Appendix U

Wetland Restoration Plan

Prepared for:
Bison Pipeline LLC

Wetland Restoration Plan

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Wetland Restoration Plan

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List of Acronyms

Bison	Bison Pipeline LLC
BLM	Bureau of Land Management
FERC	Federal Energy Regulatory Commission
Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
Project	Bison Pipeline Project
ROW	Right-of-Way
USACE	United States Army Corps of Engineers

Wetland Restoration Plan

This Plan has not been previously submitted to FERC. Therefore, there have been no changes.

Section	**Description of Modifications**
	None

1.0 Introduction

1.1 Proposed Project

On April 20, 2009, Bison filed an Application with the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act and Part 157 of the FERC's regulations for a Certificate of Public Convenience and Necessity to construct, operate, and maintain an interstate natural gas pipeline and associated ancillary and aboveground facilities, collectively known as the Bison Pipeline Project (Project). The Project was assigned Docket Number CP09-161.

The Project will consist of approximately 301 miles of 30-inch outside diameter natural gas pipeline, one 4,700-horsepower natural gas fired compressor, and related pipeline system facilities that will extend northeastward from a point near Dead Horse, Wyoming, through southeastern Montana and southwestern North Dakota where it will interconnect with Northern Border Pipeline Company's pipeline system near Northern Border's Compressor Station No. 6 in Morton County, North Dakota. The gas will then be transported by Northern Border's existing pipeline and delivered into the Midwest market. The targeted in service date for the Project is November 2010.

AECOM Environment (AECOM) acting on behalf of Bison, conducted wetlands assessment and delineation surveys during the spring and summer of 2008 and spring, summer, and fall of 2009 along the proposed Project route, associated facilities, and access roads. The field methodologies that were employed by trained AECOM and subcontractor biologists were developed in accordance with the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region approved by the United States Army Corps of Engineers (USACE) for field use. The survey corridor along the proposed alignment measured 300 feet wide along the centerline of the proposed pipeline route. At the locations of proposed aboveground facilities (including permanent and temporary facilities), surveys were conducted over the entire footprint of each facility site. Access roads not regularly maintained or planned for improvement for the use of construction equipment were surveyed a total of 12.5 feet from the center of the road (25 feet total). Environmental features and attributes including wetlands, waterbodies, listed species, critical habitat, and land use were assessed and documented. Detailed survey methodologies and results are included in the Wetland Delineation Report prepared for the USACE Omaha District by state.

The purpose of Bison's Wetland Restoration Plan is to provide Bison's approach to restoring the functions and values of wetlands temporarily impacted by the construction of the Project. Avoidance and minimization measures that were implemented during design of the Project are provided in Bison's Wetland Delineation Reports. These efforts were accomplished to the maximum extent practicable during routing of the line. Specifics about the acreage and extent of wetland impacts are also provided in Bison's Wetland Delineation Reports.

2.0 Wetland Impacts

Bison proposes a 120-foot Construction right-of-way (ROW) along the length of the Project, although the ROW will be reduced to 75 feet in wetlands. Construction, operation, and

maintenance of the Project will result in only temporary impacts to wetland areas. The Project will result in unavoidable temporary impacts along the Project to approximately 15.11 acres of palustrine emergent wetland habitat (including six seep wetlands) and 0.08 acres of palustrine scrub-shrub wetland habitat. No forested wetlands will be impacted by the Project.

In general, riparian areas that are not classified as wetlands will be restored in accordance with Bison's Reclamation Plan. Riparian areas located on Bureau of Land Management (BLM) lands in Montana will be surveyed for size and species prior to initiation of construction in 2010, as requested through consultation with the BLM Miles City Field Office. Based on the results of these surveys, Bison may amend this plan to provide specific information regarding restoration of riparian areas on BLM lands in Montana.

2.1 General Restoration Measures

Restoration of the natural hydrology, soil profiles, and topography is critical to promote natural regeneration and for developing and maintaining a successful wetland ecological system. Where the original contours are reestablished within a ROW, and no other impediments to the natural hydrology occur, natural revegetation of a ROW through wetland areas approximates the adjacent natural plant community usually within one or two growing seasons in emergent and scrub-shrub systems. Studies suggest that naturally revegetated ROWs exhibit similar species, number, and diversity as the adjacent areas, and the original predominance of obligate and facultative wetland species is maintained (Thibodeau and Nickerson 1986; Rury and Little 1991; Zimmerman et al. 1991). Natural regeneration has been shown to be more successful at narrow sites, such as pipeline ROWs, where native species can be recruited from the surrounding wetlands (Clewell and Lea 1990). In addition, wetland areas allowed to regenerate naturally recover more quickly than if established from seed or installed plants (Long and Ellis 1984; Brown 1987; Baca and Lankford 1989; Buchanan and Zagata 1991; Rury and Little 1991). Bison believes that natural revegetation, in conjunction with exotic/nuisance weed monitoring and control, is the most cost-efficient and proven method of restoring wetland areas in the pipeline ROW.

Techniques to minimize construction impacts on wetland soil profiles and hydrological function include topsoil segregation, implementation of proper erosion control techniques, reduction of soil compaction, and construction/restoration timing. Conversely, improper restoration of a wetland, such as inversion of the soil profiles or creating a slightly higher soil elevation, can prevent emergence of wetland plants (Farnworth 1981; Clewell and Lea 1990; Honig and Rury 1991; Zimmermann et al. 1991; FERC 2004). Consequently, adherence to the construction procedures identified within Bison's *Wetland and Waterbody Construction and Mitigation Procedures* (Bison's Procedures) and *Upland Erosion Control, Revegetation, and Maintenance Plan* (Bison's Plan) will minimize wetland impacts, maintain the natural hydrological function of the wetland, and promote successful revegetation.

Bison proposes to strip topsoil in unsaturated wetlands over the trench. Topsoil segregation is an important construction method employed during pipeline construction that prevents soil layer mixing and minimizes long-term impacts. This method involves removal, segregation, and storage of the topsoil horizon, ground cover, organic matter, and the viable seed bank of a wetland. Topsoil segregation has been used to provide recently disturbed wetlands with a ready source of native vegetation, which can recover to a point where pre- and post-construction community

structure is virtually the same (Farnworth 1981; Long and Ellis 1984; Montgomery and Murray 1987; Buchanan and Zagata 1991; Honig and Rury 1991). Bison proposes to complete wetland crossings as expeditiously as possible, thus minimizing the time between ditching and backfilling and allowing propagules of native species to survive in the ROW (Zellmer et al. 1991).

Various methods to control erosion, such as silt/sediment barriers, silt fences, slope breakers, and temporary vegetation cover, will be employed by Bison, as detailed in Bison's Plan, Bison's Procedures, Bison's Reclamation Plan, and state-specific Stormwater Pollution Prevention Plans (SWPPPs). Construction methods that limit heavy equipment or other activities in the wetland (e.g., push/pull) are considered a valuable strategy for minimizing impacts on soils and promoting successful natural restoration of wetlands (Clewell and Lea 1990; Gartman 1991; Honig and Rury 1991; Steenberg 1991; Zellmer et al. 1991), and will be employed by Bison.

Bison proposes two wetland restoration methods, with the success of each method to be measured and ensured during Bison's post construction monitoring program. The natural revegetation technique described below will be utilized over all of the wetlands impacted by the Project, except those wetlands on BLM lands in Wyoming. Wetlands on BLM lands in Wyoming will be sown with a BLM-provided seed mix and rate.

2.2 Natural Revegetation

To minimize the potential for the establishment of noxious species and reduce erosion issues within the first year, Bison proposes to sow all wetland areas (except those on BLM lands in Wyoming) with annual ryegrass at a rate of 40 lbs/acre immediately following construction. These wetlands will then be allowed to naturally revegetate. This seeding is part of Bison's Procedures and was based on the FERC's January 17, 2003, version of the Procedures.

2.3 Reseeding on BLM lands in Wyoming

At the request of the Wyoming BLM Buffalo Field Office, impacted wetlands on BLM lands in Wyoming will be reseeded using the seed mix/rate provided in **Table 2.3-1** below. If the specified seeds are not available, Bison will consult with the Wyoming BLM Buffalo Field Office to identify a suitable replacement.

Table 2.3-1 - BLM Buffalo Field Office Recommended Wetland Seed Mix			
Scientific Name	**Common Name**	**% in Mix**	**Lbs of Pure Live Seed**
Pascopyrum smithii	western wheatgrass	35	4.2
Nassella viridula	green needlegrass	30	3.6
Leymus cinereus	basin wildrye	25	3
Ratibida columnifera	upright coneflower	5	0.6
Dalea candida	white prairie clover	5	0.6
Totals		100	12 lbs/acre

Though these species do not necessarily represent a typical wetland plant assemblage, they will serve a similar purpose as annual ryegrass in preventing the early establishment of noxious species in the wetland habitat.

3.0 Monitoring

Bison will monitor and record the success of wetland revegetation annually for 3 years after construction, or until wetland revegetation is successful, as defined below in Section 3.3. At the end of each year following construction, an annual report will be filed with the FERC and/or BLM (for wetlands on BLM land) identifying the status of the wetland revegetation efforts, in conjunction with the noxious weed and reclamation reports. The percent cover achieved and problem areas (weed invasion issues, poor revegetation, etc.) will be identified. A report will continue to be filed annually until wetland revegetation is successful. Where and when appropriate, Bison will consult with the relevant agency to obtain written approval that the restoration has been completed satisfactorily and that additional monitoring is not required.

3.1 Survey Methodology

3.1.1 Qualitative Wetland Assessment

Qualitative Wetland Assessments will entail conducting general site reconnaissance and visual assessment of the overall condition of all wetlands temporarily impacted during the construction of the Project. Visual estimates will be made and recorded for the following wetland characteristics:

1. Dominant vegetation species percent cover;
2. Vegetative cover and vigor;
3. Surface topography in relation to adjacent (off-ROW) areas;
4. Hydrology (surface water and drainage patterns);
5. Soil profile;
6. Wildlife utilization;
7. Presence of stump re-sprouting;
8. Presence of exotic, invasive, or nuisance vegetation;
9. Residual construction impacts (construction debris, topsoil and subsoil mixing); and

10. Land use impacts (off-road vehicle damage, erosion, farming [including cattle grazing] and residential or roadway construction).

Observations will be documented on a standardized data form. In addition, a photopoint location will be established using Global Positioning System technology and revisited during each successive monitoring effort to provide time-series digital photograph documentation of wetland recovery and succession.

For each wetland temporarily impacted during the construction of the Project, data will also be collected for an adjacent reference wetland, where feasible. The selected reference wetland will be an undisturbed portion of the same wetland located adjacent to the construction ROW, but not affected by construction. If an undisturbed portion of the same wetland is not available, an adjacent off-ROW reference wetland may be selected that best represents the on-ROW wetland pre-construction conditions, with appropriate access permission.

3.1.2 Post-Construction Contours

To facilitate wetland development, wetland areas will be graded as near as possible to pre-construction contours during post-construction trench backfill activities. According to the conclusions summarized in Research of Wetland Construction and Mitigation Activities for Certificated Section 7(c) Pipeline Projects (FERC, 2004), "wetlands that achieved pre-construction grades (i.e., grading of the wetland was reestablished to pre-construction conditions) were significantly more successful than wetlands that did not meet pre-construction grades." Establishing appropriate topography is generally considered to be a primary influence in producing successful wetland restoration by facilitating the restoration of the wetland hydroperiod, and subsequently promoting the re-establishment of hydrophytic vegetation and hydric soil characteristics.

3.2 Exotic, Nuisance, and Invasive Vegetation

During the wetland monitoring effort, areas with invasive exotic species (noxious weeds) and erosion control problems within the restored wetlands will be documented and reported. Populations of noxious weeds will be addressed in accordance with Bison's Noxious and Invasive Weed Control Plan. Erosion control concerns will be addressed in accordance with Bison's Procedures.

3.3 Revegetation Success Criteria

Wetland revegetation will be considered successful if the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If revegetation is successful at the end of 3 growing seasons, Bison will submit a final monitoring report and request written approval to cease monitoring. If revegetation is not successful at the end of 3 years, a wetland remediation plan will be developed in consultation with a professional Wetland Ecologist to restore the wetland. Monitoring efforts will continue until wetland revegetation is successful.

3.4 Reporting

Annual Monitoring Reports will be produced detailing the status of each wetland relative to wetland revegetation efforts, percent cover achieved, and problem areas (weed invasion issues,

poor revegetation, other disturbances, etc.). Each Annual Monitoring Report will be filed with the FERC, USACE and /or BLM by the end of the calendar year during which the monitoring effort was conducted.

4.0 Potential Remedial Actions

Restoration will be considered successful if the ROW surface condition is similar to adjacent undisturbed lands, construction debris is removed (unless requested otherwise by the land owner or land managing agency), revegetation is successful, and proper drainage has been restored. In the event it is determined that original wetland conditions have not been returned to pre-construction conditions, measures that could include, but would not be limited to, the following may be taken to ensure compliance with the success criteria mentioned above:

- Excavation or replacement of organic or clay-based soils in order to ensure correct post-construction hydrology and soil substrate conditions;
- Invasive species removal by hand or with selected and agency-approved herbicides; and
- Replanting.

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