

VANTAGE WEST SPUR LATERAL PIPELINE
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1.0 Introduction

This document outlines the methodology Vantage Pipeline US LP (Vantage) will use to inventory the trees and shrubs within their pipeline corridor. The new pipeline will transport ethane from a natural gas processing plant near Williston, North Dakota to an existing pipeline system near Stady, North Dakota. The existing pipeline transports ethane to the Alberta petrochemical industry. The proposed pipeline would include the construction of approximately 47.3 miles of new 8-inch diameter pipeline in North Dakota. The Alternative Route would be approximately 49.1 miles of pipeline in the general vicinity. In addition to the ROW, there will be temporary work spaces (TWS) to allow storage of equipment and supplies along the ROW. The permanent ROW (PROW), approximately 30 feet of the ROW, will be maintained for the lifetime of the pipeline. Vantage Pipeline agrees to comply with all stipulations of the North Dakota Public Service Commission's (PSC) Tree and Shrub Mitigation Specifications (Appendix A), including the inventory stipulations, outlined in this document.

2.0 General Construction Tree and Shrub Plan

During the construction of the pipeline, trees and shrubs within the ROW will be avoided and undisturbed, when feasible. If trees or shrubs exist in the PROW, removal is necessary in order to maintain the integrity of the pipeline. The distribution of trees and shrubs within the ROW will be estimated using procedures outlined in this plan. The pre-construction inventory will note those likely to be removed during construction versus those which are expected to be avoided. During construction, the actual trees and shrubs removed will be documented. The sampling process is explained in more detail in the next section.

For shrubs within the ROW and outside of the PROW the above ground biomass will be cleared to allow for pipeline construction activities. The native soil in the ROW will be undisturbed during construction, which will maintain the health of the shrub rootmass, and alternatively promote shrub re-generation. When the ROW crosses a windbreak or shelterbelt, the width of the ROW to be cleared will reduce to 50 feet per the PSC tree and shrub mitigation specifications.

It is necessary to remove the trees and shrubs and their rootmass within the PROW of the ROW in order to maintain the pipeline. Trees and shrubs that exist in the PROW will be inventoried for replacement outside of the PROW. Direct transplant will be used whenever feasible.

3.0 Sampling Methodology

3.1 Pre-Inventory

Windrows, shelterbelts, and obvious groups of shrubs will be located along the ROW using 2012 aerial imagery and ArcGIS software. This step will be completed in advance of the tree and shrub sampling field visit and locations will be entered into a GPS unit.

3.2 Field Inventory

Scientists knowledgeable in tree and shrub species identification will travel along the pipeline route and collect the inventory data. The field team will visit those areas defined in the pre-inventory as well as any other woody vegetation areas observed along the route during the field visit. All data will be collected using a tablet using a Tree and Shrub Inventory Form (Appendix B). Data collected during the inventory will include:

- Date of inventory

- Field scientist(s) conducting inventory
- General location (milepost)
- Species name
- Number of individual trees or shrubs
- Whether the trees or shrubs were planted or volunteer
- Designation to avoid mature native trees during construction
- Designation to remove non-native or invasive trees or shrubs during construction and replace them with more desirable species
- Number of trees removed during construction activities
- General notes and landowner specifications for replacement

Location data will also be collected with GPS and linked to tabular data using an identification code based on the milepost and six-digit species code. For example, chokecherry (*Prunus virginiana*) near milepost 3.25 would be recorded in the GPS as “3.25-PRUVIR”. When the field data are analyzed in ArcGIS, the location of the shrub or tree on the pipeline route and its associated land-cover will be defined from the previous field surveys.

Baseline surveys conducted for the pipeline did not document any wooded or forested areas along the pipeline route. Most trees occur as part of shelterbelts and the number of trees that would be removed will easily be documented by locating the centerline of the pipeline in the crossing location. Each tree with a diameter at breast height greater than one inch within the stripping area would be inventoried in these locations. Patches of native shrubs are dispersed along the pipeline within the native grasslands. The sampling methods described below will focus on these locations.

Several species of multi-stem shrubs are found along the Vantage West Spur Lateral Pipeline including snowberry (*Symphoricarpos occidentalis*), chokecherry (*Prunus virginiana*), and prairie rose (*Rosa arkansana*). Chokecherry is an example of a shrub with multiple stems rising from a central point while snowberry and prairie rose are rhizomatous with a single individual creating large colonies. A chokecherry with many stems rising from one central base would be counted as one individual, while a colony of snowberry will be counted as one individual within a specific area. The North Dakota State University Dickenson Research Extension Center states snowberry colonies can vary in size but are typically between 60 and 170 feet in diameter (Manske, 2005). Field scientists will designate obvious colonies of rhizomatous species as one individual. For less obvious colonies, rhizomatous shrubs of a single species within a 120 foot radius will be counted as one individual.

3.3 Inventory During Construction

The total number of trees or shrubs removed may vary depending on decision-making during construction. During construction, the actual number of trees or shrubs removed in a specific location will be recorded using the Vantage West Spur Lateral Pipeline Tree and Shrub Inventory Form (Appendix B). For example, field scientists originally labeled a group of trees for removal in the initial inventory; however, the clear and grub crew deemed it feasible to avoid the group of trees by necking down the construction ROW at that specific location, changing the removal inventory. There is also the potential for the opposite situation: for example, a patch of shrubs located on a bend in the pipeline, where more work space is needed for construction.

4.0 References

Manske, L. L. 2005. “Western Snowberry Biology” in *2005 Annual Report Grassland Section*. North Dakota State University Dickenson Research Extension Center. Accessed online: February 10, 2015 <http://www.ag.ndsu.edu/archive/dickins/research/2005/range05a.htm>. Modified July 14, 2009.

**Appendix A: State of North Dakota Public Service Commission
Tree and Shrub Mitigation Specifications**

STATE OF NORTH DAKOTA
PUBLIC SERVICE COMMISSION

Tree and Shrub Mitigation Specifications

Inventory

1. Trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds (*e.g.*, *Caragana arborescens*, *Elaeagnus angustifolia*, *Rhamnus cathartica*, *Tamarix chinensis*, *T. parviflora*, *T. ramosissima*, *Ulmus pumila*), must be inventoried before cutting. The inventory must record the location, number, and species of trees and shrubs.
2. In windbreaks, shelterbelts and other planted areas, trees or shrubs anticipated to be cleared, regardless of size, must be inventoried for replacement.
3. In native growth areas, trees anticipated to be cleared that are 1 inch diameter at breast height (dbh) or greater must be inventoried for replacement.
4. In native growth areas, shrubs anticipated to be cleared in the permanent right-of-way must be inventoried for replacement.
5. In native growth areas outside the permanent right-of-way, shrubs must be cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock intact. If soil disturbance is necessary, the native topsoil must be preserved and replaced after construction. Shrubs must be allowed to regenerate naturally where native topsoil is preserved and replaced. Where native topsoil is not preserved and replaced, shrubs anticipated to be cleared must be inventoried for replacement.

6. In native growth areas, trees and shrubs may be inventoried by actual count or by a sampling method that will properly represent the woody vegetation population. A sampling plan developed by the company, filed with the North Dakota Public Service Commission (Commission) and approved prior to the start of construction must define the sampling method to be used for trees, for tall shrubs and for low shrubs. The data from the sample plots must be extrapolated to the total acreage of the wooded area to be cleared to determine the species and quantity of trees and shrubs to be replaced.

Clearing for Construction

7. Trees and shrubs must be selectively cleared, leaving mature trees and shrubs intact where practical.
8. The maximum width of clear cuts through windbreaks, shelterbelts and all other wooded areas is 50 feet, unless otherwise approved by the Commission.
9. If the area of trees or shrubs actually cleared differs from the area inventoried, the difference in number of trees and shrubs to be replaced must be noted on the inventory.

Replacement

10. Prior to tree and shrub replacement, documentation identifying the number and variety of trees and shrubs removed, as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings, must be filed with the Commission for approval.
11. Two 2-year-old saplings must be planted for every one tree removed. Two shrubs (stem cuttings) must be planted for every one shrub removed.
12. Except in the case of invasive or noxious species, trees and shrubs must be replaced by the same species or similar species, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.

Invasive or noxious species must be replaced by similar non-invasive or non-noxious species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.

13. Tree and shrub replacement must not be conducted within a 20 to 30 foot wide path over the pipeline to facilitate visual inspections of the right-of-way in accordance with U.S. Department of Transportation safety regulations.
14. Landowners must be given the option of having replacement trees and shrubs planted on the landowner's property, either on or off the right-of-way. The landowner must also be given the opportunity to waive those options in writing in order to have replacement trees and shrubs planted off the landowner's property.
15. At the conclusion of the project, documentation identifying the actual number, variety, type, location and date of the replacement plantings must be filed with the Commission.
16. Tree and shrub replacements must be inspected annually, in September, for three years. The first annual inspection must be at least one year from the anniversary date of the original plantings. A report of each annual inspection must be submitted to the Commission by October 1 of each year, documenting the condition of plantings and any woodlands work completed as of September of each year. If after the third annual report the survival rate is less than 75%, the Commission may order additional planting(s).

Appendix B: Vantage West Spur Lateral Pipeline Tree and Shrub Inventory Form

