

WOODY SPECIES INVENTORY REPORT

FOR THE ANTELOPE VALLEY STATION RAW WATER PIPELINE PROJECT

Prepared for

**North Dakota Public Service Commission
Bismarck, North Dakota**

by

BASIN ELECTRIC POWER COOPERATIVE

June 2005

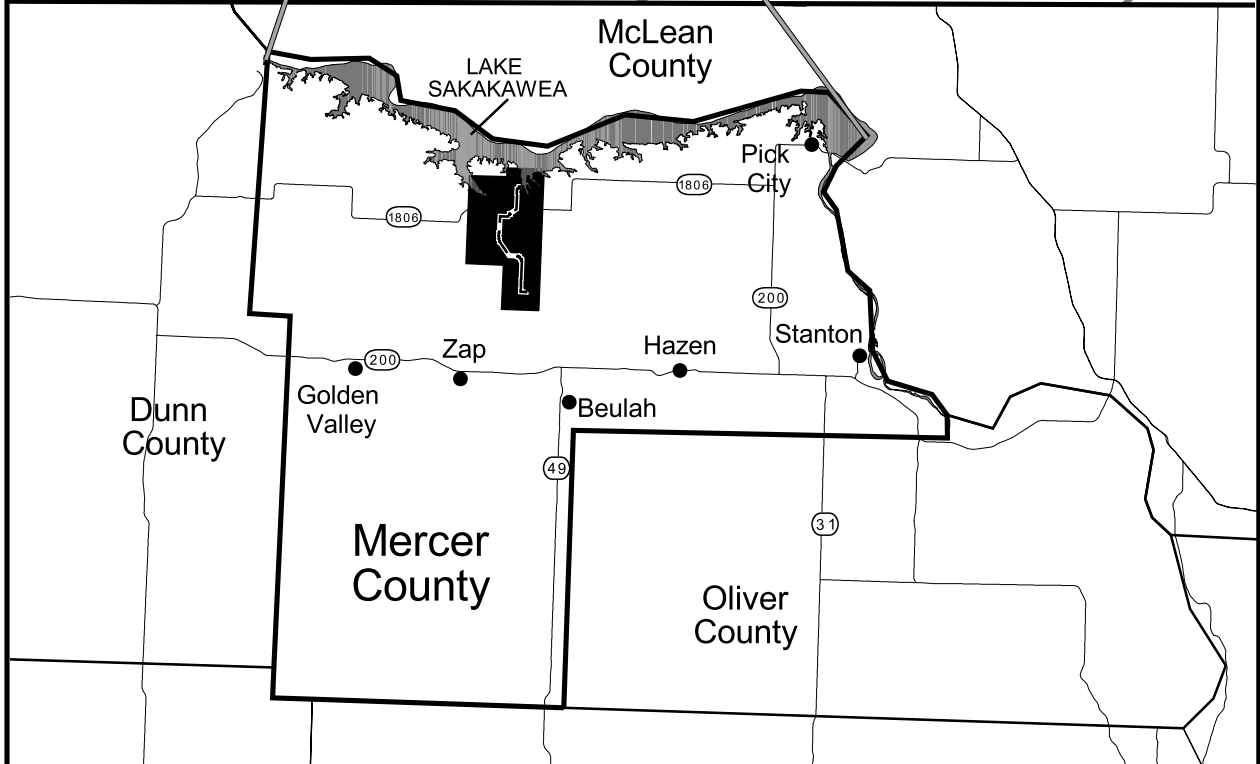
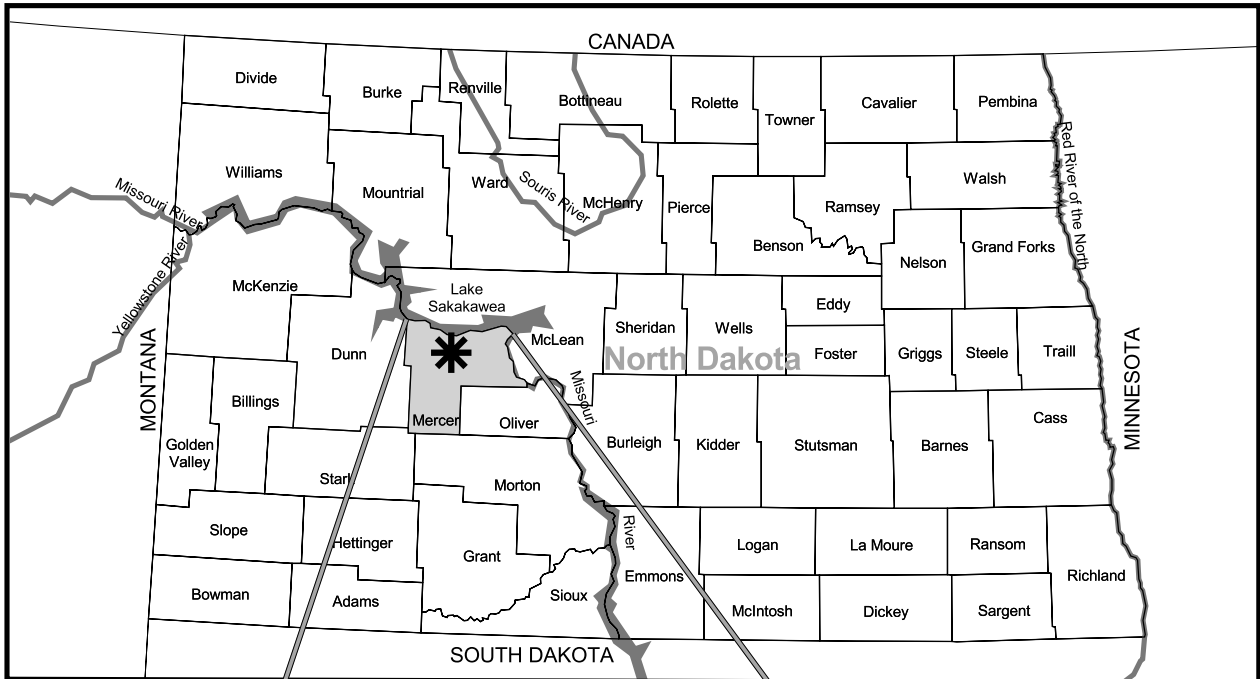
Introduction

Basin Electric Power Cooperative (BEPC) is proposing to construct a raw water pipeline to supply cooling water from Lake Sakakawea to the Antelope Valley Station (AVS) and Dakota Gasification and Coteau (lignite mine) facilities in Mercer County, North Dakota. The AVS Raw Water Pipeline Project would be constructed approximately 8 miles northwest of the town of Beulah (**Figure 1-1**). The proposed 42-inch-diameter, approximately 8.9-mile-long pipeline would replace the existing water supply pipeline. The proposed pipeline would be constructed parallel to the existing pipeline for over 67 percent of the alignment and within the existing corridor, which was used to complete the corridor compatibility analysis for the existing pipeline in 1977. The proposed pipeline would begin at the existing water pumphouse, which is located immediately adjacent to Renner Bay of Lake Sakakawea within the Hille State Game Management Area, and end at the AVS. BEPC anticipates that construction activities would occur from June 2005 through mid-2006.





The U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and North Dakota Game and Fish Department have recommended the replacement of trees and shrubs (2:1 ratio) that would be removed as a result of construction activities. A woody species inventory was conducted within the 150-foot-wide construction right-of-way (ROW) on May 16 and 17, 2005, and prior to the initiation of construction activities, which are scheduled to begin in June 2005.

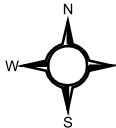
Vegetation Types

The proposed water pipeline route traverses approximately 4.9 miles of rangeland, 4.0 miles of cultivated cropland, and less than 0.1 mile of wetlands and waters of the U.S. (i.e., intermittent creek) (**Figure 1-2**). Rangeland areas that occur along the proposed route primarily consist of a variety of grasses, grass-like plants, and forbs. Dominant species include western wheatgrass (*Agropyron smithii*), prairie junegrass (*Koeleria pyramidata*), blue grama (*Bouteloua gracilis*), Kentucky bluegrass (*Poa pratensis*), smooth brome grass (*Bromus inermis*), upland sedges (*Carex* spp.), fringed sage (*Artemisia frigida*), and milkvetch (*Astragalus* spp.) species. Shrubs observed within these areas occurred in small groupings and included western snowberry (*Symphoricarpos occidentalis*), chokecherry (*Prunus virginiana*), buffaloberry (*Sheperdia canadensis*), gooseberry (*Ribes cinereum*), wild rose (*Rosa arkansana*), serviceberry (*Amelanchier alnifolia*), and skunkbush (*Rhus trilobata*).



Legend

-  Project location
-  Cities
-  Corridor
-  Proposed Pipeline Route



AVS Raw Water Pipeline Project

Figure 1-1
Project Location



Legend

—	Corridor Boundary	□	Dakota Gasification Facility
- -	Proposed Pipeline Route	□	Existing Water Pumphouse
—	Existing Pipeline	□	Coteau Office Complex
□	Antelope Valley Station		

AVS Raw Water Pipeline Project

Figure 1-2
Existing Corridor and Proposed Pipeline Route

0.75 0 0.75 Mile

Four herbaceous and shrub/scrub wetlands are crossed by the proposed route. Dominant species observed in herbaceous wetlands included reed canarygrass (*Phalaris arundinacea*), various sedges (*Carex* spp.), and curly dock (*Rumex crispus*). Common species observed in shrub/scrub wetlands included plains cottonwood (*Populus deltoides*) saplings, sandbar willow (*Salix exigua*), reed canarygrass, various sedges, and curly dock. Species observed along the intermittent creek included box elder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), chokecherry, reed canarygrass, stinging nettle (*Urtica dioica*), and smooth brome grass.

Shrubs and trees also were observed along the proposed route in two shelterbelt areas and other abandoned areas within or adjacent to an electric transmission corridor. Tree and shrub species observed in these areas included Siberian elm (*Ulmus sibiricus*), plains cottonwood, green ash, wild plum (*Prunus americana*), Russian olive (*Eleagnus angustifolia*), chokecherry, cherry (shrub species) (*Prunus* sp.), hawthorn (*Crataegus rotundifolia*), lilac, and carygana (introduced shrub). Cultivated cropland traversed by the proposed route included fields of wheat, pea, and alfalfa.

Methods

Surveys for woody species were conducted by positioning three biologists approximately 40 feet apart within the 150-foot-wide construction ROW and slowly walking the ROW for the entire length of the proposed route. When trees or shrubs were observed, the biologists would record the location, species, number of individuals, approximate heights, and approximate diameter at breast height of trees. In addition, digital photographs were taken and a Global Positioning System (GPS) unit was used to record the exact location of these trees and shrubs within the construction ROW. Individual trees and shrubs, with the exception of western snowberry, were flagged (red and white or green and white flagging) in areas where they occurred in a scattered distribution. In areas that included dense groupings of trees and/or shrubs, the perimeter of these groupings were flagged (red and white or green and white flagging). GPS points also were recorded along the perimeter of these groupings.

Results

A total of 8 tree species and 12 shrub species were identified within the 150-foot-wide construction ROW. Aerial photo-based figures provided in Appendix A illustrate the specific locations of trees and shrubs as they occur within the 150-foot-wide construction ROW. A total of approximately 1,449 trees and 1,200 shrubs were observed within the 150-foot-wide construction ROW. Plains cottonwood and western snowberry were the most prevalent tree and shrub species

observed along the proposed route, respectively. The majority of trees and shrubs occurred along the intermittent creek, two shelterbelt areas, two shrub/scrub wetlands, and rangeland areas.

Impact Assessment

Table 1-1 lists the trees and shrubs that estimated to be removed within the construction ROW as a result of construction activities. A total of approximately 1,021 out of 1,449 trees (70 percent) and 888 out of 1,200 shrubs (74 percent) would be removed during construction activities. These estimates assumed that the majority of trees and shrubs within the 150-foot-wide construction ROW would be removed during construction. Trees and shrubs that occur along the extreme edges of the construction ROW would be avoided where practicable thereby minimizing the trees and shrubs removed during construction activities.

Mitigation

The project mitigation efforts will be coordinated with the North Dakota Public Service Commission in order to finalize the number of trees and shrubs to be planted and planting locations.

**Table 1-1
Woody Species Observed Along the Proposed Route**

Common Name	Scientific Name	Number of Individuals in 150-foot-wide ROW	Estimated Number of Individuals to be Removed During Construction	Comments
<i>Trees</i>				
Box elder	<i>Acer negundo</i>	57	57	An invasive species that is highly competitive with other native tree species. This species was predominantly observed at the intermittent creek crossing.
Green ash	<i>Fraxinus pennsylvanica</i>	21	21	A highly-valued tree within the state. The majority of these trees were observed in a shelterbelt immediately north of the intermittent creek crossing.
American elm	<i>Ulmus americana</i>	37	0	A highly-valued tree within the state, which was observed along the banks of the intermittent creek. All trees would be avoided during construction since they occur on the extreme eastern edge of the 150'-foot-wide construction ROW.
Siberian elm	<i>Ulmus sibiricus</i>	245	58	An introduced, invasive species that is highly competitive with native species and is not a desirable species for wildlife habitat. Trees predominantly occurred in shelterbelts and abandoned areas along the southern portion of the proposed route.
Plains cottonwood	<i>Populus deltoides</i>	977	955	A highly-valued tree within the state and provides good cover for wildlife species. This species was observed in palustrine shrub/scrub wetlands and areas with moist soil conditions. The majority of trees are saplings that are approximately 6 to 10 feet tall.
American plum	<i>Prunus americana</i>	43 ¹ (429 clones)	43	A highly-valued species since it provides good cover and food for a variety of wildlife species. This species was predominantly observed in the shelterbelt immediately north of the intermittent creek crossing.
Russian olive	<i>Eleagnus angustifolia</i>	64	64	An introduced and highly invasive species that is highly competitive with native tree species. This species provides adequate cover and food for wildlife. The majority of trees were observed in the shelterbelt immediately north of the intermittent creek crossing.
Hawthorn	<i>Crataegus rotundifolia</i>	5	2	A species that provides good cover for a variety of wildlife species. This species was observed at the intermittent crossing.
TOTAL		1,449	1,200	
<i>Shrubs</i>				
Western snowberry	<i>Symphoricarpos occidentalis</i>	381 ¹ (3,812 clones)	381	A native species that provides adequate cover and food for wildlife. This species readily spreads via underground horizontal stems to produce clones.
Chokecherry	<i>Prunus virginiana</i>	73 ¹ (727 clones)	73	A native species that provides good cover and food for wildlife. This species readily spreads via underground horizontal stems to produce clones. This species was primarily observed in localized areas (i.e., fencelines, banks of intermittent creek) along the proposed route.
Buffaloberry	<i>Shepherdia canadensis</i>	106	85	A native species that provides good cover and food for wildlife. This species was predominantly observed in a rangeland area (MP 2.0 to 3.0) along the northern portion of the proposed route.

Table 1-1 (Continued)

Common Name	Scientific Name	Number of Individuals in 150-foot-wide ROW	Estimated Number of Individuals to be Removed During Construction	Comments
Bristly gooseberry	<i>Ribes setosa</i>	73	48	A native species that provides minimal cover and adequate food for wildlife. This species was observed in localized areas with shallow, rocky soils within a rangeland area (MP 2.0 to 3.0).
Wild rose	<i>Rosa arkansana</i>	18	10	A native species that provides minimal cover and adequate food for wildlife. This species was observed along fencelines between cultivated cropland.
Serviceberry	<i>Amelanchier alnifolia</i>	9	9	A native species that provides good cover and food for wildlife. This species was predominantly observed in a rangeland area (MP 2.0 to 3.0) along the northern portion of the proposed route. Individual plants observed within the construction ROW were heavily browsed by livestock (plant heights were approximately 2 to 3 feet).
Skunkbush	<i>Rhus trilobata</i>	45	45	A native species that provides minimal cover and adequate food for wildlife. This species was observed in localized areas with shallow, rocky soils within a rangeland area (MP 2.0 to 3.0).
Sandbar willow	<i>Salix exigua</i>	137 ¹ (1,365 clones)	137	A native species that provides good cover for wildlife species. This species was observed in palustrine shrub/scrub wetlands. The majority of shrubs are approximately 6 to 8 feet tall. This species readily spreads via underground horizontal stems to produce clones.
Common lilac	<i>Syringa vulgaris</i>	83	80	An introduced shrub that provides adequate cover for wildlife. Shrubs predominantly occurred in shelterbelt immediately north of the intermittent creek crossing and abandoned areas along the southern portion of the proposed route.
Siberian peashrub	<i>Caragana arborescens</i>	76	71	An introduced shrub that provides adequate cover for wildlife. Shrubs predominantly occurred in a shelterbelt immediately north of the intermittent creek crossing and abandoned areas along the southern portion of the proposed route.
Cherry	<i>Prunus</i> sp. (introduced shrub)	19	19	An introduced shrub that provides adequate cover for wildlife. Shrubs were observed in shelterbelt immediately north of the intermittent creek crossing.
Wild honeysuckle	<i>Lonicera dioica</i>	1	1	A native shrub that provides adequate cover for wildlife. Shrub was observed in shelterbelt immediately north of the intermittent creek crossing.
TOTAL		1,021	888	

¹ Assumes an average of 10 clones for every plant.

APPENDIX A

TREE AND SHRUB LOCATIONS ALONG THE PROPOSED ROUTE