



Antidegradation Assessment Section 401 Water Quality Certification

Enbridge Energy, Limited Partnership • Line 3 Replacement Project

October 2018



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ACRONYMS AND ABBREVIATIONS

404 (b)(1) Guidelines	U.S. Environmental Protection Agency's Section 404 (b)(1) guidelines
Antidegradation Rules	Minnesota rules parts 7050.0250 through 7050.0325
BMPs	best management practices
CFR	Code of Federal Regulations
CWA	Clean Water Act
Designated Route	Minnesota Public Utilities Commission Designated Route
DOC-EERA	Minnesota Department of Commerce, Energy Environmental Review and Analysis
EIS	Environmental Impact Statement
Enbridge	Enbridge Energy, Limited Partnership
EPA	U.S. Environmental Protection Agency
EPP	Environmental Protection Plan
FdL	Fond du Lac Band
FdL Section 401 WQC	Section 401 Water Quality Certification for the portion of the Line 3 Replacement Project inside of the Fond du Lac Band Reservation boundary
FEIS	Final Environmental Impact Statement
FMP	Fen Management Plan
Gully 30 fen	Gully 30 calcareous fen
HDD	horizontal directional drill
L3R or Project	Line 3 Replacement Project
MDNR	Minnesota Department of Natural Resources
mg/L	milligrams per liter
MP	milepost
MPCA	Minnesota Pollution Control Agency
MPCA Section 401 WQC	Section 401 Water Quality Certification for the portion of the Line 3 Replacement Project outside of the Fond du Lac Band Reservation boundary
MPUC	Minnesota Public Utilities Commission
NPDES	National Pollutant Discharge Elimination System
OHWM	ordinary high-water mark
ORVW	Outstanding Resource Value Waters
Reservation	Fond du Lac Band Reservation
RNR	River Nutrient Regions
RSA	Route Segment Alternative
SDS	State Disposal System
Section 404 Project Application	U.S. Army Corps of Engineers permit application for the Line 3 Replacement Project
Segment 18	the 13-mile segment of the Line 3 Replacement Project in Wisconsin
SONAR	Statement of Need and Reasonableness

TSS	total suspended solids
UCL	upper confidence limit
USACE	U.S. Army Corps of Engineers
WID	water identification number
WQC	water quality certifications

1.0 INTRODUCTION

On September 21, 2018, Enbridge Energy, Limited Partnership (“Enbridge”) applied to the St. Paul District, U.S. Army Corps of Engineers (“USACE”) for an individual permit under Section 404 of the Clean Water Act (“CWA”) for discharges of dredged or fill material into waters of the United States, including wetlands, in connection with the Line 3 Replacement Project (“L3R” or “Project”). This USACE permit application is referred to herein as the “Section 404 Project Application.”

The Section 404 Project Application requires two water quality certifications (“WQC”) under Section 401 of the CWA: (1) a Section 401 WQC from the Fond du Lac Band of Lake Superior Chippewa (“Fdl”) for the portion of the Project within the exterior boundaries of the Fdl reservation (“Reservation”) (“Fdl Section 401 WQC”), and (2) a Section 401 WQC from the Minnesota Pollution Control Agency (“MPCA”) for the portion of the Project in Minnesota outside the exterior boundaries of the Reservation (“MPCA Section 401 WQC”). The Fdl Section 401 WQC requires findings that the proposed Project meets applicable tribal water quality standards; the MPCA Section 401 WQC requires findings that the proposed Project meets applicable state water quality standards.

The MPCA Section 401 WQC requires antidegradation review under Minnesota Rules, part 7050.0285 and parts 7050.0250 to 7050.0335. The purpose of an antidegradation review is to achieve and maintain the highest possible quality in surface waters of the state (Minnesota Rules, part 7050.0250). This document includes an Antidegradation Assessment in support of the MPCA Section 401 WQC, hereafter referred to as the “Section 401 WQC Assessment”.

2.0 PROJECT BACKGROUND

The Project is a pipeline integrity- and maintenance-driven program designed to address identified mechanical integrity deficiencies on the existing Line 3 pipeline and to return the pipeline to the operating capabilities for which it was designed. L3R consists of approximately 355 miles of new 36-inch-diameter pipeline traversing the states of North Dakota, Minnesota, and Wisconsin, and terminating at the existing Enbridge Superior terminal facility near Superior, Wisconsin. The section of L3R which is the subject of this application, includes the replacement of approximately 282 miles of the existing 34-inch-diameter Line 3 pipeline with 330 miles of 36-inch¹-diameter pipeline and associated facilities from the Red River valve in North Dakota to the Minnesota/Wisconsin border (refer to Figure 2.0-1). Enbridge’s route generally follows the existing Line 3 pipeline along the Enbridge Mainline System right-of-way from the North Dakota/Minnesota border in Kittson County to the Clearbrook Terminal in Clearwater County. Next, L3R turns south from Clearbrook to generally follow an existing third-party crude oil pipeline right-of-way to Hubbard County. The route then turns east to generally follow other existing electric transmission lines until it rejoins the Enbridge Mainline System right-of-way in St. Louis County, through the Fdl Reservation (refer to Figure 2.0-2) to the Minnesota/Wisconsin border in Carlton County.

Enbridge applied for a Certificate of Need and a Route Permit from the Minnesota Public Utilities Commission (“MPUC”) to construct and operate L3R on April 24, 2015. The MPUC asked the

¹ 36-inch-diameter steel pipeline is a more standard pipeline than 34-inch in the industry and among the Enbridge Mainline System. The decision to replace with 36-inch-diameter pipeline makes pipe, pipefitting, valves, and maintenance equipment more readily available. A 36-inch pipeline is more energy efficient than a 34-inch pipeline.

Minnesota Department of Commerce, Energy Environmental Review and Analysis (“DOC-EERA”) staff to prepare an Environmental Impact Statement (“EIS”) in cooperation with the Minnesota Department of Natural Resources (“MDNR”) and MPCA to facilitate the review of Enbridge’s Certificate of Need and Route Permit applications for L3R in accordance with Minnesota Administrative Rules Chapter 4410. The DOC-EERA issued the draft EIS on May 15, 2017 and the final EIS (“FEIS”) on August 17, 2017². On December 7, 2017, the MPUC deemed the FEIS inadequate solely on the basis of four specific and narrow issues, and a revised FEIS was published on February 12, 2018. On May 1, 2018, the MPUC issued a written order finding the revised FEIS adequate. Further information on these proceedings is provided in Section 7.1.

² The L3R draft and final EIS are available on the Minnesota Department of Commerce website at: <https://mn.gov/commerce/energyfacilities/line3/>.

Figure 2.0-1 Line 3 Replacement Project Overview Map

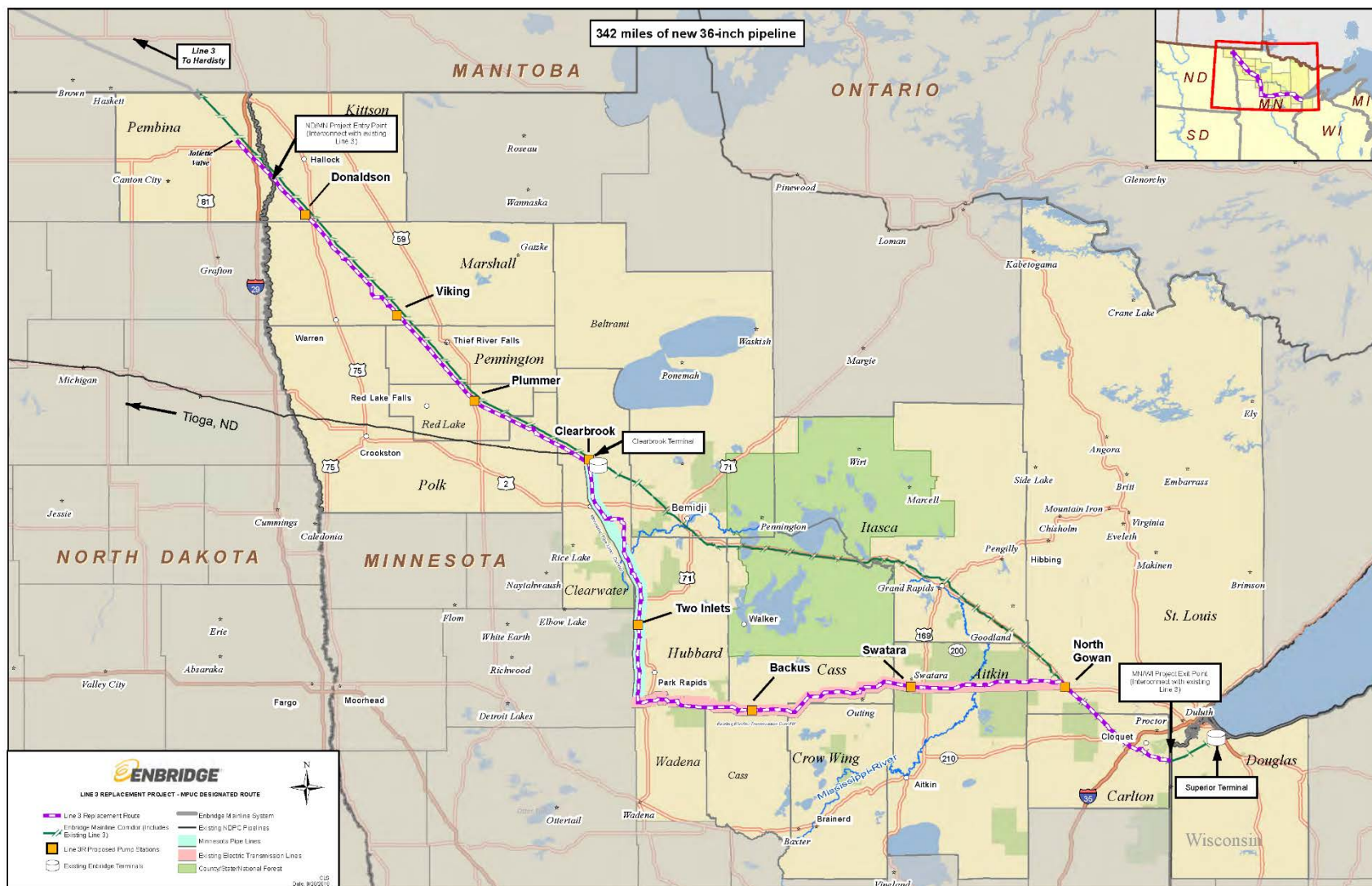
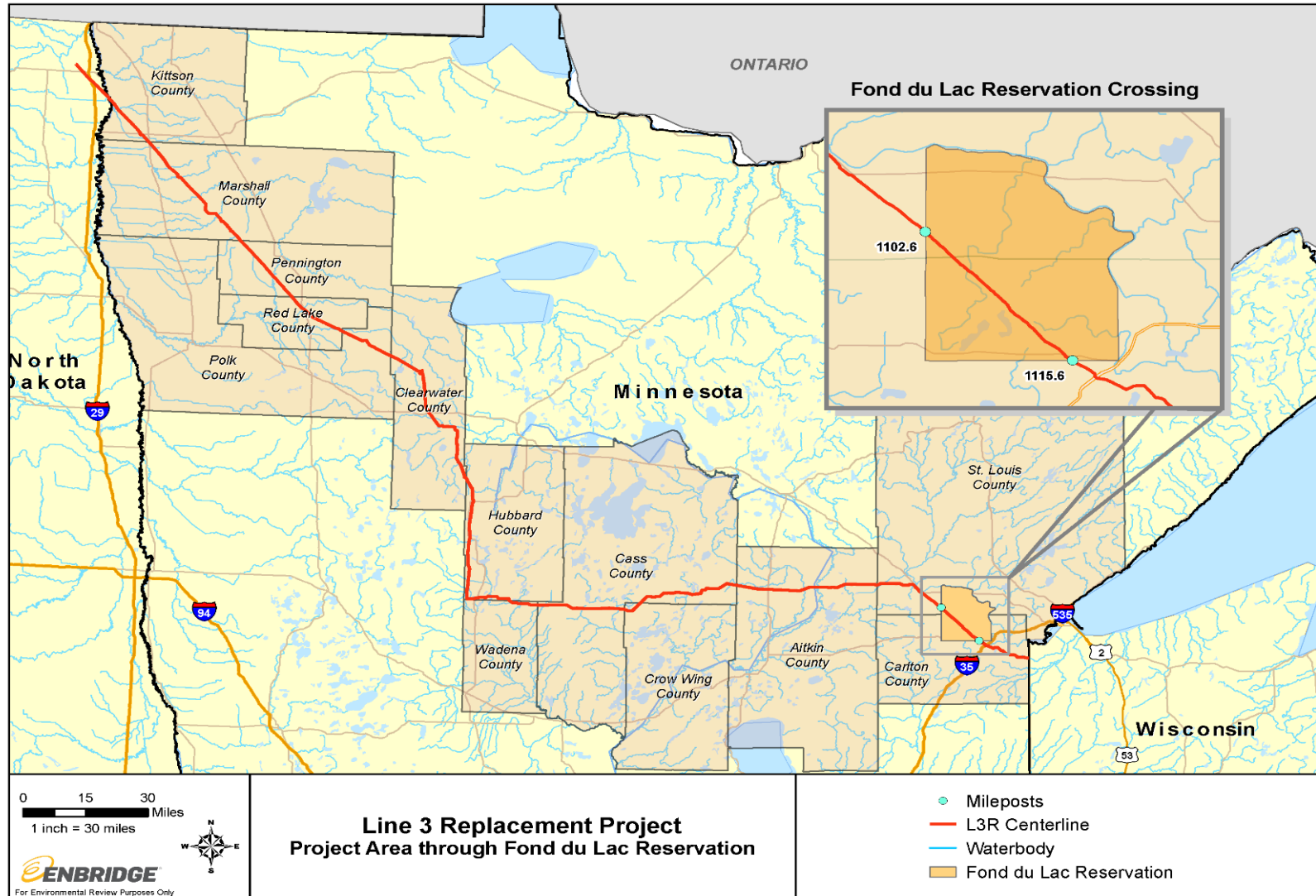


Figure 2.0-2 Line 3 Replacement Project Overview Map through Fond du Lac Reservation



3.0 REGULATORY CONTEXT

3.1 ANTIDEGRADATION STANDARDS AND PROCEDURES

Minnesota rules parts 7050.0250 through 7050.0325 ("Antidegradation Rules") include multiple antidegradation standards and procedures. The applicability of these specific standards and procedures is determined by the nature of the proposed activity and the type of "control document" required to authorize that activity. The term "control document" means any "authorization issued by the MPCA commissioner that specifies water pollution control conditions under which a regulated activity is allowed to operate" (Minnesota Rules, part 7050.0255, subpart 10). Enbridge is applying for multiple authorizations that trigger antidegradation requirements:

- the Section 401 WQC,
- an Individual National Pollutant Discharge Elimination System ("NPDES") / State Disposal System ("SDS") Permit to conduct discharge of waters used to test the structural integrity of the pipeline, and
- coverage under the NPDES / SDS construction stormwater general permit (MNR100001).

In this Section 401 WQC Assessment, Enbridge evaluates the physical alteration of wetlands and potential water quality impacts due to waterbody crossing activities. Wetland impacts from the Project will be subject to the requirements of the Section 404 permit issued by the USACE. Potential water quality impacts due to waterbody crossings are subject to the requirements of Minnesota Rules part 7050.0280.

Concurrent with the submittal of this Section 401 WQC Assessment, Enbridge submitted an Antidegradation Assessment in support of the individual NPDES/SDS permit application to conduct discharge of waters used to test the structural integrity of the pipeline as required by the antidegradation procedures for an individual NPDES/SDS (Minnesota Rules, part 7050.0280, subpart 2).

For construction stormwater discharges, Enbridge will request coverage under the NPDES/SDS construction stormwater general permit (MNR100001) after issuance of the Section 401 WQC. The Antidegradation Assessment was conducted by the MPCA during development of the Minnesota NPDES / SDS construction stormwater general permit (MNR100001); therefore, no further antidegradation assessment is required with respect to construction stormwater discharges.

Collectively, with these separate Antidegradation Assessments referenced in the three preceding paragraphs, all surface water discharges from the Project have received the requisite antidegradation evaluations required by federal and state law.

The Lake Superior Basin Antidegradation Standards (Minnesota Rules parts 7052.0300 to 7052.0380) contain antidegradation requirements for discharges of certain bioaccumulative chemicals to waters in the Lake Superior Basin. Project discharges will not contain any bioaccumulative chemicals, so the antidegradation standards of Chapter 7052 do not apply to these discharges.

3.2 SCOPE OF SECTION 401 WQC ASSESSMENT

Section 4.0 of this document summarizes the information regarding the physical alteration of wetlands and crossings of waterbodies provided in the Section 404 Project Application submitted to the USACE concurrent with this Section 401 WQC Assessment.

Table 3.2-1 outlines the antidegradation information specifically required by Minnesota Rules, part 7050.0265, subparts 2 through 8 for a Section 401 WQC Assessment and identifies the corresponding section of this document, the Section 404 Project Application, Enbridge's Antidegradation Assessment for the individual NPDES/SDS permit application, and/or the Minnesota NPDES/SDS construction stormwater general permit (MNR100001) where the information required to satisfy these procedures can be found.

TABLE 3.2-1

Roadmap to Project Information Required by the Antidegradation Standard for Activities Regulated by Section 401 WQC (Minnesota Rules, part 7050.0265)

Citation (Minnesota Rules, part 7050.0265)	Description	Information pertaining to potential water quality effects of hydrotest discharges	Information pertaining to physical alteration of wetlands	Information pertaining to crossing construction
Subpart 2	Protection of existing uses	Section 8.1 of the Individual NPDES/SDS Antidegradation Assessment (Attachment A)	- Sections 4.1 and 9.2 of this document - Section 5.0 of the Section 404 Project Application	Section 9.1 of this document
Subpart 3	Compensatory mitigation	N/A	- Section 9.2 of this document - Section 10.0 of the Section 404 Project Application	Section 9.2 of this document
Subpart 4	Protection of beneficial uses	Section 8.2 of the Individual NPDES/SDS Antidegradation Assessment (Attachment A)	N/A	Section 9.3 of this document
Subpart 5(A)	Alternatives analysis	Section 6.0 of the Individual NPDES/SDS Antidegradation Assessment (Attachment A)	- Section 7.0 of this document - Section 8.0 of the Section 404 Project Application	Section 7.0 of this document
Subpart 5(B)	Economic and social benefits	Section 8.4 of the Individual NPDES/SDS Antidegradation Assessment (Attachment A)	Section 9.5 of this document	Section 9.5 of this document
Subpart 5(C)	Compliance with all applicable surface water pollution control statutes and rules	- Section 8.0 of the Individual NPDES/SDS Antidegradation Assessment (Attachment A) - Construction Stormwater General Permit (MNR100001)	Section 404 Project Application Construction Stormwater General Permit (MNR100001)	Section 9.0 of this document Construction Stormwater General Permit (MNR100001)
Subparts 6 and 7	Protection of restricted outstanding resource value waters and prohibited outstanding resource value waters	Sections 7.2 and 8.5 of the Individual NPDES/SDS Antidegradation Assessment (Attachment A)	N/A	Section 9.6 of this document
Subpart 8	Protection against impairments associated with thermal discharges	Section 8.6 of the Individual NPDES/SDS Antidegradation Assessment (Attachment A)	N/A	Section 9.7 of this document

4.0 CONSTRUCTION ACTIVITIES AND SEQUENCE

Enbridge has developed an Environmental Protection Plan (“EPP”) (refer to Attachment A) that contains elements of industry and company-wide best management practices (“BMPs”) for addressing mitigation and erosion control measures, construction spill prevention, containment, and control; drilling fluid releases; noxious and invasive weeds; and restoration/revegetation measures. Enbridge will implement standardized erosion control and restoration measures to minimize potentially adverse environmental effects resulting from right-of-way preparation, construction, and maintenance of the pipeline.

The EPP includes, by reference, additional environmental documents, policies, plans, and protocols developed by Enbridge to minimize and/or mitigate the potential impacts of pipeline construction on the environment. These documents were developed based on Enbridge’s experience implementing BMPs during construction. Permits issued by various federal, state, or local agencies may be more restrictive than the EPP. In these cases, the permit conditions supersede guidance provided in the EPP.

Enbridge also has developed a Summary of Construction Methods and Procedures for Wetland and Waterbody Crossings (refer to Attachment B), which outlines the various construction methods that Enbridge may utilize to construct through wetlands and waterbodies on the Project. The discussion of each method includes a description of the construction procedures; conditions required to employ the method (applicability of the method, and equipment needs, such as timber mats); environmental and/or constructability advantages and disadvantages associated with the method; and mitigation measures that Enbridge will implement to avoid or reduce impacts associated with implementing the method.

Enbridge will install the replacement pipeline in uplands, wetlands, and waterbodies using industry-accepted construction methods. Pipeline construction will typically follow a sequential process, which includes: survey and staking, clearing and site preparation, pipe stringing, bending, welding, coating, trenching, lowering-in, backfilling, hydrostatic testing,³ and cleanup and restoration. In most areas, these construction processes will proceed in an orderly assembly-line fashion with construction crews moving along the construction workspace. Appropriate safety measures would be implemented before excavation begins, including notification through the One-Call system to ensure third-party utilities and adjacent pipelines are properly marked. Pipe, valves, and fittings would be transported to the workspace and placed along the workspace. Construction crews will use temporary access roads for ingress/egress to the Project workspace where travel down the right-of-way is not feasible.

4.1 DESCRIPTION OF WETLAND CROSSINGS

Enbridge will typically use conventional construction methods in wetlands similar to those implemented in uplands. Large wetlands with standing water generally cannot be crossed using these typical construction methods; therefore, Enbridge will install L3R using the push/pull and/or float technique. There are also wetlands adjacent to roads or waterbodies and will be associated with HDDs or bores where no impacts will occur. Refer to Section 3.0 of the EPP (Attachment A)

³ Hydrostatic testing: Hydrostatic testing is a process of verifying the integrity of the pipeline before it is placed into service. Hydrostatic testing involves filling the pipeline with water to a designated pressure and holding it for a specified period of time.

and Section 2.0 of the Summary of Construction Methods and Procedures for Wetland and Waterbody Crossings (Attachment B) for more additional information.

Construction will result in some unavoidable physical alteration of wetlands at certain aboveground facilities as described in Section 9.2.1 of the Section 404 Project Application. Wetland impacts will be mitigated by purchase of approved wetland bank credits, following ratios required by the USACE in its Section 404 permit (refer to Section 10.0 of the Section 404 Project Application).

4.2 DESCRIPTION OF WATERBODY CROSSING

4.2.1 Horizontal Directional Drill and Bore Crossings

Horizontal directional drill (“HDD”) and bore are both trenchless crossing methods that use a drill to install the new pipe below the stream bed. There will be no instream work and thus no anticipated increased loading or other forms of degradation. Drilling mud will be collected and disposed of at an offsite facility. No water quality impacts are anticipated for HDD crossings; however, Enbridge has developed a response plan for unanticipated drilling mud releases in the unlikely even they may occur during construction described in Section 11.0 of the EPP (Attachment A). Refer to Section 2.5.4 of the EPP (Attachment A) and Section 3.0 of the Summary of Construction Methods and Procedures for Wetland and Waterbody Crossings (Attachment B) for more detailed information on these crossing methods.

4.2.2 Open Trench Crossings

There are two forms of open trench crossings: dry crossings and wet crossings. Both involve digging a trench through the waterbody, placing the pipe in the trench, backfilling the trench, and restoring the contours of the stream bed and banks to pre-construction conditions.

Dry crossings use either the dam and pump or flume technique. Both methods dam the stream both upstream and downstream and dig a trench in the dry work area to install the pipe. Water is routed around the dry work area either by pumping water through hoses or through a flume pipe. The load of total suspended solids (“TSS”) in the water may be temporarily increased by the construction and removal of the dam, and by the flow over the disturbed stream bed when flow is restored. Impacts are expected to be short term, in most cases pipeline installation takes less than 24 hours. Refer to Sections 2.5.2 and 2.5.3 of the EPP (Attachment A) and Section 3.0 of the Summary of Construction Methods and Procedures for Wetland and Waterbody Crossings (Attachment B) for more detailed information on these crossing methods.

Wet open cut crossings involve trenching through the waterbody while water continues to flow across the in-stream work area. Generally, wet open cuts are used if the waterbody has no perceptible flow. However, there are a limited number of locations where due to surrounding saturated wetlands, it is difficult to isolate the flow and a wet trench crossing is proposed. During the wet crossing, the disturbed stream bed will temporarily increase the sediment load in the water. As with dry crossings, impacts are expected to be short term. Refer to Section 2.5.1 of the EPP (Attachment A) and Section 3.0 of the Summary of Construction Methods and Procedures for Wetland and Waterbody Crossings (Attachment B) for more detailed information on this crossing method.

5.0 PARAMETERS OF CONCERN

Antidegradation assessment and review is limited to parameters of concern as defined in the Statement of Need and Reasonableness (“SONAR”) for the Antidegradation Rules (SONAR at p 88). Parameters of concern are pollutants which:

- are reasonably expected in a discharge or as a result of a proposed activity;
- are anticipated to cause degradation (a measurable change to existing water quality made or induced by human activity resulting in diminished conditions of surface waters);
- have numeric or narrative standard; and
- present the greatest risk of degradation.

The potential water quality effects of instream work during open trench crossings will be associated with temporary increases of turbidity⁴ and TSS⁵. As described in Section 2.5 of the EPP (Attachment A) open trench crossing construction will be managed with BMPs to avoid and mitigate TSS loading, erosion, and scour. Enbridge proposes that TSS is the only parameter that meets the definition of parameters of concern for waterbody crossings. The state of Minnesota has adopted water quality standards for TSS and has abandoned turbidity-based assessments (Minnesota Rules part 7050.0220 through 7050.0227); therefore, turbidity is not carried forward as a parameter of concern.

HDD or bore crossings locations will involve no instream work, therefore no increased loading of TSS is anticipated. Concerns about potential water quality effects due to unanticipated releases of drilling mud (i.e., frac outs) will be addressed as described in Section 8.2.3.

6.0 RECEIVING WATERS

Attachment C includes a waterbody crossing table that identifies the receiving waters across which the pipeline will be installed, including their beneficial use classifications and the proposed crossing method (refer to Section 4.2). It also includes information on their impairment status, as listed on the Section 303(d) lists prepared by the MPCA in 2014, 2016, and 2018. The 2016 and 2018 lists have not yet been approved by the U.S. Environmental Protection Agency (“EPA”); however, the information is included to provide additional context. Given that TSS is the parameter of concern, relevant impairments are turbidity/TSS, and also fish and macroinvertebrates because TSS is one of the parameters that can affect fish and macroinvertebrate habitat.

Most of the receiving waters are not impaired for turbidity/TSS, fish, or macroinvertebrates. Receiving waters with relevant impairments are shown in Table 6.0-1.

⁴ Turbidity is a measure of water clarity how much the material suspended in water decreases the passage of light through the water. Suspended materials include soil particles (clay, silt, and sand), algae, plankton, microbes, and other substances. These materials are typically in the size range of 0.004 mm (clay) to 1.0 mm (sand). Turbidity can affect the color of the water (<https://archive.epa.gov/water/archive/web/html/vms55.html>).

⁵ Total suspended solids is a measure of the filterable solids present in a sample, as determined by the method specified in 40 Code of Federal Regulations (“CFR”) Part 136 (https://ofmpub.epa.gov/sor_internet/registry/termreg/searchandretrieve/termsandacronyms/search.do?search=&term=total%20suspended%20solids&matchCriteria=Contains&checkedAcronym=true&checkedTerm=true&hasDefinitions=false).

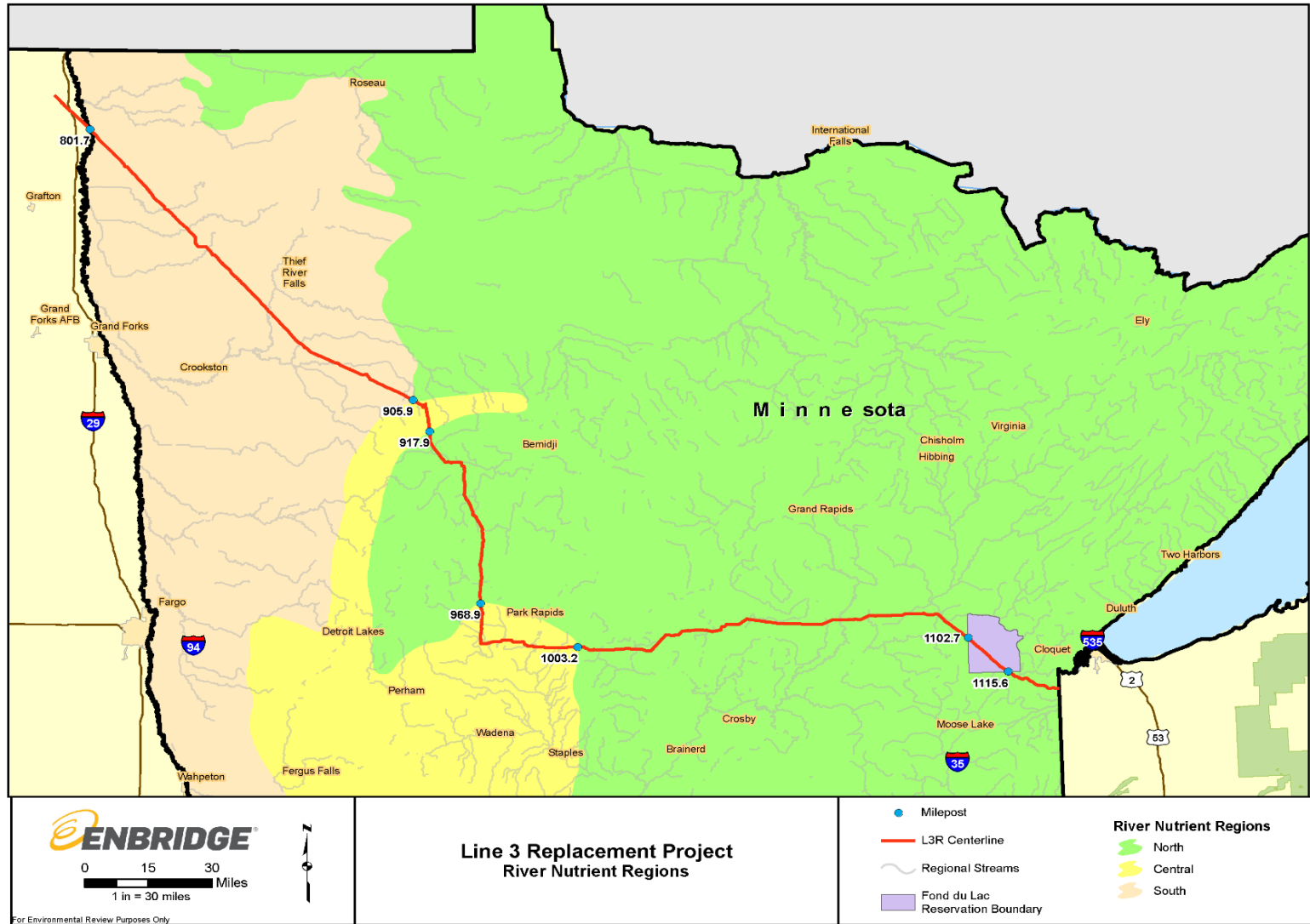
TABLE 6.0-1			
303(d) Impaired Waterbodies with Parameters of Concern Crossed by the Line 3 Replacement Project			
	Milepost ("MP")	Impairment	Proposed Crossing Method
Tamarac River	828.5	Aquatic macroinvertebrate bioassessments; Fishes bioassessments	HDD
Middle River	835.9	Turbidity/TSS	HDD
South Branch Snake River ^a	847.2	Fishes bioassessments	Dry Crossing
Black River ^b	855.0	Turbidity/TSS	Open Cut
Clearwater River	875.4	Turbidity/TSS	HDD
Shell River	976.6	Fishes bioassessments	Dry Crossing
Shell River	981.4	Fishes bioassessments	Dry Crossing
^a South Branch, Snake River is on the MPCA's Proposed 2018 303(d) Impaired Waters list, but not on the 2014 EPA-approved list. ^b Black River has been removed from MPCA's Proposed 2018 303(d) Impaired Waters list 2016 and 2018; however, it is included on the 2014 EPA-approved list. This feature was delineated as a wetland during field surveys as it has no waterbody characteristics such as a defined bed and bank or ordinary high water mark.			

There are two restricted Outstanding Resource Value Waters ("ORVWs") which will be crossed by the Project, the Mississippi River and the Gully 30 calcareous fen ("Gully 30 fen"). The Project will not cross any prohibited ORVWs.

The MPCA has developed draft eutrophication criteria for rivers protective of Minnesota's aquatic life use based on River Nutrient Regions ("RNR"). These RNRs correspond loosely to the EPA aggregated Level III Nutrient ecoregions. Figure 6.0-1 presents the Project in relation to each RNR.

The MPCA established TSS standards for Class 2A, 2Bd, 2B, 2C, and 2D waters by RNR, all of which are crossed by the Project (Minnesota Rules Part 7050.0222). Tables 8.2-1, 8.2-3, and 8.2-4 present TSS standards for each receiving water, and Attachment D identifies more detailed TSS data on an annual and quarterly basis for MPCA assessed waters.

Figure 6.0-1 River Nutrient Regions Crossed by the Project



7.0 ALTERNATIVES TO AVOID AND MINIMIZE LOADING (BMPs)

Alternatives to avoid and minimize loading can be grouped into three categories:

- Project alternatives – MPUC Certificate of Need and Route Permit Proceeding;
- Choice of crossing method; and
- BMPs and contingency planning.

An assessment of alternatives in each of these categories is described below.

7.1 PROJECT ALTERNATIVES – MINNESOTA PUBLIC UTILITIES COMMISSION CERTIFICATE OF NEED AND ROUTE PERMIT PROCEEDINGS

Attachment E describes the MPUC Certificate of Need and Route Permit Proceedings, EIS and Findings and Conclusions from September 5, 2018 MPUC Order Granting a Certificate of Need for the Project. In granting the Certificate of Need for the Project, the MPUC considered the no action alternative (denial of the certificate), which would result in continued use of the existing Line 3; System Alternative SA-04; and various rail and truck alternatives.

On June 28, 2018 the MPUC granted a Certificate of Need for the Project subject to Certificate of Need modifications. On September 5, 2018, the MPUC issued a written Order granting the Certificate of Need as modified and requiring filings. On June 28, 2018, the MPUC also granted a Route Permit for Enbridge's Preferred Project Route, including Route Segment Alternative ("RSA")-05; RSA-22 with permission of the FdL or RSA-21 in the event FdL does not grant permission for RSA-22. On August 31, 2018, Enbridge and FdL came to an agreement to proceed with the RSA-22 route. The MPUC issued a written Order on October 26, 2018 for Enbridge's Route Permit identifying the Preferred Project Route inclusive of RSA-05 and RSA-22 as the MPUC Designated Route (hereafter referred to as the "Designated Route"). The Designated Route approved by the MPUC is a 750-foot-wide corridor, which allows for minor adjustments to the pipeline alignment and permanent right-of-way within the Designated Route.

In granting the Route Permit for the Designated Route the MPUC relied in part on the EIS to comparatively evaluate impacts of Enbridge's Preferred Project Route, four (4) route alternatives and twenty-four (24) RSAs, all of which would require discharges to surface waters for hydrostatic testing. This action represents a finding that the Designated Route is the least environmentally damaging, feasible and prudent (see Minnesota Statute §116 D.04, subd. 6).

7.2 SELECTION OF CROSSING METHOD

During Project design, Enbridge evaluated crossing methods for each waterbody feature based on the following: topography; waterbody characteristics such as bank height and width, flow rate and depth; adjacent riparian features; and geotechnical results (at potential HDD locations). As part of its review of the Section 404 Project Application, USACE must determine that the proposed Project is the least environmentally damaging practicable alternative under EPA's Section 404 (b)(1) guidelines ("404 (b)(1) Guidelines") (40 CFR Part 230). This will include review of the waterbody and wetland crossing methods and procedures. Enbridge has provided preliminary information to USACE to assist the agency in its 404 (b)(1) Guidelines review and plans to provide

additional information to the agency in response to comments. Enbridge will provide these additional materials to MPCA when they are submitted to the USACE.

7.3 HDD CONTINGENCY PLANNING

For all waterbodies proposed to be crossed using the HDD method, Enbridge will prepare site-specific contingency plans detailing specific actions and pre-positioned resources to avoid and mitigate any potential effects from unanticipated releases of drilling mud. These plans are forthcoming and will be submitted as supplemental information to Section 401 WQC process.

8.0 COMPARISON OF EXISTING WATER QUALITY AND ANTICIPATED WATER QUALITY

8.1 EXISTING WATER QUALITY

Existing water quality was determined using MPCA-approved monitoring data in accordance with Minnesota Rules part 7050.0260, subpart 1A. Existing water quality data is provided in Tables 8.2-1, 8.2-3, and 8.2-4 (also refer to Attachment D).

Enbridge characterized existing water quality using the central tendency, more specifically the 95% upper confidence limit ("UCL") of that central tendency⁶. Enbridge used this approach because the 95% UCL is a method previously used by the MPCA to characterize high quality waters, but also recognizes that alternate approaches could be used, in order to take into account the variability of flow rates and seasonal variability factors.

TSS data provided by the MPCA show that waterbodies exhibit considerable variability in TSS concentrations. The MPCA-approved monitoring data is not available for 161 of the waterbody crossings. For these waters, Enbridge has assumed that if the waterbody is not listed as impaired for turbidity/TSS, then it is, on average, currently achieving the applicable TSS standard.

8.2 ANTICIPATED WATER QUALITY

Anticipated water quality effects are a function of the type of crossing (i.e., wet, dry, or HDD).

8.2.1 Wet Crossings: Anticipated Temporary Water Quality Effects

Enbridge anticipates that TSS concentrations will temporarily increase downstream of wet open cut crossings. The magnitude of temporary TSS loading depends on waterbody size, flow level, the specific instream activity (i.e., trenching vs. pipe laying), and the particle size distribution of the disturbed bed material. In general, the increase in TSS loading will be temporary and limited to the duration of instream construction. After completion of in stream work, restoration, and recruitment from aquatic biota from upstream sources, these resources would return to

⁶ Confidence limits are indicative of the accuracy of the mean. In statistics, a confidence interval is a type of interval estimate, computed from the statistics of the observed data, that might contain the true value of an unknown population parameter. If repeated samples were taken and the 95% confidence interval was computed for each sample, 95% of the intervals would contain the population mean. A 95% confidence interval has a 0.95 probability of containing the population mean. 95% of the population distribution is contained in the confidence interval.

preconstruction conditions within a few years and Enbridge anticipates there would be no long-term effects on streambed composition or fishery resources.

The FEIS prepared for the L3R Project (refer to Section 2.0) states that “impacts on surface water quality due to increases in TSS concentrations and increased sedimentation in surface waters crossed using the wet open-cut crossing method would be temporary to short term and minor” (DOC-EERA, 2018).

This is further supported by a study completed by Reid and Anderson (1999) where 27 open cut pipeline crossing monitoring studies were conducted in the U.S. and Canada. The results of these data show maximum TSS levels during construction vary and are dependent on the size, flow, and sediment characteristics of the waterbody, and the effects of open cut crossings on streambed composition, benthic invertebrates and fish communities are temporary and full recovery of streambed conditions was reported to occur between 6 weeks and 2 years after construction. Benthic invertebrate and fish communities were reported to recover to pre-construction conditions within a year.

Existing and anticipated water quality information for receiving waters that will be crossed using the wet open cut technique is summarized in Table 8.2-1.

TABLE 8.2-1

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Wet Open Cut Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
South	65	Black River	w-154n44w20-ab	855.0	221.6	See Section 8.2.1	No
North	15	Walker Brook (09020305-509)	CLC5048aWB	924.2	Assume 15	See Section 8.2.1	Assume Yes
North	15	Walker Brook	s-146n36w8-a	928.5	Assume 15	See Section 8.2.1	Assume Yes
Central	30	Unnamed Stream	WA017aWB	996.5	Assume 30	See Section 8.2.1	Assume Yes
Central	30	Unnamed Ditch	CAC5001_540bWB	999.1	Assume 30	See Section 8.2.1	Assume Yes
Central	30	Unnamed Ditch	CAC5001_540aWB	999.2	Assume 30	See Section 8.2.1	Assume Yes
Central	30	Unnamed Ditch	CAC5006aWB	999.6	Assume 30	See Section 8.2.1	Assume Yes
Central	30	Big Swamp Creek (07010106-531)	CAC5007aWB	1000.5	20.5	See Section 8.2.1	Yes
Central	30	Unnamed Stream	CAC5010aWB	1001.2	Assume 30	See Section 8.2.1	Assume Yes
North	15	Unnamed Stream	CA096aWB	1029.1	Assume 15	See Section 8.2.1	Assume Yes
North	15	Unnamed Stream	CA118_200aWB	1033.9	Assume 15	See Section 8.2.1	Assume Yes
North	15	Dagget Brook	CA133aWB	1037.4	Assume 15	See Section 8.2.1	Assume Yes
North	15	Unnamed Stream	CAC5161aWB	1046.5	Assume 15	See Section 8.2.1	Assume Yes
North	15	Tributary to Moose River	CA163cWB	1047.9	Assume 15	See Section 8.2.1	Assume Yes
North	15	Moose River (07010103-749)	CA163aWB	1048.0	12.2	See Section 8.2.1	Yes

TABLE 8.2-1

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Wet Open Cut Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
North	15	Unnamed Stream	AI020aWB	1053.4	Assume 15	See Section 8.2.1	Assume Yes
North	15	Unnamed Stream	AI027aWB	1054.6	Assume 15	See Section 8.2.1	Assume Yes
North	15	Unnamed Stream	s-51n26w33-b	1056.5	Assume 15	See Section 8.2.1	Assume Yes
North	10	Unnamed Stream	s-51n24w26-a	1070.8	Assume 10	See Section 8.2.1	Assume Yes
North	15	Unnamed Stream	s-51n23w27-a	1075.4	Assume 15	See Section 8.2.1	Assume Yes
North	15	Unnamed Stream	s-51n22w22-a	1081.4	Assume 15	See Section 8.2.1	Assume Yes
North	15	Unnamed Stream	s-51n22w24-a	1084.3	Assume 15	See Section 8.2.1	Assume Yes
North	15	Ahmik River (04010201-945)	s-50n20w2-a	1096.7	2.9	See Section 8.2.1	Yes
North	15	Unnamed Stream	s-48n17w8-a	1117.0	Assume 15	See Section 8.2.1	Assume Yes
North	10	Little Otter Creek (04010201-628)	s-48n17w16-f	1118.4	16.6	See Section 8.2.1	No

^a Data presented is based on monitoring data received from MPCA on September 4 and 12, 2018.

^b For waterbodies where TSS data is not available (unassessed waters), Enbridge has assumed that if the waterbody is not listed as impaired for turbidity/TSS, then it is currently achieving the applicable TSS standard.

^c Evaluation is based on comparison with the 95% UCL. Evaluation may differ if an alternate method of assessing existing water quality is used.

8.2.2 Dry Crossings: Anticipated Temporary Water Quality Effects

Dry crossings typically result in lower TSS and associated turbidity impacts when compared to wet open cut crossings. Enbridge collected TSS data during dry crossings conducted in the summer of 2017 along the 13-mile segment of the Project in Wisconsin referred to as “Segment 18”. The TSS data was collected prior to the crossing, during the crossing activity, and after the crossing was completed at three locations. Temporary TSS increases of approximately 2 to 50 mg/L were recorded during the crossing activity as shown in Table 8.2-2. After the crossing was completed, upstream and downstream TSS levels showed only minor differences, supporting the conclusion that downstream TSS concentrations return to background levels within a matter of hours.

TABLE 8.2-2								
Line 3 Replacement Project TSS Concentrations Measured at Dry Crossings on Segment 18								
Waterbody	Flow Regime	OHWM Width (feet)	Date of Installation	Date of Post-Construction Sampling	Location	Pre-Construction TSS (mg/L)	Pipe Installation TSS (mg/L)	Post-Construction TSS (mg/L)
Unnamed Stream	P	6	7/27/17	8/1/17	Upstream	Not available	9.6	22.0
					Downstream	13.4	60.0	20.8
Pokegama River	P	30	8/8/17	8/15/17	Upstream	13.4	12.3	9.8
					Downstream	26.8	14.4	14.2
Little Pokegama River	P	10	9/11/17	9/19/17	Upstream	20.7	4.6	3.8
					Downstream	20.0	37.8	6.8
Note: Ordinary High-Water Mark (“OHWM”)								

The L3R state FEIS prepared for the Project (refer to Section 2.0) supports these conclusions and states that “impacts from increases in TSS concentrations and increased sedimentation in surface waters crossed using dry open-cut crossing methods would be temporary to short term and minor” (DOC-EERA, 2018).

Assessments of magnitude of increased sedimentation has also been completed. Reid et al. (2002) conducted a study on the effectiveness of two dry crossing methods (dam and pump and flume method) in limiting the amount of sediment released during instream pipeline construction and associated effects on downstream fish and fish habitat in six brook trout streams. This study included crossings of brook trout streams in Minnesota, Nova Scotia, and Ontario in the summers of 1998 and 1999, and indicated that compared to wet crossings of similar-sized watercourses, increases in temporary mean downstream TSS loading during dry crossing construction is at least seven times lower. Further, the study indicated that dry crossings can be very effective at: (1) minimizing increases to downstream suspended sediment concentrations during instream construction; and, (2) preventing sediment-induced effects on habitat and fish abundance downstream of pipeline water crossings.

This study showed that once the instream activity associated with the dry crossing was complete, downstream TSS concentrations returned to background levels with one to ten hours (Reid et al., 2002).

Existing and anticipated water quality information for receiving waters that will be crossed using a dry crossing technique (flume or dam and pump) is summarized in Table 8.2-3.

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TABLE 8.2-3

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Dry Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
South	65	Unnamed Ditch	s-160n50w10-a	802.9	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-160n50w15-a	803.6	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-160n50w15-b	803.9	Assume 65	See Section 8.2.2	Assume Yes
South	65	County Ditch 27 (09020311-509)	s-160n50w23-a	805.4	202.7	See Section 8.2.2	No
South	65	Unnamed Ditch	s-160n50w25-a	805.8	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-160n49w32-a	808.4	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-160n49w32-b	808.6	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-159n49w4-a	809.8	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-159n49w9-b	811.3	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-159n49w15-a	811.5	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-159n49w15-b	812.7	Assume 65	See Section 8.2.2	Assume Yes
South	65	County Ditch No. 7	s-159n49w23-b	812.8	Assume 65	See Section 8.2.2	Assume Yes
South	65	Judicial Ditch 10 (09020311-521)	s-159n49w36-a	815.6	10.3	See Section 8.2.2	Yes
South	65	Unnamed Ditch	s-158n48w22-a	821.0	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-158n48w22-b	821.1	Assume 65	See Section 8.2.2	Assume Yes

TABLE 8.2-3

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Dry Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
South	65	Unnamed Ditch	s-157n47w6-a	825.4	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-157n47w6-b	825.7	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-157n47w26-c	831.0	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-157n47w26-d	831.2	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-157n47w26-d	831.4	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-157n47w26-b	831.7	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-157n47w36-b	832.8	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-157n47w36-a	833.1	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-156n47w1-a	833.6	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-156n47w1-b	834.1	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-156n46w7-b	835.2	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-156n46w17-a	837.2	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-156n46w21-a	838.0	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-156n46w21-b	838.1	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-156n46w28-a	839.1	Assume 65	See Section 8.2.2	Assume Yes

TABLE 8.2-3

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Dry Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
South	65	Unnamed Ditch	s-155n46w1-a	842.6	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-155n45w21-b	846.9	Assume 65	See Section 8.2.2	Assume Yes
South	65	South Branch Snake River (09020309-546)	s-155n45w28-a	847.2	2.9	See Section 8.2.2	Yes
South	65	Unnamed Stream	s-155n45w34-b	848.9	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-155n45w34-c	849.1	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-155n45w34-d	849.4	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-154n45w11-a	851.4	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-154n44w18-a	852.9	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-153n44w11-a	860.1	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-153n44w13-a	861.7	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-153n43w18-a	862.1	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-153n43w19-a	862.1	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-153n43w19-b	863.3	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-153n43w20-a	863.3	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-153n43w20-a	863.4	Assume 65	See Section 8.2.2	Assume Yes

TABLE 8.2-3

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Dry Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
South	65	Unnamed Ditch	s-153n43w33-a	865.1	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n43w4-a	867.4	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n43w14-a	869.5	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n43w14-b	869.7	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n43w14-c	869.7	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-152n43w23-a	870.4	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n43w24-b	871.3	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n43w24-c	871.3	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n42w30-a	872.0	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n42w30-b	872.4	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n42w31-a	873.3	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n42w32-b	873.8	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-152n42w32-a	873.9	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-151n41w28-c	882.4	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-151n41w28-b	882.8	Assume 65	See Section 8.2.2	Assume Yes

TABLE 8.2-3

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Dry Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
South	65	Unnamed Ditch	s-151n41w28-a	882.8	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-151n41w33-b	882.8	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-151n41w33-a	883.5	Assume 65	See Section 8.2.2	Assume Yes
South	65	Lost River (09020305-646)	s-150n41w1-b	885.8	19.2	See Section 8.2.2	Yes
South	65	Unnamed Ditch	s-150n41w1-c	886.7	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n40w7-a	888.0	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n40w8-a	888.0	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n40w9-a	889.6	Assume 65	See Section 8.2.2	Assume Yes
South	65	State Ditch No. 61 (09020305-590)	s-150n40w16-a	889.7	18.6	See Section 8.2.2	Yes
South	65	Unnamed Ditch	s-150n40w15-a	890.2	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n40w15-b	890.8	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n40w15-c	890.8	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n40w14-a	891.3	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n39w19-a	893.3	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n39w19-c	893.7	Assume 65	See Section 8.2.2	Assume Yes

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TABLE 8.2-3

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Dry Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
South	65	Unnamed Ditch	s-150n39w19-d	894.0	Assume 65	See Section 8.2.2	Assume Yes
South	65	County Ditch No. 89	s-150n39w30-a	894.3	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n39w29-a	894.8	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n39w29-b	894.9	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-150n39w29-c	894.9	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-149n38w7-c	901.1	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-149n38w8-a	902.0	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-149n38w8-b	902.0	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Ditch	s-149n38w8-c	902.1	Assume 65	See Section 8.2.2	Assume Yes
South	65	Unnamed Stream	s-149n38w16-a	902.9	Assume 65	See Section 8.2.2	Assume Yes
South	65	Lost River (09020305-512)	s-149n38w15-a	904.0	87.6	See Section 8.2.2	No
Central	30	Silver Creek (09020305-527)	CL018bWB	907.1	34.0	See Section 8.2.2	No
Central	30	Silver Creek (09020305-527)	CL019bWB	907.4	34.0	See Section 8.2.2	No
Central	30	Silver Creek (09020305-527)	s-149n37w30-a	907.7	34.0	See Section 8.2.2	No
Central	30	Unnamed Stream (09020305-572)	CL022_200aWB	909.2	Assume 30	See Section 8.2.2	Assume Yes

TABLE 8.2-3

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Dry Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
Central	30	Unnamed Stream (09020305-572)	CL022_200aWB	909.8	Assume 30	See Section 8.2.2	Assume Yes
Central	30	Unnamed Stream	s-149n37w32-b	910.9	Assume 30	See Section 8.2.2	Assume Yes
Central	30	Unnamed Stream (09020305-572)	CLC5020_300aWB	911.5	Assume 30	See Section 8.2.2	Assume Yes
Central	30	Unnamed Stream	s-148n37w20-a	915.3	Assume 30	See Section 8.2.2	Assume Yes
Central	30	Unnamed Stream	CLC5018aWB	917.1	Assume 30	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CLC5051aWB	925.4	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-146n36w8-c	928.4	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-146n36w15-b	931.6	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream (07010101-738)	s-146n36w15-a	931.7	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream (07010101-738)	s-146n36w23-b	932.6	Assume 15	See Section 8.2.2	Assume Yes
North	15	Bear Creek (07010101-631)	CLC5095aWB	940.1	20.9	See Section 8.2.2	No
North	10	La Salle Creek	HUC5002aWB	946.0	Assume 10	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	HUC5070aWB	961.4	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	HUC5074aWB	962.2	Assume 15	See Section 8.2.2	Assume Yes
Central	30	Shell River (07010106-537)	HUC5130aWB	976.6	9.7	See Section 8.2.2	Yes

TABLE 8.2-3

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Dry Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
Central	30	Shell River (07010106-537)	HUC5162aWB	981.4	9.7	See Section 8.2.2	Yes
North	15	Pine River (07010105-669)	CA063aWB	1017.3	13.6	See Section 8.2.2	Yes
North	15	Unnamed Stream	CW014aWB	1021.4	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CW021aWB	1022.5	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CW027aWB	1023.6	Assume 15	See Section 8.2.2	Assume Yes
North	15	Ada Brook / Blind Lake Creek	CA085aWB	1026.4	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CA104aWB	1030.4	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CA116aWB	1033.2	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CA120_200AWB	1034.3	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CA127aWB	1036.0	Assume 15	See Section 8.2.2	Assume Yes
North	10	Spring Brook	CA147_525a1WB	1041.2	Assume 10	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CAC5160aWB	1046.0	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CA162aWB	1047.3	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	AI001aWB	1049.9	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-51n26w33-a	1056.3	Assume 15	See Section 8.2.2	Assume Yes

TABLE 8.2-3

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Dry Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
North	15	Unnamed Stream	s-51n24w31-a	1066.9	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-51n24w29-a	1067.1	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-51n24w28-a	1068.5	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-51n23w29-b	1073.7	Assume 15	See Section 8.2.2	Assume Yes
North	15	West Savanna River (07010103-514)	s-51n23w23-a	1076.9	6.9	See Section 8.2.2	Yes
North	15	Unnamed Stream	MN_NHD_24	1086.5	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-51n21w22-a	1087.5	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-51n21w24-a	1089.5	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-51n21w24-b	1089.8	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream (04010201-A07)	s-51n20w27-a	1094.0	20.9	See Section 8.2.2	No
North	15	Unnamed Stream	s-51n20w27-b	1094.3	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-51n20w27-c	1094.8	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-51n20w35-a	1095.9	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	s-51n20w35-b	1096.0	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CR144aWB	1126.2	Assume 15	See Section 8.2.2	Assume Yes

TABLE 8.2-3

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for Dry Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
North	15	Unnamed Stream	CR145bWB	1126.4	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CR145bWB	1126.4	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CR147aWB	1126.7	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream (04010201-A61)	CRR51010_640bWB	1127.6	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CR157_200a1WB	1128.1	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CR159_200aWB	1128.1	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CR159_200bWB	1128.2	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CR159_200cWB	1128.3	Assume 15	See Section 8.2.2	Assume Yes
North	15	Unnamed Stream	CR159bWB	1128.3	Assume 15	See Section 8.2.2	Assume Yes

^a Data presented is based on monitoring data received from MPCA on September 4 and 12, 2018.

^b For waterbodies where TSS data is not available (unassessed waters), Enbridge has assumed that if the waterbody is not listed as impaired for turbidity/TSS, then it is currently achieving the applicable TSS standard.

^c Evaluation is based on comparison with the 95% UCL. Evaluation may differ if an alternate method of assessing existing water quality is used.

8.2.3 HDD and Bore Crossings: No Anticipated Water Quality Effects

Because HDD and bore crossings involve no instream work, they are not anticipated to result in an increase in TSS loading. The potential for water quality effects due to unanticipated release of drilling mud will be avoided and minimized as follows:

- Enbridge performed geotechnical surveys to determine that all proposed HDD and bore crossing locations were suitable for these crossing methods.
- Mitigation measures for unplanned loading due to any unanticipated releases are described in Section 11.0 of the EPP (Attachment A).
- Site-specific HDD Contingency Plans will be prepared for each HDD crossing location and will include information such as the locations of spill containment resources pre-positioned at the crossing.

Existing and anticipated water quality information for waters that will be crossed by HDD and bore crossing techniques is summarized in Table 8.2-4.

TABLE 8.2-4							
Line 3 Replacement Project Existing and Anticipated TSS Concentrations for HDD/Bore Crossings by River Nutrient Region ^a							
River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
Red River	100	Red River of the North (09020311-560)	s-160n50w5-a	801.8	543.4	Same as Existing	No
South	65	Unnamed Ditch	s-160n50w25-b	807.0	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-159n49w4-b	810.0	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-159n49w9-a	810.0	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-159n49w23-a	814.0	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-159n49w26-a	814.0	Assume 65	Same as Existing	Assume Yes
South	65	Judicial Ditch 3	s-158n48w6-a	816.9	Assume 65	Same as Existing	Assume Yes
South	65	Tamarac River (09020311-503)	s-157n47w16-b	828.5	54.5	Same as Existing	Yes
South	65	Unnamed Ditch	s-156n47w12-a	835.0	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-156n46w7-a	835.0	Assume 65	Same as Existing	Assume Yes
South	65	Middle River (09020309-540)	s-156n46w7-c	835.9	212.7	Same as Existing	No
South	65	Snake River (09020309-543)	s-155n46w12-a	843.2	2.9	Same as Existing	Yes
South	65	Unnamed Ditch	s-155n45w28-c	848.2	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-155n45w33-a	848.2	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-154n45w2-a	851.1	Assume 65	Same as Existing	Assume Yes

TABLE 8.2-4							
Line 3 Replacement Project Existing and Anticipated TSS Concentrations for HDD/Bore Crossings by River Nutrient Region ^a							
River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
South	65	Unnamed Ditch	s-154n45w11-b	851.1	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-153n44w3-a	858.7	Assume 65	Same as Existing	Assume Yes
South	65	Red Lake River (09020303-513)	s-153n43w29-a	864.3	33.6	Same as Existing	Yes
South	65	County Ditch 21 (09020303-541)	s-153n43w32-a	864.7	23.7	Same as Existing	Yes
South	65	Clearwater River (09020305-648)	s-151n42w4-a	875.4	93.2	Same as Existing	No
South	65	Unnamed Ditch	s-151n41w35-a	884.7	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-150n41w1-a	885.7	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-150n40w23-a	892.4	Assume 65	Same as Existing	Assume Yes
South	65	Unnamed Ditch	s-149n38w9-a	902.7	Assume 65	Same as Existing	Assume Yes
Central	30	Unnamed Ditch	CL020aWB	908.4	Assume 30	Same as Existing	Assume Yes
North	15	Clearwater River (09020305-517)	CLC5037aWB	922.2	21.7	Same as Existing	No
North	15	Tributary of Clearwater River	CLC5038aWB	922.3	Assume 15	Same as Existing	Assume Yes
North	15	Mississippi River (07010101-753)	CLC5098aWB	941.0	21.7	Same as Existing	No
North	15	Hay Creek	HUC5081aWB	963.7	Assume 15	Same as Existing	Assume Yes
Central	10	Straight River (07010106-558)	HUC5122_200aWB	974.2	23.3	Same as Existing	No

TABLE 8.2-4

**Line 3 Replacement Project
Existing and Anticipated TSS Concentrations for HDD/Bore Crossings by River Nutrient Region ^a**

River Nutrient Region (RNR)	RNR TSS Standards (mg/L)	Receiving Water Name (WID)	Receiving Water Feature ID	MP	Existing TSS (mg/L) 95% UCL ^b	Anticipated TSS	Existing Use Attained (High-Quality for TSS) ^c
Central	30	Shell River (07010106-537)	HUC5175aWB	983.7	9.7	Same as Existing	Yes
Central	30	Oxbow Pond (Shell River) (07010106-537)	HUC5179_240aWB	985.3	9.7	Same as Existing	Yes
Central	30	Shell River (07010106-537)	WA002aWB	991.2	9.7	Same as Existing	Yes
Central	30	Crow Wing River (07010106-516)	WA006aWB	993.3	13.4	Same as Existing	Yes
North	15	Willow River (07010103-748)	s-51n24w31-b	1066.4	20.6	Same as Existing	No
North	15	Mississippi River (07010103-708)	s-51n24w27-a	1069.6	40.7	Same as Existing	No
North	15	East Savanna River (04010201-561)	s-51n21w20-a	1085.9	11.2	Same as Existing	Yes
^a Data presented is based on monitoring data received from MPCA on September 4 and 12, 2018. ^b For waterbodies where TSS data is not available (unassessed waters), Enbridge has assumed that if the waterbody is not listed as impaired for turbidity/TSS, then it is currently achieving the applicable TSS standard. ^c Evaluation is based on comparison with the 95% UCL. Evaluation may differ if an alternate method of assessing existing water quality is used.							

9.0 ANTIDEGRADATION ASSESSMENT SUMMARY

9.1 EXISTING USES WILL BE MAINTAINED AND PROTECTED

Minnesota Rules, part 7050.0255, subpart 15, defines “existing uses” as “those uses actually attained in the surface water on or after November 28, 1975.” EPA guidance clarifies that a use is “actually attained” when (a) the water quality necessary to support a particular use has been attained, and (b) the use has actually occurred in the waterbody.⁷ Existing uses identify uses that have actually occurred in or on the waterbody, regardless of whether they are designated, as well as the corresponding water quality that has allowed the uses to occur.

The parameter of concern, TSS, evaluated in this Section 401 WQC Assessment is associated with Class 2 uses, which are aquatic life and recreation. Receiving waters for waterbody crossings which currently attain the TSS standard associated with Class 2 uses are noted on Tables 8.2-1 and 8.2-3. As described in Section 8.2, the existing use will be maintained and protected at these waters because the increased loading of TSS will be temporary, limited to the duration of instream construction, and therefore are not anticipated to result in long-term effects to streambed composition or benthic invertebrate and fish communities.

9.2 COMPENSATORY MITIGATION FOR PHYSICAL ALTERATION OF WETLANDS

Minnesota’s antidegradation standard that is specifically applicable to compensatory mitigation, Minnesota Rules, part 7050.0265, subpart 3, states that “the commissioner shall allow compensatory mitigation as a means to preserve an existing use when there is a physical alteration to a surface water only when all of the ... conditions [listed in Minnesota Rules, part 7050.0265, subpart 3(A)] are met.” This section summarizes information about the Project’s expected performance relative to the specific conditions in the antidegradation standard for compensatory mitigation as a means of maintaining and protecting the existing uses of wetlands that will be physically altered by the Project.

The quantity and quality of wetlands that will be physically altered by the Project are detailed in Section 9.2 of the Section 404 Project Application. Enbridge will provide compensatory wetland mitigation for unavoidable Project permanent fill and for wetland type conversion of scrub-shrub and forested wetlands, as well as temporal loss, in accordance with Minnesota Rules, part 7050.0285, subpart 2, and as described in Section 10.0 of the Section 404 Project Application.

Enbridge will restore all affected wetlands to pre-construction conditions, which is considered in-place compensation, but not in-kind and not in-advance. In applying the in-kind and in-advance factors, Enbridge proposes to use the USACE’s baseline compensation ratios for impacts to emergent, forested, and scrub-shrub wetland types presented in Tables 10.0-1 and 10.0-2 of the Section 404 Project Application.

Enbridge has purchased mitigation credits from USACE-approved wetland mitigation banks to compensate for unavoidable wetland impacts in watersheds crossed by the Project.

⁷ See 80 Fed. Reg. 51019, 51027 (8-21-2015) (preamble to EPA’s final rule revising 40 CFR part 131).

To minimize indirect impacts such as fragmentation of forested and scrub-shrub to emergent wetlands, Enbridge has co-located with other Enbridge pipelines; third-party pipelines and utilities; and roads, railroads, or highways for approximately 91 percent of the route. Other construction-related indirect impacts on wetlands are generally addressed by implementing the BMPs described in Section 3.0 of Enbridge's EPP (Attachment A), and also the BMPs required to obtain covered under the NPDES/SDS general construction stormwater permit (MNR100001).

As described in Section 11.0 of the Section 404 Project Application, Enbridge proposes to conduct monitoring efforts during the growing season in years 1, 3, and 5 post-construction. Post-construction wetland monitoring will begin after restoration work is complete.

9.3 THE PROJECT WILL NOT PERMANENTLY PRECLUDE ATTAINMENT OF WATER QUALITY STANDARDS

Minnesota Rules, part 7050.0265, subpart 4, prohibits the MPCA commissioner from approving activities that would "permanently preclude attainment of water quality standards." All discharges associated with the Project are temporary and limited to the crossing location; therefore the Project, including the activities regulated by the Section 401 WQC will not permanently preclude attainment of water quality standards in the receiving and downstream waters.

9.4 THE PROJECT WILL MINIMIZE DEGRADATION OF HIGH QUALITY WATERS

Minnesota Rules, part 7050.0255, subpart 21 defines a waterbody as "high quality" if it "exceeds, on a parameter-by parameter basis, levels necessary to support the protection and propagation of aquatic life and recreation in and on the water." Of the 205 waters that will be crossed by the Project, 188 are known or assumed (due to lack of monitoring data) to be high quality for TSS.

The term "degradation" is defined as a "measurable change to existing water quality made or induced by human activity resulting in diminished chemical, physical, biological, or radiological qualities of surface water" (Minnesota Rules, part 7050.0255, subpart 11). In turn, "measurable change" is defined as "the practical ability to detect a variation in water quality, taking into account limitations in analytical technique and sampling variability" (Minnesota Rules, part 7050.0255, subpart 24). The Project is anticipated to result in temporary degradation of the high quality waters identified in Tables 8.2-1 and 8.2-3.

Antidegradation procedures require "an analysis of alternatives that avoid net increases in loading or other causes of degradation through prudent and feasible prevention, treatment, or loading offsets" (emphasis added). Minnesota Rules, part 7050.0280, subpart 2(A). When there are no prudent and feasible alternatives to avoid net increases in loading, an analysis of prudent and feasible alternatives to minimize degradation is required (Minnesota Rules, part 7050.0280 subpart (C)(1)), as well as identification of the least degrading prudent and feasible alternatives.

As described in Section 7.0, Enbridge has analyzed alternatives to avoid or minimize degradation of high quality waters. As a result of this process, Enbridge determined that although there are no prudent and feasible alternatives to completely avoid degradation of all high quality waters, there are prudent and feasible measures available to minimize degradation, including selection of crossing methods as further evaluated in Section 8.0, implementation of HDD contingency plans described in Section 7.3, BMPs designed to address the unanticipated release of drilling mud

described in Section 11.0 of the EPP (Attachment A), BMPs implemented during the crossing of waterbodies described in Section 2.0 of the EPP, in addition to the BMPs that Enbridge would implement in order to obtain coverage under the NPDES/SDS general construction stormwater permit (MNR100001). By implementing these prevention and treatment alternatives Enbridge will minimize degradation of high quality waters.

9.5 THE PROJECT WILL RESULT IN IMPORTANT SOCIAL AND ECONOMIC DEVELOPMENT

Attachment E provides an overview of the MPUC Certificate of Need and Route Permit proceedings, the EIS, and Findings and Conclusions from the September 5, 2018 MPUC Order Granting a Certificate of Need for the Project. This document highlights the findings and conclusions which describes the important economic or social changes resulting from the Project.

9.6 OUTSTANDING RESOURCE WATERS WILL BE PROTECTED

There are no prohibited ORVWs downstream of the Project.

The Project will use HDD methods to cross a reach (Swan River to Sandy River) of the Mississippi River which is a restricted ORVW. Minnesota Rules, part 7050.0265 subpart 6 state that discharge to a restricted ORVW must be controlled as necessary to preserve the existing water quality as necessary to maintain and protect the exceptional characteristics for which the restricted ORVW was designated. The SONAR accompanying the rule which designated this reach of the Mississippi River a restricted ORVW states that the river was so designated because it "...possesses outstanding and unique natural, scientific, historical recreational and cultural values..." (SONAR at 18). The SONAR also references the purpose and goals of the Wild and Scenic Rivers Act, which focuses on maintaining free-flowing conditions. However, the SONAR does not specify the water quality associated with the river's exceptional characteristics.

The reach of the Mississippi river that will be crossed using HDD techniques is listed as impaired for TSS, and MPCA monitoring data show the 95% UCL of TSS is approximately 40 mg/L. By using the HDD crossing method, for which no increase in TSS loading is anticipated, Enbridge will avoid TSS loading to the restricted ORVW. Further, Enbridge will develop an ORVW-specific HDD Contingency Plan for this crossing detailing specific actions and pre-positioned resources to avoid and mitigate any potential effects from an unanticipated release of drilling mud. These measures will protect the exceptional characteristics for which this reach of the Mississippi River was designated a restricted ORVW.

The Project will also cross the Gully 30 fen, which has been designated a restricted ORVW. The portion of L3R in Minnesota that crosses the Gully 30 fen (Fen ID No. 35382) requires MDNR approval of a Fen Management Plan ("FMP") under Minnesota Statutes, 103G.223. Enbridge prepared a FMP for the crossing of the Gully 30 calcareous fen, which has been submitted to MDNR for review and approval concurrent with this Section 401 Assessment. The crossing of Gully 30 fen is co-located with Enbridge's Light Sour and Alberta Clipper pipelines (Lines 65 and 67, respectively). The measures specified in the FMP for the crossing of the Gully 30 fen will protect the exceptional characteristics for which this calcareous fen was designated a restricted ORVW.

9.7 WATERS WILL BE PROTECTED FROM THERMAL DISCHARGES

Thermal discharges are regulated by Minnesota Rules, part 7050.0265, subpart 8, which states that “when there is potential for water quality impairment associated with thermal discharges, the commissioner’s allowance for existing water quality degradation shall be consistent with section 316 of the CWA”, which states that effluent temperature must be controlled to “assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made” (33 USC § 1326).

The Class 2B standard for temperature is 5°F above natural in streams and 3°F above natural lakes. The Class 2D standard for temperature is that it shall not deviate from the range of natural background temperatures such that there are significant adverse impacts. Dry crossing techniques may slightly warm or cool the water as it is diverted around the trench, however because the discharges are temporary and at a controlled rate they present no reasonable potential for water quality impairment associated with thermal discharge. Wet crossings are not expected to affect water temperature. Therefore, there will be no degradation of receiving waters due to temperature associated with waterbody crossings.

10.0 REFERENCES

- MN DOC-EERA. 2018. Final Revised Environmental Impact Statement. Line 3 Project. Docket Nos. PPL-15-137/CN-14-916.
- Reid, S.M. and P.G. Anderson. 1999. Effects of Sediment Released during Open-Cut Pipeline Water Crossings. Canadian Water Resources Journal, 24:3, 235-251. U.S. Department of the Interior: 10.4296/cwrj2403235. Available online at: <https://www.tandfonline.com/doi/pdf/10.4296/cwrj2403235>. Accessed August 2018.
- Reid, S.M., S. Stoklosar, S. Metikosh, and J. Evans. 2002. Effectiveness of Isolated Pipeline Crossing Techniques to Mitigate Sediment Impacts on Brook Trout Streams. Water Qual. Res. J. Canada, 2002. Volume 37, No. 2, 473-488.

Attachment A
Environmental Protection Plan



Environmental Protection Plan

Enbridge Energy, Limited Partnership • Line 3 Replacement Project

September 2018



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ACRONYMS AND ABBREVIATIONS

ATWS	additional temporary workspace
BMP	best management practices
CLL	Construction Line List
Contactora	construction Contractor
CRP	Conservation Reserve Program
DOT	Department of Transportation
ECD	erosion and sediment control device
EI	environmental inspector
Enbridge	Enbridge Energy, Limited Partnership
EPP	Environmental Protection Plan
HDD	horizontal directional drilling
NFPA	National Fire Protection Association
NRCS	Natural Resources Conservation Service
OHWL	ordinary high water level
OHWM	ordinary high water mark
PLS	Pure Live Seed
ROW	right-of-way
TWS	temporary workspace
UFC	Unified Facilities Criteria

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INTRODUCTION

This Environmental Protection Plan ("EPP") outlines construction-related environmental policies, procedures, and protection measures Enbridge Energy, Limited Partnership ("Enbridge") developed as a baseline for construction. This EPP was developed based on Enbridge's experience implementing Best Management Practices ("BMPs") during construction as well as the Federal Energy Regulatory Commission's Upland Erosion Control, Revegetation, and Maintenance Plan (May 2013 Version) and Wetland and Waterbody Construction and Mitigation Procedures (May 2013 Version). It is intended to meet or exceed federal, state, tribal, and local environmental protection and erosion control requirements, specifications and practices. The EPP is designed to address typical circumstances that may be encountered along the Project. Project-specific permit conditions and/or landowner agreements may supersede the general practices described in this document.

This document includes the following sections:

- Section 1.0 describes general mitigation measures, including soil erosion and sedimentation control procedures, to be implemented during upland construction and upland restoration;
- Section 2.0 describes stream and river construction, crossing, and restoration;
- Section 3.0 describes practices for wetland construction, crossings, and restoration;
- Section 4.0 describes highway, road, and rail crossings;
- Section 5.0 describes construction dewatering;
- Section 6.0 outlines water appropriation practices;
- Section 7.0 addresses revegetation measures;
- Section 8.0 addresses winter construction issues;
- Section 9.0 addresses waste management issues;
- Section 10.0 addresses construction equipment-related spill prevention, containment and controls; and
- Section 11.0 addresses containment, response, and notification procedures for inadvertent releases of drilling fluid.

Alternative construction procedures implemented in lieu of this EPP will provide an equal or greater level of protection to the environment, and will be approved in writing by Enbridge.

Unless otherwise specified, the construction Contractor ("Contractor") is responsible for implementing the requirements of this EPP.

Enbridge will provide appropriate construction oversight to confirm and document compliance with the measures of this EPP and requirements of applicable federal, state, tribal, and local permits. Enbridge's Environmental Inspectors ("EIs") will assist the Contractor in interpreting and implementing the requirements of the EPP, and verify compliance with these procedures for Enbridge. Enbridge will employ experienced EIs to manage unforeseen situations that are not directly addressed by project documents. Enbridge relies on the experience and judgment of the

EIs, through coordination and consultations with project management staff, to address unforeseen situations should they occur in the field. The EIs will be expected to use judgment in the field to interpret environmental conditions and requirements, but will not be authorized to make major modifications or changes without the prior written approval of Enbridge. The EI, in consultation with Enbridge Environment staff, will have the authority to stop activities and order corrective mitigation for actions that are not in compliance with the measures in this EPP, landowner agreements, or environmental permit requirements. The EI will maintain appropriate records to document compliance with these and other applicable environmental permit conditions.

Enbridge has also committed to applicable agencies to fund a comprehensive third-party monitoring program to be deployed during Project construction. Enbridge has constructed numerous projects with the oversight of third-party monitors and accepts the recommendation by state agencies regarding their use. Enbridge will work with the agencies to define the role and qualifications of proposed third-party monitors to ensure they are experienced in the type of construction they will be observing and knowledgeable regarding the resources that may be impacted.

1.0 GENERAL MITIGATION MEASURES

1.1 IDENTIFICATION OF AVOIDANCE AREAS

The EI will post signs for environmental features such as wetlands, waterbodies, drainages/drain tiles, buffer zones, rare plant or ecological community sites, invasive species and noxious weed locations, regulated wildlife habitat, cultural resources, and erosion-prone or steep slopes.

1.2 CONSTRUCTION LINE LIST AND PERMITS

Enbridge will provide the Contractor with a Construction Line List (“CLL”) that describes special requirements (e.g., timber salvage, topsoil segregation, restoration measures, fencing requirements) as agreed upon with landowners provided the special requirements conform to project permits. The Contractor will comply with these special requirements and/or permit conditions.

The CLL identifies requirements and comments provided by landowners; however, it is not a comprehensive list of construction requirements. The CLL will be considered in conjunction with other project documents and permits.

1.3 WET WEATHER SHUTDOWN

During construction, certain activities may be suspended in wet soil conditions, based on consideration of the following factors:

- extent of surface ponding;
- extent and depth of rutting and mixing of soil horizons;
- areal extent and location of potential rutting and compaction (i.e., can traffic be rerouted around wet area); and
- type of equipment and nature of the construction operations proposed for that day.

The Contractor will cease work in the applicable area until Enbridge determines that site conditions are such that work may continue. The EIs, in collaboration with Enbridge construction management, will ultimately decide if wet weather shutdown is necessary in a given location.

1.4 RIGHT-OF-WAY ACCESS

Access to the right-of-way (“ROW”) will be from public roadways and Enbridge-approved private access roads only. Existing roads are generally in a condition that can accommodate construction traffic without modification or improvement. Some roads will require improvements such as widening and/or grading and the placement of timber mats or gravel.

Enbridge is responsible for posting signs or other methods to identify approved access roads in the field and to ensure that access is confined to only the approved roads. Vehicle tracking of soil from the construction site will be minimized by installation and implementation of BMPs such as stone pads, timber mats, reducing equipment/vehicle access to the construction ROW

where practicable (off-ROW parking), or equivalent. Installation of stone or timber mat access pads will be in accordance with applicable permits and state/federal specifications. If such BMPs are not adequately preventing sediment from being tracked onto public roads, street sweeping, or other equivalent means of collecting sediment, will be used. If soil is tracked onto a roadway, the contractor will remove accumulated material from the road and return it to the construction ROW within an upland area as soon as possible, but in no circumstances more than 24 hours after discovery. In addition, soil on roadways cannot be broomed, washed, and/or graded into the road ditch or onto the shoulder.

After construction, Enbridge will return improved roads to their pre-construction condition unless the landowner or land-managing agency requests that the improvements be left in place. Enbridge will maintain permanent access roads to aboveground facilities (e.g. pump stations, mainline valves) throughout project operation.

1.5 RIGHT-OF-WAY REQUIREMENTS

All construction equipment and vehicles will be confined to the approved construction ROW and additional temporary workspace ("ATWS"). Prior to commencement of clearing operations, the outer limits of the construction ROW and ATWS areas will be marked with distinctive stakes and flagging by Enbridge. Construction activities are restricted to the approved designated areas.

The construction ROW (i.e., construction workspace) for the Project will vary and may include a portion of Enbridge's existing corridor, new permanent corridor, permitted temporary workspace ("TWS"), and site-specific extra workspaces as defined below and shown in Figures 1 through 3. The construction ROW width will be reduced in selected locations (e.g., wetlands, waterbodies, and forested shelterbelts), in accordance with applicable permit conditions, as indicated on the Project construction alignment sheets and in the field by the use of staking.

(a) ROW (Permanent)

Enbridge's existing permanent ROW varies in width. Additional footage may be added, depending on the location of the new pipeline(s) in relation to the existing pipelines. The permanent ROW is maintained to facilitate access and aerial inspection of the pipeline system.

(b) TWS

In addition to the ROW/permanent corridor, construction will require TWS. The TWS will be located adjacent to and contiguous with the proposed ROW/permanent corridor and will be identified on the construction alignment sheets and by distinctive staking of construction limits prior to clearing.

(c) ATWS

Site-specific ATWS locations, (construction work areas beyond the permanent corridor and TWS previously described), will be required at select locations such as steep slopes, road, waterbody, railroad, some wetland crossings, and where it is necessary to cross under the existing pipelines or foreign utilities. ATWS will typically be located in uplands adjacent to the construction ROW and set at least 50-feet back from sensitive resource boundaries where site-specific field conditions allow. However, to complete

work safely, Enbridge may need to locate ATWS within a wetland or within the 50-foot setback from a wetland or waterbody based on site-specific conditions. ATWS adjacent to waterbodies and/or wetlands is addressed further in Sections 2.0 and 3.0, respectively.

1.6 CONTROLLING SPREAD OF UNDESIRABLE SPECIES

It is Enbridge's intent to minimize the potential introduction and/or spread of undesirable species (i.e., invasive species, noxious weeds, or crop diseases) along the construction ROW due to pipeline construction activities. However, it is not practicable for Enbridge to eradicate undesirable species that are adjacent to the construction ROW. Enbridge will minimize the potential for the establishment of undesirable species by minimizing the time duration between final grading and permanent seeding.

In consultation with the applicable agencies, Enbridge will identify plant species that are considered noxious weeds and/or invasive plants that may occur within the counties being crossed by the pipeline corridor (refer to Appendix A).

1.6.1 Prevention and Control Measures

To prevent the introduction of identified noxious weeds and invasive species into the Project areas from other construction sites, construction equipment and mats will be cleaned prior to arriving on site. This cleaning consists of removing visible dirt from the equipment and mats and blowing loose material from equipment using compressed air. Equipment designated for use within waterbodies will be washed and dried prior to use. Purge and clean all pumps before proceeding from one location to the next if designated noxious weeds or invasive plants or infested waters (e.g. zebra mussels, Eurasian milfoil) are known to be present in the area. Known locations of noxious or invasive plant infestations and infested waters will be identified in the appropriate permits. If the EI identifies aquatic invasive species in an area not previously identified as an infested water, the EI will contact the Minnesota Department of Natural Resources. The Contractor(s) will keep logs documenting the cleaning history of each piece of equipment and make the logs available to the EI upon request. Contractors may use the equipment cleaning log provided in Appendix B or an equivalent form approved by Enbridge. Equipment found to be in non-compliance with the cleaning requirement will not be allowed on the Project sites until it has been adequately cleaned.

Prior to clearing and grading of the construction ROW and pending landowner permission, major infestation areas identified during surveys or by Enbridge's EIs may be treated with the herbicides. All proposed herbicides will be reviewed and approved by Enbridge's Environment Department through consultation with Minnesota Department of Agriculture and U.S. Environmental Protection Agency and as recommended through consultation with local authorities prior to use. Selective foliage or basal application will be used when practicable. Alternatively, full construction ROW topsoil segregation may be implemented for weed control to allow equipment to work through the area after topsoil has been stripped, as long as equipment stays on the subsoil (clearing, grading, and restoration equipment will still be cleaned). The Contractor(s) will obtain necessary permits and/or certifications for the use of the applicable herbicides, is responsible to limit off-ROW overspray, and will comply with state laws regarding the use of those herbicides. Contractor(s) will keep proper documentation of the locations where the herbicides have been used and provide such documentation to Enbridge within 3 days of

completing the work. Weed control spraying will be restricted near certified organic farms and prohibited on certified organic farms.

Treatment of known infestation areas will be completed in accordance with applicable chemical contact times (as specified by the manufacturer) in advance of clearing and grading within the construction ROW. Treatment may be restricted in areas that are not readily accessible, such as areas where access is limited by topography or other site conditions such as saturated/inundated soils. In the event that an area is determined to be inaccessible, the EI will be notified and a site-specific alternative treatment method will be developed.

If additional noxious weed infestations are identified subsequent to herbicide applications, mechanical means (scrape down/blow down) may be used to remove weeds from tracked equipment and mats prior to leaving the infested area. High pressure water wash stations may be established in select areas if the above measures do not adequately remove soil and vegetation debris from construction equipment. Enbridge will determine where this practice will be implemented. The Contractor(s) will keep logs documenting the cleaning history of each piece of equipment and make the logs available to the EI or other Enbridge Representative upon request. Any equipment found to be in noncompliance with the cleaning requirement will be removed from the Project sites until it has been adequately cleaned.

To prevent the spread of noxious weeds and invasive species during construction, mulch used on the Project will be composed of weed-free material. Certified weed-free mulch may also be required at site-specific locations. The Contractor(s) will be responsible for identifying and acquiring sources of weed-free and certified weed-free mulch. Sources will be approved by Enbridge prior to purchase. As discussed further in Section 1.8.3, tree stumps outside the ditch line will be ground below normal ground surface or completely removed and hauled off to an approved disposal facility. Stumps within the ditch line will be completely removed, ground, and/or hauled off to an approved disposal facility. Enbridge will consult with the appropriate agency to determine the appropriate treatment for felled infested and diseased trees.

In the case that a healthy oak tree adjacent to the construction ROW is damaged or wounded during construction activities in counties where the oak wilt fungus is present, Enbridge will treat the cut surface with water-based paint, a pruning/wound sealer, or shellac to prevent further spread of the disease. Treated trees will be inspected by the EI.

1.6.2 Pesticide Use and Application

Enbridge does not typically authorize use of pesticides on the construction or permanent ROW or at Enbridge facilities. However, should pesticide use be required to control the spread of undesirable pests and/or at the request of an agency, Enbridge will only utilize those pesticides and methods of application approved by the Minnesota Department of Agriculture, Minnesota Department of Natural Resources, and the U.S. Environmental Protection Agency in the state of Minnesota. Selective foliage or basal application will be used when practicable. All pesticides will be applied in a safe and cautious manner so as not to damage adjacent properties including crops, orchards, tree farms, apiaries, or gardens. Enbridge will contact the landowner or designee to obtain approval for the use of pesticide at least 14 days prior to any application on their property. The landowner may request that there be no application of pesticides on any part of the site within the landowner's property. Enbridge will provide notice of pesticide application to affected landowners and known beekeepers operating apiaries within three miles of the site at least 14 days prior to such application.

1.7 POTHOLING/HYDROVAC SLURRY

Hydrovac excavation is used to positively identify pipelines and other buried utilities. The Contractor will construct an unlined but bermed containment area or identify comparable containment (e.g., open top tank) to hold the hydrovac slurry in an Enbridge and landowner-approved upland area within the construction workspace or dispose of the material off-site at a licensed disposal facility. Once the slurry is drained and dry, it may be incorporated with the subsoil in an Enbridge and landowner-approved upland area within the construction workspace. Discharging hydrovac slurry on to topsoil is not permitted as the material will degrade the quality of the topsoil and potentially affect revegetation.

1.8 UPLAND CLEARING

The initial stage of construction involves the clearing of brush, trees, and tall herbaceous vegetation from the ROW. Clearing may be accomplished with chain saws, mowers, and hydraulic tree-cutting equipment.

1.8.1 Disposal of Non-Merchantable Timber

Unless otherwise directed by Enbridge, non-merchantable timber and slash will be disposed of by mowing, chipping, grinding, and/or hauling off site to an approved disposal facility or used in stabilizing erodible slopes or construction entrances. In non-agricultural, non-wetland areas, chips, mulch, or mechanically cut woody debris may be uniformly broadcast across the ROW where the material would ultimately be incorporated into the topsoil layer during grading activities, with landowner approval (coordinated through Enbridge ROW agents). Burning of non-merchantable wood may be allowed only where the Contractor has acquired all applicable permits and approvals (e.g. agency, tribal, and landowner) and in accordance with all tribal, state, and local regulations. The Contractor will provide Enbridge with copies of these permits and/or approvals prior to initiating burning.

1.8.2 Disposal of Merchantable Timber

All merchantable timber will be managed in accordance with Enbridge contract specifications.

1.8.3 Upland Grading and Stump Removal

To facilitate proper cleanup and restoration in upland areas, tree stumps outside the ditch line will be ground below normal ground surface or completely removed and hauled off to an approved disposal facility. Stumps in the ditch line will be completely removed, ground, and/or hauled off to an approved disposal facility.

1.9 TEMPORARY EROSION AND SEDIMENT CONTROLS

Temporary erosion and sediment control devices ("ECDs") include, but are not limited to, slope breakers, sediment barriers (silt fence, straw bales, bio-logs, etc.), stormwater diversions, trench breakers, mulch, and revegetation subsequent to seeding of exposed soils (refer to Figures 4 through 11). The Contractor will maintain erosion and sediment control structures as required in the Project construction documents and as required by all applicable permits. Non-functional erosion and sediment controls will be repaired, replaced, or supplemented with functional materials within 24 hours after discovery, or as otherwise specified in project permits. ECDs will

be installed after initial clearing but before grading activities and will be replaced by permanent erosion controls as restoration is completed.

Temporary ECDs will be installed after clearing and prior to grubbing and grading activities at the base of sloped approaches to streams, wetlands, and roads. Temporary ECDs will also be installed at the edge of the construction ROW as needed, and/or in other areas determined by the EI to slow water leaving the site and prevent siltation of waterbodies and wetlands down slope or outside of the construction ROW (e.g., swales and side slopes). Temporary ECDs will be placed across the entire construction ROW at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from tile line inlets, drainage ways, wetlands, and/or waterbodies until the area is revegetated and there is no potential scouring or sediment transport to surface waters. Adequate room will be available between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition.

If silt fence is used, when the depth of sediment reaches about one-third of the height, the sediment will be removed. Non-functional ECDs will be repaired, replaced, or supplemented with functional structures within 24 hours after discovery, or as otherwise specified in project permits.

Temporary ECDs installed across the travel lane may be removed during active daytime construction; however, ECDs will be properly reinstalled after equipment passage, or activities in the area are completed for the day. These ECDs will also be repaired and/or replaced prior to inclement weather when forecasted.

1.9.1 Temporary Stabilization

Installation of temporary seeding, mulch (straw or hydromulch), and erosion control mats may be required by Enbridge in certain locations (including topsoil piles) if there are construction delays within a spread of at least 14 days. The Contractor may be required by Enbridge to install temporary stabilization materials sooner based on site conditions, or as required in project permits.

1.9.2 Erosion Control Blanket

The appropriate class of erosion control blanket will be installed in accordance with manufacture recommendations and/or state Department of Transportation ("DOT") specifications on slopes greater than 5 percent that would be exposed over the winter and drain to surface waters (refer to Figures 8 and 9). The Contractor will attempt to install erosion control blankets on the exposed slopes prior to snowfall; however, construction progress and/or seasonal weather variations may prevent installation prior to the first snowfall. Installation of erosion control blankets and additional BMPs, as applicable based on site conditions, is required after the first snowfall to protect slopes prior to spring melt and runoff. Erosion control blankets will be installed running parallel (up and down) with the direction of the slope (not perpendicular).

1.9.3 Mulch

Mulch (weed-free straw, wood fiber hydromulch, or a functional equivalent) will be applied to disturbed areas (except for actively cultivated land and wetlands) if requested by the landowner or land managing agency, if specified by the applicable permits or licenses, or as required by Enbridge. Mulch will specifically be required on:

- slopes greater than 5 percent; and
- dry, sandy areas that can blow or wash away (field decision).

Mulch will be free of noxious weeds as listed in applicable state laws. Certified weed-free mulch may also be required at site-specific locations. The Contractor will be responsible for identifying and acquiring sources of weed-free and certified weed-free mulch. Sources will be approved by Enbridge prior to purchase.

Mulch will be applied at a rate of 2 tons per acre to cover at least 75 percent of the ground surface unless otherwise stipulated by permit conditions. Mulch will be uniformly distributed by a mechanical mulch blower, or by hand in areas not accessible to the mulch blower. Mulch will be anchored/crimped using a mulch-anchoring tool or disc set in the straight position to minimize loss by wind and water, as site conditions allow. In areas not accessible to a mulch-anchoring tool or too steep for safe operation, the mulch may be anchored by liquid tackifiers, with advance written approval from Enbridge. The manufacturer's recommended method and rate of application will be followed.

Hydro-mulch and liquid tackifier can be used in place of straw or weed-free hay mulch with prior approval from Enbridge. All hydromulch and liquid tackifier products used will be on the applicable state DOT product list. Application rates will be at the manufacturer's recommended rate, equal to or greater than 2 tons per acre of straw mulch.

1.9.4 Cat Tracking

Cat tracking, also known as horizontal slope grading, may be implemented based on site conditions (sandy or silt soils) to reduce erosion potential. Cat tracking is achieved by driving a bulldozer vertically up and down the slope which results in the tracks being oriented horizontally; creating small speed bumps for water (refer to Figure 11).

1.9.5 Temporary Slope Breakers

Temporary slope breakers will be installed to minimize concentrated or sheet flow runoff in disturbed areas in accordance with the following maximum allowable spacing unless otherwise specified in permit conditions.

<u>Slope (%)</u>	<u>Approximate Spacing (ft)</u>
3-5	250
5-15	200
15-25	150
>25	<100

If the length of the slope is less than the distance of the required spacing, slope breakers are not required unless a sensitive resource area (e.g., wetland or public roadway) is located immediately down slope, or as requested by the EI. Temporary slope breakers may be constructed using earthen subsoil material, silt fence, straw bales, or in non-agricultural land, rocked trenches may be used. On highly erodible slopes, slope breakers in the form of earthen berms will be used whenever possible.

Temporary slope breakers will be constructed according to the following specifications (refer to Figures 4 and 5):

- straw bales used as slope breakers will be trenched in and staked so as to not allow spacing between bales or allow flow underneath the bales;
- the outfall of temporary slope breakers will be directed off the construction ROW into a stable well-vegetated upland area or into an appropriate energy-dissipating sediment control device (e.g., silt fence, straw bales, rock aprons) to prevent the discharge of sediments (refer to Figure 4);
- proper slope breaker outfalls will be established where topsoil segregation and/or grading has created a barrier at the edge of the construction workspace; and
- gaps will be created through spoil piles where necessary to allow proper out letting of temporary berms.

1.10 UPLAND TOPSOIL SEGREGATION

Upland areas where topsoil will be stripped includes cropland, hay fields, pasture, residential areas, and other areas as requested by the landowner or as specified in the project plans, commitments, and/or permits. Topsoil will not be used to construct berms, trench breakers, temporary slope breakers, improving or maintaining roads, or to pad the pipe. Berms used for stacking pipe in pipe yards may be constructed using topsoil if landowner permission and necessary approvals are obtained. Gaps will be left and ECDs installed where stockpiled topsoil and spoil piles intersect with water conveyances (i.e., ditches, swales, and waterways) to maintain natural drainage.

Topsoil Segregation Methods

The following topsoil segregation methods may be employed during construction:

- Full Construction ROW (refer to Figure 1)
- Trench-Line-Only (refer to Figure 2)
- Modified Ditch-Plus-Spoil Side (refer to Figure 3)

The Full Construction ROW topsoil segregation technique will typically be used in active cropland, which will consist of stripping topsoil from the spoil storage area, ditch line, and the primary travel lane. The Trench-Line-Only topsoil segregation method may be used where Enbridge determines that the width of the construction ROW is insufficient for other methods to be used. Enbridge may also use the Trench-Line-Only topsoil segregation method in areas where there is a thick sod layer such as in hay fields, pastures, golf courses, and residential areas, unless otherwise requested by the landowner. Alternative topsoil segregation methods, such as Modified Ditch-Plus-Spoil Side, may be used on a site-specific basis or as requested by the landowner. Topsoil is not typically segregated in standing water wetlands unless specifically requested by the landowner and/or managing land agency in accordance with applicable permit conditions.

Depth of Upland Topsoil Stripping

In deep soils (more than 12 inches of topsoil), topsoil will be stripped to a minimum depth of 12 inches, unless otherwise specified/requested by other plans, permit conditions, or the landowner. Additional space may be needed for spoil storage if more than 12 inches of topsoil are segregated. If less than 12 inches of topsoil are present, the Contractor will attempt to segregate to the depth that is present.

1.11 UPLAND TRENCHING

Trenching in uplands is typically accomplished with a backhoe excavator or a rotary wheel ditching machine. Excavated material will be side cast (stockpiled) within the approved construction ROW separate from topsoil, and stored such that the area subject to erosion is minimized. Enbridge will coordinate with landowners to minimize disruption of access caused by the trench during construction. Where deemed appropriate by Enbridge, the Contractor will leave plugs of subsoil in the ditch or will construct temporary access bridges across the trench for the landowner to move livestock or equipment. Trenches may also be sloped where started and ended to allow ramps for wildlife to escape. Spacing of plugs and ramps will be determined in the field.

1.11.1 Timing

The length of time a trench is left open will be minimized to ensure that installation of the pipe and restoration of the construction ROW occurs in a timely fashion. Therefore, unless otherwise specified by project permits or Enbridge, the Contractor will limit the amount of excavated open trench to a maximum of 3 days of anticipated welding production per spread. This timeframe may be decreased at the discretion of Enbridge based on site conditions. Site-specific activities such as horizontal directional drilling ("HDD"), guided bores, road bores, tie-in points, and valve work may be performed independent of a spread.

1.12 FOAM PILLOW INSTALLATION

Use of foam pillows for pipe protection in the trench will be approved by Enbridge in advance and installed in accordance with applicable project permits, local/state/federal regulations, and manufacturer's recommendations.

1.13 TRENCH BREAKERS

Trench breakers will be installed as deemed necessary by Enbridge in sloped areas after the pipe has been lowered into the trench. Trench breakers protect against subsurface water flow along the pipe after the trench is backfilled. Trench breakers will be constructed with bags filled with rock-free subsoil or sand. Topsoil will not be used to construct trench breakers.

Use of foam trench breakers will be approved by Enbridge in advance and installed in accordance with applicable project permits, local/state/federal regulations, and manufacturer's recommendations. Trench breakers will be placed from the bottom of the trench to near the top of the trench, completely surrounding the pipe and will be properly keyed into the undisturbed trench walls (refer to Figures 12 and 13). The location for trench breakers will be based on field conditions including the degree and length of slope, presence of down slope sensitive resource areas such as wetland and waterbodies, and proximity to other features such as roads and/or

railroads. The following conditions apply to the placement and installation of trench breakers unless otherwise directed by Enbridge:

- Trench breakers will be installed on slopes greater than 5 percent adjacent to streams, wetlands, or other waterbodies.
- Where the pipeline exits a wetland towards areas of lower relief, trench breakers will be installed (within the upland) where there is a potential for underground drainage along the pipe in order to prevent wetland or waterbody drainage.
- At all waterbody crossings, as necessary, to prevent diversion of water into upland portions of the pipeline trench and to keep accumulated trench water out of the waterbody.

The actual location of each trench breaker will be selected through coordination between Enbridge's EIs, Enbridge's Craft Inspectors, and the Contractor's Foreman for backfilling activities.

1.14 DRAIN TILE INLET PROTECTION AND TILE REPAIRS

Enbridge will attempt to locate existing drain tile inlets that are located near the construction work area prior to construction. Drain tile inlets will be marked using flags. The Contractor will protect located drain tile inlets with the potential to receive stormwater from construction of the Project using the appropriate ECDs until sources with the potential to discharge have been stabilized. The determination of the specific ECD will be made based on the location of an inlet with respect to the project area, drainage area from the construction work area to the inlet, topography, vegetation, soils, and accessibility to the inlet. Where drain tile inlets are located off of Enbridge's construction ROW, Enbridge may not have authorization to install ECDs at the inlet site. In these cases, sediment control measures (typically silt fence) will be installed along the edge of the construction work area that drains to the inlet structure to minimize sedimentation.

If underground drainage tile is damaged by pipeline construction, it will be repaired in a manner that assures proper tile line operation at the point of repair in accordance with the Agricultural Protection Plan.

1.15 UPLAND BACKFILLING

Backfilling follows pipe installation and consists of replacing the material excavated from the trench. In areas where topsoil has been segregated, the subsoil will be replaced first, and the topsoil will be spread uniformly over the area from which it was removed. Prior to backfilling, the trench will be dewatered in accordance with the methods discussed in Section 5.0 if water obscures the trench bottom.

1.16 CLEANUP AND ROUGH/FINAL GRADING

All waste materials, including litter generated by construction crews, will be disposed of daily by the Contractor. Initial cleanup and rough grading activities may take place simultaneously. Cleanup involves removing construction debris (including litter generated by construction crews and excess rock) and large woody debris. Rough and final grading includes restoring disturbed

areas as near as practicable to preconstruction conditions, returning the topsoil where topsoil has been stripped, preparing a seedbed and de-compacting subsoil (where applicable) for permanent seeding, installing or repairing temporary erosion control measures, repairing/replacing fences, and installing permanent erosion controls.

1.16.1 Timing

The Contractor will begin cleanup and rough grading (including installation of temporary erosion and sediment control measures) within 72 hours after backfilling the trench. The Contractor will attempt to complete this rough cleanup within one week. The Contractor will initiate final grading, topsoil replacement, seeding, and installation of permanent erosion control structures within 14 days after backfilling the trench. If seasonal or other weather conditions prevent compliance with these timeframes, temporary erosion controls will be maintained until conditions allow completion of cleanup.

1.17 PERMANENT EROSION AND SEDIMENT CONTROLS

During final grading, slopes in areas other than cropland will be stabilized with erosion control structures. With exception for actively cultivated areas, permanent berms (diversion dikes or slope breakers) will be installed on all slopes, according to the following maximum spacing requirements unless otherwise specified in permit conditions:

<u>Slope (%)</u>	<u>Approximate Spacing (ft)</u>
3-5	250
5-15	200
15-25	150
>25	<100

Permanent berms will be constructed according to the following specifications:

- Permanent berms will be constructed of compacted earth, stone, or functional equivalent as approved in advance by Enbridge.
- The outfall of berms will be directed toward appropriate energy-dissipating devices, and off the construction ROW if possible.
- Permanent berms will be inspected and repaired as deemed necessary by Enbridge to maintain function and prevent erosion.
- Erosion control blankets (curlex, jute, or equivalent) will be placed on slopes over 30 percent or that are a continuous slope to a sensitive resource area (e.g., wetland or waterway).

1.18 SOIL COMPACTION TREATMENT

Cultivated fields and compacted or rutted areas will be tilled prior to topsoil replacement with a deep tillage device or chisel plowed to loosen compacted subsoils. If subsequent construction and cleanup activities result in further compaction, additional measures will be undertaken to alleviate the soil compaction.

1.19 STONE REMOVAL

A diligent effort will be made to remove excess stones equal to or larger than 4 inches in diameter from the upper 8 inches of subsoil or as specified in permit conditions, contract documents, or landowner agreements. After the topsoil is replaced, stone removal efforts will cease when the size and density of stones on the construction ROW are similar to undisturbed areas adjacent to the construction ROW as determined by the EI. Excess rock will be piled in upland areas where landowner permission has been obtained or will be hauled off-site to an Enbridge approved disposal site.

1.20 REPAIR OF DAMAGED CONSERVATION PRACTICES

The Contractor will restore all soil conservation practices (such as terraces, grassed waterways, etc.) that are damaged by the pipeline construction to preconstruction conditions to the extent practicable.

1.21 LAND LEVELING FOLLOWING CONSTRUCTION

Following the completion of the pipeline, the construction ROW will be restored to its pre-construction conditions as practical. Should uneven settling or documented surface drainage problems occur following the completion of pipeline construction and restoration, Enbridge will take appropriate steps to remedy the issue.

2.0 STREAM AND RIVER CROSSING GENERAL REQUIREMENTS

The procedures in this section apply to streams, rivers, and other waterbodies such as jurisdictional ditches, ponds, and lakes. These procedures require that judgment be applied in the field and will be implemented under the supervision of Enbridge.

Stream crossing requirements, including construction methods, timing, erosion control, and restoration are described in this section and in the stream crossing permits issued by state and federal agencies and by tribal authorities (as applicable). If the contractor considers certain parts of these procedures to be technically impractical due to site-specific engineering constraints, they may submit an on-site modification request to Enbridge for consideration of alternative measures that would provide an equal or greater level of protection to the stream and river ecosystems. Enbridge will review the contractor's alternatives and consult with appropriate regulatory agencies and tribal resource specialists (as applicable). The contractor will receive written approval from Enbridge prior to implementing the alternatives. During wet and high runoff conditions, the EI will determine whether conditions warrant additional considerations for construction activities.

2.1 TIME WINDOW FOR CONSTRUCTION

All in-stream work activities (installation of dams, sheet piling, etc.) will be minimized to the extent practicable on an area and time duration basis. In-stream trenching will be conducted during periods permitted by the appropriate regulatory agencies and applicable permits. Unless otherwise specified in applicable permits and with exception to blasting and other rock breaking measures and directional drill, in-stream construction activities (specifically trenching, pipeline installation, backfill, and restoration of the streambed contours) for wet crossing methods will occur within the following timeframes:

- Minor Waterbodies (all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing): 24 hours
- Intermediate Waterbodies (all waterbodies greater than 10 feet wide but less than 100 feet wide at the water's edge at the time of crossing): 48 hours
- Major Waterbodies (all waterbodies greater than 100 feet wide at the time of crossing): As specified by Enbridge or in the applicable permits.

These timeframes apply regardless of the presence or absence of flow. These timeframes also apply to dry crossing methods as a guideline and can be extended based on site-specific conditions with approval from Enbridge Environment staff, Construction Management, and the EI.

Stream crossings will be designed as close to perpendicular to the axis of the stream channel as engineering and routing constraints allow, creating the shortest crossing length.

2.2 CLEARING AND GRADING

The construction ROW width will consist of a 25-foot-wide neck down beginning 20 feet from the ordinary high water mark ("OHWM") / ordinary high water level ("OHWL") on the working side of the ROW (refer to Figures 15 through 17).

2.2.1 Beaver Dam Removal and Prevention of Dam Rebuilding

With landowner approval and in accordance with necessary permits obtained, the Contractor may trap beavers, alter or remove beaver dams in order to attempt to lower the water level prior to construction. For alterations, the Contractor will insert a 12-inch minimum diameter, 20-foot long minimum perforated steel culvert, or an equivalent device, through the dam to allow the water to continually drain. The perforations should be a minimum of 1.5-inch diameter, encompassing the entire circumference and extend for the full length of the culvert.

2.2.2 Impaired Waters

Where discharges of stormwater may occur to waters designated under Section 303(d) of the Clean Water Act as Impaired Waters, additional BMPs will be implemented as specified in the applicable project permits.

2.3 ADDITIONAL TEMPORARY WORKSPACE

ATWS includes work areas outside the boundary of the typical construction ROW. These spaces are typically used to assemble pipe segments and for temporary spoil storage. Clearing of forested and brushy areas for ATWS will be avoided as much as possible. Woody vegetation in wetlands and riparian areas will typically not be cleared for the purpose of ATWS unless approved by appropriate regulatory agencies as stipulated in permits issued for the Project. ATWS will be constructed as follows:

- ATWS will be located at least 50 feet away from the OHWM/OHWL if topographic or other physical conditions such as stream channel meanders allow, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land (refer to Figures 15 through 17).
- If safe work practices or site conditions do not allow for a 50-foot setback, ATWS should be located no closer than 20 feet from the OHWM/OHWL, subject to site-specific approval by Enbridge.
- ATWS will be limited to the minimum size needed to construct the stream crossing.

2.4 BRIDGES

Temporary equipment bridges will be used on most waterways (upon approval by the appropriate agency), including small waterways such as ditches and intermittent streams, where there is a potential for stormwater runoff or rain events to transport sediment downstream from equipment crossing the waterway. Bridges will be constructed as described below and will be removed as soon as possible during final restoration. Bridges will not typically be installed at directionally drilled waterbodies, unless there is no reasonable alternative that provides an efficient, economical way to transport heavy construction equipment around the waterbody by truck.

With exception to clearing-related equipment, fording of waterways is prohibited (i.e. civil survey, potholing, or other equipment are not permitted to ford waterways prior to bridge placement). Clearing equipment and equipment necessary for installation of equipment bridges

will be allowed a single pass across waterbodies prior to bridge installation, unless restricted by applicable permits.

2.4.1 Types of Bridges

Equipment bridges will be constructed using one of the following techniques:

- Typical Span Type Bridge (timber mats - refer to Figure 19)
- Rock Flume (refer to Figure 20)
- Railroad flat cars
- Flexi-float or other pre-fabricated portable bridges
- Other methods as approved by Enbridge and appropriate agencies

2.4.2 Bridge Design and Maintenance

Bridges will be designed as close to perpendicular to the axis of the stream channel, creating the shortest crossing length and will be built and maintained in accordance with applicable permits. Equipment bridges will be designed to withstand the maximum foreseeable flow of the stream with headers and support structures being placed above the OHWM of the feature. In the event that local jurisdictions require stricter guidelines associated with bridge placement, Enbridge will design the bridge to comply with these requirements. Bridges will not restrict flow or pool water while the bridge is in place, and will be constructed with clean materials. Bridges will be designed and maintained to prevent soil from entering the waterbody. Soil that accumulates on the bridge decking will be removed as needed, or as deemed necessary by the EI.

2.5 STREAM AND RIVER CROSSING CONSTRUCTION METHODS

The following stream and river crossing methods are typically used, subject to further restrictions by Enbridge and applicable permits and subject to modifications as approved by appropriate regulatory agencies and tribal resource specialists (as applicable) during construction.

2.5.1 Wet Trench Method

Installation

The wet trench method will be used to cross streams and rivers not permitted to be flumed, dam and pumped, or directionally drilled (refer to Figure 15). The following procedures will be used during wet trench crossings:

- Sediment control measures will be installed before grading from the 20-foot vegetative buffer left on each stream bank. Spoil containment structures will be installed back from the stream bank so that spoil does not migrate into the stream.

- Grading will be directed away from the waterbody to minimize the potential for sediment to enter the stream. Grading of stream banks will be restricted to the trench line and areas necessary for safe bridge installation.
- After grading, backhoes or draglines will be used to excavate the trench. Where possible, excavating equipment will operate from one or both banks, without entering the stream. If equipment must encroach into the stream, it will operate on clean construction mats. Streambed material will be segregated (e.g., upper one foot and the remaining trench spoil will be stored separately) and placed within a spoil containment structure in approved construction work area limits. Storage of streambed spoil within the stream will only be allowed if expressly approved in the applicable permits.
- Earthen trench plugs (hard plugs) between the stream and the upland trench will be left undisturbed during excavation of the in-stream trench to prevent diversion of the stream flow into the open trench and to prevent water that may have accumulated in the adjacent upland trench from entering the waterbody. Trench plugs will be removed immediately prior to pipe placement, and then replaced when the pipe is in place. Trench water accumulated upslope of trench plugs will be dewatered appropriately prior to trench plug removal.
- Water within the trench will be managed in accordance with Section 5.0
- Backfilling will begin after the pipe is positioned in the trench at the desired depth. Backfill material will consist of the spoil material excavated from the trench and parent streambed unless otherwise specified in state or federal permits. The in-stream trench will be backfilled so that the stream bottom is as near as practicable to its pre-construction condition, with no impediments to normal water flow.

Temporary Stabilization

The Contractor will restore the stream banks as near as practicable to pre-construction conditions unless that slope is determined to be unstable. If Enbridge determines the slope is considered unstable, the Contractor will reshape the banks to prevent slumping. Once the banks have been reshaped, ECDs will be installed within 24 hours of backfilling the crossing. Temporary slope breakers will be installed on all sloped approaches to streams in accordance with the spacing requirements previously specified.

A temporary seed mix (e.g., annual rye or annual oats) and mulch and/or erosion control blankets will be installed within a 50-foot buffer on either side of the stream, with exception to actively cultivated land. Silt fence or functional equivalent as approved in advance by Enbridge will be installed upslope of the temporary seeding area.

2.5.2 Dam and Pump Method

Installation

The dam and pump method is a dry crossing technique that is suitable for low flow streams and is generally preferred for crossing meandering channels. The dam and pump method involves damming of the stream upstream and downstream of the proposed trench before excavation

(refer to Figure 16) and pumping water around the construction area. The following procedures will be used for dam and pump crossings:

- Dams may be constructed of sandbags, inflatable dams, aqua-dams, sheet piling, and/or steel plates. The dams will prevent the stream from flowing into the construction area. The dams will be continuously monitored for a proper seal. Additional sandbags, plastic sheeting, steel plating, or similar materials will be used where necessary to minimize the amount of water seeping around the dams and into the construction work area. The dam will not be removed until after the pipeline has been installed, the trench has been backfilled, and the banks have been stabilized.
- Pumping of the stream across the ROW will commence simultaneously with dam construction to prevent interruption of downstream flow. Stream flow will be pumped across the construction area through a hose and will be discharged to an energy-dissipation device, such as plywood boards, to prevent scouring of the streambed.
- The pumps and fuel containers will be located on the upstream side of the crossing and will be placed in impermeable, sided structures which will act as containment units (refer to Section 10.0). The pumps used for this crossing method will not be placed directly in the stream or on the streambed. Pumps will have a capacity greater than the anticipated stream flow. The pumping operation will be staffed 24 hours a day and pumping will be monitored and adjusted as necessary to maintain an even flow of water across the work area and near-normal water levels upstream and downstream from the crossing.

The pump intake will be suspended to prevent sediment from being sucked from the bottom of stream and will be equipped with a screen, or equivalent device, to prevent fish uptake.

- Where possible, excavating equipment will operate from one or both banks, without entering the stream. If equipment must encroach into the stream, it will operate on clean construction mats (free of soil and plant material prior to being transported onto the construction ROW). Streambed material will be segregated as stated in the wet trench method and will be placed within a spoil containment structure in approved construction work area limits. Storage of streambed spoil within the stream will only be allowed if expressly approved in the applicable permits.
- Earthen trench plugs (hard plugs) between the stream and the upland trench will be left undisturbed during excavation of the in-stream trench to prevent diversion of the stream flow into the open trench and to prevent water that may have accumulated in the adjacent upland trench from entering the waterbody. Trench plugs will be removed immediately prior to pipe placement, and then replaced when the pipe is in place. Trench water accumulated upslope of trench plugs will be dewatered appropriately prior to trench plug removal.
- Standing water that is isolated in the construction area by the dams will be managed in accordance with Section 5.0
- Backfilling will begin after the pipe is positioned in the trench to the desired depth. Backfill material will consist of the spoil material and parent streambed excavated from the trench unless otherwise specified in state or federal permits. The in-stream trench

will be backfilled so that the stream bottom is similar to its pre-construction condition, with no impediments to normal water flow.

Temporary Stabilization

Restoration of the stream banks and the installation of temporary erosion controls will be similar to that described for the wet trench method above but will occur immediately following installation of the pipeline. Once the stream banks have been stabilized, the dams and pump will be removed.

2.5.3 Flume Method

Installation

The flume method is a dry crossing technique that is suitable for crossing relatively narrow streams that have straight channels and are relatively free of large rocks and bedrock at the point of crossing (refer to Figure 17). This method involves placement of flume pipe(s) in the stream bed to convey stream flow across the construction area without introducing sediment to the water. The procedures for using the flume method are described below.

- The flume(s) will be of sufficient diameter to transport the maximum flows anticipated to be generated from the watershed. The flume(s), typically 40 to 60 feet in length, will be installed before trenching and will be aligned so as not to impound water upstream of the flume(s) or cause downstream bank erosion. The flumes will not be removed until after the pipeline has been installed, trench has been backfilled, and the stream banks have been stabilized.
- The upstream and downstream ends of the flume(s) will be incorporated into dams made of sand bags and plastic sheeting (or equivalent). The upstream dam will be constructed first and will funnel stream flow into the flume(s). The downstream dam will prevent backwash of water into the trench and construction work area. The dams will be continuously monitored for a proper seal. Adjustments to the dams will be made where necessary to prevent large volumes of water from seeping around the dams and into the trench and construction work area.
- Where possible, excavating equipment will operate from one or both banks, without entering the stream. If equipment must encroach into the stream, it will operate on clean construction mats. Streambed material will be segregated and placed within a spoil containment structure in approved construction work area limits. Storage of streambed spoil within the stream will only be allowed if expressly approved in the applicable permits.
- Earthen trench plugs (hard plugs) between the stream and the upland trench will be left undisturbed during excavation of the in-stream trench to prevent diversion of the stream flow into the open trench and to prevent water that may have accumulated in the adjacent upland trench from entering the waterbody. Trench plugs will be removed immediately prior to pipe placement, and then replaced when the pipe is in place. Trench water accumulated upslope of trench plugs will be dewatered appropriately prior to trench plug removal.

- If additional trench dewatering is necessary to complete the installation of the pipe, the discharge will be managed in accordance with Section 5.0.
- Backfilling will begin after the pipe is positioned in the trench to the desired depth. Backfill material will consist of the spoil material excavated from the trench and parent streambed unless otherwise specified in state or federal permits. The in-stream trench will be backfilled so that the stream bottom is similar to its pre-construction condition, with no impediments to normal water flow.

Temporary Stabilization

Restoration of the ROW and the installation of temporary erosion controls will be similar to that described for the wet trench method above but will occur immediately following installation of the pipeline. After the stream banks have been stabilized, the dams and flume will be removed from the stream bed allowing water to resume its flow in the channel.

2.5.4 Directional Drill and/or Guided Bore Method

Installation

Installing the pipe underneath a stream will involve placing a drill unit on one side of the stream (refer to Figure 18). A small-diameter pilot hole will be drilled under the stream along a prescribed profile. After the pilot hole has been completed, barrel reams will be used to enlarge the pilot hole to accommodate the desired pipeline diameter. Drilling mud will be necessary to remove cuttings and maintain the integrity of the hole. Water from an Enbridge-approved source will be used to prepare the slurry of drilling mud, and will be appropriated according to applicable permits. The pipe section will be pulled through the hole by the drilling rig and welded to the adjoining sections of pipe on each side of the river.

Drilling Mud

During drilling operations, drilling mud and slurry will be stored back from the waterbody in an earthen berm sediment control structure, in tanks, or by other methods so that it does not flow into the waterbody, adjacent wetlands or off the workspace (refer to Section 11.0 for additional details).

After the pipe is in place, excess drilling mud will be hauled off-site to an Enbridge-approved disposal location or licensed disposal facility.

Temporary Stabilization

The directional drilling/guided bore method normally does not result in the disturbance of the stream banks or riparian vegetation (with exception of extremely limited hand clearing of woody vegetation required to facilitate guide wire placement), which reduces the potential for erosion and sedimentation at the stream crossing. Consequently, temporary erosion control measures that are installed at open-cut crossings typically are not necessary for drilled/bored crossings.

2.6 PERMANENT RESTORATION

Stream/channel banks disturbed during installation of the pipelines will be stabilized with erosion control materials such as an erosion control blanket and seeded in accordance with Section 7.0. Permanent stabilization will be initiated within 24 hours after installation of the crossing using the wet trench method and prior to restoring flow using the dam and pump or flume method, unless site and permit conditions delay permanent installation. Where the banks have been disturbed, the Contractor will restore the slopes as near as practicable to pre-construction conditions unless that slope is determined by Enbridge to be unstable. Where the slope of the banks is determined to be unstable or has the potential to erode or fail, the banks will be reshaped to transition the disturbed areas into the natural stream bank with the intent to stabilize the bank and create a blended, natural appearance.

Berms or other sediment filter devices will be installed at the base of sloped approaches to streams greater than five percent and the outlet of the berm will be directed away from the stream into a well vegetated area. Temporary sediment control devices will remain in place until the area has stabilized and adequate revegetation has established.

2.6.1 Vegetative Bank Restoration

Typically, waterbody banks will be restored as near as practicable to preconstruction conditions after backfilling is complete and will be seeded with an appropriate seed mix as specified in Section 7.0 and covered with an erosion control blanket. Erosion controls, (e.g. straw bales, bio-logs, silt fences, etc.) will be installed as necessary based on site-specific conditions.

2.6.2 Supplemental Bank Stabilization

Unstable soils and/or site-specific factors such as stream velocity and flow direction may require additional restoration efforts, such as installation of rock rip-rap, to stabilize disturbed stream banks. Rock rip-rap will be used only where site-specific conditions require and where applicable permits or approvals have been acquired. Geotextile fabric and rock riprap will be placed according to site and permit conditions (refer to Figure 23). Disturbed soils upslope and on either side of the riprap will be prepared for seeding according to Section 7.0 and other stream bank protection requirements. Bioengineering techniques may also be implemented as determined by Enbridge (refer to Figures 26 through 28).

2.6.3 Bridge Removal

Equipment bridges will be removed during final cleanup or, if access is needed, after final cleanup and permanent seeding. Restoration of the bridge area will be completed upon bridge removal.

2.6.4 Swales

Swales will be restored as near as practicable to original conditions. Swales will be seeded and either mulched with straw or erosion control blankets will be installed to the perceivable top of bank for the width of the construction ROW.

3.0 WETLAND CROSSING GENERAL REQUIREMENTS

The procedures in this section apply to all wetlands that will be affected by the Project. These procedures require that judgment be applied in the field and will be implemented under the supervision of Enbridge and the EI. The intent of these procedures is to minimize construction-related disturbance and sedimentation of wetlands and to restore wetlands as nearly as possible to pre-existing conditions. Additionally, in wetlands that are being farmed at the time of construction, Enbridge will construct the pipeline using standard upland methods. Most seasonally saturated farmed wetlands are used for crop production and topsoil will be segregated in the same manner as topsoil in upland agricultural lands. Pipe stringing and fabrication may occur within the farmed wetland adjacent to the trench, or adjacent to the farmed wetland in a designated ATWS.

Wetland crossing requirements, including construction methods, timing, erosion control, and restoration, are described in this section and in the wetland crossing permits issued by state, federal and/or tribal agencies as applicable. If the contractor considers certain parts of these procedures to be technically impractical due to site-specific engineering constraints, they may submit an on-site modification request to Enbridge for approval of alternative measures. Enbridge will review the contractor's alternatives and consult with appropriate regulatory agencies. The contractor must receive approval from Enbridge prior to implementing the alternatives.

3.1 WETLAND ACCESS

The Contractor will use the construction ROW and only approved roads to access wetland areas.

3.2 CLEARING

Clearing the construction ROW in wetlands will be similar to clearing in uplands. For construction to proceed, obstructions (e.g., trees, brush, and logs) need to be removed. Typically, low ground pressure equipment will be used, limiting disturbance to the wetland. Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be removed from the wetland for disposal. Hydro-axe debris, or similar can be left in the wetland if spread evenly in the construction ROW to a depth which will allow for normal revegetation, as determined by the EI.

3.3 ADDITIONAL TEMPORARY WORKSPACE IN WETLANDS

In general, Enbridge attempts to locate ATWS outside of wetlands wherever practicable; however, ATWS may be sited in select wetlands where the wetland is adjacent to a waterbody, road, railroads, foreign utility crossings, and/or pipeline cross-over with prior approval from the applicable regulatory agencies. Clearing of forested wetlands for ATWS will be avoided as much as possible.

- Staging areas, additional spoil storage areas, and other ATWS will be located in upland areas at least 50 feet away from wetland boundaries (refer to Figures 24), where safe work practices or site conditions permit, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. If site conditions do not permit a 50-foot setback, then these areas will be located as far away from the wetland as is

practicable. Vegetation will not be cleared between these areas and the wetland in any event. No construction activities including vegetation clearing or earthwork will occur between the ATWS and the wetland.

- The size of the ATWS areas will be limited to the minimum needed to construct the wetland crossing.

3.4 GRADING IN A WETLAND

Grading activities will be confined to the area of the trench and will be minimized to the extent practicable. Grading outside the trench will only be allowed where required to ensure safety and restore the construction ROW after backfilling the trench with prior approval from Enbridge.

ECDs will be installed:

1. across the entire construction ROW upslope of the wetland boundary, where necessary, to prevent sediment flow into the wetland;
2. along the edge of the construction ROW as necessary to prevent sediment flow into off-ROW wetlands; and
3. along the edge of the construction ROW as necessary to contain spoil and sediment within the construction ROW through wetlands.

ECDs will be maintained in proper working order to prevent the flow of sediment into wetlands from spoil piles or sloped approaches that are adjacent to the wetlands. .

3.5 RIGHT-OF-WAY STABILIZATION

Tree stumps, brush riprap, imported soil, and rock fill will not be brought in to stabilize the ROW in wetlands. Where low ground pressure equipment is not used, construction equipment will operate from timber construction mats or equivalent means with prior approval from Enbridge (refer to Figure 24). To prevent the spread of noxious and invasive plant species, timber mats will be free of soil and plant material prior to being transported onto the construction ROW and/or moved from one area of the construction ROW to another area. Timber riprap (also known as corduroy road) will not be used without prior written approval from Enbridge and the appropriate regulatory agencies. Pre-existing corduroy roads in wetlands may be used but may not be improved, maintained, restored, or replaced without site-specific authorization from applicable agencies.

Subsoil from the pipeline trench within the immediate wetland may be placed on top of equipment mats for additional stabilization. Timber mats may be placed over the ditch line or on the working side to facilitate trench excavation. All timber mats, construction debris, and larger woody vegetative debris will be removed during cleanup of wetlands.

3.6 TRENCHING

Excavation of the pipeline trench in wetlands typically will be accomplished using backhoe excavators. The Contractor will take reasonable steps to ensure that the duration of open trench in wetlands, including tie-ins, is minimized to the fullest extent possible.

3.6.1 Topsoil Segregation

When constructing in wetland areas without standing water, up to one foot of topsoil (organic layer) will be stripped from the trench line and stockpiled separate from trench spoil to preserve the native seed stock. In standing water wetlands, organic soil segregation is not typically practical; however, the Contractor will attempt to segregate as much of the organic layer as possible based on site/saturation conditions. If normally unsaturated wetlands are saturated at the time of construction, topsoil segregation will be attempted according to Figure 2 and based on recommendations from the EI and appropriate regulatory agencies.

3.6.2 Trench Breakers

Where the EI determines that the pipeline trench has the potential to drain or partially drain a wetland, trench breakers will be installed as necessary to maintain the original wetland hydrology.

3.7 PIPELINE INSTALLATION

The following procedures are intended to minimize siltation and disturbance to wetlands during installation.

3.7.1 Push/Pull Method

Large wetlands with standing water can generally not be crossed with typical crossing methods. In these areas, the pipeline will be assembled in an upland area and positioned in the trench using the "push-pull" and/or "float" techniques.

Usually this fabrication requires use of ATWS adjacent to the construction ROW. A backhoe (or equivalent) supported on timber mats or equivalent low ground pressure equipment will be used to dig the trench. The prefabricated section of pipeline will then be pushed-pulled into position or floated across the wetland. When the pipeline is in position, floats, if used, will be removed and the pipeline will sink into position. The trench will then be backfilled and a backhoe or similar equipment working from construction mats or by low ground pressure equipment will be used restore the wetland.

3.7.2 Temporary Erosion and Sediment Controls

ECDs at approaches to wetlands will be installed as previously described and in accordance with Section 1.0.

3.7.3 Concrete Coating

Concrete will generally be mixed off-site, and concrete coated pipe will be transported to the construction ROW on trucks. If required, pre-fabricated concrete weights and/or saddlebag weights will also be used to provide negative buoyancy. Concrete weights will be manufactured off-site and transported to the ROW. Weights will be strung along the construction ROW, where necessary, until they are placed over the pipe within the excavated ditch. Limited mixing and coating activities may occur on the construction ROW for coating pipe joints and concrete weight repairs according to the concrete usage specifications in Section 10.0. Washing equipment used for mixing, pouring, casting, or coating will not be within 100 feet of any wetland

and will be conducted and contained in a leak-proof containment facility or impermeable liner. The EI will determine where ECDs will be installed down slope of equipment wash areas to capture sediments and minimize erosion from runoff.

3.8 BACKFILLING

Subsequent to pipe installation, backfilling of wetland trenches will take place immediately, or as approved by EI. The Contractor will restore wetlands as near as practicable to pre-construction conditions and will make a reasonable attempt to return the subsoil to its pre-construction density. During backfilling of wetland areas, subsoil material removed from the trench during construction will be replaced so that the material is not mounded above the adjacent ground surface (undisturbed trench wall). Subsoil that exceeds the elevation of the ground adjacent to the trench will be removed from the wetland and disposed of in an upland area or an Enbridge-approved disposal site. After the trench has been backfilled with subsoil, previously segregated topsoil will be spread over the trench area and mounded.

3.9 ROUGH GRADING, CLEANUP, AND TEMPORARY RESTORATION

Cleanup and rough grading activities may take place simultaneously. Cleanup typically involves removing construction debris and replacing fences removed during construction. Rough grading includes restoring original conditions within the disturbed areas (i.e., ditch line, spoil storage areas, and equipment travel lane) and installing or repairing temporary ECDs. Temporary slope breakers will be installed near the boundary between the wetland and adjacent sloped approaches, to prevent sediment flow into the wetland.

3.9.1 Timing

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting.

3.9.2 Temporary Stabilization

Where necessary, disturbed wetland areas will be seeded with oats (40 lbs/acre) and/or a temporary seed mix, unless standing water is prevalent or unless permanent planting or seeding with native wetland vegetation is required by applicable permits. No fertilizer, lime, or mulch will be applied in wetlands.

4.0 HIGHWAY, ROAD AND RAIL CROSSINGS

4.1 ADDITIONAL WORKSPACE

Additional workspaces for bored road and railroad crossings and open-cut road crossings will be determined on a site-specific basis. These workspaces will be adjacent to the road or railroad and limited to the size needed to contain spoil, stage equipment, and store supplies for the crossing.

4.2 MAINTENANCE

Roadway crossings will be maintained in a condition that will prevent tracking of mud onto the roadway.

Rock tracking pads, constructed of stone as required by the applicable permits, will be installed adjacent to paved public roads to prevent or minimize the tracking of soil onto the roadway. If the roadside ditch is part of a jurisdictional waterway, a permit will be obtained prior to installing the tracking pad or culvert. If permitted in wetlands, tracking pads will be limited in size to reduce impacts. Tracking pads installed in wetlands will be constructed with clean rock placed on geotextile fabric, as approved by an EI and with approval from applicable regulatory agencies. All rock and fabric will be removed from the wetland during cleanup.

4.3 TEMPORARY EROSION AND SEDIMENT CONTROLS

Temporary ECDs (e.g., silt fence and/or double-staked straw bales) will be installed on sloped approaches to road crossings where vegetation has been disturbed (refer to Figure 25).

5.0 CONSTRUCTION DEWATERING

5.1 TRENCH DEWATERING

Prior to initiating dewatering activities, the EI will approve the water discharge plan to ensure that the BMPs are applied in such a way as to minimize the potential for scour and water containing sediment from reaching a wetland or waterbody. Furthermore, landowner approval is required in advance of placement of dewatering structures outside of the approved construction ROW. The Contractor will assess each water discharge situation to include:

1. **Water Discharge Setting** - This includes:
 1. Soil Type - The soil type the discharged water would flow over. The management of discharged water traveling over sandy soil is more likely to soak into the ground as compared to clay soils.
 2. Ground Surface - The topography in the area that would influence the surface flow of the discharged water.
 3. Adjustable Discharge rate - The flow rate of the discharged water (which may need to vary) can be managed based on the site conditions to minimize instances of water from reaching a sensitive resource area such as a wetland or waterbody. (Example - Water discharged at 500 gallons per minute may soak into the ground while if discharged at a higher flow rate would cause water to flow via overland runoff into a sensitive resource area)
 4. Discharge Outfall - The amount of hose and number/size of pumps needed to attempt to discharge water at a location which drains away from waterbodies or wetlands.
2. **Pump Intake** - Use floating suction hose or other similar measures to prevent sediment from being sucked from bottom of trench.
3. **Overwhelming Existing Drainage** - If the discharge (assumed to be clean) enters a stream, the flow added to the stream will not exceed 50 percent of the peak storm event flow (to prevent adding high water volumes to a small stream channel that causes erosion due to imposing high flow conditions on the stream).
4. **Filtering Mechanism** – All dewatering discharges will be directed through a filtering device as indicated below.
 1. Well-Vegetated Upland Area – Water can be directed to a well-vegetated upland area through a geotextile filter bag. Geotextile bags need to be sized appropriately for the discharge flow and suspended sediment particle size.
 2. Straw Bale Dewatering Structure – Where the dewatering discharge point cannot be located in an upland area due to site conditions and/or distance, the discharge should be directed into a straw bale dewatering structure. The size of the straw bale dewatering structure is dependent on the maximum water discharge rate (refer to

Figure 21). A straw bale dewatering structure should be used in conjunction with a geotextile filter bag to provide additional filtration near sensitive resource areas.

3. Alternative dewatering methods - Alternative methods may be approved by Enbridge on a site-specific basis.

5.1.1 Flow Measurement and Water Sampling

The volume of water discharged from the trench will be recorded as required by the applicable permits. The volume may be determined using a flow meter, or equivalent method, as approved by Enbridge or specified by applicable permit conditions.

Samples of the water discharged will be sampled if required by tribal permits and/or state-issued discharge permits.

5.1.2 Regulatory Notification and Reporting

Enbridge will notify and submit reports to appropriate tribal, state and federal agencies as required by all permits/authorizations.

5.2 HYDROSTATIC TEST DISCHARGES

Hydrostatic testing involves filling the new pipeline segments with water acquired in accordance with applicable permits (refer to Section 6.0), raising the internal pressure level, and holding that pressure for a specific period of time per federal DOT specifications. Hydrostatic testing will be done to verify that there are no flaws in the pipe or welds. Pre-built sections may be hydrostatically tested prior to installation using HDD and/or guided bore techniques. Hydrostatic testing will be conducted in accordance with applicable appropriation and discharge permits obtained by Enbridge. Hydrostatic test waters will not be transferred from one waterbody to another. Chlorinated source water will be used and treated as specified in applicable permits. After the hydrostatic test is complete, the line will be depressurized and the water discharged.

5.2.1 Refueling

The operation and refueling of hydrostatic test equipment will be in accordance with the conditions outlined in Section 10.0.

5.2.2 Siting of Test Manifolds

Hydrostatic test manifolds will be installed where necessary to ensure proper test pressures and incorporates changes due to topography. Where feasible, Enbridge will incorporate minor adjustments to the test manifold locations to avoid placement in wetlands and riparian areas. However, completely avoiding the placement of a test manifold in a wetland may not always be possible. The Contractor will install appropriate erosion control measures where the EI determines they are necessary.

5.2.3 Water Sampling

Water discharged from hydrostatic tests will be sampled as required by state-issued appropriation or discharge permits. Water volumes and flow rates will be recorded using the form provided in Appendix D.

5.2.4 Best Management Practices

Prior to hydrostatic testing the pipeline, Enbridge will prepare the pipe by removing accumulated construction debris, mill scale, dirt, and dust using a cleaning pig. The debris will be collected in a temporary receiver and will be properly disposed off-site of by the Contractor. Upon completion of the cleaning operation, the pipeline will be sealed with the test headers.

Test headers and pigs will be arranged to allow for rinse water to be installed ahead of the fill pigs. Rinse water will be treated and disposed of in accordance with applicable permit conditions.

Following testing, the test section will be depressurized and the water will be discharged to a well-vegetated, upland area with an appropriate dewatering structure such as a geotextile filter bag and/or a hay bale structure that will be lined with geotextile fabric. Direct discharges to surface waters, if allowed by permit, will be directed into an energy dissipation device such as a splash pup.

At no time will the discharge rate exceed the applicable discharge rates specified in state-issued or other discharge permits. In the event no maximum discharge rate is identified, discharges will be monitored and adjusted as necessary to avoid scouring, erosion, or sediment transport from the discharge location.

To minimize the potential for introduction and/or spread of invasive species due to hydrostatic testing activities, Enbridge will discharge water to the same source location from which it was appropriated. If water is used to test multiple test sections, it will be relayed back to the source water through the pipeline for final discharge. Test water will not be discharged to a waterbody other than the appropriation source, unless coordinated and permitted through the applicable agencies.

5.2.5 Flow Measurement

The total volume of water discharged will be determined with a flow meter (or equivalent), or as required by the applicable state permit. The total volume of water discharged will not exceed the volume specified in the applicable permit.

6.0 WATER APPROPRIATION

6.1 GENERAL

Water may be drawn from local sources, such as lakes, streams, and private or municipal wells for construction activities such as dust control, HDD/guided boring, trench dewatering, and hydrostatic testing. The Project will follow applicable permit conditions for the appropriation of water.

The intake hose will be suspended off of the stream or lake bottom and equipped with a screen, or equivalent device, to prevent fish uptake. During withdrawal, adequate waterbody flow rates and volumes will be maintained to protect aquatic life and allow for downstream uses. The volume and rate of withdrawal will be monitored to comply with applicable permit conditions.

6.2 WATER SOURCES

Water will only be withdrawn from sources approved by Enbridge and in accordance with applicable permits. No additives to the water are permitted unless written approval is received from Enbridge and applicable permits authorize such additives.

If appropriation is scheduled to occur during possible periods of low flow, including frozen conditions, a backup source will be identified.

6.3 FLOW MEASUREMENT

At no time will the withdrawal rate for the water source exceed the rate specified in the applicable permits.

The Contractor will measure the withdrawal rate and total volumes of water appropriated with a flow meter (or equivalent) and provide the data to Enbridge, as required by the applicable permits.

6.4 WATER SAMPLING

Where required by permit conditions, Enbridge will sample the water during appropriation. The Contractor will assist Enbridge in obtaining these samples.

6.5 REGULATORY NOTIFICATION AND REPORTING

Enbridge will notify appropriate agencies of the time of appropriations if required by the state appropriations permits. Enbridge will submit reports regarding the volume and quality of the water withdrawn if required by the applicable permits.

7.0 REVEGETATION & MONITORING

This section was developed in conjunction with Natural Resources Conservation Service (“NRCS”) guidelines. Project-specific permit conditions and landowner requests (with exception to wetlands) for specific seed mixes (as indicated in the Project CLL) take precedence over this section.

7.1 PROJECT SEED SPECIFICATIONS

Seed used will be purchased on a “Pure Live Seed” (“PLS”) basis for seeding (both temporary and permanent) revegetation areas. Seed tags will identify:

- purity;
- germination;
- date tested;
- total weight and PLS weight;
- weed seed content; and
- seed supplier's name and business information.

Seed will be used within 12 months of testing as required by applicable state rules and regulations. The seed tags on the seed sacks will also certify that the seed is “Noxious Weed Free”. Seed rates used on the Project will be based on PLS rate, not actual weight basis. Therefore, to determine the correct application rate if not indicated on the seed tag, a correction calculation will be performed based the purity and germination. For example, a seed mix that has a specified 10 pounds PLS per acre, 95 percent germination rate, and is 80 percent pure needs to be applied at the following rate:

$$(95\% \text{ germination} \times 80\% \text{ purity})/100 = 76\% \text{ PLS}$$
$$10 \text{ pounds PLS per acre} / .76\% \text{ PLS} = 13.2 \text{ pounds per acre actual seeding rate}$$

The species components of individual mixes are subject to availability at the time of purchase. Grass species may be substituted with alternative native or non-invasive species that are included in the NRCS guidelines and subject to approval by Enbridge.

Seed tags will be collected by the contractor and provided to Enbridge during seeding activities. The tags will be reviewed by the EI prior to installation to ensure that the seed mix complies with Enbridge's specifications and that it is being applied to the correct location. If bulk delivery of seed is made, the above information will still be made available to Enbridge. Off-loading/on-loading of seed will not be performed in a designated wetland area.

Legume seed (if used) will be treated with an inoculant specific to the species and in accordance with the manufacturer's recommended rate of inoculant appropriate for the seeding method (broadcast, drill, or hydroseeding). When hydroseeding, four times the manufacturer's recommended rate of inoculant will be used.

7.2 TEMPORARY REVEGETATION

Enbridge's temporary seed mix (refer to Appendix C) was developed based on recommendations from the NRCS. Unless specifically requested by landowners or land

managing agencies, Enbridge does not intend to establish temporary vegetation in actively cultivated land, standing water wetlands, and/or other standing water areas.

7.3 TIMING FOR TEMPORARY VEGETATION

Temporary revegetation will be established in construction work areas where 14 days or more will elapse between:

- the completion of final grading at a site and the establishment of permanent vegetation; and/or,
- where there is a high risk of erosion due to site-specific soil conditions and topography.

Enbridge may require the Contractor(s) to conduct temporary seeding sooner than 14 days at site-specific locations near sensitive resource areas and/or areas prone to wind/water erosion.

Temporary vegetation should be established at any time between **April 1 and September 1**. Attempts at temporary revegetation after this date should be assessed on a site-specific basis and with approval from Enbridge.

7.4 MULCH

Mulch (weed-free straw, wood fiber hydromulch, or a functional equivalent) will be applied to disturbed areas (except for actively cultivated land and wetlands) if requested by the landowner or land managing agency, if specified by the applicable permits or licenses, or as required by Enbridge. Mulch will specifically be required on:

- slopes greater than 5 percent; and
- dry, sandy areas that can blow or wash away (field decision).

Mulch will be free of noxious weeds as listed in applicable state laws. Certified weed-free mulch may also be required at site-specific locations. The Contractor will be responsible for identifying and acquiring sources of weed-free and certified weed-free mulch. Sources will be approved by Enbridge prior to purchase.

Mulch will be applied at a rate of 2 tons per acre to cover at least 75 percent of the ground surface unless otherwise stipulated by permit conditions. Mulch will be uniformly distributed by a mechanical mulch blower, or by hand in areas not accessible to the mulch blower. Mulch will be anchored/crimped using a mulch-anchoring tool or disc set in the straight position to minimize loss by wind and water, as site conditions allow. In areas not accessible to a mulch-anchoring tool or too steep for safe operation, the mulch may be anchored by liquid tackifiers, with advance written approval from Enbridge. The manufacturer's recommended method and rate of application will be followed.

Hydro-mulch and liquid tackifier can be used in place of straw or weed-free hay mulch with prior approval from Enbridge. All hydromulch and liquid tackifier products used will be on the applicable state DOT product list. Application rates will be at the manufacturer's recommended rate, equal to or greater than 2 tons per acre of straw mulch.

7.5 PERMANENT REVEGETATION

Permanent vegetation will be established in areas disturbed within the construction work area (permanent easement, TWS, and ATWS) except in actively cultivated areas and standing water wetlands. The seed mixes for permanent seeding include native seed varieties commonly found and/or available from local seed distributors. Enbridge's seed mixes (refer to Appendix C) were selected to augment revegetation via natural recruitment from native seed stock in the topsoil and are not intended to change the natural species composition. Rates provided are assumed for a drill application and will be adjusted as discussed in Section 7.1.

7.6 UPLAND CONSTRUCTION AREAS

In consulting with the NRCS and other agencies, Enbridge developed standard upland seed mixes for restoring disturbed areas affected by the Project (Appendix C, Tables 1-23). These mixes include species that will provide for effective erosion control and revegetation of the project area. These seed mixes will be used by Enbridge as the standard upland mixes unless an alternate seed mix is specified by a landowner or land managing agency.

7.7 PERMANENT SEEDING OF WETLAND AREAS

7.7.1 Unsaturated Wetland Areas

Non-standing water wetlands in Minnesota will be seeded with the mix provided in Appendix C, Table 17 (MN Seed Mix 3) to provide temporary cover and allowed to revegetate naturally. No unsaturated wetlands will be seeded in North Dakota. The natural revegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the ROW after pipe installation. No fertilizer, lime, or mulch will be applied in wetlands.

7.7.2 Saturated/Standing Water Wetlands

Enbridge does not propose to seed saturated or standing water wetland areas. It is widely accepted that the reestablishment of vegetation within standing water wetlands occurs best through natural process without supplemental seeding.

7.7.3 Forested Wetland Restoration

Enbridge proposes to allow natural reforestation of the TWS area within forested wetlands via stump sprouting, root sprouting, and natural recruitment. Specific forested wetland restoration provisions will be followed as indicated in applicable permits issued for the Project.

7.8 PERMANENT SEEDING OF WATERBODY BANKS

Enbridge will reestablish stream bank vegetation in North Dakota using ND Seed Mix 2 (Table 2, Appendix C), and in Minnesota using MN Seed Mix 2 (Table 16 Appendix C) unless an alternate seed mix is requested by applicable agencies. Additional vegetation requirements may also be contained within project-specific permits. Where a waterbody is located within a wetland, the Contractor will re-seed the banks with the applicable wetland seed mix.

7.9 SPECIALIZED SEED MIXES

Enbridge developed specialized seed mixes for restoring these areas:

1. Native prairie in North Dakota and Minnesota;
2. Openings in forested areas in Minnesota;
3. Mixed native prairie/tamed hayland areas and road ditches in North Dakota, and Minnesota;
4. Tame pasture and Conservation Reserve Program (“CRP”) lands;
5. North Dakota State School land; and
6. Protected waterbody banks and wetland fringes in Minnesota.

Enbridge will provide other specialized seed mixes upon landowner request on a site-specific basis for:

- Residential Areas: This seed mix will be used to reestablish residential lawns or other types of “turf-type” land cover.
- Wildlife Areas: This seed mix will be used to provide a desirable food source for wildlife, specifically deer.

7.10 CONSERVATION RESERVE PROGRAM PROPERTIES

Enbridge’s Land Agents will contact landowners where the construction ROW crosses land enrolled in CRP. Enbridge will work with the respective landowners to identify the parcel-specific CRP seed mixes. CRP lands will be seeded at the direction of the landowner per the site-specific landowner CRP requirements for that parcel and no non-CRP approved seed mix will be planted on CRP lands. CRP parcels will also be seeded with Enbridge’s temporary cover seed mix. Seed for CRP seeding will meet the same criteria as other seed described in Section 7.1

7.11 SEED BED PREPARATION AND SEEDING PROCEDURES

After final grading, deep tillage will be performed in actively cultivated areas and in non-agricultural areas (as directed by Enbridge) to relieve soil compaction and promote root penetration. Deep tillage will not be conducted in non-farmed wetlands. The soil will then be tilled with a disc, field cultivator, or chisel plow (or equivalent) to prepare a seedbed, breaking up large clods and firm the soil surface.

Tillage and equipment operations related to seeding and mulching will be performed parallel to ground contours as much as practicable. Fertilizer and other soil amendments will be incorporated into the soil during seedbed preparation as specified by Enbridge in the project-specific CLL requirements and permits. No soil amendments will be applied in wetlands unless directed by the appropriate agencies.

7.12 SEEDING METHODS

Seed will be applied uniformly at specified rates across the prepared construction ROW by drilling, broadcasting, hydroseeding, or air seeding. The EI will suspend seeding activities if conditions are such that equipment will cause rutting of the surface in the designated seeding areas. Enbridge will continue to monitor ROW conditions to resume seeding activities as site conditions improve and according to the general seeding timing restrictions listed in Section 7.15.

7.12.1 Drill Seeding

Seeding equipment will be capable of uniformly distributing the seed and sowing it at the required depth. Drills will be equipped with a feeding mechanism that will provide a uniform flow of seed at the desired application rate. Double-disc furrow openers equipped with depth bands and packer wheels to firm the soil over the seed will be used where practicable.

7.12.2 Broadcast Seeding

Broadcast seeding rate will be double the drill-seeding rate. Seed will be uniformly distributed by a mechanical or hand operated seeder. Following seeding, a cultipacker, harrow, or hand rake will be used to cover the seeds and firm the seedbed as is appropriate for the area.

7.12.3 Hydroseeding

Hydroseeding rate will be double the drill seeding rate, or the same as broadcast seeding rate. Seed will be applied alone or in a seed, fertilizer, and/or hydromulch slurry. If seeding is applied alone, the amount of hydromulch material will be adjusted to the seed slurry to show where seeding has taken place, providing a means to identify uniform cover of the construction ROW. Hydroseeders will provide continuous agitation and be capable of supplying a continuous, non-fluctuating flow of slurry. Enbridge will pre-approve all hydromulch products, which must be on the applicable state DOT product list.

7.13 COMPANION CROPS

A companion crop is an annual that can be planted with the perennial species where soil erosion is a severe hazard. A companion crop may be used for all seed mixes.

Seeding rates for companion crops are lower than normal seeding rates for those crops to reduce competition with the seeded perennial species.

Table 7.13-1 Companion Crops	
Seed	Planting Rate
Barley	10 lbs/acre
Oats	10 lbs/acre
Spring wheat	15 lbs/acre
Flax	7 lbs/acre

7.14 SOIL AMENDMENTS

Enbridge will consult with NRCS representatives and review county soil survey information to assess where soil amendments, specifically the application of fertilizer or lime are needed to promote successful revegetation. No fertilizer or lime will be added with native seed mixes. When using non-native species on dry, dry-mesic and mesic sites for permanent seeding a minimum of 150 pounds of 20-10-10, and 2 tons of 80-85 lime or equivalent will be applied, unless otherwise specified or restricted by the landowner, NRCS, or land-managing agency. Soil amendments may be applied to agricultural, pasture, and/or residential lands if requested by landowners and/or land managing agencies. Enbridge will apply phosphate free fertilizers to areas within 100 feet of a waterway if soil amendments are required.

7.15 SEEDING PERIODS

Recommended seeding dates in Table 7.15-1 are based on climatic records, research, and experience; and they also represent optimum periods for the germination of grass and legumes. The dates below provide adequate development of adventitious roots prior to stressful periods.

Table 7.15-1 Recommended Seeding Dates	
Species Type and Season of Planting	Recommended Dates
<u>Cool Season Species</u> Spring Late Summer Late fall dormant seeding	Prior to May 20 August 10 to September 1 Typically, November 1 and later
<u>Warm Season Species</u> Spring	May 10 to June 25
<u>Warm/Cool Season Mix</u> Spring	May 1 to June 14

Enbridge will delay seeding during frozen ground conditions until the applicable spring seeding period or will complete dormant seeding where conditions allow (i.e., no snow cover). Enbridge will install temporary erosion controls during frozen conditions.

7.16 TIMING OF FINAL SEEDING

Upon final grading of the construction ROW, and upon the restoration of wetland and waterways, seeding and restoration/stabilization will occur within 48 hours if weather and soils conditionals allow. Other methods of stabilization will be used if temporary seeding is not appropriate due to seasonal conditions (e.g., mulch, erosion control matting).

7.17 EROSION AND SEDIMENT CONTROL

Erosion control blankets, such as sewn straw mats, jute mats, coconut erosion control blankets, or biodegradable synthetic erosion control blankets, as approved by Enbridge, will be used on slopes over 30 percent, on stream banks and ditch banks and as directed by Enbridge.

7.18 DORMANT SEEDING

Dormant seeding is a method used after soil temperatures have cooled to 55 degrees Fahrenheit or cooler to prevent seed germination. Dormant seeding is only practicable if the soil is not frozen and snow is not present. Procedures for applying soil amendments, seedbed preparation, seeding, and mulching are the same as outlined for permanent revegetation in this section.

Where dormant seeding is conducted, one or more of the following temporary erosion and sediment controls will be put in place over the freshly seeded area unless the local soil conservation authority, landowner, or land managing agency specifies otherwise. The temporary measures will be in place within 48 hours of seeding, and are as follows:

- noxious weed-free straw mulch, at not more than 2 tons/acre, anchored;
- hydromulch, at 2 tons/acre, anchored; and/or
- erosion control blanket.

Additional erosion control measures will be applied as requested by the EI.

7.19 MANAGEMENT AND MONITORING

Enbridge will monitor and address all areas where stabilization techniques have been implemented in accordance with conditions identified in the applicable project permits and/or licenses.

8.0 WINTER CONSTRUCTION

Frozen conditions can preclude effective topsoil segregation. When soil is frozen to a depth greater than the depth of topsoil, the soil will come off in thick slabs that contain both topsoil and subsoil, and mixing can result. If topsoiling will proceed under these conditions, it should be done at the excavation only. A ripper (deep tillage device or scarifier) should be used to break up the frozen topsoil over the trench line only. Care should be taken to only rip to the actual depth of topsoil or to a maximum depth of 12 inches, whichever is less. Topsoil in the spoil storage area should be graded smooth to minimize mixing during backfilling. Sufficient time is needed to allow the newly graded topsoil to freeze in place prior to trenching.

Summer construction of large diameter pipelines in saturated/standing water wetlands with unconsolidated soils can be difficult and potentially result in greater wetland disturbance including wider trench widths and extensive rutting/surface disturbance. Constructing across these types of wetlands in the winter can result in fewer impacts. Heavy construction equipment use and travel along the construction ROW, which may not be possible in summer conditions due to saturated, unstable soil conditions, can be accomplished in the winter by establishing temporary winter frost/ice roads. These frost/ice roads protect underlying vegetation and upper layers of wetland surfaces from disturbance potentially created during summer construction.

The area of open excavation will be minimized during winter construction to reduce amount of frozen backfill and facilitate restoration to pre-construction contours. If winter conditions preclude final grading and cleanup, the Contractor will stabilize the area and temporary erosion control measures will remain in place until permanent erosion control measures are installed. Depending on site and weather conditions, Enbridge may require the Contractor to install dormant seeding, mulching, and/or installation of erosion control blanket on stream banks or other sensitive locations.

9.0 WASTE MANAGEMENT

The Contractor will properly handle, store, and dispose of all solid and hazardous materials and wastes that are used or generated by the Contractor as a result of the Project. The Contractor will determine if the materials and wastes associated with the Project classify as hazardous materials and/or wastes in accordance with applicable federal and/or state criteria. Upon request by Enbridge, the Contractor will provide documentation to Enbridge to substantiate findings of the regulatory status of materials and/or wastes used and/or generated as a result of the Project.

The Contractor will collect all waste materials, including oil or other waste liquids generated as a result of equipment maintenance, daily in suitable or approved containers (i.e., labeled and meeting any relevant regulatory requirements). On a routine basis, the Contractor will remove the containers of waste from the site and properly dispose of them. Throughout the duration of the Project, the Contractor will cleanup areas to the satisfaction of Enbridge. The Contractor is responsible for proper off-site disposal of all wastes generated during the Project. No wastes are to be left on Enbridge property, along the ROW, or buried in an excavation or otherwise disposed of on Enbridge property or ROW.

9.1 HAZARDOUS WASTES

If a Contractor generates a hazardous waste from materials they have brought on-site (e.g., paint clean-up solvents, waste paints), then the Contractor is responsible for proper waste collection, storage and disposal in accordance with all applicable regulations. The Contractor remains responsible for the proper handling, storage and disposal of the hazardous waste. Any release of the hazardous waste as a result of the improper handling, storage or disposal by the Contractor in this instance is the responsibility of the Contractor to rectify to the satisfaction of Enbridge and all applicable regulatory agencies.

9.2 ABRASIVE BLAST DEBRIS

The Contractor will contain and collect spent abrasive blast materials and place it into appropriate containers. The Contractor is responsible for covering the containers with appropriate means of rainwater and stormwater control to prevent said waters from entering or exiting the container. The Contractor is responsible for disposal of the spent abrasive in accordance with applicable federal, state and local regulatory requirements. The Contractor is responsible for determining if the spent abrasive is classified as a “hazardous” or “special” waste as defined by applicable federal and state regulations. If the spent abrasive is determined to be hazardous waste as a direct result of constituents of an Enbridge facility or equipment, Enbridge will coordinate proper disposal with the Contractor as previously discussed.

10.0 SPILL PREVENTION, CONTAINMENT, AND CONTROL MEASURES

This section describes planning, prevention and control measures to minimize impacts resulting from spills of fuels, petroleum products, or other regulated substances as a result of construction. These measures will be implemented by the Contractor, unless otherwise indicated by Enbridge.

10.1 PLANNING AND PREVENTION

Enbridge requires its Contractors to implement proper planning and preventative measures to minimize the likelihood of spills, and to quickly and successfully clean up a spill should one occur. This section sets forth minimum standards for handling and storing regulated substances and cleaning up spills. Potential sources of construction-related spills include machinery and equipment failure, fuel handling, transfer accidents and storage tank leaks. The Contractor will be responsible for implementing, at a minimum, the following planning and prevention measures.

10.2 ROLES AND RESPONSIBILITIES

10.2.1 Spill Coordinator

A Spill Coordinator will be designated by the Contractor, subject to approval by Enbridge. For all construction related spills, the Spill Coordinator will:

- report all spills to the Enbridge Representative immediately;
- report spills to appropriate federal, state and local agencies as soon as possible (subject to EI verification);
- mobilize on-site personnel, equipment, and materials for containment and/or cleanup commensurate with the extent of the spill;
- assist the Emergency Response Contractor (refer to a list of potential contractors provided in Appendix E) and monitor containment procedures to ensure that the actions are consistent with the requirements of this section;
- in consultation with Enbridge and appropriate agencies, determine when it is necessary to evacuate spill sites to safeguard human health;
- in consultation with Enbridge, coordinate with appropriate agencies the need to contact additional parties or agencies; and
- complete a Spill Report Form (refer to Appendix F) within 24-hours of the occurrence of a spill, regardless of the size of the spill.

10.2.2 Environmental Inspector

The EI will monitor the Contractor's compliance with the provisions of this section to ensure that appropriate agency notifications are made, spill resources are allocated, and clean-up is accomplished in accordance with applicable agency requirements

10.2.3 Authorized Personnel

Authorized Personnel are representatives of the Contractor who are designated to handle fuel, lubricants or other regulated substances. Authorized Personnel will be familiar with the requirements of this section and the consequences of non-compliance.

10.2.4 Construction Superintendent

The Contractor's Construction Superintendent or representative will notify the EI immediately of any spill of a petroleum product or hazardous liquid, regardless of volume.

10.2.5 Construction Personnel

Construction Personnel are representatives of the Contractor involved with the installation of the pipeline. Construction Personnel will notify the crew foreman or Spill Coordinator immediately of any spill of a petroleum product or hazardous liquid, regardless of volume.

10.3 TRAINING

The Contractor will train all employees handling fuels and other regulated substances to follow spill prevention procedures. The Contractor will train all employees who handle fuels and other regulated substances to prevent spills and to quickly and effectively contain and clean up spills that may occur in accordance with applicable regulations. .

10.4 EQUIPMENT

- Each construction crew will have adequate absorbent materials and containment booms on hand, to enable the rapid cleanup of any spill which may occur.
- The Contractor will maintain spill kits containing a sufficient quantity of absorbent and barrier materials to adequately contain and recover foreseeable spills. These kits may include, but are not limited to absorbent pads, straw bales, absorbent clay, sawdust, floor-drying agents, spill containment barriers, plastic sheeting, skimmer pumps, and holding tanks. This equipment will be located near fuel storage areas and other locations as necessary to be readily available to control foreseeable spills.
- Suitable plastic lining materials will be available for placement below and on top of temporarily-stored contaminated soils and materials.
- All fueling vehicles, and where necessary, service vehicles, will carry materials adequate to control foreseeable spills. Such material may include but not be limited to absorbent pads, commercial absorbent material, plastic bags with ties, and shovels.

- The Spill Coordinator will inform the Authorized Personnel, Construction Personnel, and the EIs of the locations of spill control equipment and materials, and have them readily accessible during construction activity. Spill kits should be clearly labeled for quick and easy identification in the field.
- All fuel nozzles will be equipped with functional automatic shut-offs.
- Fuel trucks transporting fuel to on-site construction equipment will travel only on approved access roads.

10.5 SUPERVISION AND INSPECTION

The Contractor will perform a pre-construction inspection and test of all equipment to ensure that it is in good repair. During construction, the Contractor will regularly inspect hoses, pipes, valves, and tanks to ensure equipment is free of leaks. Any equipment that found to be is leaking or in need of repair will be immediately removed from service by Contractor and repaired, prior to resuming work.

10.6 STORAGE AND HANDLING OF FUELS/HAZARDOUS LIQUIDS

10.6.1 Fuel Storage - General

The Contractor will follow proper fuel storage practices, including, but not limited to the following:

- Fuel storage will be at Contractor yards only or as approved by Enbridge.
- Proper signage at and adjacent to fuel storage areas to include "Fuel Storage Area – No smoking within 50 feet."
- Tools and materials to stop the flow of leaking will be kept on-site. Such equipment may include, but not be limited to, plugs of various sizes, 3M tank patches, a hammer, assorted sizes of metal screws with rubber washers, a screwdriver, and plastic tape.
- Fuels, lubricants, waste oil, and any other regulated substances will be stored in aboveground tanks only.
- Storage tanks and containers will conform to all applicable industry codes (e.g., National Fire Protection Association [NFPA], Unified Facilities Criteria [UFC]).
- A suitable secondary containment structure will be utilized at each fuel storage site. These structures will be lined with suitable plastic sheeting; provide a minimum containment volume equal to 150 percent of the volume of the largest storage vessel.
- Secondary containment areas will not have drains. Precipitation may be drawn off as necessary. If visual inspection indicates that no spillage has occurred in the secondary containment structure, accumulated water may be drawn off and discharged in accordance with Section 5.0. If spillage has occurred in the structure, accumulated waste will be drawn off and pumped into drum storage for disposal.

10.6.2 Refueling

Contractor will make all efforts to dispense fuel by Authorized Personnel during daylight hours. Fuel dispensing operations will be attended by Authorized Personnel at all times. Personnel will be stationed at both ends of the hose during fueling unless both ends are visible and are readily accessible by one person.

10.6.3 Refueling, Maintenance, and Fuel Storage Near Wetlands and Waterbodies

Enbridge requires that the storage of petroleum products, refueling, maintenance, and lubricating operations take place in upland areas that are more than 100 feet from wetlands, streams, and waterbodies (including drainage ditches), and water supply wells. In addition, the Contractor will store hazardous materials, chemicals, fuel and lubricating oils, and perform concrete coating activities outside these areas.

In certain instances, refueling or fuel storage may be unavoidable due to site-specific conditions or unique construction requirements (e.g., continuously operating pumps or equipment on barges). These locations will be approved in advance by the EI. Site-specific precautions, in addition to those practices described above, will be taken when refueling or maintenance activities are required within 100 feet of streams, wetlands or other waterbodies. These precautions include, but are not limited to:

- adequate amounts of absorbent materials and containment booms will be kept on hand by each construction crew to enable the rapid cleanup of any spill which may occur;
- if fuel will be stored within wetlands or near streams for refueling of continuously operating pumps, secondary containment will be used;
- secondary containment structures will be lined with suitable plastic sheeting, provide a containment volume of at least 150 percent of the storage vessel, and allow for at least one foot of freeboard; and
- provide adequate lighting for these locations and activities.

10.6.4 Overnight parking

Overnight parking of equipment (including but not limited to light plants, generators, pumps, and machinery) is not allowed within 100 feet of a wetland or waterbody unless special containment provisions have been implemented and approved by the EI in advance.

10.6.5 Concrete Washout Handling

Concrete wash water, grindings and slurry, will not be discharged to wetlands, waterbodies, and storm sewer systems or allowed to drain onto adjacent properties. Wash water disposal will be limited to a defined area of the site or to an area designated for cement washout. The area(s) will be sufficient to contain the wash water and residual cement. Contractors hired to provide concrete products will provide equipment capable of reclaiming wash water during wash out.

10.7 INITIAL SPILL MANAGEMENT

10.7.1 Immediate Response

Immediately upon learning of any fuel, oil, hazardous material or other regulated substance spill, or upon learning of conditions that will lead to an imminent spill, the person discovering the situation will:

- initiate actions to contain the fluid that has spilled or is about to spill, and initiate action to eliminate the source of the spill to the maximum extent that is safely possible; and
- notify the crew foreman and/or the Spill Coordinator and provide them with the following information:
 - o location and cause of the spill;
 - o the type of material that has spilled; and
 - o whether the spill has reached or is likely to reach any surface water.

Upon learning of a spill or a potential spill the Spill Coordinator will:

- assess the situation and determine the need for further action;
- direct subsequent activities and/or further assign responsibilities to other personnel; and
- notify the EI.

10.7.2 Mobilization

The Spill Coordinator will mobilize on-site personnel, equipment, and materials for containment and/or cleanup commensurate with the extent of the spill. If the Spill Coordinator feels that a spill is beyond the scope of on-site equipment and personnel, the Spill Coordinator will immediately notify the Construction Superintendent that an Emergency Response Contractor is needed to contain and/or clean up the spill. Appendix E contains a list of potential Emergency Response Contractors. The Spill Coordinator will assist the Emergency Response Contractor and monitor containment procedures to ensure that the actions are consistent with the requirements of this Section.

In the event of a suspected Enbridge pipeline spill (or from an adjacent pipeline), Enbridge's Emergency Pipeline Control Center will be notified at 1-800-858-5253 (24-hours/day), as well as the Enbridge EI. Actions requiring emergency response will be coordinated by Enbridge.

10.8 SPILL NOTIFICATION RESPONSIBILITIES

10.8.1 Notification Volumes

The Contractor's Construction Superintendent or representative will notify the Enbridge Representative and the EI immediately of any spill of a petroleum product or hazardous liquid, regardless of volume.

10.8.2 Spill Report Form

The Spill Coordinator will complete a Spill Report Form (Appendix F) for each release of a regulated substance, regardless of volume. The Spill Report Form will be submitted to the EI within 24 hours of the occurrence of a spill. Follow-up written reports, associated laboratory analyses, and other documentation may also be required separately on a site-specific basis as directed by the EI. Documentation is the responsibility of the Contractor.

10.8.3 Agency Notification

The Contractor will report spills to appropriate federal, state and local agencies as soon as possible. A listing of federal, state, and local agencies including reporting thresholds and timeframes is provided in Appendix G.

The Contractor, in coordination with Enbridge and the appropriate federal, state and local agencies will ensure that additional parties or agencies are properly notified. Additionally, the Contractor is responsible for ensuring that all cleanup activities required by a jurisdictional agency are satisfactorily met and provide documentation to Enbridge demonstrating this compliance.

10.9 SPILL CONTAINMENT AND CLEANUP

In the event of a spill, the Contractor will abide by all applicable federal, state and local regulations with respect to cleaning up the spill. All clean-up and other construction related spill activities will be completed by, and costs assumed by the Contractor. Specific cleanup measures for both upland and wetland/waterbody spills are described below.

10.9.1 Spill Control - Upland Areas

- If a spill should occur during refueling operations, STOP the operation until the spill can be controlled and the situation corrected.
- The source of the spill will be identified and contained immediately.
- For large spills on land, the spill will be contained and pumped immediately into tank trucks. The Contractor or, if necessary, an Emergency Response Contractor, will excavate contaminated soil.
- The spilled material and the contaminated soil will be treated and/or disposed of in accordance with all applicable federal, state, and local agency requirements.

- Smaller spills on land will be cleaned up with absorbent materials. Contaminated soil or other materials associated with these releases will also be collected and disposed of in accordance with applicable regulations.
- Flowing spills will be contained and/or absorbed before reaching surface waters or wetlands.
- Absorbent material(s) will be placed over spills to minimize spreading and to reduce its penetration into the soil.
- The Spill Coordinator, in consultation with the EI and appropriate agencies, determine when spill sites will be evacuated as necessary to safeguard human health. Evacuation parameters will include consideration for the potential of fire, explosion, and hazardous gases.

10.10 SPILL CONTROL - WETLANDS AND WATERBODIES

In addition to the above measures, the following conditions apply if a spill occurs near or into a wetland or waterbody, regardless of size:

- If a spill occurs during refueling operations, **STOP** the operation until the spill can be controlled and the situation corrected.
- The Contractor will use absorbent booms and pads to contain and recover released materials in standing water.
- If necessary, for large spills in waterbodies, The Contractor will secure an Emergency Response Contractor to further contain and clean up the spill.
- The Contractor will excavate contaminated soils in wetlands and temporarily place them on plastic sheeting in a bermed area, a minimum of 100 feet away from the wetland. Contaminated soils will be covered with plastic sheeting while being stored temporarily and properly disposed of as soon as possible, in accordance with Section 10.11.

10.11 STORAGE AND DISPOSAL OF CONTAMINATED MATERIALS

- Appendix E lists potential treatment and disposal facilities for contaminated materials, petroleum products, and other construction-related wastes. The Contractor should recycle those wastes, such as motor oil, where there is an established recycling program available. Wastes such as grease or oily rags shall be disposed of in accordance with state requirements.
- The Contractor will store and dispose of all contaminated soils, absorbent materials, and other wastes in accordance with all applicable state and federal regulations.
- Only licensed carriers may be used to transport contaminated material from the site to a disposal facility.

- If it is necessary to temporarily store excavated soils on site, these materials will be placed on, and covered by, plastic sheeting, and the storage area bermed to prevent and contain runoff.

11.0 DRILLING FLUID RESPONSE, CONTAINMENT, AND NOTIFICATION PROCEDURES

Construction of a pipeline may include the use of trenchless methods known as the HDD and guided/road bore methods. Throughout this section, both methods are referred to collectively as “drilling”. While the HDD method always includes the use of drilling fluid, the guided or road bore method might use drilling fluid or only use water to power and lubricate the bore. The HDD drilling fluids/mud consists primarily of water mixed with inert bentonite clay. Under certain conditions an additive may need to be mixed with the drilling fluids/mud for viscosity or lubricating reasons. Only non-hazardous additives will be used and a Safety Data Sheet for the drilling fluid will be maintained on-site.

This section elaborates on measures to be implemented by the Contractor if an inadvertent release of drilling fluid occurs despite prevention efforts. Prior to the commencement of drilling operations, the Contractor will inform construction personnel involved as to the responsible party(ies) for release containment and response. The Contractor will ensure that the appropriate response personnel and containment equipment are on site for each drill/bore.

11.1 ON-SITE OBSERVATION DURING CONSTRUCTION

During construction of a drilled crossing, Contractor personnel will monitor the pipeline route throughout the process, as follows:

The Contractor will inform construction observers on what to watch for and will make them aware of the importance of timely detection and response actions to any release of drilling fluid.

- Construction observers will have appropriate, operational communication equipment (e.g., radio and cell phones) available at all times during installation of the directionally drilled crossing, with the ability to communicate directly with the HDD operator.
- The HDD operator will monitor the annular drilling fluid pressures during pilot hole operations.
- If the HDD operator identifies a sustained loss in fluid pressure or loss of circulation:
 - o The operator will immediately notify the construction observers of the assumed position of the drill tool; and
 - o The Contractor will visually monitor the appropriate portion of the drill path where the drill tool is located to determine if an inadvertent return occurred. The Contractor may perform this monitoring by walking or by using a boat, as appropriate.
- Construction observers, EI(s), or the Enbridge HDD craft inspector have the authority to order installation of containment structures, if needed, and to require additional response measures if deemed appropriate.

11.2 CONTAINMENT, RESPONSE, AND CLEAN-UP EQUIPMENT

Containment, response and clean-up equipment will be available at both sides of an HDD crossing location and one side of a guided or road bore prior to the commencement to assure a timely response in the event of an inadvertent release of drilling fluid. Containment and response equipment includes but is not limited to:

- A. straw bales and staking
- B. pre-filled sandbags
- C. turbidity curtain (not necessary for guided or road bores that do not involve a waterbody)
- D. silt fence
- E. plastic sheeting and/or geotextile fabric
- F. shovels, brooms, buckets, and other appropriate hand tools
- G. pumps and sufficient hose
- H. fluid storage tanks (may not be necessary for guided or road bores)
- I. vacuum truck on 24-hour call
- J. one small boat (for larger rivers and open water wetlands)
- K. light plant/generator (only necessary where operations are conducted outside of daylight hours)

11.3 RESPONSE

In the event an inadvertent drilling fluid release is observed, the EI and the Contractor will assess to determine the amount of fluid being released and potential for the release to reach sensitive resource areas (e.g., wetlands and waterbodies). Response measures will vary based on location of inadvertent release as discussed below.

11.3.1 Upland Locations

Response measures include the following:

- The EI will evaluate the release to determine if containment structures are warranted and if they will effectively contain the release.
- If the amount of the surface release is not great enough to allow the practical physical collection from the affected area, it will be diluted with clean water and/or the fluid will be allowed to dry and dissipate naturally.
- Earthen or sandbag berms, silt fence, and/or hay bales will be installed to contain small releases and prevent migration of drilling fluid.
- The Contractor will remove excess fluid at a rate sufficient to prevent an uncontrolled release.
- If the amount of the surface release exceeds that which can be completely contained with hand-placed barriers, small collection sumps (less than 5 cubic yards) may be used (with approval from Enbridge) to remove released drilling fluid by the use of portable pumps and hoses.

- The EI will inform the Contractor to initiate immediate suspension of drilling operations if the fluid release cannot be effectively contained.

11.3.2 Wetland and Waterbody Locations

This section also applies to areas immediately adjacent to wetlands and waterbodies, such as stream banks or steep slopes, where drilling fluid releases could quickly reach surface waters.

- In the event of a drilling fluid release in wetlands, waterbodies, or adjacent areas:
 1. The EI will evaluate the release, and the Contractor will implement appropriate containment measures.
 2. The EI and the Contractor will evaluate the recovery measures to determine the most effective collection method.
 3. Enbridge Engineering and the Contractor will review and consider adjusting drill pressures, pump volume rates, and drill profile, based on BMPs, to minimize the extent of the release.
 4. Enbridge will suspend drilling operations if containment measures do not effectively control the release.
- If the amount of the surface release exceeds that which can be contained with hand-placed barriers, small collection sumps (less than 5 cubic yards) may be utilized to collect released drilling fluid for removal by the use of portable pumps and hoses.
- If the amount of the surface release is not great enough to allow the practical physical collection from the affected area without causing additional impacts, with approval from both Enbridge Environmental and Construction Management, the drilling fluid may be diluted with clean water and/or the fluid will be allowed to dry and dissipate naturally.
- Excess fluid will be held within the containment area and removed using pumps or other appropriate measures at a rate sufficient to maintain secure containment.
- Recovered fluid will be stored in a temporary holding tank or other suitable structure out of the floodplain and/or wetland for reuse or eventual disposal in an approved disposal facility
- Enbridge will consult with the appropriate regulatory agencies to evaluate the circumstances of the release, discuss additional containment or cleanup requirements, and determine whether and under what conditions the HDD may proceed.

11.4 NOTIFICATION AND RESUMPTION OF SUSPENDED HDD OPERATIONS

The Contractor will immediately notify the EI of all drilling fluid releases. If the EI determines the release affects wetland or waterbody areas, he or she will immediately notify Enbridge Environment and Construction Management and the appropriate regulatory agencies.

If notifications are necessary during non-business hours they will be done according to prior arrangements made between Enbridge and the regulatory agencies. Follow-up notifications will be made as necessary and practicable.

The conditions under which drilling/boring operations can resume will be discussed with appropriate regulatory agencies and/or field representatives. If containment measures are functioning, and the circumstances and potential impacts of the release are understood, drilling/boring operations will resume.

11.5 CLEAN-UP

The following measures are to be considered as appropriate:

- Drilling fluid will be cleaned up by hand using hand shovels, buckets and soft-bristled brooms as possible without causing extensive ancillary damage to existing vegetation. Clean water washes may also be employed if deemed beneficial and feasible.
- Containment structures will be pumped out and the ground surface scraped to bare topsoil without causing undue loss of topsoil or ancillary damage to existing and adjacent vegetation.
- Material will be collected in containers for temporary storage prior to removal from the site.
- The EI will regularly evaluate the potential for secondary impact from the clean-up process and clean-up activities terminated if physical damage to the site is deemed to exceed the benefits of removal activities. This decision will be made in consultation with the appropriate regulatory agencies and/or Enbridge.

11.6 RESTORATION AND POST-CONSTRUCTION MONITORING

Following cleanup activities, restoration and revegetation of affected areas will be completed in accordance with all applicable local, state, and federal permits in addition to Enbridge's EPP. Enbridge will monitor the release site as appropriate to assure adequate restoration.

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Figures

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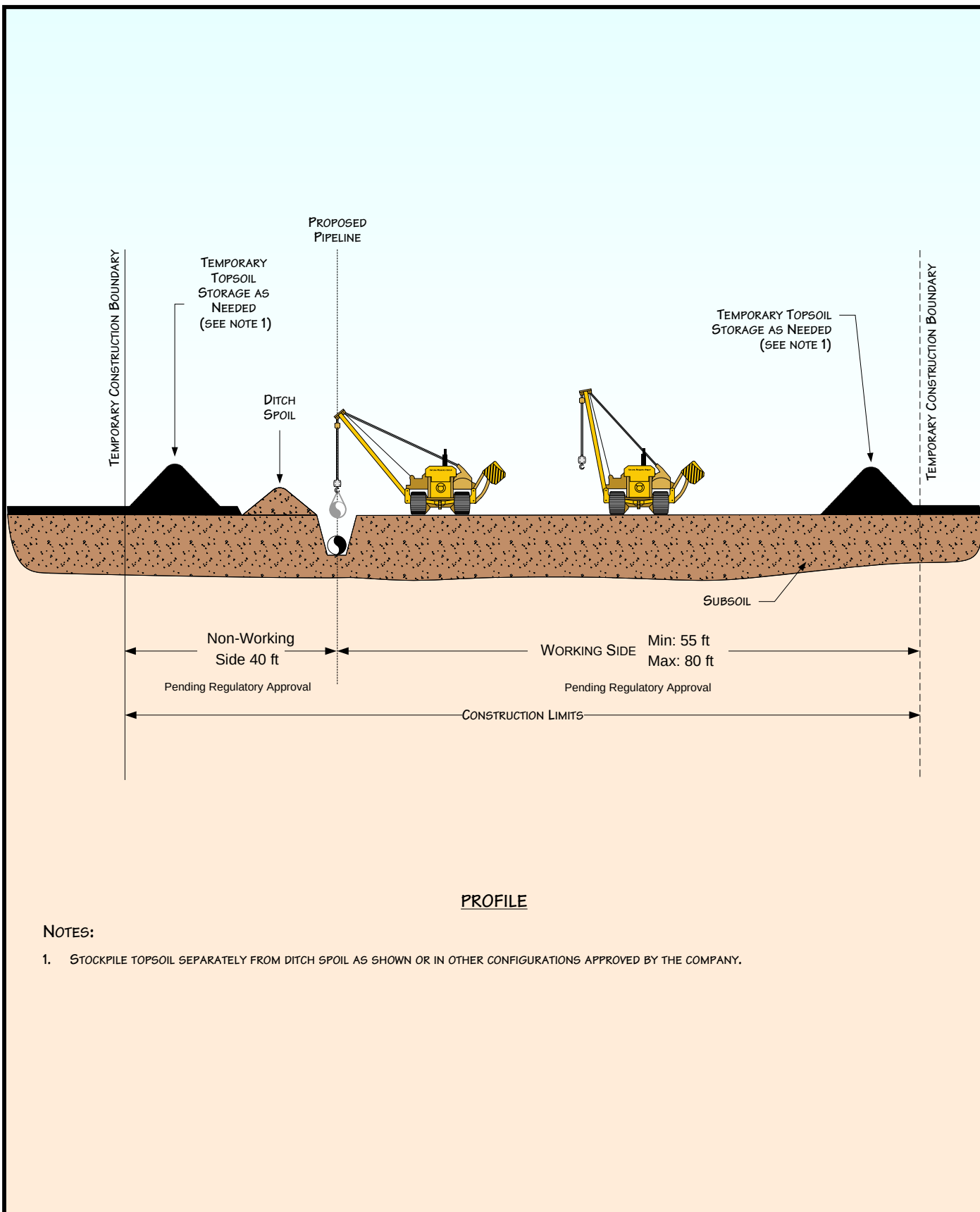


Figure 1
Environmental Protection Plan
 Typical Topsoil Segregation - Full Right-of-Way

DATE: 7/9/2001

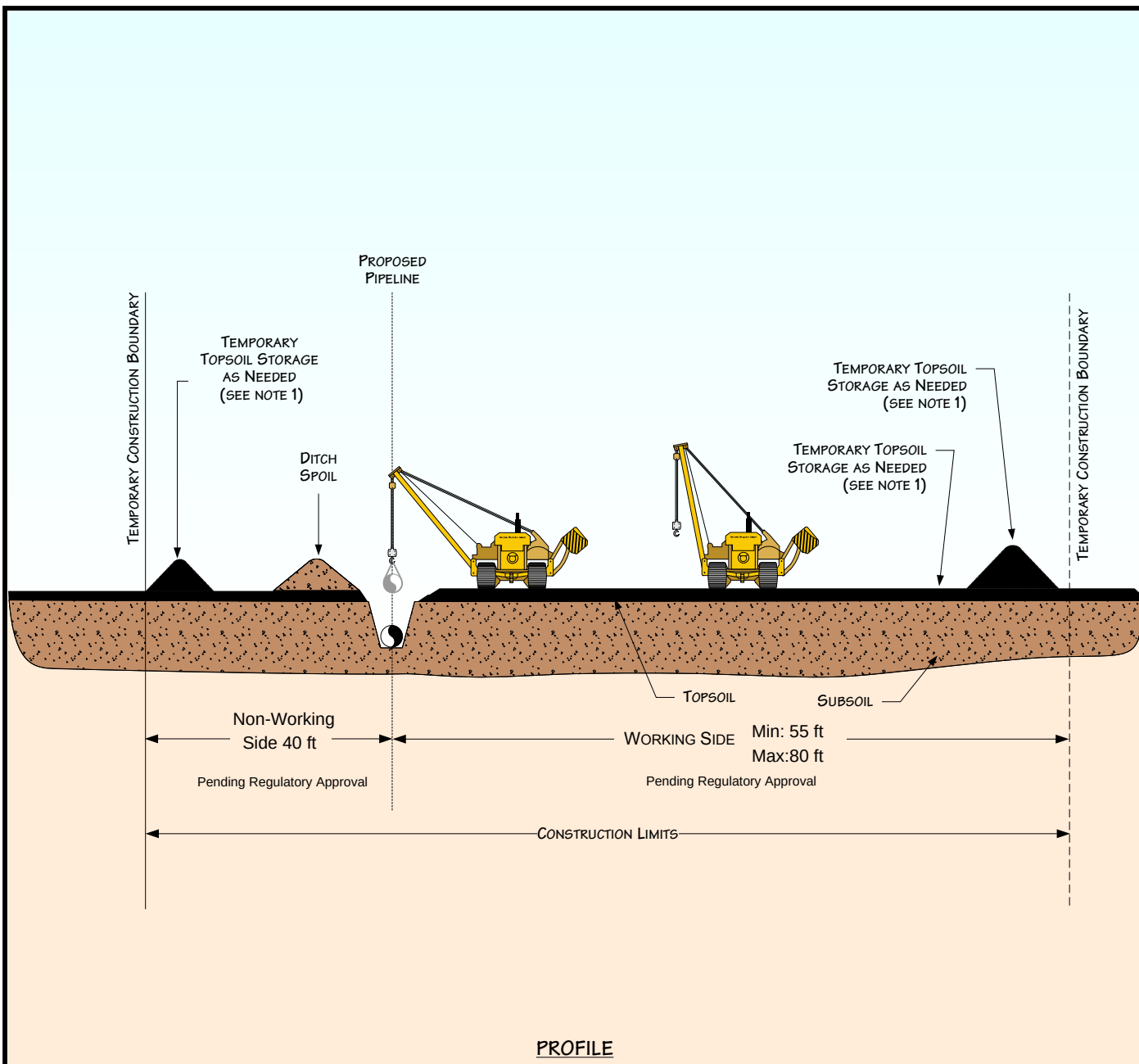
REVISED: 3/11/2011

SCALE: NTS

DRAWN BY: JPBOENTJE

K:\CLIENT_PROJECTS\ID-FIEEL\2011-019\FIG 1-3_TYPICAL_TOPSOIL_SEGREGATION.VSD





PROFILE

NOTES:

1. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL AS SHOWN OR IN OTHER CONFIGURATIONS APPROVED BY THE COMPANY.



Figure 2
Environmental Protection Plan
 Typical Topsoil Segregation –
 Trench Line Only

DATE: 7/9/2001

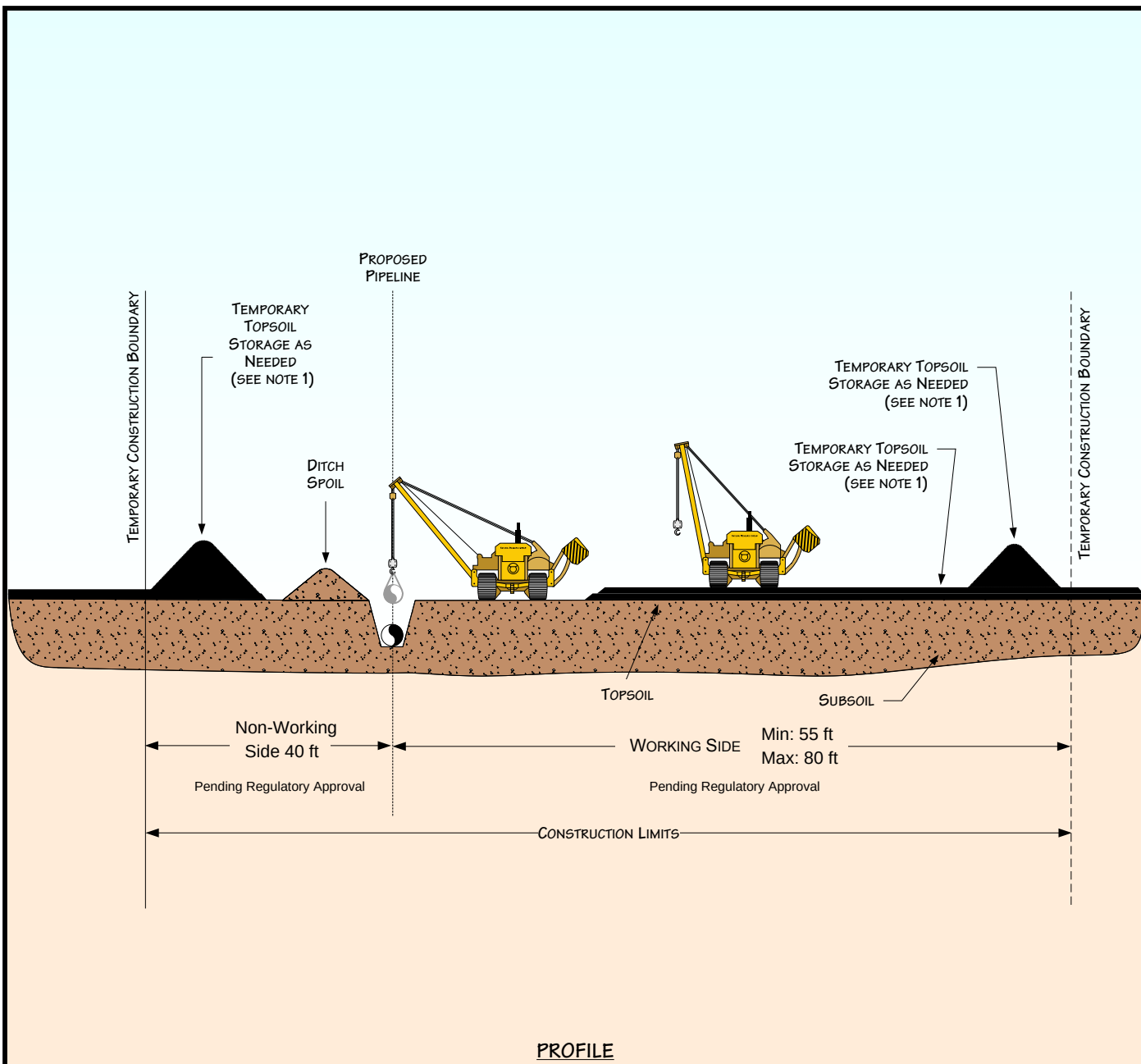
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DRAWN BY: JPBOENTJE

K:\CLIENT_PROJECTS\ID-FIEEL\2011-019\FIG 1-3_TYPICAL_TOPSOIL_SEGREGATION.VSD





PROFILE

NOTES:

1. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL AS SHOWN OR IN OTHER CONFIGURATIONS APPROVED BY THE COMPANY.



Figure 3
Environmental Protection Plan
 Typical Topsoil Segregation –
 Modified Ditch Plus Spoil Side

DATE: 7/9/2001

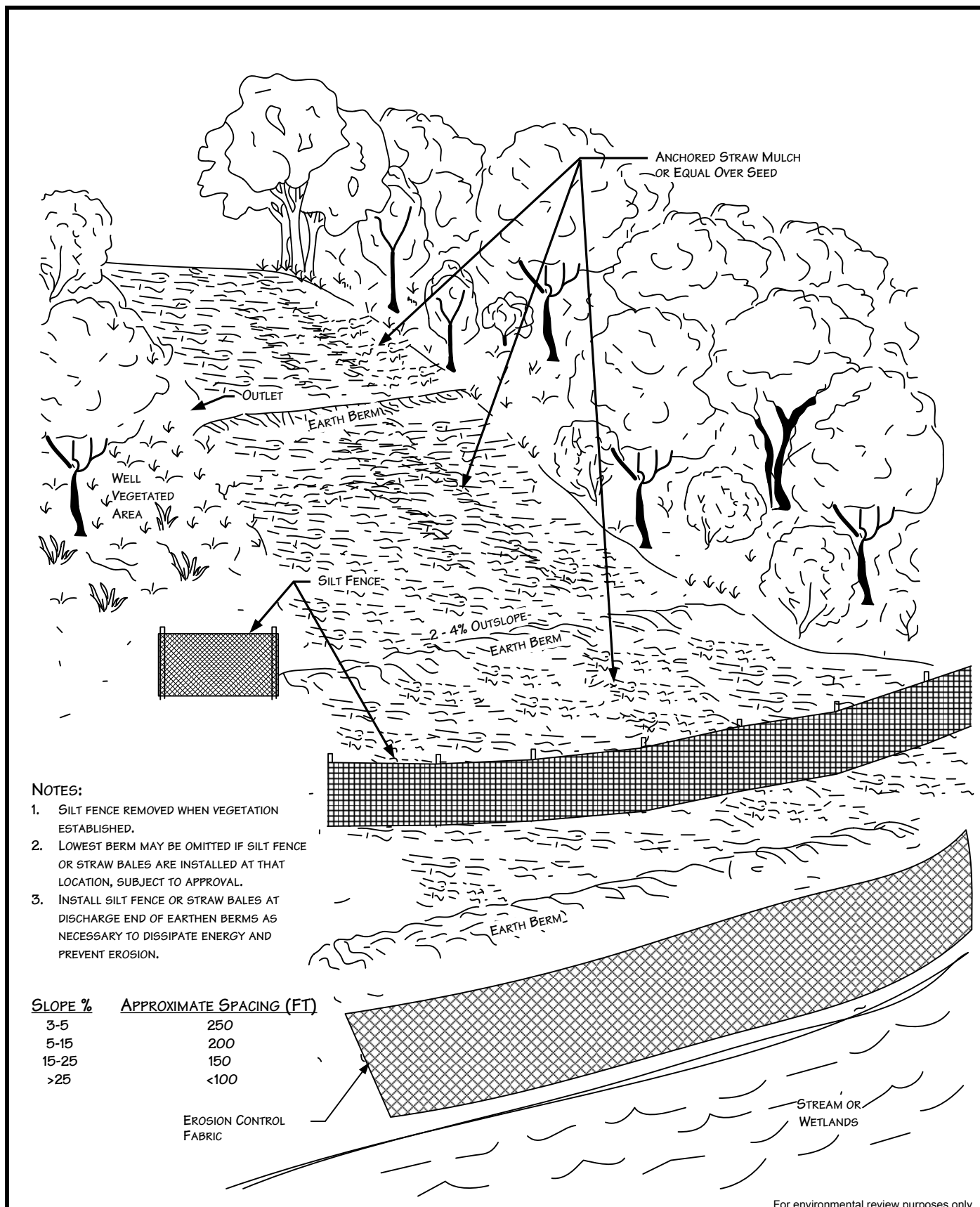
REVISED: 3/11/2011

SCALE: NTS

DRAWN BY: JPBOENTJE

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Figure 4
Environmental Protection Plan
 Typical Temporary or Permanent Berms
 Perspective View

DATE: 11/14/2000

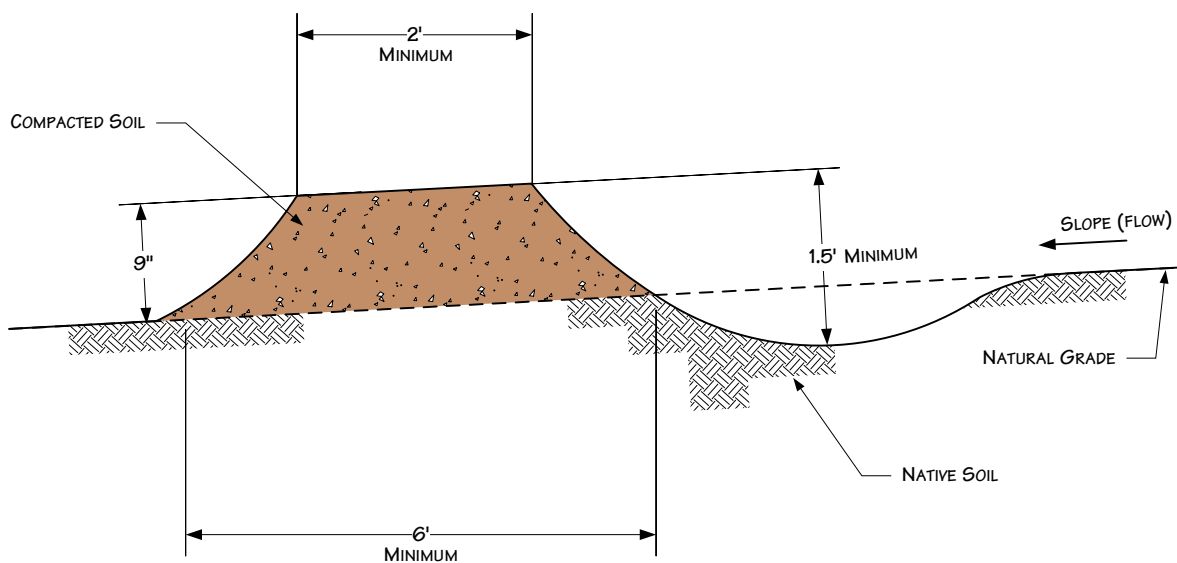
REVISED: 3/11/2011

SCALE: NTS

DRAWN BY: KMKENDALL

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NOTES

1. BERMS SHALL BE CONSTRUCTED WITH 2 TO 4 PERCENT OUTSLOPE.
2. BERMS SHALL BE OUTLETED TO WELL VEGETATED STABLE AREAS, SILT FENCES, STRAW BALES OR ROCK APRONS.
3. BERMS SHALL BE SPACED AS DESCRIBED IN CONSTRUCTION SPECIFICATIONS.
4. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS.

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Figure 5
Environmental Protection Plan
 Typical Temporary or Permanent Berms
 Elevation View

DATE: 5/25/2001

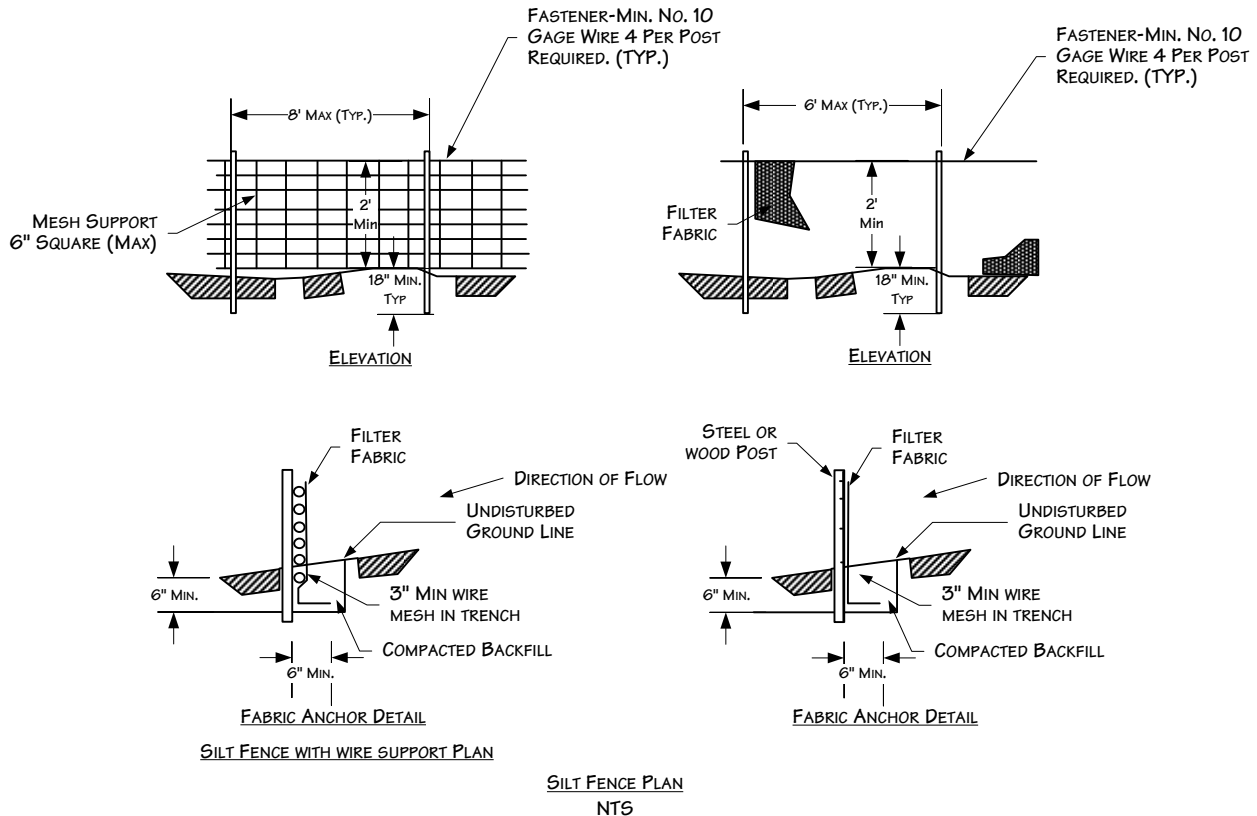
REVISED: 3/11/2011

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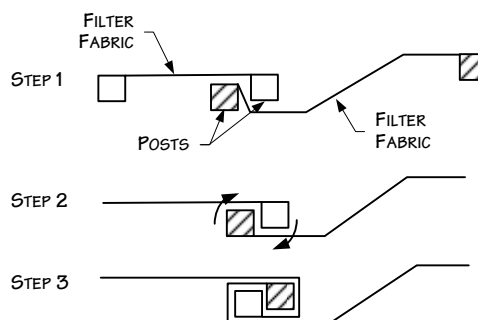
K:\CLIENT PROJECTS\ID-PEEL\2011-019\FIG_5_BERMS_ELEVATION_VIEW.VSD





NOTES:

1. WIRES OF MESH SUPPORT SHALL BE MIN. GAGE NO. 12.
2. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF THE SPECIFICATION WITH EQUIVALENT OPENING SIZE OF AT LEAST 30 FOR NONWOVEN AND 50 FOR WOVEN. (SIEVE NO.)
3. THE POSTS USED TO SUPPORT THE SILT FENCE SHOULD BE HARDWOOD MATERIAL WITH A MINIMUM CROSS SECTIONAL AREA OF 4 INCHES SQUARE AND 4 FEET LONG. METAL POSTS SHOULD BE USED IN AREAS THAT POND WATER.



NOTES:

1. PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE.
2. ROTATE BOTH POSTS AT LEAST 180 DEGREES IN A CLOCKWISE DIRECTION TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL.
3. DRIVE BOTH POSTS A MINIMUM OF 18 INCHES IN THE GROUND AND BURY THE FLAP.

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Figure 6
Environmental Protection Plan
Typical Silt Fence Installation

DATE: 5/25/2001

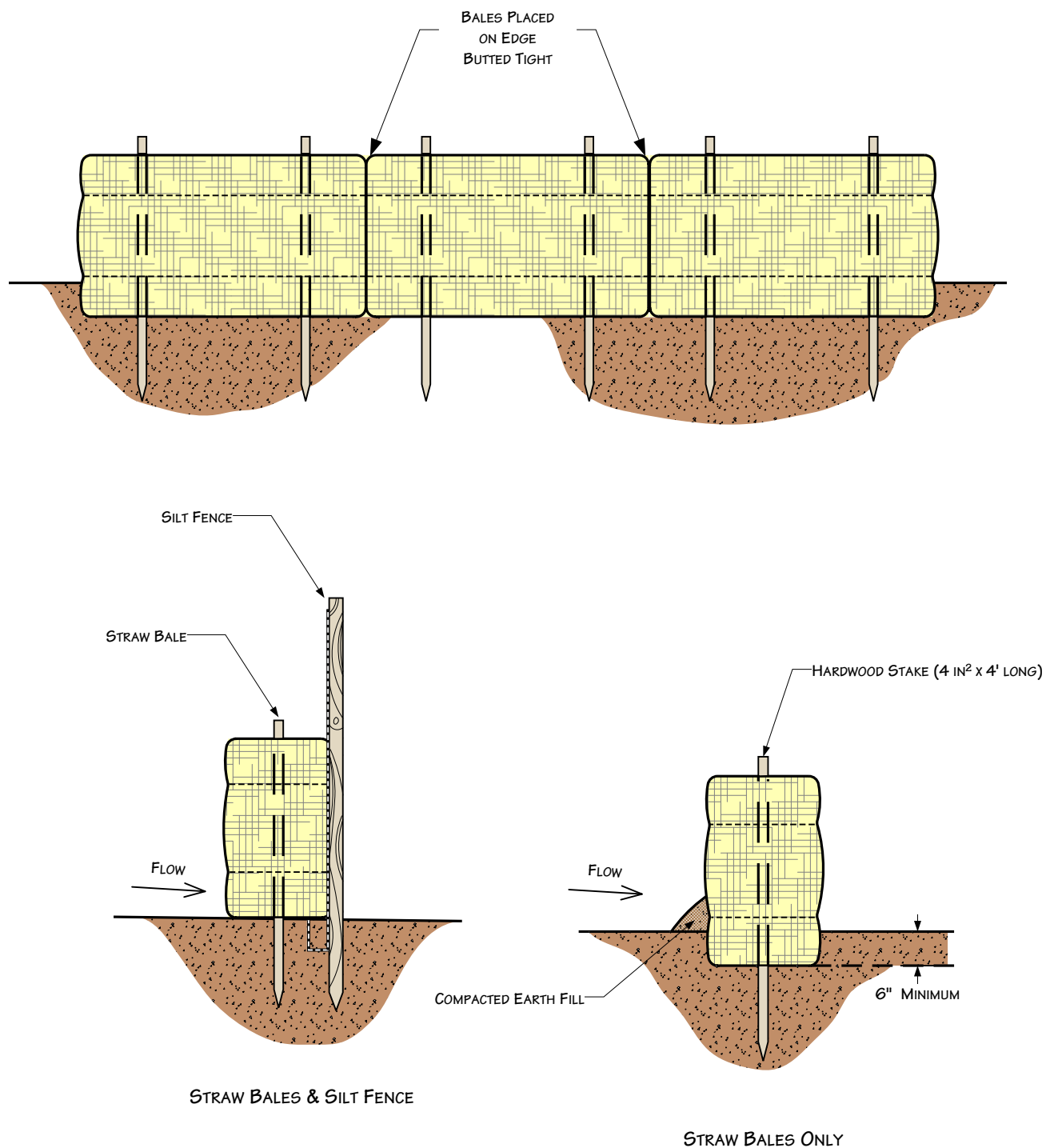
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Figure 7
Environmental Protection Plan
 Typical Straw Bale Installation

DATE: 5/25/01

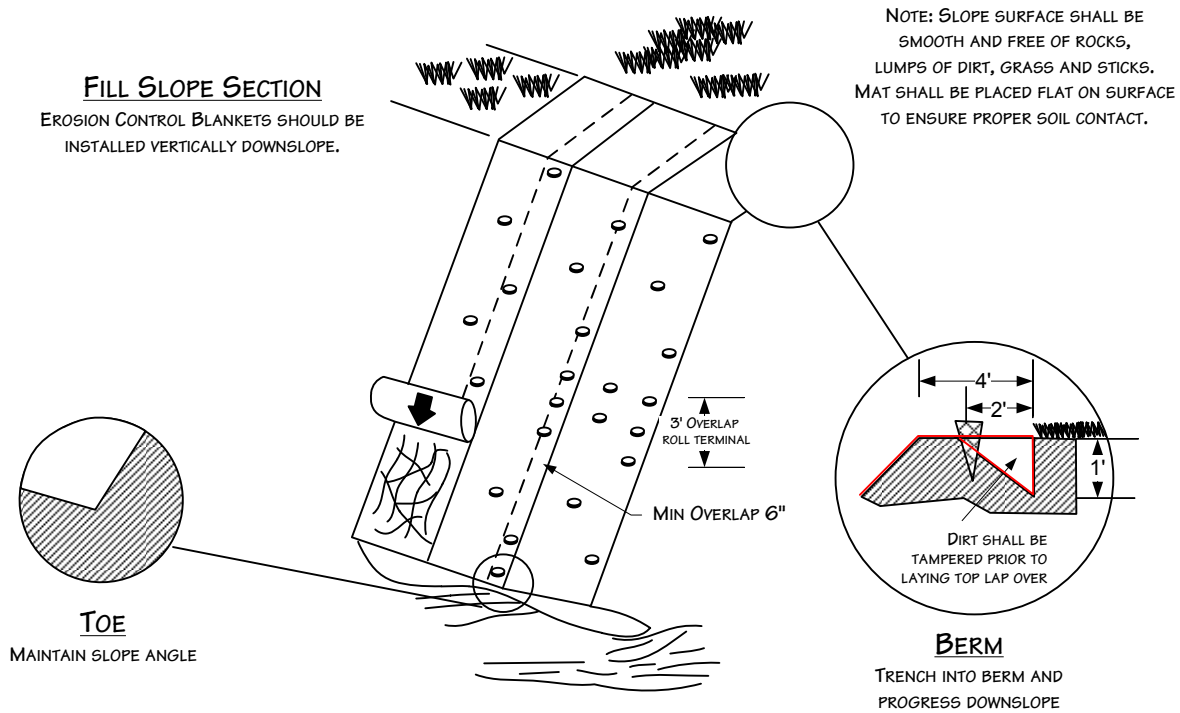
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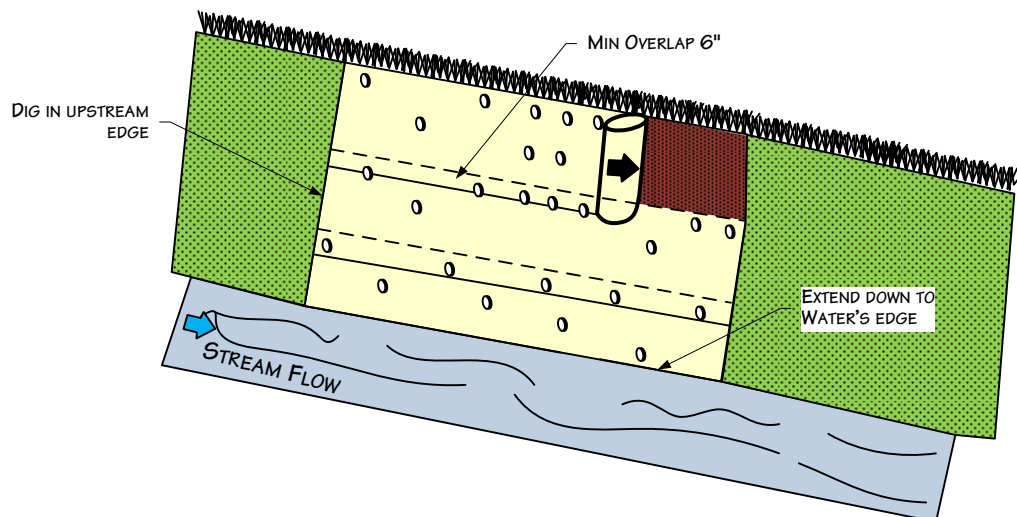
DRAWN BY: KMKENDALL

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STREAM CHANNEL
EROSION CONTROL BLANKETS SHOULD BE INSTALLED HORIZONTALLY WITH STREAM FLOW.



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Figure 8
Environmental Protection Plan
Typical Erosion Control Blanket Installation

DATE: 5/25/2001

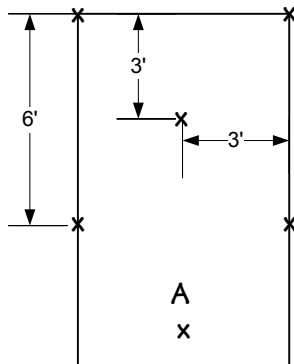
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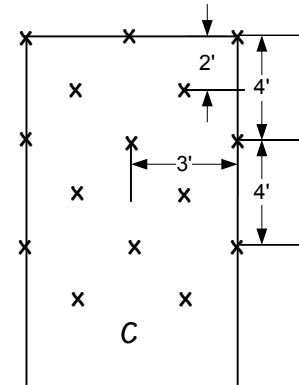
DRAWN BY: KMKENDALL

K:\CLIENT PROJECTS\ID-FEEL\2011-019\FIG 8 EROSION_CONTROL_BLANKET_INS TALL.VSD

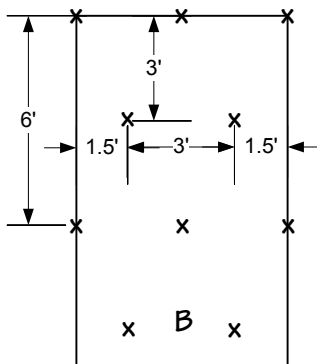
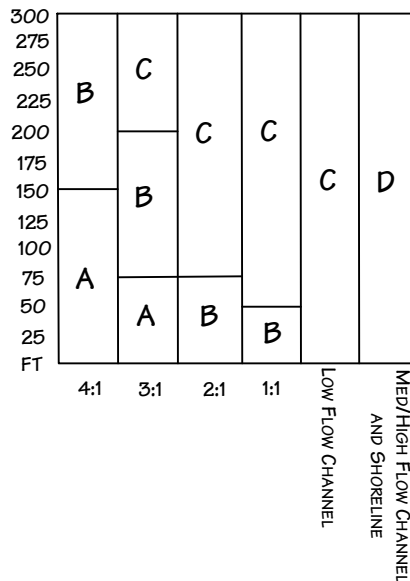




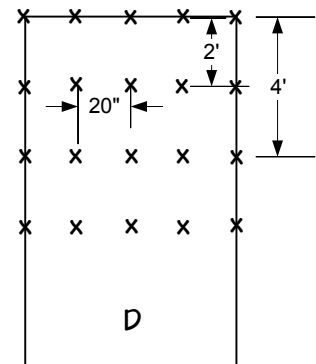
1 STAPLE PER SQ. YD



2 STAPLES PER SQ. YD



1 1/2 STAPLES PER SQ. YD



3 1/2 STAPLES PER SQ. YD

FOR OPTIMUM RESULTS, THESE
RECOMMENDED STAPLE PATTERN GUIDES
MUST BE FOLLOWED. SUGGESTED
ANCHORING METHODS VARY ACCORDING TO
THE MANUFACTURER. THIS CHART SHOWS
HOW TO SLOPE LENGTHS AND HOW
GRADIENTS AFFECT SAMPLING PATTERNS.

For environmental review purposes only.



Figure 9
Environmental Protection Plan
Typical Staple Pattern for
Erosion Control Fabric

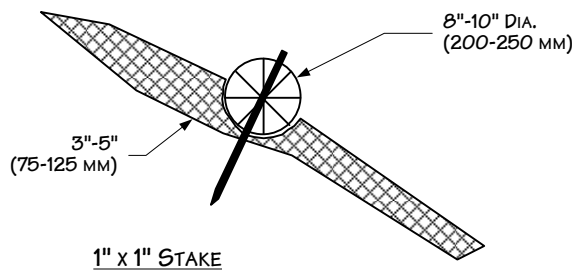
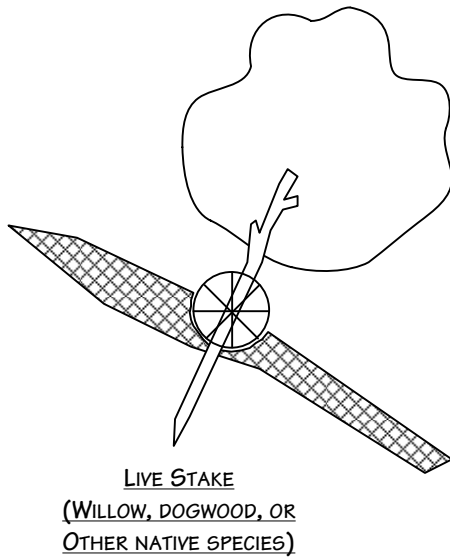
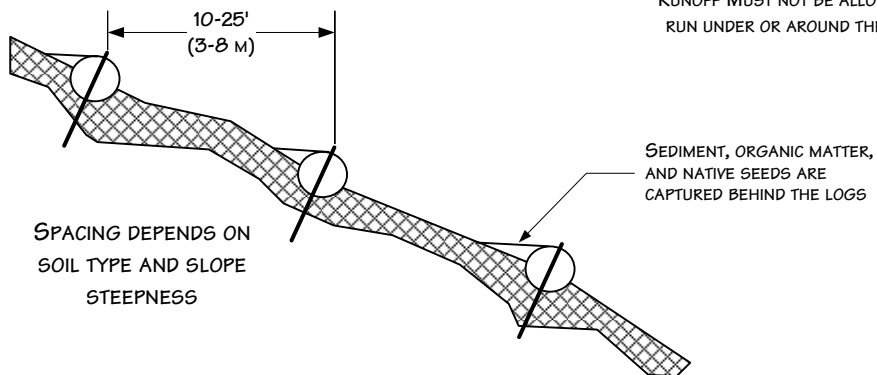
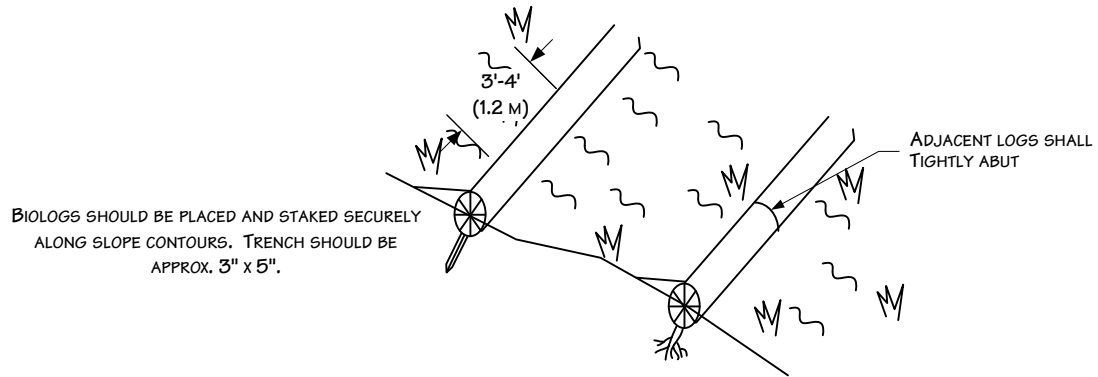
DATE: 5/25/2001
REVISED: 3/24/2011

SCALE: NTS

DRAWN BY: KMKENDALL

K:\CLIENT PROJECTS\ID-FEEL\2011-019\FIG 9 STAPLE PATTERN_EROSION_CON
TROL_FABRIC.VSD





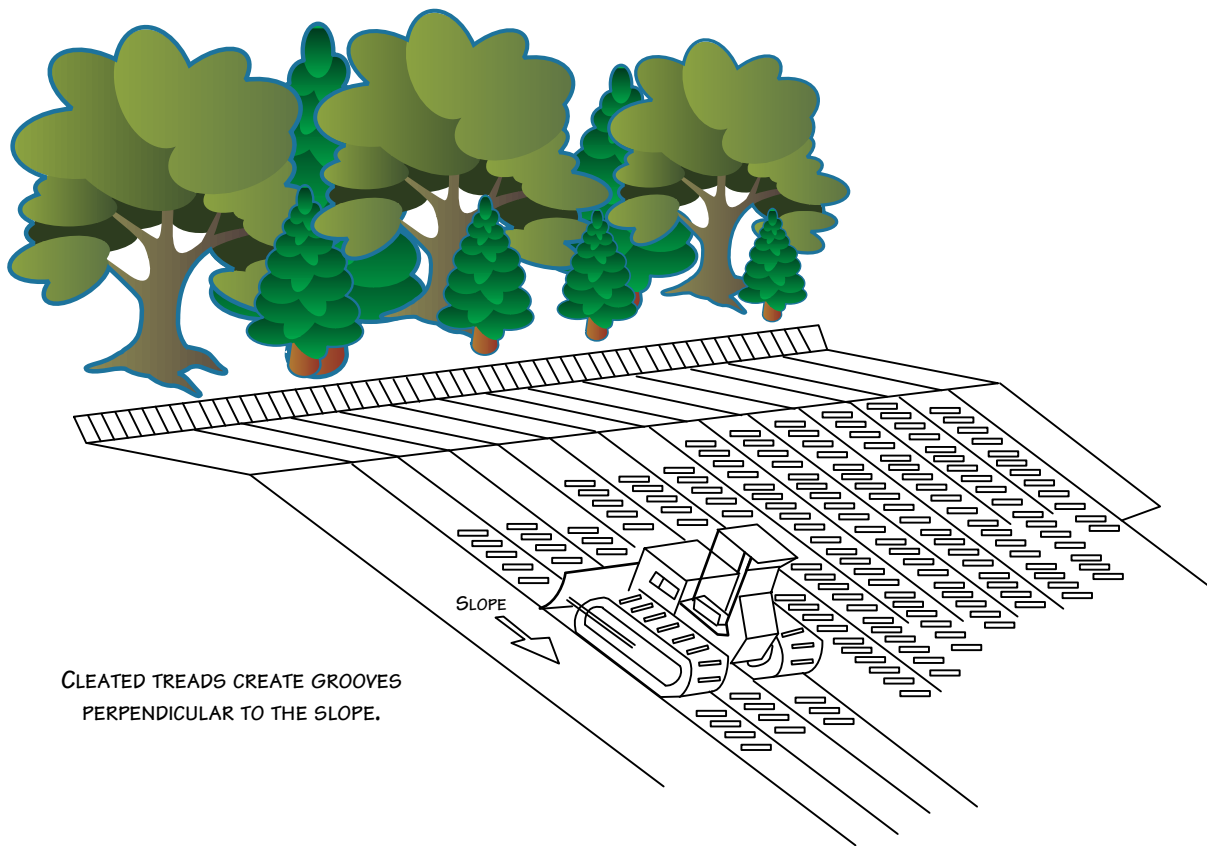
For environmental review purposes only.



Figure 10
Environmental Protection Plan
Typical Biolog Installation

DATE: 5/25/2001
REVISED: 3/24/2011
SCALE: NTS
DRAWN BY: KMKENDALL
K:\CLIENT PROJECTS\SD-FEEL\2011-019\FIG_10_BIOLOG INSTALL.VSD





For environmental review purposes only.



Figure 11
Environmental Protection Plan
Typical Cat Tracking

DATE: 5/25/2001

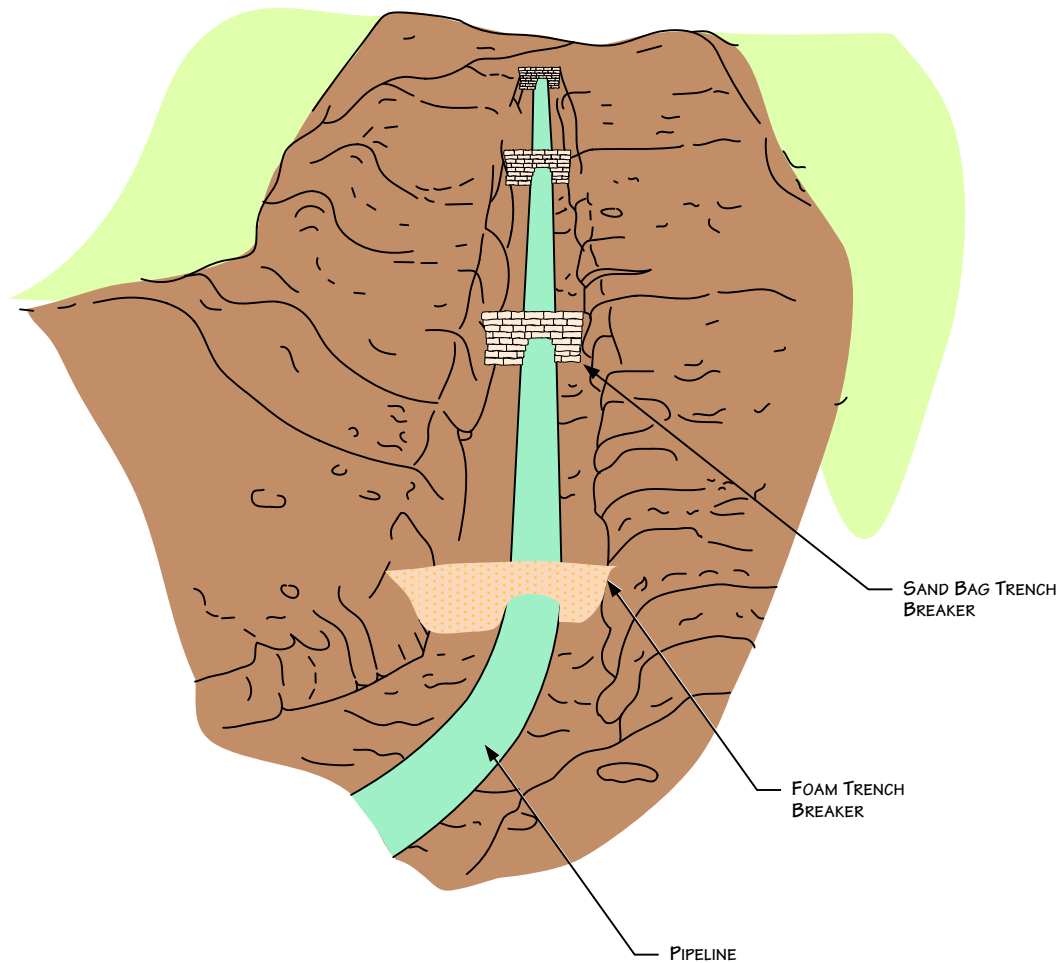
REVISED: 3/24/2011

SCALE: NTS

DRAWN BY: KMKENDALL

K:\CLIENT_PROJECTS\SD-FEEL\2011-019\FIG_11_CAT_TRACKING.VSD





NOTES

1. BAGS WILL NOT BE FILLED WITH TOPSOIL.
2. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS.

For environmental review purposes only.



Figure 12
Environmental Protection Plan
Typical Trench Breakers - Perspective View

DATE: 5/25/2001

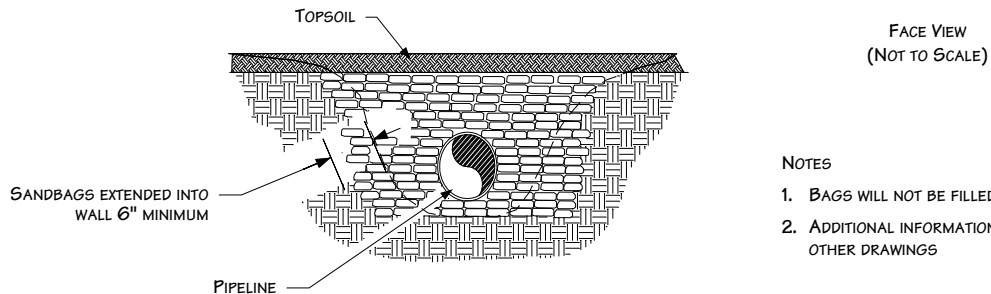
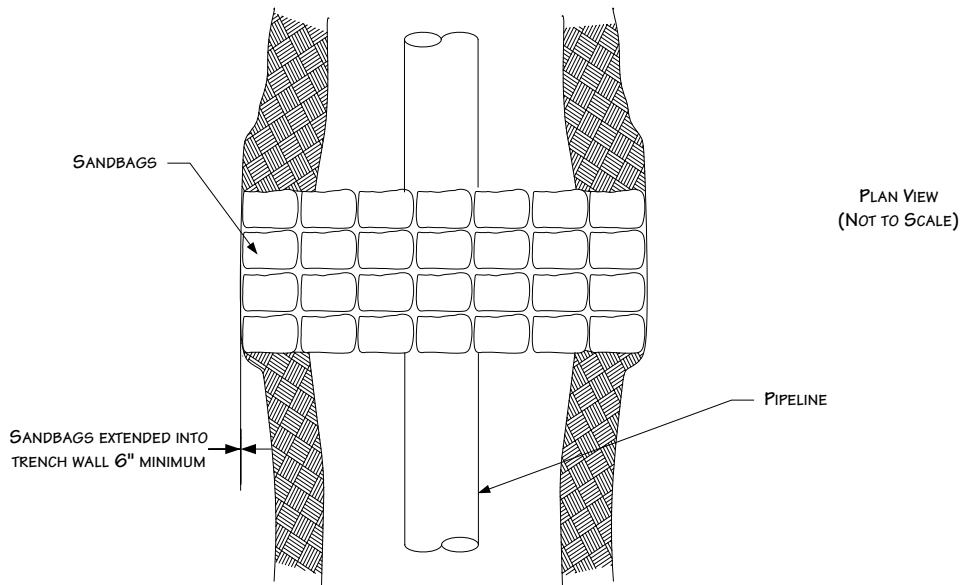
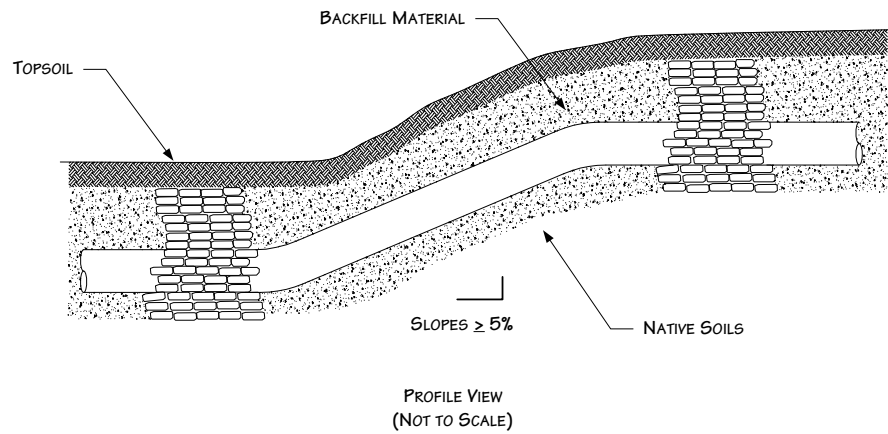
REVISED: 3/11/11

SCALE: NTS

DRAWN BY: KMKENDALL

K:\CLIENT PROJECTS\ID-FEEL\2011-019\FIG 12 TRENCH_BREAKER_PERSPECTIV E_VIEW.VSD





NOTES

1. BAGS WILL NOT BE FILLED WITH TOPSOIL
2. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS

For environmental review purposes only.



Figure 13
Environmental Protection Plan
Typical Trench Breakers – Plan & Profile View

DATE: 11/15/2000

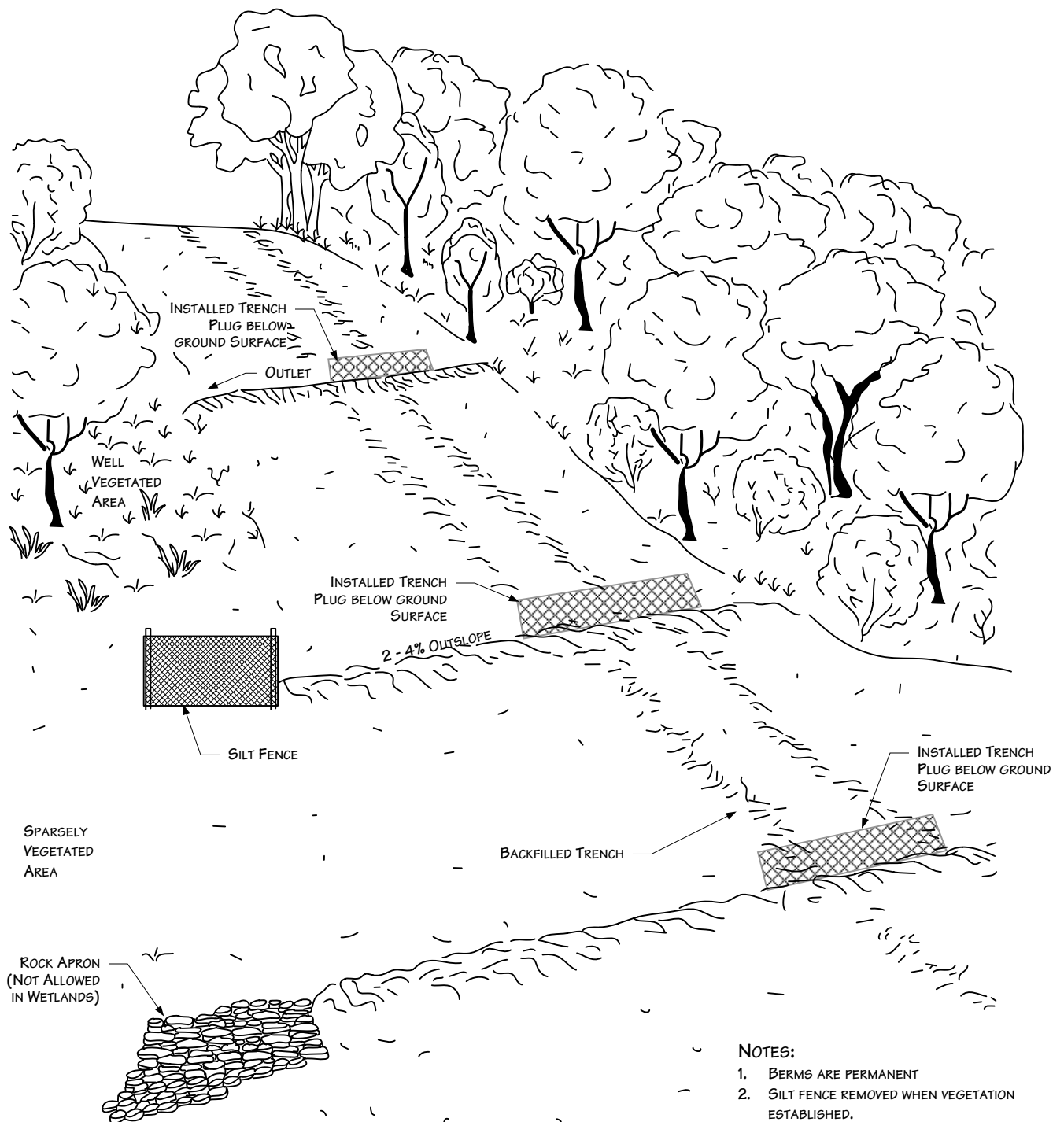
REVISED: 3/11/11

SCALE: NTS

DRAWN BY: KMKENDALL

K:\CLIENT PROJECTS\ID-FEEL\2011-019\FIG_13_TRENCH_BREAKER_PLAN_PROFILE_VIEW.VSD





PERSPECTIVE VIEW
(NOT TO SCALE)

SLOPE %	APPROXIMATE SPACING (FT)
3-5	250
5-15	200
15-25	150
>25	<100

NOTES:

1. BERMS ARE PERMANENT
2. SILT FENCE REMOVED WHEN VEGETATION ESTABLISHED.
3. LOWEST BERM MAY BE OMITTED IF SILT FENCE OR STRAW BALES ARE INSTALLED AT THAT LOCATION, SUBJECT TO APPROVAL.
4. INSTALL SILT FENCE OR STRAW BALES AT DISCHARGE END OF EARTHEN BERMS AS NECESSARY TO DISSIPATE ENERGY AND PREVENT EROSION.

For environmental review purposes only.



Figure 14
Environmental Protection Plan
Permanent Slope Breakers - Perspective View

DATE: 5/25/2001

REVISED: 3/11/11

SCALE: NTS

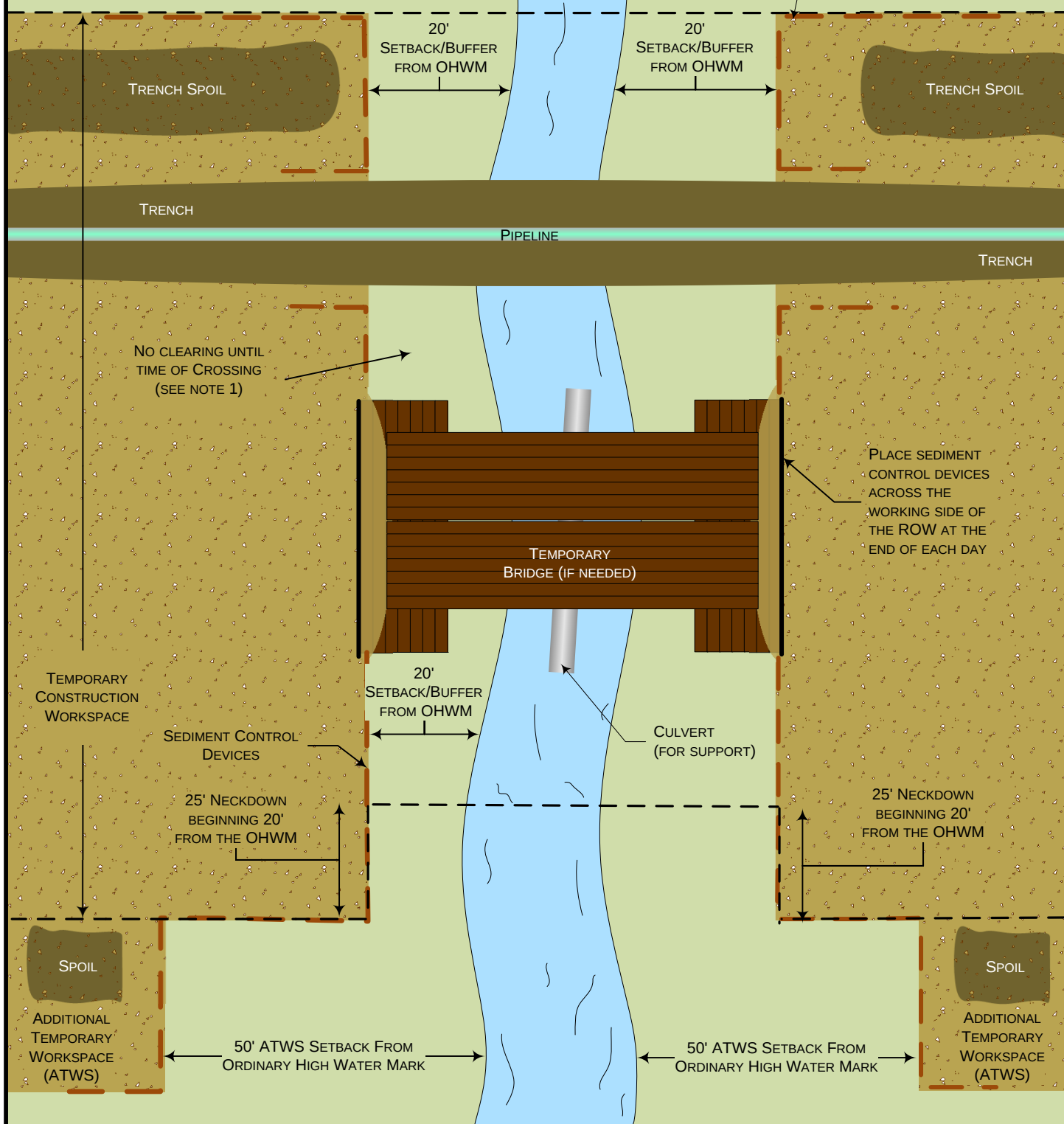
DRAWN BY: KMKENDALL

K:\CLIENT PROJECTS\ID-FEEL\2011-019\FIG 14_SLOPE_BREAKERS_PERSPECTIVE_VIEW.VSD



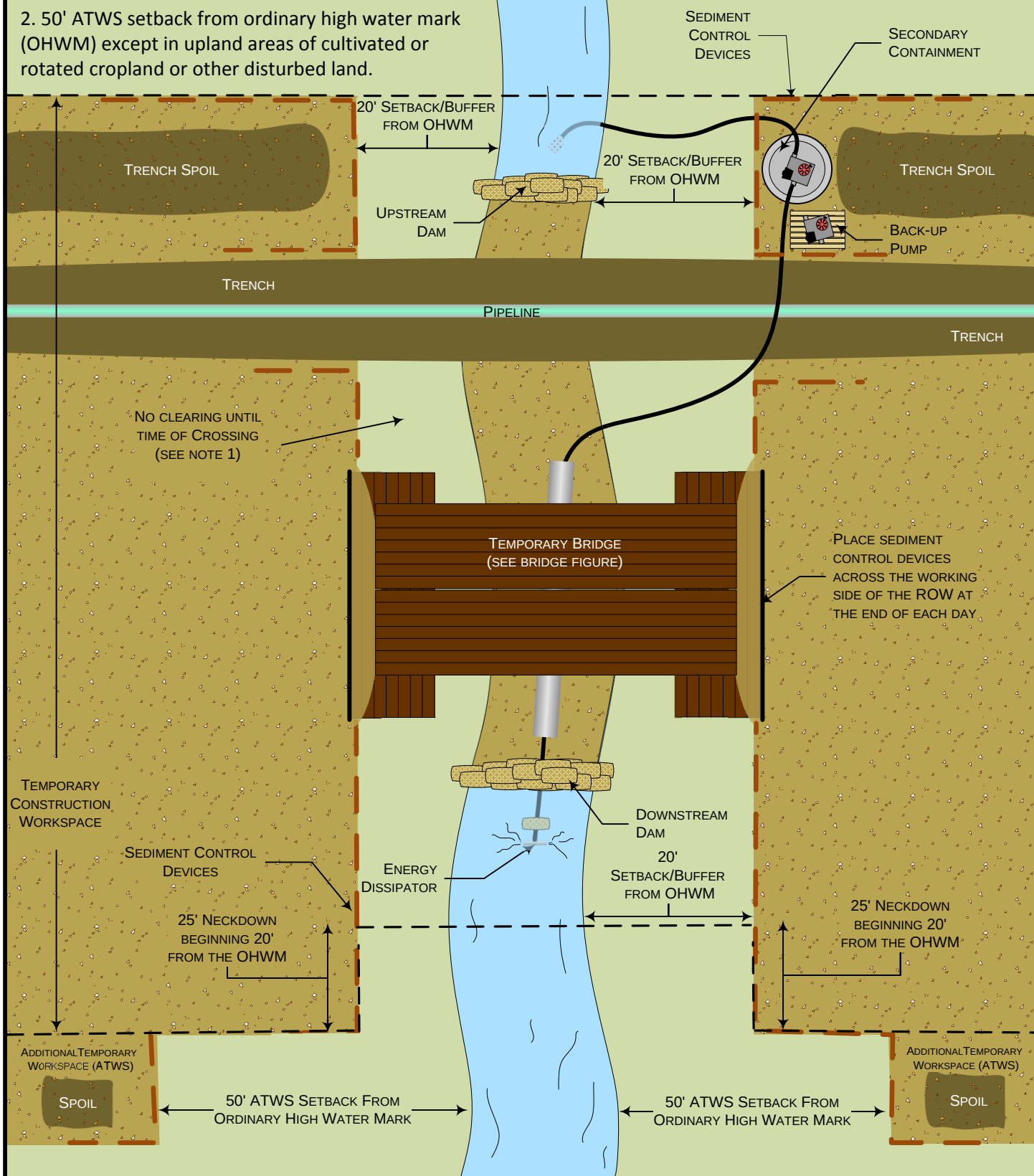
NOTES:

1. No clearing until time of crossing. Only woody vegetation may be flush cut during initial clearing.
2. 50' ATWS setback from ordinary high water mark (OHWM) except in upland areas of cultivated or rotated cropland or other disturbed land.



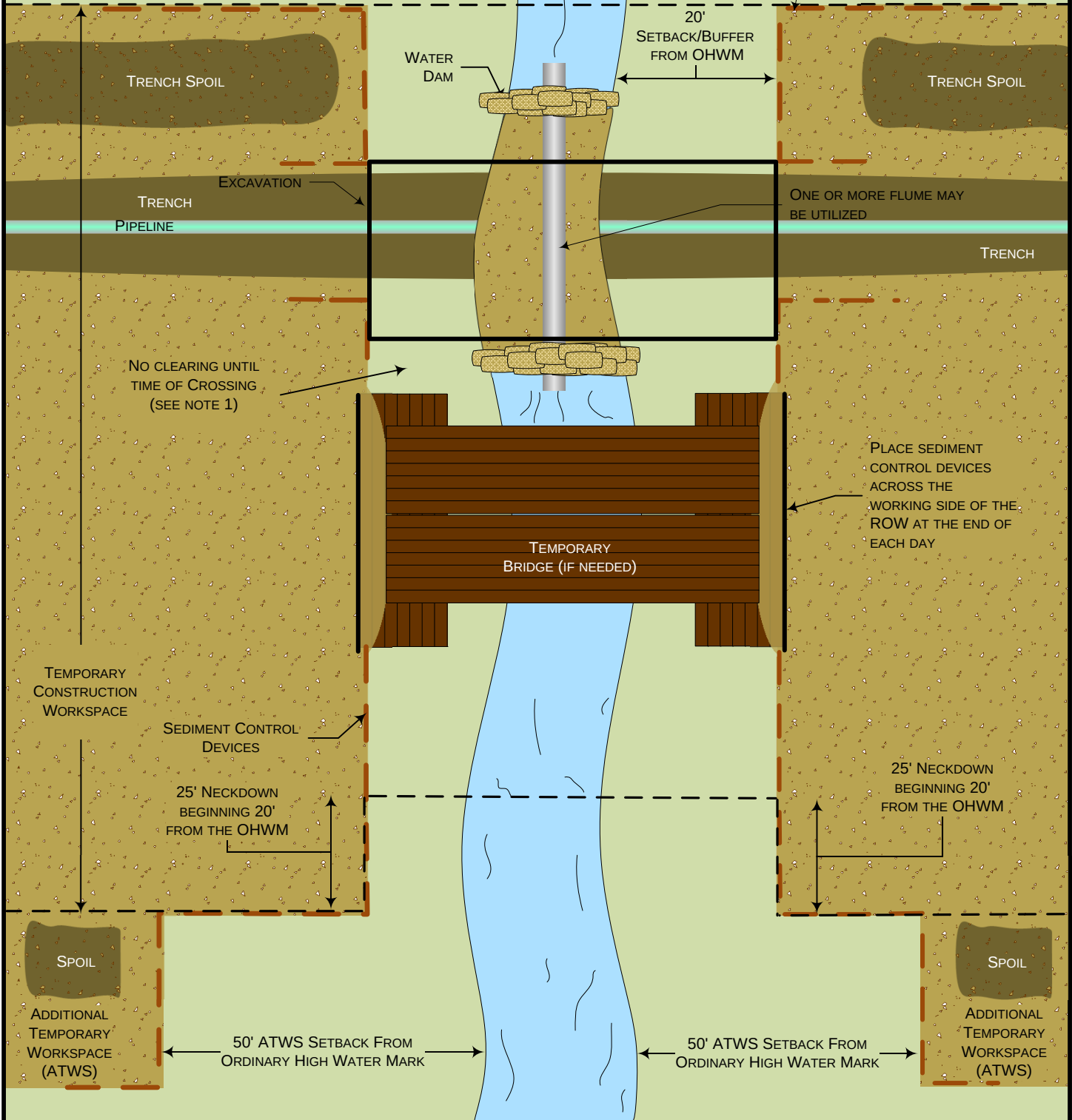
NOTES:

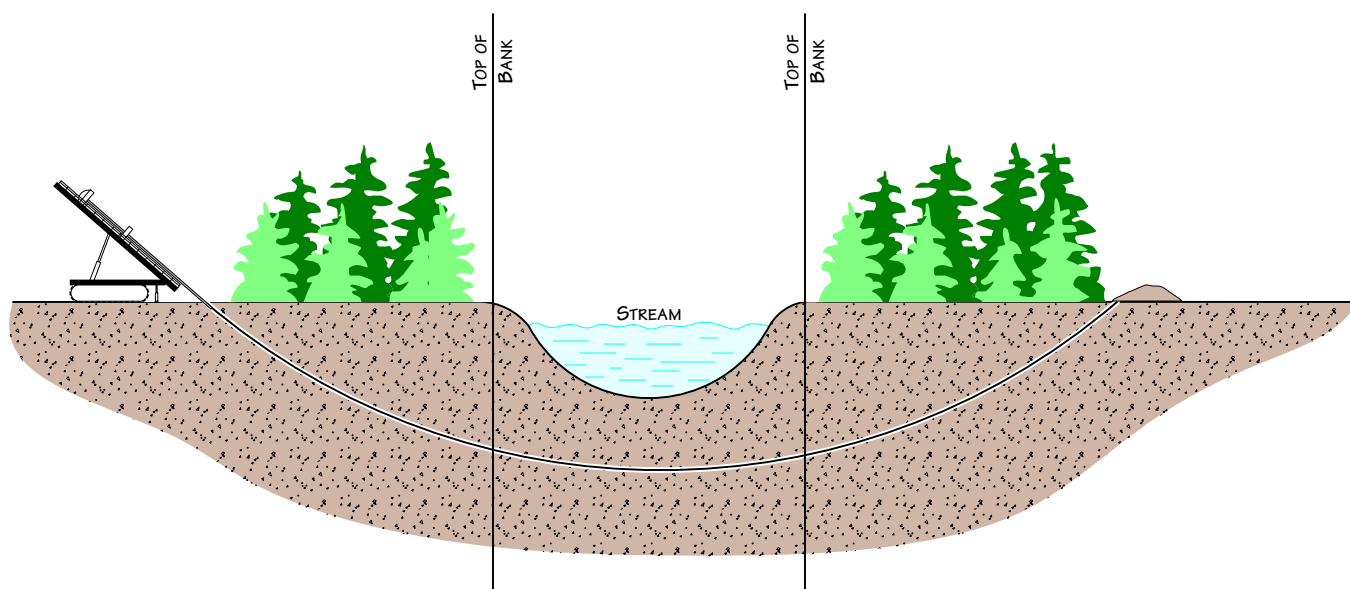
1. No clearing until time of crossing. Only woody vegetation may be flush cut during initial clearing.
2. 50' ATWS setback from ordinary high water mark (OHWM) except in upland areas of cultivated or rotated cropland or other disturbed land.



NOTES:

1. No clearing until time of crossing. Only woody vegetation may be flush cut during initial clearing.
2. 50' ATWS setback from ordinary high water mark (OHWM) except in upland areas of cultivated or rotated cropland or other disturbed land.





For environmental review purposes only.



Figure 18
Environmental Protection Plan
 Typical Waterbody Crossing
 Directional Drill Method

DATE: 7/14/2000

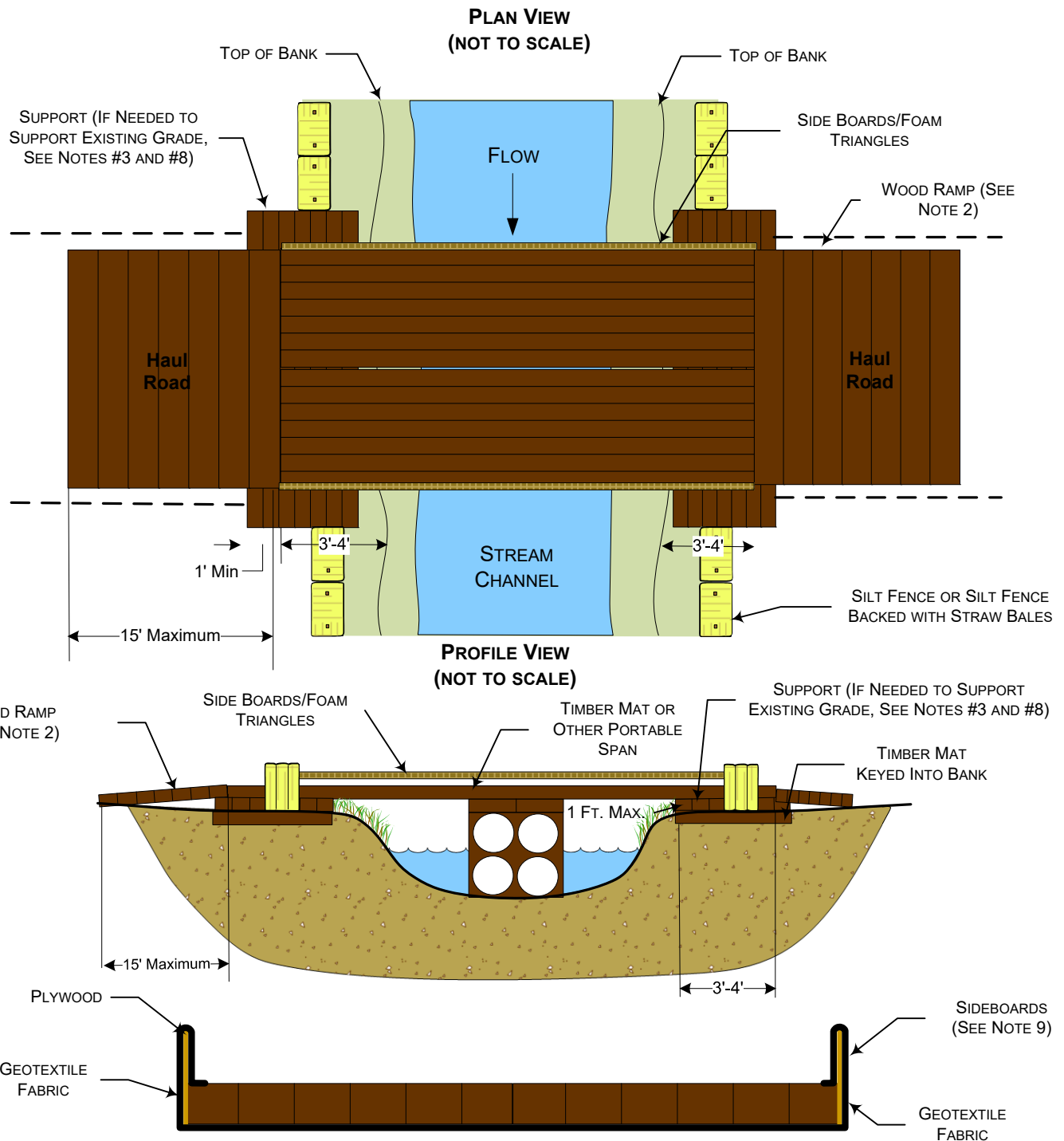
REVISED: 3/11/11

SCALE: NTS

DRAWN BY: KMKENDALL

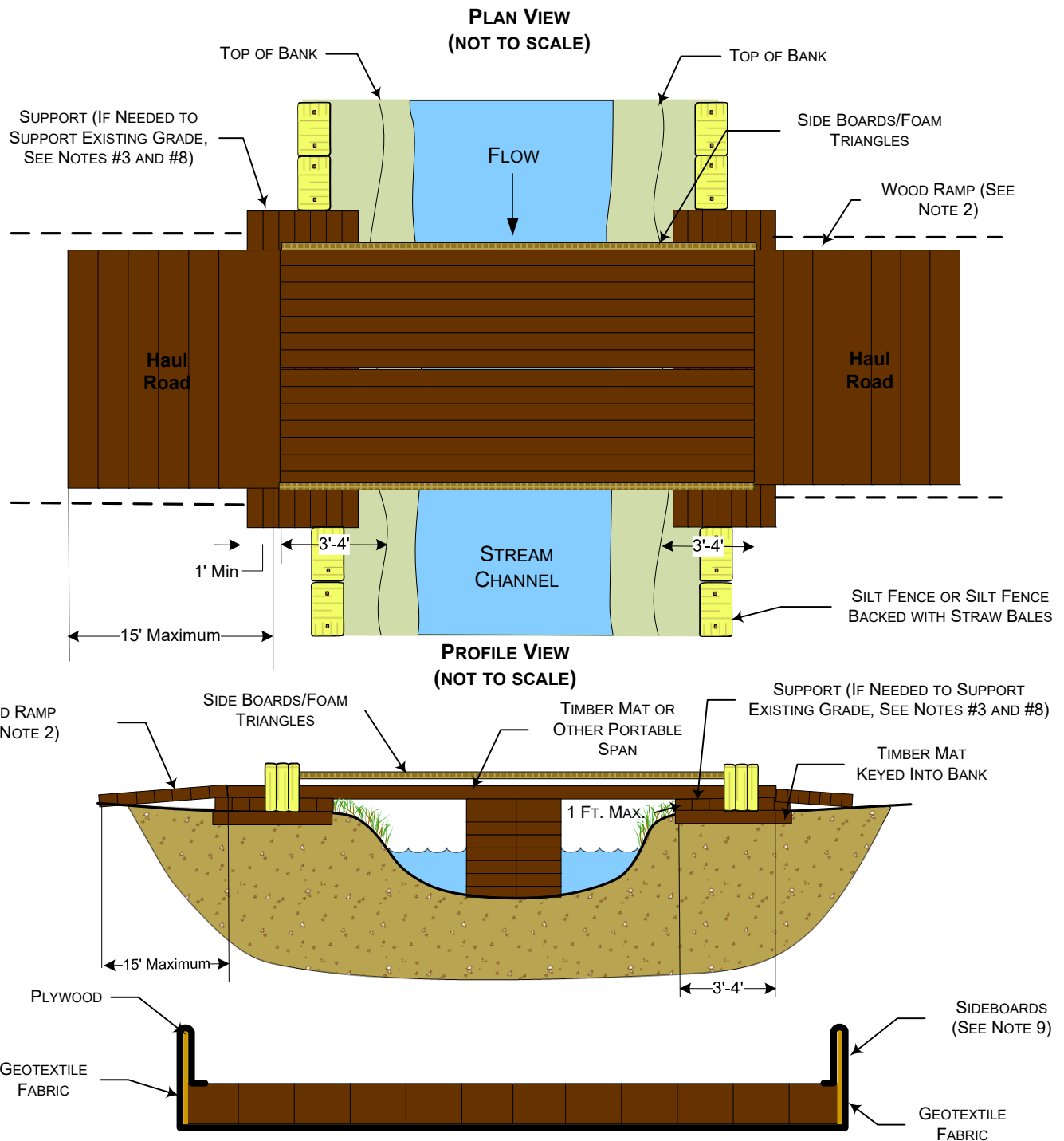
K:\CLIENT PROJECTS\ID-FEEL\2011-019\FIG_18_WATERBODY_DIRECTIONAL_DRILL_VSD





NOTES:

1. INSPECT BRIDGE OPENING PERIODICALLY AND FOLLOWING RAINFALLS OF OVER ½". REMOVE ANY DEBRIS RESTRICTING FLOW AND DEPOSIT IT AT AN UPLAND SITE OUTSIDE OF FLOODPLAIN.
2. IF PHYSICAL CIRCUMSTANCES PROHIBIT WOOD OR METAL RAMPS, EARTHEN RAMPS MAY BE USED AS APPROVED.
3. INSPECT BRIDGE ELEVATION SO BRIDGE REMAINS SUPPORTED ABOVE OHWM.
4. THE CULVERT SUPPORT MUST BE ANCHORED TO THE STREAM BOTTOM AND MAY NOT BE SUPPORTED WITH FILL.
5. EARTHEN RAMP CANNOT BE TALLER THAN 1' AND CANNOT EXTEND FOR MORE THAN 15' ON EITHER SIDE OF THE CROSSING.
6. THE BRIDGE MUST SPAN ABOVE OHWM TO OHWM.
7. ADDITIONAL SUPPORT MUST BE ADDED ON TOP OF BANK AND UNDER SPAN IF THE SPAN IS 12' WIDE OR GREATER, OR IF INITIAL SUPPORT STARTS TO SETTLE.
8. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE COMPANY'S ENVIRONMENTAL PROTECTION PLAN.
9. SIDEBOARDS WILL BE INSTALLED ON TEMPORARY BRIDGES TO MINIMIZE THE POTENTIAL FOR SEDIMENT TRANSPORT. SIDEBOARDS MAY BE CONSTRUCTED OUT OF PLYWOOD, OR EQUIVALENT, AND AFFIXED TO THE OUTER SIDES OF THE BRIDGE. GEO-TEXTILE FABRIC, OR EQUIVALENT, MUST ALSO BE ADEQUATELY SECURED TO THE UNDERSIDE OF THE BRIDGE TO PREVENT MATERIAL FROM FALLING THROUGH THE BRIDGE DECK. THE GEO-TEXTILE FABRIC OR AN EQUIVALENT SHOULD BE SECURED TO THE BOTTOM OF THE BRIDGE AND WRAPPED AROUND THE SIDEBOARDS IN A CONTINUOUS FASHION.



NOTES:

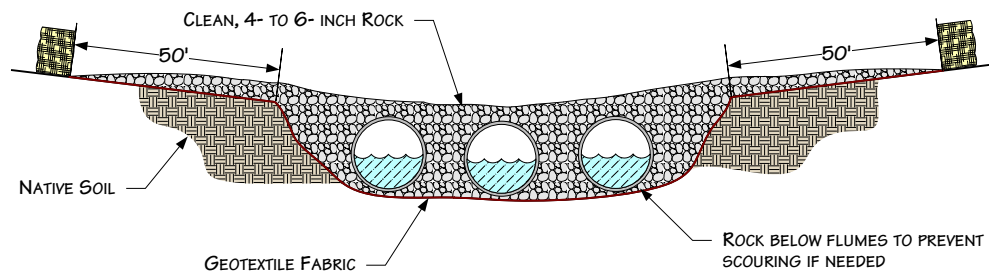
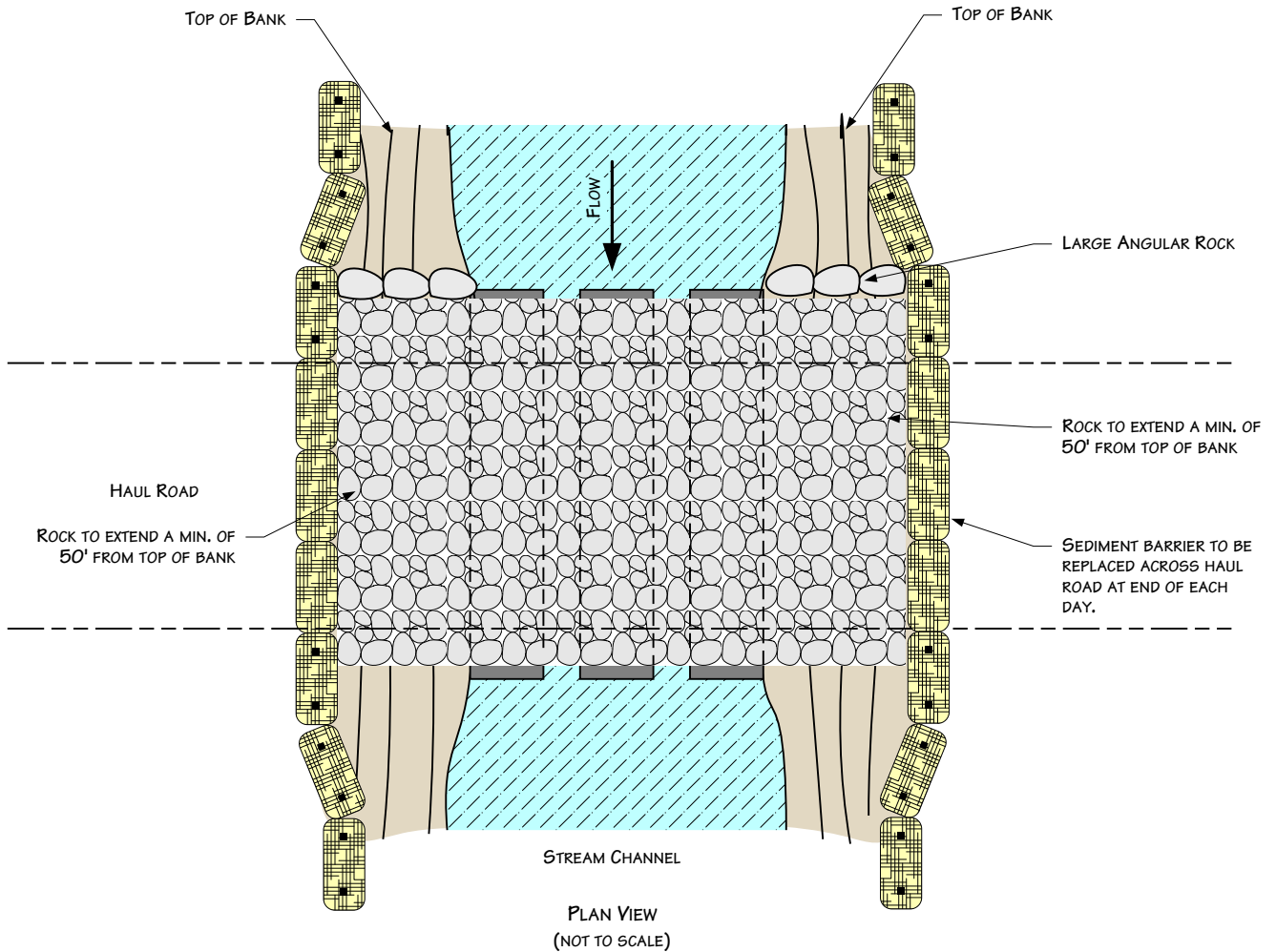
1. INSPECT BRIDGE OPENING PERIODICALLY AND FOLLOWING RAINFALLS OF OVER ½". REMOVE ANY DEBRIS RESTRICTING FLOW AND DEPOSIT IT AT AN UPLAND SITE OUTSIDE OF FLOODPLAIN.
2. IF PHYSICAL CIRCUMSTANCES PROHIBIT WOOD OR METAL RAMPS, EARTHEN RAMPS MAY BE USED AS APPROVED.
3. INSPECT BRIDGE ELEVATION SO BRIDGE REMAINS SUPPORTED ABOVE OHWM.
4. THE CULVERT SUPPORT MUST BE ANCHORED TO THE STREAM BOTTOM AND MAY NOT BE SUPPORTED WITH FILL.
5. EARTHEN RAMP CANNOT BE TALLER THAN 1' AND CANNOT EXTEND FOR MORE THAN 15' ON EITHER SIDE OF THE CROSSING.
6. THE BRIDGE MUST SPAN ABOVE OHWM TO OHWM.
7. ADDITIONAL SUPPORT MUST BE ADDED ON TOP OF BANK AND UNDER SPAN IF THE SPAN IS 12' WIDE OR GREATER, OR IF INITIAL SUPPORT STARTS TO SETTLE.
8. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE COMPANY'S ENVIRONMENTAL PROTECTION PLAN.
9. SIDEBOARDS WILL BE INSTALLED ON TEMPORARY BRIDGES TO MINIMIZE THE POTENTIAL FOR SEDIMENT TRANSPORT. SIDEBOARDS MAY BE CONSTRUCTED OUT OF PLYWOOD, OR EQUIVALENT, AND AFFIXED TO THE OUTER SIDES OF THE BRIDGE. GEO-TEXTILE FABRIC, OR EQUIVALENT, MUST ALSO BE ADEQUATELY SECURED TO THE UNDERSIDE OF THE BRIDGE TO PREVENT MATERIAL FROM FALLING THROUGH THE BRIDGE DECK. THE GEO-TEXTILE FABRIC OR AN EQUIVALENT SHOULD BE SECURED TO THE BOTTOM OF THE BRIDGE AND WRAPPED AROUND THE SIDEBOARDS IN A CONTINUOUS FASHION.



Figure 19B
Environmental Protection Plan
Typical Span Type Bridge
With or Without Instream Support (Timber Matted Support)

Environmental Protection Plan

Drawn by: **merjent**



NOTES:

1. STEEL FLUME PIPE(S) SIZED TO ALLOW FOR STREAM FLOW AND EQUIPMENT LOAD.
2. STRAW BALES SHALL BE PLACED ACROSS BRIDGE ENTRANCE EVERY NIGHT.
3. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS.

For environmental review purposes only.



Figure 20
Environmental Protection Plan
Typical Rock Flume Bridge

DATE: 5/25/2001

REVISED: 3/15/11

SCALE: NTS

DRAWN BY: KMKENDALL

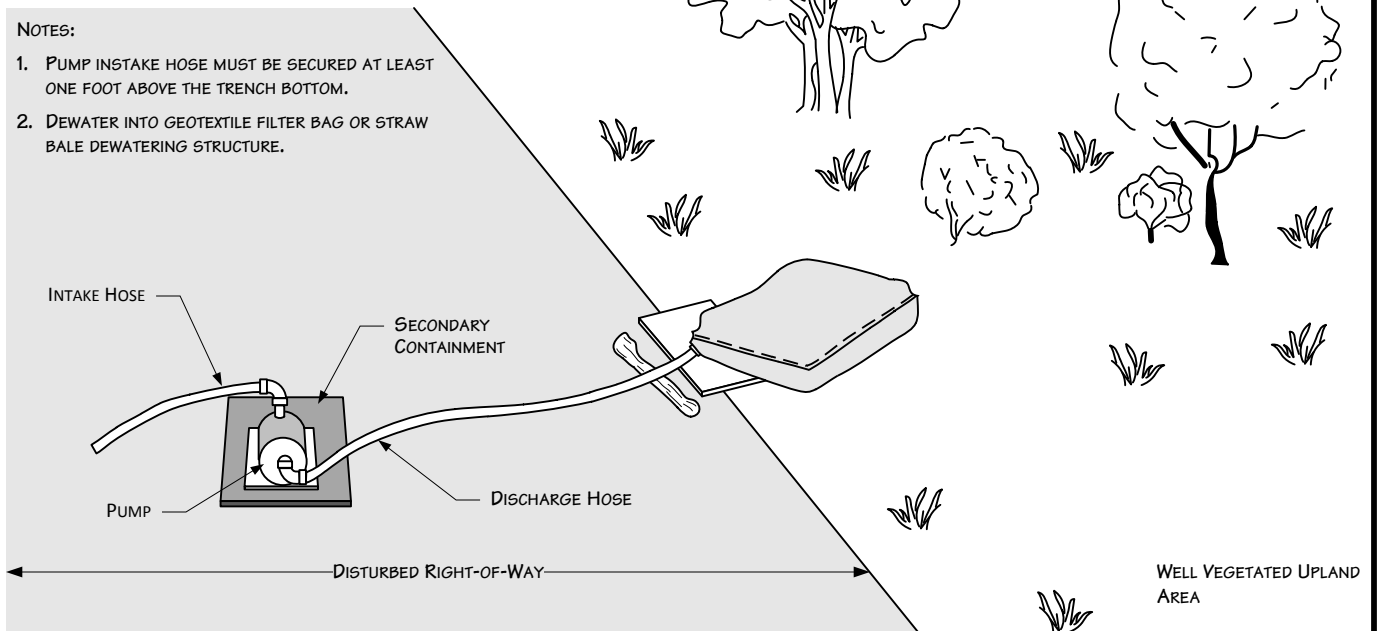
K:\CLIENT PROJECTS\ID-PEEL\2011-019\FIG_20_ROCK_FLUME_BRIDGE.VSD



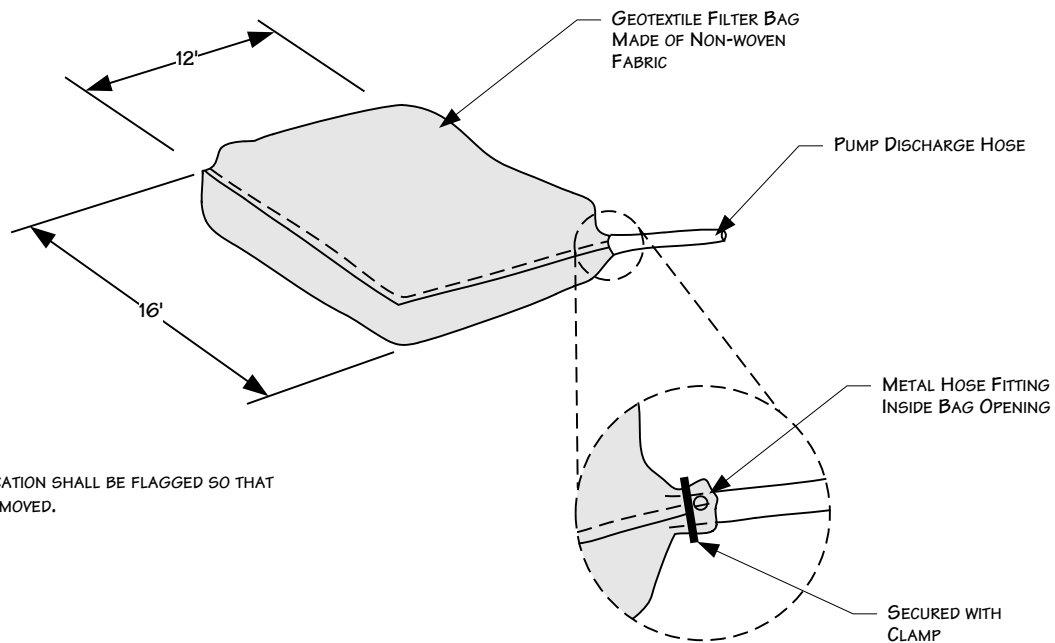
DEWATERING DISCHARGE IN WELL VEGETATED UPLANDS

NOTES:

1. PUMP INTAKE HOSE MUST BE SECURED AT LEAST ONE FOOT ABOVE THE TRENCH BOTTOM.
2. DEWATER INTO GEOTEXTILE FILTER BAG OR STRAW BALE DEWATERING STRUCTURE.



GEOTEXTILE FILTER BAG



NOTE:

1. FILTER BAG LOCATION SHALL BE FLAGGED SO THAT BAG CAN BE REMOVED.

For environmental review purposes only.



Figure 21
Environmental Protection Plan
Typical Dewatering Measures

DATE: 5/25/2001

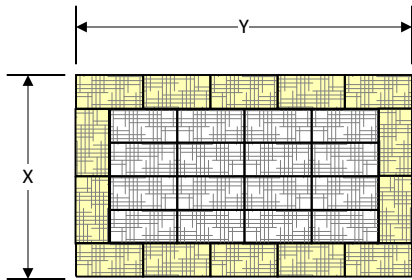
REVISED: 3/15/11

SCALE: NTS

DRAWN BY: KMKENDALL

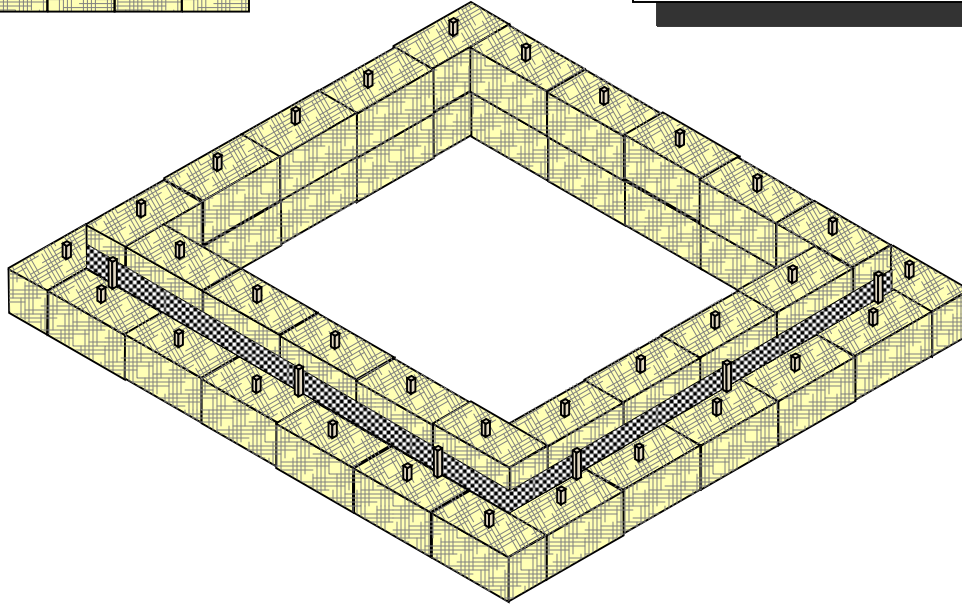
K:\CLIENT_PROJECTS\SD-FEEL\2011-019\FIG_21_DEWATERING_MEASURES.VSD



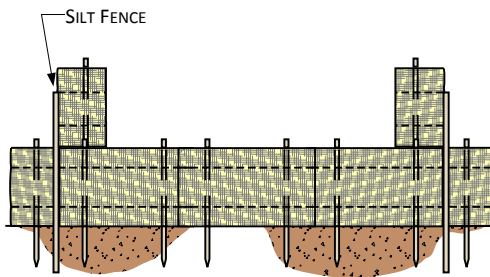


NOTES

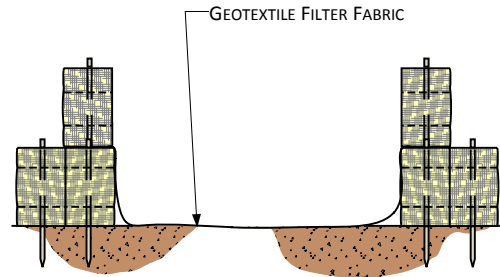
1. ARRANGE THE STRAW BALES TO THE X AND Y DIMENSIONS AS SPECIFIED BELOW.
2. IF BOTTOM OF STRUCTURE IS NOT LINED WITH STRAW BALES (OPTION 1), LINE ENTIRE STRUCTURE WITH GEOTEXTILE FILTER FABRIC.



PERSPECTIVE VIEW



OPTION 1



OPTION 2

TYPICAL MINIMUM SUMP DIMENSIONS (FEET)

<u>X</u>	<u>Y</u>
10	20
15	20
20	20
20	25
25	25
25	30
30	30

MAXIMUM PUMPING RATE GALLONS PER MINUTE

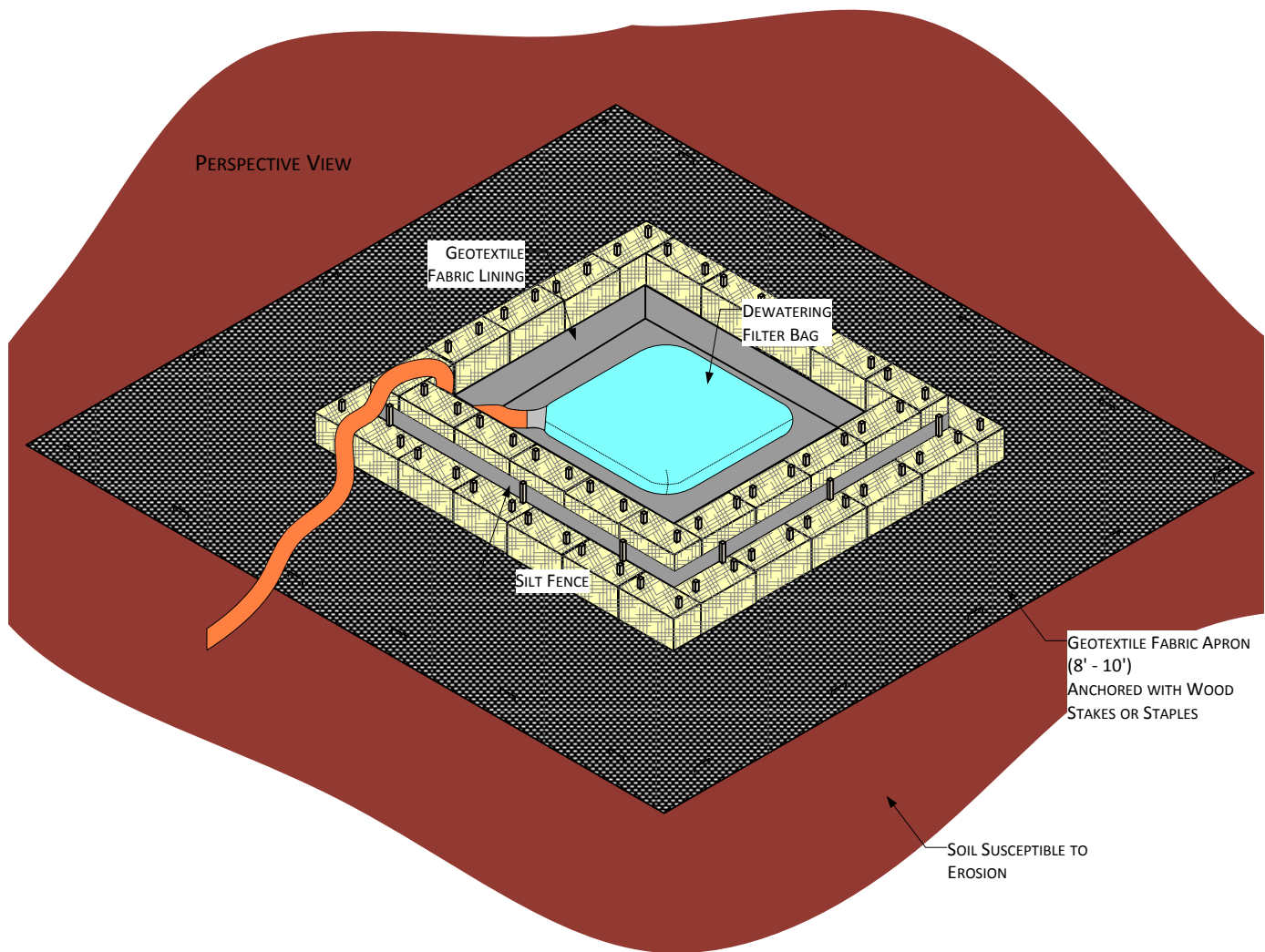
300
350
400
450
500
550
660

For environmental review purposes only.



Figure 22A Environmental Protection Plan Straw Bale Dewatering Structure





CONSTRUCT DEWATERING STRUCTURE TO ACCOMMODATE ANTICIPATED PUMPING RATES. SEE EXAMPLE BELOW.

EXAMPLE PUMPING RATE = 200 G.P.M.

STORAGE VOLUME (C.F.) = 16 x 200 G.P.M. = 3200 C.F.

HEIGHT OF STRAW BALE STRUCTURE = 3 FEET (2 BALES STACKED) (BASED ON HEIGHT OF BALES, NOT SILT FENCE)

INSIDE DIMENSIONS OF STRUCTURE = 33 x 33 FEET SQUARE

NOTES:

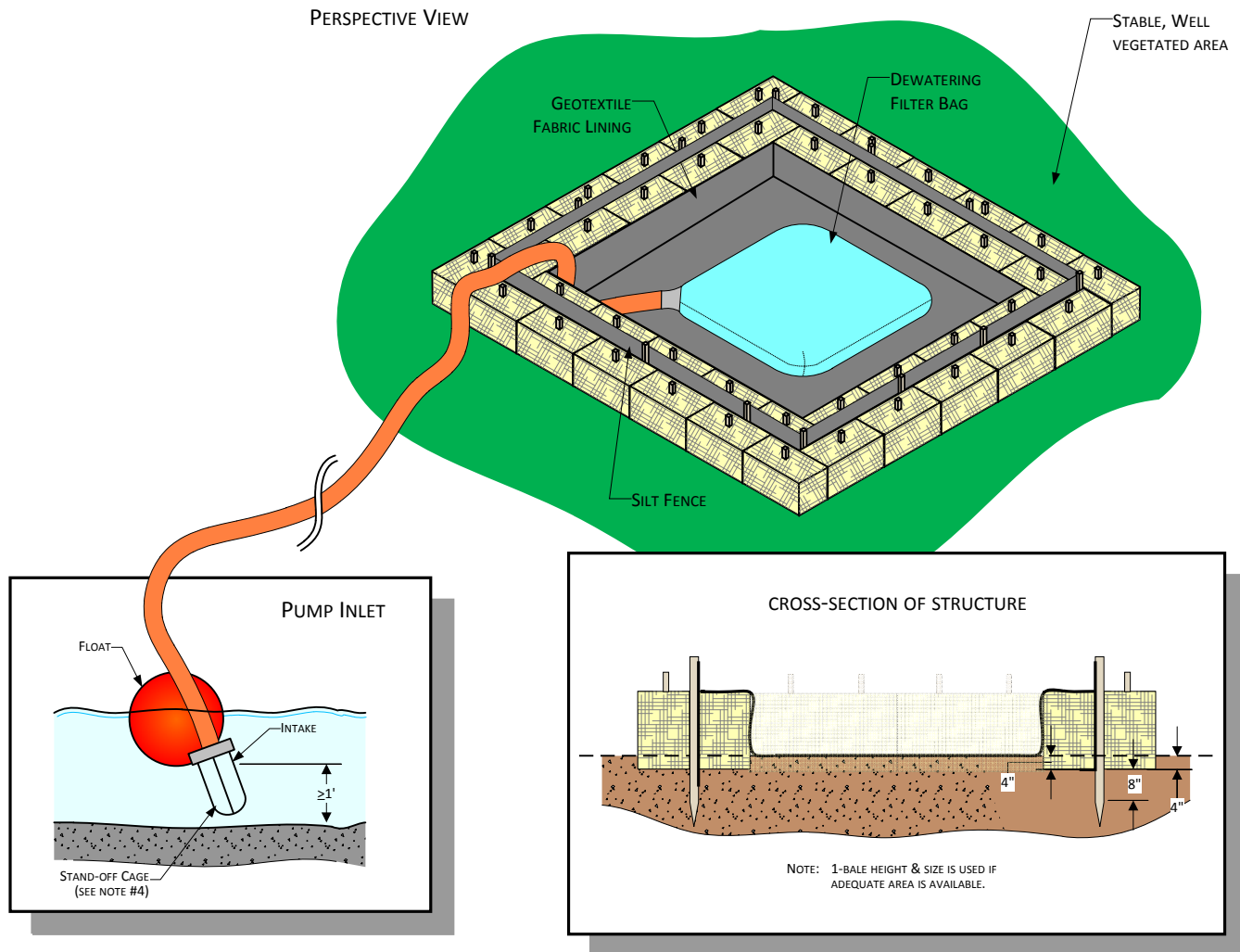
1. SILT FENCE ENDS MUST BE WRAPPED TO JOIN TWO SECTIONS.
2. INSTALL SILT FENCE 2 INCHES ABOVE TOP OF STRAW BALES, AND ANCHOR A MINIMUM OF 8 INCHES STRAIGHT DOWN.
3. SILT FENCE POST STAKING MUST BE 4 FEET OR LESS.
4. DEWATERING INTAKE HOSE SUPPORTED AT LEAST 1 FOOT FROM BOTTOM OF TRENCH BEING DEWATERED.
5. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE COMPANY'S UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN.

For environmental review purposes only.



Figure 22B
Environmental Protection Plan
Straw Bale Dewatering Structure





CONSTRUCT DEWATERING STRUCTURE TO ACCOMMODATE ANTICIPATED PUMPING RATES. SEE EXAMPLE BELOW.

EXAMPLE PUMPING RATE = 200 G.P.M.
 STORAGE VOLUME (C.F.) = $16 \times 200 \text{ G.P.M.} = 3200 \text{ C.F.}$
 HEIGHT OF STRAW BALE STRUCTURE = 1.5 FEET (1 BALE) (BASED ON HEIGHT OF BALES, NOT SILT FENCE)
 INSIDE DIMENSIONS OF STRUCTURE = 46 X 46 FEET SQUARE

NOTES:

1. SILT FENCE ENDS MUST BE WRAPPED TO JOIN TWO SECTIONS.
2. INSTALL SILT FENCE 2 INCHES ABOVE TOP OF STRAW BALE, AND ANCHOR A MINIMUM OF 8 INCHES STRAIGHT DOWN.
3. SILT FENCE POST STAKING MUST BE 4 FEET OR LESS.
4. DEWATERING INTAKE HOSE SUPPORTED AT LEAST 1 FOOT FROM BOTTOM OF TRENCH BEING DEWATERED.
5. USE A FILTER BAG AT THE DISCHARGE HOSE END.
6. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE COMPANY'S UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN.

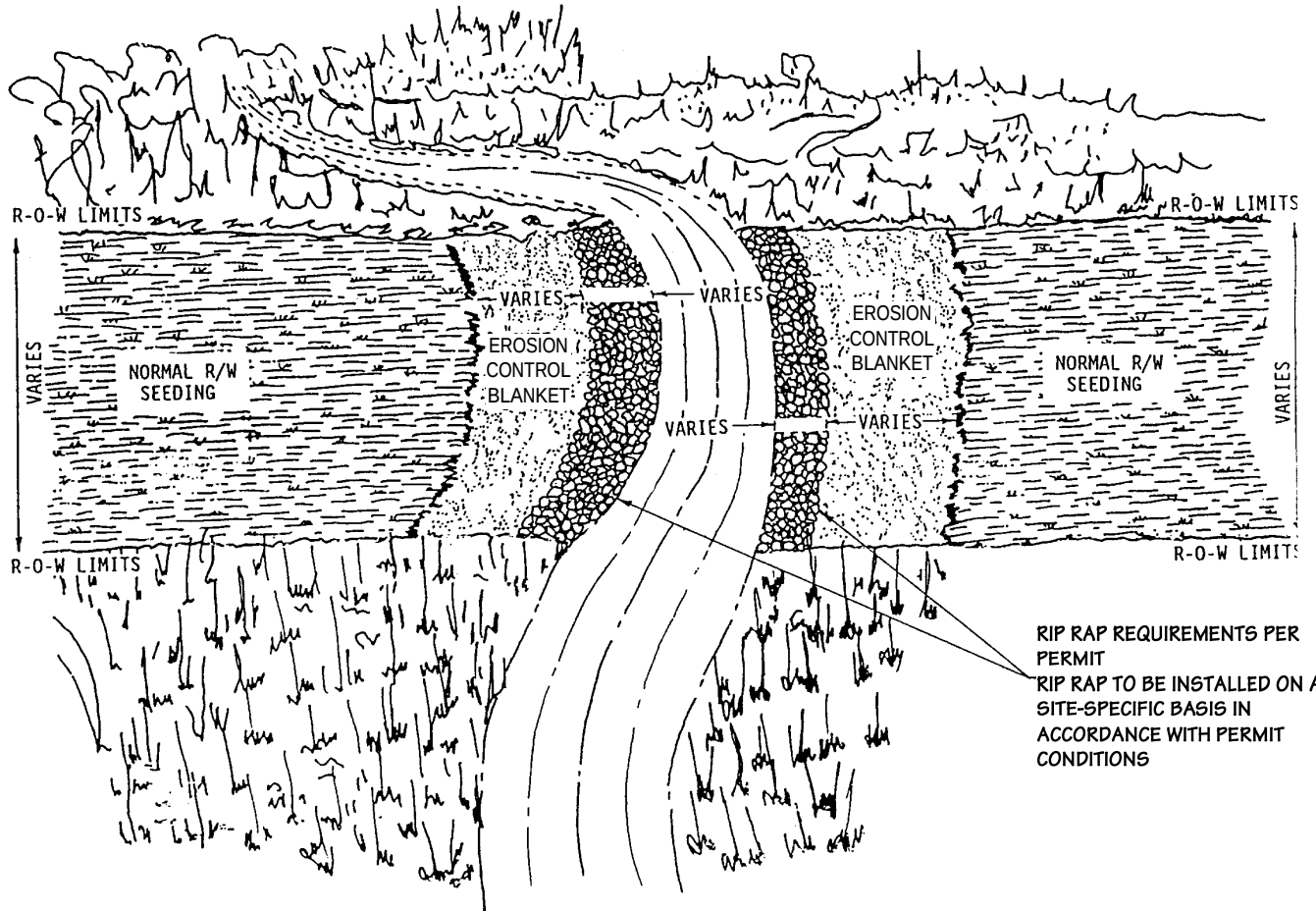
For environmental review purposes only.



Figure 22C
Environmental Protection Plan
Straw Bale Dewatering Structure



NOTE: PLACE JUTE BLANKET A MINIMUM OF ONE (1) FOOT UNDER RIP RAP. EXTEND JUTE BLANKET FROM MEAN HIGH WATER LEVEL TO SEVERAL FEET BEHIND HIGH BANK.



For environmental review purposes only.



Figure 23
Environmental Protection Plan
 Typical Final Stream Bank Stabilization
 Rip Rap & Erosion Control

DATE: 7/19/2000

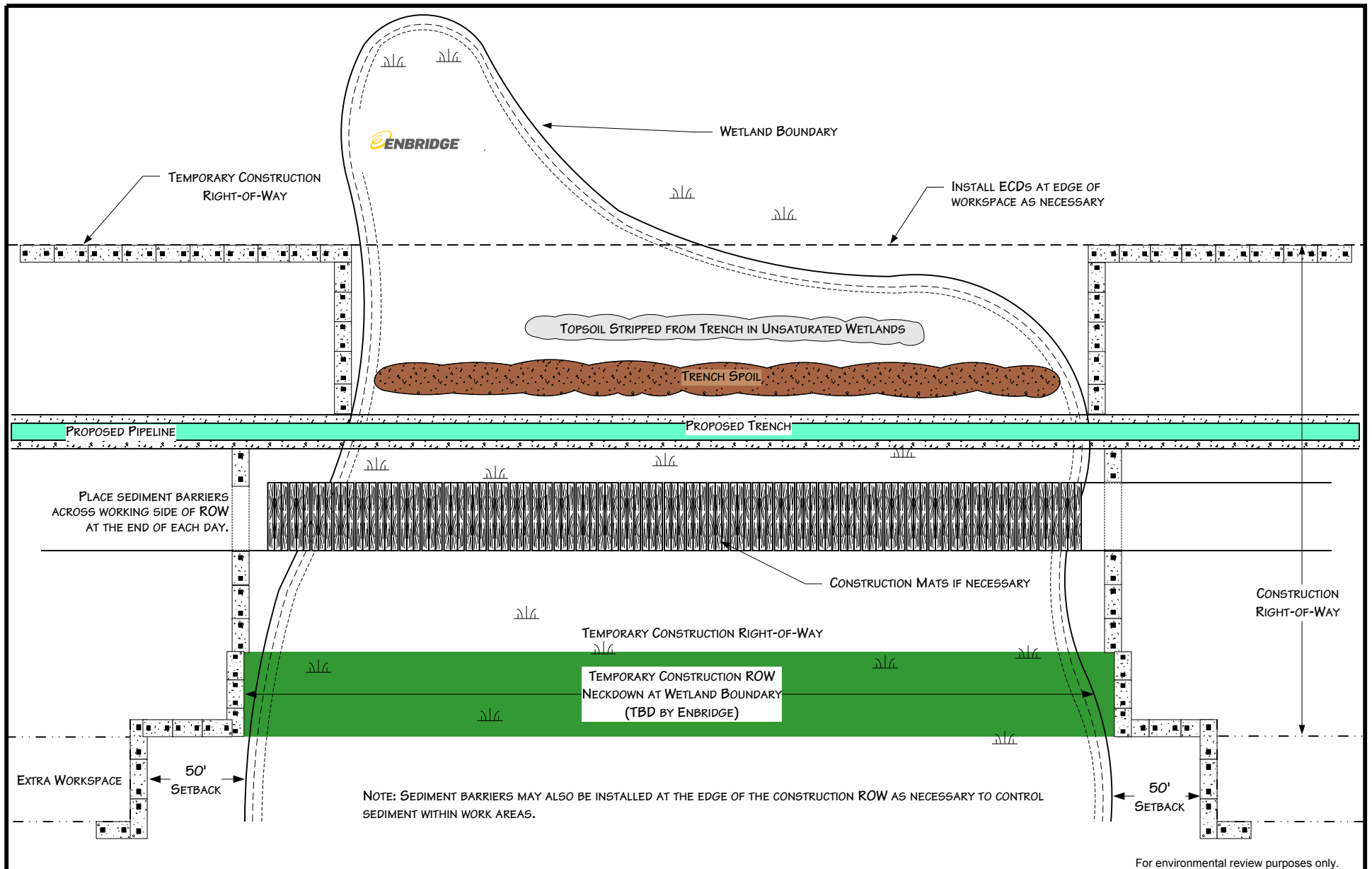
REVISED: 3/14/11

SCALE: NTS

DRAWN BY: KMKENDALL

K:\CLIENT PROJECTS\SD-FEEL\2011-019\FIG_23_STREAM_BANK_STABILIZATION.VSD





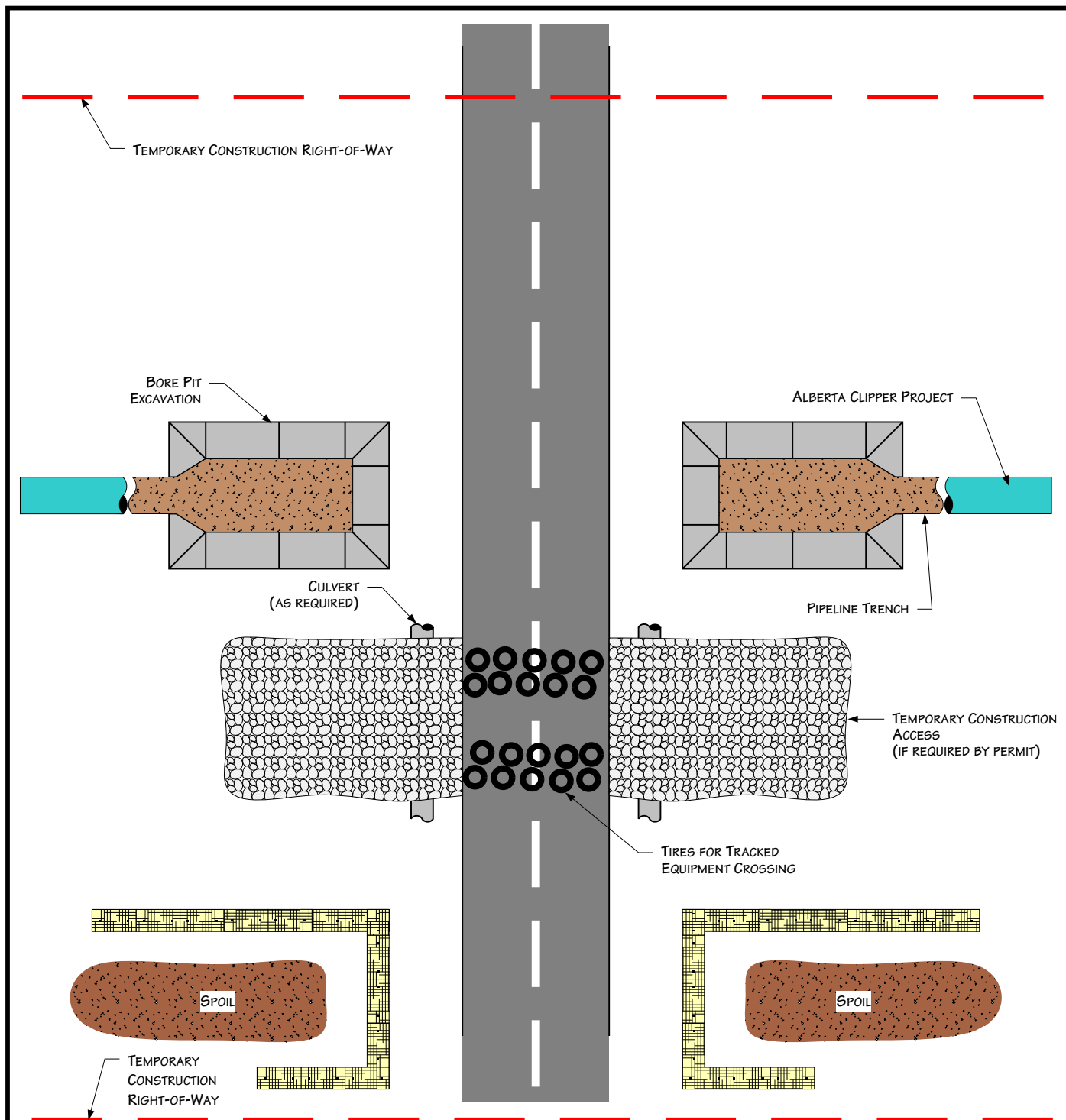
For environmental review purposes only.



Figure 24
Environmental Protection Plan
 Typical Wetland Crossing Method

DATE: 5/25/2001
REVISED: 3/14/11
SCALE: NTS
DRAWN BY: KMKENDALL
K:\CLIENT PROJECTS\SD-FEEL\2011-019\FIG_24_WETLAND_CROSSING_METHOD.VSD





PLAN VIEW

NOTES

1. PROCEDURES SHOWN IN THIS DRAWING APPLY TO IMPROVED ROADS.
2. ROADS MUST BE CLEANED AFTER EQUIPMENT CROSSES AND DIRT PLACED IN SPOIL CONTAINMENT AREAS.
3. TEMPORARY ACCESS MATERIALS MUST BE REMOVED UPON PROJECT COMPLETION.
4. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS OR PERMITS.
5. CONSTRUCTION AREAS LOCATED OUTSIDE ROAD ROW.

For environmental review purposes only.



Figure 25
Environmental Protection Plan
 Typical Improved Road Crossing
 Directional Bore Method

DATE: 7/13/1999

REVISED: 3/14/11

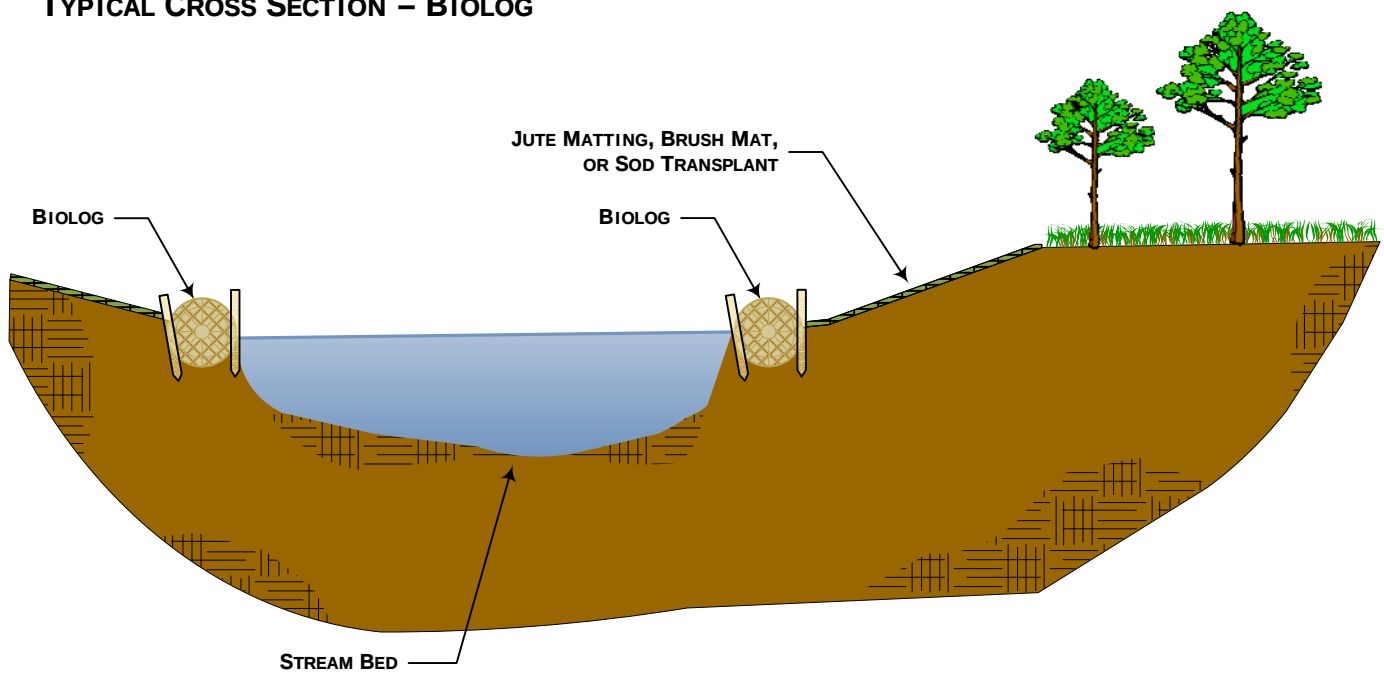
SCALE: NTS

DRAWN BY: KMKENDALL

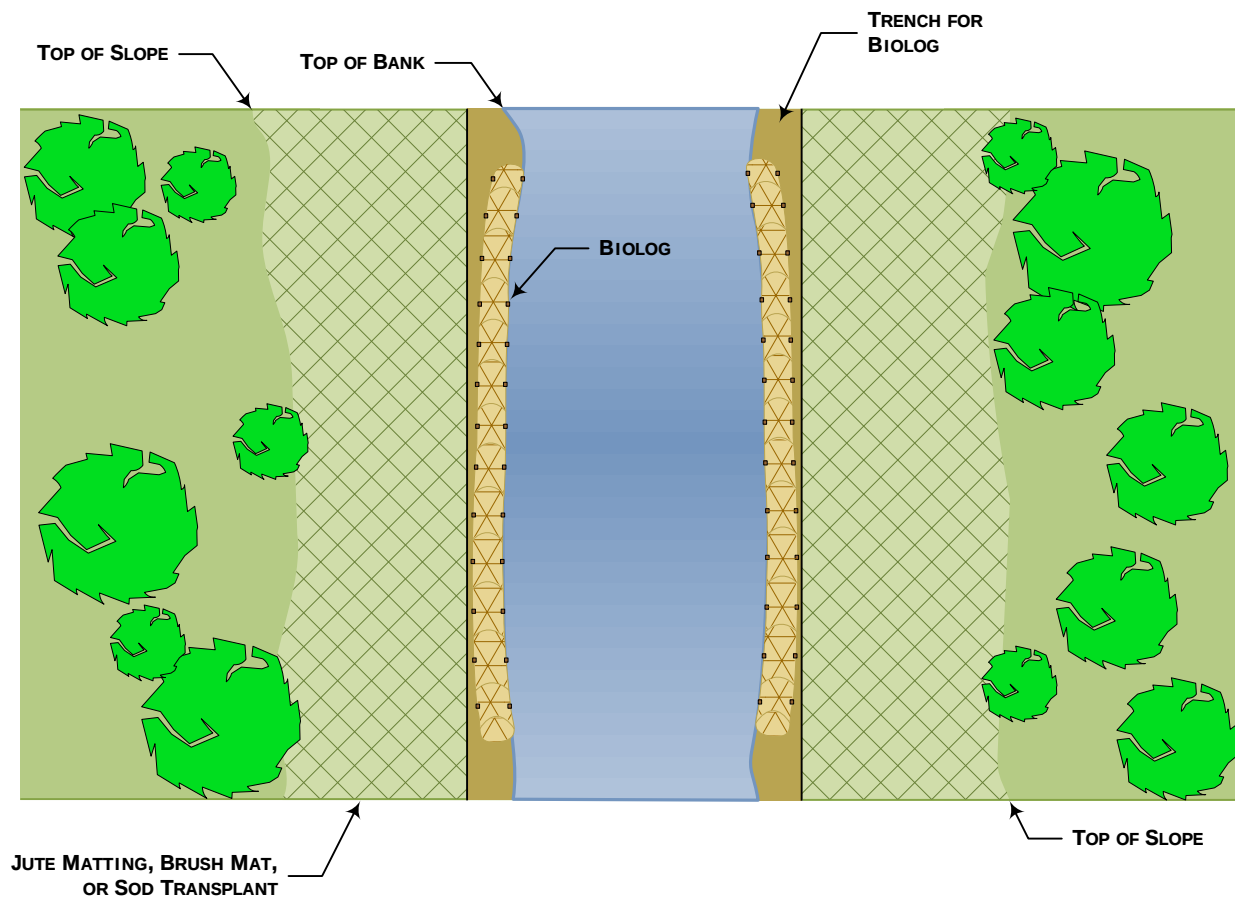
K:\CLIENT_PROJECTS\0-PIEL\2011-019\FIG_25_IMPROVED_ROAD_BORE_CROSSING.VSD



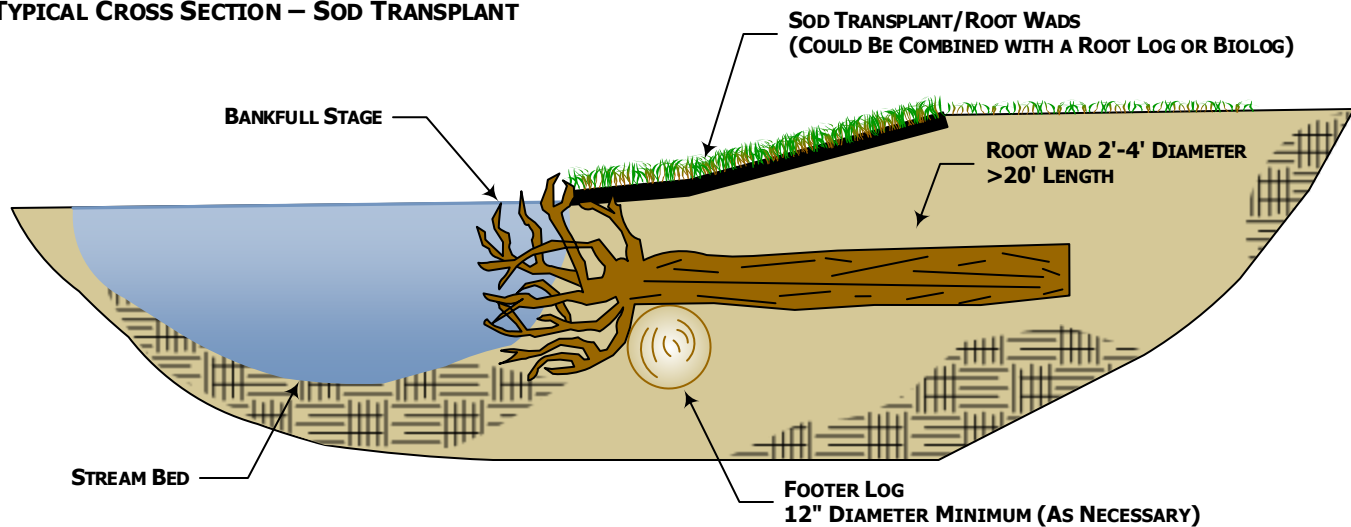
TYPICAL CROSS SECTION – BIOLOG



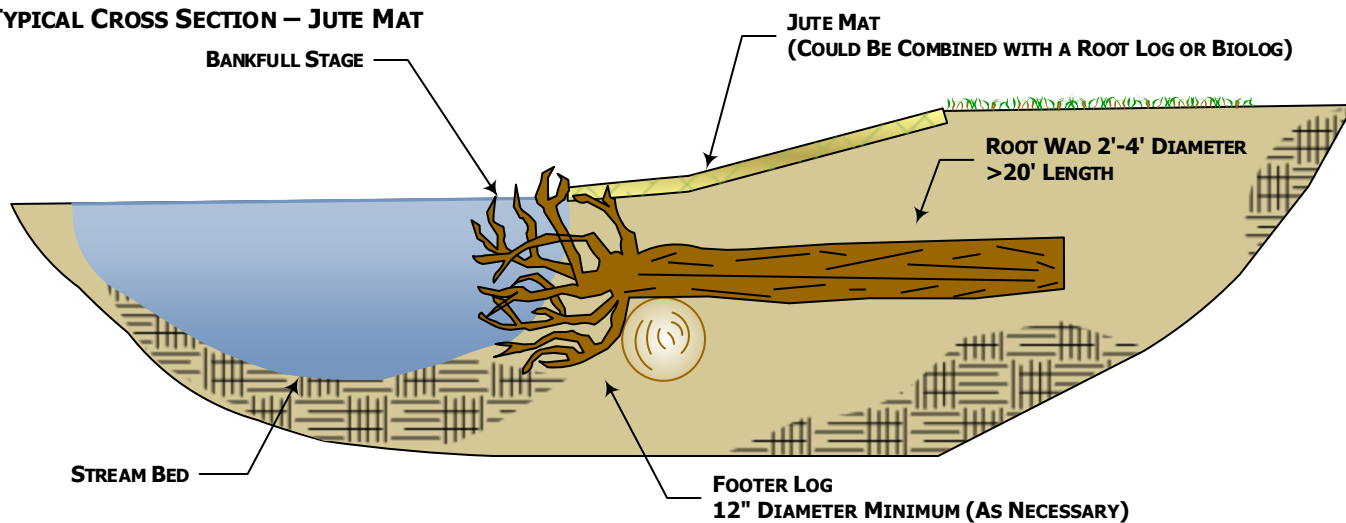
TYPICAL PLAN VIEW – BIOLOG



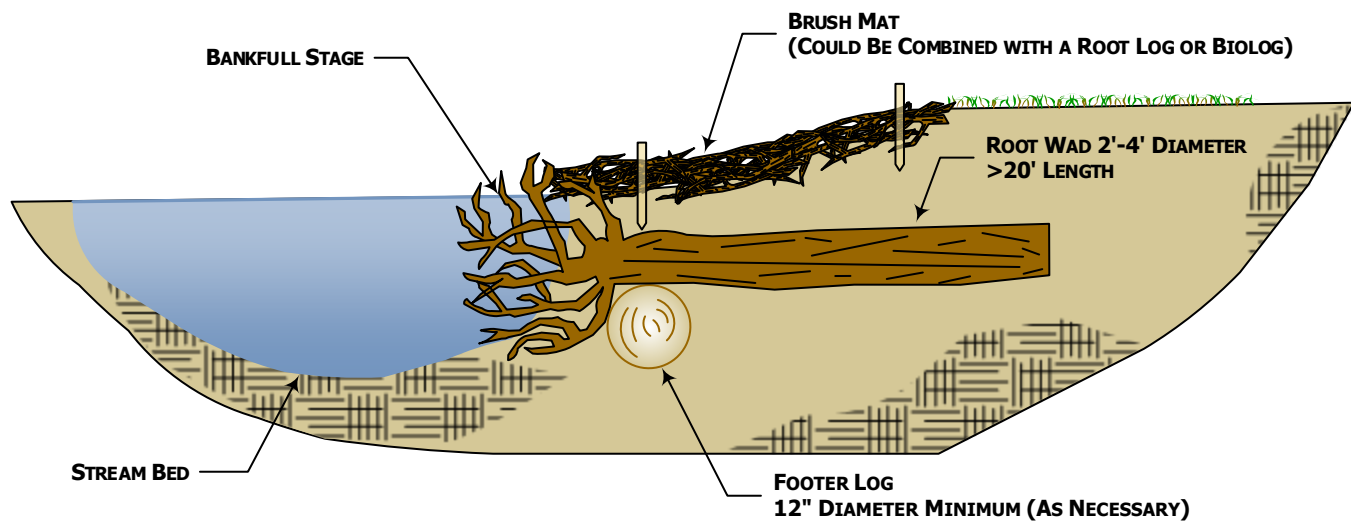
TYPICAL CROSS SECTION – SOD TRANSPLANT



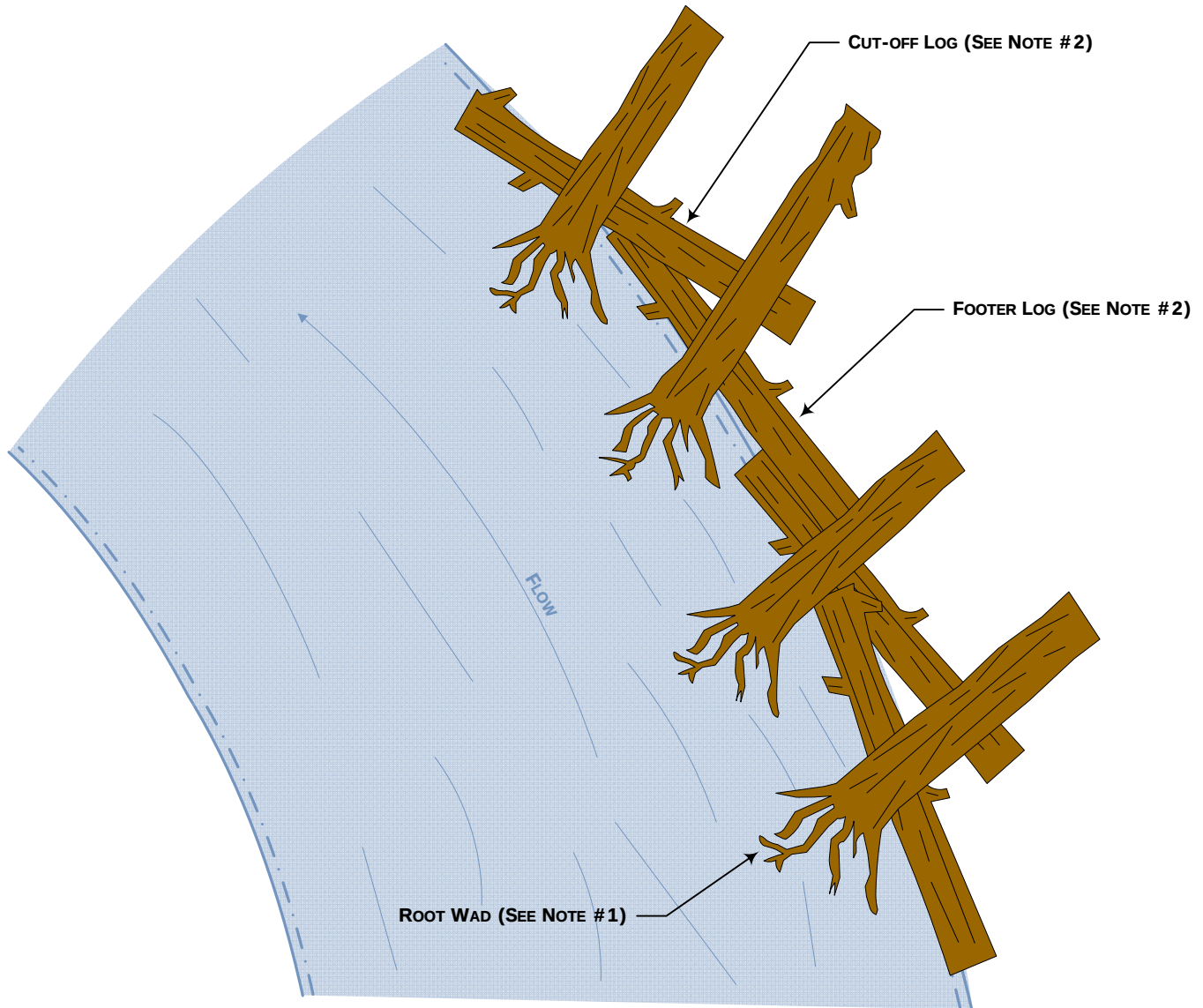
TYPICAL CROSS SECTION – JUTE MAT



TYPICAL CROSS SECTION – BRUSH MAT



TYPICAL PLAN VIEW – NATURAL MATERIAL REVETMENT



Notes:

#1 – Root wad logs to be used on steep banks or based on agency recommendations.

#2 - Root wad logs to be anchored appropriately based on site-specific conditions or agency recommendations.

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Appendix A
Noxious and Invasive Weed Species

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NOXIOUS AND INVASIVE SPECIES REGULATIONS

<i>Region</i>	<i>Regulatory Category</i>	<i>Agency¹</i>	<i>Reference</i>
Federal	Federal Noxious Weeds (aquatic and terrestrial plants)	USDA-APHIS	https://plants.usda.gov/java/noxious?rptType=Federal
	Federal Plant Pest Protection Act	USDA-APHIS	https://www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/pests-and-diseases
	Interstate Regulations: Pest movement restriction	USDA-APHIS	https://www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs
North Dakota	State Aquatic Nuisance Species	NDGFD	https://gf.nd.gov/ans/species
	State Noxious Weeds	NDDA	https://www.nd.gov/ndda/plant-industries/noxious-weeds
	County/City Noxious Weeds	Defining County/City	https://www.nd.gov/ndda/sites/default/files/resource/2018%20Feb%20-%20City%20County%20Noxious%20Weeds%20List.pdf
Minnesota	State Prohibited, Regulated, Unregulated Nonnative, and Unlisted Nonnative Invasive Species (wild animals and aquatic plants)	MDNR	https://www.dnr.state.mn.us/invasives/laws.html
	State Prohibited, Restricted, and Specially Regulated Noxious Weeds (terrestrial plants)	MDA	http://www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist.aspx
	State Plant Pest Act (insects and terrestrial plants)	MDA	http://www.mda.state.mn.us/plants/pestmanagement/invasivesunit/pestindex.aspx
	State ballast water regulations (aquatic organisms)	MPCA	https://www.pca.state.mn.us/water/vessel-discharge
Wisconsin	State Regulated - Aquatic	WDNR	https://dnr.wi.gov/topic/Invasives/species.asp?filterBy=Aquatic&filterVal=Y
	State Regulated - Terrestrial	WDNR	https://dnr.wi.gov/topic/Invasives/species.asp?filterBy=Terrestrial&filterVal=Y
	State Regulated - Wetland	WDNR	https://dnr.wi.gov/topic/Invasives/species.asp?filterBy=Wetland&filterVal=Y
¹ APHIS: Animal Plant Health Inspection Service MDA: Minnesota Department of Agriculture MDNR: Minnesota Department of Natural Resources MPCA: Minnesota Pollution Control Agency NDDA: North Dakota Department of Agriculture NDGFD: North Dakota Game and Fish Department USDA: United States Department of Agriculture WDNR: Wisconsin Department of Natural Resources			

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Appendix B
Equipment Cleaning Log

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Equipment Cleaning Log

Form Completed By: _____

Date: _____ Time: _____

Location of Equipment (tract & milepost): _____

Equipment Type: _____

Equipment ID (e.g., company, unique ID number): _____

Cleaning Method: (check all that apply)

- ☐ Scrape Down
- ☐ Steam Wash Blow Down (compressed air)
- ☐ Power/Pressure Wash (water)
- ☐ Other (Describe): _____

Comments: _____

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Appendix C

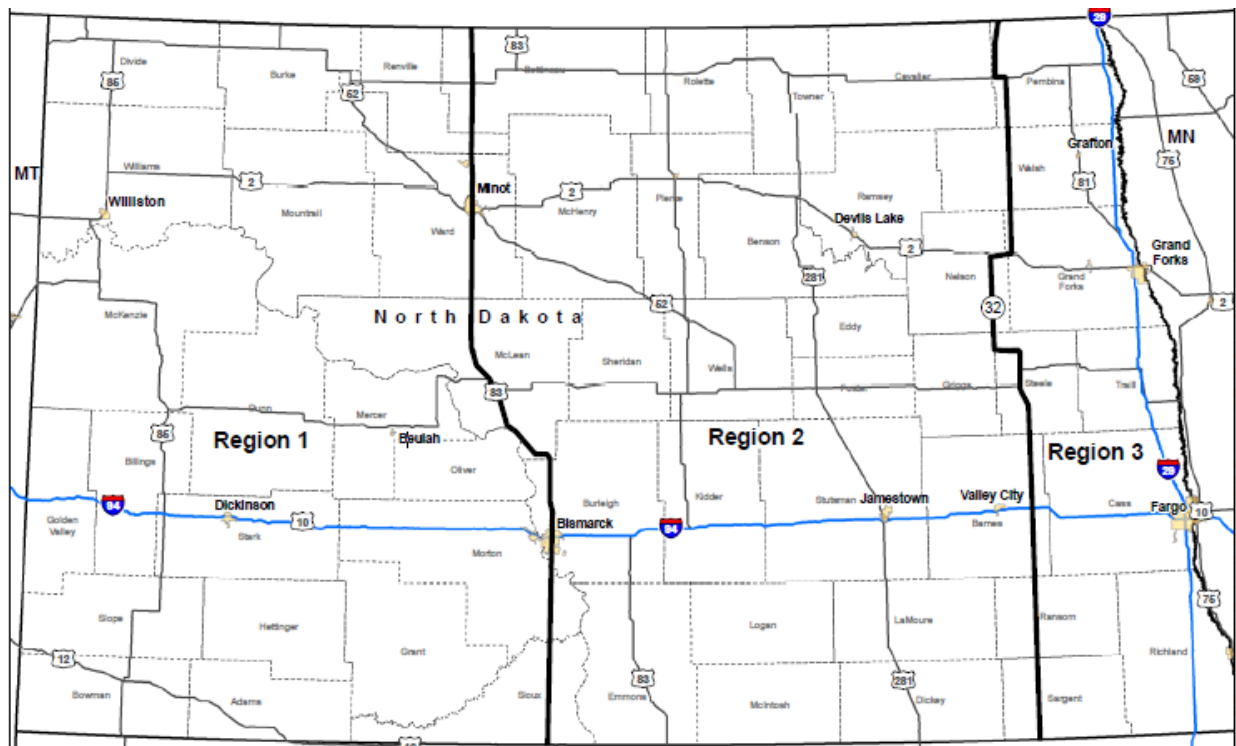
Seed Mixes

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NORTH DAKOTA SEED MIXES

Upon recommendations of the North Dakota Natural Resources Conservation Service, Enbridge divided regional seeding in North Dakota into three regions based on precipitation and general soil types as follows:

- Region 1 is between the Montana state line and Highway 83;
- Region 2 is between Highway 83 and Highway 32; and
- Region 3 is between Highway 32 and the Minnesota state line.



NORTH DAKOTA STATE-WIDE SEED MIXES

Table 1 ND Seed Mix 1 – State-Wide Temporary Cover Crop <u>Use:</u> Where agency, landowner, or Enbridge requests a cover crop <u>Seeding rate:</u> 80.0 pounds/acre Pure Live Seed (“PLS”) drilled or 160.0 pounds /acre PLS broadcast <u>Notes:</u> <i>No species substitutions allowed</i>		
Species: Preferred Varieties (if available)	Pounds/Acre Pure Live Seed (PLS)	Percent of Mix
Oats <i>if spring or summer seeding</i> , OR Winter Wheat <i>if dormant (late fall) seeding</i>	40.0	50.0
Annual Ryegrass or Slender Wheat Grass	40.0	50.0
Total Seed	80.0	100.0

Table 2
ND Seed Mix 2 – North Dakota State-Wide State School Lands Seed Mix

Use: School Trust Lands and reestablishing stream bank vegetation where the waterbodies are open cut
Seeding Rate: 19.0 pounds/acre PLS drilled or 38.0 pounds/acre PLS broadcast without the companion crop. Double the rate of the companion crop when broadcast seeding

Notes: *No species substitutions allowed*

Species: Preferred Variety (if available)	Pounds/Acre PLS	Percent of Mix
Western wheatgrass: Rodan, Walsh, Flintlock, Rosana, Recovery	8.0	42.1
Slender wheatgrass: Adanac, Pryor, Revenue, Primar, First Strike	5.0	26.3
Green needlegrass: Lodorn, AC Mallard, Fowler	4.0	21.1
Side-oats grama: Killdeer, Pierre, Butte	2.0	10.5
Total	19.0	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	29.0	100.0¹
¹ May not equal 100 percent due to rounding		

NORTH DAKOTA REGION 1 SEED MIXES

Table 3 ND Seed Mix 3 – Region 1 Native Prairie Seed Mix		
<u>Use:</u> North Dakota Region 1 on private and state lands (non-school trust) where native and degraded prairie are currently managed as range or hay land <u>Seeding rate:</u> 11.90 pounds/acre PLS drilled or 23.80 pounds/acre PLS broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> <i>Enbridge Environment must approve substitutions in advance</i>		
Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Western wheatgrass: Rodan, Walsh, Flintlock, Rosana, Recovery	2.50	21.0
Green needlegrass: Lodorn, AC Mallard, Fowler	2.00	16.8
Slender wheatgrass: Adanac, Pryor, Revenue, Primar, First Strike	1.50	12.6
Little bluestem: Badlands, Itasca	1.00	8.4
Prairie sandreed: Goshen, Bowman, Koch	1.00	8.4
Side oats grama: Killdeer, Pierre, Butte	2.00	16.8
Blue grama: Bad River	0.50	4.2
Prairie cordgrass: Red River	0.50	4.2
Purple prairieclover: Common	0.10	0.8
White prairieclover: Antelope	0.10	0.8
Maximilian sunflower: Medicine Creek	0.10	0.8
Blanket flower: Common	0.20	1.7
Black-eyed Susan: Common	0.05	0.4
Stiff sunflower: Common	0.10	0.8
Canada goldenrod or Missouri goldenrod: Common	0.05	0.4
Lewis flax: Appar, Maple Grove	0.10	0.8
Prairie coneflower: Stillwater	0.10	0.8
Total	11.90	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.00	100.0
Total Seed	21.90	100.0¹
¹ May not equal 100 percent due to rounding		

Table 4
ND Seed Mix 4 – Mixed Hay Land (Converted Prairie) and Open-Cut Road Ditch Seed Mix

Use: North Dakota Region 1 for private land hay land planting and re-establishing road bank/ditch vegetation

Seeding Rate: 11.4 pounds/acre PLS drilled or 22.8 pounds/acre PLS broadcast without the companion crop

Double the rate of the companion crop when broadcast seeding

Notes: *Enbridge Environment must approve substitutions in advance*

Species/Preferred Varieties (if available)	Pounds/ Acre PLS	Percent of Mix
Crested wheatgrass: Nordan, RoadCrest, Summit	3.0	26.3
Pubescent: Manska, Greenleaf; OR Intermediate wheatgrass: Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest	4.0	35.1
Alfalfa: Vernal, Ladak	4.0	35.1
Purple prairieclover: Bismarck	0.1	0.9
White prairieclover: Antelope	0.1	0.9
Narrow leaf purple coneflower: Bismarck	0.1	0.9
Stiff sunflower: Bismarck	0.1	0.9
Total	11.4	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	21.4	100.0¹

¹ May not equal 100 percent due to rounding

Table 5
ND Seed Mix 5 – Tame Pasture Reclamation Seed Mix

Use: North Dakota Region 1 on private tame (improved) pasture planting
Seeding Rate: 14.0 pounds/acre PLS drilled or 28.0 pounds/acre PLS broadcast without the companion crop
 Double the rate of the companion crop when broadcast seeding
Notes: *Enbridge Environment must approve substitutions in advance*

Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Crested wheatgrass: Nordan, RoadCrest, Summit	4.0	28.6
Pubescent: Manska, Greenleaf; OR Intermediate wheatgrass: Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest	5.0	35.7
Western wheatgrass: Rodan, Walsh, Flintlock, Rosana, Recovery	5.0	35.7
Total	14.0	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	24.0	100.0¹
¹ May not equal 100 percent due to rounding		

Table 6
ND Seed Mix 6– North Dakota Default Conservation Reserve Program (CRP) Seed Mix

Use: North Dakota Region 1 on tracts enrolled in CRP
Seeding Rate: 8.0 pounds/acre PLS drilled or 16.0 pounds/acre PLS broadcast without the companion crop
 Double the rate of the companion crop when broadcast seeding
Notes: *No species substitutions allowed*

Species: Preferred Variety (if available)	Pounds/Acre PLS	Percent of Mix
Tall Wheatgrass: Platt, Orbit	4.4	55.0
Intermediate Wheatgrass: Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest	1.7	21.3
Slender Wheatgrass: Adanac, Pryor, Revenue, Primar, First Strike	0.5	6.3
Alfalfa: Vernal, Ladak or any with Zone 2 winter hardiness	1.1	13.8
Sweetclover: Common	0.3	3.8
Total	8.0	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	18.0	100.0¹
¹ May not equal 100 percent due to rounding		

NORTH DAKOTA REGION 2 SEED MIXES

Table 7 ND Seed Mix 7 – Native Prairie Seed Mix		
<u>Use:</u> North Dakota Region 2 on private and state lands (non-school trust) where native and degraded prairie are currently managed as range or hay land <u>Seeding Rate:</u> 11.9 pounds/acre PLS drilled or 23.8 pounds/acre PLS broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> <i>Enbridge Environment must approve substitutions in advance</i>		
Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Western wheatgrass: Rodan, Walsh, Flintlock, Rosana, Recovery	2.50	21.0
Green needlegrass: Lodorn, AC Mallard, Fowler	1.50	12.6
Slender wheatgrass: Adanac, Pryor, Revenue, Primar, First Strike	1.50	12.6
Little bluestem: Badlands, Itasca	1.00	8.4
Big Bluestem: Sunnyview, Bison, Bonilla, Bounty	1.00	8.4
Prairie sandreed: Goshen, Bowman, Koch	1.00	8.4
Side oats grama: Killdeer, Pierre, Butte	2.00	16.8
Blue grama: Bad River	0.25	2.1
Switch grass: Dacotah, Forestburg, Sunburst, Summer	0.25	2.1
Purple prairieclover: Common	0.10	0.8
White prairieclover: Antelope	0.10	0.8
Maximilian sunflower: Medicine Creek	0.10	0.8
Blanket flower: Common	0.20	1.7
Black-eyed Susan: Common	0.05	0.4
Stiff sunflower: Common	0.10	0.8
Canada goldenrod or Missouri goldenrod: Common	0.05	0.4
Lewis flax: Appar, Maple Grove	0.10	0.8
Prairie coneflower: Stillwater	0.10	0.8
Total	11.90	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.00	100.0
Total Seed	21.90	100.0¹
¹ May not equal 100 percent due to rounding		

Table 8
ND Seed Mix 8 – Mixed Hay Land (Converted Prairie) and Open-Cut Road Ditch Seed Mix

Use: North Dakota Region 2 on private land mixed hay land planting and re-establishing road bank/ditch vegetation

Seeding Rate: 13.4 pounds/acre PLS drilled or 26.8 pounds/acre PLS broadcast without the companion crop

Double the rate of the companion crop when broadcast seeding

Notes: *Enbridge Environment must approve substitutions in advance*

Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Pubescent: Maska, Greenleaf; OR Intermediate wheatgrass: Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest	3.0	22.4
Meadow Bromegrass: Fleet, Paddock, Regar, Montana, MacBeth, Cache	7.0	52.2
Alfalfa: Vernal, Ladak	3.0	22.4
Purple prairieclover: Bismarck	0.1	0.7
White prairieclover: Antelope	0.1	0.7
Narrow leaf purple coneflower: Bismarck	0.1	0.7
Stiff sunflower: Bismarck	0.1	0.7
Total	13.4	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	23.4	100.0¹

¹ May not equal 100 percent due to rounding

Table 9
ND Seed Mix 9 – Tame Pasture Reclamation Seed Mix

Use: North Dakota Region 2 on private tame (improved) pasture planting
Seeding Rate: 21.0 pounds/acre PLS drilled or 42.0 pounds/acre PLS broadcast without the companion crop
 Double the rate of the companion crop when broadcast seeding
Notes: *Enbridge Environment must approve substitutions in advance*

Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Pubescent: Manska, Greenleaf; OR Intermediate wheatgrass: Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest	6.0	28.6
Meadow brome grass: Fleet, Paddock, Regar, Montana, MacBeth, Cache	15.0	71.4
Total	21.0	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	31.0	100.0¹
¹ May not equal 100 percent due to rounding		

Table 10
ND Seed Mix 10– North Dakota Default Conservation Reserve Program (CRP) Seed Mix

Use: North Dakota Region 2 on tracts enrolled in CRP
Seeding Rate: 8.0 pounds/acre PLS drilled or 16.0 pounds/acre PLS broadcast without the companion crop
 Double the rate of the companion crop when broadcast seeding
Notes: *No species substitutions allowed*

Species: Preferred Variety (if available)	Pounds/Acre PLS	Percent of Mix
Tall Wheatgrass: Platt, Orbit	4.4	55.0
Intermediate Wheatgrass: Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest	1.7	21.3
Slender Wheatgrass: Adanac, Pryor, Revenue, Primar, First Strike	0.5	6.3
Alfalfa: Vernal, Ladak or any with Zone 2 winter hardiness	1.1	13.8
Sweetclover: Common	0.3	3.8
Total	8.0	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	18.0	100.0¹
¹ May not equal 100 percent due to rounding		

NORTH DAKOTA REGION 3 SEED MIXES

Table 11 ND Seed Mix 11 – Native Prairie Seed Mix		
<u>Use:</u> North Dakota Region 3 on private and state lands (non-school trust) where native or degraded prairie currently managed as range or hay land <u>Seeding Rate:</u> 12.15 pounds/acre PLS drilled or 24.30 pounds/acre PLS broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> <i>Enbridge Environment must approve substitutions in advance</i>		
Species: Preferred Varieties	Pounds/Acre PLS	Percent of Mix
Western wheatgrass: Rodan, Walsh, Flintlock, Rosana, Recovery	2.00	16.5
Green needlegrass: Lodorn, AC Mallard, Fowler	2.00	16.5
Slender wheatgrass: Adanac, Pryor, Revenue, Primar, First Strike	1.00	8.2
Canada wildrye: Mandan	1.00	8.2
Big Bluestem: Sunnyview, Bison, Bonilla, Bounty	1.50	12.3
Side oats grama: Killdeer, Pierre, Butte	2.00	16.5
Blue grama: Bad River	0.25	2.1
Switch grass: Dacotah, Forestburg, Sunburst, Summer	0.50	4.1
Indiangrass: Tomahawk	1.00	8.2
Purple prairieclover: Common	0.10	0.8
White prairieclover: Antelope	0.10	0.8
Maximilian sunflower: Medicine Creek	0.10	0.8
Blanket flower: Common	0.20	1.6
Black-eyed Susan: Common	0.05	0.4
Stiff sunflower: Common	0.10	0.8
Canada goldenrod or Missouri goldenrod: Common	0.05	0.4
Lewis flax: Appar, Maple Grove	0.10	0.8
Prairie coneflower: Stillwater	0.10	0.8
Total	12.15	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.00	100.0
Total Seed	22.15	100.0¹
¹ May not equal 100 percent due to rounding		

Table 12 ND Seed Mix 12 –Mixed Hay Land (Converted Prairie) and Open-Cut Road Ditch Seed Mix		
<u>Use:</u> North Dakota Region 3 on private land mixed hay land planting and re-establishing road bank/ditch vegetation <u>Seeding Rate:</u> 15.3 pounds/acre PLS drilled or 30.6 pounds/acre PLS broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> <i>Enbridge Environment must approve substitutions in advance</i>		
Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Meadow Bromegrass: Fleet, Paddock, Regar, Montana, MacBeth, Cache	10.0	65.4
Alfalfa: Vernal, Ladak	5.0	32.7
Purple prairieclover: Bismarck	0.1	0.7
White prairieclover: Antelope	0.1	0.7
Narrow leaf purple coneflower: Bismarck	0.1	0.7
Total	15.3	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	25.3	100.0¹
¹ May not equal 100 percent due to rounding		

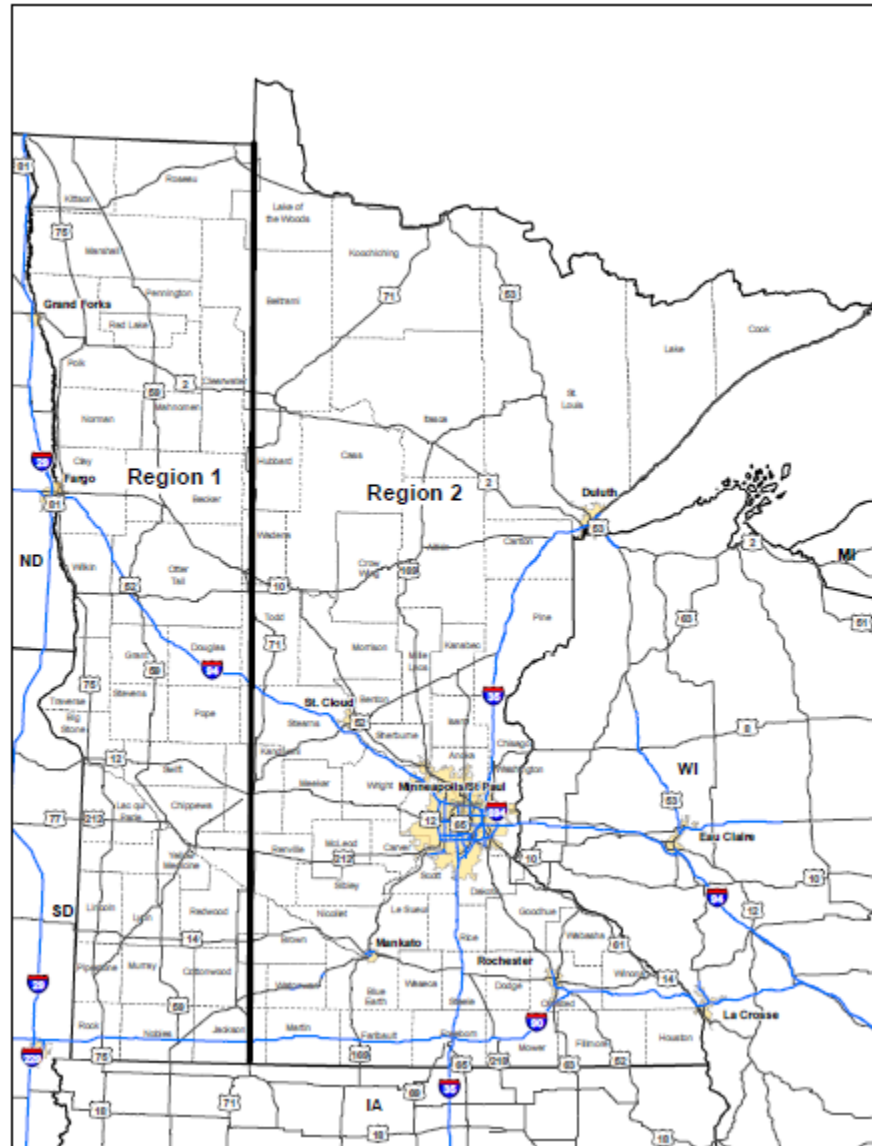
Table 13 ND Seed Mix 13 – Tame Pasture Reclamation Seed Mix		
Use: North Dakota Region 3 on private tame (improved) pasture planting <u>Seeding Rate:</u> 21.0 pounds/acre PLS drilled or 42.0 pounds/acre PLS broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> <i>Enbridge Environment must approve substitutions in advance</i>		
Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Pubescent: Manska, Greenleaf; OR Intermediate wheatgrass: Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest	6.0	28.6
Meadow brome grass: Fleet, Paddock, Regar, Montana, MacBeth, Cache	15.0	71.4
Total	21.0	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	31.0	100.0¹
¹ May not equal 100 percent due to rounding		

Table 14 ND Seed Mix 14 – North Dakota Default CRP Seed Mix		
<u>Use:</u> North Dakota Region 3 on tracts enrolled in CRP <u>Seeding Rate:</u> 10.0 pounds/acre PLS drilled or 20.0 pounds/acre PLS broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> <i>No species substitutions allowed</i>		
Species: Preferred Variety (if available)	Pounds/Acre PLS	Percent of Mix
Western Wheatgrass: Rodan, Walsh, Flintlock, Rosana, Recovery	2.0	20.0
Intermediate Wheatgrass: Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest	5.0	50.0
Alfalfa: Any with Zone 2 winter hardiness	2.0	20.0
Sweetclover: Common	1.0	10.0
Total	10.0	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	20.0	100.0¹
¹ May not equal 100 percent due to rounding		

MINNESOTA SEED MIXES

Based on average annual precipitation and temperatures and soil types, Enbridge divided seeding in Minnesota into two regions. These regions have different seed mixes for specific areas.

- Region 1 is between the North Dakota state line and approximately Highway 71; and
- Region 2 is between Highway 71 and the Wisconsin state line.



MINNESOTA STATEWIDE SEED MIXES

Table 15 MN Seed Mix 1 – Minnesota Default CRP Seed Mix		
<u>Use:</u> Minnesota state-wide on tracts enrolled in the CRP <u>Seeding Rate:</u> 12.0 pounds/acre PLS drilled or 24.0 PLS pounds/acre broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> No species substitutions allowed		
Species: Preferred Variety (if available)	Pounds/Acre PLS	Percent of Mix
Big Bluestem: Bison, Bonilla	4.0	33.3
Western Wheatgrass: Rodan	0.5	4.2
Slender Wheatgrass; Revenue	0.9	7.5
Sideoats Grama: Bad River	1.6	13.3
Switchgrass:Dacotah, Forestburg, Sunburst, Nebraska	0.2	1.7
Indiangrass: Tomahawk, Holte	0.5	4.2
Rough Dropseed: Common	0.3	2.5
Yarrow: Common	0.1	0.8
Purple Prairie Clover: Common	2.0	16.7
Ox-eye Sunflower: Common	1.0	8.3
Prairie Cinquefoil: Common	0.1	0.8
Black-eyed Susan Common	0.8	6.7
Total	12.0	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	22.0	100.0¹
¹ May not equal 100 percent due to rounding		

Table 16
MN Seed Mix 2 – Minnesota Protected and Other Waters Seed Mix

Use: Minnesota state-wide on the outer fringe of Public Water Inventory ("PWI") waterbodies and wetlands
and all other waterbody banks

Seeding Rate: 8.255 pounds/acre PLS drilled or 16.510 pounds/acre PLS broadcast without the companion crop
Double the rate of the companion crop when broadcast seeding

Notes: *Enbridge Environment must approve substitutions in advance*

Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
American slough grass: Common	1.500	18.2
Blue-joint grass: Common	0.100	1.2
Reed manna grass: Common	0.200	2.4
Fowl manna grass: Common	0.100	1.2
Fowl bluegrass: Common	1.800	21.8
Rice cut-grass: Common	0.250	3.0
Annual ryegrass: Common	0.900	10.9
Tussock sedge: Common	0.100	1.2
Fox sedge: Common	0.300	3.6
Green bulrush: Common	0.100	1.2
Wool grass: Common	0.005	0.1
River bulrush: Common	0.250	3.0
Soft-stem bulrush: Common	0.100	1.2
March milkweed: Common	0.100	1.2
Flat-topped aster: Common	0.300	3.6
Joe-pye weed: Common	0.300	3.6
Boneset: Common	0.250	3.0
Sneezeweed: Common	0.250	3.0
Spotted touch-me-not: Common	0.100	1.2
Great blue lobelia: Common	0.100	1.2
Monkey flower: Common	0.100	1.2
Mountain mint: Common	0.100	1.2
Giant goldenrod: Common	0.250	3.0
Blue vervain: Common	0.350	4.2
Ironweed: Common	0.350	4.2
Total	8.255	100.0¹
Companion Crop		
Slender wheatgrass: Adanac, Pryor, Revenue, Primar, First Strike	3.000	100.0
Total Seed	11.255	100.0¹
¹ May not equal 100 percent due to rounding		

Table 17 MN Seed Mix 3 – Minnesota Unsaturated Wetlands Seed Mix <u>Use:</u> Minnesota state-wide in unsaturated wetland areas <u>Seeding Rate:</u> 17.0 pounds/acre PLS drilled or 34.0 pounds/acre PLS broadcast <u>Notes:</u> No species substitutions allowed		
Species: Preferred Variety (if available)	Pounds/Acre PLS	Percent of Mix
American slough grass: Common	6.0	35.3
Annual ryegrass: Common	8.0	47.1
Flow bluegrass: Common	3.0	17.6
Total Seed	17.0	100.0¹
¹ May not equal 100 percent due to rounding		

MINNESOTA REGION 1 SEED MIXES

Table 18 MN Seed Mix 4 – Native Prairie Seed Mix		
<u>Use:</u> Minnesota Region 1 on private and public land where native or degraded prairie are currently managed as range or hay land <u>Seeding Rate:</u> 13.0 pounds/acre PLS drilled or 26.0 pounds/acre PLS broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> <i>Enbridge Environment must approve substitutions in advance</i>		
Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Big bluestem: Sunnyview, Bison, Bonilla, Bounty	1.25	9.6
Side-oats grama: Killdeer, Pierre, Butte	1.00	7.7
Fringed brome grass: Common	1.40	10.8
Canadian wild rye: Mandan	2.00	15.4
Slender wheatgrass: Adanac, Pryor, Revenue, Primar, First Strike	2.50	19.2
Virginia wild rye: Common	2.00	15.4
Switchgrass: Dacotah, Forestburg, Sunburst, Summer	0.75	5.8
Fowl bluegrass: Common	0.60	4.6
Indian grass: Tomahawk	1.00	7.7
Black-eyed Susan: Common	0.10	0.8
Wild bergamont: Common	0.05	0.4
Hoary vervain: Common	0.05	0.4
Partridge pea: Common	0.30	2.3
Total	13.00	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.00	100.0
Total Seed	23.00	100.0¹
¹ May not equal 100 percent due to rounding		

Table 19 MN Seed Mix 5 – Mixed Hay Land (Converted Prairie) and Open-Cut Road Ditches Seed Mix		
Use: Minnesota Region 1 on private mixed hay land and for re-establishing road bank/ditch vegetation <u>Seeding Rate:</u> 15.0 pounds/acre PLS drilled or 30.0 pounds/acre PLS broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> <i>Enbridge Environment must approve substitutions in advance</i>		
Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Meadow brome grass: Fleet, Paddock, Regar, Montana, MacBeth, Cache	3.75	25.0
Intermediate wheatgrass: Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest	3.75	25.0
Crested wheatgrass: Nordan, RoadCrest, Summit	3.75	25.0
Tetraploid ryegrass: Common	1.50	10.0
Alfalfa: Any with Zone 2 hardiness	2.25	15.0
Total	15.00	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.00	100.0
Total Seed	25.00	100.0¹
¹ May not equal 100 percent due to rounding		

Table 20
MN Seed Mix 6 – Tame Pasture Reclamation Seed Mix

Use: Minnesota Region 1 on private land tame (improved) pasture planting
Seeding Rate: 20.0 pounds/acre PLS drilled or 40.0 pounds/acre PLS broadcast without the companion crop
 Double the rate of the companion crop when broadcast seeding
Notes: *Enbridge Environment must approve substitutions in advance*

Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Alfalfa: Any with Zone 2 hardiness	6.0	30.0
Red clover: Arlington, Astred, Cinnamon , Concord or Marathon	4.0	20.0
Timothy: Climax or Claire	2.0	10.0
Orchard grass: Orion, Hawkeye, Duke, Condor, Albert	3.0	15.0
Smooth brome grass: Alpha, Badger, Bounty , York	5.0	25.0
Total	20.0	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	30.0	100.0¹
¹ May not equal 100 percent due to rounding		

MINNESOTA REGION 2 SEED MIXES

Table 21 MN Seed Mix 7 – Native Prairie Seed Mix		
<u>Use:</u> Minnesota Region 2 on private and public land where native or degraded prairie are currently managed as range or hay land <u>Seeding Rate:</u> 8.20 pounds/acre PLS drilled or 16.40 pounds/acre PLS broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> Enbridge Environment must approve substitutions in advance		
Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Fringed brome grass: Common	2.00	24.4
Bluejoint grass: Common	0.15	1.8
Poverty grass: Common	0.50	6.1
Canadian (Nodding) wild rye: Manda	1.25	15.2
Slender wheatgrass: Adanac, Pryor, Revenue, Primar, First Strike	2.00	24.4
Fowl Bluegrass: Common	0.85	10.4
False melic grass: Common	0.25	3.0
Stiff golden rod: Common	0.15	1.8
Smooth wild rose: Common	0.15	1.8
Black-eyed susan: Common	0.25	3.0
Smooth aster: Common	0.15	1.8
American vetch: Common	0.50	6.1
Total	8.20	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.00	100.0
Total Seed	18.20	100.0¹
¹ May not equal 100 percent due to rounding		

Table 22
MN Seed Mix 8 – Mixed Hay Land and Open-Cut Road Ditches Seed Mix

Use: Minnesota Region 2 on private mixed hay land and for re-establishing road bank/ditch vegetation
Seeding Rate: 45.00 pounds/acre PLS drilled or 90.00 pounds/acre PLS broadcast without the companion crop
 Double the rate of the companion crop when broadcast seeding
Notes: *Enbridge Environment must approve substitutions in advance*

Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Fowl Bluegrass: Common	6.00	13.3
Smooth Bromegrass: Alpha, Badger, Bounty , York	7.75	17.2
Slender Wheatgrass: Adanac, Pryor, Revenue, Primar, First Strike	2.00	4.4
Perennial Rye: Citadel, Mongita, Madera, Pagent, Achiever, SR-4000, Vivid, Linn Perennial Ryegrass, Windstar, and Festulolium hybrid	13.50	30.0
Switchgrass: Kanlow, Blackwell, Shelter, Carthage	1.50	3.3
Timothy: Climax or Claire	1.75	3.9
Alfalfa: Any with Zone 2 hardiness	12.50	27.8
Total	45.00	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.00	100.0
Total Seed	55.00	100.0¹
¹ May not equal 100 percent due to rounding		

Table 23
MN Seed Mix 9 – Tame Pasture Reclamation Seed Mix

Use: Minnesota Region 2 on private land tame (improved) pasture planting
Seeding Rate: 20.0 pounds/acre PLS drilled or 40.0 pounds/acre PLS broadcast without the companion crop
 Double the rate of the companion crop when broadcast seeding
Notes: *Enbridge Environment must approve substitutions in advance*

Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Alfalfa: Any with Zone 2 hardiness	6.0	30.0
Red clover: Arlington, Astred, Cinnamon , Concord or Marathon	4.0	20.0
Timothy: Climax or Claire	2.0	10.0
Orchard grass: Orion, Hawkeye, Duke, Condor, Albert	3.0	15.0
Smooth brome grass: Alpha, Badger, Bounty , York	5.0	25.0
Total	20.0	100.0¹
Companion Crop		
Oats (or see Table 4 in Seed Standards and Specifications)	10.0	100.0
Total Seed	30.0	100.0¹
¹ May not equal 100 percent due to rounding		

WISCONSIN SEED MIXES

Based on precipitation and general soil types the following seed mixes will be used in Wisconsin:

Table 24 WI Seed Mix 1 – Standard Upland Seed Mix		
<u>Use:</u> Wisconsin state-wide in upland areas <u>Seeding Rate:</u> 15.0 pounds/acre PLS drilled or 30.0 pounds/acre PLS broadcast without the companion crop Double the rate of the companion crop when broadcast seeding <u>Notes:</u> <i>Enbridge Environment must approve substitutions in advance</i>		
Species: Preferred Varieties (if available)	Pounds/Acre PLS	Percent of Mix
Perennial Ryegrass	2	17.0
Canada Wild-rye	4	33.0
Switchgrass: unimproved native variety	4	33.0
Timothy	2	17.0
Subtotal	12	100.0 ¹
Associated Companion Crop Mix		
Oats for summer seeding; or Winter Wheat for seeding in late fall (dormant) or spring	16	80.0
Annual Ryegrass or Slender Wheat Grass	4	20.0
Companion/Cover Crop Subtotal	20	100.0
GRAND TOTAL (pounds)	32	100.0¹
¹ May not equal 100 percent due to rounding		

Table 25
WI Seed Mix 2 – Native Sedge/Wet Meadow Mixture (W2)

Use: Wisconsin state-wide in unsaturated Wet Meadow wetland areas

Seeding Rate: See below summary.

Notes: Enbridge Environment must approve substitutions in advance

Common Name	Botanical Name	Indicator Status	Seeds/oz.	Seeds/ft ²	% of Mix
Brome, fringed	<i>Bromus ciliata</i>	FACW	10,000	1.5	8.1
Blue-joint grass	<i>Calamagrostis canadensis</i>	OBL	280,000	8.2	1.6
Wild-rye, Virginia	<i>Elymus virginicus</i>	FACW-	4,200	3.2	42.3
Manna grass, reed	<i>Glyceria grandis</i>	OBL	80,000	4.7	3.2
Manna grass, fowl	<i>Glyceria striata</i>	OBL	160,000	4.7	1.6
Bluegrass, fowl	<i>Poa palustris</i>	FACW+	118,000	16.7	7.1
Sedge, bottlebrush	<i>Carex comosa</i>	OBL	30,000	2.2	4.3
Sedge, pointed- broom	<i>Carex scoparia</i>	FACW	84,000	1.5	1.0
Sedge, tussock	<i>Carex stricta</i>	OBL	53,000	0.8	0.8
Sedge, Common fox	<i>Carex stipata</i>	OBL	34,000	2.0	3.2
Sedge, fox	<i>Carex vulpinoidea</i>	OBL	100,000	5.9	3.2
Rush, slender	<i>Juncus tenuis</i>	FAC	1,000,000	11.0	0.2
Torry's Rush	<i>Juncus toryi</i>	OBL	1,600,000	5.9	0.6
Bulrush, green	<i>Scirpus atrovirens</i>	OBL	460,000	16.9	2.0
Wool grass	<i>Scirpus cyperinus</i>	OBL	1,700,000	6.2	0.2
Milkweed, marsh	<i>Asclepias incarnata</i>	OBL	4,800	0.4	5.0
Aster, swamp	<i>Aster puniceus</i>	OBL	80,000	5.9	4.0
Aster, flat-topped	<i>Aster umbellatus</i>	FACW	67,000	1.5	1.2
Joe-pye weed	<i>Eupatorium maculatum</i>	OBL	95,000	0.7	0.4
Boneset	<i>Eupatorium perfoliatum</i>	FACW+	160,000	1.2	0.4
Goldenrod, grass- leaved	<i>Euthamia graminifolia</i>	FACW-	350,000	1.0	0.2
Sneezeweed	<i>Helenium autumnale</i>	FACW+	130,000	0.8	0.3
Sunflower, serrated	<i>Helianthus grosseserratus</i>	FACW-	15,000	0.2	0.6
Lobelia, great-blue	<i>Lobelia siphilitica</i>	FACW+	500,000	2.9	0.3
Monkey flower	<i>Mimulus ringens</i>	OBL	2,300,000	6.8	0.2
Mint, mountain	<i>Pycnanthemum virginianum</i>	FACW+	220,000	1.3	0.3
Meadow-rue, purple	<i>Thalictrum dasycarpum</i>	FACW	11,000	0.1	0.4
Vervain, blue	<i>Verbena hastata</i>	FACW+	93,000	2.2	1.3
Alexanders, Golden	<i>Zizia aurea</i>	FACW	11,000	1.0	5.0

Recommended Rate: 5.0 (PLS lbs/acre)

SUMMARY

Mix Seeds Per Square Foot	Mix Seeds Per Square Yard	Mix Seeds Per Acre
121	1,093	5,290,320
% by wt. Grasses	% by wt. Graminoids	% by wt. Forbs
64.0	15.0	21.0
% by Seed Count Grasses	% by Seed Count Graminoids	% by Seed Count Forbs
32.1	43.2	24.7

Table 26
WI Seed Mix 3 –Native Wet Prairie Mixture (W3)

Use: Wisconsin state-wide in unsaturated Wet Prairie wetland areas

Seeding Rate: See below summary.

Notes: Enbridge Environment must approve substitutions in advance

Common Name	Botanical Name	Indicator Status	Seeds/oz.	Seeds/ft ²	% of Mix
Bluestem, big	<i>Andropogon gerardi</i>	FAC-	10,000	3.7	15.3
Brome, fringed	<i>Bromus ciliata</i>	FACW	10,000	1.8	7.7
Blue-joint grass	<i>Calamagrostis canadensis</i>	OBL	280,000	6.2	0.9
Wild-rye, Virginia	<i>Elymus virginicus</i>	FACW-	4,200	2.0	19.9
Manna grass, reed	<i>Glyceria grandis</i>	OBL	80,000	2.9	1.5
Manna grass, fowl	<i>Glyceria striata</i>	OBL	160,000	3.5	0.9
Switchgrass	<i>Panicum virgatum</i>	FAC+	14,000	3.1	9.2
Bluegrass, fowl	<i>Poa palustris</i>	FACW+	118,000	9.6	3.0
Indian grass	<i>Sorghastrum nutans</i>	FACU+	12,000	2.0	6.7
Cord grass, prairie	<i>Spartina pecinata</i>	FACW+	6,600	1.1	6.9
Sedge, tussock	<i>Carex stricta</i>	OBL	53,000	0.7	0.5
Sedge, fox	<i>Carex vulpinoidea</i>	OBL	100,000	3.7	1.5
Bulrush, green	<i>Scirpus atrovirens</i>	OBL	460,000	7.7	0.7
Wool grass	<i>Scirpus cyperinus</i>	OBL	1,700,000	18.7	0.5
Anemone, Canada	<i>Anemone canadensis</i>	FACW	8,000	0.09	0.5
Milkweed, marsh	<i>Asclepias incarnata</i>	OBL	4,800	0.1	1.4
Aster, swamp	<i>Aster puniceus</i>	OBL	80,000	2.4	1.2
Aster, flat-topped	<i>Aster umbellatus</i>	FACW	67,000	1.5	0.9
Tic-trefoil, showy	<i>Desmodium canadense</i>	FAC-	5,500	0.8	6.1
Joe-pye weed	<i>Eupatorium maculatum</i>	OBL	95,000	1.7	0.8
Boneset	<i>Eupatorium perfoliatum</i>	FACW+	160,000	2.4	0.6
Goldenrod, grass- leaved	<i>Euthamia graminifolia</i>	FACW-	350,000	2.0	0.3
Sneezeweed	<i>Helenium autumnale</i>	FACW+	130,000	2.39	0.8
Sunflower, serrated	<i>Helianthus grosseserratus</i>	FACW-	15,000	0.3	0.7
Blazingstar, tall	<i>Liatris pycnostachya</i>	FAC-	11,000	0.1	0.5
Lobelia, great-blue	<i>Lobelia siphilitica</i>	FACW+	500,000	1.4	0.1
Monkey flower	<i>Mimulus ringens</i>	OBL	2,300,000	6.4	0.1
Mint, mountain	<i>Pycnanthemum virginianum</i>	FACW+	220,000	1.2	0.3
Vervain, blue	<i>Verbena hastate</i>	FACW+	93,000	1.0	0.5
Ironweed	<i>Veronia fasciculate</i>	FACW	24,000	0.1	0.3
Culver's root	<i>Veronicastrum virginicum</i>	FAC	800,000	8.8	0.5
Alexander's, golden	<i>Zizia aurea</i>	FAC+	11,000	2.4	9.2

Recommended Rate: 5.0 (PLS lbs/acre)

SUMMARY

Mix Seeds Per Square Foot	Mix Seeds Per Square Yard	Mix Seeds Per Acre
102	884	4,436,283
% by wt. Grasses	% by wt. Graminoids	% by wt. Forbs
72.0	3.0	24.0
% by Seed Count Grasses	% by Seed Count Graminoids	% by Seed Count Forbs
35.0	30.0	35.0

Appendix D
Enbridge Environment Hydrotest Discharge
Authorization and Documentation

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Enbridge Environment Hydrotest Discharge Authorization & Documentation - *Instructions*

The purpose of this form is to document and insure that appropriate planning occurs prior to hydrostatic test discharge activities as well as the proper recording of necessary information during the actual discharge event. If the discharge permit specifies the need for a Certified Operator, he/she is responsible for the final section of the form. Otherwise, an Environmental Inspector will be responsible for completion of this form.

Part 1: Basic Discharge Information: All information must be completed. Coordination with Enbridge Engineering is necessary to obtain the exact test section length and volume of water to be discharged. The estimated duration of the discharge must be calculated using the maximum permitted rate (or the anticipated rate, if lower than the permitted rate) and the total volume of water to be discharged. This is critical information and will ensure that any required sampling is conducted at the appropriate frequency specified in the permit.

Part 2: Pre-Discharge Planning Checklist: A pre-discharge planning meeting must be held with the Certified Operator (if required), Contractor, Craft Inspection, Environmental Inspection, and Construction Management staff to review items included in the checklist and any other pertinent information deemed necessary. A full copy of the permit and discharge plan must be provided to all participants. Upon completion of this meeting, all participants must sign the form to indicate that they understand all steps of the discharge process. ***Note: In order to proceed with discharge activities, the Enbridge Construction Manager and Environment Staff assigned to the project, or their designees, must review the information and provide their authorization by signing and dating the form.***

Part 3: Discharge Monitoring: A copy of the permit, discharge plan, and parts one and two of the form must be on-site at all times during the discharge event. In addition to the items specified on the form, the following photographs are required:

- Receiving water before, during, and after the discharge (minimum 3 photos/day)
- Discharge structure/device before and during the discharge (minimum 3 photos/day)

As noted, upon completion of the discharge event, the Certified Operator or Environmental Inspector, Craft Inspector, Contractor Foreman, and Enbridge Construction Manager must sign and date the form. **The completed form, along with the supplemental photographs, and a copy of the chain of custody for any samples submitted for laboratory analysis must be submitted to the Enbridge Environment Project Manager/Lead within 12 hours of ending the discharge. Any permit violations will be reported to the applicable agencies by the Enbridge Environment Project Manager/Lead within the timeframes specified in the discharge permit.**

Enbridge Construction Manager Signature and Date: _____

[illegible]

Flow meter manufacturer and model:

Flow meter date of last calibration :

pH/Dissolved Oxygen instrument manufacturer and model:

pH/Dissolved Oxygen instrument date of last calibration:

Date and Time discharge start: _____ Date and Time discharge complete: _____

Equipment, Discharge, and Receiving Water Inspection Notes (minimum 3 enteries per day):

Outfall Observations & Photo Documentation Notes (note presence or absence of any unusual characteristics such as unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits - minimum 3 enteries per day) :

Certified Operator or Environmental Inspector Signature: _____

Enbridge Craft Inspector Signature: _____

Contractor Foreman Signature: _____

Enbridge Construction Manager Signature: _____

Page 2 of 2

Appendix E
Emergency Response Contractors/Disposal and
Treatment Facilities

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Emergency Response Contractors

The Contractor will dispose of all wastes according to applicable federal, state, and local requirements. A listing of potential Emergency Spill Response Contractors and is provided below, and waste disposal facilities by state are provided in the pages that follow. This list was developed from state-wide databases. This list represents firms operating at the time the database was produced. The Contractor is responsible for verifying if a contractor or facility is currently operating under appropriate permits or licenses. The Contractor is responsible for ensuring wastes are disposed of properly.

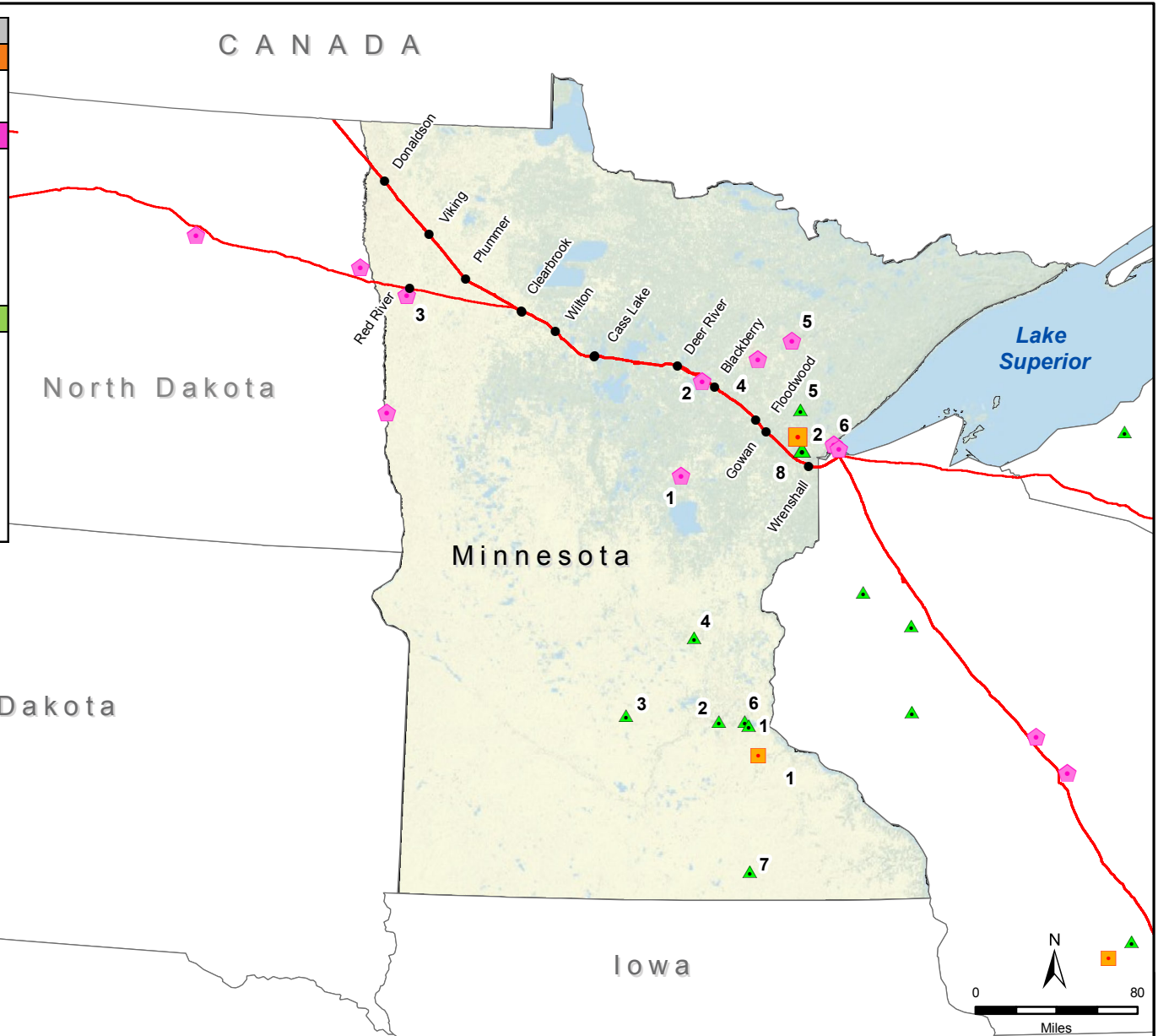
Spill Response Contractors		
Company	City/State	Phone Number
North Dakota		
Clean Harbors Environmental	Williston, ND	(701) 774-2201 (800) 645-8265
Garner Environmental Services	Williston, ND	(701) 577-1200 (855) 774-1200
Absorbent & Safety Solutions	Watford City, ND	(701) 838-4558
Minnesota Limited	Berthold, ND	(701) 453-3700
Bobs Oilfield Service Inc	Belfield, ND	(701) 575-4666
Keitu Engineers & Consultants, Inc.	Mandan, ND	(701) 667-1800
Minnesota		
Bay West Environmental	St. Paul, MN	(800) 279-0456 (651) 291-0456
West Central Environmental Consultants Inc.	Morris, MN	(800) 422-8356 (888) 923-2778
Minnesota Limited	Bemidji, MN	(218) 755-9595
OSI Environmental	Bemidji, MN	(800) 585-8838
OSI Environmental	Eveleth, MN	(800) 777-8542
Bay West Environmental	Duluth, MN	(800) 279-0456 (218) 740-0110
Wisconsin - The Contractor should consult with the WDNR Northern Regional Spill Coordinator (John Sager: phone (715) 365-8959) for assistance when selecting a spill response contractor.		

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Source: Aerial imagery from ArcGIS Online
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Facility ID	Facility (Minnesota)
Hazardous Waste Facilities	
1	Clean Harbors, Cannon Falls
2	Safety-Kleen, Inc.
Waste Water Treatment Plant Facilities (WWTP)	
1	Aitkin Sewage Treatment Plant
2	GRPUC Wastewater Treatment Facility
3	Crookston Wastewater Treatment Facility
4	Hibbing Waste Treatment Plant
5	Virginia Wastewater Treatment
6	WLSSD
Non-Hazardous Waste Facilities	
1	Pinebend Landfill (Republic Services)
2	Burnsville Sanitary Landfill (WM)
3	Spruce Ridge Landfill (WM)
4	Elk River Landfill (WM)
5	Canyon (Voyageur) (WM)
6	SKB - Rosemount
7	SKB - Environmental Landfill
8	SKB - Shamrock Landfill

*For North Dakota and Wisconsin - see state map for facility information



Drawn: LBG 5/13/2016
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- Legend**
- Hazardous Waste Facility
 - ⬠ Waste Water Treatment Plant (WWTP)
 - ▲ Non-Hazardous Waste Facility
 - Enbridge Pipeline

**WASTE
FACILITIES -
MINNESOTA**

Waste Facilities – Minnesota

Facility ID	Facility (Minnesota)	Waste Type	Address	City	State	Zip	County	Contact Phone
Hazardous Waste Facilities								
1	Clean Harbors, Cannon Falls	Solid & Liquid - Haz	211 Holiday Avenue	Cannon Falls	MN	55009	Goodhue	(507) 263-0252
2	Safety-Kleen, Inc.	Solid & Liquid - Haz	1302 18th Street	Cloquet	MN	55720	Goodhue	(218) 879-2164
Waste Water Treatment Plant Facilities (WWTP)								
1	Aitkin Sewage Treatment Plant	Liquid - WWTP	120 1st Street Northwest	Aitkin	MN	56431	Aitkin	(218) 927-3406
2	GRPUC Wastewater Treatment Facility	Liquid - WWTP	1105 SE 23rd Avenue	Grand Rapids	MN	55744	Itasca	(218) 326-7024
3	Crookston Wastewater Treatment Facility	Liquid - WWTP	County Road 233	Crookston	MN	56716	Polk	(218) 281-5711
4	Hibbing Waste Treatment Plant	Liquid - WWTP	11669 Town Line Road	Hibbing	MN	55746	St. Louis	(218) 362-5999
5	Virginia Wastewater Treatment	Liquid - WWTP	1204 Southern Drive	Virginia	MN	55792	St. Louis	(218) 748-7519
6	WLSSD	Liquid - WWTP	2626 Courtland Street	Duluth	MN	55806	St. Louis	(218) 722-3336
Non-Hazardous Waste Facilities								
1	Pinebend Landfill (Republic Services)	Solid - NonHaz	2495 East 117th Street	Inver Grove Heights	MN	55077	Dakota	(651) 450-2155
2	Burnsville Sanitary Landfill (WM)	Solid - NonHaz	2650 West Cliff Road	Burnsville	MN	55337	Dakota	(952) 890-3248
3	Spruce Ridge Landfill (WM)	Solid - NonHaz	12755 137th Street	Glencoe	MN	55336	McLeod	(320) 864-5503
4	Elk River Landfill (WM)	Solid - NonHaz	22460 Highway 169	Elk River	MN	55330	Sherburne	(763) 441-2464
5	Canyon (Voyageur) (WM)	Solid - NonHaz	6830 Highway 53	Canyon	MN	55717	St. Louis	(218) 345-6302
6	SKB - Rosemount	Solid - NonHaz	13425 Courthouse Blvd	Rosemount	MN	55060	Dakota	(651) 438-1500
7	SKB - Environmental Landfill	Solid - NonHaz	52563 243rd Street	Austin	MN	55912	Mower	(507) 433-8131
8	SKB - Shamrock Landfill	Solid - NonHaz	761 MN Highway 45	Cloquet	MN	55720	Carlton	(218) 878-0112

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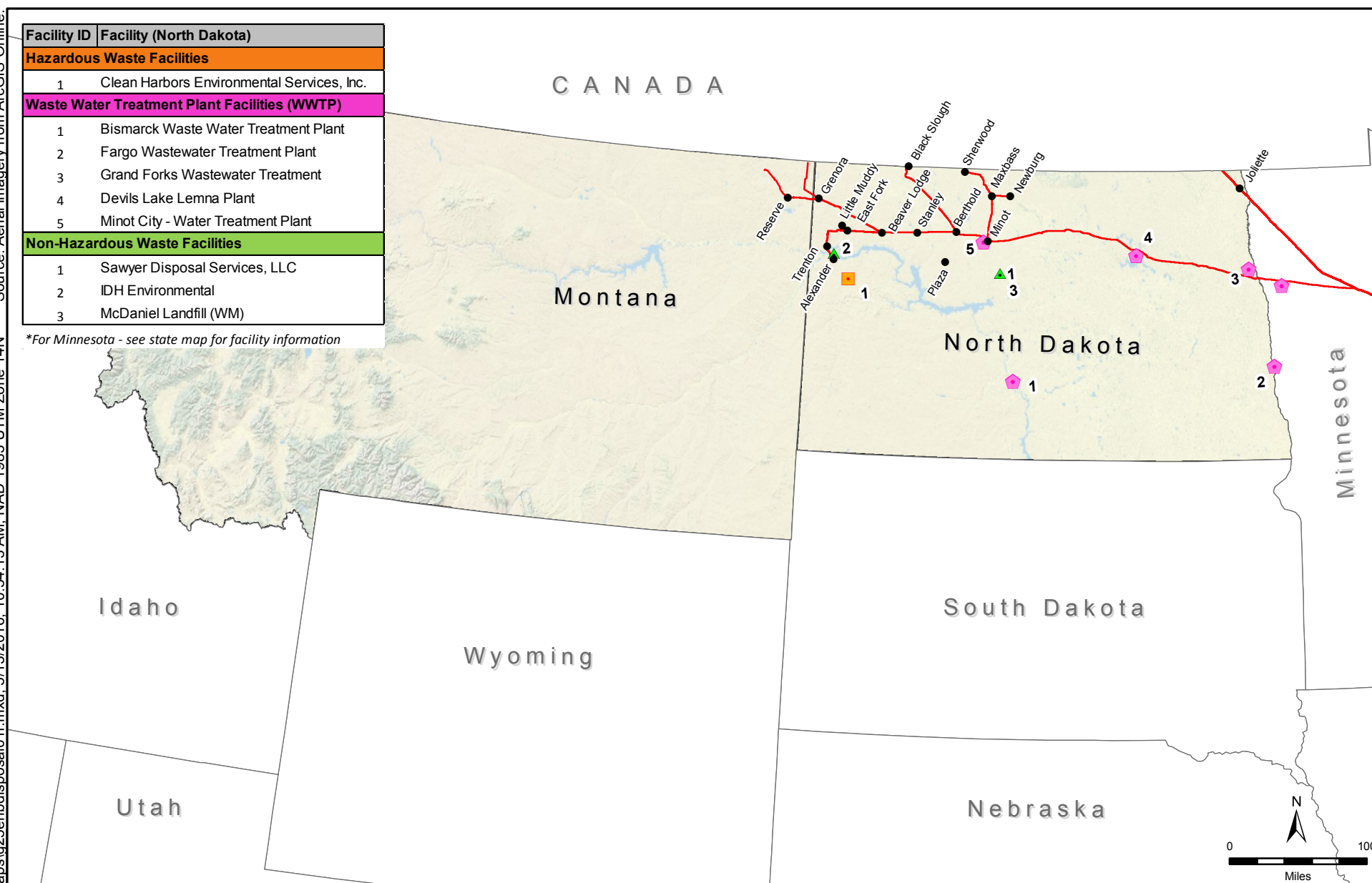
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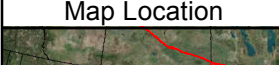
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Facility ID	Facility (North Dakota)
Hazardous Waste Facilities	
1	Clean Harbors Environmental Services, Inc.
Waste Water Treatment Plant Facilities (WWTP)	
1	Bismarck Waste Water Treatment Plant
2	Fargo Wastewater Treatment Plant
3	Grand Forks Wastewater Treatment
4	Devils Lake Lemna Plant
5	Minot City - Water Treatment Plant
Non-Hazardous Waste Facilities	
1	Sawyer Disposal Services, LLC
2	IDH Environmental
3	McDaniel Landfill (WM)

*For Minnesota - see state map for facility information



 ENBRIDGE	Map Location		Legend Hazardous Waste Facility Waste Water Treatment Plant (WWTP) Non-Hazardous Waste Facility Enbridge Pipeline	WASTE FACILITIES - NORTH DAKOTA AND MONTANA
				
	Drawn: LBG 5/13/2016			
	Approved: LBG 5/13/2016			
Project #: Disposal				

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Waste Facilities – North Dakota and Montana

Facility ID	Facility (North Dakota)	Waste Type	Address	City	State	Zip	County	Contact Phone
Hazardous Waste Facilities								
1	Clean Harbors Environmental Services, Inc.	Solid & Liquid - Haz	2541 132nd C Avenue NW	Arnegard	ND	58835	McKenzie	(701) 586-3170
Waste Water Treatment Plant Facilities (WWTP)								
1	Bismarck Waste Water Treatment Plant	Liquid - WWTP	601 London Avenue	Bismarck	ND	58504	Burleigh	(701) 222-6618
2	Fargo Wastewater Treatment Plant	Liquid - WWTP	3400 Broadway North	Fargo	ND	58102	Cass	(701) 241-1454
3	Grand Forks Wastewater Treatment	Liquid - WWTP	3251 North 69th Street	Grand Forks	ND	58203	Grand Forks	(701) 787-9131
4	Devils Lake Lemna Plant	Liquid - WWTP	2815 North Dakota 19	Devils Lake	ND	58301	Ramsey	(701) 662-7623
5	Minot City - Water Treatment Plant	Liquid - WWTP	900 16th Street Southwest	Minot	ND	58701	Ward	(701) 857-4760
Non-Hazardous Waste Facilities								
1	Sawyer Disposal Services, LLC	Solid & Liquid - NonHaz	12400 247th Ave Southeast	Sawyer	ND	58781	Ward	(701) 624-5622
2	IDH Environmental	Solid - NonHaz	14070 43rd Street Northwest	Williston	ND	58801	Williams	(701) 774-8514
3	McDaniel Landfill (WM)	Solid - NonHaz	12300 247th Avenue Southeast	Sawyer	ND	58781	Ward	(701) 624-5250

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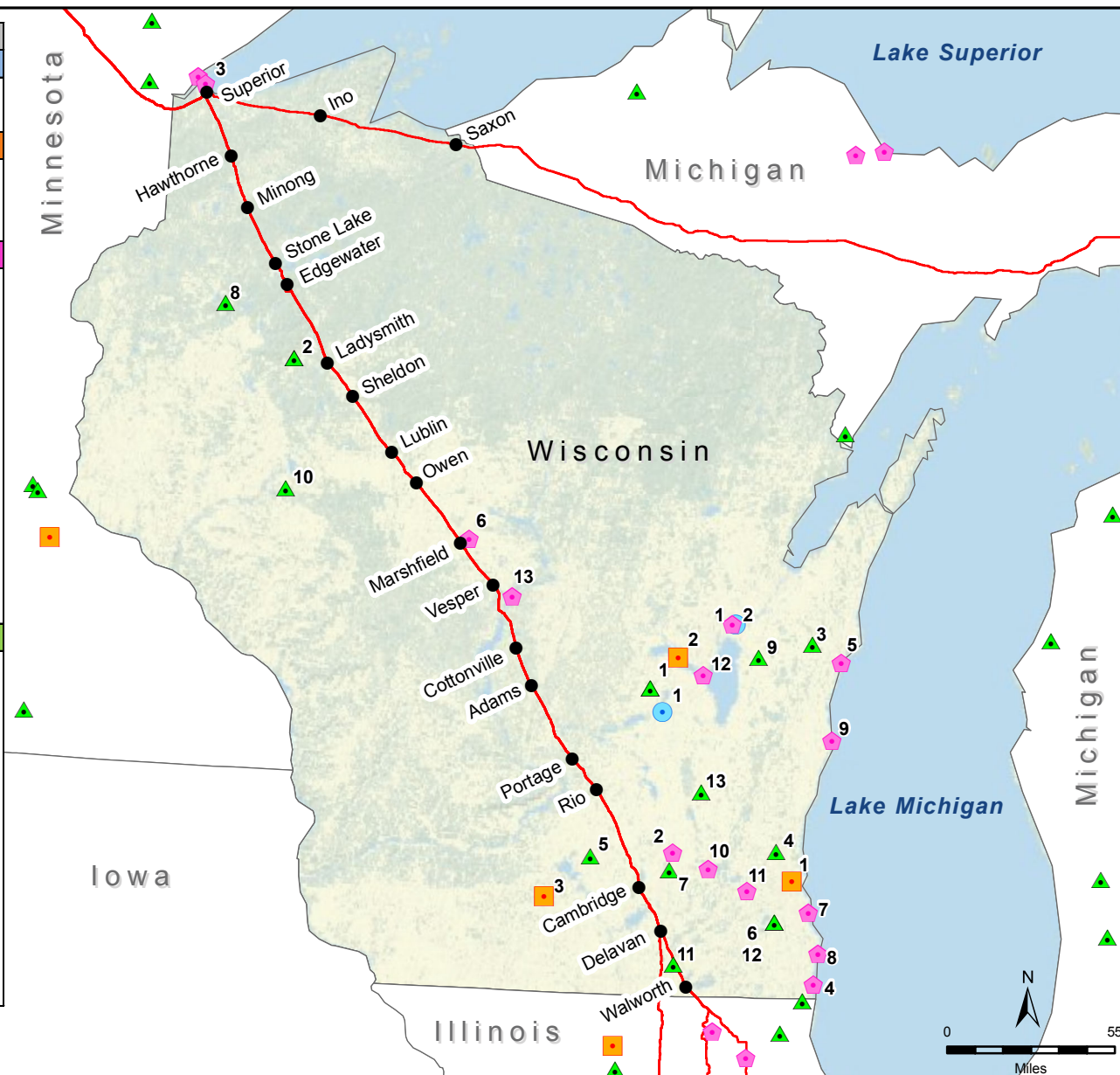
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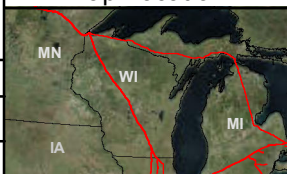
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Facility ID	Facility (Wisconsin)
Liquid Waste Facilities	
1	Covanta Environmental Solutions
2	Covanta Environmental Solutions
Hazardous Waste Facilities	
1	Advanced Waste Services of WI
2	Covanta Environmental Solutions
3	Safety-Kleen, Inc.
Waste Water Treatment Plant Facilities (WWTP)	
1	Appleton Wastewater Treatment Facility
2	Watertown Wastewater Treatment Facility
3	Superior Wastewater Division of Public Works
4	Kenosha Wastewater Treatment Plant
5	Manitowoc Wastewater Treatment Facility
6	Marshfield Wastewater Treatment Facility
7	South Milwaukee Wastewater Treatment Facility
8	Racine Utilities - Wastewater Utility
9	Sheboygan Regional Wastewater Treatment Facility
10	Oconomowoc Wastewater Treatment Facility
11	Waukesha Wastewater Treatment Plant
12	Oshkosh Wastewater Treatment Plant
13	Wisconsin Rapids Wastewater Treatment Plant
Non-Hazardous Waste Facilities	
1	Valley Trail Landfill (WM)
2	Timberline Trail Landfill (WM)
3	Ridgeview (WM)
4	Orchard Ridge (WM)
5	Madison Prairie (WM)
6	Metro (WM)
7	Deer Track Park (WM)
8	Lake Area Landfill (Republic Services)
9	Hickory Meadows Landfill (Advanced Disposal)
10	Seven Mile Creek Landfill (Advanced Disposal)
11	Mallard Ridge Landfill (Advanced Disposal)
12	Emerald Park Landfill (Advanced Disposal)
13	Glacier Ridge Landfill (Advanced Disposal)

*For Minnesota, Illinois, and Michigan - see state map for facility information



Map Location



Legend

- Liquid Waste Facility
- Hazardous Waste Facility
- ◆ Waste Water Treatment Plant (WWTP)
- ▲ Non-Hazardous Waste Facility
- Enbridge Pipeline

Drawn: LBG 5/13/2016

Approved: LBG 5/13/2016

Project #: Disposal

WASTE
FACILITIES -

WISCONSIN

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Waste Facilities – Wisconsin

Facility ID	Facility (Wisconsin)	Waste Type	Address	City	State	Zip	County	Contact Phone
Liquid Waste Facilities								
1	Covanta Environmental Solutions	Liquid	625 Douglas Street	Ripon	WI	54971	Fond du Lac	(920) 582-7596
2	Covanta Environmental Solutions	Liquid	552 Carter Court	Kimberly	WI	54136	Outagamie	(920) 582-7596
Hazardous Waste Facilities								
1	Advanced Waste Services of WI	Solid & Liquid - Haz	3801 West McKinley Avenue	Milwaukee	WI	53208	Milwaukee	(414) 397-6301
2	Covanta Environmental Solutions	Liquid - Haz	210 Tower Road	Winneconne	WI	54986	Winnebago	(920) 582-7596
3	Safety-Kleen, Inc.	Solid & Liquid - Haz	3715 Lexington Avenue	Madison	WI	53714	Dane	(608) 221-0714
Waste Water Treatment Plant Facilities (WWTP)								
1	Appleton Wastewater Treatment Facility	Liquid -WWTP	2006 East Newberry Street	Appleton	WI	54914	Calumet	(920) 832-5945
2	Watertown Wastewater Treatment Facility	Liquid -WWTP	800 Hoffmann Road	Watertown	WI	53094	Jefferson	(920) 262-4085
3	Superior Wastewater Div. Of Public Works	Liquid -WWTP	51 East First Street	Superior	WI	54880	Douglas	(715) 394-0392
4	Kenosha Wastewater Treatment Plant	Liquid -WWTP	7834 3rd Avenue	Kenosha	WI	53143	Kenosha	(262) 653-4335
5	Manitowoc Wastewater Treatment Facility	Liquid -WWTP	1015 South Lakeview Drive	Manitowoc	WI	54220	Manitowoc	(920) 686-3550
6	Marshfield Wastewater Treatment Facility	Liquid -WWTP	2601 East 34th Street	Marshfield	WI	54449	Marathon	(715) 486-2007
7	South Milwaukee Wastewater Treatment Facility	Liquid -WWTP	3003 5th Avenue	South Milwaukee	WI	53172	Milwaukee	(414) 768-8180
8	Racine Utilities - Wastewater Utility	Liquid -WWTP	2101 S. Wisconsin Avenue	Racine	WI	53403	Racine	(262) 636-9520
9	Sheboygan Regional Wastewater Treatment Facility	Liquid -WWTP	3333 Lakeshore Drive	Sheboygan	WI	53081	Sheboygan	(920) 459-3464
10	Oconomowoc Wastewater Treatment Facility	Liquid -WWTP	900 South Worthington Street	Oconomowoc	WI	53066	Waukesha	(262) 569-2192
11	Waukesha Wastewater Treatment Plant	Liquid -WWTP	600 Sentry Drive	Waukesha	WI	53186	Waukesha	(262) 524-3625
12	Oshkosh Wastewater Treatment Plant	Liquid -WWTP	233 North Campbell Road	Oshkosh	WI	54902	Winnebago	(920) 232-5365
13	Wisconsin Rapids Wastewater Treatment Plant	Liquid -WWTP	2540 1st Street South	Wisconsin Rapids	WI	54494	Wood	(715) 421-8287
Non-Hazardous Waste Facilities								
1	Valley Trail Landfill (WM)	Solid - NonHaz	N9101 Willard Road	Berlin	WI	54923	Green Lake	(920) 361-4995
2	Timberline Trail Landfill (WM)	Solid - NonHaz	N4581 Hutchinson Road	Weyerhaeuser	WI	54895	Rusk	(715) 868-7000
3	Ridgeview (WM)	Solid - NonHaz	6207 Hempton Lake Road	Whitelaw	WI	54247	Manitowoc	(920) 796-6007
4	Orchard Ridge (WM)	Solid - NonHaz	W124 N9355 Boundary Road	Menomonee Falls	WI	53051	Waukesha	(262) 509-5629
5	Madison Prairie (WM)	Solid - NonHaz	6002 Nelson Road	Sun Prairie	WI	53590	Dane	(608) 837-9031
6	Metro (WM)	Solid - NonHaz	10712 South 124th Street	Franklin	WI	53132	Milwaukee	(414) 529-6180
7	Deer Track Park (WM)	Solid - NonHaz	N6756 Waldmann Lane	Watertown	WI	53094	Jefferson	(920) 699-3475
8	Lake Area Landfill (Republic Services)	Solid - NonHaz	W5987 County Road D	Sarona	WI	54870	Washburn	(715) 469-3356
9	Hickory Meadows Landfill (Advanced Disposal)	Solid - NonHaz	W3105 Schneider Road	Hilbert	WI	54129	Calumet	(920) 853-8553
10	Seven Mile Creek Landfill (Advanced Disposal)	Solid - NonHaz	8001 Olson Drive	Eau Claire	WI	54703	Eau Claire	(715) 830-0284
11	Mallard Ridge Landfill (Advanced Disposal)	Solid - NonHaz	W8470 State Road 11	Delavan	WI	53115	Walworth	(262) 724-3257
12	Emerald Park Landfill (Advanced Disposal)	Solid - NonHaz	W124 S10629 South 124th Street	Muskego	WI	53150	Waukesha	(414) 529-1360
13	Glacier Ridge Landfill (Advanced Disposal)	Solid - NonHaz	N7296 County Road V	Horicon	WI	53032	Dodge	(920) 387-0987

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Appendix

External Distribution Requires Prior Written Approval by the Law Department

Appendix F
Spill Report Form

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Spill Report Form

(The Contractor Spill Coordinator must complete this for any spill, regardless of size, and submit the form to the Enbridge Representative within 24 hours of the occurrence)

Date of Spill: _____ Date of Spill Discovery: _____

Time of Spill: _____ Time of Spill Discovery: _____

Name and Title of Discoverer: _____

Type of material spilled and manufacturer's name: _____

Legal Description of spill location to the quarter section: _____

Directions from nearest community: _____

Estimated volume of spill: _____

Weather conditions: _____

Topography and surface conditions of spill site: _____

Spill medium (pavement, sandy soil, water, etc.): _____

Proximity of spill to surface waters: _____

Did the spill reach a waterbody? _____ Yes _____ No

If so, was a sheen present? _____ Yes _____ No

Describe the causes and circumstances resulting in the spill: _____

Describe the extent of observed contamination, both horizontal and vertical (i.e., spill-stained soil in a 5-foot radius to a depth of 1 inch): _____

Describe immediate spill control and/or cleanup methods used and implementation schedule: _____

Current status of cleanup actions: _____

Name and Company for the following:

Construction Superintendent: _____

Spill Coordinator: _____

Enbridge Representative: _____

Person Who Reported the Spill: _____

Environmental Inspector: _____

Form completed by: _____ Date: _____

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Appendix G
Spill Reporting-Agency Contacts

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Spill Reporting Contacts						
Agency	Water	Soil	Notification Period	24-Hour Reporting Hotline	Regulation/Code	Comments
Federal Contacts						
National Response Center	Any quantity of discharged oil that violates state water quality standards, causes a film or sheen on water's surface or leaves sludge or emulsion beneath the surface	Release of a hazardous substance in an amount equal to or greater than its reportable quantity under CERCLA	Immediately	1-800-424-8802	40 CFR 302 – Designation, Reportable Quantities, and Notification	
Environmental Protection Agency Region V (MN / WI)	Any quantity of discharged oil that violates state water quality standards, causes a film or sheen on water's surface or leaves sludge or emulsion beneath the surface		Immediately	1-312-353-2000	40 CFR 117 – Determination of Reportable Quantities for Hazardous Substances Clean Water Act § 311 – Oil and Hazardous Substance Liability	

Spill Reporting Contacts						
Agency	Water	Soil	Notification Period	24-Hour Reporting Hotline	Regulation/Code	Comments
Environmental Protection Agency Region VIII (ND)	Any quantity of discharged oil that violates state water quality standards, causes a film or sheen on water's surface or leaves sludge or emulsion beneath the surface		Immediately	1-303-312-6312	40 CFR 117 – Determination of Reportable Quantities for Hazardous Substances Clean Water Act § 311 – Oil and Hazardous Substance Liability	
State Contacts						
Minnesota Pollution Control Agency	Visible Sheen or Emulsion	No minimum quantity for crude oil. Any spill >5 gallons of refined petroleum product. Spills of any quantity of all other chemicals or materials should be reported.	Immediately upon discovery.	Minnesota State Duty Officer 1-800-422-0798 (In State) or (651) 649-5451	Minnesota Statute 115.061	Follow up report established after initial response.

Spill Reporting Contacts						
Agency	Water	Soil	Notification Period	24-Hour Reporting Hotline	Regulation/Code	Comments
North Dakota Department of Health	Visible Sheen or Emulsion	No minimum requirement. All spills that impact or threaten groundwater or surface water or may potentially have adverse effects on human health or the environment are reportable.	Immediately upon discovery.	North Dakota Department of Health 1-701-328-5210 North Dakota Hazardous Materials Emergency Assistance and Spill Reporting 1-800-472-2121 (In State) 1-701-328-5210 (Out of State)	North Dakota Administrative Code NDAC 33-16-02.1-1	Follow up report established after initial response.

Spill Reporting Contacts						
Agency	Water	Soil	Notification Period	24-Hour Reporting Hotline	Regulation/Code	Comments
Wisconsin Department of Natural Resources	Visible Sheen or Emulsion	All spills are reportable unless they meet the following criteria: 1) spill is contained on an impervious surface; 2) <5 gallons of petroleum products on a pervious surface; 3) <1 gallon of gasoline on a pervious surface.	Immediately of any discharge not exempted by the statute.	24-hour WI DNR reporting number 1-800-943-0003	Chapter 292.11 of the Wisconsin Statutes, Chapter NR 706 Wisconsin Administrative Code	Follow up report established after initial response.
County Contacts – Minnesota						
Kittson County Emergency Management	As Needed			Scot Olson (218) 843-2113	Kittson County 2015 Hazard Management Plan	
Marshall County Emergency Services	As Needed			Josh Johnston (218) 745-5841	Marshall County, MN Hazard Mitigation Plan 2016 Update	
Pennington County Emergency Management	As Needed			Erik Beitel (218) 683-7087		
Wadena County Emergency Management	As Needed			Tyler Wheeler (218) 631-7795		

Spill Reporting Contacts						
Agency	Water	Soil	Notification Period	24-Hour Reporting Hotline	Regulation/Code	Comments
Polk County Emergency Management	As Needed			Jody Beauchane, Director (218) 470-8263	Polk County, MN Hazard Mitigation Plan (July 2015)	
Red Lake County Emergency Management	As Needed			Mitch Bernstein (218) 253-2996		
Clearwater County Emergency Management	As Needed		8:00 AM – 4:30 PM Monday – Friday	(218) 694-6226		
Hubbard County Emergency Management	As Needed			Brian Halbasch (218) 732-2588		
Cass County Emergency Management	As Needed			Chad Emery (218) 547-7437	Cass County Hazard Mitigation Plan	
Crow Wing County Emergency Management	As Needed			John Bowen, Director (218) 829-4749		
Aitkin County Emergency Management	As Needed			Dispatch (non-emergency) (218) 927-7400		
Carlton County Emergency Management	As Needed			Steve VanKekerix, Director (218) 384-9539		

Spill Reporting Contacts						
Agency	Water	Soil	Notification Period	24-Hour Reporting Hotline	Regulation/Code	Comments
St Louis County Emergency Management	As Needed			Sheriff's Office Emergency Management Division (218) 336-4340		
County Contacts – North Dakota						
Pembina County Emergency Management	As Needed			Andrew Kirking (701) 265-4849		
County Contacts – Wisconsin						
Douglas County Emergency Management	As Needed		8:00 AM – 4:30 PM Monday – Friday	Keith Kesler, Director (715) 395-1636		

Minnesota

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MINNESOTA SPILL NOTIFICATION REQUIREMENTS

The Minnesota Department of Public Safety, Division of Emergency Management (DEM) operates a 24-hour State Duty Officer service establishing a one call system for all state reporting requirements. The Duty Officers record all pertinent information and then make the appropriate notifications to the county and state agencies. The 24-Hour spills and leaks hotline can be reached via one of the following telephone numbers:

1-800-422-0798 (In State)

1-651-649-5451 (Out of State)

The Minnesota Pollution Control Agency (MPCA) requires immediate notification upon discovery of any spill of any quantity of crude oil. This includes historical contamination found during environmental investigations.

Every person who has “any substance or material under its control” is required to report. This includes:

- Property owners who discover contamination – Individuals, partnerships, companies, corporations;
- Governmental subdivisions, including officers of these entities;
- Owners of substances being stored or transported by another company; and
- Contractors that are in physical control of a discharged substance.

In addition to MPCA notification, local regulations may require additional notifications.

Additionally, reporting of releases of non-petroleum materials greater than the Reportable Quantity (RQ) is required if the material exceeds the quantity listed in **Table 3** (located at the beginning of this document).

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Minnesota Reporting of Petroleum Releases Guidance Documents

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Reporting leaks and spills

Minn. Stat. §115.061, which has been in effect since 1969, describes the duty of people to notify the Minnesota Pollution Control Agency (MPCA) when spills and leaks occur:

115.061 — Duty to Notify and Avoid Water Pollution

- a) Except as provided in paragraph (b), it is the duty of every person to notify the agency immediately of the discharge, accidental or otherwise, of any substance or material under its control which, if not recovered, may cause pollution of waters of the state, and the responsible person shall recover as rapidly and thoroughly as possible such substance or material and take immediately such other action as may be reasonably possible to minimize or abate pollution of waters of the state caused thereby.
- b) Notification is not required under paragraph (a) for a discharge of five gallons or less of petroleum, as defined in section 115C.02, subdivision 10. This paragraph does not affect the other requirements of paragraph (a).

The law provides penalties of up to \$10,000 per day for violations.

The Minnesota Department of Public Safety, Bureau of Criminal Apprehension, operates a 24 hour service, establishing a one call system for all state reporting requirements.

Reportable spills should be directed to the Minnesota Duty Officer by calling 651-649-5451 or 800-422-0798.

The duty officer will record all pertinent information and then make the appropriate notifications to the state agencies.

Spills that must be reported

Report spills that may cause pollution, such as spills of toxic, flammable, corrosive and dangerous industrial chemicals. Also report spills of environmentally damaging materials, including milk, coal, animal parts, batteries, etc.

Reportable quantities

Minnesota has a reporting threshold of greater than five-gallons for petroleum spills. Spills of any quantity of all other chemicals or materials should be reported. If in doubt, report.

Anyone who spills is required to report

EVERY person who has “any substance or material under its control” must report spills and leaks. This includes:

- property owners who discover contamination;
- individuals, partnerships, companies and corporations;
- governmental subdivisions, including officers of these entities;
- owners of substances being stored or transported by another company; and
- contractors who are in physical control of a discharged substance.

Sometimes a fire department, police agency or other local or state agency that responds to a spill or leak chooses to report the incident to the MPCA. In some circumstances, the entity may be required to report the

spill. However, in no case does a report from someone else stand in lieu of your responsibility to report to the MPCA by calling the Minnesota Duty Officer if a substance is under your control.

Be aware that there may be other reporting requirements imposed by local ordinances, state or federal law, or permits. Understanding all reporting requirements is the responsibility of those who handle substances which can pollute.

It is the responsibility of the spiller to ensure an effective cleanup and proper management of all wastes generated. With the exception of used oil, waste generated from petroleum spills that have been reported and cleaned up immediately are exempt from Minnesota's Hazardous Waste Rules. Waste from used oil spills must be sent to a facility for energy recovery.

For more information

For more information on spill prevention, cleanup or disposal, call the MPCA at 651-296-6300 or 800-657-3864 and ask for a member of the Emergency Management Unit or go to <https://www.pca.state.mn.us/waste/emergency-response>.

More information is also on the U.S. Environmental Protection Agency website at <https://www.epa.gov/oilspill/>.



Crude oil and unrefined petroleum wastes

Crude oil and related unrefined petroleum wastes present risks to human health and the environment if improperly managed. This fact sheet will discuss the hazardous waste requirements for these wastes administered by the Minnesota Pollution Control Agency (MPCA) and the Metropolitan Counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington (Metro Counties).

What are crude oil and unrefined petroleum wastes?

Crude oil wastes include:

- Spilled crude oil or unrefined petroleum from pipelines, trains, trucks, tanks, and other sources.
- Absorbents, cleanup materials, soil, and water contaminated with crude oil or unrefined petroleum.

Crude oil and unrefined petroleum wastes almost always contain enough benzene and related organic compounds to make them a characteristic hazardous waste. They may also contain hazardous concentrations of heavy metals, including arsenic, cadmium, chromium, lead, mercury, and selenium.

Assume untested crude oil, unrefined petroleum, and any related wastes that will be disposed or burned are hazardous wastes until you evaluate them and document that they are non-hazardous. See MPCA fact sheet #w-hw1-01, Evaluate Waste, at <https://www.pca.state.mn.us/sites/default/files/w-hw1-01.pdf>.

What are *not* crude oil or unrefined petroleum wastes?

Other wastes may be confused with crude oil and unrefined petroleum wastes, including:

- o Manufactured or refined petroleum-based and other-based fuels, such as fuel oil, gasoline, and diesel. Manage these fuel-related wastes as discussed in MPCA fact sheet #w-hw4-19, Fuel-related Wastes, at <https://www.pca.state.mn.us/sites/default/files/w-hw4-19.pdf>.
- o Used oils and related wastes, including lubricating, hydraulic, and cutting oils. Manage these used oil wastes as discussed in MPCA fact sheet #w-hw4-30, Used Oil and Related Wastes, at <https://www.pca.state.mn.us/sites/default/files/w-hw4-30.pdf>.
- o Recovered crude oil or unrefined petroleum that will be managed by refining along with normal process streams at a petroleum refining facility. This material is considered a commodity instead of a regulated waste.

What must I do if crude oil or unrefined petroleum is spilled?

Immediately report all spills of crude oil or unrefined petroleum to the Minnesota Duty Officer. See [More information](#) on the page 3. If needed, call 911 to summon emergency responders first.

Note: The five-gallon exemption in Minnesota's spill reporting law applies only to refined petroleum fuel products, not crude oil or unrefined petroleum-contaminated wastes. All spills of crude oil or unrefined petroleum, regardless of volume, must be reported.

Next, take all reasonable steps to contain the spill and begin to recover as much of the spilled material as possible. Follow any directions given to you by MPCA Emergency Management Unit (EMU) staff.

Finally, document your spill response actions. Submit a written report of transport-related spills to the U.S. Department of Transportation (DOT) within 30 days.

How must crude oil and unrefined petroleum wastes be managed?

- Manage untested wastes and wastes that are not eligible for any of the other options below as fully regulated hazardous wastes. See MPCA fact sheet #w-hw1-06, Treat or Dispose of Hazardous Waste, at <https://www.pca.state.mn.us/sites/default/files/w-hw1-06.pdf>.
- In certain situations, MPCA EMU staff may allow specific management of crude oil or unrefined petroleum wastes that is different than explained in this fact sheet. If the EMU staff issue a specific allowance, this authorization supersedes the requirements discussed here. EMU authorizations are incident-specific and cannot be used for a different spill.
- Liquids and solids that meet the criteria below may be managed equivalent to off-specification used oil and burned for energy recovery in utility or industrial furnaces and boilers. Crude oil and unrefined petroleum wastes that will be burned for energy recovery equivalent to used oil must contain:
 - 10 parts per million (ppm) or less of arsenic.
 - 0.2 ppm or less of mercury.

For guidance on management requirements for off-specification used oil, see MPCA fact sheet #w-hw4-30, Used Oil and Related Wastes, at <https://www.pca.state.mn.us/sites/default/files/w-hw4-30.pdf>.

- Contaminated soil shown to leach less arsenic, cadmium, chromium, lead, mercury, and selenium than the hazardous waste toxicity characteristic levels in MPCA fact sheet #w-hw2-04, Characteristic Hazardous Wastes, at <https://www.pca.state.mn.us/sites/default/files/w-hw2-04.pdf>, may be transported without a hazardous waste manifest in Minnesota and:
 - Landfilled if soils have been dewatered and the receiving landfill's permit and Industrial Solid Waste Management Plan allow its acceptance. The landfill must be notified prior to shipment and must agree to accept the soil. The landfill may require additional testing before accepting the waste, and may apply specific conditions or limitations to the disposal.
 - Land applied if soil application has been approved by the MPCA's Petroleum Remediation Program (PRP). For information on the PRP approval process, see MPCA fact sheet #c-prp3-03, Land Treatment of Petroleum Contaminated Soil, at <https://www.pca.state.mn.us/sites/default/files/c-prp3-03.pdf>.
- Contaminated water shown to contain less arsenic, cadmium, chromium, lead, mercury, and selenium than the hazardous waste toxicity characteristic levels in MPCA fact sheet #w-hw2-04, Characteristic Hazardous Wastes, at <https://www.pca.state.mn.us/sites/default/files/w-hw2-04.pdf>, may be transported without a hazardous waste manifest in Minnesota and:
 - Discharged to a publicly owned treatment works (POTW). The POTW must be notified prior to shipment and must agree to accept the water. The POTW may require additional testing before accepting the waste, and may apply specific conditions or limitations to the discharge.
 - Land applied if water application has been issued a National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Permit for Contaminated Groundwater by the MPCA. For the application process for this permit, see MPCA form #wq-wwprm7-29, Industrial Groundwater Pump-Out Application, at <https://www.pca.state.mn.us/sites/default/files/wq-wwprm7-29.doc>.

More information

Guidance in this fact sheet was compiled from Minnesota Statutes, Chapter 115, and Minnesota Rules, Chapters 7037 and 7045, and incorporates regulatory interpretation decisions made by the MPCA on April 13, 2016. To review Minnesota laws, visit the Office of the Revisor of Statutes at <https://www.revisor.mn.gov/pubs>.

For information about waste minimization, contact the Minnesota Technical Assistance Program (MnTAP). The MPCA's Small Business Environmental Assistance Program can offer free, confidential compliance assistance. Immediately report all hazardous waste spills to the Minnesota Duty Officer.

Metro County Hazardous Waste Offices

Anoka	763-422-7093
.....	https://www.anokacounty.us/
Carver	952-361-1800
.....	http://www.co.carver.mn.us/
Dakota	952-891-7557
.....	https://www.co.dakota.mn.us/
Hennepin	612-348-3777
.....	http://www.hennepin.us/
Ramsey	651-266-1199
.....	https://www.ramseycounty.us/
Scott	952-496-8475
.....	http://www.scottcountymn.gov/
Washington	651-430-6655
.....	https://www.co.washington.mn.us/

Minnesota Pollution Control Agency

Toll free (all offices)	1-800-657-3864
All offices	651-296-6300
.....	https://www.pca.state.mn.us/

Minnesota Duty Officer

Toll free	1-800-422-0798
Metro	651-649-5451

Small Business Environmental Assistance Program

Toll free	1-800-657-3938
Metro	651-282-6143
.....	https://www.pca.state.mn.us/sbeap/

Minnesota Technical Assistance Program

Toll free	1-800-247-0015
Metro	612-624-1300
.....	http://www.mntap.umn.edu

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Minnesota Pollution Control Agency District Contacts

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**Minnesota
Pollution
Control
Agency**

520 Lafayette Road North
St. Paul, Mn. 55155-4194
651-296-6300
800-657-3864
www.pca.state.mn.us

Minnesota PCA District office contacts

Brainerd:

7678 College Road
Suite 105
Baxter, MN 56425
218-828-2492
800-657-3864
Fax: 218-828-2594

Detroit Lakes:

714 Lake Ave.
Suite 220
Detroit Lakes, MN 56501
218-847-1519
800-657-3864
Fax: 218-846-0719

Duluth:

525 Lake Ave. S.
Suite 400
Duluth, MN 55802
218-723-4660
800-657-3864
Fax: 218-723-4727

Mankato:

12 Civic Center Plaza
Suite 2165
Mankato, MN 56001
507-389-5977
800-657-3864
Fax: 507-389-5422

Marshall:

504 Fairgrounds Rd
Suite 200
Marshall, MN 56258
507 537-7146
800-657-3864
Fax: 507 537-6001

Rochester:

18 Wood Lake Drive SE
Rochester, MN 55904
507-285-7343
800-657-3864
Fax: 507-280-5513

St. Paul:

520 Lafayette Road N
St. Paul, MN 55155-4194
651-296-6300
800-657-3864,
TTY: use your preferred
telecommunications relay service.

Willmar:

1601 Highway 12 East
Suite 1
Willmar, MN 56201-6002
320-214-3786
800-657-3864
Fax: 320-214-3787

North Dakota

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NORTH DAKOTA SPILL NOTIFICATION REQUIREMENTS

The North Dakota Department of Health (NDDH) provides regulatory oversight of environmental issues. Specific minimum quantities for spill reporting have not been established. However, the following spills should be reported immediately (Note - All substances are included, not just “hazardous materials”):

- Any incident which may potentially have adverse effects to human health or the environment;
- Any incident or spill which may potentially result in pollution of waters of the state, either surface water or groundwater;
- Any historical contamination discovered during environmental investigations;

All reportable spills must be reported to the NDDH Division of Municipal Facilities or the North Dakota Hazardous Materials Emergency Assistance and Releases Reporting 24-Hour hotline immediately upon discovery. The telephone number for the 24-Hour hotline is:

1-800-472-2121 (In State)

1-701-328-2121 (Out of State)

The notification requirements above apply equally to new releases and historic releases. North Dakota regulations do not distinguish between the two.

Additionally, the reporting of releases of non-petroleum materials greater than the reportable quantity (RQ) is required if the material exceeds the quantity listed in Table 3 (located at the beginning of this document).

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North Dakota Environmental Incident Reports

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**North Dakota Department of Health (1.701.328.5210) or
North Dakota Oil and Gas Division (1.701.328.8020) or
North Dakota Department of Emergency Services (1.701.328.8100) or
(1.800.472.2121) State Radio 24-Hour Hotline - valid only in North Dakota.)**

ENVIRONMENTAL INCIDENT REPORTS

Instructions For: | [Oilfield Form](#) | [General Form](#) | [Fish Kill Form](#) |

If there is any question as to proper response call the Department of Health, or the Oil and Gas Division, or the North Dakota Department of Emergency Services and provide all relevant information about the incident.

[Oilfield Related Incident Report Form \(click to go there\)](#) (If the report incident button on this form does not display another form, try adding the URL of the form to the trusted sites on your internet browser.)

This form is only for RCRA-exempt releases in the oilfield. This will generally include:

- Produced fluids such as crude oil, water, or oil/water emulsion before ownership transfer takes place, (i.e. a release from the producer's lease, flow lines, or tank battery before being trucked off-site or going into crude transportation pipeline.)
- Brine water from a commercial disposal facility.
- Condensate from gas lines or gas plant before leaving the gas plant in the transportation pipeline.

Please Note:

- Releases of crude oil or produced water from truck transport are not exempt and should use the General Environmental Incident Report Form link below.
- Releases of crude oil or other non-gaseous petroleum products from transportation pipelines are not exempt and should use the General Environmental Incident Report Form link below .
- Releases of non-oilfield-produced substances, even when released on an oil lease, are not exempt and should use the General Environmental Incident Report Form link below. This would include spills such as fuel for rig motors, acid for well stimulation, etc.

[General Environmental Incident \(and non-exempt Oilfield Related Incident\) Report Form \(click to go there\)](#)

This form should be used for any environmental incident or release that is not exempt under the RCRA oilfield exemptions. This will generally include:

- Any spill which may potentially have adverse effects to human health or the environment.
- Any incident or spill which may potentially result in pollution of waters of the state, either surface water or ground water.

- Specific minimum quantities for mandatory reporting of spills have not been established. All incidents which may potentially impact human health or safety, waters of the state, either surface water or ground water, or other impacts to the environment, must be reported.
- All substances are included, not just "hazardous materials." Recent examples that a person may not normally think of as having a potential impact to the environment, include "non toxic" substances such as molasses or salt. These may not be immediately harmful to human health, but they may impact aquatic life or soil fertility.

Please Note:

- Sometimes an environmental incident does not actually result in a release to the environment, but should still be reported. Examples might include the loss of a sealed radiation source or a traffic accident involving hazardous chemicals, even if the containers did not break open.
- Releases of crude oil or produced water from truck transport are not exempt and should use the General Environmental Incident Report Form.
- Releases of crude oil or other non-gaseous petroleum products from transportation pipelines are not exempt and should use the General Environmental Incident Report Form.
- Releases of non-oilfield-produced substances, even when released on an oil lease, are not exempt and should use the General Environmental Incident Report Form. This would include spills such as fuel for rig motors, acid for well stimulation, etc.

[Fish Kill Report Form \(click to go there\)](#)

Use this form to report a fish kill even if the cause is not known. If the cause is a known spill then also use one of the Environmental Incident Report Forms shown above.

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[NDDH Home Page](#)

[NDIC Oil & Gas Division Home Page](#)

Last Updated: Friday, January 29, 2016 10:55:00 AM
Allen Johnson - ND Dept. of Health - ajohnson@nd.gov

North Dakota Department of Health Contacts

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NDDH Office Locations

Main Office - Bismarck

Address

North Dakota Department of Health [[Gold Seal Center Map](#)]
Environmental Health Section
918 East Divide Avenue
Bismarck, ND 58501-1947

Phone Numbers

Environmental Health Section – Chief's Office
701.328.5150
Fax
701.328.5200
Air Quality
701.328.5188
Municipal Facilities
701.328.5211
Waste Management
701.328.5166
Water Quality
701.328.5210

Environmental Training Center

Address

Environmental Training Center
[[Environmental Training Center Map](#)]
2639 East Main Avenue
Bismarck, ND 58504
Phone: 701.328.6628

Laboratory Services Division - Bismarck

Address

2635 East Main [[Laboratory Services Map](#)]
P.O. Box 5520
Bismarck, ND 58506-5520

Phone Numbers

Fax 701.328.6280
Office 701.328.6140

Fargo Field Office

Address

1120 28th Ave N, Suite B [[Fargo Map](#)]
Fargo ND 58102

Phone Numbers

[Jane Kangas](#) (Air Quality) 701.499.5208
[Christine Roob](#) (Waste Management)
701.499.5207
[Michael Hargiss](#) (Water Quality)
701.499.5209
Fax: 701.235.7394

Towner Field Office

Address & Phone Number
[Heather Duchscherer](#) (Water Quality)
314 Main St. South #2 [[Towner Map](#)]
Towner, ND 58788

Phone

701.537.2043
Gwinner - Big Dipper Enterprises Field Office

Address & Phone Numbers

[Tracy Lundquist](#)
PO Box 218
7972 129th Ave. SE [[Gwinner Map](#)]
Gwinner, ND 58040

Fax 701.678.2083

Office 701.678.2308

Sawyer Disposal Services Field Office

Address & Phone Numbers

[Kathleen Kangas](#)
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North Dakota Local Emergency Manager Contacts

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FOR OFFICIAL USE ONLY											
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Wisconsin

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WISCONSIN SPILL NOTIFICATION REQUIREMENTS

Spill notification requirements in the State of Wisconsin are addressed under Chapter 292.11 (Hazardous Substance Spills) of the Wisconsin Statutes. Commonly referred to as the Wisconsin Spill Law, it specifies the notification requirements for discharges of hazardous substances. As defined in the Statute, hazardous substances cover a broad range of materials including petroleum products.

Besides the Wisconsin Spill Law, Chapter NR 706 Wisconsin Administrative Code establishes “De Minimis” reporting requirements for those spills in which damage to the environment does not occur.

Discharges or spills of gasoline and/or another petroleum product do not require notification if any of the following conditions are met:

- The spill or discharge is completely contained within and on an impervious surface;
- The volume of the spill is less than 1-gallon of gasoline on a pervious surface or runs off an impervious surface; and
- The volume of the spill is less than 5-gallons of petroleum product other than gasoline on a pervious surface or runs off an impervious surface.

The De Minimis reporting requirement can only be applied if the discharged substance:

- Has evaporated or been cleaned up in accordance with NR 700 through 726;
- Does not adversely threaten or impact the air, lands, and waters of the State as either a single discharge or an accumulation of past and present discharges;
- Does not threaten or cause acute or chronic impacts to human health; and
- Does not present a fire, explosion, or other safety hazard.

Additionally, the reporting of releases of non-petroleum materials greater than the reportable quantity (RQ) is required if the material exceeds the quantity listed in Table 3 (located at the beginning of this document).

According to NR 706, “discharges to the environment include recent discharges” and “historic discharges”.

If the above bulleted conditions are not met, the Wisconsin Department of Natural Resources (WDNR) must be notified immediately. The 24-Hour spill reporting hotline can be reached at:

1-800-943-0003

A listing of regional WDNR offices is also attached.

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Wisconsin Spill Reporting Code

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Chapter NR 706

HAZARDOUS SUBSTANCE DISCHARGE NOTIFICATION
AND SOURCE CONFIRMATION REQUIREMENTS

NR 706.01	Purpose.
NR 706.02	Applicability.
NR 706.03	Definitions.
NR 706.05	General requirements for responsible parties.

NR 706.07	Exemptions.
NR 706.11	Additional responsibilities for owners or operators of underground storage tank systems.

Note: Corrections made under s. 13.93 (2m) (b) 7., Stats., [Register, February, 1997, No. 494](#).

NR 706.01 Purpose. The purpose of this chapter is to adopt by administrative rule notification requirements for discharges of hazardous substances. This chapter is adopted pursuant to ss. 227.11 (2) and 292.11, Stats.

History: Cr. Register, February, 1997, No. 494, eff. 3-1-97; CR 12-023: am. Register October 2013 No. 694, eff. 11-1-13.

NR 706.02 Applicability. (1) This chapter applies to hazardous substance discharges that are subject to the requirements of s. 292.11, Stats.

(2) Section NR 706.05 applies to all persons who have responsibility under s. 292.11, Stats., for any hazardous substance discharge that may occur. Section NR 706.11 contains additional requirements that only apply to the owners and operators of underground storage tank systems that are subject to regulation under 42 USC 6991 *et seq.* and 40 CFR part 280, or ch. ATCP 93, for hazardous substance discharges that are related to the underground storage tank system.

Note: The definition of “underground storage tank” in s. NR 700.03, which applies to this chapter, is based on the definition of “underground storage tank” in ch. ATCP 93, which includes certain farm and residential motor fuel storage tanks and heating oil tanks that are excluded from the federal UST program definition in 42 USC 6991.

(3) Persons and facilities subject to the release notification requirements in CERCLA section 103 (a), 42 USC 9603(a), or the emergency notification and notification requirements in s. 323.60, Stats., and 42 USC 11004, 11021, 11022 and 11023, are required to comply with those requirements in addition to complying with the notification requirements of this chapter, except that notification of a hazardous substance discharge which is given to the department in compliance with the requirements of this chapter constitutes notification of the division of emergency management as required by s. 323.60, Stats., if the notification contains all of the information specified in 42 USC 11004(b)(2).

History: Cr. Register, February, 1997, No. 494, eff. 3-1-97; correction in (2) made under s. 13.93 (2m) (b) 7., Stats., [Register, March, 2001, No. 543](#); correction in (2), (3) made under s. 13.92 (4) (b) 7., Stats., [Register February 2012 No. 674](#); correction in (3) made under s. 13.92 (4) (b) 7., Stats., [Register June 2013 No. 690](#); CR 12-023: am. (2), (3) [Register October 2013 No. 694](#), eff. 11-1-13; **correction in (2) made under s. 13.92 (4) (b) 7., Stats., [Register November 2013 No. 695](#)**.

NR 706.03 Definitions. In this chapter:

(2) “Fertilizer” has the meaning specified in s. 94.64 (1) (e), Stats., except that it does not include nitrates or other forms of nitrogen found in the environment that cannot be attributed to a discharge.

Note: Section 94.64 (1) (e), Stats., defines “fertilizer” to mean “any substance, containing one or more plant nutrients, which is used for its plant nutrient content and which is designed for use or claimed to have value in promoting plant growth, except unmanipulated animal or vegetable manures, marl, liming material, sewage sludge other than finished sewage sludge products, and wood ashes. ‘Fertilizer’ includes fertilizer materials, mixed fertilizers, custom mixed fertilizers, nonagricultural fertilizers and all other fertilizers or mixtures of fertilizers, regardless of type or form.”

(4) “Impervious” means incapable of being penetrated by a discharged substance.

Note: Asphalt and concrete, if intact and undamaged, are considered impervious surfaces. However, if hazardous substances are capable of penetrating asphalt

or concrete due to cracks or holes, or repeated discharges, the surface would not be considered impervious.

(5) “Nonhousehold pesticide” has the meaning specified in s. 94.681 (1) (c), Stats., except that it does not include pentachlorophenol, inorganic arsenical wood preservatives and coal tar creosote.

Note: Section 94.681 (1) (c), Stats., defines “nonhousehold pesticide” as “a pesticide that is not a household pesticide or an industrial pesticide.” “Household pesticide” is defined in s. 94.681 (1) (a), Stats.

(6) “Pesticide” has the meaning specified in s. 94.67 (25), Stats.

Note: Section 94.67 (25), Stats., defines “pesticide” to mean “any substance or mixture of substances labeled or designed or intended for use in preventing, destroying, repelling or mitigating any pest, or as a plant regulator, defoliant or desiccant.”

(7) “Petroleum product” means any refined petroleum based substance or blend intended for use as motor fuel, turbine fuel, heating fuel, a lubricant, a coolant, or for machine cutting.

History: Cr. Register, February, 1997, No. 494, eff. 3-1-97; correction in (5) made under s. 13.93 (2m) (b) 7., Stats., [Register, March, 2001, No. 543](#); CR 12-023: r. (1), (3), am. (7) [Register October 2013 No. 694](#), eff. 11-1-13.

NR 706.05 General requirements for responsible parties. (1) DISCHARGE NOTIFICATION. (a) Unless the discharge is specifically exempted under s. NR 706.07, persons who cause the discharge to the environment of a hazardous substance or who possess or control a hazardous substance which is discharged to the environment shall immediately notify the department of the discharge. Discharges to the environment may include recent discharges, historic discharges, and discharges caused by the long-term application of a substance. A hazardous substance that is “discharged” into a secondary containment structure, that is completely contained and can be recovered with no discharge to the environment, is not subject to the discharge notification requirements in s. 292.11 (2), Stats.

Note: The department believes that the dictionary definition of “immediately”, i.e. “occurring at once; next in line,” does not lend itself to quantification. An across-the-board time-period can’t be specified. In uncomplicated hazardous substance discharge situations, responsible parties are expected to provide notice to the department within a matter of a few minutes after they learned of the discharge. In other situations, especially where emergency action of some kind is being taken by the responsible party or where the responsible party does not have access to a telephone, notification may not be possible for several hours, but would still be considered “immediate” if promptly given.

(b) Hazardous substance discharges shall be immediately reported to the department by telephoning the department-designated 24-hour hotline telephone number. The department may allow alternate notification procedures on a case-by-case basis.

Note: Use of the department-designated 24-hour hotline is for notification of spills. The hotline operated by the division of emergency management in cooperation with the department can be reached at 1-800-943-0003.

(bm) Hazardous substance discharges discovered through soil, water or other analyses may be reported by telefaxing a completed discharge notification form provided by the department, or by alternate notification procedures approved by the department. Laboratory results shall be included with the completed discharge notification form.

Note: Use of the discharge notification form is intended only for notification of discharges typically found through tank closure assessment, phase II environmental assessments, or by other discoveries through soil, water or other media analysis.

The discharge notification form can be obtained at the following web address:
<http://dnr.wi.gov/files/PDF/forms/4400/4400-225.pdf>.

(c) The notification required by this subsection shall contain the following information to the extent practicable or applicable:

1. Name, address, and telephone number of the person reporting the discharge.
2. Name, address, and telephone number of the discharger, or owner and operator of the UST system and any other potentially responsible persons.
3. Date, time, and duration of the discharge.
- 3m. Location of the discharge including street address, county, town, city or village, if appropriate, quarter-quarter section, township, range, geographic position obtained in accordance with the requirements of s. NR 716.15 (5) (d), and legal description of lot, if located in a platted area.

Note: The provisions in s. NR 716.15 (5) (d) require that all geographic position data shall be obtained and submitted to the department in accordance with the following requirements: 1) for properties that are not more than 200 feet wide or long, a single point geographic position shall be obtained at least 40 feet within the boundaries of the property, or as close to the center of the property as possible if the property is less than 80 feet wide or long. For properties that are more than 200 feet wide or long, coordinates describing the approximate location of the property's boundaries, forming a polygon, shall be obtained; and 2) geographic position data shall be originally collected in Wisconsin Transverse Mercator '91 or projected onto Wisconsin Transverse Mercator '91.

4. Identity, physical state, and quantity of the material discharged.
5. Physical, chemical, hazardous, and toxicological characteristics of the substance.
6. Cause of the discharge.
7. Immediate actions being taken and the name of the contractor or other person performing the action.
8. Source, speed of movement, and destination or probable destination of the discharged hazardous substance.
9. Actual or potential impacts to human health or the environment, including actual or potential impacts to drinking water supplies.
10. Weather conditions existing at the scene, including presence of precipitation and wind direction and velocity.
11. Other agencies on-scene during the discharge incident.

(2) **CONTAINMENT, CLEANUP, DISPOSAL, AND RESTORATION.** Responsible parties shall comply with the requirements of chs. NR 700 to 754 for response actions to discharges of hazardous substances.

History: Cr. Register, February, 1997, No. 494, eff. 3-1-97; CR 12-023: am. (title), (1) (a), (b), cr. (1) (bm), am. (1) (c) (intro.), 3., cr. (1) (c) 3m., am. (1) (c) 11., (2) Register October 2013 No. 694, eff. 11-1-13.

NR 706.07 Exemptions. The exemptions in this section are limited to notification or penalty provisions. Responsible parties shall comply with the response requirements of s. NR 706.05 (2) for all situations. While notification of the discharge is exempt under this section, a response to the discharge is still required under s. 292.11, Stats. The exemptions are as follows:

(1) **STATUTORY NOTIFICATION EXEMPTIONS.** The following persons are not required to notify the department of a hazardous substance discharge that falls within any of the following categories:

(a) Any person holding a valid permit under ch. 283, Stats., is exempt with respect to substances discharged within the limits authorized by the permit.

(bm) Any person discharging in conformity with a permit or program approved under chs. 280 to 299, Stats., is exempt with respect to substances discharged within the limits authorized by the permit or program.

(cm) Any person applying a registered pesticide according to the label instructions, or applying a fertilizer at or below normal and beneficial agronomic rates, is exempt with respect to that pesticide or fertilizer application.

(2) **DE MINIMIS EXEMPTIONS.** (a) Except when reporting is required under par. (b), the following discharges do not require notification to the department:

1. A discharge of gasoline or another petroleum product that is completely contained on an impervious surface.
2. A discharge of gasoline if less than one gallon is discharged onto a surface that is not impervious or runs off an impervious surface.
3. A discharge of a petroleum product other than gasoline if less than 5 gallons is discharged onto a surface that is not impervious or runs off an impervious surface.
4. A discharge of a dry fertilizer if the amount is less than 250 pounds.
5. A discharge of a liquid fertilizer if the amount is less than 25 gallons, unless the reportable quantities listed for chemicals in 40 CFR part 117 or 302 are more restrictive, in which case the values in 40 CFR part 117 or 302 apply.
6. A discharge of pesticides registered for use in Wisconsin if the amount discharged when diluted as indicated on the pesticide label would cover less than one acre of land if applied according to label instructions, unless the reportable quantities listed for chemicals in 40 CFR part 117 or 302 are more restrictive, in which case the values in 40 CFR part 117 or 302 apply.
7. A discharge of substances specifically listed in 40 CFR part 117 or 302 if the amount discharged in any 24 hour period is less than the amount listed in 40 CFR part 117 or 302. If responsible parties are uncertain about how to interpret or apply 40 CFR part 117 or 302, they may report any discharge to the department.

Note: Notification requirements under this rule may not meet the obligations for responsible parties to report hazardous substance releases to the federal government. Questions on federal requirements should be directed to the US EPA Superfund hotline at 1-800-535-0202.

(b) Whenever, in light of site-specific conditions, any of the following criteria apply, hazardous substance discharges which would otherwise be exempt from notification under par. (a) shall be reported as required in s. NR 706.05:

1. The discharged substance has not evaporated or has not been cleaned up in compliance with the requirements of chs. NR 700 to 754.
2. The discharged substance has adversely impacted or threatens to adversely impact the air, lands or waters of the state either as a single discharge or when accumulated with previous discharges, even though the degree of the impact or threatened impact may not have been thoroughly evaluated.

Note: Where there is a sheen on surface water or the discharged substance has entered or is on the verge of entering the waters of the state, typically via a storm sewer, or drainage ditch, the department would consider the discharged substance to adversely impact or threaten to adversely impact the waters of the state.

3. The discharged substance has caused or threatens to cause acute or chronic human health impacts if immediate action, such as evacuation or in-place sheltering, is not taken. If the responsible party is unsure about potential human health effects, the responsible party shall consult with local or state health officials, and the responsible party shall make a notification decision based on that consultation.

4. The discharged substance presents or threatens to present a fire or explosion hazard or other safety hazards, such as slippery conditions on a roadway.

Note: In determining whether a threat exists under subd. 1., 2., 3., or 4., the standard of conduct to which the responsible party must conform is that of a reasonable person under the site-specific circumstances.

(3) **EXEMPTION FROM PENALTIES.** Law enforcement officers or members of fire departments using hazardous substances in carrying out their responsibility to protect public health, safety or welfare are exempted from the penalty requirements of s. 292.11 (9), Stats., but shall report to the department any dis-

charges of a hazardous substance occurring within the performance of their duties.

History: Cr. [Register, February, 1997, No. 494](#), eff. 3-1-97; [CR 12-023](#): cr. (intro.), am. (1) (title), r. (1) (b), renum. (1) (c) to (1) (bm), (1) (d) to (1) (cm), am. (2) (b) 1., cr. (3) [Register October 2013 No. 694](#), eff. 11-1-13.

NR 706.11 Additional responsibilities for owners or operators of underground storage tank systems.

(2) ADDITIONAL INFORMATION. The owner or operator of an UST system shall document and submit to the department, within 72 hours of the original notification, any additional information that the owner or operator obtains concerning the discharge which was not included at the time of the original notification, unless otherwise directed by the department.

(3) CLOSURE ASSESSMENT REPORTS. The owner or operator of an UST system shall submit to the department any tank closure

assessment report that is generated to document compliance with the requirements of ch. [ATCP 93](#), regardless of whether a discharge of a hazardous substance was detected during the site assessment.

(3m) SOURCE AND CAUSE OF DISCHARGES. At the time the owner or operator of an UST system reports a discharge from an UST system, they shall also provide information to the department on the source and cause of the discharge.

Note: Sources may include tanks, piping, dispensers, submersible turbine pump areas, delivery problems, etc. Causes may include spills, overfills, physical or mechanical damage, corrosion, installation problems, etc., and those situations where the cause is unknown.

History: Cr. [Register, February, 1997, No. 494](#), eff. 3-1-97; correction in (3) made under s. 13.93 (2m) (b) 7., Stats., [Register, March, 2001, No. 543](#); correction in (3) made under s. 13.92 (4) (b) 7., Stats., [Register February 2012 No. 674](#); [CR 12-023](#): am. (title), r. (1), cr. (3m), r. (4) [Register October 2013 No. 694](#), eff. 11-1-13; correction in (3) made under s. 13.92 (4) (b) 7., Stats., [Register October 2013 No. 694](#).

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**Wisconsin Department of Natural Resources Hazardous
Substance Spills Guidance**

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Immediate Reporting Required for Hazardous Substance Spills

If you are aware of a hazardous substance spill notify the Department of Natural Resources (DNR). State law requires the IMMEDIATE reporting of hazardous substance spills and other discharges to the environment.

**CALL 800-943-0003
TO REPORT SPILLS**

Use **DNR Form 4400-225** to report other hazardous substance discharges



Other hazardous substance discharges, including historical contamination and contamination caused by an ongoing long-term release, discovered during an environmental assessment or laboratory analysis of soil, sediment, groundwater or vapor samples, should be reported to DNR by filling out and submitting DNR Form 4400-225, "Notification for Hazardous Substance Discharge (Non-Emergency Only)," which is available at <http://dnr.wi.gov/files/pdf/forms/4400/4400-225.pdf>.

- ✓ Report hazardous substance discharges as soon as visual or olfactory evidence confirms a discharge or laboratory data is available to document a discharge. **Do not wait** to complete a Phase II environmental assessment, or other similar report, to notify DNR.

Reporting is everyone's responsibility

Individuals and entities that cause a hazardous substance spill or discharge to the environment are required by state law to notify DNR immediately - as soon as the spill or discharge is identified. Individuals and entities that own or control property where the spill or discharge occurred must report the discharge immediately if it is not reported by the person or entity that caused the discharge.

For public health and safety, DNR encourages everyone to report known hazardous substance discharges. Reporting a spill or other discharge, in itself, does not make a person or entity liable for the contamination.

Proper spill containment, cleanup, and disposal is always required

Every person/entity (including lenders and local governments) that causes a hazardous substance discharge, or owns or controls property at which a discharge occurred, must comply with the response action requirements in [Wis. Admin. Chs. NR 700 to 754](#). No spill or discharge is exempt from the duty to properly contain, clean up and dispose of the substance and associated contaminated media, such as soil, water and other affected materials.

Spill reporting exemptions

All spills must be cleaned up, but it is generally not necessary to report recent spills that are:

- less than 1 gallon of gasoline
- less than 5 gallons of any petroleum product other than gasoline
- any amount of gasoline or other petroleum product that is completely contained on an impervious surface
- individual discharges authorized by a permit or program approved under Wis. Stats. Chs. 289 - 299
- less than 25 gallons of liquid fertilizer
- less than 250 pounds of dry fertilizer
- pesticides that would cover less than 1 acre of land if applied according to label instructions
 - * NOTE: Reporting is required if the ongoing, long-term release or application of a permitted pesticide, fertilizer or other substance accumulates to levels that exceed current health or safety standards.
- less than the federal reportable quantities listed in 40 C.F.R. §§ 117 or 302
 - * NOTE: U.S. EPA (federal) spill reporting requirements are outlined on the internet at <https://www.epa.gov/emergency-response/when-are-you-required-report-oil-spill-and-hazardous-substance-release>.

Spill reporting exemptions do not apply (and reporting is required) when:

- the spilled substance has not evaporated or been cleaned up in accordance with Wis. Admin. chs. NR 700 - 754
- the spilled substance is a potential fire, explosion or safety hazard
- the spilled substance causes, or threatens to cause, chronic or acute human health concerns
 - * NOTE: If you are unsure about potential human health effects, consult with local or state health officials.
- the spilled substance adversely impacts, or threatens to impact, the air, lands or waters of the state (as either a single discharge or when accumulated with past discharges) - even if the degree of the impact has not yet been thoroughly evaluated
 - * NOTE: If the substance causes sheen on surface water, has entered or is on the verge of entering the waters of the state, DNR will consider the spilled substance a threat to impact, or to have adversely impacted, waters of the state and reporting is required.

Terms, definitions, statutes and rules

Hazardous substance — Any substance that can cause harm to human health and safety, or the environment, because of where it is spilled, the amount spilled, its toxicity or its concentration. Even common products such as milk, butter, pickle juice, corn, beer, etc., may be considered a hazardous substance if discharged to a sensitive area.

Discharge — Spilling, leaking, pumping, pouring, emitting, emptying, dumping, etc., to land, air or water.

Spill — A discharge that is typically a one-time event or occurrence, and usually inadvertent.

Wis. Stat. § 292.11(2) and Wis. Admin. § NR 706.05 — Require individuals and entities that possess or control a hazardous substance, or that cause the discharge of a hazardous substance to the environment, to notify DNR immediately about the discharge.

Wis. Stat. § 292.99 — Authorizes penalties up to \$5,000 for each violation of the notification requirement.

Consult [Wis. Stat. Ch. 292](#) and [Wis. Admin. §§ 700 – 754](#), and <http://dnr.wi.gov/topic/Spills/> for further information on hazardous substance spill and discharge reporting, investigation and cleanup.

Regional Spill Coordinators - DNR contacts

Northeast: [Rick Joslin](#) (920) 424-7077

Northern: [John Sager](#) (715) 392-7822

Southeast: [Trevor Nobile](#) (414) 263-8524

South Central: [Mike Schmoller](#) (608) 275-3303

West Central: [Pat Collins](#) (715) 684-2914 x117

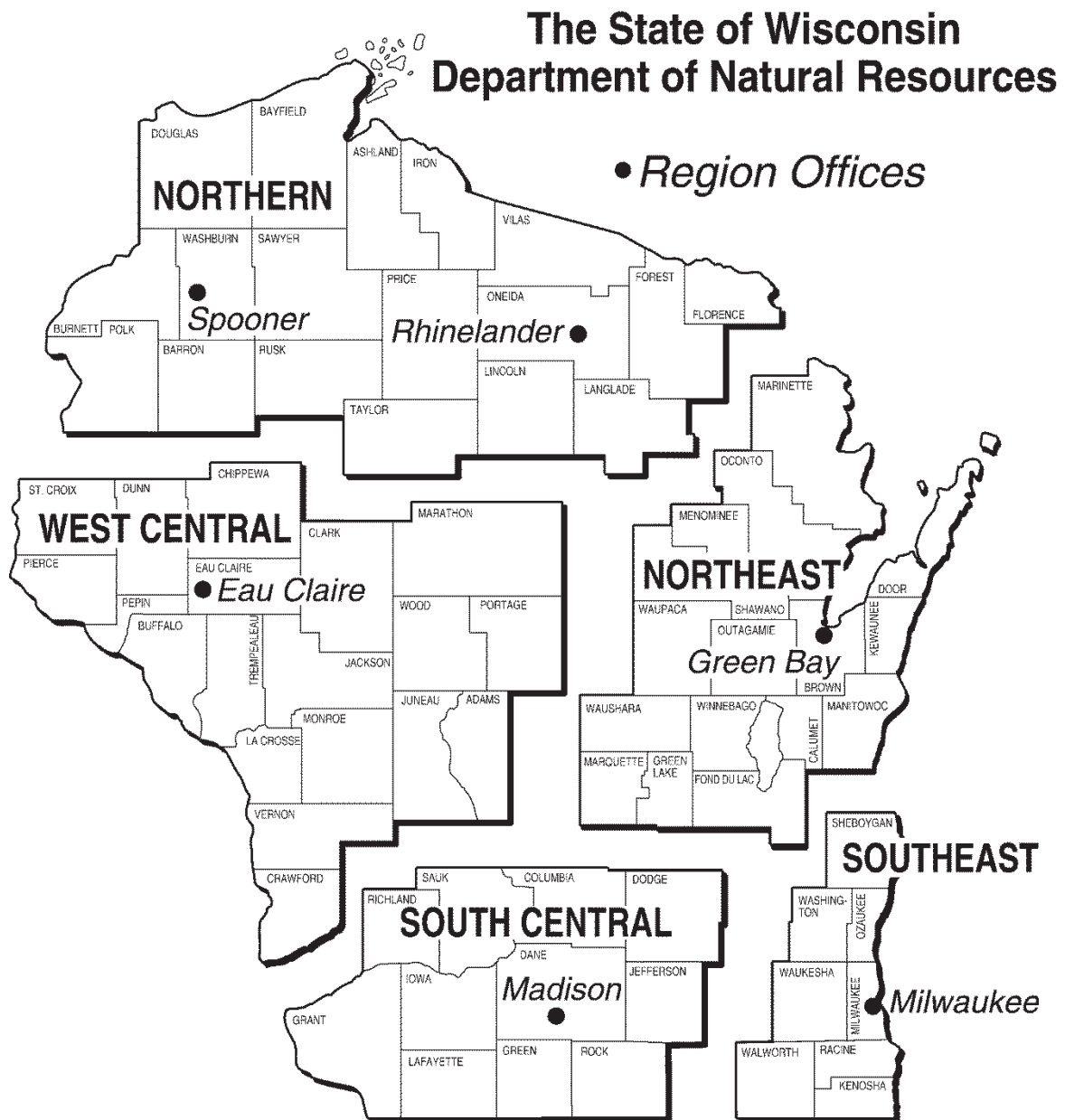
Spill Team Leader: [John Sager](#) (715) 392-7822

**Wisconsin Department of Natural Resources – Regional Spill
Coordinator Contacts**

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DNR Spill Coordinator Telephone Numbers

Name	Region	Office
24 Hour Hotline	Statewide	800-943-0003
Rick Joslin	Northeast	920-424-7077
John Sager	Northern	715-392-7822
Mike Schmoller	South Central	608-275-3303
Trevor Nobile	Southeast	414-263-8524
Pat Collins	West Central	715-684-2914 ext.117



Attachment B

Summary of Construction Methods and Procedures for Wetland and Waterbody Crossings



Summary of Construction Methods and Procedures for Wetland & Waterbody Crossings

Enbridge Energy, Limited Partnership • Line 3 Replacement Project

September 2018



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ACRONYMS AND ABBREVIATIONS

ATWS	additional temporary workspace
EPP	Environmental Protection Plan
HDD	horizontal directional drill

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1.0 INTRODUCTION

This Summary outlines the various construction methods that Enbridge will utilize to construct through wetlands and waterbodies. The discussion of each construction method includes:

- Description of the construction procedures;
- Conditions required to employ the method (applicability of the method);
- Environmental and/or constructability advantages and disadvantages associated with the method; and
- Mitigation measures that Enbridge will implement to avoid or reduce impacts associated with implementing the method.

2.0 PIPELINE CONSTRUCTION THROUGH WETLANDS

Enbridge identified and delineated wetland resources according to the procedures in the U.S. Army Corps of Engineers 1987 Manual and the associated Regional Supplement applicable to the project locations. To facilitate wetland impact assessment, Enbridge classified delineated wetlands into emergent, unconsolidated bottom, scrub-shrub, or forested wetland components (Cowardin Classification System), by the Eggers and Reed Classification System, and Circular 39 Classification System by watershed (8-digit Hydrologic Unit Code).

2.1 CHOOSING A CONSTRUCTION METHOD

Table 2-1 describes the wetland crossing techniques Enbridge intends to utilize during construction. Enbridge and the Contractor will select the method of pipeline installation and post-construction restoration in wetlands that depend on the season, saturation level, and stability of the soils at the time of construction.

Enbridge will typically install the pipelines through wetlands with moderate- to high-bearing strength soils using standard upland crossing methods utilizing timber mats or equivalent to avoid rutting, minimizing disturbance to soils and vegetation, and to ensure safe and stable working surfaces for construction equipment and personnel. Enbridge may install the pipeline through saturated wetlands with low bearing strength peat soils by using push-pull techniques, if practicable, or by using standard upland crossing techniques with frost or ice roads during the winter when conditions allow. Enbridge may install the pipelines through narrow wetlands or ditches adjacent to roads or railroads and sensitive wetlands or riparian wetlands adjacent to waterbody crossings using trenchless techniques such as the auger bore or the horizontal directional drill (“HDD”) method.

2.2 WETLAND AVOIDANCE AND MITIGATION MEASURES

The Environmental Protection Plan (“EPP”) provides additional details on wetland construction, restoration techniques, avoidance and/or minimization measures. Avoidance and/or minimization measures that are generally applicable to all wetland crossings include the following:

- Reduced construction workspace compared to uplands;
- Perform right-of-way clearing using low ground-pressure equipment or operate off timber mats to limit disturbance to the wetland (Section 3.2 of the EPP);

- Locating additional temporary workspace (“ATWS”) outside of wetlands to the extent practicable to minimize the area of disturbance (Section 3.3 of the EPP);
- Confine grading to the area of the trench and minimize to the extent practicable (Section 3.4 of the EPP);
- Install and maintain erosion control devices to prevent sediment flow into wetlands (Section 3.4 of the EPP); and
- Strip and segregate up to 1 foot of the organic layer and/or topsoil (i.e., “O” and/or “A” horizons) from the trench line and separate from trench spoil to preserve the native seed stock from wetlands without standing water. In standing water wetlands, the Contractor will attempt to segregate as much of the soil surface as possible based on site and saturation conditions (Section 3.6.1 of the EPP).

TABLE 2-1
Pipeline Wetland Installation Methods

Method (Season)	Description ^a	Applicability	Advantages	Disadvantages
Modified Upland Construction Method (Spring-Fall/non-frozen)	Conduct construction from timber mats or equivalent (refer to Figure 24 from the EPP provided in Appendix A).	Generally suitable in wetlands with unsaturated mineral soils constructed during unfrozen conditions. Generally suitable in saturated wetlands with moderate to high bearing strength, shallow peat soils over mineral substrate, or forested peatlands where roots provide a relatively firm foundation for timber mats or equivalent.	• Relatively quick construction/installation • No need for specialized equipment • Minimizes impacts on soils and vegetation • Facilitates revegetation from seedbank and provides favorable plant growth conditions	• Potential need for wider than normal trench and therefore additional construction workspace to avoid trench sidewall slump in loose, poorly graded sands • Requires additional time for installation of multiple timber mats • Increased disturbance and compaction of the travel lane • Potentially difficult to remove timber mats • Additional restoration efforts of travel lane as compressed surface rebounds • Clearing and brush/stump removal required along travel lane in forested wetlands
Modified Upland Construction Method (Winter/Freeze down)	Conduct construction from frost or ice pad/road, and/or timber mats, or equivalent. Topsoil segregation performed as practicable, but modified dependent on depth of frost and thickness of topsoil. May use a ripper to break up frozen topsoil over the trench line only. Topsoil in spoil storage graded smooth to minimize mixing during backfilling.	Generally suitable for wetlands with unsaturated mineral soils or saturated wetlands with moderate to low strength peat over mineral soils during frozen conditions.	• Relatively quick construction/installation • Minimizes impacts on wetland soils and vegetation • Stable foundations for spoil storage and travel lane • Facilitates revegetation from seedbank and provides favorable plant growth conditions	• Potential need for wider than normal trench and therefore additional construction workspace to avoid trench sidewall slump in loose, poorly graded sands • Susceptible to winter thaw; limited to freezing conditions and contingency required for thawing conditions • Additional safety concerns associated with cold weather work • Potential for mixing of topsoil and subsoil during excavation • Backfilling of frozen spoil piles may result in subsidence of the trench during thaw introducing potential increase in backfill volume and/or additional restoration efforts • If post-thaw restoration is necessary, mats will typically be left in place increasing the period of disturbance • Frost/ice roads often require a water source

ENBRIDGE ENERGY, LIMITED PARTNERSHIP
SUMMARY OF CONSTRUCTION METHODS AND PROCEDURES
FOR WETLAND AND WATERBODY CROSSINGS

TABLE 2-1 Pipeline Wetland Installation Methods				
Method (Season)	Description ^a	Applicability	Advantages	Disadvantages
Push-Pull Method: Excavator (Spring-Fall)	Use an excavator to excavate the trench operating from timber mats "walked" down the trenchline. Float and sink the pre-assembled pipe then backfill. May or may not use a travel lane depending on conditions with backfilling occurring from the spoil storage side or the working side.	Generally suitable in saturated wetlands, typically with relatively competent peat soils, shallow peat over mineral soils, or forested peatlands with moderate bearing strength soils.	- Minimizes impacts on wetland soils and vegetation - No specialized equipment needed and allows for construction in unfrozen, saturated wetlands - Little or no travel lane and reduced heavy equipment traffic further reduces impacts on wetland soils and vegetation	- Topsoil segregation typically not practical; inability to maintain a cohesive spoil pile due to liquid nature of soil - Potential for stranding of the excavator if extremely loose, deep peat soils are encountered unexpectedly - Additional workspace required for pipe assembly or pipe may be fabricated off-site and brought in as a drag section - Due to lack of travel lane, additional adjacent workspace required for equipment turnarounds - May require spread move around.
Push-Pull Method: Swamphoe (Spring-Fall)	Excavate the trench using an excavator mounted on tracked pontoons operating along the trenchline. Float and sink the pre-assembled pipe then backfill. May or may not use a travel lane depending on conditions with backfilling occurring from the spoil storage side or the working side.	Generally suitable in saturated emergent and scrub-shrub wetlands with loose, deep peat soils or floating mat peat, low-bearing strength soils.	- Allows for construction in saturated wetlands during unfrozen conditions - No travel lane and reduced heavy equipment traffic further reduces impacts to wetland soils and vegetation	- Specialized equipment (i.e., swamphoe) required - Topsoil segregation typically not practical; inability to maintain a cohesive spoil pile due to liquid nature of soil - Potential for spoil settlement preventing complete replacement of backfill and potentially resulting in open water along the trenchline - Additional adjacent workspace required for pipe assembly or pipe may be fabricated off-site and brought in as a drag section - Additional adjacent workspace may be required for equipment turnarounds - Slower than normal construction progress in the wetland due to equipment speed. - May require spread move around.

TABLE 2-1 Pipeline Wetland Installation Methods				
Method (Season)	Description ^a	Applicability	Advantages	Disadvantages
Auger Bore	Auger bore under wetland from bell hole on one side to bell hole on the other side with or without casing.	Generally suitable for narrow wetlands or ditches adjacent to roads and railroads. Not suitable where there are high water tables, loose sand/gravel substrates, or adjacent steep slopes.	• Avoids disturbance in the wetland or ditch adjacent to the road/railroad feature • No sediment release	• Deep bell holes may require dewatering and sheet-piling • Pump(s) may be required to drain seepage within the bell holes onto surrounding lands • Possibility of sump-water causing sediment release into wetland • Requires additional workspace for bell holes, spoil piles, and sump(s) • Potential for borehole cave-in and/or dewatering • Slower than other crossing techniques • Large excavations required on both sides of the crossing • Increases potential for subsidence
HDD	Place a rig on one side of the wetland and drill a small-diameter pilot-hole under the wetland/waterbody along a prescribed profile. Upon completion of the pilot-hole, the Contractor uses a combination of cutting and reaming tools to accommodate the desired pipeline diameter. Drilling mud is necessary to remove cuttings and maintain the integrity of the hole. The Contractor then pulls the welded pipe section through the drilled hole.	Generally suitable to cross sensitive wetland areas and riparian wetlands adjacent to waterbody crossings. Dependent on site-specific topography and the local geologic substrate. Not feasible in areas with artesian conditions, areas of glacial till or outwash interspersed with boulder and cobbles, fractured bedrock, or non-cohesive coarse sands and gravels.	• Avoids surface ground disturbance in riparian wetlands adjacent to sensitive or large waterbodies • Limits vegetation disturbance to within the permanently maintained easement	• Potential for inadvertent release of drilling fluids in unconsolidated gravel, coarse sand, and fractured bedrock and clays • Requires ATWS on both sides of the crossings to stage construction, fabricate the pipeline, and store materials • Some tree and brush clearing is necessary to install guide wires for monitoring and steering the drill bit • Requires obtaining water to formulate the drilling fluid as well as hydrostatic testing • Success depends on substrate • Requires specialized equipment • May require spread move around
Notes: ^a For all methods except HDD, vegetation and trees within wetlands will be cut off at ground level along the entire workspace, leaving existing root systems intact; clearing debris will generally be removed from the wetland for disposal. For the HDD method, vegetation and trees within the wetland will be removed along the permanent right-of-way. Hydro-axe debris or similar may be left in the wetland if spread evenly in the construction right-of-way to a depth that allows for normal revegetation as determined by the Environmental Inspector.				

3.0 PIPELINE CONSTRUCTION THROUGH WATERBODIES

Table 3-1 describes the waterbody crossing techniques Enbridge intends to utilize during construction. The routing and planning of large pipeline construction projects is an iterative process that is subject to change due to site-specific constraints, public and agency comments, and feasibility studies that may result in changes to the proposed waterbody crossing methods described below.

Refer to Sections 2.1 through 2.4 and 2.6 of the EPP for details regarding construction procedures and mitigative measures for each crossing method. The EPP also details procedures for temporary and permanent stabilization.

3.1 UNFORSEEN CONDITIONS

Enbridge may need to implement alternative crossing methods due to the followings situations, including but not specifically limited to:

- Significant fluctuation in water level (i.e., up or down) at the time of installation and/or significant changes to soil conditions at the time of installation (e.g., trench wall stability);
- Change in time of year of construction (winter construction vs. push-pull method or modified upland construction) due to delays in permit issuance (i.e., timing restrictions);
- Weather conditions at the time of installation;
- Unanticipated issues encountered during trenching or excavation; and
- Failure to install the pipe using the HDD method.

Enbridge identifies a primary and alternative crossing method for all waterbody crossings. In the case where an unforeseen condition makes the primary crossing method not practicable, Enbridge would proceed with the alternative crossing method per the conditions of regulatory approvals and permits.

ENBRIDGE ENERGY, LIMITED PARTNERSHIP
SUMMARY OF CONSTRUCTION METHODS AND PROCEDURES
FOR WETLAND AND WATERBODY CROSSINGS

TABLE 3-1
Pipeline Waterbody Installation Methods

Method	Description	Applicability	Advantages	Disadvantages
Wet Trench	Open-cut crossing technique that involves trenching through the waterbody while water continues to flow across the in-stream work area (refer to Figure 15 from the EPP provided in Appendix A).	Generally suitable for small, non-fishery streams, such as agricultural ditches and intermittent waterways, as well as larger waterbodies where other crossing methods are not practical. In Minnesota, these are primarily waterbodies located within large, saturated wetlands, and waterbodies with beaver dams.	• Rapid construction/installation • No need for specialized equipment • Compatible with granular substrates and some rock • Minimizes period of in-stream activity • Generally maintains streamflow • Maintains fish passage • Relatively short duration of sediment release (<24 hours)	• Requires implementation of erosion and sediment control devices to mitigate potentially high sediment release during excavation and backfilling • In-stream stockpiling of spoil on wide watercourses • May interrupt streamflow
Dry Crossing: Dam and Pump	Create a dry work area by damming the flow up- and downstream of the crossing and pumping water around. Dam materials may include but are not limited to: sand bags, aqua dams, sheet piling, or street plates (refer to Figure 16 from the EPP provided in Appendix A).	Generally suitable for streams with low flow and defined banks where fish passage is not of concern. Generally works best in non-permeable substrate and preferred for crossing meandering channels.	• Limited sediment release • Maintains streamflow • Minimal release and transport of sediment downstream that is not likely to result in negative effects on fish and fish habitat • Relatively dry working conditions • May be adapted for non-ideal conditions • Hose can be routed around area of construction • May reduce trench sloughing and trench width	• Minor sediment release during dam construction, dam removal and as water flushes over area of construction • Slow construction/installation resulting in extended period in-stream and prolonged sediment release • Fish salvage may be required from dried up reach • Short-term barrier to fish movement • Specialized equipment and materials • Slow construction/installation • Hose(s) may impede construction traffic • Seepage may occur in coarse, permeable substrate • Susceptible to mechanical failure of pumps

TABLE 3-1
Pipeline Waterbody Installation Methods

Method	Description	Applicability	Advantages	Disadvantages
Dry Crossing: Flume	Create a dry work area by damming the flow up- and downstream of the crossing and installing flume to convey water. Dam materials may include but are not limited to: sand bags, aqua dams, sheet piling, or street plates (refer to Figure 17 from the EPP provided in Appendix A).	Generally suitable for crossing relatively narrow streams that have straight channels and are relatively free of large rocks and bedrock at the point of crossing where fish passage is of concern. The waterbody should have defined banks and channel with solid, fine-textured substrate.	• Limited sediment release • Maintains streamflow • May allow fish passage • Minimal release and transport of sediment downstream that is not likely to result in negative effects on fish and fish habitat • Allows for flushing of substrates • Relatively dry or no flow working conditions • May be adapted for non-ideal conditions • May reduce trench sloughing and trench width	• Minor sediment release during dam construction, removal and as water flushes over area of construction • Slow construction/installation • Fish salvage may be required from dried up reach • Short-term barrier fish passage if water velocity in culvert is too high • Difficult to trench and lay pipe, especially large diameter pipe, under flume pipe • Work area may not stay dry in coarse, permeable substrate • Seepage may occur in coarse, permeable substrate
Auger Bore	Auger bore under watercourse from bell hole on one side to bell hole on the other side with or without casing.	Generally suitable for fine-textured impermeable soils and deep water table. Used most commonly for road and railroad crossings and can include adjacent ditches. Requires a slightly incised watercourse with approach slopes that are absent or slight.	• No sediment release • No disturbance of streambed or banks • Maintains normal streamflow • Maintains fish passage • Maintains vegetative buffer on either side of watercourse	• Pump(s) may be required to drain seepage within the bell holes onto surrounding lands • Possibility of sump water causing sediment release in watercourse • Requires additional workspace for bell holes, spoil piles, and sump(s) • Potential for borehole cave-in and/or dewatering • Slower than wet trench or dry crossing techniques • Difficult with till or coarse material • Excessive borehole depth on deeply incised watercourses or watercourses with moderate or steeper slopes • Large excavations required both sides of the crossing

TABLE 3-1
Pipeline Waterbody Installation Methods

Method	Description	Applicability	Advantages	Disadvantages
HDD	Place a rig on one side of the waterbody and drill a small-diameter pilot hole under the waterbody along a prescribed profile. Upon completion of the pilot hole, the Contractor uses a combination of cutting and reaming tools to accommodate the desired pipeline diameter. Drilling mud is necessary to remove cuttings and maintain the integrity of the hole. The Contractor then pulls the pipe section through and welds the adjoining sections of pipe on each side of the waterbody (refer to Figure 18 from the EPP provided in Appendix A).	Generally suitable to cross sensitive or particularly deep, wide, or high-flow waterbodies and depends on site-specific topography and the local geologic substrate. Typically drilling is not feasible in areas of glacial till or outwash interspersed with boulder and cobbles, fractured bedrock, or non-cohesive coarse sands and gravels. This method requires a minimum length drill of approximately 1400 feet for 36 inch pipe. That length is dependent on the designed drill depth determined by subsurface geology and topography of the crossing.	• No sediment release unless an inadvertent return occurs • Minimal bank and approach slope disturbance • No streambed disturbance unless an inadvertent return occurs • Maintains normal streamflow • Maintains fish passage • Significantly reduces clean-up and restoration between entry and exit points • May be able to construct during restricted activity windows for sensitive fisheries	• Potential for inadvertent release of drilling fluids in unconsolidated gravel, coarse sand, and fractured bedrock and clays • Requires ATWS on both sides of the crossings to stage construction, fabricate the pipeline, and store materials • Tree and brush clearing is necessary to install guide wires for monitoring and steering the drill bit • Requires obtaining water to formulate the drilling fluid as well as hydrostatic testing • Success depends on substrate and length of crossing • Requires specialized equipment • Limited drilling radius that is allowed for pilot hole based on the pipelines engineering characteristics • Pull string area along the alignment for the same length of the crossing to allow continuous pullback • Drill stem may get "stuck in the hole" and tools can be lost, especially on large diameter reams • No guarantees that drill will be successful • May damage coating or pipe during pullback

Source: Canadian Association of Petroleum Producers, Canadian Energy Pipeline Association, and Canadian Gas Association, 2005.

3.2 BRIDGES

Section 2.4 of the EPP provides details regarding the use of temporary bridges to facilitate equipment passage across waterbodies. Enbridge intends to utilize span (i.e., timber mat, engineered structures, or railroad flat car) with or without in-stream support, or rock flume bridges. Table 3-2 provides details regarding the applicability, advantages, and disadvantages of each technique.

**TABLE 3-2
Types of Bridges**

Type	Description	Applicability	Advantages	Disadvantages
Typical Span Type Bridge (timber mats, engineered structures or railroad flat cars)	Construction of temporary bridge utilizing native timber mats, an imported engineered portable bridge material or railroad flat cars with or without instream supports (e.g., stacked mats or flume) (refer to Figures 19A and 19B from the EPP provided in Appendix A).	Generally suitable for small- to medium-sized streams with stable banks. Multiple bridge spans and in-stream abutments. This bridge type can be used for large waterbodies. In-stream supports may be required. Regular bridge maintenance required. Preferred bridge type to provide safe crossing for heavy construction equipment.	• Strong, removable, and portable bridge that can be optimally located • Limited in-stream disturbance • Limited sediment release • Maintains streamflow • Maintains fish passage	• Specialized equipment/crew required • Substantial amount of work may be necessary to transport and/or construct • Limited span for timber bridges and cap may be required • Regular maintenance of erosion and sediment controls required • Possible sediment release from bank disturbance or if cap used over timber bridge • May cause interference on navigable waterways • In-stream disturbance and sediment mobilization if in-stream abutments used for multiple spans • Bridges need to be keyed into the banks
Rock Flume	Geotextile fabric would be placed over the stream bed. Non-galvanized steel culvert(s) would be laid parallel to the flow of water to allow continued flow and a ramp would be built over the top of the culvert flumes using rock (refer to Figure 20 from the EPP included in Appendix A).	Primarily used in situations where there are heightened safety concerns with timber mat bridges. Generally suitable for medium- to large-sized streams with defined channel and banks where streamflow and fish passage are of concern.	• Limited sediment release • Maintains streamflow • Maintains fish passage	• Specialized materials may be required to construct • Heavy traffic can crush culverts • Icing in winter may block flow and fish passage • Sediment release during construction of the dam • May require bank grading • Susceptible to washout

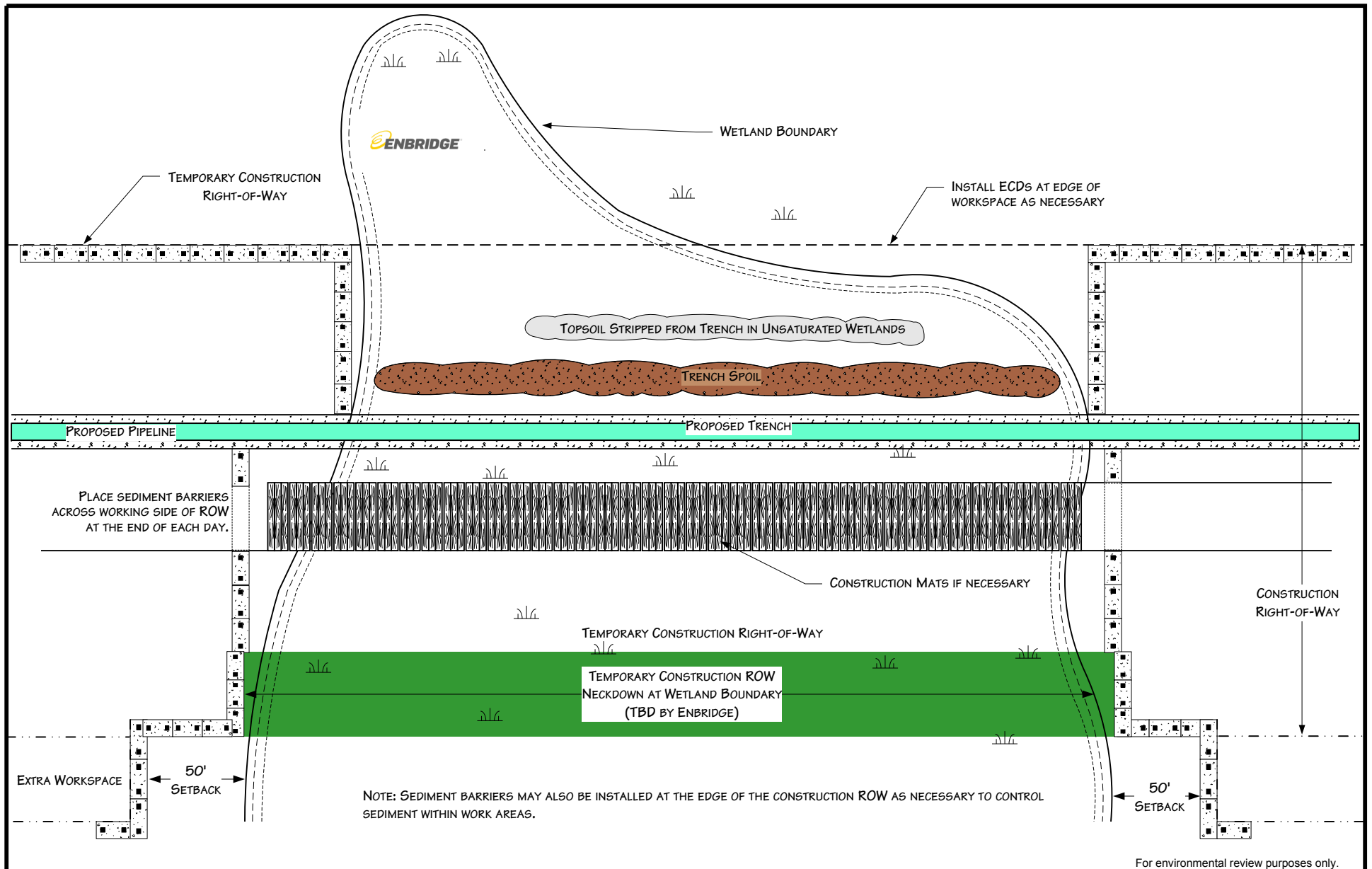
Source: Canadian Association of Petroleum Producers, Canadian Energy Pipeline Association, and Canadian Gas Association, 2005.

4.0 REFERENCES

- Canadian Association of Petroleum Producers, Canadian Energy Pipeline Association, and Canadian Gas Association. 2005. Pipeline Associated Watercourse Crossings. Prepared by TERA Environmental Consultants and Salmo Consulting Inc. Calgary, AB.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment station, Vicksburg, MS (on-line edition).
- Minnesota Department of Natural Resources. 2015. Ecological Classification System. <http://www.dnr.state.mn.us/ecs/index.html>. Accessed May 1, 2015.

Appendix A
Construction Typical Drawings

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For environmental review purposes only.



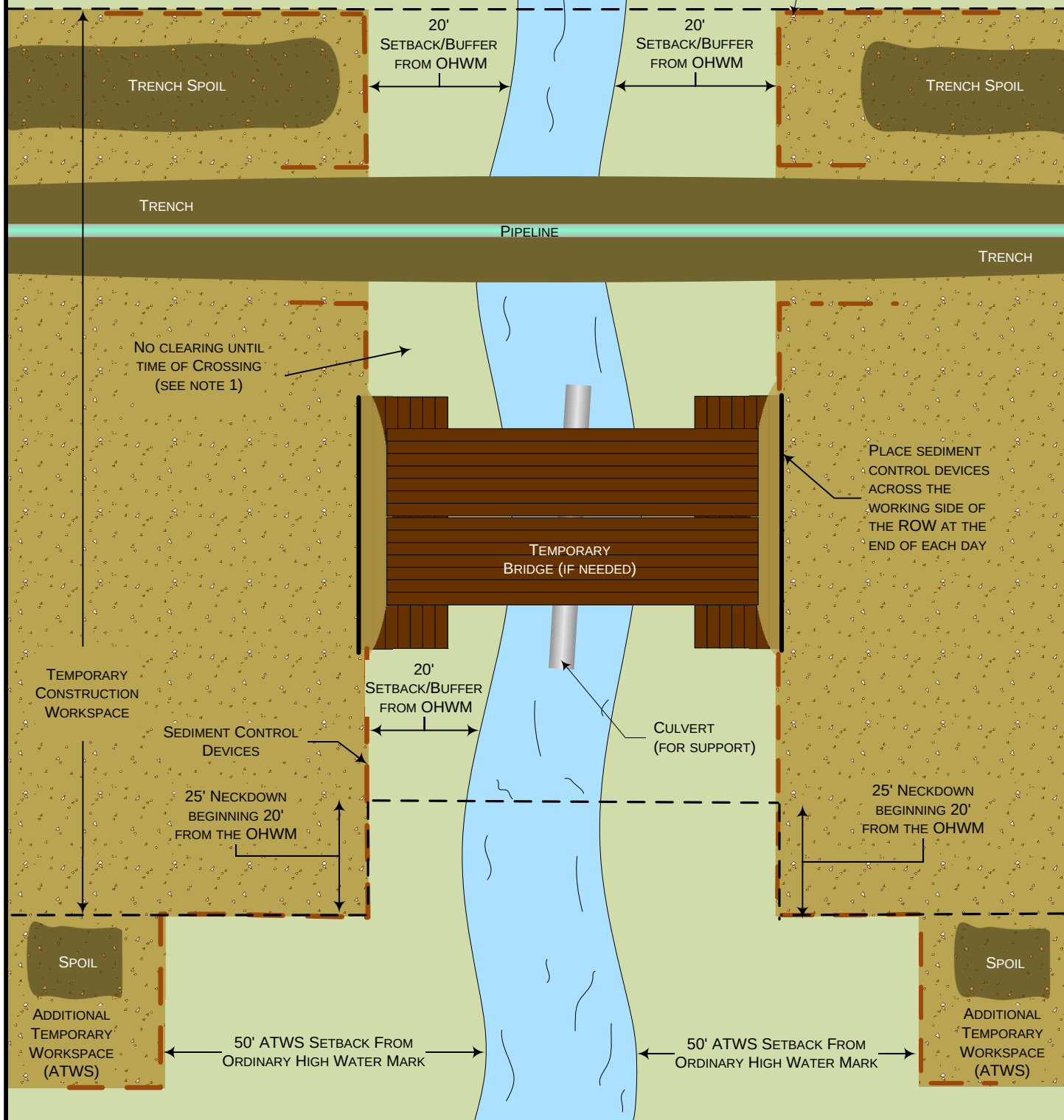
Figure 24
Environmental Protection Plan
 Typical Wetland Crossing Method

DATE: 5/25/2001
REVISED: 3/14/11
SCALE: NTS
DRAWN BY: KMKENDALL
K:\CLIENT PROJECTS\SD-FEEL\2011-019\FIG_24_WETLAND_CROSSING_METHOD.VSD



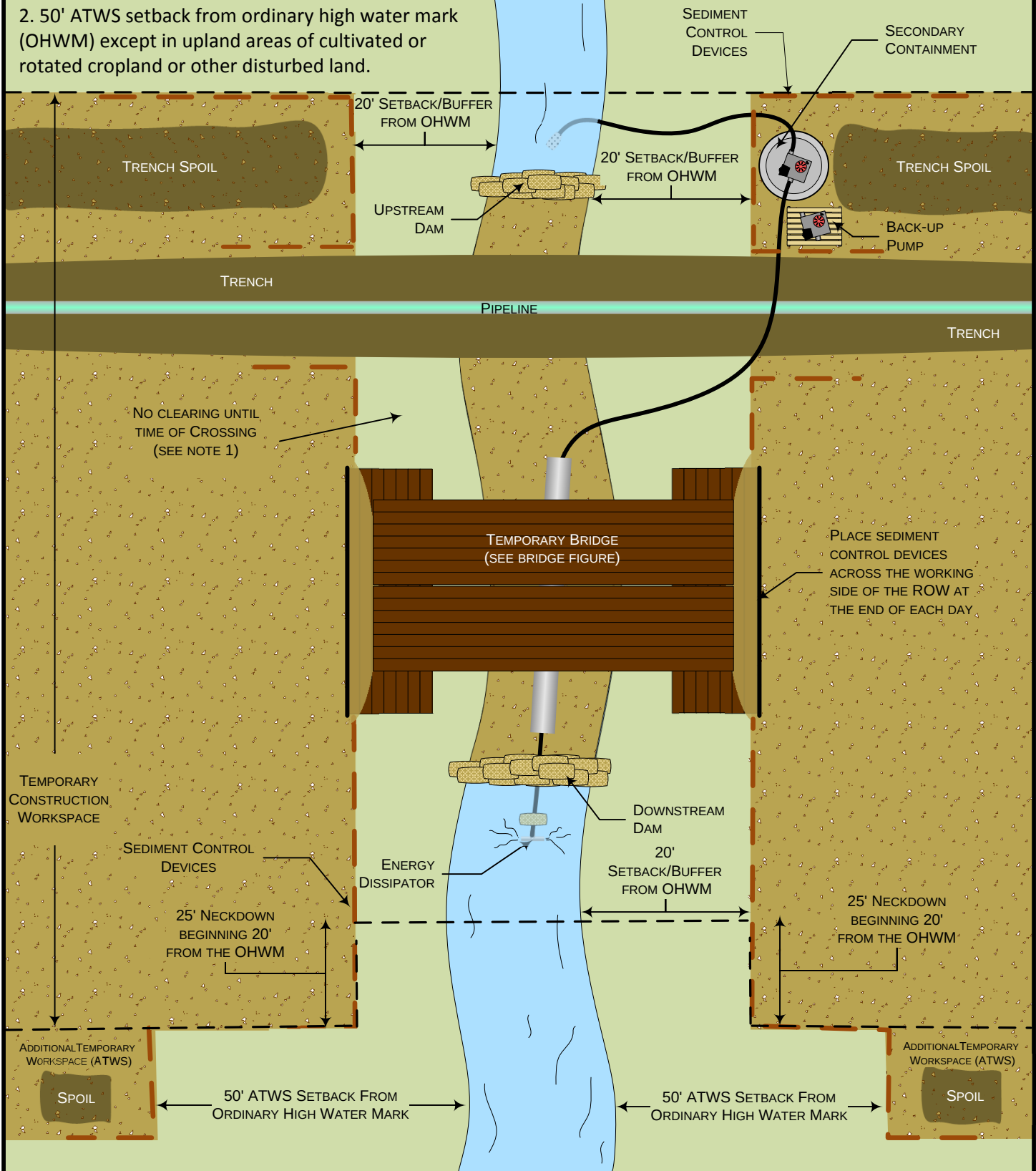
NOTES:

1. No clearing until time of crossing. Only woody vegetation may be flush cut during initial clearing.
2. 50' ATWS setback from ordinary high water mark (OHWM) except in upland areas of cultivated or rotated cropland or other disturbed land.



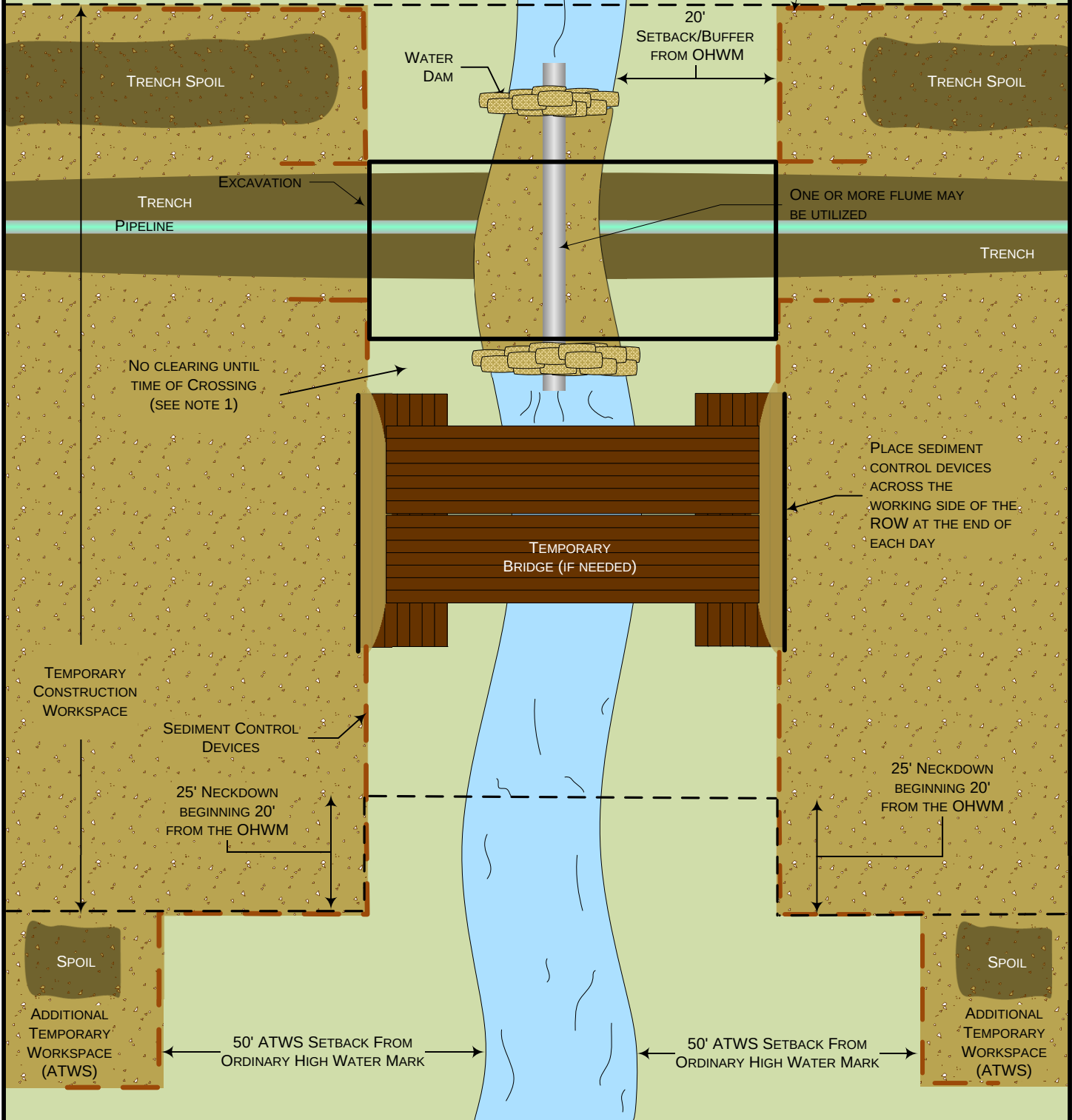
NOTES:

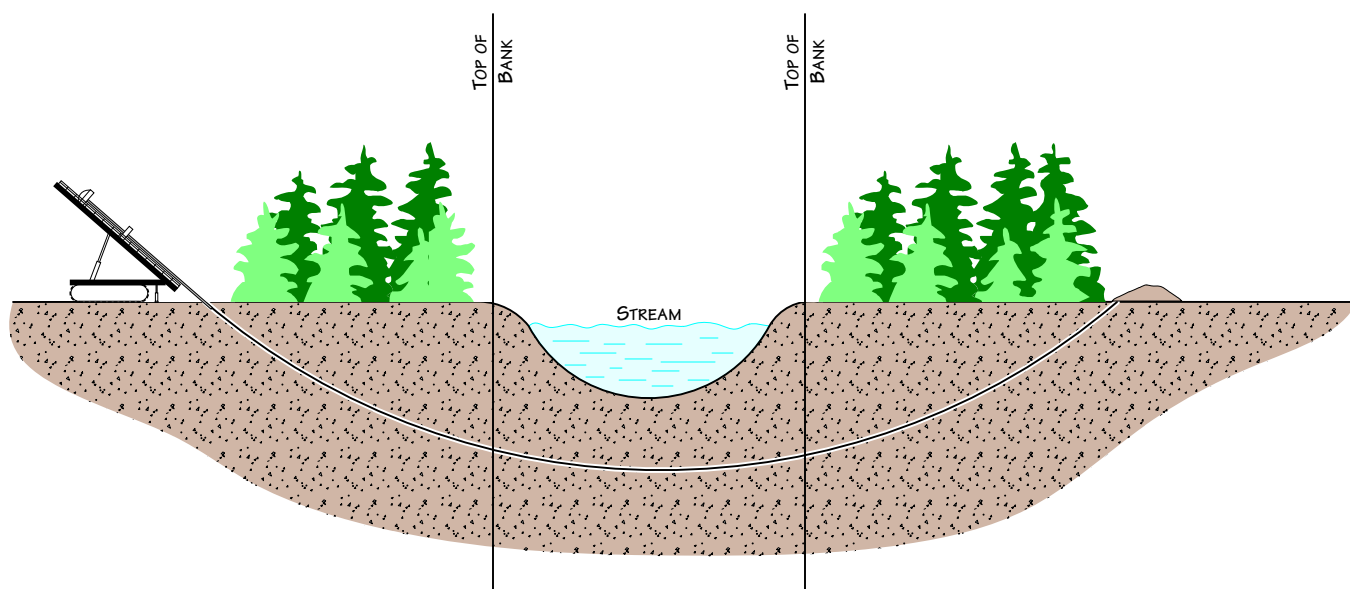
1. No clearing until time of crossing. Only woody vegetation may be flush cut during initial clearing.
2. 50' ATWS setback from ordinary high water mark (OHWM) except in upland areas of cultivated or rotated cropland or other disturbed land.



NOTES:

1. No clearing until time of crossing. Only woody vegetation may be flush cut during initial clearing.
2. 50' ATWS setback from ordinary high water mark (OHWM) except in upland areas of cultivated or rotated cropland or other disturbed land.





For environmental review purposes only.



Figure 18
Environmental Protection Plan
 Typical Waterbody Crossing
 Directional Drill Method

DATE: 7/14/2000

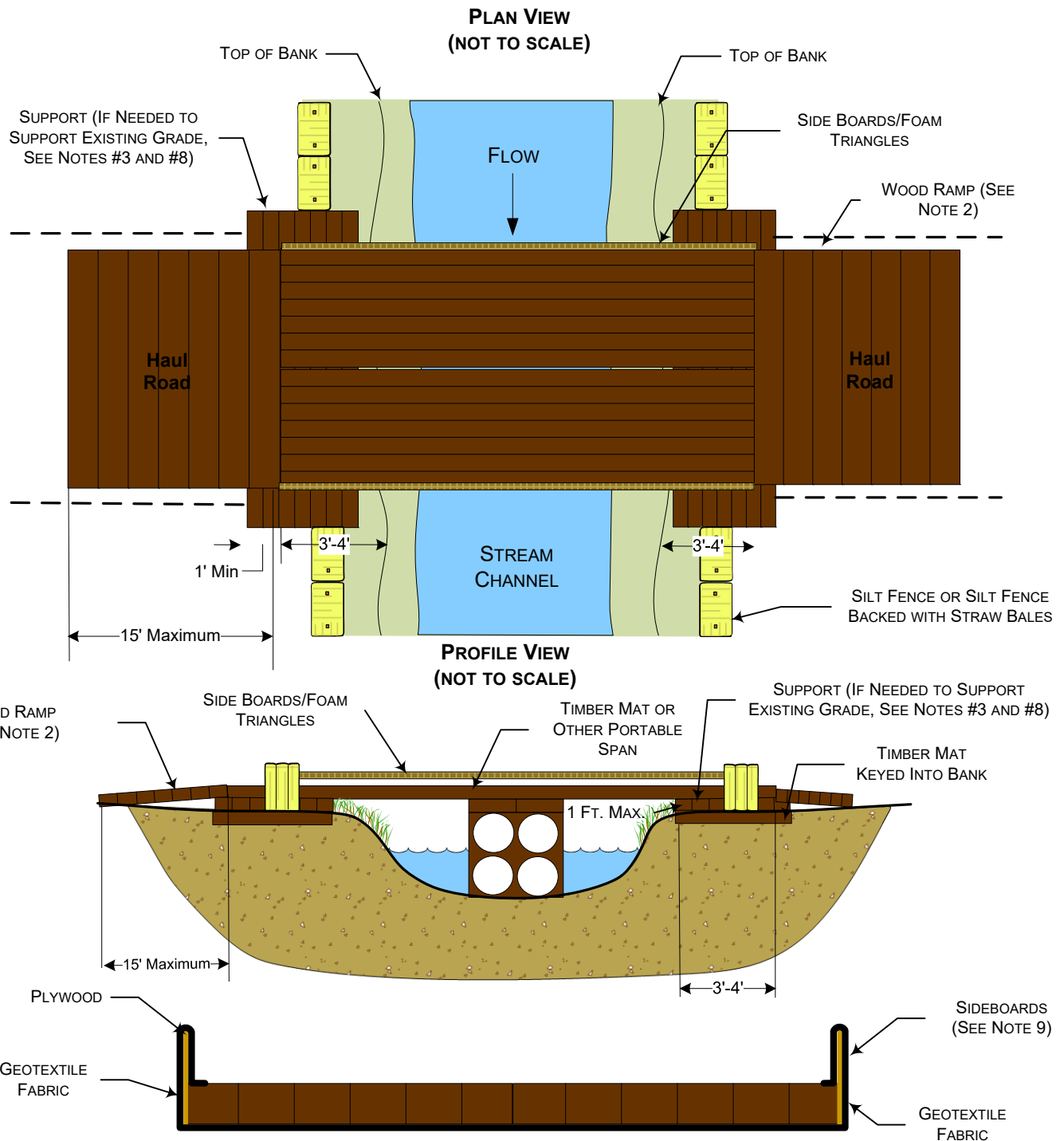
REVISED: 3/11/11

SCALE: NTS

DRAWN BY: KMKENDALL

K:\CLIENT PROJECTS\ID-FEEL\2011-019\FIG_18_WATERBODY_DIRECTIONAL_DRILL_VSD





NOTES:

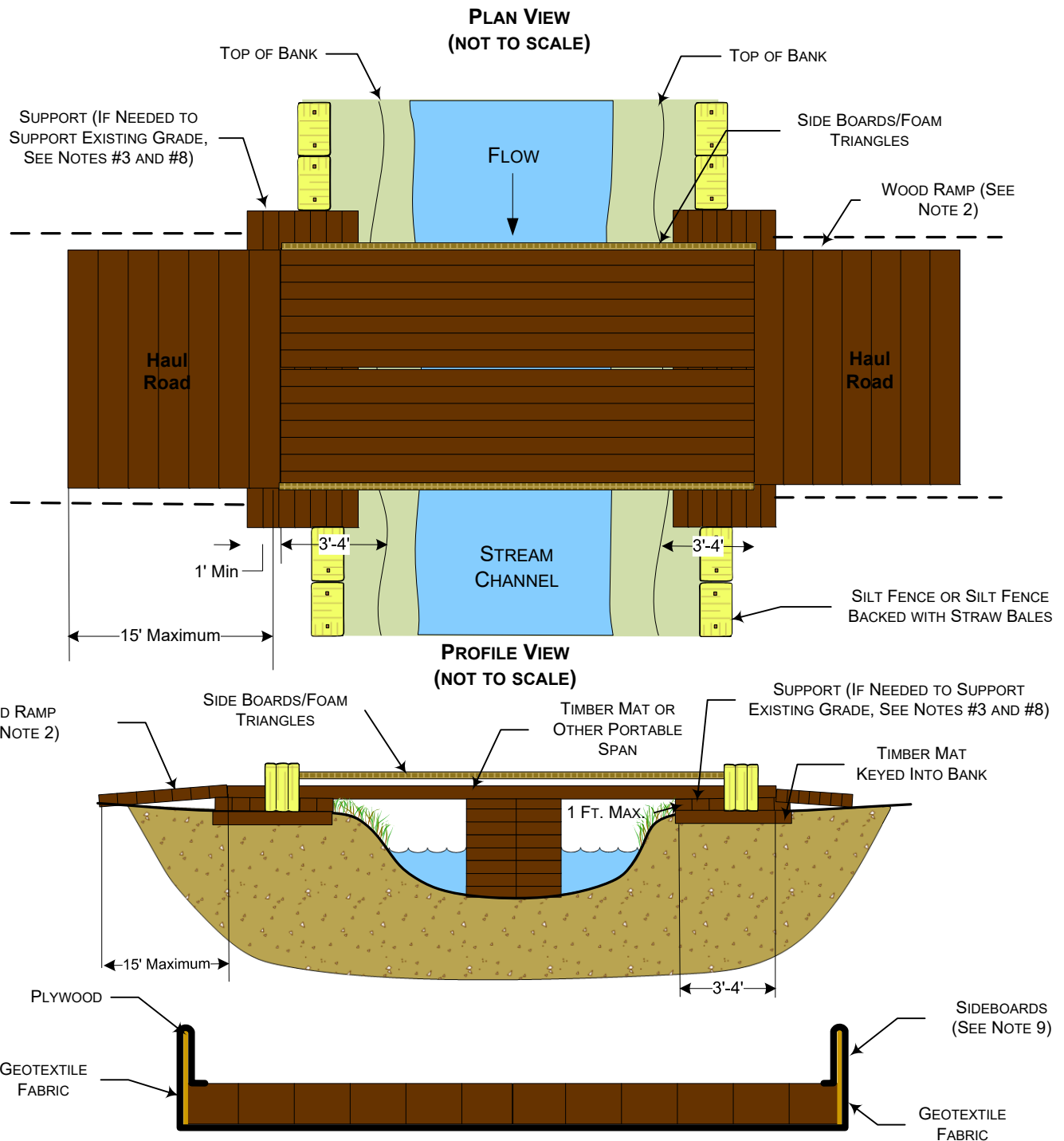
1. INSPECT BRIDGE OPENING PERIODICALLY AND FOLLOWING RAINFALLS OF OVER ½". REMOVE ANY DEBRIS RESTRICTING FLOW AND DEPOSIT IT AT AN UPLAND SITE OUTSIDE OF FLOODPLAIN.
2. IF PHYSICAL CIRCUMSTANCES PROHIBIT WOOD OR METAL RAMPS, EARTHEN RAMPS MAY BE USED AS APPROVED.
3. INSPECT BRIDGE ELEVATION SO BRIDGE REMAINS SUPPORTED ABOVE OHWM.
4. THE CULVERT SUPPORT MUST BE ANCHORED TO THE STREAM BOTTOM AND MAY NOT BE SUPPORTED WITH FILL.
5. EARTHEN RAMP CANNOT BE TALLER THAN 1' AND CANNOT EXTEND FOR MORE THAN 15' ON EITHER SIDE OF THE CROSSING.
6. THE BRIDGE MUST SPAN ABOVE OHWM TO OHWM.
7. ADDITIONAL SUPPORT MUST BE ADDED ON TOP OF BANK AND UNDER SPAN IF THE SPAN IS 12' WIDE OR GREATER, OR IF INITIAL SUPPORT STARTS TO SETTLE.
8. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE COMPANY'S ENVIRONMENTAL PROTECTION PLAN.
9. SIDEBOARDS WILL BE INSTALLED ON TEMPORARY BRIDGES TO MINIMIZE THE POTENTIAL FOR SEDIMENT TRANSPORT. SIDEBOARDS MAY BE CONSTRUCTED OUT OF PLYWOOD, OR EQUIVALENT, AND AFFIXED TO THE OUTER SIDES OF THE BRIDGE. GEO-TEXTILE FABRIC, OR EQUIVALENT, MUST ALSO BE ADEQUATELY SECURED TO THE UNDERSIDE OF THE BRIDGE TO PREVENT MATERIAL FROM FALLING THROUGH THE BRIDGE DECK. THE GEO-TEXTILE FABRIC OR AN EQUIVALENT SHOULD BE SECURED TO THE BOTTOM OF THE BRIDGE AND WRAPPED AROUND THE SIDEBOARDS IN A CONTINUOUS FASHION.



Figure 19A
Environmental Protection Plan
Typical Span Type Bridge
With or Without Instream Support (Flume Support)

Environmental Protection Plan

Drawn by: **merjent**



NOTES:

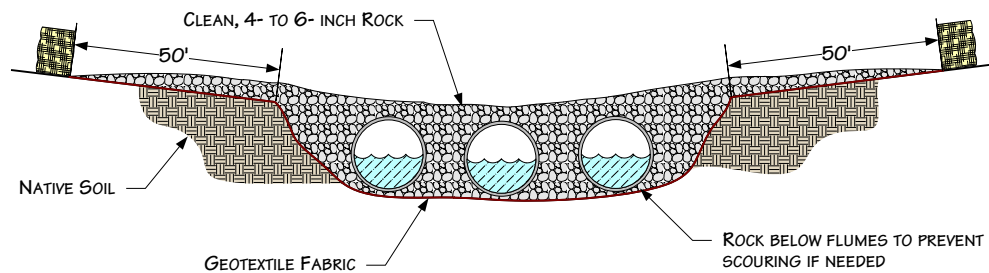
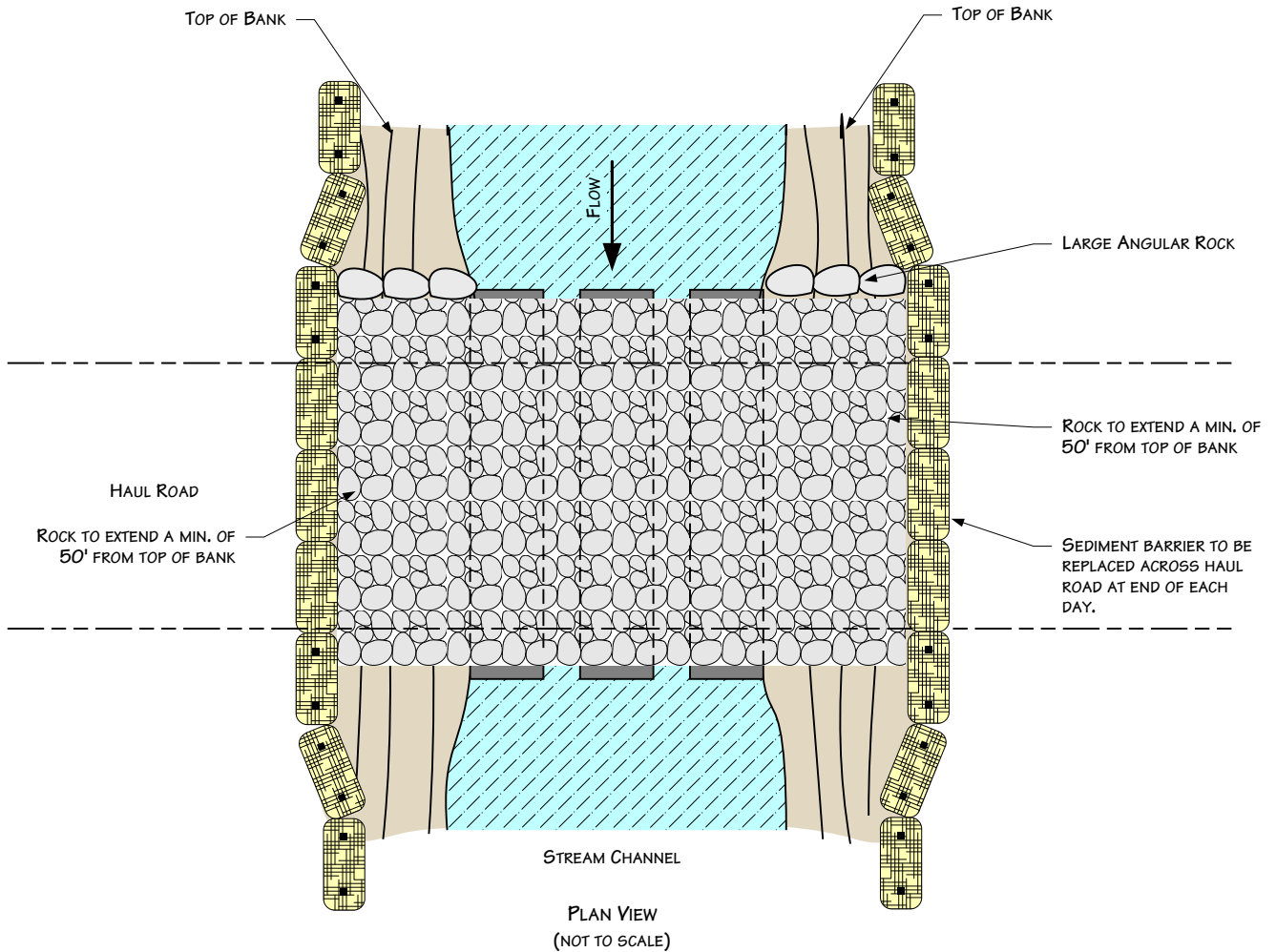
1. INSPECT BRIDGE OPENING PERIODICALLY AND FOLLOWING RAINFALLS OF OVER ½". REMOVE ANY DEBRIS RESTRICTING FLOW AND DEPOSIT IT AT AN UPLAND SITE OUTSIDE OF FLOODPLAIN.
2. IF PHYSICAL CIRCUMSTANCES PROHIBIT WOOD OR METAL RAMPS, EARTHEN RAMPS MAY BE USED AS APPROVED.
3. INSPECT BRIDGE ELEVATION SO BRIDGE REMAINS SUPPORTED ABOVE OHWM.
4. THE CULVERT SUPPORT MUST BE ANCHORED TO THE STREAM BOTTOM AND MAY NOT BE SUPPORTED WITH FILL.
5. EARTHEN RAMP CANNOT BE TALLER THAN 1' AND CANNOT EXTEND FOR MORE THAN 15' ON EITHER SIDE OF THE CROSSING.
6. THE BRIDGE MUST SPAN ABOVE OHWM TO OHWM.
7. ADDITIONAL SUPPORT MUST BE ADDED ON TOP OF BANK AND UNDER SPAN IF THE SPAN IS 12' WIDE OR GREATER, OR IF INITIAL SUPPORT STARTS TO SETTLE.
8. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE COMPANY'S ENVIRONMENTAL PROTECTION PLAN.
9. SIDEBOARDS WILL BE INSTALLED ON TEMPORARY BRIDGES TO MINIMIZE THE POTENTIAL FOR SEDIMENT TRANSPORT. SIDEBOARDS MAY BE CONSTRUCTED OUT OF PLYWOOD, OR EQUIVALENT, AND AFFIXED TO THE OUTER SIDES OF THE BRIDGE. GEO-TEXTILE FABRIC, OR EQUIVALENT, MUST ALSO BE ADEQUATELY SECURED TO THE UNDERSIDE OF THE BRIDGE TO PREVENT MATERIAL FROM FALLING THROUGH THE BRIDGE DECK. THE GEO-TEXTILE FABRIC OR AN EQUIVALENT SHOULD BE SECURED TO THE BOTTOM OF THE BRIDGE AND WRAPPED AROUND THE SIDEBOARDS IN A CONTINUOUS FASHION.



Figure 19B
Environmental Protection Plan
Typical Span Type Bridge
With or Without Instream Support (Timber Matted Support)

Environmental Protection Plan

Drawn by: merjent



NOTES:

1. STEEL FLUME PIPE(S) SIZED TO ALLOW FOR STREAM FLOW AND EQUIPMENT LOAD.
2. STRAW BALES SHALL BE PLACED ACROSS BRIDGE ENTRANCE EVERY NIGHT.
3. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS.

For environmental review purposes only.



Figure 20
Environmental Protection Plan
Typical Rock Flume Bridge

DATE: 5/25/2001

REVISED: 3/15/11

SCALE: NTS

DRAWN BY: KMKENDALL

K:\CLIENT PROJECTS\ID-PEEL\2011-019\FIG_20_ROCK_FLUME_BRIDGE.VSD



Attachment C

Receiving Waters Table

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kittle Number	Wild Rice Present	Agency Permit Required
1	Pembina / Kittson	Middle Red	9020311	09020311-560	Red River	801.8	s-160n50w5-a	Red River of the North	P	2014	450.0	220.0	5.0	Section 10, NDSWC Sovereign Land, NDGF Class I Fishery, NDCC Class I stream, NDGF Wildlife Management Area parcel, USDA-NRCS floodplain easement, MN Public Water, 303d Impaired, Canoe Route	Mercury in fish; PCB	Mercury in fish; PCB	Arsenic; Mercury in fish; Mercury in water column; Turbidity	HDD	NA	Potential restrictions from NDGF Special Use Permit (no construction before July 15 or after August 29); PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T160N, R50W, S5	48.70529	-97.114806	Yes	1C, 2Bdg, 2C, 3C, 4A, 4B, 5, 6	H-026		COE, NDSWC, NDGF/USDA-NRCS, MPCA, MDNR
1	Kittson	Middle Red	9020311		South	802.9	s-160n50w10-a	Unnamed Ditch	I	2014	12.0	3.5	0.5					Dry Crossing	Wet Open Cut		Span	T160N, R50W, S10 SESW	48.693183	-97.098769		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Kittson	Middle Red	9020311		South	803.6	s-160n50w15-a	Unnamed Stream	E	2014	6.0	10.0	0.8					Dry Crossing	Wet Open Cut		Span	T160N, R50W, S15 NENE	48.686305	-97.088135		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Kittson	Middle Red	9020311		South	803.9	s-160n50w15-b	Unnamed Stream	E	2014	4.0	8.0	2.5					Dry Crossing	Wet Open Cut		Span	T160N, R50W, S14 SWNW	48.68229	-97.083944		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218839		COE, MPCA
1	Kittson	Middle Red	9020311	09020311-509	South	805.4	s-160n50w23-a	Unnamed Stream	P	2014	25.0	12.0	3.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span - in stream support	T160N, R50W, S23 NESE	48.665002	-97.066459	Yes	2Bg, 3C, 4A, 4B, 5, 6	H-026-011-001		COE, MPCA, MDNR
1	Kittson	Middle Red	9020311		South	805.8	s-160n50w25-a	Unnamed Ditch	I	2014	3.0	3.0	1.0					Dry Crossing	Wet Open Cut		Span	T160N, R50W, S25 NWNW	48.660469	-97.060838		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Kittson	Middle Red	9020311		South	807.0	s-160n50w25-b	Unnamed Ditch	I	2014	2.5	3.0	1.3					Bore	Dry Crossing		Span	T160N, R50W, S25 SESE	48.647511	-97.041513		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Kittson	Middle Red	9020311		South	808.4	s-160n49w32-a	Unnamed Ditch	I	2014	8.0	10.0	3.0					Dry Crossing	Wet Open Cut		Span	T160N, R49W, S32 SWSW	48.633174	-97.02015		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Kittson	Middle Red	9020311		South	808.6	s-160n49w32-b	Unnamed Ditch	I	2014	8.0	2.5	0.3					Dry Crossing	Wet Open Cut		Span	T159N, R49W, S5 NWNW	48.631089	-97.017045		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Kittson	Middle Red	9020311		South	809.8	s-159n49w4-a	Unnamed Ditch	I	2014	8.0	3.0	1.0					Dry Crossing	Wet Open Cut		Span	T159N, R49W, S5 SESE	48.619179	-96.999309		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Kittson	Middle Red	9020311		South	810.0	s-159n49w4-b	Unnamed Ditch	I	2014	11.0	3.0	0.8					Bore	Wet Open Cut		Span	T159N, R49W, S4 SWSW	48.617032	-96.996126		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218980		COE, MPCA
1	Kittson	Middle Red	9020311		South	810.0	s-159n49w9-a	Unnamed Ditch	I	2014	20.0	5.0	0.5					Bore	Wet Open Cut		Span - in stream support	T159N, R49W, S4 SWSW	48.616847	-96.995863		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218979		COE, MPCA
1	Kittson	Middle Red	9020311		South	811.3	s-159n49w9-b	Unnamed Ditch	I	2014	20.0	5.0	0.5					Dry Crossing	Wet Open Cut		Span - in stream support	T159N, R49W, S9 SESE	48.60354	-96.976554		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Kittson	Middle Red	9020311		South	811.5	s-159n49w15-a	Unnamed Ditch	I	2014	12.0	12.0	1.0					Dry Crossing	Wet Open Cut		Span	T159N, R49W, S15 NWNW	48.601867	-96.974131		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218726		COE, MPCA
1	Kittson	Middle Red	9020311		South	812.7	s-159n49w15-b	Unnamed Ditch	I	2014	12.0	12.0	1.0					Dry Crossing	Wet Open Cut		Span	T159N, R49W, S15 SESE	48.588437	-96.955139		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Kittson	Middle Red	9020311		South	812.8	s-159n49w23-b	County Ditch No. 7	I	2014	20.0	30.0	6.0					Dry Crossing	Wet Open Cut		Span - in stream support	T159N, R49W, S23 NWNW	48.587288	-96.953827		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218599		COE, MPCA
1	Kittson	Middle Red	9020311		South	814.0	s-159n49w23-a	Unnamed Ditch	I	2014	7.0	12.0	1.5					Bore	Dry Crossing		Span	T159N, R49W, S23 SWSE	48.572743	-96.939893		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218366		COE, MPCA
1	Kittson	Middle Red	9020311		South	814.0	s-159n49w26-a	Unnamed Ditch	I	2014	10.0	0.3	0.3					Bore	Dry Crossing		Span	T159N, R49W, S26 NWNE	48.572457	-96.939884		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218366		COE, MPCA
1	Kittson	Middle Red	9020311	09020311-521	South	815.6	s-159n49w36-a	Judicial Ditch 10	I	2014	20.0	20.0	6.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span - in stream support	T159N, R49W, S25 SESE	48.557517	-96.91262		2Bg, 3C, 4A, 4B, 5, 6	H-026-011		COE, MPCA, MDNR
1	Marshall	Middle Red	9020311		South	816.9	s-158n48w6-a	Judicial Ditch 3	I	2015	20.0	20.0	4.5					Bore	Wet Open Cut		Span - in stream support	T158N, R48W, S6 NENE	48.543125	-96.893879		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218759		COE, MPCA
1	Marshall	Middle Red	9020311		South	821.0	s-158n48w22-a	Unnamed Ditch	I	2014	12.0	12.0	4.0					Dry Crossing	Wet Open Cut		Span	T158N, R48W, S22 NENW	48.499631	-96.836399		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218433		COE, MPCA
1	Marshall	Middle Red	9020311		South	821.1	s-158n48w22-b	Unnamed Ditch	I	2014	8.0	8.0	0.5					Dry Crossing	Wet Open Cut		Span	T158N, R48W, S22 NENW	48.49844	-96.83486		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Middle Red	9020311		South	825.4	s-157n47w6-a	Unnamed Ditch	I	2014	5.0	3.0	0.5					Dry Crossing	Wet Open Cut		Span	T157N, R47W, S6 NWSW	48.448656	-96.780063		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kittle Number	Wild Rice Present	Agency Permit Required
1	Marshall	Middle Red	9020311		South	825.7	s-157n47w6-b	Unnamed Ditch	I	2014	8.0	1.0	1.0					Dry Crossing	Wet Open Cut		Span	T157N, R47W, S6 SESW	48.44564	-96.774511		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218220		COE, MPCA
1	Marshall	Middle Red	9020311	09020311-503	South	828.5	s-157n47w16-b	Tamarac River	P	2014	30.0	25.0	3.0	Public Water, 303d Impaired	Aquatic macroinvertebrate bioassessments; Fishes bioassessments	Aquatic macroinvertebrate bioassessments; Fishes bioassessments	Aquatic macroinvertebrate bioassessments; Fishes bioassessments	HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T157N, R47W, S16 SWSW	48.415892	-96.732695	Yes	1C, 2Bdg, 2C, 3C, 4A, 4B, 5, 6	H-026-019		COE, MPCA, MDNR
1	Marshall	Middle Red	9020311		South	831.0	s-157n47w26-c	Unnamed Stream	E	2014	10.0	4.0	1.5					Dry Crossing	Wet Open Cut		Span	T157N, R47W, S26 SWNW	48.391842	-96.690959		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218249		COE, MPCA
1	Marshall	Middle Red	9020311		South	831.2	s-157n47w26-d	Unnamed Stream	I	2014	15.0	8.0	0.5					Dry Crossing	Wet Open Cut		Span - in stream support	T157N, R47W, S26 NESW	48.389676	-96.687974		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218374		COE, MPCA
1	Marshall	Middle Red	9020311		South	831.4	s-157n47w26-d	Unnamed Stream	I	2014	15.0	8.0	0.5					Dry Crossing	Wet Open Cut		Span - in stream support	T157N, R47W, S26 NESW	48.387886	-96.685664		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218374		COE, MPCA
1	Marshall	Middle Red	9020311		South	831.7	s-157n47w26-b	Unnamed Ditch	I	2014	15.0	10.0	0.5					Dry Crossing	Wet Open Cut		Span - in stream support	T157N, R47W, S35 NWNE	48.384349	-96.681183		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218215		COE, MPCA
1	Marshall	Middle Red	9020311		South	832.8	s-157n47w36-b	Unnamed Ditch	I	2014	11.0	4.0	0.5					Dry Crossing	Wet Open Cut		Span	T157N, R47W, S36 SESW	48.37332	-96.665754		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Middle Red	9020311		South	833.1	s-157n47w36-a	Unnamed Ditch	I	2014	19.0	10.0	1.5					Dry Crossing	Wet Open Cut		Span - in stream support	T157N, R47W, S36 SESW	48.36988	-96.660781		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090218691		COE, MPCA
1	Marshall	Middle Red	9020311		South	833.6	s-156n47w1-a	Unnamed Ditch	I	2014	15.0	10.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T156N, R47W, S1 SWNW	48.364225	-96.65264		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309		South	834.1	s-156n47w1-b	Unnamed Stream	E	2014	32.0	7.0	0.4					Dry Crossing	Wet Open Cut		Span - in stream support	T156N, R47W, S1 NESW	48.359877	-96.64621		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090217643		COE, MPCA
1	Marshall	Snake	9020309		South	835.0	s-156n47w12-a	Unnamed Ditch	I	2014	20.0	11.0	1.5					Bore	Dry Crossing		Span - in stream support	T156N, R47W, S12 SENE	48.350402	-96.631177		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309		South	835.0	s-156n46w7-a	Unnamed Ditch	I	2014	25.0	7.0	1.0					Bore	Dry Crossing		Span - in stream support	T156N, R46W, S7 SWNW	48.350158	-96.630788		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309		South	835.2	s-156n46w7-b	Unnamed Ditch	I	2014	25.0	2.5	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T156N, R46W, S7 SWNW	48.348267	-96.627763		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309	09020309-540	South	835.9	s-156n46w7-c	Middle River	P	2014	45.0	30.0	2.0	NRI, Public Water, 303d Impaired	Dissolved oxygen; Turbidity	Aquatic macroinvertebrate bioassessments; Dissolved oxygen; Turbidity	Aquatic macroinvertebrate bioassessments; Dissolved oxygen; Turbidity	HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T156N, R46W, S7 SWSE	48.341569	-96.617902	Yes	2Bg, 3C, 4A, 4B, 5, 6	H-026-021-004		COE, MPCA, MDNR
1	Marshall	Snake	9020309		South	837.2	s-156n46w17-a	Unnamed Ditch	I	2014	20.0	10.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T156N, R46W, S17 SWSE	48.327217	-96.598691		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309		South	838.0	s-156n46w21-a	Unnamed Ditch	I	2014	26.0	9.0	1.5					Dry Crossing	Wet Open Cut		Span - in stream support	T156N, R46W, S21 NWSW	48.319102	-96.587305		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309		South	838.1	s-156n46w21-b	Unnamed Stream	E	2014	37.0	8.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T156N, R46W, S21 NWSW	48.317435	-96.585332		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090217515		COE, MPCA
1	Marshall	Snake	9020309		South	839.1	s-156n46w28-a	Unnamed Stream	I	2014	12.0	11.0	1.0					Dry Crossing	Wet Open Cut		Span	T156 R46W Sec. 28	48.303405	-96.577012		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090217590		COE, MPCA
1	Marshall	Snake	9020309		South	842.6	s-155n46w1-a	Unnamed Ditch	I	2014	2.0	2.0	0.5					Dry Crossing	Wet Open Cut		Span	T155N, R46W, S1 NWSW	48.272659	-96.518901		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309	09020309-543	South	843.2	s-155n46w12-a	Snake River	P	2014	30.0	25.0	0.5	Public Water, 303d Impaired	Dissolved oxygen	Dissolved oxygen; E. coli; Aquatic macroinvertebrate bioassessments; Fishes bioassessments	Dissolved oxygen; E. coli; Aquatic macroinvertebrate bioassessments; Fishes bioassessments	HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T155N, R46W, S12 NWNE	48.265427	-96.509462	Yes	2Bg, 3C, 4A, 4B, 5, 6	H-026-021		COE, MPCA, MDNR
1	Marshall	Snake	9020309		South	846.9	s-155n45w21-b	Unnamed Ditch	I	2014	2.5	1.0	0.5					Dry Crossing	Wet Open Cut		Span	T155N, R45W, S21 SWSW	48.225279	-96.454252		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309	09020309-546	South	847.2	s-155n45w28-a	South Branch Snake River	P	2014	24.0	20.0	5.0	Public Water, 303d Impaired - proposed	NA	Fishes bioassessments	Fishes bioassessments	Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span - in stream support	T155N, R45W, S28 NENW	48.222935	-96.450912	Yes	2Bg, 3C, 4A, 4B, 5, 6	H-026-021-010		COE, MPCA, MDNR

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kittle Number	Wild Rice Present	Agency Permit Required
1	Marshall	Snake	9020309		South	848.2	s-155n45w28-c	Unnamed Ditch	I	2014	10.0	4.0	0.5					Bore	Dry Crossing		Span	T155N, R45W, S28 SESE	48.211234	-96.438924		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309		South	848.2	s-155n45w33-a	Unnamed Ditch	I	2014	25.0	10.0	2.0					Bore	Dry Crossing		Span - in stream support	T155N, R45W, S33 NENE	48.210966	-96.438904		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309		South	848.9	s-155n45w34-b	Unnamed Stream	E	2014	36.0	6.0	0.5					Dry Crossing	Wet Open Cut		Span - in stream support	T155N, R45W, S34 SENW	48.205327	-96.426261		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309		South	849.1	s-155n45w34-c	Unnamed Ditch	I	2014	3.0	2.0	0.5					Dry Crossing	Wet Open Cut		Span	T155N, R45W, S34 NESW	48.203696	-96.424053		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Snake	9020309		South	849.4	s-155n45w34-d	Unnamed Stream	E	2014	25.0	2.0	0.5					Dry Crossing	Wet Open Cut		Span - in stream support	T155N, R45W, S34 SWSE	48.199939	-96.418495		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Grand Marais-Red	9020306		South	851.1	s-154n45w2-a	Unnamed Ditch	I	2014	12.0	3.0	0.5					Bore	Dry Crossing		Span	T154N, R45W, S2 SESE	48.182344	-96.395017		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Grand Marais-Red	9020306		South	851.1	s-154n45w11-b	Unnamed Ditch	I	2014	20.0	8.0	1.5					Bore	Dry Crossing		Span - in stream support	T154N, R45W, S11 NENE	48.182202	-96.394871		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Marshall	Grand Marais-Red	9020306		South	851.4	s-154n45w11-a	Unnamed Ditch	I	2014	17.0	6.0	0.5					Dry Crossing	Wet Open Cut		Span - in stream support	T154N, R45W, S11 SENE	48.178076	-96.390619		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Pennington	Red Lake	9020303		South	852.9	s-154n44w18-a	Unnamed Ditch	I	2014	14.0	10.0	2.0					Dry Crossing	Wet Open Cut		Span - in stream support	T154N, R44W, S20 SWSE	48.162364	-96.368297		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090211537		COE, MPCA
1	Pennington	Red Lake	9020303		South	855.0	w-154n44w20-ab	Black River	NA	2016	NA	NA	NA	303d Impaired	Dissolved oxygen, Turbidity	NA	NA	Open Cut	NA		NA	T154N, R44W, S18 SWNW	48.1401954	-96.337313		2D			COE, MPCA
1	Pennington	Red Lake	9020303		South	858.7	s-153n44w3-a	Unnamed Ditch	I	2014	30.0	15.0	4.0					Bore	Dry Crossing		Span - in stream support	T153N, R44W, S3 SENE	48.101289	-96.284351		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090211676		COE, MPCA
1	Pennington	Red Lake	9020303		South	860.1	s-153n44w11-a	Unnamed Ditch	I	2014	40.0	10.0	3.0					Dry Crossing	Wet Open Cut		Span - in stream support	T153N, R44W, S11 SENE	48.08634	-96.263036		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090212356		COE, MPCA
1	Pennington	Red Lake	9020303		South	861.7	s-153n44w13-a	Unnamed Ditch	I	2014	40.0	25.0	4.0					Dry Crossing	Wet Open Cut		Span - in stream support	T153N, R44W, S13 NESE	48.067929	-96.241293		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090211843		COE, MPCA
1	Pennington	Red Lake	9020303		South	862.1	s-153n43w18-a	Unnamed Ditch	I	2014	25.0	12.0	1.5					Dry Crossing	Wet Open Cut		Span - in stream support	T153N, R43W, S18 SWSW	48.064113	-96.236588		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Pennington	Red Lake	9020303		South	862.1	s-153n43w19-a	Unnamed Ditch	I	2014	15.0	3.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T153N, R43W, S19 NWNW	48.063948	-96.236355		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Pennington	Red Lake	9020303		South	863.3	s-153n43w19-b	Unnamed Ditch	I	2014	20.0	8.0	1.5					Dry Crossing	Wet Open Cut		Span - in stream support	T153N, R43W, S19 SESE	48.051063	-96.219768		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Pennington	Red Lake	9020303		South	863.3	s-153n43w20-a	Unnamed Ditch	I	2014	20.0	10.0	2.0					Dry Crossing	Wet Open Cut		Span - in stream support	T153N, R43W, S20 SWSW	48.050876	-96.219538		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Pennington	Red Lake	9020303		South	863.4	s-153n43w20-a	Unnamed Ditch	I	2014	20.0	10.0	2.0					Dry Crossing	Wet Open Cut		Span - in stream support	T153N, R43W, S20 SWSW	48.049655	-96.218043		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Pennington	Red Lake	9020303	09020303-513	South	864.3	s-153n43w29-a	Red Lake River	P	2014	230.0	215.0	2.0	Section 10, NRI, Public Water, 303d Impaired, Canoe Route	Mercury in fish	Mercury in fish	Mercury in fish	HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T153N, R43W, S29 Meandered waterbody	48.039535	-96.205976	Yes	1C, 2Bdg, 2C, 3C, 4A, 4B, 5, 6	H-026-030		COE, MPCA, MDNR
1	Pennington	Red Lake	9020303	09020303-541	South	864.7	s-153n43w32-a	Unnamed Ditch	I	2014	10.0	10.0	2.0					HDD	NA		NA	T153N, R43W, S29 SESE	48.035082	-96.199621		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090211546		COE, MPCA
1	Pennington	Red Lake	9020303		South	865.1	s-153n43w33-a	Unnamed Ditch	I	2014	18.0	3.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T153N, R43W, S33 NWNW	48.031461	-96.193216		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Pennington	Red Lake	9020303		South	867.4	s-152n43w4-a	Unnamed Ditch	I	2014	40.0	12.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T152N, R43W, S4 SESE	48.006781	-96.161232		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090211530		COE, MPCA
1	Pennington	Red Lake	9020303		South	869.5	s-152n43w14-a	Unnamed Ditch	I	2014	18.0	3.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T152N, R43W, S14 NWSW	47.983896	-96.132567		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Pennington	Red Lake	9020303		South	869.7	s-152n43w14-b	Unnamed Ditch	I	2014	24.0	12.0	2.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span - in stream support	T152N, R43W, S14 NESW	47.981373	-96.129118		2Bg, 3C, 4A, 4B, 5, 6	H-026-030-028		COE, MPCA, MDNR

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kittle Number	Wild Rice Present	Agency Permit Required
1	Pennington	Red Lake	9020303		South	869.7	s-152n43w14-c	Unnamed Ditch	I	2014	35.0	18.0	5.0					Dry Crossing	Wet Open Cut		Span - in stream support	T152N, R43W, S14 SESW	47.981189	-96.128868		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090211654		COE, MPCA
1	Pennington	Red Lake	9020303		South	870.4	s-152n43w23-a	Unnamed Stream	E	2014	6.0	2.0	1.0					Dry Crossing	Wet Open Cut		Span	T152N, R43W, S23 SENE	47.974036	-96.119151		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Pennington	Red Lake	9020303		South	871.3	s-152n43w24-b	Unnamed Ditch	I	2014	9.0	6.0	1.0					Dry Crossing	Wet Open Cut		Span	T152N, R43W, S24 SWSE	47.964586	-96.106386		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Red Lake	Red Lake	9020303		South	871.3	s-152n43w24-c	Unnamed Ditch	I	2014	20.0	10.0	3.0					Dry Crossing	Wet Open Cut		Span - in stream support	T152N, R43W, S24 SWSE	47.963622	-96.105213		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090211727		COE, MPCA
1	Red Lake	Red Lake	9020303		South	872.0	s-152n42w30-a	Unnamed Ditch	I	2014	14.0	4.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T152N, R42W, S30 SWNW	47.956504	-96.096351		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090212509		COE, MPCA
1	Red Lake	Red Lake	9020303		South	872.4	s-152n42w30-b	Unnamed Ditch	I	2014	20.0	3.0	0.3					Dry Crossing	Wet Open Cut		Span - in stream support	T152N, R42W, S30 SESW	47.952051	-96.091196		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090212455		COE, MPCA
1	Red Lake	Red Lake	9020303		South	873.3	s-152n42w31-a	Unnamed Ditch	I	2014	12.0	8.0	2.0					Dry Crossing	Wet Open Cut		Span	T152N, R42W, S31 NESE	47.941249	-96.078262		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Red Lake	Red Lake	9020303		South	873.8	s-152n42w32-b	Unnamed Ditch	I	2014	18.0	12.0	2.0					Dry Crossing	Wet Open Cut		Span - in stream support	T152N, R42W, S32 SWSW	47.936308	-96.072213		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090212661		COE, MPCA
1	Red Lake	Red Lake	9020303		South	873.9	s-152n42w32-a	Unnamed Ditch	I	2014	18.0	1.0	2.0					Dry Crossing	Wet Open Cut		Span - in stream support	T152N, R42W, S32 SWSW	47.934661	-96.070248		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Red Lake	Clearwater	9020305	09020305-648	South	875.4	s-151n42w4-a	Clearwater River	P	2014	70.0	60.0	3.0	Public Water, 303d Impaired	Dissolved oxygen; Mercury in fish; Turbidity	Dissolved oxygen; Mercury in fish; Turbidity	Mercury in fish; Turbidity	HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T151N, R42W, S9 NENW	47.91956	-96.048284	Yes	2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019		COE, MPCA, MDNR
1	Red Lake	Clearwater	9020305		South	882.4	s-151n41w28-c	Unnamed Ditch	I	2014	20.0	12.0	3.0					Dry Crossing	Wet Open Cut		Span - in stream support	T151N, R41W, S28 SWSW	47.864683	-95.923469		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Red Lake	Clearwater	9020305		South	882.8	s-151n41w28-b	Unnamed Ditch	I	2014	18.0	8.0	2.0					Dry Crossing	Wet Open Cut		Span - in stream support	T151N, R41W, S28 SESW	47.862558	-95.916783		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Red Lake	Clearwater	9020305		South	882.8	s-151n41w28-a	Unnamed Ditch	I	2014	20.0	12.0	2.0					Dry Crossing	Wet Open Cut		Span - in stream support	T151N, R41W, S28 SESW	47.862477	-95.916533		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Red Lake	Clearwater	9020305		South	882.8	s-151n41w33-b	Unnamed Ditch	I	2014	20.0	7.0	0.5					Dry Crossing	Wet Open Cut		Span - in stream support	T151N, R41W, S33 NENW	47.862289	-95.915953		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Red Lake	Clearwater	9020305		South	883.5	s-151n41w33-a	Unnamed Ditch	I	2014	13.0	5.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T151N, R41W, S33 SENE	47.857812	-95.902159		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Red Lake	Clearwater	9020305		South	884.7	s-151n41w35-a	Unnamed Ditch	I	2014	60.0	16.0	2.0					Bore	Dry Crossing		Span - in stream support	T151N, R41W, S35 SWSW	47.850696	-95.880092		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090215241		COE, MPCA
1	Red Lake	Clearwater	9020305		South	885.7	s-150n41w1-a	Unnamed Ditch	I	2014	50.0	15.0	1.5					Bore	Dry Crossing		Span - in stream support	T150N, R41W, S1 NWNW	47.845575	-95.858322		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Red Lake	Clearwater	9020305	09020305-646	South	885.8	s-150n41w1-b	Lost River	P	2014	80.0	50.0	3.0	Section 408, Public Water, 303d Impaired - proposed	NA	NA	<i>E. coli</i>	Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span - in stream support	T150N, R41W, S1 NWNW	47.845344	-95.856877		2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019-007	Yes	COE, MPCA, MDNR
1	Red Lake	Clearwater	9020305		South	886.7	s-150n41w1-c	Unnamed Ditch	I	2014	75.0	20.0	1.5					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R41W, S1 NWSE	47.838192	-95.842189		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090215772		COE, MPCA
1	Polk	Clearwater	9020305		South	888.0	s-150n40w7-a	Unnamed Ditch	I	2014	25.0	12.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R40W, S7 SENE	47.829756	-95.816486		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090215951		COE, MPCA
1	Polk	Clearwater	9020305		South	888.0	s-150n40w8-a	Unnamed Ditch	I	2014	15.0	5.0	0.5					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R40W, S8 SWNW	47.829678	-95.816248		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Polk	Clearwater	9020305		South	889.6	s-150n40w9-a	Unnamed Ditch	I	2014	20.0	8.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R40W, S9 SESW	47.819395	-95.784786		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Polk	Clearwater	9020305	09020305-590	South	889.7	s-150n40w16-a	State Ditch No. 61	I	2014	60.0	20.0	4.0					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R40W, S16 NWNE	47.818997	-95.78355		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090214966		COE, MPCA

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kittle Number	Wild Rice Present	Agency Permit Required
1	Polk	Clearwater	9020305		South	890.2	s-150n40w15-a	Unnamed Ditch	I	2014	10.0	4.0	1.0					Dry Crossing	Wet Open Cut		Span	T150N, R40W, S16 NENE	47.815722	-95.773557		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090216211		COE, MPCA
1	Polk	Clearwater	9020305		South	890.8	s-150n40w15-b	Unnamed Ditch	I	2014	40.0	12.0	2.0					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R40W, S15 SENW	47.81216	-95.762821		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Polk	Clearwater	9020305		South	890.8	s-150n40w15-c	Unnamed Ditch	I	2014	50.0	20.0	5.0					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R40W, S15 SWNE	47.812072	-95.76258		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090216518		COE, MPCA
1	Polk	Clearwater	9020305		South	891.3	s-150n40w14-a	Unnamed Ditch	I	2014	30.0	15.0	1.0					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R40W, S14 NWSW	47.808611	-95.752094		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Polk	Clearwater	9020305		South	892.4	s-150n40w23-a	Unnamed Ditch	I	2014	35.0	10.0	1.5					Bore	Wet Open Cut		Span - in stream support	T150N, R40W, S23 NENE	47.801758	-95.730794		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Polk	Clearwater	9020305		South	893.3	s-150n39w19-a	Unnamed Ditch	I	2014	14.0	3.0	3.0					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R39W, S19 NWNW	47.803862	-95.708921		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090215880		COE, MPCA
1	Polk	Clearwater	9020305		South	893.7	s-150n39w19-c	Unnamed Ditch	I	2014	8.0	6.0	0.5					Dry Crossing	Wet Open Cut		Span	T150N, R39W, S19 NWSW	47.797673	-95.70419		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Polk	Clearwater	9020305		South	894.0	s-150n39w19-d	Unnamed Ditch	I	2014	15.0	12.0	3.0					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R39W, S19 NESW	47.794172	-95.700493		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Polk	Clearwater	9020305		South	894.3	s-150n39w30-a	County Ditch No. 89	I	2014	15.0	10.0	0.5					Dry Crossing	Wet Open Cut		Span - in stream support	T150N, R39W, S19 SWSE	47.79051	-95.696626		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090216406		COE, MPCA
1	Polk	Clearwater	9020305		South	894.8	s-150n39w29-a	Unnamed Ditch	I	2014	12.0	8.0	2.0					Dry Crossing	Wet Open Cut		Span	T150N, R39W, S30 SENE	47.783673	-95.687389		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Polk	Clearwater	9020305		South	894.9	s-150n39w29-b	Unnamed Ditch	I	2014	12.0	8.0	2.0					Dry Crossing	Wet Open Cut		Span	T150N, R39W, S30 SENE	47.78361	-95.687179		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
1	Polk	Clearwater	9020305		South	894.9	s-150n39w29-c	Unnamed Ditch	I	2014	12.0	8.0	2.0					Dry Crossing	Wet Open Cut		Span	T150N, R39W, S30 SENE	47.783211	-95.68583		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
2	Clearwater	Clearwater	9020305		South	901.1	s-149n38w7-c	Unnamed Ditch	I	2014	8.0	5.0	1.0					Dry Crossing	Wet Open Cut		Span	T149N, R38W, S7 SWNE	47.742412	-95.567492		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090215927		COE, MPCA
2	Clearwater	Clearwater	9020305		South	902.0	s-149n38w8-a	Unnamed Ditch	I	2014	8.0	3.0	1.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span	T149N, R38W, S8 NESW	47.736602	-95.549381		2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019-007-007		COE, MPCA, MDNR
2	Clearwater	Clearwater	9020305		South	902.0	s-149n38w8-b	Unnamed Ditch	I	2014	10.0	7.0	1.0					Dry Crossing	Wet Open Cut		Span	T149N, R38W, S8 NESW	47.736514	-95.549103		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
2	Clearwater	Clearwater	9020305		South	902.1	s-149n38w8-c	Unnamed Ditch	I	2014	8.0	5.0	1.0					Dry Crossing	Wet Open Cut		Span	T149N, R38W, S8 NWSE	47.736449	-95.548896		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
2	Clearwater	Clearwater	9020305		South	902.7	s-149n38w9-a	Unnamed Ditch	I	2014	18.0	7.0	1.5					Bore	Wet Open Cut		Span - in stream support	T149N, R38W, S9 SWSW	47.731741	-95.536338		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
2	Clearwater	Clearwater	9020305		South	902.9	s-149n38w16-a	Unnamed Stream	I	2014	18.0	8.0	2.0					Dry Crossing	Wet Open Cut		Span - in stream support	T149N, R38W, S16 NWNW	47.730541	-95.533418		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090214818		COE, MPCA
2	Clearwater	Clearwater	9020305	09020305-512	South	904.0	s-149n38w15-a	Lost River	P	2014	30.0	18.0	3.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span - in stream support	T149N, R38W, S15 NWSW	47.721857	-95.512996	Yes	2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019-007		COE, MPCA, MDNR
2	Clearwater	Clearwater	9020305	09020305-527	Central	907.1	CL018bWB	Silver Creek	P	2014	20.0	12.0	3.0	Public Water, 303d Impaired	Fecal Coliform	Fecal Coliform	Fecal Coliform; Aquatic macroinvertebrate bioassessments	Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T149N, R38W, S25, SENE	47.698832	-95.456331	Yes	2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019-007-005		COE, MPCA, MDNR
2	Clearwater	Clearwater	9020305	09020305-527	Central	907.4	CL019bWB	Silver Creek	P	2014	22.0	22.0	8.0	Public Water, 303d Impaired	Fecal Coliform	Fecal Coliform	Fecal Coliform; Aquatic macroinvertebrate bioassessments	Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery - No in-channel work from March 15- June 15	Span in-stream support	T149N, R37W, S30, NWSW	47.695855	-95.45092	Yes	2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019-007-005		COE, MPCA, MDNR
2	Clearwater	Clearwater	9020305	09020305-527	Central	907.7	s-149n37w30-a	Silver Creek	P	2014	16.0	12.0	2.0	Public Water, 303d Impaired	Fecal Coliform	Fecal Coliform	Fecal Coliform; Aquatic macroinvertebrate bioassessments	Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery - No in-channel work from March 15- June 15	Span - in stream support	T149N, R37W, S30 NESW	47.693694	-95.444815	Yes	2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019-007-005		COE, MPCA, MDNR

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kittle Number	Wild Rice Present	Agency Permit Required
2	Clearwater	Clearwater	9020305		Central	908.4	CL020aWB	Unnamed Ditch	I	2014	1.5	1.5	1.5					Bore	Wet Open Cut		Span	T149N, R37W, S30 SESE	47.689598	-95.431086		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
2	Clearwater	Clearwater	9020305	09020305-572	Central	909.2	CL022_200aWB	Unnamed Stream	P	2014	1.5	1.5	1.5					Dry Crossing	Wet Open Cut		Span	T149N, R37W, S29 SWSE	47.689612	-95.415962		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090216465		COE, MPCA
2	Clearwater	Clearwater	9020305	09020305-572	Central	909.8	CL022_200aWB	Unnamed Stream	P	2014	1.5	1.5	1.5					Dry Crossing	Wet Open Cut		Span	T149N, R37W, S29 SWSE	47.689885	-95.416094		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090216465		COE, MPCA
2	Clearwater	Clearwater	9020305		Central	910.9	s-149n37w32-b	Unnamed Stream	P	2014	8.0	8.0	1.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery - No in-channel work from March 15- June 15	Span	T149, R37W, Sec. 32	47.68214	-95.426796		2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019-007-005-001		COE, MPCA , MDNR
2	Clearwater	Clearwater	9020305	09020305-572	Central	911.5	CLC5020_300aWB	Unnamed Stream	I	2013/2014	6.0	3.0	0.5					Dry Crossing	Wet Open Cut		Span	T149, R37W, Sec. 32	47.68112	-95.413752		2Bg, 3C, 4A, 4B, 5, 6	MAJ-090216465		COE, MPCA
2	Clearwater	Clearwater	9020305		Central	915.3	s-148n37w20-a	Unnamed Stream	I	2017	4.0	2.5	0.5					Dry Crossing	Wet Open Cut		Span	T148 R37W Sec. 20	47.628322	-95.400682		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
2	Clearwater	Clearwater	09020305		Central	917.1	CLC5018aWB	Unnamed Stream	E	2013	3.0	3.0	1.0					Dry Crossing	Wet Open Cut		Span	T148N, R37W, S29, SESW	47.603846	-95.395001		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
2	Clearwater	Clearwater	09020305	09020305-517	North	922.2	CLC5037aWB	Clearwater River	P	2013	42.0	42.0	2.0	NRI, Public Water, 303d Impaired	Mercury in fish; Dissolved Oxygen	Mercury in fish; Dissolved Oxygen	Mercury in fish; Dissolved Oxygen	HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T147N, R37W, S21, NESW	47.532476	-95.374322	Yes	2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019		COE, MPCA, MDNR
2	Clearwater	Clearwater	09020305		North	922.3	CLC5038aWB	Tributary of Clearwater River	P	2013	12.0	12.0	2.0					HDD	NA		NA	T147N, R37W, S21, NESW	47.532057	-95.373991		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
2	Clearwater	Clearwater	09020305	09020305-509	North	924.2	CLC5048aWB	Walker Brook	P	2013	20.0	20.0	5.0	Public Water, 303d Impaired	Dissolved Oxygen	Dissolved Oxygen	Dissolved Oxygen	Wet Open Cut	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T147N, R37W, S34, SWNE	47.508786	-95.350037		2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019-029		COE, MPCA, MDNR
2	Clearwater	Clearwater	09020305		North	925.4	CLC5051aWB	Unnamed Stream	P	2013	8.0	10.0	4.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span	T146N, R37W, S2, SWNW	47.495036	-95.335995		2Bg, 3C, 4A, 4B, 5, 6	H-025-030-019-029-001		COE, MPCA, MDNR
2	Clearwater	Clearwater	09020305		North	928.4	s-146n36w8-c	Unnamed Stream	E	2017	6.0	1.0	0.5					Dry Crossing	Wet Open Cut		Span	T146 R36W Sec. 8	47.475601	-95.28773		2Bg, 3C, 4A, 4B, 5, 6			
2	Clearwater	Clearwater	9020305		North	928.5	s-146n36w8-a	Walker Brook	P	2017	18.0	7.0	4.0	Public Water				Wet Open Cut	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T146 R36W Sec. 8	47.475938	-95.284696		2Bg, 3C, 4A, 4B, 5, 6	H-026-030-019-029		COE, MPCA, MDNR
2	Clearwater	Mississippi River - Headwaters	7010101		North	931.6	s-146n36w15-b	Unnamed Stream	P	2018	10.0	8.0	3.0					Dry Crossing	Wet Open Cut		Span	T146 R36W Sec. 10	47.464865	-95.232766		2Bg, 3C, 4A, 4B, 5, 6	M-161-004-009		COE, MPCA
2	Clearwater	Mississippi River - Headwaters	7010101	07010101-738	North	931.7	s-146n36w15-a	Unnamed Stream	P	2017	15.0	9.0	3.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T146 R36W Sec. 15	47.464658	-95.231733	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-161-004-009		COE, MPCA, MDNR
2	Clearwater	Mississippi River - Headwaters	7010101	07010101-738	North	932.6	s-146n36w23-b	Unnamed Stream	P	2017	10.0	6.0	2.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span	T146 R36W Sec. 23	47.45582	-95.221713		2Bg, 3C, 4A, 4B, 5, 6	M-161-004-009		COE, MPCA, MDNR
2	Clearwater	Mississippi River - Headwaters	07010101	07010101-631	North	940.1	CLC5095aWB	Bear Creek	P	2013	15.0	15.0	3.5	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T145N, R36W, S26, SENW	47.350412	-95.218902	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-164		COE, MPCA, MDNR

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kittle Number	Wild Rice Present	Agency Permit Required
2	Clearwater	Mississippi River - Headwaters	07010101	07010101-753	North	941.0	CLC5098aWB	Mississippi River	P	2013	13.0	12.5	3.5	Public Water, 303d Impaired, Canoe Route, ORVW	Dissolved Oxygen	Mercury in fish	Mercury in fish	HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T145N, R36W, S35, NWNW	47.338322	-95.210043	Yes	2Bg, 3C, 4A, 4B, 5, 6	M		COE, MPCA, MDNR
2	Hubbard	Mississippi River - Headwaters	07010101		North	946.0	HUC5002aWB	La Salle Creek	P	2013	13.0	13.0	3.0	Public Water, Trout Stream, Aquatic Management Area				Dry Crossing	Wet Open Cut	PWI COLDWATER FISHERY no in-channel work from September 1-April 15	Span in-stream support	T144N, R35W, S19, SWNW	47.276458	-95.167842	Yes	1B, 2Ag, 2C, 3B, 4A, 4B, 5, 6	M-163		COE, MPCA, MDNR
2	Hubbard	Crow Wing River	07010106		North	961.4	HUC5070aWB	Unnamed Stream	P	2013	4.0	6.0	3.0					Dry Crossing	Wet Open Cut		Span	T141N, R35W, S5 NENW	47.062956	-95.141998		2Bg, 3C, 4A, 4B, 5, 6	MAJ-070119105_A		COE, MPCA
2	Hubbard	Crow Wing River	07010106		North	962.2	HUC5074aWB	Unnamed Stream	P	2013	4.0	3.0	1.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span	T141N, R35W, S8, NWNW	47.05097	-95.140839		2Bg, 3C, 4A, 4B, 5, 6	M-096-035-002-004-000.5		COE, MPCA, MDNR
2	Hubbard	Crow Wing River	07010106		North	963.7	HUC5081aWB	Hay Creek	P	2013	N/A	N/A	N/A	Public Water				HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T141N, R35W, S17, SENW	47.030611	-95.145041	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-096-035-002	Yes	COE, MPCA, MDNR
2	Hubbard	Crow Wing River	07010106	07010106-558	Central	974.2	HUC5122_200aWB	Straight River	P	2013	90.0	90.0	10.0	Public Water, Trout Stream, 303d Impaired	Dissolved Oxygen	Dissolved Oxygen	Dissolved Oxygen	HDD	NA	PWI COLDWATER FISHERY - no in-channel work from September 1-April 15	NA	T139N, R35W, S6, NESE	46.882347	-95.143044	Yes	1B, 2A, 2C, 3B, 4A, 4B, 5, 6	M-096-035-002-002		COE, MPCA, MDNR
3	Hubbard	Crow Wing River	07010106	07010106-537	Central	976.6	HUC5130aWB	Shell River	P	2013	24.0	24.0	4.0	Public Water, 303d Impaired	Fishes bioassessments	Fishes bioassessments	Fishes bioassessments	Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T139N, R35W, S19, NENE	46.847405	-95.146742	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-096-035-004		COE, MPCA, MDNR
3	Hubbard	Crow Wing River	07010106	07010106-537	Central	981.4	HUC5162aWB	Shell River	P	2013	20.0	20.0	5.0	Public Water, 303d Impaired	Fishes bioassessments	Fishes bioassessments	Fishes bioassessments	Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T139N, R35W, S33, NESE	46.811305	-95.105465	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-096-035-004		COE, MPCA, MDNR
3	Hubbard	Crow Wing River	07010106	07010106-537	Central	983.7	HUC5175aWB	Shell River	P	2013	70.0	60.0	6.0	Public Water				HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T139N, R35W, S36, SWNW	46.814946	-95.057276	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-096-035		COE, MPCA, MDNR
3	Hubbard	Crow Wing River	07010106	07010106-537	Central	985.3	HUC5179_240aWB	Oxbow Pond (Shell River)	P	2013	75.0	70.0	5.0	Public Water				HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T139N, R34W, S31, NWNW	46.819799	-95.024903	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-096-035		COE, MPCA, MDNR
3	Wadena	Crow Wing River	07010106	07010106-537	Central	991.2	WA002aWB	Shell River	P	2014	400.0	210.0	5.0	NRI, Public Water, 303d Impaired	Dissolved oxygen	Dissolved oxygen	Dissolved oxygen	HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T138N, R34W, S1, SWNE	46.799062	-94.918355	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-096-035		COE, MPCA, MDNR
3	Wadena	Crow Wing River	07010106	07010106-516	Central	993.3	WA006aWB	Crow Wing River	P	2014	500.0	210.0	7.0	NRI, Public Water, 303d Impaired, Canoe Route	Mercury in fish	Mercury in fish	Mercury in fish	HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	NA	T138N, R33W, S5, NESE	46.794747	-94.875677	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-096	Yes	COE, MPCA, MDNR
3	Wadena	Crow Wing River	07010106		Central	996.5	WA017aWB	Unnamed Stream	P	2014	8.0	8.0	6.0					Wet Open Cut	NA		Span	T138N, R33W, S2, SESW	46.790474	-94.809339		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kettle Number	Wild Rice Present	Agency Permit Required
3	Cass	Crow Wing River	07010106		Central	999.1	CAC5001_540bWB	Unnamed Ditch	I	2014	10.0	3.0	3.0					Wet Open Cut	NA		Span	T138N, R33W, S2, SWSE	46.78983	-94.754563		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Cass	Crow Wing River	07010106		Central	999.2	CAC5001_540aWB	Unnamed Ditch	I	2014	10.0	8.0	0.5					Wet Open Cut	NA		Span	T138N, R32W, S5, SESE	46.789814	-94.752729		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Cass	Crow Wing River	07010106		Central	999.6	CAC5006aWB	Unnamed Ditch	I	2014	8.0	5.0	1.5					Wet Open Cut	NA		Span	T138N, R32W, S5, SESE	46.789737	-94.743745		2Bg, 3C, 4A, 4B, 5, 6			
3	Cass	Crow Wing River	07010106	07010106-531	Central	1000.5	CAC5007aWB	Big Swamp Creek	P	2013	42.0	42.0	5.0	Public Water				Wet Open Cut	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T138N, R32W, S4, SESE	46.79162	-94.725508		2C, 3C, 4A, 4B, 5, 6	M-096-030		COE, MPCA, MDNR
3	Cass	Crow Wing River	07010106		Central	1001.2	CAC5010aWB	Unnamed Stream	P	2013	4.0	3.0	1.0					Wet Open Cut	NA		Span	T138N, R32W, S3, SWSE	46.79177	-94.710748		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Cass	Pine River	07010105	07010105-669	North	1017.3	CA063aWB	Pine River	P	2013	100.0	100.0	2.0	Public Water, Canoe Route				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T138N, R29W, S8, NESW	46.781462	-94.377479	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-106		COE, MPCA, MDNR
3	Crow Wing	Pine River	07010105		North	1021.4	CW014aWB	Unnamed Stream	P	2013	6.0	6.0	2.0					Dry Crossing	Wet Open Cut		Span	T138N, R29W, S12, NWSW	46.779515	-94.297958		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Crow Wing	Pine River	07010105		North	1022.5	CW021aWB	Unnamed Stream	P	2013	100.0	12.0	1.0					Dry Crossing	Wet Open Cut		Span in-stream support	T138N, R29W, S1, SESE	46.791248	-94.282757		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Crow Wing	Pine River	07010105		North	1023.6	CW027aWB	Unnamed Stream	P	2013	5.0	2.5	2.0					Dry Crossing	Wet Open Cut		Span	T138N, R28W, S6, NWNE	46.80309	-94.2674		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Cass	Pine River	07010105		North	1026.4	CA085aWB	Ada Brook / Blind Lake Creek	P	2013	60.0	50.0	3.5	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T139N, R28W, S28, NWNE	46.830899	-94.22705		2Bg, 3C, 4A, 4B, 5, 6	M-106-014-002		COE, MPCA, MDNR
3	Cass	Pine River	07010105		North	1029.1	CA096aWB	Unnamed Stream	P	2013	N/A	10.0	N/A					Wet Open Cut	NA		Span in-stream support	T139N, R28W, S25, NWNW	46.830595	-94.17212		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Cass	Leech Lake River	07010102		North	1030.4	CA104aWB	Unnamed Stream	P	2013	4.0	8.0	2.0					Dry Crossing	Wet Open Cut		Span	T139N, R27W, S19, NWNW	46.842813	-94.150859		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Cass	Pine River	07010105		North	1033.2	CA116aWB	Unnamed Stream	I	2013	3.0	10.0	1.0					Dry Crossing	Wet Open Cut		Span	T139N, R27W, S21, NENE	46.846583	-94.094584		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Cass	Pine River	07010105		North	1033.9	CA118_200aWB	Unnamed Stream	P	2013	14.0	14.0	3.0					Wet Open Cut	NA		Span in-stream support	T139N, R27W, S15, SWSE	46.847839	-94.081512		2Bg, 3C, 4A, 4B, 5, 6	M-106-004-003-001		COE, MPCA
3	Cass	Pine River	07010105		North	1034.3	CA120_200AWB	Unnamed Stream	I	2013	4.0	2.0	0.5					Dry Crossing	Wet Open Cut		Span	T139, R27W, S15, SESE	46.847837	-94.071432		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Cass	Pine River	07010105		North	1036.0	CA127aWB	Unnamed Stream	P	2013	4.0	3.0	0.5					Dry Crossing	Wet Open Cut		Span	T139N, R27W, S24, NWNE	46.845462	-94.037143		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
3	Cass	Pine River	07010105		North	1037.4	CA133aWB	Dagget Brook	P	2013	50.0	40.0	5.0	Public Water				Wet Open Cut	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T139N, R26W, S19, SENE	46.842638	-94.009346		2Bg, 3C, 4A, 4B, 5, 6	M-106-004		COE, MPCA, MDNR
4	Cass	Pine River	07010105		North	1041.2	CA147_525a1WB	Spring Brook	P	2013	15.0	12.5	1.0	Public Water, Trout Stream				Dry Crossing	Wet Open Cut	PWI COLDWATER FISHERY - no in-channel work from September 1-April 15	Span	T139N, R26W, S11, NWSW	46.858012	-93.942329	Yes	1B, 2Ag, 2C, 3B, 4A, 4B, 5, 6	M-106-004-002-001		COE, MPCA, MDNR
4	Cass	Mississippi River - Grand Rapids	07010103		North	1046.0	CAC5160aWB	Unnamed Stream	P	2013	2.0	2.0	1.0					Dry Crossing	Wet Open Cut		Span	T139N, R25W, S9, NENW	46.873378	-93.850871		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
4	Cass	Mississippi River - Grand Rapids	07010103		North	1046.5	CAC5161aWB	Unnamed Stream	P	2013	8.0	8.0	4.0					Wet Open Cut	NA		Span	T139N, R25W, S4, SESE	46.877568	-93.840821		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kittle Number	Wild Rice Present	Agency Permit Required
4	Cass	Mississippi River - Grand Rapids	07010103		North	1047.3	CA162aWB	Unnamed Stream	E	2013	4.0	1.0	0.5					Dry Crossing	Wet Open Cut		Span	T139N, R25W, S3, SENW	46.884301	-93.827192		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
4	Cass	Mississippi River - Grand Rapids	07010103		North	1047.9	CA163cWB	Tributary to Moose River	P	2013	6.0	5.0	2.0					Wet Open Cut	NA		Span	T139N, R25W, S2, SWNW	46.883464	-93.815226		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
4	Cass	Mississippi River - Grand Rapids	07010103	07010103-749	North	1048.0	CA163aWB	Moose River	P	2013	25.0	20.0	2.5	NRI, Public Water, 303d Impaired	Dissolved oxygen	Dissolved oxygen	Dissolved oxygen	Wet Open Cut	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from March 15 - June 15	Span in-stream support	T139N, R25W, S2, SWNW	46.883306	-93.813965		2Bg, 3C, 4A, 4B, 5, 6	M-117-012		COE, MPCA, MDNR
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1049.9	AI001aWB	Unnamed Stream	P	2013	20.0	5.0	4.0					Dry Crossing	Wet Open Cut		Span	T51N, R27W, S28, SWNW	46.878301	-93.774265		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1053.4	AI020aWB	Unnamed Stream	P	2013	30.0	25.0	0.0	Public Water				Wet Open Cut	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	Span in-stream support	T51N, R27W, S36, NENE	46.869178	-93.702174		2Bg, 3C, 4A, 4B, 5, 6	M-117-012-002		COE, MPCA, MDNR
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1054.6	AI027aWB	Unnamed Stream	P	9/13/2013	5.0	5.0	1.5					Wet - Push pull	NA		Span	T51N, R26W, S32, SWNW	46.866045	-93.677261		2Bg, 3C, 4A, 4B, 5, 6	MAJ-07013171_A		COE, MPCA
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1056.3	s-51n26w33-a	Unnamed Stream	I	8/22/2017	4.0	3.0	3.0					Dry Crossing	Wet Open Cut		Span	T51N, R26W, S33, SWNE	46.864171	-93.641105		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1056.5	s-51n26w33-b	Unnamed Stream	P	8/22/2017	6.0	6.0	3.0					Wet - Push pull	NA		Span	T51N, R26W, S33, SENE	46.863426	-93.636975		2Bg, 3C, 4A, 4B, 5, 6	M-117-012-001		COE, MPCA
4	Aitkin	Mississippi River - Grand Rapids	07010103	07010103-748	North	1066.4	s-51n24w31-b	Willow River	P	8/28/2017	50.0	30.0	5.0	NRI, Public Water				HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	NA	T51N, R24W, S31, SWNE	46.865021	-93.430846	Yes	2Bg, 3C, 4A, 4B, 5, 6	M-117		COE, MPCA, MDNR
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1066.9	s-51n24w31-a	Unnamed Stream	I	8/28/2017	10.0	7.0	2.0					Dry Crossing	Wet Open Cut		Span	T51N, R24W, S32, NWNW	46.867939	-93.421145		2Bg, 3C, 4A, 4B, 5, 6	MAJ-07016614_A		COE, MPCA
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1067.1	s-51n24w29-a	Unnamed Stream	I	8/28/2017	30.0	15.0	3.0					Dry Crossing	Wet Open Cut		Span in-stream support	T51N, R24W, S29, SWSW	46.869217	-93.416892		2Bg, 3C, 4A, 4B, 5, 6	MAJ-07014751_A		COE, MPCA
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1068.5	s-51n24w28-a	Unnamed Stream	P	7/23/2018	30	10	2					Dry Crossing	Wet Open Cut		Span in-stream support	T51N, R24W, S28, NWSE	46.873036	-93.389371		2Bg, 3C, 4A, 4B, 5, 6	MAJ-07013683_A		COE, MPCA
4	Aitkin	Mississippi River - Grand Rapids	07010103	07010103-708	North	1069.6	s-51n24w27-a	Mississippi River	P	8/25/2017	200.0	130.0	7.0	Canoe Route, Section 10, 303d Impaired, Public Water, ORVW	Mercury in fish	Mercury in fish; Turbidity	Mercury in fish; Turbidity	HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	NA	T51N, R24W, S27	46.873365	-93.365226	Yes	2Bg, 3C, 4A, 4B, 5, 6	M		COE, MPCA, MDNR
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1070.8	s-51n24w26-a	Unnamed Stream	P	8/31/2017	15.0	15.0	4.0	Public Water, Trout Stream				Wet Open Cut	NA	PWI COLDWATER FISHERY - No in-channel work from September 15 - May 15	Span in-stream support	T51N, R24W, S26, NESE	46.873065	-93.339421		2Bg, 3C, 4A, 4B, 5, 6	M-122-001		COE, MPCA, MDNR
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1073.7	s-51n23w29-b	Unnamed Stream	P	9/1/2017	5.0	4.0	2.0					Dry Crossing	Wet Open Cut		Span	T51N, R23W, S29, NWSE	46.873165	-93.27926		2Bg, 3C, 4A, 4B, 5, 6	N/A		COE, MPCA
4	Aitkin	Mississippi River - Grand Rapids	07010103		North	1075.4	s-51n23w27-a	Unnamed Stream	P	9/5/2017	6.0	6.0	4.0	Public Water				Wet - Push pull	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	Span	T51N, R23W, S27, SENW	46.877805	-93.245103		2Bg, 3C, 4A, 4B, 5, 6	M-120-005-001-005		COE, MPCA, MDNR
4	Aitkin	Mississippi River - Grand Rapids	07010103	07010103-514	North	1076.9	s-51n23w23-a	West Savanna River	P	9/6/2017	6.0	5.0	3.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	Span	T51N, R23W, S23, SWSE	46.885558	-93.217548		2Bg, 3C, 4A, 4B, 5, 6	M-120-005-001		COE, MPCA, MDNR

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kittle Number	Wild Rice Present	Agency Permit Required
4	Aitkin	St. Louis River	04010201		North	1081.4	s-51n22w22-a	Unnamed Stream	P	9/7/2017	15.0	15.0	6.0					Wet Open Cut	NA		Span in-stream support	T51N, R22W, S21, SESE	46.88423	-93.122465		2Bg, 3C, 4A, 4B, 5, 6	S-002-031-004		COE, MPCA
4	Aitkin	St. Louis River	04010201		North	1084.3	s-51n22w24-a	Unnamed Stream	P	9/7/2017	50.0	60.0	7.0					Wet Open Cut	NA		Span in-stream support	T51N, R22W, S24, SESE	46.883315	-93.060055		2Bg, 3C, 4A, 4B, 5, 6	S-002-031-004-001		COE, MPCA
5	St. Louis	St. Louis River	04010201	04010201-561	North	1085.9	s-51n21w20-a	East Savanna River	P	9/8/2017	30.0	20.0	6.0	Public Water				HDD	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	Span in-stream support	T51N, R21W, S20, NESW	46.888834	-93.030293	Yes	2Bg, 3C, 4A, 4B, 5, 6	S-002-031		COE, MPCA, MDNR
5	St. Louis	St. Louis River	04010201		North	1086.5	MN_NHD_24	Unnamed Stream	P	TBD	TBD	TBD	TBD					Dry Crossing	Wet Open Cut		Span in-stream support	T51N, R21W, S20, NESE	46.888679	-93.017331		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
5	St. Louis	St. Louis River	04010201		North	1087.5	s-51n21w22-a	Unnamed Stream	P	9/8/2017	8.0	8.0	4.0					Dry Crossing	Wet Open Cut		Span	T51N, R21W, S22, NWSW	46.888531	-92.995937		2Bg, 3C, 4A, 4B, 5, 6	S-002-031-001		COE, MPCA
5	St. Louis	St. Louis River	04010201		North	1089.5	s-51n21w24-a	Unnamed Stream	I	9/9/2017	20.0	7.0	2.0					Dry Crossing	Wet Open Cut		Span in-stream support	T51N, R21W, S24, NWSW	46.888148	-92.953258		2Bg, 3C, 4A, 4B, 5, 6	S-002-031-000.6		COE, MPCA
5	St. Louis	St. Louis River	04010201		North	1089.8	s-51n21w24-b	Unnamed Stream	I	9/9/2017	4.0	0.5	0.5					Dry Crossing	Wet Open Cut		Span	T51N, R21W, S24, NESW	46.888098	-92.947573		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
5	St. Louis	St. Louis River	04010201	04010201-A07	North	1094.0	s-51n20w27-a	Unnamed Stream	P	9/11/2017	15.0	6.0	3.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	Span in-stream support	T51N, R20W, S27, SWNW	46.877115	-92.866893		2Bg, 3C, 4A, 4B, 5, 6	S-002-028		COE, MPCA, MDNR
5	St. Louis	St. Louis River	04010201		North	1094.3	s-51n20w27-b	Unnamed Stream	P	9/12/2017	5.0	3.0	1.5					Dry Crossing	Wet Open Cut		Span	T51N, R20W, S27, NESW	46.872852	-92.863128		2Bg, 3C, 4A, 4B, 5, 6	S-002-027.9		COE, MPCA
5	St. Louis	St. Louis River	04010201		North	1094.8	s-51n20w27-c	Unnamed Stream	I	9/12/2017	3.0	3.0	0.5					Dry Crossing	Wet Open Cut		Span	T51N, R20W, S27, SWSE	46.867942	-92.855118		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
5	St. Louis	St. Louis River	04010201		North	1095.9	s-51n20w35-a	Unnamed Stream	P	9/12/2017	3.0	3.0	0.5	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	Span	T51N, R20W, S35, NESW	46.856006	-92.841661		2Bg, 3C, 4A, 4B, 5, 6	S-002-027		COE, MPCA, MDNR
5	St. Louis	St. Louis River	04010201		North	1096.0	s-51n20w35-b	Unnamed Stream	P	9/12/2017	7.0	6.0	2.0					Dry Crossing	Wet Open Cut		Span	T51N, R20W, S35, SESW	46.855031	-92.839996		2Bg, 3C, 4A, 4B, 5, 6	S-002-027-001		COE, MPCA
5	St. Louis	St. Louis River	04010201	04010201-945	North	1096.7	s-50n20w2-a	Ahmik River	P	9/13/2017	17.0	12.0	4.0	Public Water				Wet Open Cut	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	Span in-stream support	T50N, R20W, S2, NENE	46.850022	-92.828114		2Bg, 3C, 4A, 4B, 5, 6	S-002-026		COE, MPCA, MDNR
5	Carlton	St. Louis River	04010201		North	1117.0	s-48n17w8-a	Unnamed Stream	P	9/16/2017	7.0	5.0	2.0	Public Water ⁱ				Wet Open Cut	NA	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	Span	T48N, R17W, S8, NESE	46.653071	-92.517132		2Bg, 3C, 4A, 4B, 5, 6	S-002-009-001-001		COE, MPCA
5	Carlton	St. Louis River	04010201	04010201-628	North	1118.4	s-48n17w16-f	Little Otter Creek	P	9/18/2017	12.0	8.0	4.0	Public Water, Trout Stream				Wet Open Cut	NA	PWI COLDWATER FISHERY - No in-channel work from September 15 - June 30	Span	T48N, R17W, S16, SENE	46.642983	-92.493728		1B, 2Ag, 3B, 4A, 4B, 5, 6	S-002-009-001		COE, MPCA, MDNR
5	Carlton	Nemadji River	04010301		North	1126.2	CR144aWB	Unnamed Stream	P	2013	7.0	7.0	4.0	Public Water				Dry Crossing	Wet Open Cut	PWI Cool/ Warm Water Fishery (MN) - No in-channel work from April 1 - June 30	Span	T48N, R17W, S31, NWNW	46.60328	-92.352596	Yes	2Bg, 3C, 4A, 4B, 5, 6	S-001.5-007		COE, MPCA, MDNR
5	Carlton	Nemadji River	04010301		North	1126.4	CR145bWB	Unnamed Stream	E	2013	2.0	2.0	1.5					Dry Crossing	Wet Open Cut		Span	T48N, R16W, S34 NWNE	46.600968	-92.350905		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
5	Carlton	Nemadji River	04010301		North	1126.4	CR145bWB	Unnamed Stream	E	2013	2.0	2.0	1.5					Dry Crossing	Wet Open Cut		Span	T48N, R16W, S34 NWNE	46.600713	-92.350562		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
5	Carlton	Nemadji River	04010301		North	1126.7	CR147aWB	Unnamed Stream	E	2013	2.5	2.0	0.5					Dry Crossing	Wet Open Cut		Span	T48N, R16W, S34, SENE	46.598198	-92.346299		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
5	Carlton	St. Louis River	04010201	04010201-A61	North	1127.6	CRR51010_640bWB	Unnamed Stream	E	2015	3.0	1.5	1.0					Dry Crossing	Wet Open Cut		Span	T48N, R16W, S35, SWNE	46.598116	-92.327517		2Bg, 3C, 4A, 4B, 5, 6	S-001.7		COE, MPCA

Attachment C
Line 3 Replacement Project
Receiving Waters Table

Spread Number	County	Watershed Name	Hydrologic Unit Code (HUC) 8	WID	RNR	Milepost	Feature_ID	Waterbody Name	Flow Regime ^a	Survey Date	Top-of-Bank Width (feet)	OHWM Width (feet) ^b	OHWM Depth (feet) ^c	Agency Designation	Approved 2014 Impairment ^d	Proposed 2016 Impairment	Proposed 2018 Impairment	Proposed Crossing Method ^e	Alternative Crossing Method ^f	Construction Timing Restriction ^g	Bridge Type ^h	Legal Description	Latitude	Longitude	Enbridge Site-Specific Plan	MPCA Classification	MDNR Kittle Number	Wild Rice Present	Agency Permit Required
5	Carlton	St. Louis River	04010201		North	1128.1	CR157_200a1WB	Unnamed Stream	E	2014	2.0	2.0	1.0					Dry Crossing	Wet Open Cut		Span	T48N, R16W, S36 SWNW	46.598171	-92.317993		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
5	Carlton	St. Louis River	04010201		North	1128.1	CR159_200aWB	Unnamed Stream	E	2015	4.0	4.0	0.5					Dry Crossing	Wet Open Cut		Span	T48N, R16W, S36 SWNW	46.598148	-92.31723		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
5	Carlton	St. Louis River	04010201		North	1128.2	CR159_200bWB	Unnamed Stream	E	2014	4.0	4.0	0.5					Dry Crossing	Wet Open Cut		Span	T48N, R16W, S36, NESW	46.597848	-92.314461		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA
5	Carlton	St. Louis River	04010201		North	1128.3	CR159_200cWB	Unnamed Stream	E	2015	3.0	3.0	0.5					Dry Crossing	Wet Open Cut		Span	T48N, R16W, S36, NESW	46.597727	-92.313218		2Bg, 3C, 4A, 4B, 5, 6	S-001.7-003		COE, MPCA
5	Carlton	St. Louis River	04010201		North	1128.3	CR159bWB	Unnamed Stream	E	2015	3.0	1.0	0.3					Dry Crossing	Wet Open Cut		Span	T48N, R16W, S36, NESW	46.597666	-92.312579		2Bg, 3C, 4A, 4B, 5, 6			COE, MPCA

NA = Not Applicable
a P = Perennial flow; I = Intermittent flow; E = Ephemeral flow
b Width of the channel in feet between the Ordinary High Water Mark (OHWM) on both channel banks.
c Estimated or measured channel depth in feet from the OHWM to the channel bed.
d Impairments based on MPCA's 2014 EPA-approved Inventory of Impaired Waters per CWA Section 303(d).
e Proposed waterbody crossing methods are based on engineering investigations, constructability, and environmental constraints. Generally if the waterbody has perceptible flow at the time of crossing Enbridge will utilize a dry open cut crossing method (i.e., flume or dam and pump), otherwise a wet trench open cut method will be used. Refer to Enbridge's EPP for further detail.
f It is possible that an HDD or bore may encounter subsurface objects that prevents the drill from being successfully completed. If this occurs, Enbridge will attempt a slightly adjusted drill path to avoid the object. If boulders or hard bedrock interferes with the adjusted drill path, Enbridge will abandon the drill aer two attempts and cross the waterbody using the alternative method aer obtaining agency approval (if applicable).
g Timing restrictions are based on anticipated state agency permit conditions.
h Bridges may consist of timber construction mats, rail car decks, other bridge decking and may or may not be supported by flumes, clean rock or other supports in the water column. Sediment control for bridging is described in the EPP.
i Unnamed Stream s-48n17w8-a is treated as a PWI because it is a tributary to a designated trout stream.

Attachment D

Water Quality Data Received from the Minnesota Pollution Control Agency

Attachment D
TSS and Turbidity Data

Waterbody/WID/Parameter/Quarter	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
RED RIVER												
09020311-560												
Total suspended solids												
Qtr1						266.5						
Qtr2					156.8	99.0			155.7	390.0		
Qtr3					111.8	45.0			210.6	150.0		
Qtr4					25.0							
Turbidity												
Qtr1						152.9						
Qtr2					102.8	67.1						
Qtr3					91.6	58.6						
Qtr4					16.5							
COUNTY DITCH 27 (09020311-509)												
09020311-564												
Total suspended solids												
Qtr2							12.0	15.8				
Qtr3							3.0					
Turbidity												
Qtr2								25.8				
09020311-566												
Total suspended solids												
Qtr1									50.5	47.3	36.0	
Qtr2		23.3					6.0	77.5	95.7	55.9	21.7	
Qtr3		34.3					12.0	96.3	28.9	17.9	9.7	
Qtr4									11.5	10.0	19.5	
Turbidity												
Qtr1									72.3			
Qtr2		16.5	28.4					104.7	121.1			
Qtr3		20.8	41.6					164.3	63.3			
Qtr4									11.7			
JUDICIAL DITCH 10 (09020311-521)												
09020311-520												
Total suspended solids												
Qtr2						2.0	3.0	4.0				
Qtr3							2.0					
Turbidity												
Qtr2								7.1				
TAMARAC RIVER												
09020311-503												
Total suspended solids												
Qtr2			18.8	25.6								
Qtr3			10.4	10.5								
Qtr4			5.5	8.5								
Turbidity												
Qtr2			15.5	21.2								
Qtr3			13.4	11.5								

Attachment D
TSS and Turbidity Data

Waterbody/WID/Parameter/Quarter	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Qtr4			8.5	10.4								
MIDDLE RIVER												
09020309-505												
Total suspended solids												
Qtr1									14.0	67.2	94.5	
Qtr2			8.5	44.0			18.3	60.0	56.3	62.3	54.3	
Qtr3			7.2	44.0			14.2	56.2	82.3	59.3	26.8	
Qtr4								7.0	6.0	2.5	2.0	
Turbidity												
Qtr1									12.3			
Qtr2		68.3	12.3	10.1	2.3			37.1	38.1			
Qtr3		24.3	16.6	16.6	3.5			35.3	57.8			
Qtr4		11.9		3.0	3.2			6.6	5.5			
SNAKE RIVER												
09020309-506												
Total suspended solids												
Qtr2			3.0									
Qtr3				3.0								
Turbidity												
Qtr2		4.7	5.1									
Qtr3		4.1	4.9	4.7								
Qtr4		3.4										
SNAKE RIVER SOUTH BRANCH (09020309-546)												
09020309-543												
Total suspended solids												
Qtr2			3.0									
Qtr3				3.0								
Turbidity												
Qtr2		4.7	5.1									
Qtr3		4.1	4.9	4.7								
Qtr4		3.4										
BLACK RIVER												
09020303-557												
Total suspended solids												
Qtr2		5.0	2.5	9.5	5.0	1.0	2.0	5.0	3.0	6.5	1.5	
Qtr3		14.7	20.3	5.5	6.7	308.5	8.0	2.5	1.7	5.7	1.0	
Qtr4		4.0	7.0	1.0	3.0	1.0	4.0	1.0	35.0		3.0	
Turbidity												
Qtr2		3.1	2.2	10.9	2.6	2.7	1.8	10.3	6.0	11.3	1.1	
Qtr3		9.6	10.5	10.0	9.5	6.9	10.2	4.1	3.2	5.7	2.0	
Qtr4		3.7	11.2	2.8	5.9	1.7	16.9	3.2	20.0			
RED LAKE RIVER												
09020303-513												
Total suspended solids												
Qtr2		3.5	10.5	15.3	12.3	17.3	4.5	15.3	7.0	13.5	16.0	
Qtr3		2.3	8.0	13.5	13.5	2.8	2.8	15.0	9.0	15.8	14.0	

Attachment D
TSS and Turbidity Data

Waterbody/WID/Parameter/Quarter	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Qtr4		47.0	7.0	11.5	3.0	1.5	4.7	6.0	10.5		9.0	
Turbidity												
Qtr1						4.5						
Qtr2		4.5	7.5	15.3	12.5	12.0	6.4	18.7	7.0	11.7	8.8	
Qtr3		3.1	9.6	14.3	12.6	4.8	6.1	13.4	8.7	13.0	6.8	
Qtr4		8.2		13.7	4.5	4.8	10.3	5.7	9.0		10.5	
COUNTY DITCH 21												
09020303-541												
Total suspended solids												
Qtr2		1.0	1.7					1.0	3.0	1.0	3.0	
Qtr3		13.0	1.8					2.0	1.6	1.0		
Qtr4		1.0	1.0						9.0		1.0	
Turbidity												
Qtr2		1.0	1.1					1.1	2.8	1.2	1.8	
Qtr3		13.1	1.3					1.8	1.8	1.3		
Qtr4		1.0	0.7						9.0		1.1	
CLEARWATER RIVER												
09020305-648												
Total suspended solids												
Qtr1									3.0	3.0	11.0	
Qtr2		21.4	13.8	21.0	19.3	7.5	141.7	32.6	22.5	9.8	13.5	
Qtr3		19.7	19.0	19.1	14.6	7.0	15.8	9.1	9.8	21.4	11.1	
Qtr4		10.0	10.0	6.0	2.0	2.0	6.5	1.7	3.5	1.0	2.0	
Turbidity												
Qtr1			4.0						3.4			
Qtr2		20.1	12.5	14.9	13.8	6.5	15.3	18.8	13.1	7.1	9.0	
Qtr3		17.9	19.4	17.6	12.7	9.0	11.7	6.0	6.5	12.9	11.3	
Qtr4		12.3	8.3	9.2	3.5	3.7	2.9	2.5	3.1	1.5	4.7	
LOST RIVER 1												
09020305-646												
Total suspended solids												
Qtr2		17.0	3.5	2.0	12.2	5.5	2.0	3.0	3.0	2.2	5.5	
Qtr3		3.0	1.0	5.0	3.5	1.0	2.5	1.0	1.0	1.3	13.0	
Qtr4		4.0		3.0		1.0	2.0	1.0	2.0		3.0	
Turbidity												
Qtr1			5.4									3.2
Qtr2		22.0	4.2	3.6	17.5	8.0	2.9	8.2	4.6	2.2	5.7	
Qtr3		2.4	3.8	10.0	6.2	2.5	5.4	2.0	2.7	1.7	7.8	
Qtr4		7.2	4.4	5.1	8.0	2.2	0.6	3.7	6.2	1.7	2.2	
STATE DITCH 61 (09020305-590)												
09020305-646												
Total suspended solids												
Qtr2	2.5	17.0	3.5	2.0	12.2	5.5	2.0	3.0	3.0	2.2	5.5	
Qtr3	3.0	3.0	1.0	5.0	3.5	1.0	2.5	1.0	1.0	1.3	13.0	
Qtr4	2.0	4.0		3.0		1.0	2.0	1.0	2.0		3.0	
Turbidity												

Attachment D
TSS and Turbidity Data

Waterbody/WID/Parameter/Quarter	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Qtr1			5.4									
Qtr2	4.4	22.0	4.2	3.6	17.5	8.0	2.9	8.2	4.6	2.2	5.7	
Qtr3	9.2	2.4	3.8	10.0	6.2	2.5	5.4	2.0	2.7	1.7	7.8	
Qtr4	2.5	7.2	4.4	5.1	8.0	2.2	0.6	3.7	6.2	1.7	2.2	
LOST RIVER 2												
09020305-512												
Total suspended solids												
Qtr1					130.5							
Qtr2		3.5	4.5	1.5	6.3	3.0	10.5	8.0	3.0	1.6	2.0	
Qtr3		1.0	4.0	2.0	4.0		3.3	2.6	4.0	2.3	1.8	
Qtr4		1.0		2.3		2.4	2.5	4.0	7.5		1.5	
Turbidity												
Qtr1					42.8							
Qtr2		3.3	2.1	2.0	4.1	7.4	5.4	2.2	3.5	2.0	2.2	
Qtr3		2.2	4.7	2.2	6.2	18.0	4.3	2.5	4.9	2.2	2.3	
Qtr4		1.2		1.6		2.3	3.0	3.4	11.5	9.3	2.2	
SILVER CREEK												
09020305-527												
Total suspended solids												
Qtr1					12.7							
Qtr2		5.0	1.5	3.0	5.5	6.0	13.0	10.3	3.0	2.0	3.0	
Qtr3		3.0	2.5	2.0	2.0	28.0	20.5	6.3	15.5	4.5	17.0	
Qtr4		3.0		4.0			9.0		3.0		1.0	
Turbidity												
Qtr1					11.0							
Qtr2		6.0	2.8	3.9	4.2	6.1	11.1	6.6	3.4	3.6	4.1	
Qtr3		4.5	6.7	5.2	8.4	29.7	18.9	7.8	28.0	5.2	8.1	
Qtr4		0.7		2.8			9.9	1.2	7.5	1.8	12.9	
UNNAMED CREEK 1												
09020305-572												
Total suspended solids												
Qtr3											1.0	
Turbidity												
Qtr3											1.2	
CLEARWATER RIVER												
09020305-517												
Total suspended solids												
Qtr2		2.5	16.0	5.5	3.0	2.5	3.8	2.7	6.7	3.5	4.4	
Qtr3			1.0	3.0	1.5	2.5	2.0	1.3	1.5	1.7	1.0	
Qtr4		1.0		1.0		1.5	1.0		1.0		2.0	
Turbidity												
Qtr2		2.0	2.1	4.6	3.0	3.8	2.6	1.9	4.9	5.7	6.6	
Qtr3		1.9	3.4	9.1	4.8	4.6	6.4	2.7	3.4	2.0	1.8	
Qtr4		1.1	2.9	2.5	5.3	4.5	3.6		2.7		1.3	
WALKER BROOK												
09020305-509												

Attachment D
TSS and Turbidity Data

Waterbody/WID/Parameter/Quarter	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Turbidity												
Qtr2		0.9	0.6	1.3	0.9	1.6	2.6	0.9	0.6	0.6	0.6	
Qtr3		0.5	0.3	1.7	2.0	3.2	3.2	1.1	1.1	3.0	2.0	
Qtr4		2.2	1.3	-0.7	2.0	2.7	0.5				0.6	
BEAR CREEK (07010101-631)												
07010101-753												
Total suspended solids												
Qtr1	5.4			2.2						7.7	6.0	
Qtr2	2.2			5.9			2.5	5.6	13.0	8.9	5.3	
Qtr3	2.4			2.9			2.1	2.0	2.5	2.5	1.5	
Qtr4			1.2						2.7	1.7	1.5	
Turbidity												
Qtr1	15.1			2.4								
Qtr2	12.2			9.3					6.0			
Qtr3	2.0			8.7					1.8			
Qtr4			5.4						2.1			
MISSISSIPPI RIVER												
07010101-753												
Total suspended solids												
Qtr1				2.2						7.7	6.0	
Qtr2				5.9			2.5	5.6	13.0	8.9	5.3	
Qtr3				2.9			2.1	2.0	2.5	2.5	1.5	
Qtr4			1.2						2.7	1.7	1.5	
Turbidity												
Qtr1				2.4								
Qtr2				9.3					6.0			
Qtr3				8.7					1.8			
Qtr4			5.4						2.1			
STRAIGHT RIVER												
07010106-558												
Total suspended solids												
Qtr2		5.3		14.4								
Qtr3		7.0		4.0								
Turbidity												
Qtr2		3.7										
Qtr3		2.9										
SHELL RIVER												
07010106-537												
Total suspended solids												
Qtr2		6.3										
Qtr3		3.8										
Turbidity												
Qtr1				6.2		16.6			8.2	5.2		
Qtr2		2.9		8.4	3.6	6.1	4.0	3.9	6.3	6.4		
Qtr3		4.1		6.8	5.0	2.5	3.6	4.8	4.0	7.1		
Qtr4				3.4	3.2	3.5	3.1	2.6	3.6	4.5		

Attachment D
TSS and Turbidity Data

Waterbody/WID/Parameter/Quarter	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
07010106-536												
Total suspended solids												
Qtr2		4.3										
Qtr3		13.7										
Turbidity												
Qtr1				2.6		4.7			5.9	3.1		
Qtr2		2.9		4.8	4.3	4.8	4.9	4.0	2.9	6.5		
Qtr3		17.9		5.7	8.1	7.4	11.6	7.4	11.1	10.3		
Qtr4				4.5	3.8	5.5	14.3	2.9	5.6	5.0		
07010106-679												
Total suspended solids												
Qtr2		5.0										
Turbidity												
Qtr2		3.9										
Qtr3		1.7										
07010106-681												
Total suspended solids												
Qtr1									3.5	3.7	4.0	
Qtr2		3.7	1.8	2.8					6.4	4.3	3.5	
Qtr3		2.0	1.3	2.7					2.4	2.0	1.6	
Qtr4									7.2	2.2	4.4	
Turbidity												
Qtr1									2.9			
Qtr2		3.1							3.0			
Qtr3		1.1							1.2			
CROW WING RIVER (07010106-516)												
07010106-515												
Total suspended solids												
Qtr2					6.9				6.9			
Qtr3					4.7				4.7			
Turbidity												
Qtr3					3.5				3.5			
Qtr4					5.0				5.0			
07010106-523												
Total suspended solids												
Qtr4					3.9				3.9			
Turbidity												
Qtr4					2.2				2.2			
BIG SWAMP CREEK (07010106-531)												
07010106-515												
Total suspended solids												
Qtr1	13.9	2.0	9.0						5.8	8.3	5.6	
Qtr2	5.5	5.2	4.3						8.5	13.7	5.6	
Qtr3	1.4	2.3	3.1						2.6	8.5	3.1	
Qtr4	1.8	1.4	2.8						5.6	3.0	5.8	
Turbidity												

Attachment D
TSS and Turbidity Data

Waterbody/WID/Parameter/Quarter	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Qtr1	6.3	3.6	8.6						4.9			
Qtr2	4.1	6.1	4.2						4.4			
Qtr3	1.3	1.8	3.0						2.0			
Qtr4	1.8	2.4	2.7									
PINE RIVER												
07010105-669												
Total suspended solids												
Qtr2				2.9	5.8							
Qtr3				2.9	1.8							
Qtr4				1.3	1.7							
MOOSE RIVER												
07010103-749												
Total suspended solids												
Qtr2		4.9	4.2						5.8			
Qtr3		3.6	5.0						1.0			
Qtr4		1.7	3.2									
Turbidity												
Qtr2		4.3	3.2									
Qtr3		3.6	2.4									
Qtr4		2.5	3.2									
WILLOW RIVER												
07010103-509 (748)												
Total suspended solids												
Qtr1			3.2							3.8		
Qtr2		7.7	6.5						6.3	6.0	4.4	
Qtr3		2.0	8.0						6.6	12.9	9.5	
Qtr4		2.4	4.7						3.0	3.5	2.3	
Turbidity												
Qtr1			8.4									
Qtr2		6.6	7.1						5.8			
Qtr3		4.8	2.6						10.1			
Qtr4		5.2	5.6						6.6			
MISSISSIPPI RIVER												
07010103-708												
Total suspended solids												
Qtr1			24.0									
Qtr2		22.1	16.8				29.3	32.0				
Qtr3		13.0	14.2				29.9	21.0				
Qtr4		7.0										
Turbidity												
Qtr1			13.4									
Qtr2		12.2	11.5									
Qtr3		8.0	7.2									
Qtr4		4.8										
WEST SAVANNA RIVER												
07010103-514												

Attachment D
TSS and Turbidity Data

Waterbody/WID/Parameter/Quarter	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total suspended solids												
Qtr2		4.3										
Qtr3		1.8										
Qtr4		2.2										
Turbidity												
Qtr2		2.0										
Qtr3		4.9										
Qtr4		2.5										
EAST SAVANNA RIVER												
04010201-561												
Total suspended solids												
Qtr2			6.3									
Qtr3			4.1									
Turbidity												
Qtr2			5.2									
Qtr3			5.0									
UNNAMED CREEK 3												
04010201-A07												
Total suspended solids												
Qtr2			5.5									
Qtr3			7.3									
Turbidity												
Qtr2			5.4									
Qtr3			4.8									
AHMIK RIVER (04010201-945)												
04010201-506												
Total suspended solids												
Qtr3						3.0						
Turbidity												
Qtr3						2.8						
LITTLE OTTER CREEK (04010201-628)												
04010201-629												
Total suspended solids												
Qtr1						9.2						
Qtr2						5.7						
Qtr3	1.0					1.8						
Turbidity												
Qtr3						4.3						

Attachment E

Overview of the Minnesota Public Utilities Commission
("MPUC") Certificate of Need and Route Permit Proceedings,
the Environmental Impact Statement, and Findings and
Conclusions from the September 5, 2018 MPUC Order Granting
A Certificate of Need for the Project

ATTACHMENT E

Minnesota Public Utilities Commission Certificate of Need and Route Permit Proceedings, Environmental Impact Statement and Findings and Conclusions from September 5, 2018 MPUC Order Granting a Certificate of Need for the Project

On April 24, 2015, Enbridge applied to the Minnesota Public Utilities Commission (“MPUC”) for a certificate of need and a route permit (“MPUC Applications”) for the Project. The MPUC asked the Minnesota Department of Commerce Energy Environmental Review and Analysis (“DOC-EERA”) staff to prepare an environmental impact statement (“EIS”) for the Project with the assistance of the Minnesota Department of Natural Resources (“MDNR”) and the MPCA in accordance with Minnesota Rules, Chapter 4410. DOC-EERA issued a draft EIS on May 15, 2017 and a final EIS (“FEIS”) on August 17, 2017. On December 7, 2017, the MPUC deemed the FEIS inadequate solely on the basis of four specific and narrow issues, and a revised FEIS (“Revised FEIS”) was published on February 12, 2018. On May 1, 2018, the MPUC issued a written order finding the Revised FEIS adequate.

At the conclusion of contested case proceedings on the MPUC Applications presided over by an administrative law judge (“ALJ”), which included sixteen (16) public hearings resulting in over 2,600 pages of public hearing transcripts, the MPUC heard oral arguments and deliberated on the merits of the MPUC Applications on June 18, 19, 26, 27, and 28.

On June 28, 2018 the MPUC granted a Certificate of Need for the Project subject to Certificate of Need modifications. On September 5, 2018, the MPUC issued a written Order granting the Certificate of Need as modified and requiring filings (“MPUC CN Order”). On June 28, 2018, the MPUC also granted a Route Permit for Enbridge’s Preferred Project Route, including Route Segment Alternative (“RSA”)-05; RSA-22 with permission of the Fond du Lac Band of Lake Superior Chippewa (“FdL”) or RSA-21 in the event FdL does not grant permission for RSA-22. On August 31, 2018, Enbridge and FdL came to an agreement to proceed with the RSA-22 route. The MPUC issued a written Order on October 26, 2018 granting Enbridge’s Route Permit identifying the Preferred Project Route inclusive of RSA-05 and RSA-22 as the MPUC Designated Route (hereafter referred to as the “Designated Route”). The Designated Route approved by the MPUC is a 750-foot-wide corridor, which allows for minor adjustments to the pipeline alignment and permanent right-of-way within the Designated Route.

The MPUC CN Order considered factors set forth in statute (Minn. Stat., Sect. 216B.243, subd. 3) and rule (Minn. Rules, Chapter 7853) to evaluate the need for the Project. In particular, Minn. Rules, part 7853.0130 directs the MPUC to issue a certificate of need for a proposed large petroleum pipeline such as the Project when the applicant satisfies the following four factors: (1) the probable result of denial would adversely affect the future adequacy, reliability, or efficiency of energy supply to the applicant, to the applicant’s customers, or to the people of Minnesota and neighboring states, considering five enumerated sub-factors; (2) a more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record by parties or persons other than the applicant, considering four enumerated sub-factors; (3) the consequences to society of granting the certificate of need are more favorable than the consequences of denying the certificate, considering four enumerated

sub-factors; and (4) it has not been demonstrated on the record that the design, construction, or operation of the proposed facility will fail to comply with those relevant policies, rules, and regulations of other state and federal agencies and local governments.

The following paragraphs highlight findings and conclusions from the MPUC CN Order [including page citations] that describe those “**important economic or social changes**” (Minn. Rules, part 7850.0265, subp. 5B) resulting from the Project that the MPUC relied on in part in approving the certificate of need for the Project, contingent on suitable modifications including (i) a parental guaranty for environmental damages; (ii) implementation of Enbridge’s Landowner Choice Program for existing Line 3; (iii) the creation and funding of a trust fund for decommissioning of the Project, including the costs of removal of the Project; (iv) implementation of a neutral footprint program that provides for Enbridge to acquire renewable energy credits to offset the incremental increase in nonrenewable energy consumed by the Project and carries out a tree replacement program; and (v) acquiring and maintaining General Liability and Environmental Impairment Liability Insurance:

- ***The Future Adequacy, Reliability, or Efficiency of Energy Supply***

- * The forecasts in the MPUC record, together with the evidence of significant, persistent apportionment, show that denial of the Project would adversely impact the adequacy, reliability, and efficiency of delivery of crude oil to all of Enbridge’s customers by continuing and possibly exacerbating the significant levels of apportionment of heavy crude oil on Enbridge’s Mainline System. According to the ALJ, “without any changes to the Mainline System, ... the existing facilities will...not be able to meet future demand.” Even if Enbridge’s Minnesota and regional refinery customers are able, despite apportionment, to obtain adequate supplies of crude oil through other means, such as rail and truck, those means are more costly and uncertain. (p.15).
- * The MPUC agrees with the ALJ that Enbridge has shown that current facilities are insufficient to meet future demand in a reliable or efficient manner (p. 16).
- * The MPUC agrees with the ALJ that the Project would make efficient use of resources by reducing required maintenance and running mixed service by carrying both light and heavy crude oil. (p.17).
- * Increasing the pipeline diameter as proposed from 34 inches to 36 inches would result in 22 percent greater energy savings and reduce greenhouse gas emissions from the Project by 33 percent. The MPUC finds that these concrete energy savings outweigh the possible risk that a slightly higher volume of oil could spill from a 36-inch pipeline. (p. 18).

- ***Reasonable and Prudent Alternatives***

- * The MPUC considered each alternative to the Project presented by a party or person other than Enbridge and finds that none of the proposed alternatives is more reasonable and prudent than the Project. (p. 19):
 - o Based on the number of trucks and trains needed, the cost, and the increased risk of accidents and spills, the MPUC agrees with the ALJ that rail and truck are not reasonable or prudent alternatives to the Project. (p. 20).
 - o SA-04 was proposed during the EIS scoping process “as an alternative that would completely avoid northern and central Minnesota, and would interconnect with the regional pipeline system closer to the major refineries in central Illinois.” The MPUC agrees with the ALJ’s assessment that SA-04 lacks the efficiency benefits of the Project because it is separate from the Mainline System, and would not reduce apportionment, make use of existing infrastructure, provide system benefits to the Mainline System, or directly serve Minnesota or Wisconsin refineries. Therefore, SA-04 would not directly benefit Minnesotans, but it would be twice as long as the Project, significantly more expensive, have twice the greenhouse gas emissions to transport the same amount of crude oil, and would require permitting in three other states. For these reasons, the MPUC agrees with the ALJ’s assessment that SA-04 would not be a more reasonable and prudent alternative to the Project. (p. 21).
 - o The Minnesota Department of Commerce Division of Energy Resources (“DER”) proposed Keystone XL (“Keystone”) as an alternative to the Project. Keystone is a pipeline in development by TransCanada Corporation that would transport approximately 800 kbpd of crude oil from Alberta to Cushing, Oklahoma or Wood River, Illinois via Montana, South Dakota, Nebraska, and Kansas. The ALJ found that Keystone would not directly serve Minnesota or Wisconsin refineries nor refineries in the broader 15-state Midwest Region of the Petroleum Administration for Defense Districts or PADD II. The ALJ also found that shippers that use the Mainline System and do not execute long-term contracts for Keystone would pay significantly more per barrel to ship on Keystone than they would for the Project. And though Keystone would not have environmental or socioeconomic impacts in Minnesota, it would have impacts elsewhere in the Midwest. For these reasons, the MPUC agrees with the ALJ’s assessment that Keystone would not be a more reasonable and prudent alternative to the Project. (p. 21).
 - o DER also proposed construction of a new 760 kbpd or 370 kbpd pipeline along the existing right-of-way of the Spectra Energy pipeline (“Spectra”), which was recently purchased by Enbridge. The ALJ found that construction costs for the larger Spectra pipeline would be over \$4 billion higher than for the Project and construction costs for the smaller Spectra

pipeline would be over \$1 billion higher than for the Project. The Spectra alternative would not serve Minnesota refiners and would cause underutilization of the Mainline System. For these reasons, the MPUC agreed with the ALJ that neither Spectra alternative would be a more reasonable and prudent alternative to the Project. (p. 22).

- ***Consequences to Society of Granting vs. Denying the Certificate of Need for the Project.***

- * In accordance with rule, the MPUC analyzed the consequences of the Project as proposed by Enbridge and modified by the MPUC, and compared those to the consequences of the continued use of existing Line 3, which would result from denial of the certificate of need. In doing so, the MPUC finds that the consequences of granting the certificate of need with suitable modifications enumerated in the MPUC CN Order are more favorable than the consequences of denying the certificate of need:

- o ***Overall State Energy Needs***

The MPUC agrees with the ALJ that the Project would result in a net benefit to overall state energy needs by reducing apportionment on the Mainline System and increasing access for Minnesota refiners to different types of crude oil. Minnesota is one of 19 states that does not produce any oil and therefore relies exclusively on imports to meet its crude oil and refined product needs. In contrast, denying the certificate of need would exacerbate apportionment of heavy crude oil on the Mainline System, potentially forcing shippers and refiners to transport more crude oil by rail, which is less reliable and has greater environmental risks. The extensive maintenance required to keep existing Line 3 in operation would require temporary shutdowns, decreasing the reliability and efficiency of crude oil supply to Minnesota refiners. Continuing to operate existing Line 3 also increases the risk of an accidental release. (p. 26).

- o ***Effect on the Natural and Socioeconomic Environments***

The MPUC finds that either granting or denying the certificate of need would have significant consequences for the natural and socioeconomic environments of northern Minnesota.

(i) *Construction Impacts.* Denial of the certificate would require approximately 6,250 integrity digs over the next 15 years to maintain and replace the badly corroded existing Line 3 pipeline. Enbridge estimates that these integrity digs would impact approximately 270,000 acres of land in a manner comparable to new pipeline construction. While the opening of a new pipeline corridor [significantly reduced by the Enbridge-FdL agreement

allowing the Project to be constructed through the Reservation along an expanded right-of-way adjacent to the existing Enbridge pipelines] presents the risk of environmental impacts related to construction, continued operation of existing Line 3 presents similar impacts. Also, the MPUC finds that the permanent clearing of trees required in the Project right-of-way is mitigated somewhat by Enbridge's implementation of the required tree replacement program. (pp. 26-27).

(ii) *Risk of Accidental Release.* A new pipeline will be built with better materials such as thicker, stronger steel and superior coating, better welding technology and engineering, and would be subject to more effective monitoring and testing. The increased capacity of the Project will also likely reduce the volume of oil shipped by rail, by as much as 510 kbpd, further reducing the risk of an accidental release. (pp. 27-28).

(iii) *Climate Change.* While the lifecycle Project greenhouse gas emissions are a significant consequence, they include emissions from ultimate consumption of the oil transported by the Project. These costs do not result directly from the Project, but instead result from the continued demand for crude oil to produce refined products used by consumers. The MPUC finds that the record evidence does not support a conclusion that denial of the certificate would likely significantly reduce crude oil demand. Instead, the evidence establishes that the most likely result would be increased transport by more dangerous means such as rail and continued use of the deteriorating existing Line 3. The MPUC will, however, mitigate climate change impacts by modifying the proposed Project to require Enbridge to purchase renewable energy credits to offset the incremental increase in nonrenewable energy consumed by the Project, and to implement a tree replacement program (pp. 28-29).

(iv) *Impacts to Indigenous Populations.* While the MPUC recognizes the Project's significant impacts on indigenous populations as described in the Revised FEIS, denial of the certificate would also have disproportionate adverse impacts on indigenous populations because it would result in continuing operation of the deteriorating existing Line 3 through the Leech Lake and FdL Reservations. Ultimately, granting the certificate of need would avoid frequent, necessary repairs of existing Line 3 and allow the decommissioning of existing Line 3 through Reservation lands. (pp.29-30).

(v) *Socioeconomic Impacts*. The potential for positive economic impacts to the communities along the Project route is a major benefit of the Project, especially because these communities generally have a lower household income than the state median. The Revised FEIS estimates that the Project will generate 4,200 construction jobs, while Enbridge estimates approximately 7,200 direct jobs would result. Due to Minnesota labor agreement requirements, at least 50 percent of those employed by the Project would come from local union halls. While the specific amount of tax benefits to communities along the Project route is less clear, the MPUC finds that these communities would realize minor to major tax benefits in the form of higher income and property tax revenue resulting from the Project. (pp. 30-31).

(vi) *Abandonment of Existing Line 3*. The MPUC finds that the consequences of granting the certificate are more favorable than the consequences of denying the certificate if the proposed Project is modified to include removal of existing Line 3 as provided in Enbridge's Landowner Choice Program. (p. 31).

o ***Inducing Future Development***

The jobs created by the Project have the potential to cause indirect and induced economic benefits in the communities along the Project route. For example, a construction worker who spends money on basic goods and services in the local community is causing indirect economic benefits, and a worker who is able to spend more on discretionary items, like entertainment, is causing induced economic benefits in the community. Enbridge presented evidence that the Project would create over 2,400 jobs indirectly and induce the creation of 3,800 jobs. Increased property tax payments to counties along the Project route have the potential to provide long-term support to local governments. (pp. 31-32).

o ***Socially Beneficial Uses of Output***

The MPUC agrees with the ALJ that the Project output, crude oil, is ultimately refined into numerous products that "are used to meet basic human needs, such as the production of food and the transportation of people and products." Minnesotans depend on a variety of petroleum products every day, including gasoline, tires, asphalt for roads, jet fuel, medical equipment and products, plastics, furniture, flooring, shingles, insulation, heating fuel, appliances, carpet and clothing. The MPUC acknowledges that the crude oil output from the Project is not used to protect or enhance environmental quality and that governments and businesses, and

citizens in Minnesota and around the world are making efforts to reduce fossil fuel consumption in order to mitigate climate change. But the MPUC finds that for this factor, the consequences of granting the certificate of need are more favorable than the consequences of denial, because "...the fact remains that petroleum products derived from crude oil currently and into the foreseeable future have socially beneficial uses." (p. 32).

- ***Compliance with Existing Law and Policy***

- * The MPUC agrees with the ALJ's finding that "there has been no evidence presented that the Project's design, construction, or operation will be in violation of any applicable laws, rules or regulations." (pp. 32-33).

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