 Township 142N-Range 83W, CONSENTOR, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTOR personal property.

The CONSENTOR understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities preformed on the CONSENTOR personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTOR

NAME HERE Robert Reinke

COUNTY OF Oliver.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802

Alternative Mitigation Location Agreement

Leslie and Laurie Brandt, whose property is located at Section 34 Twonship141N-Range 85W, CONSENTORS, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTORS personal property.

The CONSENTORS understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities preformed on the CONSENTORS personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTORS

NAME HERE 

NAME HERE 

COUNTY OF Oliver

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802

Alternative Mitigation Location Agreement

Mr. & Mrs. Windhorst, whose property is located in Section 30 & 32 Township 142N-Range 83W, CONSENTOR, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTOR personal property.

The CONSENTOR understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities preformed on the CONSENTOR personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTOR

NAME HERE Wayne Windhorst NAME HERE _____

POA for Kathleen Windhorst

COUNTY OF Oliver.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802

Alternative Mitigation Location Agreement

Lance Doll, whose property is located at Section 3 Township 140N-Range 86W, CONSENTOR, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTOR personal property.

The CONSENTOR understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities performed on the CONSENTOR personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTOR

NAME HERE

Lance Doll

COUNTY OF Morton.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802

Appendix B

Woodland Inventory Procedures and Survey Results

WOODY SPECIES DISTURBANCE REPORT
FOR ALLETE, INC. BISON I WIND PROJECT-
TRANSMISSION CORRIDOR
IN OLIVER/MORTON COUNTIES OF NORTH DAKOTA

Prepared by KDK Consulting
Kelly Krabbenhoft- Certified Professional Range Management
October 2010

Woodland inventory within the 130-foot diameter corridor (65-feet each side of the center line) along the approximately 22-mile length for the proposed transmission line related to the Bison I Wind Project was conducted in early April 2010 by KDK Consulting. The inventory was conducted to meet the specifications outlined in Case No. PU-09-587. This was accomplished by conducting a thorough ground-truth reconnaissance. All trees and tall shrubs were inventoried by species through direct counts within the sample area. Low shrubs were estimated by utilizing 2-meter by 2-meter quadrats in 30 representative areas (locations provided as point data layer in ArcMap) along the corridor. This methodology for low shrub sampling is utilized for baseline sampling protocol within coal mining permits in North Dakota. Average stems per quadrat can then be converted to stems per acre. This will assist in extrapolation of total stems removed by disturbance in the mapped low shrub community acreage within the corridor. Sample adequacy (Stein's) was met for the low shrub inventory. All data by each tree and shrub species related to the disturbance inventory (by ownership) conducted in late September can be found in Tables 1 and 2 following construction of the transmission line. Now that the determinations of disturbance numbers by species are calculated, a planting plan and survivability monitoring protocol can be outlined to mitigate these losses due to construction. Depending upon each owner's preference, these losses can be either within their own lands or possibly the total disturbance could be pooled together for one significant off-site planting to be determined later.

Table 2- Stems Disturbed (by Species) Along Transmission Line For Bison 1 Wind Project By Owner

Common Name	Scientific Name	Windhorst	Windhorst	Reinke	Ternes	BNI Coal
Trees		N2NE4 Sec. 32 T142N, R83W	SE4 Sec. 30 T142N, R83W	SE4, W2 Sec. 31 T142N, R83W	Sec. 35 T142N, R83W	SE4 Sec. 34 T142N, R83W
Northern Hawthorn	<i>Crataegus rotundifolia</i>				5	8
Russian Olive	<i>Eleagnus angustifolia</i>					
Green Ash	<i>Fraxinus pennsylvanica</i>				13	2
Scots Pine	<i>Pinus sylvestris</i>					
Blue Spruce	<i>Picea pungens</i>					
Cottonwood	<i>Populus deltoides</i>					
Peach-leaved Willow	<i>Salix amygdaloides</i>					
Siberian Elm	<i>Ulmus pumila</i>					
TOTAL		0	0	0	18	10
Shrubs						
Pea Tree (Caragana)	<i>Caragana arborescens</i>					
Chokecherry	<i>Prunus virginiana</i>				7	1
Wild Plum	<i>Prunus americana</i>					
Bristly Gooseberry	<i>Ribes setosum</i>					5
Buffaloberry	<i>Shepherdia argentea</i>		4			8
Western Snowberry	<i>Symphoricarpos occidentalis</i>	50	10	47		
Common Lilac	<i>Syringa vulgaris</i>					
TOTAL		50	14	47	7	14

Table 2 (cont.)- Stems Disturbed (by Species) Along Transmission Line For Bison 1 Wind Project By Owner

Common Name	Scientific Name	Lyle & Karen Mosbrucker	Callen Doll	Brandt	Ann Doll	
Trees		N2 Sec. 18 T141N, R84W	N2 Sec. 34 T141N, R85W	S2 Sec. 34 T141N, R85W	Sec. 3 T140N, R86W	
Northern Hawthorn	<i>Crataegus rotundifolia</i>					
Russian Olive	<i>Eleagnus angustifolia</i>					
Green Ash	<i>Fraxinus pennsylvanica</i>					
Scots Pine	<i>Pinus sylvestris</i>					
Blue Spruce	<i>Picea pungens</i>					
Cottonwood	<i>Populus deltoides</i>					
Peach-leaved Willow	<i>Salix amygdaloides</i>					
Siberian Elm	<i>Ulmus pumila</i>					
TOTAL		0	0	0	0	
Shrubs						
Pea Tree (Caragana)	<i>Caragana arborescens</i>					
Chokecherry	<i>Prunus virginiana</i>			5		
Wild Plum	<i>Prunus americana</i>					
Bristly Gooseberry	<i>Ribes setosum</i>					
Buffaloberry	<i>Shepherdia argentea</i>					
Western Snowberry	<i>Symphoricarpos occidentalis</i>	24	32		213	
Common Lilac	<i>Syringa vulgaris</i>					
TOTAL		24	32	5	213	

WOODY SPECIES DISTURBANCE REPORT
FOR ALLETE, INC. BISON I WIND PROJECT-
PHASE 1A- TREES
IN OLIVER/MORTON COUNTIES OF NORTH DAKOTA

Prepared by KDK Consulting
Kelly Krabbenhoft- Certified Professional Range Management
October 2010

Woodland inventory within the easement corridors for Phase 1A of the Bison I Wind Project was conducted in early May 2010 by KDK Consulting. The inventory was conducted to meet the specifications outlined in Case No. PU-09-151. This was accomplished by conducting a thorough ground-truth reconnaissance. All trees were inventoried by species through direct counts within the sample area. All data by each tree species related to the initial and disturbance inventory can be found in Table 1. Only one tree was disturbed during Phase 1a construction based on the inventory in late September. Now a planting plan and survivability monitoring protocol can be outlined to mitigate this loss due to construction. Depending upon the owner's preference, this loss could be planted within their lands or added to the planting plan for trees disturbed along the transmission line during construction.

Table 1- Woody Species Observed Within Phase 1A Easement Boundary for the Bison I Wind Project

Common Name	Scientific Name	Number of Individuals in Easement Boundary	Number of Individuals Disturbed in Easement Boundary
Trees			
Box Elder	<i>Acer negundo</i>	2	
Peach-leaved Willow	<i>Salix amygdaloides</i>	4	1*
TOTAL		6	1

* Disturbed Tree was on land owned by Les & Jackie Doll in the NW4 Sec. 10 T140N, R86W

Appendix C
2011 Survival Report

**WOODLAND PLANT SURVIVABILITY MONITORING
FOR MINNESOTA POWER- A DIVISION OF ALLETE, INC.
WITHIN BISON I WIND FARM**

Conducted by KDK Consulting August 15, 2011

A survival count within 3 block plantings within the Bison I Wind Farm, planted in the spring of 2011, was conducted by KDK Consulting on August 15, 2011. Variable results were seen within and across blocks as found in Tables 1 through 3. The overall survival for the first growing season was 84.9% (1112 living trees/shrubs from a total of 1310 potential trees/shrubs evaluated). Trees/tall shrubs fared the best at 86.8 and the low shrubs were at 84.6% survival. However, the 1112 living replanted trees/shrubs is greater than the number of individuals that were disturbed to date (853 total individuals: 29 trees, 79 tall shrub, and 745 low shrub) based upon the 2010 disturbance sampling conducted by KDK Consulting. Both the tree/tall shrub and low shrub replacement numbers are above the disturbed levels.

The survival within individual blocks ranged from 81.3% in Block 2 to 97.3% in Block 3. Within Block 2 on the private land, the only two losses of individuals was due to their being run over by what appeared to be ATV tracks. As expected, north aspect survival (Block 1) was greater than that of the south aspect (Block 2). However, adequate survival appears evident to meet the assigned goal of having woodland all around the mitigation pond. Overall, the result was greater than anticipated given the trees/shrubs were going into unprepared conditions. Competition from surrounding vegetation usually will decrease the survival percentage of newly planted woodlands. However, above-average moisture was received during the growing season, with adequate soil moisture present during planting, which aided in the better than anticipated results.

The mitigation ratio of 2:1 has been exceeded for each category of disturbed woodlands planted during the spring of 2011. The number surviving, in each case, exceeds 100% of what was required which is the threshold for successful mitigation of woodlands disturbed during the construction phase.

The data provided within the tables provides sufficient information to aid in any additional efforts that may need to be undertaken based on this evaluation.

Minnesota Power- A Division of Allete, Inc.: Bison I Wind Farm
 Woodland Plant Survivability Monitoring: 2011
 August 15, 2011

Table 1: Block 1 (South of Mitigation Pond)

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Trees/Tall Shrub	33	35	94.3
Willow	3	3	100.0
Low Shrub	581	678	85.7
	617	716	86.2

Table 2: Block 2 (North of Mitigation Pond)

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Trees/Tall Shrub	49	69	71.0
Low Shrub	373	450	82.9
	422	519	81.3

Table 3: Block 3 (Private Landowner: Section 35)

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Green Ash	38	39	97.4
Hawthorn	15	15	100.0
Chokecherry	20	21	95.2
	73	75	97.3

Overall Survival

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Trees/Tall Shrub	158	182	86.8
Low Shrub	954	1128	84.6
	1112	1310	84.9

Total Needed For 2:1 Mitigation

	<u>Number Needed for 2:1 Ratio</u>	<u>Observed Total</u>	<u>% of Needed¹</u>
Trees/Tall Shrub	116	158	136.2
Willow	2	3	150.0
Low Shrub	752	954	126.9

¹ If greater than 100%, then survival exceeds mitigation ratio

Minnesota Power Tree and Shrub Mitigation Plan

For Bison 1B (PU-09-151) and Bison 2 (PU-11-57)





Contents

Minnesota Power Tree and Shrub Mitigation Plan. Pages 2-4

Figure 1. Mitigation Site Locations

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Tree and Shrub Mitigation Plan- Bison 1B & Bison 2.

Minnesota Power Tree and Shrub Mitigation Plan

AN ALLETE COMPANY

Case # PU-09-151 and PU-09-57

Page 2 of 4



Introduction

In 2011 Minnesota Power (an Allete company) completed construction of the second phase (phase 1B) of its Bison 1 81.8 MW wind energy conversion facility (Facility). In addition, MP began construction of its Bison 2 105 MW Facility. During construction some trees and shrubs were disturbed. In keeping with the Certificate of Site Compatibility for both Facilities, Minnesota Power has developed a Tree and Shrub Mitigation Plan. This mitigation plan will facilitate the replacement of the trees and shrubs that were disturbed during construction and will minimize any associated environmental impacts.

Number and Variety of Trees

The trees and shrubs that were disturbed during construction of Bison 1, phase 1A were mitigated in 2011. No trees or shrubs were disturbed during construction of the Bison 2 Facility. As a result, the following table (Table 1-1) shows the total number of trees and shrubs that were disturbed during construction of phase 1B of the Bison 1 Facility. Post construction vegetation surveys were performed by KDK Consulting, Kelly Krabenhof-Certified Professional Range Management.

The species disturbed have been organized into section-township-range. The tree and shrub numbers are as follows:

Table 1-1 Stems Disturbed (by Species) During Bison 1, Phase 1B Construction.

Common Name	Scientific Name	Stems Disturbed	
		Sec. 25 T141N, R86W	Sec. 26 T141N, R86W
Shrubs	-	-	-
Chokecherry	<i>Prunus virginiana</i>	5	3

*No tree or shrub species were removed during construction of Bison 2.

Mitigation Plan

Following the requirements in the North Dakota Public Service Commission Certificate of Site Compatibility for the Bison 1 Facility, Minnesota Power will replace all disturbed trees and shrubs. The trees and shrubs disturbed during construction are required to be replaced at a minimum ratio of 2:1. However, the actual planting will be at a ratio closer to 3:1 to account for mortality associated with any planting/re-vegetation effort.

All disturbed trees and shrubs will be replaced by the same species in following with the North Dakota Public Service Commission’s Tree and Shrub Mitigation Specifications.



Upon completion of mitigation activities, the planting site will then be monitored for three years to ensure that there has been a 75% survival rate based on a **2:1** planting regime. Survival surveys will occur in the fall of each year and will be used to determine if any additional mitigation activities will be required.

Proposed Number, Variety, Type

Table 1-2 lists the original species that were disturbed during construction, the number of species disturbed and the number of mitigation stems that will be planted. Again, these planting numbers are based on a 3:1 planting ratio however, the percent survival will be determined assuming a 2:1 planting ratio.

Table 1-2 # Stems Disturbed (by Species) During Construction of Bison 1, Phase 1B

Common Name	Scientific Name		
Shrubs		Plants Removed	Plants to Replace*
Chokecherry	<i>Prunus virginiana</i>	8	24

*The # of species to plant was estimated using a 3:1 ratio.

** No Species were disturbed during construction of Bison 2.

Location and Date of Replacements

In an effort to maintain customer satisfaction, project acceptance and a high standard of public relations, Minnesota Power has developed an alternative site for the mitigation plantings to occur if requested by land owners. Land owners have their choice to have mitigation activities occur either on their ownership or on Minnesota Power’s alternative site. Due to the kind of species planted, all affected land owners prefer mitigation (planting) activities not occur on their ownership and have instead opted for Minnesota Power’s alternative site.

The Minnesota Power alternate site is located in Morton County in Section 4 - Township 140N - Range 86W. See Attached Figure #1 for mitigation site location information.



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Tree and Shrub Mitigation Plan- Bison 1B & Bison 2.

Figure 1.

-Mitigation Site Location

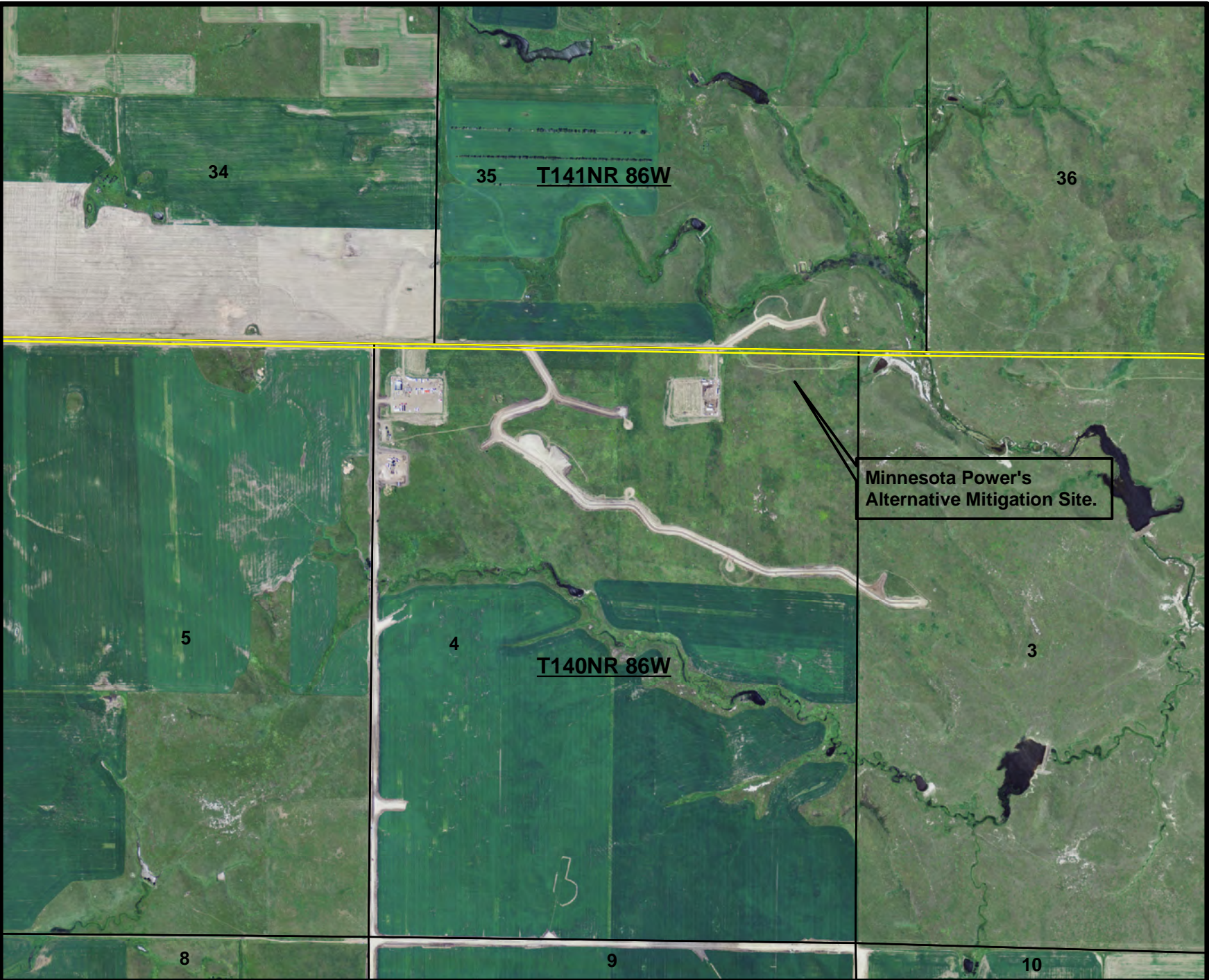
Minnesota Power Alternative Mitigation Site.

Legend

- Bison Area Roads
- ▭ PLSS_townships
- ▭ PLSS_sections



0.25 Miles





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Tree and Shrub Mitigation Plan- Bison 1B & Bison 2.

Appendix A.

-Alternative Mitigation Agreements



Alternative Mitigation Location Agreement

Terrance and Sherry Doll, whose property is located in Section 26 Township 141N-Range 86W, CONSENTOR, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTOR personal property.

The CONSENTOR understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities preformed on the CONSENTOR personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTOR
NAME HERE Terrance Doll

NAME HERE Sherry Doll

COUNTY OF Oliver.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802



Alternative Mitigation Location Agreement

Henry and Bertha Freidt, whose property is located in Section 25 Township 141N-Range 86W, CONSENTOR, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTOR personal property.

The CONSENTOR understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities performed on the CONSENTOR personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTOR

NAME HERE Bertha Freidt

NAME HERE Henry Freidt

COUNTY OF Oliver.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802



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Tree and Shrub Mitigation Plan- Bison 1B & Bison 2.

Appendix B

-Woodland Inventory Procedures & Survey Results

- Bison 1B
 - Trees
 - Shrubs
- Results

WOODY SPECIES DISTURBANCE REPORT
FOR ALLETE, INC. BISON I WIND PROJECT-
PHASE 1B- SHRUBS/TREES
IN OLIVER/MORTON COUNTIES OF NORTH DAKOTA

Prepared by KDK Consulting
Kelly Krabbenhoft- Certified Professional Range Management
February 2012

Woodland inventory within the easement corridors for Phase 1B of the Bison I Wind Project was conducted in late September 2010 by KDK Consulting. The inventory was conducted to meet the specifications outlined in Case No. PU-09-151. This was accomplished by conducting a thorough ground-truth reconnaissance. All tall shrubs/trees were inventoried by species through direct counts within the sample area. Low shrubs were estimated by utilizing information gathered from 2-meter by 2-meter quadrats collected in 30 representative areas along the transmission line corridor. This methodology for low shrub sampling is utilized for baseline sampling protocol within coal mining permits in North Dakota. Average stems per quadrat can then be converted to stems per acre. This will assist in extrapolation of total stems removed by potential disturbance in the mapped low shrub community acreage within the corridor. Sample adequacy (Stein's) was met for the low shrub inventory. Western snowberry patches within the easement corridor had similar densities based on ocular estimations, allowing for utilization of the previous quadrats from the transmission corridor.

All data by each tree and shrub species related to the disturbance inventory conducted in early February can be found in Tables 1 and 2 following construction of Phase 1b for the Bison 1 Wind Farm. The only trees/tall shrubs (5 Chokecherry) with a dbh greater than 3 inches located within the easement corridors of Phase 1B were along the fenceline in the SW4 Section 25 T141N, R86W and each of these were removed. The remaining 3 disturbed chokecherry (>1" dbh but less than 3") were along the fenceline separating the SW4 & SE4 Section 26 T141N, R86W (all 3 were located in the SW4). None of the western snowberry had stems greater than the 1" threshold as found in the specifications.

Now that the determinations of disturbance numbers by species are calculated, a planting plan and survivability monitoring protocol can be outlined to mitigate these losses due to construction. Depending upon each owner's preference, these losses can be either planted within their own lands or possibly the total disturbance could be pooled together for one off-site planting to be determined later.

Table 1- Shrub/Tree Species Observed Along Phase 1B Easement Boundary for the Bison I Wind Project

Common Name	Scientific Name	Number of Individuals in Easement Boundary	Number of Acres in Easement Boundary	Estimated Stems per Acre Based on Quadrat Sampling ¹	Number of Individuals Disturbed in Easement Boundary >1"(Shrub), >3" (Trees)
Trees					
Russian Olive	<i>Eleagnus angustifolia</i>	2			0
TOTAL		2			0
Shrubs					
Chokecherry	<i>Prunus virginiana</i>	11			8
Western Wild Rose	<i>Rosa woodsii</i>	3			0
Western Snowberry	<i>Symphoricarpos occidentalis</i>		0.830663	67915 (6792 Plants)	0
TOTAL		14	0.830663 ³	67915 (6792 Plants)	8

¹ Data for quadrat sampling to determine stems per acre found in Table 2; Data based on total stems- divide by 10 for total plants (assumes 10 clones for every plant)

³ Total number of western snowberry stems (and plants) estimated within the easement boundary based on statistically valid sampling from Transmission Corridor- 56,415 (5,642)

Minnesota Power Tree and Shrub Mitigation Plan

For Bison 3 (PU-11-162)





Contents

Minnesota Power Tree and Shrub Mitigation Plan. Pages 2-4

Figure 1. Mitigation Site Locations

Appendix A- Alternative Mitigation Location Agreements

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- **Bison 3**
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- **Results**



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Tree and Shrub Mitigation Plan- Bison 3

Minnesota Power Tree and Shrub Mitigation Plan

AN ALLETE COMPANY



Introduction

Throughout 2012 Minnesota Power (an Allete company) has been constructing its Bison 3, 105 MW wind energy conversion facility (Facility). During construction some trees and shrubs were disturbed. In keeping with the Certificate of Site Compatibility for this Facility, Minnesota Power has developed this Tree and Shrub Mitigation Plan. This mitigation plan will facilitate the replacement of the trees and shrubs that were disturbed during construction and minimize any associated environmental impacts.

Number and Variety of Trees

Post construction vegetation surveys were performed for the Bison 3 project area to determine the species disturbed, the number of species disturbed and their location. The post construction vegetation surveys were performed by KDK Consulting, Kelly Krabenhof- Certified Professional Range Management. The species disturbed have been organized into section-township-range. The following table (Table 1-1) shows the total number of trees and shrubs that were disturbed during construction of Minnesota Power’s Bison 3 Facility.

Table 1-1 Stems Disturbed (by Species) During Bison 3 Construction.

Common Name	Scientific Name	Sec. 36 T141N, R87W	Sec. 26 T141N, R86W
Shrubs	-	-	-
Siberian elm	Ulmus pumila	28	1
Green ash	Fraxinus pennsylvanica	6	
Russian olive	Elaeagnus angustifolia		1
Ponderosa pine	Pinus ponderosa		1
Shrubs	-	-	-
Honeysuckle	Lonicera sp.		2
Total	-	34	5

Mitigation Plan

Following the requirements of the North Dakota Public Service Commission Certificate of Site Compatibility for the Bison 3 Facility, Minnesota Power will mitigate trees and shrubs disturbed during construction. The disturbed trees and shrubs will be replaced at a minimum ratio of 2:1. However, the actual planting of most species will be at a ratio closer 3:1 to account for mortality associated with any planting/re-vegetation effort.

All disturbed trees and shrubs will be replaced by the same or similar species in following with the North Dakota Public Service Commission’s Tree and Shrub Mitigation Specifications.





Upon completion of mitigation activities, the planting site will then be monitored for three years to ensure that there has been a 75% survival rate based on a **2:1** planting regime. Survival surveys will occur in the fall of each year and will be used to determine if any additional mitigation activities will be required.

Proposed Number, Variety, Type

Table 1-2 lists the species that were disturbed during construction, the number of species disturbed and the number of mitigation stems that will be planted. The percent survival will be determined assuming a 2:1 planting ratio.

In following with recommendations provided by local Soil Conservation Districts, range management professionals and local expertise Minnesota Power has opted to replace the species that were disturbed by construction with species with native to North Dakota. As a result Siberian elm and Russian olive will not be used for mitigation. Instead, those species will be replaced with Green ash (native to North Dakota). Also, due to availability, Honeysuckle will be replaced with Buffaloberry.

Table 1-2 # Stems Disturbed (by Species) During Construction of Bison 3			
Common Name	Scientific Name	Plants Removed	Plants to Replace
Green ash	Fraxinus pennsylvanica	36*	72
Ponderosa pine	Pinus ponderosa	1	2
Buffaloberry**	Shepherdia argentea	2	4

* Plants removed include Green Ash, Russian Olive and Siberian Elm.

**Honeysuckle will be replaced with Buffaloberry.

Location and Date of Replacements

In an effort to maintain customer satisfaction, project acceptance and a high standard of public relations, Minnesota Power has developed an alternative site for the mitigation plantings to occur if requested by land owners. Land owners have their choice to have mitigation activities occur either on their ownership or on Minnesota Power’s alternative site. All affected land owners prefer mitigation (planting) activities not occur on their ownership and have instead opted for Minnesota Power’s alternative site.

The Minnesota Power alternate site is located in Morton County in Section 4 - Township 140N - Range 86W. See Attached Figure #1 for mitigation site location information.





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Tree and Shrub Mitigation Plan- Bison 3.

Figure 1

-Mitigation Site Location

Figure 1

Minnesota Power Alternative Mitigation Site.



- Legend**
- Bison Area Roads
 - ▭ PLSS_townships
 - ▭ PLSS_sections



0.25 Miles





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Tree and Shrub Mitigation Plan- Bison 3.

Appendix A

-Alternative Mitigation Agreements



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Alternative Mitigation Location Agreement

Dave Klusman, whose property is located in Section 5 Township 140N-Range 85W, CONSENTOR, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTOR personal property.

The CONSENTOR understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities preformed on the CONSENTOR personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTOR

NAME HERE Dave Klusman 7-18-12

COUNTY OF Morton.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802



minnesota power / 30 west superior street / duluth, minnesota 55802-2093 / 800-228-4966 / www.mnpower.com

Alternative Mitigation Location Agreement

Greg and Jeanne Voegele, whose property is located in Section 36 Township 141N-Range 87W, CONSENTOR, for valuable consideration, hereby acknowledge consent and convey unto MINNESOTA POWER legally incorporated as ALLETE, Inc., a Minnesota corporation, CONSENTEES and its successors, the right to perform tree and shrub mitigation activities at a mitigation restoration site which is not located on the CONSENTOR personal property.

The CONSENTOR understand that this replaces their rights to have tree and shrub mitigation, as required by applicable permits issued by the North Dakota Public Service Commission, activities preformed on the CONSENTOR personal property in favor of a location determined at the CONSENTEES discretion.

CONSENTOR

NAME HERE Greg Voegele

NAME HERE Jeanne Voegele

COUNTY OF Oliver.

This instrument was drafted by:
Minnesota Power
30 West Superior Street
Duluth, MN 55802



Appendix B

-Woodland Inventory Procedures & Survey Results

- Bison 3
 - Trees
 - Shrubs
- Results

WOODY SPECIES DISTURBANCE REPORT
FOR ALLETE, INC. BISON I WIND PROJECT-
PHASE 1C- SHRUBS/TREES
IN OLIVER/MORTON COUNTIES OF NORTH DAKOTA

Prepared by KDK Consulting
Kelly Krabbenhoft- Certified Professional Range Management
July 2012

Woodland inventory within the easement corridors for Phase 1C of the Bison Wind Projects was conducted on July 11th, 2012 by KDK Consulting. The inventory was conducted to meet the specifications outlined in Case No. PU-09-151. This was accomplished by conducting a thorough ground-truth reconnaissance. All tall shrubs/trees were inventoried for loss by species through direct counts within the previously sampled area.

All data by each tree and shrub species related to the disturbance inventory conducted in mid-July can be found in Table 1 following construction of Phase 1c for the Bison 1 Wind Farm. NRAWV2 had a majority of the construction losses with 28 Siberian Elm individuals removed. NRAWV4 was next in numbers with 6 green ash individuals removed during construction. Within NRBWV1, 5 individuals were removed across 4 separate species. A total of 39 trees/shrubs were removed during the construction of Phase 1C of the Bison Wind Projects.

Now that the determinations of disturbance numbers by species are calculated, a planting plan and survivability monitoring protocol can be outlined to mitigate these losses due to construction. Depending upon each owner's preference, these losses can be either within their own lands or possibly the total disturbance could be pooled together for one off-site planting to be determined later.

Table 1- Shrub/Tree Species Observed Following Construction Along Phase 1C Easement Boundary for the Bison I Wind Project

Name	Species	Number of Individuals	Number of Individuals	
			Remaining following Construction	Disturbed during Construction
NRAWV1	Chokecherry (<i>Prunus virginiana</i>)	17	17	0
NRAWV2	Siberian elm (<i>Ulmus pumila</i>)	59	31	28
NRAWV3	Green ash (<i>Fraxinus pennsylvanica</i>)	24	24	0
NRAWV4	Green ash	11	5	6
NRAWV5	Green ash	2	2	0
NRAWV6	Green ash	43	43	0
NRBWV1	Russian olive (<i>Elaeagnus angustifolia</i>)	17	16	1
	Siberian elm	9	8	1
	Honeysuckle (<i>Lonicera</i> sp.)	30	28	2
	Ponderosa pine (<i>Pinus ponderosa</i>)	11	10	1
NRBWV2	Ponderosa pine	79	79	0

Total Removed=39

Total Disturbed Amount By Species

<u>Species</u>	<u># Individuals Removed</u>
Siberian elm (<i>Ulmus pumila</i>)	29
Green ash (<i>Fraxinus pennsylvanica</i>)	6
Russian olive (<i>Elaeagnus angustifolia</i>)	1
Honeysuckle (<i>Lonicera</i> sp.)	2
Ponderosa pine (<i>Pinus ponderosa</i>)	1

TOTAL

39

Appendix B

-2012 Survival Survey Results

a) Planting 1

b) Planting 2

2012 Survival Survey Results
a) Planting 1

**WOODLAND PLANT SURVIVABILITY MONITORING
FOR MINNESOTA POWER- A DIVISION OF ALLETE, INC.
WITHIN BISON I WIND FARM**

Conducted by KDK Consulting August 14, 2012

A survival count within 3 block plantings for the Bison I Wind Farm, planted in the spring of 2011, was conducted by KDK Consulting on August 14, 2012. Variable results were seen within and across blocks as found in Tables 1 through 3. The overall survival for the first growing season (2011 planting) was 84.9% (1112 living trees/shrubs from a total of 1310 potential trees/shrubs evaluated). Trees/tall shrubs fared the best at 86.8 and the low shrubs were at 84.6% survival. However, the 1112 living replanted trees/shrubs was greater than the number of individuals that were disturbed to date (853 total individuals: 29 trees, 79 tall shrub, and 745 low shrub) based upon the 2010 disturbance sampling conducted by KDK Consulting. Both the tree/tall shrub and low shrub replacement numbers were above the disturbed levels in 2011. This changed in 2012 with the onset of drought conditions. The lack of fabric and/or mulch associated with the plantings allowed what little moisture was available in 2012 to be utilized by associated grass and forb species. The root systems of these plants are very dynamic and allowed them to obtain moisture and nutrients more competitively than the young trees and shrubs. Concomitant with this factor, was the loss of shrubs due to a local cooperater haying through a significant portion of the 2011 block 1 planting (see photo following narrative). These will likely not recover from this event. Overall survival for the trees/tall shrub dropped to 67% from the original 86.8%. The number of trees and tall shrubs (122) is still above the 108 to meet mitigation goals. The low shrub story is quite different. After an initial survival of 84.6% they fell to 20.7%. The number of low shrubs (234) is now well below mitigation levels of 745. A majority of the losses were on the south aspect planting where evaporation and grass competition losses took their toll and where the cooperater hayed. The total number lost was greater from the haying error versus the natural losses.

The survival within individual blocks ranged from 81.3% in Block 2 to 97.3% in Block 3 in 2011. This changed in 2012 with survival ranging from 16.2% in Block 1 to 77.3% in Block 3. Within Block 3 on the private land, the only two losses in 2011 of individuals was due to their being run over by what appeared to be ATV tracks. Seventeen total losses were seen in 2012. As expected, north aspect survival (Block 1) was greater than that of the south aspect (Block 2) in 2011. However, adequate survival in 2011 appeared evident to meet the assigned goal of having woodland all around the mitigation pond. Overall, the result in 2011 was greater than anticipated given the trees/shrubs were going into unprepared conditions. Competition from surrounding vegetation usually will decrease the survival percentage of newly planted woodlands. However, above-average moisture was received during the growing season, with adequate soil moisture present during planting, which aided in the better than anticipated results in 2011.

This survival outlook in Blocks 1 and 2 changed drastically in 2012. Survivability, due to nature and anthropomorphic influences, dropped significantly. From Block 1 to Block 3, the survival percentages are as follows: 16.2%, 35.1%, and 77.3%. Trees and tall shrubs within the 2011 planting are still above mitigation needs as stated earlier but getting close to the lower threshold. However, the low shrubs will need to be reassessed and replanted to exceed mitigation goals.

The data provided within the tables provides sufficient information to aid in any additional efforts that may need to be undertaken based on this evaluation.



Image was taken south of Mitigation Pond on August 14th, 2012. Producer was instructed to stay 100' away from planting (actual distance was about 5 feet). Eight rows of low shrub were lost due to this error.

Minnesota Power- A Division of Allete, Inc.: Bison I Wind Farm
 Woodland Plant Survivability Monitoring: 2011
 August 15, 2011

Planting 1- 2011 Check (Bison 1A and 230kV HVTL)

Table 1: Block 1 (South of Mitigation Pond)

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Trees/Tall Shrub	33	35	94.3
Willow	3	3	100.0
Western Snowberry	581	678	85.7

Table 2: Block 2 (North of Mitigation Pond)

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Trees/Tall Shrub	49	69	71.0
Western Snowberry	373	450	82.9

Table 3: Block 3 (Private Landowner: Section 35)

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Green Ash	38	39	97.4
Hawthorn	15	15	100.0
Chokecherry	20	21	95.2

Overall Survival:2011

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Trees/Tall Shrub	158	182	86.8
Low Shrub	954	1128	84.6
	1112	1310	84.9

Total Needed for 2:1 Mitigation

	<u>Number Needed For 2:1 Ratio</u>	<u>Observed Total</u>	<u>% of Needed*</u>
Trees/Tall Shrubs	118	161	136%
Low Shrubs	752	954	127%

* If greater than 100% then survival exceeds mitigation ratio.

Minnesota Power- A Division of Allete, Inc.: Bison I Wind Farm
 Woodland Plant Survivability Monitoring: 2012
 August 14, 2012

Planting 1- 2011 Check (Bison 1A and 230kV HVTL)

Table 1: Block 2 (South of Mitigation Pond)

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Trees/Tall Shrub	31	35	88.6
Willow	0	3	0.0
Western Snowberry*	85	678	12.5

*Majority lost to haying

Table 2: Block 2 (North of Mitigation Pond)

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Trees/Tall Shrub	33	69	47.8
Western Snowberry	149	450	33.1

Table 3: Block 3 (Private Landowner: Section 35)

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Green Ash	32	39	82.1
Hawthorn	13	15	86.7
Chokecherry	13	21	61.9

Overall Survival:2012

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Trees/Tall Shrub	122	182	67.0
Low Shrub	234	1128	20.7

Total Needed for 2:1 Mitigation

	<u>Number Needed For 2:1 Ratio</u>	<u>Observed Total</u>	<u>% of Needed*</u>
Trees/Tall Shrubs	118	122	103%
Low Shrubs	752	234	31%

* If greater than 100% then survival exceeds mitigation ratio.

2012 Survival Survey Results
b) Planting 2

**WOODLAND PLANT SURVIVABILITY MONITORING
FORM MINNESOTA POWER- A DIVISION OF ALLETE, INC
WITHIN THE BISON 1 (PHASE 1B) AND 2 WIND FARM**

Conducted by Minnesota Power August 21, 2011

A survival count of planting 2 (comprised of one block) for the Bison 1B and Bison 2 wind farms was conducted by Minnesota Power staff on August 21, 2012. The survival results can be found in table 1. The overall survival for the first growing season was 94%. 59 living trees/shrubs were identified from a total of 63 trees/shrubs that were originally planted. No low shrubs were required to be planted. As stated previously, the survival was at 94% however, the 63 stems originally planted is greater than the number of individuals that were required for mitigation based upon the 2012 disturbance sampling conducted by KDK Consulting. The tree/tall shrub replacement numbers are well above the 2:1 replacement numbers required by the North Dakota Public Service Commission (ND PSC).

The number of stems surviving based on a 2:1 planting ratio exceeds 100%. A survival ratio of 75% for species planted at a 2:1 ratio is what was required by the ND PSC for successful mitigation of disturbed woodlands during construction.

The data provided within the tables provides sufficient information to aid in any additional efforts that may be needed based on this evaluation.

Minnesota Power- A Division of ALLETE, INC: Bison 1 (Phase 1B) and Bison 2 Wind Farm
 Woodland Pland Survivability Minitoring: 2012
 21-Aug-12

Planting 2- 2012 Check (Bison 1B and Bison 2)

Table 1: Block 1

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Chokecherry	59	63	94%

Overall Survival:2012

	<u>Total Alive</u>	<u>Total</u>	<u>% Survival</u>
Trees/Tall Shrubs	59	63	94%
Low Shrub	n/a	n/a	n/a

Total Needed For 2:1 Mitigation

	<u>Number Needed For 2:1 Ratio</u>	<u>Observed Total</u>	<u>% of Needed*</u>
Trees/Tall Shrubs	16	59	369%
Low Shrubs	n/a	n/a	n/a

* If greater than 100% then survival exceeds mitigation ratio.