Exhibit E

Environmental Mitigation Plan

Berthold Station Expansion Project

Enbridge Pipelines (North Dakota) LLC

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ENVIRONMENTAL MITIGATION PLAN
Berthold Station Expansion Project

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EXHIBITS[1]

[1] **Site-specific plans supersede any design presented in the typical details.**

INTRODUCTION

This Environmental Mitigation Plan (EMP) outlines construction-related environmental policies, procedures, and mitigation measures developed by Enbridge for the construction of the Berthold Station Expansion Project (Project). The EMP was developed based on Enbridge's experience implementing best management practices during construction. It is intended to mesh with applicable federal, state and local environmental protection and erosion control specifications and practices. This EMP is designed to address typical circumstances that may be encountered during the above-referenced North Dakota project.

Project-specific permit conditions and/or landowner agreements may supersede general practices described in this document. Project-specific procedures have been incorporated into the EMP. The measures described in the EMP are consistent with relevant portions of North Dakota's *Guide to Temporary Erosion-Control Measures for Contractors, Designers and Inspectors,*[2] the *Erosion and Sediment Control Handbook,*[3] and *Construction Stormwater NPDES General Permit NDR-10-0000*.[4]

This document includes the following sections of the EMP:

- Section 1.0 describes general mitigation measures, including soil erosion and sedimentation control procedures, to be implemented during construction;
- Section 2.0 discusses stream and river construction and crossing requirements;
- Section 3.0 describes practices for wetland construction and crossings;
- Section 4.0 discusses highway, road, and rail crossings;
- Section 5.0 discusses construction dewatering and hydrostatic test discharges;
- Section 6.0 outlines water appropriation practices;
- Section 7.0 addresses restoration of disturbed areas;
- Section 8.0 addresses winter construction issues; and
- Section 9.0 addresses Waste Management issues.

Unless otherwise specified, the construction contractor (Contractor) will be responsible for implementing the requirements of this EMP. Enbridge will make the requirements of the EMP and applicable environmental permits known to the Contractor. If the Contractor has questions concerning these environmental requirements, the Contractor will contact an Enbridge representative.

Effective management of change is critical to the overall success of any project. During construction, an Enbridge Environmental Inspector (EI) will evaluate each proposed change request to determine if the potential for further environmental impact exists. The Enbridge EI will review applicable federal, state, and local permits and consult with agencies as needed to ensure that this EMP, in combination with any

[2] North Dakota Department of Health-Division of Water Quality (June 2001)
[3] North Dakota Department of Transportation (June 2004)
[4] North Dakota Department of Health – General Permit No. NDR10-0000 (effective October 12, 2009-September 30, 2014)

applicable permit, will continue to provide a baseline of environmental protection regardless of said change request.

Enbridge will provide appropriate construction oversight to confirm Company and Contractor compliance with the measures of this EMP and requirements of applicable federal, state, and local permits. The Enbridge EI will assist the Contractor in interpreting and implementing the requirements of the EMP, and verify compliance with these procedures for the Company. Enbridge hires experienced EIs to manage unforeseen situations that are not specifically addressed by the project documents. Enbridge relies on the experience and judgment of the Environmental Inspector through coordination and consultations with project management staff to manage those unforeseen situations should they occur in the field. The EI will be expected to use judgment in the field to interpret environmental conditions and requirements, but will not have the authority to authorize major modifications or changes without the prior written approval of Enbridge. The EI will have the authority to stop activities and order corrective mitigation for actions that are not in compliance with the measures in this EMP, landowner agreements, or environmental permit requirements. The EI will maintain appropriate records to document compliance with these and other applicable environmental permit conditions.

1.0 GENERAL MITIGATION MEASURES

1.1 TEMPORARY EROSION AND SEDIMENT CONTROL

Temporary erosion and sediment control measures include but are not limited to: slope breakers, sediment barriers, stormwater diversions, trench breakers, mulch and revegetation. The goal of temporary erosion and sedimentation control measures is to minimize erosion on site, and prevent construction-related sediment from migrating off site into sensitive resource areas such as streams, wetlands, lakes, or drainage ditches (dry or flowing). The Contractor will, at all times, 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 control features must be repaired, replaced, or supplemented with functional materials within 24 hours after discovery or report of discovery by an EI or other project personnel as soon as field conditions allow the features to be repaired.

Temporary erosion and sediment controls are expected to withstand and function properly during precipitation events of up to the 2-year, 24-hour storm event. Additional information of the project erosion and sediment control measures are provided in the applicable sections below.

Temporary erosion controls will be installed after initial clearing and before disturbance of the soil, and will be replaced by permanent erosion controls as restoration is complete. Temporary erosion control measures are discussed further in sections 1.4.5 and 1.4.6.

1.2 SITE ACCESS

Access to the project site will be from public roadways and Enbridge-approved private access roads only. The Contractor is responsible for creating signs or other visible methods to identify approved access roads in the field and to ensure that access is confined to only approved roads. Vehicle tracking of soil from the construction site will be minimized by installation of Best Management Practices (BMPs) such as stone pads or equivalent, where not specified by permit. Street sweeping will be used if Enbridge and/or the Environmental Inspector determine that BMPs are not adequate to prevent soil from being tracked onto public roads. The Contractor will repair private roads, lanes, and public roads damaged by equipment or obtaining access to the project site.

1.3 PERMITS

Enbridge will obtain all necessary permits for the execution of this project. Permit requirements may be more stringent than the requirements of this EMP. In all cases, the more restrictive requirements will apply.

1.4 UPLAND CLEARING AND GRADING

The initial stage of construction involves the clearing of brush, trees, and vegetation from the project site. Clearing may be accomplished with chain saws, brush hogs, hydraulic tree-cutting equipment, or similar equipment. Unless otherwise directed by the EI, the clearing crew will typically mow, chip, mulch and/or haul off all non-merchantable wood. No chips, mulch, or mechanically cut woody debris will be stockpiled in a wetland and no upland woody debris will be disposed of in a wetland. Please refer to Sections 1.4.1 and 1.4.2 for discussion of disposal methods for woody debris.

Grading generally follows clearing and involves leveling and smoothing the construction footprint, as necessary, to create an even working surface for equipment and vehicles. Topsoil and subsoil disturbed during grading operations will not be mixed with foreign material (e.g., stumps and brush).

1.4.1 Disposal of Non-Merchantable Timber

Non-merchantable timber and slash will be disposed of by mowing, chipping, grinding, and/or hauling off site to an approved disposal facility. No woody debris disposal will be allowed in agricultural areas or wetlands. Burning of non-merchantable woody debris may be allowed only where the Contractor has acquired all applicable permits and approvals (e.g., agency) and in accordance with all federal, state and local regulations. Prior to initiating any burning, the Contractor will submit a Burning Plan to Enbridge for approval. Burning is prohibited in wetlands.

1.4.2 Disposal of Merchantable Timber

The Contractor will be responsible for merchandising all merchantable timber. If a commercial buyer cannot be found, the timber may be considered non-merchantable and disposed of as referenced in Section 1.4.1.

1.4.3 Trees and Shelterbelts

Care will be taken to minimize tree removal. Shelterbelts within the project area must be re-established in accordance with applicable project permits. A tree and shrub survey will be conducted prior to construction to document tree removal. The North Dakota Public Service Commission requires woody vegetation be replaced at a 2:1 ratio.

1.4.4 Topsoil Segregation

Topsoil generally has physical and chemical properties that are conducive to good plant growth. Because subsoil properties are usually less favorable, mixing of topsoil and subsoil can result in lowering the overall productivity of soils. To prevent soil mixing during construction topsoil will be segregated. A minimum separation of one-foot must be maintained between the topsoil and subsoil piles to prevent mixing. Where the one-foot separation cannot be maintained, a physical barrier, such as an adequately thick layer of weed-free straw mulch, may be used between the spoil and topsoil piles to prevent mixing. Topsoil must not be used to construct trench breakers or to pad the pipe. Gaps must be left in stockpiled topsoil and spoil piles at water conveyances (i.e., ditches, swales, and waterways) to maintain natural drainage. Topsoil is not typically segregated in forested areas and saturated wetlands. Topsoil will be stripped to a maximum depth of 12 inches. If less than 12 inches of topsoil are present, the Contractor will attempt to segregate to the depth that is present.

1.4.5 Temporary Slope Breakers

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

Slope (%)	Approximate Spacing (ft)
5-15	300
15-30	200
>30	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) is located immediately down slope, or as directed by the EI. Temporary slope breakers (e.g., waterbars) will be constructed according to the following specifications:

- slope breakers may be constructed using earthen material, silt fence, or straw bales;
- earthen berms will be installed with a two to eight percent out-slope, with a four-foot base and a minimum height of 1.5 feet (refer to Exhibits 1.1 and 1.2);
- earthen berms will be constructed of compacted subsoil where practicable;
- the outfall of temporary slope breakers will be directed off the construction site into a stable well-vegetated upland area or into an appropriate energy-dissipating device/sediment control device (e.g., silt fence, straw bales, rock aprons) to prevent the discharge of sediments (refer to Exhibit 1.1);
- proper slope breaker outfalls will be established where topsoil segregation and/or grading has created a barrier at the edge of the construction workspace;
- gaps will be created through spoil piles where necessary to allow proper outletting of temporary berms;
- slope breakers will be inspected daily and repaired as necessary within 24 hours after discovery of maintenance and/or repair issues to maintain operational functionality and prevent erosion in active construction areas;
- a hard plug will be left in place where a slope breaker crosses the open trench.

1.4.6 Temporary Sediment Barriers

Sediment barriers are intended to stop the movement of sediments off the construction site and to prevent the deposition of sediments into sensitive resources that may be on or adjacent to the construction site. Temporary sediment barriers may be constructed with silt fence (36 inches high or greater) and/or staked straw bales (refer to Exhibits 1.3 and 1.4) and other barriers such as compacted earth (e.g., drivable berms across travelways), sand bags, or other appropriate materials. Silt fence should be installed in ditches with slopes of five percent or less; in ditches with slopes steeper than five percent, rock checks or an appropriate alternative should be used. If temporary sediment barriers are removed to allow equipment access, the barriers will be reinstalled at the end of the day or sooner based on weather events.

Temporary sediment barriers will be installed after clearing and prior to grubbing and grading activities and maintained at the base of sloped approaches to streams, wetlands, and roads as needed to prevent siltation of waterbodies and wetlands downslope or outside of the construction site (e.g., swales and side slopes).

When the depth of sediment reaches about one-third of the height of a sediment barrier, the barrier will be replaced and/or the sediment removed. Non-functional erosion and sediment control features must

be repaired, replaced, or supplemented with functional materials immediately following discovery, or report of discovery by an EI or other project personnel within 24 hours, or as soon as field conditions allow the features to be repaired.

Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary to prevent sediment flow into the wetland or waterbody.

Install and maintain temporary sediment barriers around surface drain tile inlets located within the construction work area. Where surface drain tile inlets are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary to prevent sediment flow into the inlet.

Installation of temporary mulch and erosion control mats may be necessary in certain locations if there are construction delays or other conditions that increase sediment transport potential. Enbridge's EI will identify the specific areas and which BPMs will be required when this situation occurs.

1.4.7 Noise and Dust Control

The Contractor will take all reasonable steps to control construction-related noise and dust near residential areas and other areas as directed by Enbridge. Control practices may include wetting the site, limiting working hours in residential areas, re-establishment of vegetation, and/or additional measures as appropriate based on site-specific conditions.

1.5 PIPE DELIVERY, BENDING & WELDING

Typically, individual joints of pipe will be strung along the construction corridor and arranged to be accessible to construction personnel prior to excavation of the pipeline trench.

After pipe stringing is complete, the pipe will be bent, as necessary, to conform to changes in ground contour and pipeline alignment. Individual pipe joints will be welded together and the welds will be radiographically inspected. The welds will then be coated with a material to protect them from corrosion.

1.6 UPLAND TRENCHING

Trenching in uplands consists of excavating the trench for the pipeline, and is typically accomplished with a trackhoe excavator or a rotary wheel ditching machine. Excavated subsoil will be sidecast within the approved construction corridor separate from topsoil (refer to Section 1.4.4), and stored such that the area subject to erosion is minimized. Trenches will also be sloped where started and ended to allow ramps for wildlife to escape in the event individuals become trapped in the trench.

1.6.1 Pipeline Depth

At a minimum, the pipeline will be buried in accordance with U.S. Department of Transportation (DOT) regulations (49 CFR Part 195), which stipulate a minimum of three feet of topcover (measured from the top of set-on weights, concrete coating or other weight/shield) for normal excavations, four feet of topcover in cultivated land, and 18 to 30 inches of cover for rock excavations (depending on the location), to prevent damage to the pipeline from normal use of the land. A state-level agency may specify a more stringent requirement for pipeline depth than the DOT.

1.7 PIPE INSTALLATION

Once the trench has been inspected for proper depth, rocks, or other obstructions, the welded pipe is lowered into the trench. The pipe may be wrapped with a protective shielding if necessary to protect the pipe coating while backfilling.

1.8 TRENCH BREAKERS

After the pipe has been lowered into the trench, trench breakers will be installed as deemed necessary by Enbridge in sloped areas. Trench breakers protect against subsurface water flow erosion along the pipe after the trench is backfilled. Trench breakers will be constructed with bags filled with rock-free subsoil or sand or other materials approved for use by Enbridge. They will be placed from the bottom of the trench to near the top of the trench, keyed into the trench walls and completely surrounding the pipe (refer to Exhibits 1.5 and 1.6). The following conditions apply to the placement and installation of trench breakers unless otherwise directed by the EI:

- Trench breakers will be spaced as described for permanent berms (refer to Section 7.2) or as otherwise specified by Enbridge.
- Trench breakers will be installed on slopes greater than five percent adjacent to streams, wetlands, or other waterbodies.
- Topsoil will not be used to construct trench breakers.
- Where the pipeline exits a wetland towards areas of lower relief, trench breakers will be installed where there is a potential for underground drainage along the pipe in order to prevent wetland or waterbody drainage, as identified by the EI.

1.9 BACKFILLING

Backfilling follows pipe installation and generally 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. An earth crown will be left over the trench line to allow for future settling of the backfill material. Crowns will be no more than 6 inches in height in upland areas. The Contractor will restore contours as near as practicable to pre-construction conditions.

1.10 WET WEATHER SHUTDOWN

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

- plasticity of the surface soil to a depth of approximately four to eight inches;
- 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.

If the above factors are determined by Enbridge and the EI that the area is too wet to work, the Contractor will cease work in the applicable area until such a time that Enbridge determines that site conditions are suitable for work to continue. The Contractor is responsible for appropriately planning for work, considering for the potential for wet conditions, and being prepared to implement mitigative measures in the event of wet weather conditions prevail. This is particularly important when working in unsaturated wetlands. For example, if the Contractor attempts to construct through the "dry" wetland without matting or an approved equivalent, the Contractor is responsible for implementing any and all such corrective measures should conditions subsequently worsen where the above described criteria cannot be met.

1.11 CONTROLLING SPREAD OF UNDESIRABLE SPECIES

It is Enbridge's intent to minimize the potential introduction and/or spread of invasive species due to construction activities. To that end, Enbridge will require that all construction equipment be cleaned before arriving on site to prevent the introduction of undesirable species to the project area.
It is not possible for Enbridge to eradicate invasive species on its construction site. Enbridge will minimize the potential for the establishment of invasive species by minimizing the time duration between final grading and permanent seeding.

2.0 STREAM AND RIVER CROSSING GENERAL REQUIREMENTS

Pre-construction planning is an essential part of stream crossings. 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. If the contractor considers any section of these procedures to be technically impractical due to site-specific engineering constraints, the contractor may seek modifications through the On-Site Modification Request Process. Prior to construction, the contractor must identify alternative provisions that would provide an equal or greater level of protection to stream and river ecosystems. Enbridge will review the contractor's alternatives and consult with appropriate regulatory agencies. The EI will confer with the agency representative, if applicable, during construction at waterbodies during wet and high runoff conditions to determine whether conditions warrant additional considerations for construction activities.

The procedures in this section apply to streams, rivers, and other permanent waterbodies such as drainage ditches, ponds and lakes. The intent of the mitigation procedures is to minimize construction-related disturbance to streams and waterbodies by limiting the duration of construction in these areas and by minimizing erosion and sedimentation.

2.1 TIME WINDOW FOR CONSTRUCTION

In-stream trenching will be conducted during periods permitted by the appropriate regulatory agencies and applicable permits.

2.2 PRE-CONSTRUCTION CONSIDERATIONS

2.2.1 Hazardous Materials

Enbridge or its Contractors will not store hazardous materials, chemicals, fuels, lubricating oils, or perform concrete coating activities within 100 feet of streams and waterbodies. Refer to Enbridge's Spill Prevention, Containment and Control Plan (Spill Plan) for additional requirements pertaining to hazardous materials. Please refer to Sections 3.2.1 and 3.2.2 for discussion of hazardous material storage and refueling near wetlands.

2.2.2 Refueling/Equipment Care

Construction equipment will be refueled at least 100 feet from streams and waterbodies. Where the Contractor in conjunction with the EI determines that conditions require construction equipment (e.g., trench dewatering pumps) to be refueled within 100 feet of streams, the Contractor must follow the procedures described in Enbridge's Spill Plan. No equipment will be washed, lubricated, or parked overnight within 100 feet of streams or waterbodies unless special provisions have been implemented in accordance with Enbridge's Spill Plan. Refer to Enbridge's Spill Plan for additional requirements pertaining to refueling and equipment care near waterbodies.

2.3 CLEARING AND GRADING

The Contractor will leave a 20-foot buffer (from the waterbody bank) of undisturbed herbaceous vegetation on all stream banks during initial clearing, except where grading is needed for bridge installation, or further restricted by applicable regulations and/or permit conditions. Woody vegetation within this buffer may be manually cut and removed during clearing. Non-woody vegetation and the soil profile will be left intact until the contractor is ready to begin trenching the stream crossing. The

contractor will properly install and maintain sediment control measures adjacent to streams immediately after clearing and prior to initial ground disturbance. This buffer should not be confused with the 50-foot setback required for extra workspace.

2.4 BRIDGES

Temporary equipment bridges will be used on most waterways, including small waterways such as ditches and intermittent streams with significant flow, 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 during final restoration. Bridges will not typically be installed at directionally drilled streams (refer to Exhibit 2.1) unless specifically approved by Enbridge and the applicable permitting agencies.

Only clearing equipment and equipment necessary for installation of equipment bridges will cross waterbodies prior to bridge installation. The number of such crossings of each waterbody will be limited to a single crossing per piece of clearing equipment.

2.4.1 Types of Bridges

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

- Typical Span Bridge (Timber mats) (refer to Exhibit 2.2)
- Clean rock and flume (refer to Exhibit 2.3)
- Railroad flat-cars
- Flexi-floats
- Other methods as approved by Enbridge and appropriate agencies

2.4.2 Bridge Design and Maintenance

Equipment bridges will be designed to withstand the maximum foreseeable flow of the stream, and may be required by permit condition to be securely anchored with cables or cable-like material. Bridges will not restrict flow or pool water while the bridge is in place, and will be constructed with clean materials. They will be designed and maintained to prevent soil from entering the waterbody and soil will be removed from the bridges as often as necessary to prevent soil from entering the waterbody.

2.5 DRAINAGE DITCHES AND INTERMITTENT STREAMS

Intermittent streams and agricultural ditches will be crossed using the wet trench method if water is present and flowing (refer to Exhibit 2.4). For dry intermittent streams and agricultural drainage ditches, standard upland construction procedures will be used, which involve stringing, welding, excavating the trench with backhoes, installing the pipe in the trench, and backfilling the trench with native material. However, materials will be readily available to complete the crossing using a dry method in the event it begins flowing during the time of crossing. As soon as deemed practical by the EI, the banks of each crossing will be reshaped, mulched, and, if required, seeded with the required mix to stabilize the crossing until permanent erosion control is implemented. No refueling or fuel storage is allowed within 100 feet of a drainage ditch or intermittent stream. Where dry swales cross the right-of-way (ROW), silt fence or straw bales will be installed at the edge of the ROW to prevent the flow of sediment from the ROW.

3.0 WETLAND CROSSING GENERAL REQUIREMENTS

Typical pipeline construction in wetlands consists of clearing, stringing, trenching, dewatering, installation, backfilling, final grading, cleanup, and revegetation. However, due to the unstable nature of some wetland soils, construction activities may differ somewhat from those described for upland areas. Construction activities must be minimized in wetlands to the extent practicable. The Contractor will also use special construction techniques to minimize the disturbance to plants and soils and to protect wetland hydrology.

Pre-construction planning is an essential part of wetland crossings. 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 and federal agencies and applicable tribes. If the Contractor considers any section of these procedures to be technically impractical due to site-specific engineering constraints, they may submit a request to Enbridge for approval of alternative measures. Prior to construction, the Contractor must identify alternative provisions that would provide an equal or greater level of protection to wetland ecosystems. 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.

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.

3.1 WETLAND ACCESS

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

3.2 SPILL PREVENTION

3.2.1 Storage of Fuels and Other Materials

No storage of hazardous materials, chemicals, fuels, and lubricating oils, and no concrete coating activities will be permitted in, or within 100 feet of, any wetland unless special provisions have been implemented in accordance with Enbridge's Spill Plan and prior approval is obtained from the EI. Vehicles and equipment left within the construction area overnight must be parked at least 100 feet from a delineated wetland unless special provisions have been implemented in accordance with Enbridge's Spill Plan, secondary containment structures are functional and properly placed, and prior approval is obtained from the EI.

3.2.2 Refueling, Fuel Handling, and Equipment Maintenance

Construction equipment will be refueled in upland areas at least 100 feet from a wetland. Where the Contractor and EI determines that conditions require construction equipment (e.g., swamp hoe, trench dewatering pumps, or portable generators) to be refueled within 100 feet of a wetland, the Contractor must follow the procedures described in Enbridge's Spill Plan and implement additional provisions based on site-specific conditions. No equipment will be washed within 100 feet of streams or waterbodies. Overnight parking of equipment is not allowed within 100 feet of a wetland unless special provisions have been implemented in accordance with Enbridge's Spill Plan and approval from the EI. Maintenance

(e.g., lubricating) of construction equipment will not be allowed within the 100 foot buffer zone without approval from the EI with additional special provisions for containment.

3.3 CLEARING

Clearing 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 to limit 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 (less than 1.5 inch diameter and/or 12 inches in length) can be left in the wetland if spread evenly in the ROW to a depth not to exceed 1 inch in thickness and in a manner, as determined by the EI, which will allow for normal revegetation.

3.3.1 Extra Workspace in Wetlands

In general, Enbridge attempts to locate Extra Work Space (EWS) outside of wetlands wherever practicable; however, EWS 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 EWS will be avoided as much as possible.

- Staging areas, additional spoil storage areas, and other additional work areas (EWS) will be located in upland areas at least 50 feet away from wetland boundaries (refer to Exhibit 3.1), where safe work practices or site conditions permit. 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 EWS and sensitive resource areas (wetlands or waterways).

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

3.4 GRADING IN A WETLAND

Grading in a wetland, if required, must be conducted in a manner consistent with applicable federal, state, and local permits. Grading activities must 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 ROW after backfilling the trench with prior approval from Enbridge.

Erosion Control Devices (ECD)s (e.g., silt fence) must be installed across the entire construction site upslope of the wetland boundary, where necessary, to prevent sediment flow into the wetland. Where wetlands are adjacent to the construction site and the site slopes toward the wetlands, ECDs must be installed along the edge of the construction site as necessary to prevent sediment flow into the wetlands. ECDs must be installed along the edge of the construction site as necessary to contain spoil and sediment within the construction site through wetlands.

ECDs must 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. When the depth of sediment reaches one-third of the height of a sediment barrier, the barrier will be replaced and/or the sediment

removed. Non-functional sediment-control measures will be repaired, replaced, or supplemented with functional features as soon as field conditions allow, but no later than 24 hours after discovery.

3.5 RIGHT-OF-WAY STABILIZATION

Tree stumps, brush riprap, imported soil, and rock fill cannot used to stabilize the right-of-way in wetlands. Where low ground pressure equipment is not used, construction activities will occur on timber construction mats or equivalent means with prior approval from Enbridge (refer to Exhibit 3.1). The contractor is responsible for having a sufficient number of construction mats to perform the work. To prevent the spread of noxious and invasive plant species, timber mats must be free of soil and plant material prior to being transported onto the construction site and/or moved from one area of the construction site to another area. Timber riprap (also known as corduroy road) cannot 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 (greater than 1.5 inch diameter and/or 12 inches in length) will be removed during cleanup of wetlands.

3.6 TRENCHING

Trackhoe excavators will typically be used to excavate the trench in wetlands. . The duration of open trench must be minimized to the 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 separately 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 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 (Refer to section 1.8)

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 EWS adjacent to the ROW. The trench will be dug by a trackhoe (or equivalent) supported on timber mats or equivalent low ground pressure equipment. 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 the wetland will be restored by a trackhoe or similar equipment working from construction mats or by low ground pressure equipment.

3.7.2 Temporary Erosion and Sediment Controls

ECDs at approaches to wetlands will be installed as previously described and in accordance with the specifications presented on Exhibits 1.3 and 1.4.

3.7.3 Concrete Coating

Concrete will generally be mixed off-site, and concrete coated pipe will be transported to the 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 Enbridge's Spill Plan. Washing equipment used for mixing, pouring, casting, or coating will not be conducted within 100 feet of any wetland and will be conducted and contained in a leak-proof containment facility or impermeable liner. Erosion and sediment controls will be installed down slope of equipment wash areas where needed to capture sediments and minimize erosion from runoff.

3.8 BACKFILLING

The Contractor shall restore wetlands as near as practicable to pre-construction conditions and must 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 no more than 12 inches above the adjacent, undisturbed soil. In unsaturated wetlands, Enbridge may specify a lower maximum mound height based on site conditions.

3.9 ROUGH GRADING, CLEANUP, AND TEMPORARY RESTORATION

Cleanup and rough grading activities may take place simultaneously. Cleanup typically will involve removing construction debris and replacing fences removed during construction. Rough grading will include restoring original conditions within the disturbed areas (i.e., ditch line, spoil storage areas, and equipment travel lane) and installing or repairing temporary erosion control measures. 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 revegetated 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. It has been Enbridge's experience that the natural seed bank within the wetland provides the most effective revegetation.

4.0 HIGHWAY, ROAD AND RAIL CROSSINGS

4.1 MAINTENANCE

Roadway crossings will be maintained in a condition that will prevent tracking of mud onto the roadway. If mud is tracked onto a roadway, the Contractor will have it shoveled or swept off the road and placed within a sediment barrier as soon as possible, but in no circumstances more than 24 hours after discovery.

Rock tracking pads, constructed of stone no smaller than 4-inch or 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 must 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 must be constructed with clean rock placed on geotextile fabric, as approved by and EI and with approval from applicable regulatory agencies. All rock and fabric must be removed from the wetland during cleanup.

4.2 SEDIMENT BARRIERS

Temporary sediment barriers (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 Exhibits 1.3, 1.4 and 4.1).

5.0 CONSTRUCTION DEWATERING AND HYDROSTATIC TESTING DISCHARGES

At each location where dewatering is to be conducted, the Contractor must consider the following conditions in planning the dewatering event. Prior to initiating dewatering activities, the EI must check the water discharge site to ensure that the best management practices are applied in such a way as to minimize the potential for water containing sediment from reaching a waterbody. Furthermore, landowner approval is required in advance of placement of dewatering structures outside of the approved construction site.

1. **Water Discharge Setting** – The Contractor shall assess each water discharge site to include:
   a. Soil Type - The soil type the discharged water would flow over. The management of discharged water traveling over sandy soil is more likely to infiltrate into the ground as compared to clay soils.
   b. Ground Surface - The topography in the area that would influence the surface flow of the discharged water.
   c. 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 occurrences of water from reaching a sensitive resource area such as a wetland or waterbody. (Example - Water discharged at 500 gallons per minute may infiltrate into the ground while if discharged at a higher flow rate would cause water to flow via overland runoff into a sensitive resource area)
   d. 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) does enter a stream, the flow added to the stream cannot 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.

   a. Well-Vegetated Upland Area – Water can be directed to a well-vegetated upland area and discharged into a geotextile filter bag. Geotextile bags need to be sized appropriately for the discharge flow and suspended sediment particle size.
   b. 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 Exhibit 5.1). A straw bale dewatering structure should be used in conjunction with a geotextile filter bag to provide additional filtration near sensitive resource areas.
   c. Alternative dewatering methods (e.g., use of water cannons or filter bags) may be approved by Enbridge on a site-specific basis (refer to Exhibit 5.2).

5.1.1 Regulatory Notification and Reporting

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

Reports regarding the volume and quality of the water withdrawn and discharged will be submitted by Enbridge, as required by the applicable state and/or tribal permits. The Contractor will provide Enbridge with the appropriate data to determine volumes of water appropriated. .

5.1.2 Flow Measurement

The volume of water discharged from the trench must be recorded as required by the applicable permits. The volume may be determined using a flow meter, or equivalent method as dictated by permit stipulations.

5.1.3 Water Sampling

Water discharged from trench dewatering locations may need to be sampled as required by tribal permits and/or state-issued discharge permits. If required, the Contractor will assist Enbridge in obtaining these samples and will be responsible for complying with the permit limitations.

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), increasing the internal pressure level, and holding that pressure for a specific period of time per federal DOT specifications. Hydrostatic testing is required to verify that there are no flaws in the pipe or welds. Pre-built sections may be hydrostatically tested prior to installation at significant streams and wetland crossings. Water used for hydrostatic testing will be discharged back to the waterbody it was appropriated from or to an Enbridge-approved discharge location. After the hydrostatic test is completed, the line will be depressurized and the water expelled. During withdrawal and discharge, the water will be sampled as required by permits. Water volumes must be measured and recorded.

If site conditions or engineering constraints make adhering to these hydrostatic testing procedures and documentation impractical, Enbridge will propose alternative provisions to the regulatory agency issuing the NPDES permit and/or applicable tribal permits. Any such alternative will provide an equal or greater level of protection to the environment than the condition from which Enbridge or its Contractor seeks relief.

5.2.1 Refueling

The operation and refueling of hydrostatic test equipment will be in accordance with the conditions outlined in Enbridge's Spill Plan.

5.2.2 Permit Requirements

Hydrostatic testing will be conducted in accordance with applicable appropriation and discharge permits obtained by Enbridge. Hydrostatic test water will not be transferred from one waterbody to another, across watersheds, or major drainage divides, unless coordinated and permitted through the applicable agencies. Chlorinated source water will be sampled at appropriation. If chlorine levels are at or above aquatic toxicity standards, the water will not be discharged to surface water without proper treatment.

5.2.3 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 must install appropriate erosion control measures where the EI determines that topographic conditions, primarily elevation changes, require test sections to be located in a wetland or riparian area.

5.2.4 Water Sampling

Water discharged from hydrostatic tests will be sampled as required by state-issued appropriation or discharge permits. Hydrostatic water discharges will comply with permit limitations as required by the applicable permit conditions. If required, the Contractor will assist Enbridge in obtaining these samples and will be responsible for complying with the permit limitations.

5.2.5 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 shall be properly disposed 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 used ahead of the fill pigs. Rinse water must 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 may or may not 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 shall 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.

5.2.6 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 used for hydrostatic testing may need to be appropriated from nearby waterbodies. The following outlines the procedures that will be implemented for water appropriation. Intake hoses will be suspended off of the stream or lake bottom and will be screened to prevent entrainment of fish. During withdrawal, adequate waterbody flow rates and volumes will be maintained to protect aquatic life and allow for downstream uses.

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 and permitted.

6.3 FLOW MEASUREMENT

The Contractor will record withdrawal rate and total volume of water appropriated with a flow meter (or equivalent) and provide this information to Enbridge immediately upon request. The Contractor will be responsible for complying with all permit conditions and will ensure that at no time the withdrawal rate for the water source exceeds the rate specified in the applicable permits.

6.4 WATER SAMPLING

Water withdrawn for hydrostatic tests will be sampled as required by state-issued water appropriation or discharge permits. The Contractor will assist Enbridge in obtaining these samples.

6.5 REGULATORY NOTIFICATION AND REPORTING

Enbridge will notify appropriate state agencies of the time of appropriations if required by the state appropriations permits. Reports regarding the volume and quality of the water withdrawn will be submitted by Enbridge if required by the state permit.

7.0 RESTORATION

Site restoration will begin as soon as soil conditions permit seed bed preparation and seed germination. Every effort will be made to begin site restoration, including installation of permanent erosion control measures, as soon as practicable.

7.1 FINAL CLEANUP AND FINAL GRADING

Final cleanup will begin with removal of all construction-related debris and material which is not an integral part of the facility (including litter generated by construction crews) from the project area. After cleanup is completed, the disturbed areas shall be graded to restore the contours of the land to previous conditions.

7.2 PERMANENT EROSION CONTROL MEASURES

After final grading, slopes in areas other than cropland will be stabilized with erosion control structures (refer to Exhibit 7.1). Erosion control treatments of specific physical land features are described below.

7.2.1 Slopes

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:

Slope (%)	Approximate Spacing (ft)
5-15	300
15-30	200
>30	100

Permanent berms will be constructed according to the following specifications:

- Permanent berms will be installed with a two to eight percent outslope.
- Permanent berms will be constructed of compacted earth.
- The outfall of berms will be directed toward appropriate energy-dissipating devices, and off the construction site if possible
- Permanent berms will be inspected and repaired as deemed necessary by the EI to maintain function and prevent erosion. Exhibits 7.1 and 1.2 illustrate berm specifications.
- Erosion control blankets (Curlex, jute, or equivalent) will be placed on slopes over 30 percent.

7.2.2 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. Bridges installed for winter construction (if required) will be removed before spring break up.

7.2.3 Swales

Swales across the construction site will be restored to original contours wherever practicable. Swales will be revegetated or lined with rock according to project specifications.

7.2.4 Drainage Ditches and Intermittent Streams

Drainage ditches and intermittent streams will be permanently restored to as near preconstruction conditions as possible and stabilized with erosion control blanket, permanent seeding, or other appropriate measures.

7.3 REVEGETATION

If it is found that any conditions or requirements of this section or any other supporting documents are not in compliance with any governmental law or ordinance, the applicable law or ordinance will take precedent, but will not nullify other portions of this section or supporting documentation. In addition, project-specific permit conditions and landowner requests (with exception to wetlands) for specific seed mixes (as indicated in the project Line List) take precedence over this section.

7.3.1 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 must 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% germination × 80% purity)/100 = 76% PLS
10 pounds PLS per acre/.76% PLS = 13.2 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 must be collected by the contractor and provided to Enbridge during seeding activities. The tags will be reviewed by Enbridge prior to seeding to ensure that the seed mix complies with Enbridge's specifications and that the seed will be being planted at 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.

The Contractor's proposed seed sources must be submitted to Enbridge for review and approval prior to construction. The Contractor must also arrange for appropriate storage of the seed.

7.3.2 Temporary Revegetation

The primary focus of Enbridge's temporary revegetation measures is to quickly establish a protective ground cover, minimize potential soil erosion, and minimize noxious weed establishment. Enbridge's temporary seed mix 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.

7.3.3 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 seed temporary seed mixes 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.

7.3.4 Temporary Use of Mulch

Straw mulch may be used to help stabilize areas during the establishment of temporary vegetation. The Contractor(s) will apply mulch during the establishment of temporary vegetation in areas:

- requested by the landowner or land managing agency;
- specified by the applicable permits or licenses; and/or
- as requested by Enbridge.

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 must be approved by Enbridge prior to purchase and copies of the applicable documentation must be provided to Enbridge.

Mulch used in conjunction with temporary revegetation efforts will be applied at a rate of 2 tons per acre 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. Strands of mulch will be a minimum of 8 inches in length to allow proper anchoring. Mulch will be anchored/crimped to a depth of 2-3 inches using a mulch-anchoring tool or disc set in the straight position to minimize loss by wind and water, as site conditions allow. Additional erosion control measures (e.g., silt fence, erosion control blankets, hydromulch) may also be applied as previously outlined.

7.3.5 Permanent Revegetation

Permanent vegetation will be established in areas disturbed within the construction work area (permanent easement, TWS, and EWS) 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 will be selected to augment revegetation via natural recruitment from native seed stock in the topsoil and are not intended to change the natural species composition.

7.3.6 Upland Construction Areas

Enbridge will consult with the NRCS to develop a seed mix for upland areas. This mix will contain species that will provide for effective erosion control and revegetation of the project area. This seed mix will be used by Enbridge as the standard upland mix unless an alternate seed mix is specified by landowners or land managing agencies.

7.3.6.1 Permanent Seeding of Wetland Areas

7.3.6.1.1 Unsaturated Wetland Areas

Non-standing water wetlands will be seeded with an annual seed or mix to provide temporary cover and allowed to permanently revegetate naturally. The natural revegetation process will be encouraged by the seeds and rhizomes in the topsoil distributed over the right-of-way after pipe installation. No fertilizer, lime, or mulch will be applied in wetlands.

7.3.6.1.2 Saturated/Standing Water Wetlands

Enbridge does not propose to seed standing water wetland areas. It has been Enbridge's experience that the reestablishment of vegetation within standing water wetlands occurs best through natural process without supplemental seeding.

7.3.7 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 to a minimum depth of 4 inches with a disc, field cultivator, or chisel plow (or equivalent) to prepare a seedbed, breaking up large clods and firm the soil surface. The resulting seedbed must be soft enough to permit seed to be covered and mulch to be anchored, yet firm enough to support the weight of an adult without sinking into the soil more than about 1/2 inch. 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 Line List requirements and permits. No soil amendments will be applied in wetlands unless directed by the appropriate agencies.

Seed will be sown at a depth of ¼ inch in loamy and clayey soils, and ½ inch deep in sandy soils.

7.3.8 Seeding methods

Seed will be applied uniformly at specified rates across the prepared construction site by drilling, broadcasting, or hydroseeding. Seeding activities will be suspended if conditions are such that equipment will cause rutting of the surface in the designated seeding areas. Enbridge will continue to monitor construction site conditions to resume seeding activities as site conditions improve and according to the general seeding timing restrictions listed in Section 7.3.13.

7.3.9 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.

7.3.10 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.

7.3.11 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 area. Hydroseeders must provide continuous agitation and be capable of supplying a continuous, non-fluctuating flow of slurry. Hydroseed slurry will not be held in the tank more than 1 hour before use. All hydromulch products used must be pre-approved by Enbridge and be on the applicable state DOT product list.

7.3.12 Soil Amendments

Enbridge will consult with Natural Resources Conservation Service (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.

7.3.13 Seeding Periods

Seeding periods have been established in consultation with local and state agencies that have knowledge of the optimum times to establish vegetation in the construction area. Date of seeding is a critical factor to determine the success of the revegetation effort. Seed should be applied as early as possible within the given seeding periods once favorable soil conditions have been attained. These

seeding windows have been developed in consultation with the NRCS and local/regional seed suppliers for normal average growing seasons, in conjunction with normal climate and soils conditions for maximum seed germination.

Seeding Periods

Native Mixes	
Spring Permanent Seeding	**Fall Dormant Seeding**
April 1 to June 15	Soil temperature below 55 degrees Fahrenheit

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.

7.3.14 Timing of Final Seeding

Upon final grading of the construction area, and upon the restoration of wetland and waterways, seeding and restoration/stabilization will occur within 48 hours. Other methods of stabilization will be used if temporary seeding is not appropriate (e.g., mulch, erosion control matting).

7.3.15 Mulch

Straw mulch 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 requested 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. The Contractor will be responsible for identifying and acquiring sources of weed-free and certified weed-free mulch. Sources must be approved by Enbridge prior to purchase and copies of the applicable documentation must be provided to Enbridge.

Mulch will be applied at a rate of 2 tons per acre 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. Strands of mulch will be a minimum of 8 inches in length to allow proper anchoring. Mulch will be anchored/crimped to a depth of 2 to 3 inches using a mulch-anchoring tool or disc set in the straight position to minimize loss by wind and water. In areas not accessible to a mulch-anchoring tool, 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. Mulch will not be applied in wetlands or actively cultivated farmland.

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 must 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.

7.3.16 Erosion & 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. Erosion control blankets will be used according to the manufacturer's recommendations as to weight and material for the specific application. Erosion control blankets will be anchored according to the manufacturer's recommendations.

7.3.17 Dormant Seeding

Dormant seeding is conducted 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 (refer to Section 7.3).

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:

- 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.

7.3.18 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.

7.4 REPAIR OF DAMAGED CONSERVATION PRACTICES

All soil conservation practices (such as terraces, grassed waterways, etc.) that are damaged by the pipeline construction will be restored to preconstruction conditions to the extent practicable.

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 fracture into thick slabs that contain both topsoil and subsoil, and mixing can result. If top soiling must proceed under these conditions, it should be restricted to the trench line only. A ripper should be used to break up the frozen topsoil. 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 as smooth as possible to minimize mixing during backfilling. Sufficient time is needed to allow the newly graded topsoil to freeze in place prior to trenching.

The area of open excavation must 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 must stabilize the area and temporary erosion control measures must 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. The Contractor must monitor areas until final restoration is complete.

Other than those issues discussed above, most environmental requirements can be successfully implemented by the Contractor during winter construction.

9.0 WASTE MANAGEMENT

Proper handling and management of solid and hazardous wastes and materials are an important aspect of every job. The Contractor must 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 must 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 must 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.

All waste materials are to be collected daily by the Contractor. Wastes must be collected in suitable or approved containers (i.e., labeled and meeting any relevant regulatory requirements) provided by the Contractor. On a routine basis, the Contractor must remove the containers of waste from the site and properly dispose of them. Throughout the duration of the project, the Contractor must 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.

Any used oil or other waste liquids generated by the Contractor as a result of maintaining its equipment during the course of the project shall be the responsibility of the Contractor to handle in accordance with all applicable regulations and Enbridge policies. Used oil and all other waste liquids must be stored in approved storage containers in good condition. The containers must be properly labeled. The Contractor is responsible for disposing of waste liquids in accordance with all applicable regulations.

9.1 Hazardous Wastes

It is the responsibility of the Contractor to ensure that all workers are properly trained in the proper storage, handling and disposal of hazardous wastes generated during the project. The Contractor must ensure that wastes classified as hazardous by federal and state regulations are properly labeled and, if liquid, stored on-site with secondary containment and in accordance with all regulatory requirements. Wastes may not be placed, spilled, or poured on or into the ground. If this should occur, the Contractor is responsible for evaluation and cleanup of contaminated soils and associated costs. The Contractor is responsible for immediately reporting the spill to Enbridge. Refer to the Spill Plan for additional details.

If a Contractor generates a hazardous waste from materials they have brought on-site (e.g., paint clean-up solvents, waste paints, etc.), then the Contractor is responsible for proper waste collection, storage and disposal in accordance with all applicable regulations. If a Contractor generates a waste classified as hazardous as a direct result of the constituents coming from an Enbridge facility or equipment (e.g., sandblast debris with lead paint, pipeline coatings, etc.), then Enbridge will coordinate proper waste collection, storage and disposal with the Contractor. 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

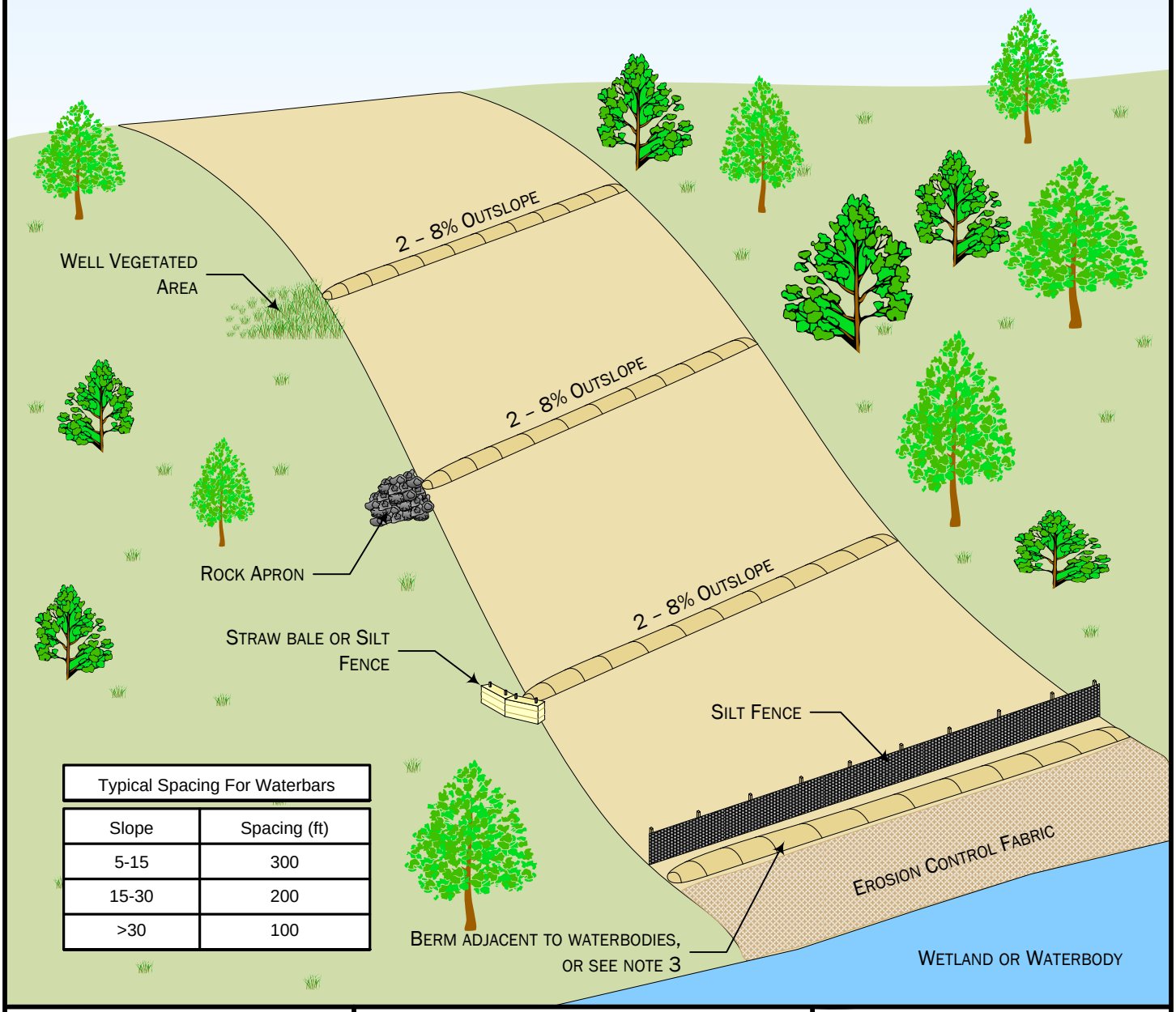
The Contractor must contain and collect spent abrasive blast materials and place it into appropriate containers. The Contractor is responsible for covering the containers with appropriate means of rainwater and stormwater control to prevent said waters from entering or exiting the container. The Contractor 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.

Exhibits

NOTES:

1. WATERBARS AND BERMS ARE PERMANENT EROSION CONTROL STRUCTURES.
2. STRAW BALES OR SILT FENCE SHALL BE REMOVED AFTER VEGETATION IS ESTABLISHED.
3. LOWEST BERM MAY BE OMITTED IF SILT FENCE OR STRAW BALES ARE INSTALLED AT THAT LOCATION, AS APPROVED BY THE ENVIRONMENTAL REPRESENTATIVE.

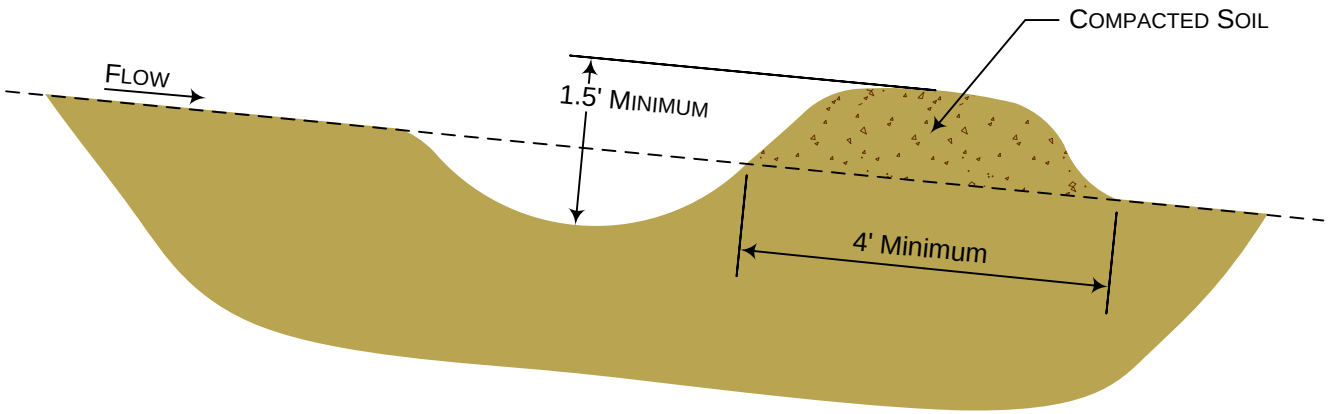


Typical Spacing For Waterbars	
Slope	Spacing (ft)
5-15	300
15-30	200
>30	100

ENBRIDGE

Exhibit 1.1
Typical Temporary Berm Installations

Environmental Mitigation Plan
Berthold Station Expansion Project
Drawn by: merjent
11/30/2011



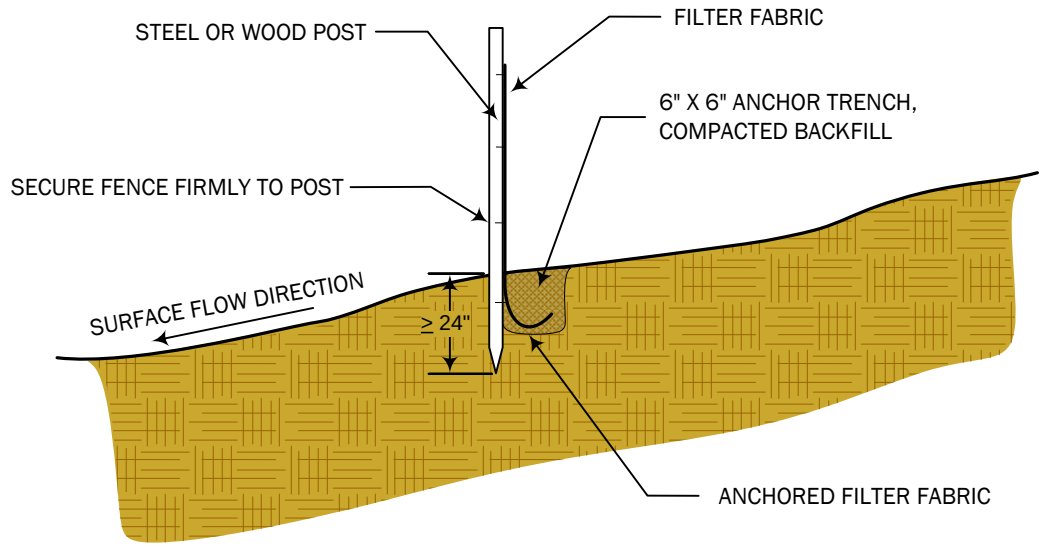
NOTES:

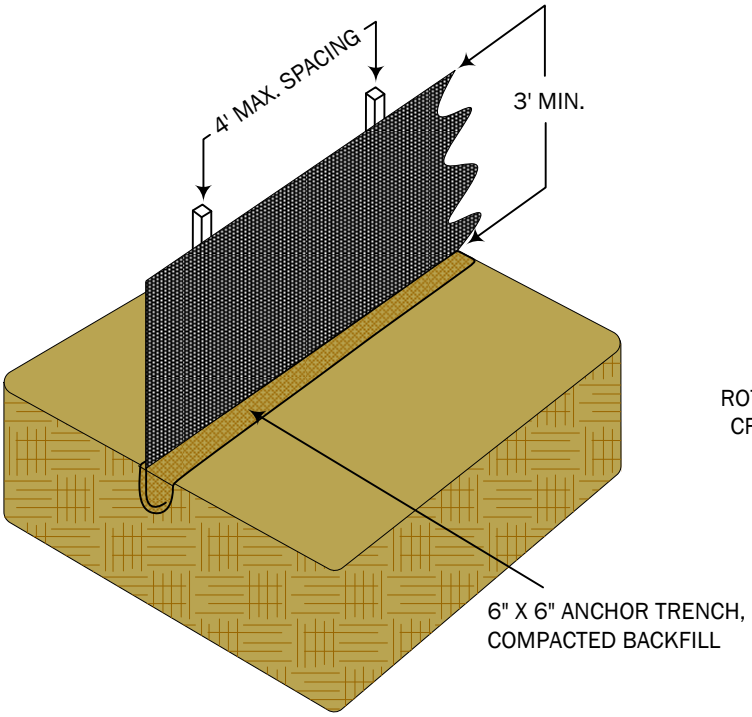
1. WATERBARS OR BERMS SHOULD BE CONSTRUCTED WITH 2 TO 8 PERCENT OUTSLOPES.
2. WATERBARS OR BERMS SHALL BE DIRECTED TO WELL VEGETATED AREAS, ROCK APRONS, OR SILT FENCE OR STRAW BALE STRUCTURES.

ENBRIDGE

Exhibit 1.2
Typical Waterbar Installation
(Profile View)

Environmental Mitigation Plan
Berthold Station Expansion Project
Drawn by: merjent
11/30/2011

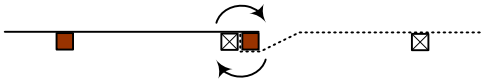




ATTACHING TWO SILT FENCES

PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE.

ROTATE BOTH FENCE POST 180 DEGREES CLOCKWISE TO CREATE A TIGHT SEAL BETWEEN THE FABRIC MATERIAL.

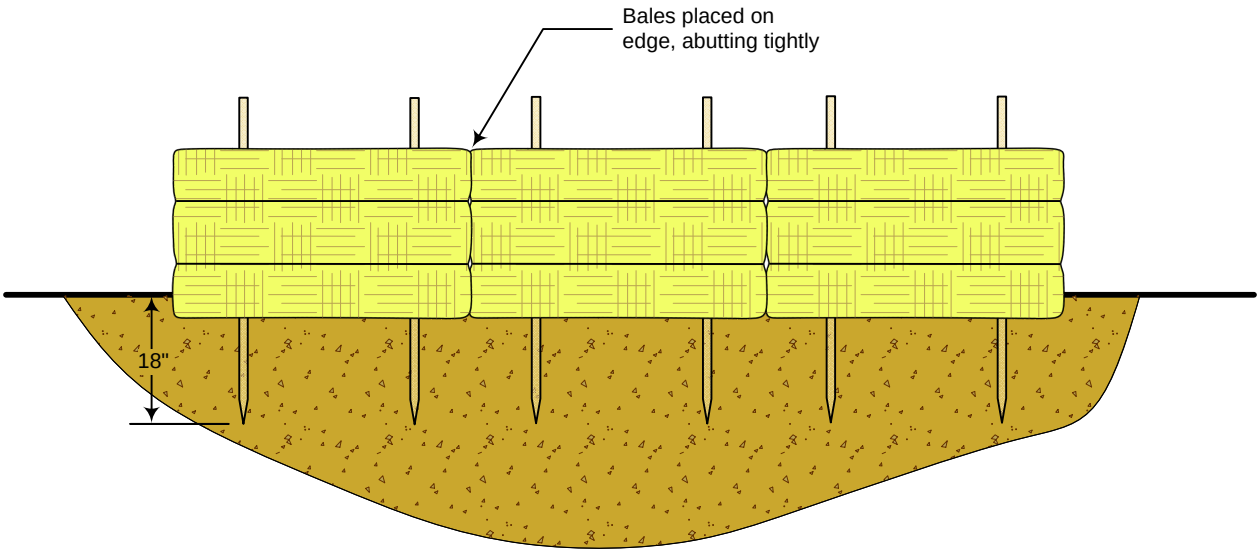


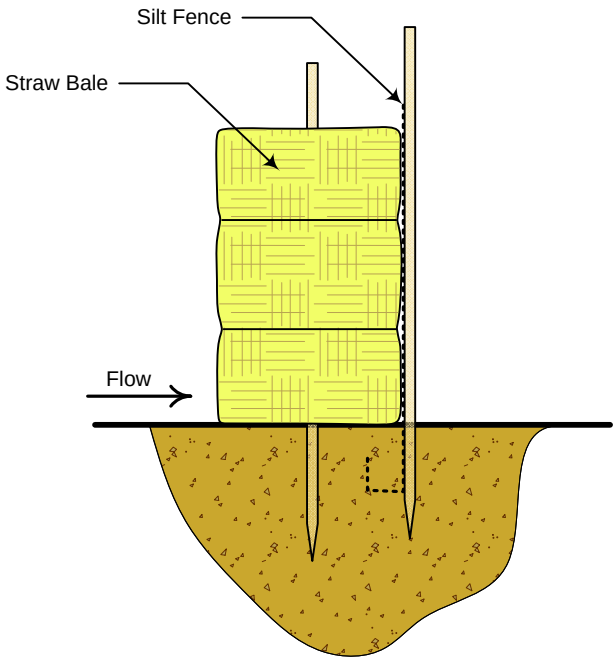
DRIVE BOTH POSTS AT LEAST 10" INTO GROUND AND BURY FLAP.

NOTES:

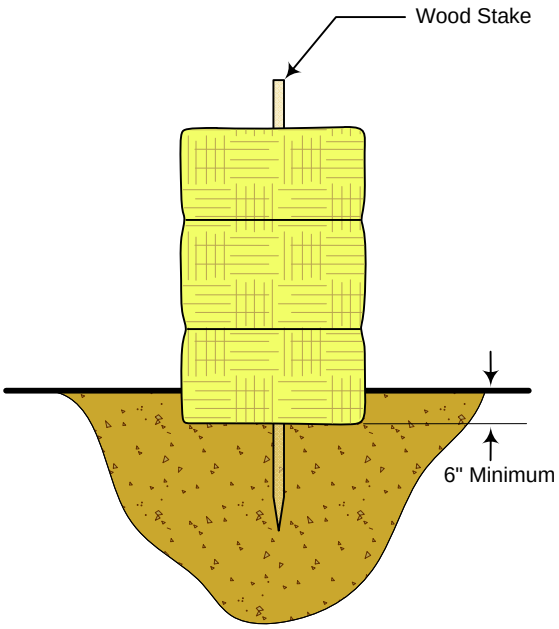
1. SILT FENCE FABRIC SHOULD CONFORM TO THE AASHTO M288 96 SILT FENCE SPECIFICATION.
2. THE POSTS USED TO SUPPORT THE SILT FENCE FABRIC SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 50 MILLIMETERS (2 INCHES) SQUARE (NOMINAL) BY 1.2 METERS (4 FEET) LONG. FOR STRUCTURAL STABILITY, METAL POSTS SHOULD BE USED IN AREAS THAT WILL POND WATER.
3. PERPENDICULAR TO THE DITCH FLOWLINE, EXCAVATE A TRENCH THAT IS AT LEAST 150 MILLIMETERS (6 INCHES) DEEP BY 100 MILLIMETERS (4 INCHES) WIDE. EXTEND THE TRENCH IN A STRAIGHT LINE ALONG THE ENTIRE LENGTH OF THE PROPOSED DITCH CHECK. PLACE THE SOIL ON THE UPSTREAM SIDE OF THE TRENCH FOR LATER USE. ANOTHER COMMON AND LESS LABOR INTENSIVE INSTALLATION METHOD USES A TRENCHER OR CHISEL PLOW TO INSTALL THE SILT FENCE. THE SILT FENCE WILL LAST LONGER AND IS LESS LIKELY TO BLOW OUT UNDERNEATH.
4. ROLL OUT A CONTINUOUS LENGTH OF SILT FENCE FABRIC ON THE DOWNSTREAM SIDE OF THE TRENCH. PLACE THE EDGE OF THE FABRIC IN THE TRENCH STARTING AT THE TOP UPSTREAM EDGE OF THE TRENCH. LINE ALL THREE SIDES OF THE TRENCH WITH THE FABRIC. BACKFILL OVER THE FABRIC IN THE TRENCH WITH THE EXCAVATED SOIL, AND COMPACT. AFTER FILLING THE TRENCH, A MINIMUM OF 900 MILLIMETERS (36 INCHES) OF SILT FENCE FABRIC SHOULD REMAIN EXPOSED.

ENBRIDGE	Exhibit 1.3 Typical Silt Fence Installation	Environmental Mitigation Plan Berthold Station Expansion Project Drawn by: merjent 11/30/2011





STRAW/HAY BALES & SILT FENCE



STRAW/HAY BALES ONLY

NOTES:

1. BALE DITCH CHECKS MAY BE CONSTRUCTED OF WHEAT STRAW, OAT STRAW, PRAIRIE HAY OR BROMEGRASS HAY THAT IS FREE OF WEEDS DECLARED NOXIOUS BY THE NORTH DAKOTA STATE BOARD OF AGRICULTURE.
2. THE STAKES USED TO ANCHOR THE BALES SHOULD BE MADE OF A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 50 MILLIMETERS (2 INCHES X2 INCHES) SQUARE (NOMINAL) BY 1.2 METERS (4.0 FEET) LONG. STEEL STAKES MUST BE A MINIMUM 1.5 METERS (5.0 FEET) LONG.
3. TWINE SHOULD BE USED TO BIND BALES. THE USE OF WIRE BINDING IS PROHIBITED BECAUSE IT DOES NOT BIODEGRADE READILY.
4. PERPENDICULAR TO THE DITCH FLOWLINE, EXCAVATE A TRENCH THAT IS 150 MILLIMETERS (6 INCHES) DEEP AND A BALE'S WIDTH WIDE. EXTEND THE TRENCH IN A STRAIGHT LINE ALONG THE ENTIRE LENGTH OF THE PROPOSED DITCH CHECK. PLACE THE SOIL ON THE UPSTREAM SIDE OF THE TRENCH TO SAVE FOR LATER USE.

SOURCE: A GUIDE TO TEMPORARY EROSION-CONTROL MEASURES FOR CONTRACTORS, DESIGNERS, AND INSPECTORS (ND DEPARTMENT OF HEALTH – DIVISION OF WATER QUALITY, JUNE 2001)

ENBRIDGE

Exhibit 1.4
Typical Straw Bale Installation

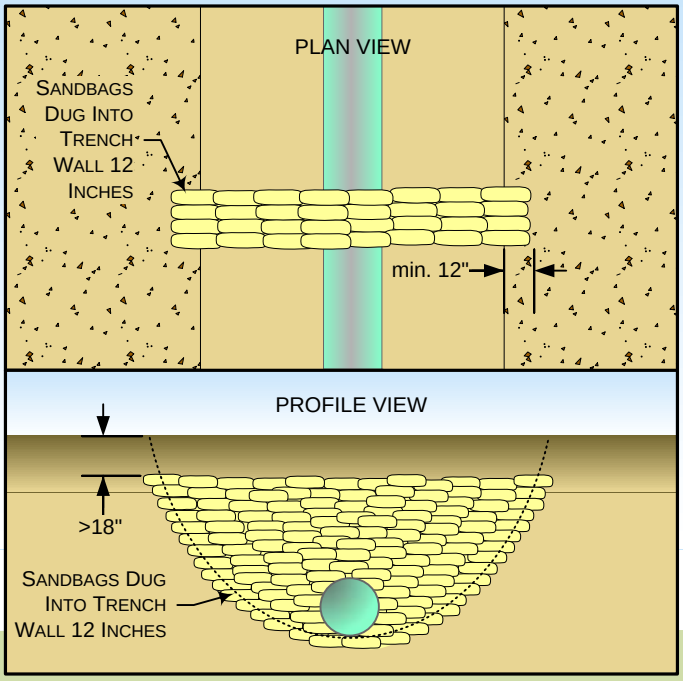
Environmental Mitigation Plan
Berthold Station Expansion Project
Drawn by: merjent
11/30/2011

NOTES:

At a minimum, install trench breakers at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a wetland or waterbody, or where needed.

A minimum cover of 18 inches of soil is required over the installed trench breaker.

Trench breakers must be constructed of sandbags or other approved material and must be a minimum 2 sacks wide.



Typical Spacing For Trench Breakers	
Slope	Spacing (ft)
5 – 15	300
15 - 30	200
>30	100

ENBRIDGE

Exhibit 1.5
Typical Sandbag Trench Breaker Installation

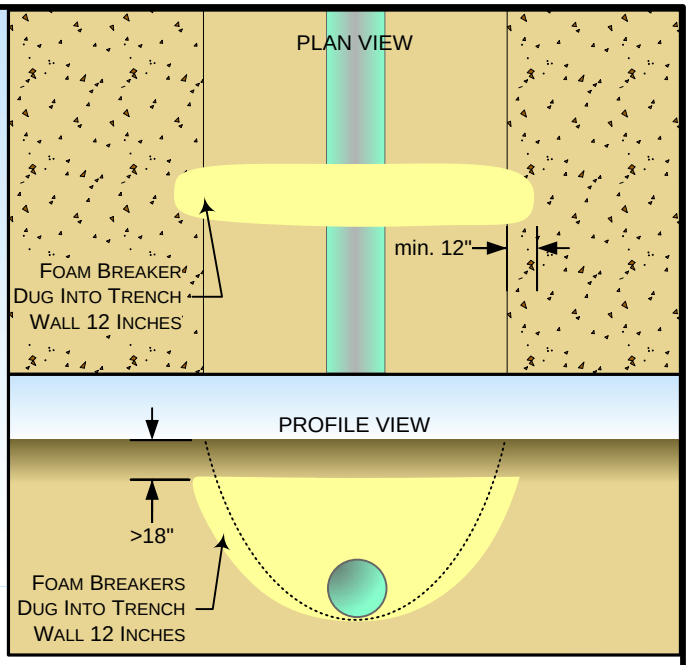
Environmental Mitigation Plan
Berthold Station Expansion Project
Drawn by: merjent
11/30/2011

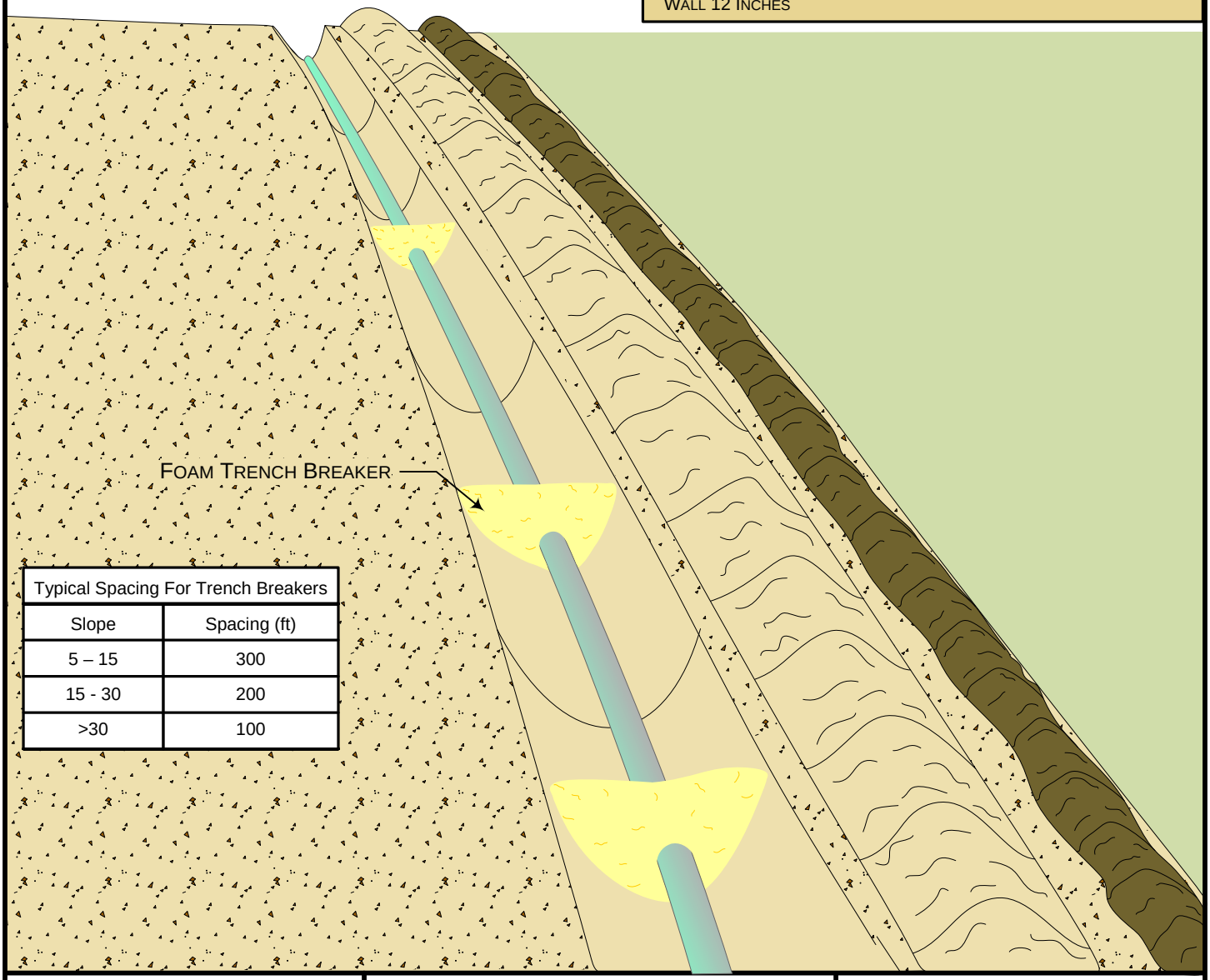
NOTES:

At a minimum, install trench breakers at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a wetland or waterbody, or where needed.

A minimum cover of 18 inches of soil is required over the installed trench breaker.

Trench breakers must be constructed of approved foam material.





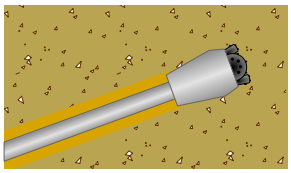
Typical Spacing For Trench Breakers	
Slope	Spacing (ft)
5 – 15	300
15 - 30	200
>30	100

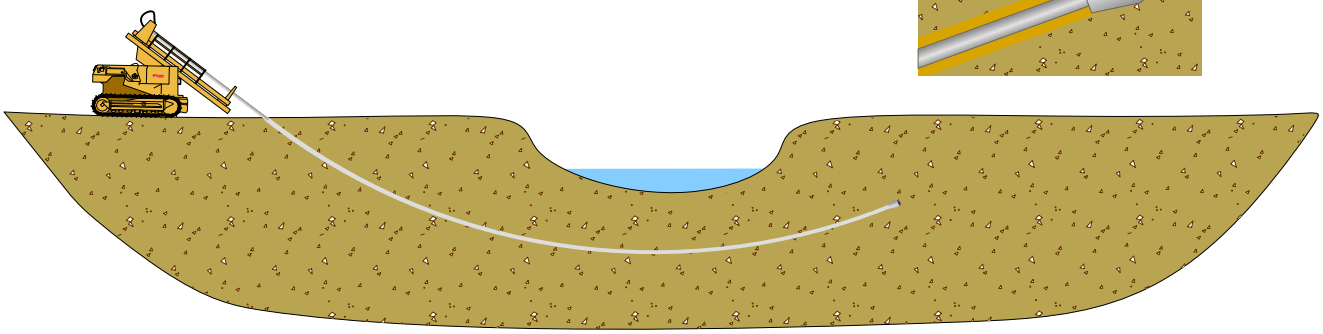
ENBRIDGE

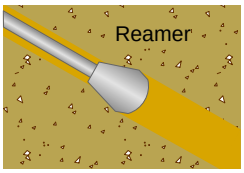
Exhibit 1.6
Typical Foam Trench Breaker Installation

Environmental Mitigation Plan
Berthold Station Expansion Project
Drawn by: Merjent
11/30/2011

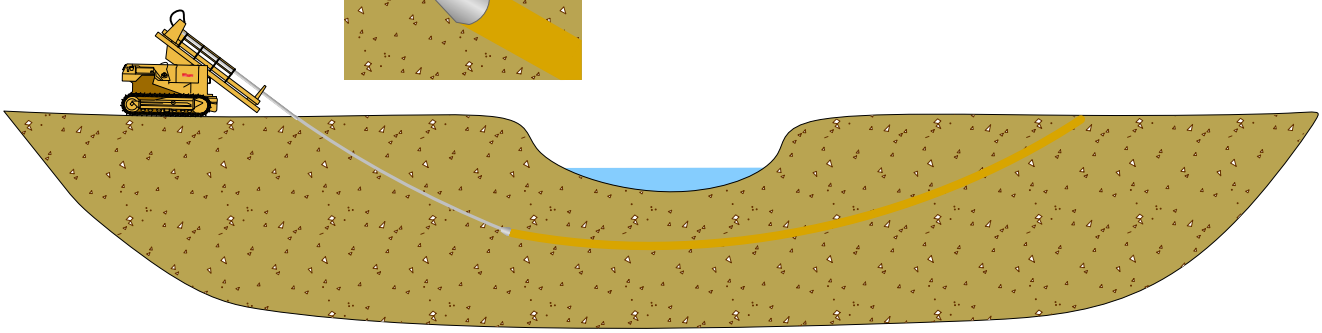
DRILING THE PILOT HOLE

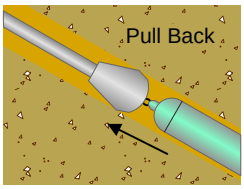






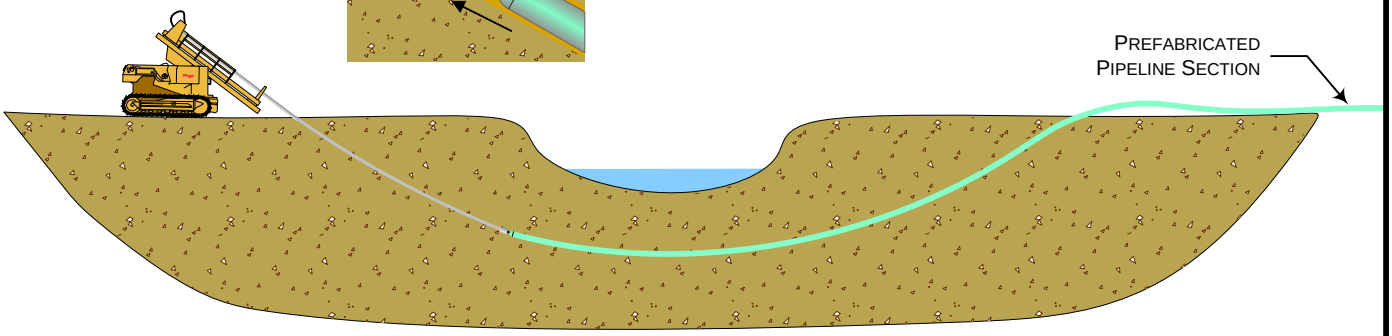
REAMING THE PILOT HOLE





PULL BACK OF THE PIPELINE STRING

PREFABRICATED
PIPELINE SECTION



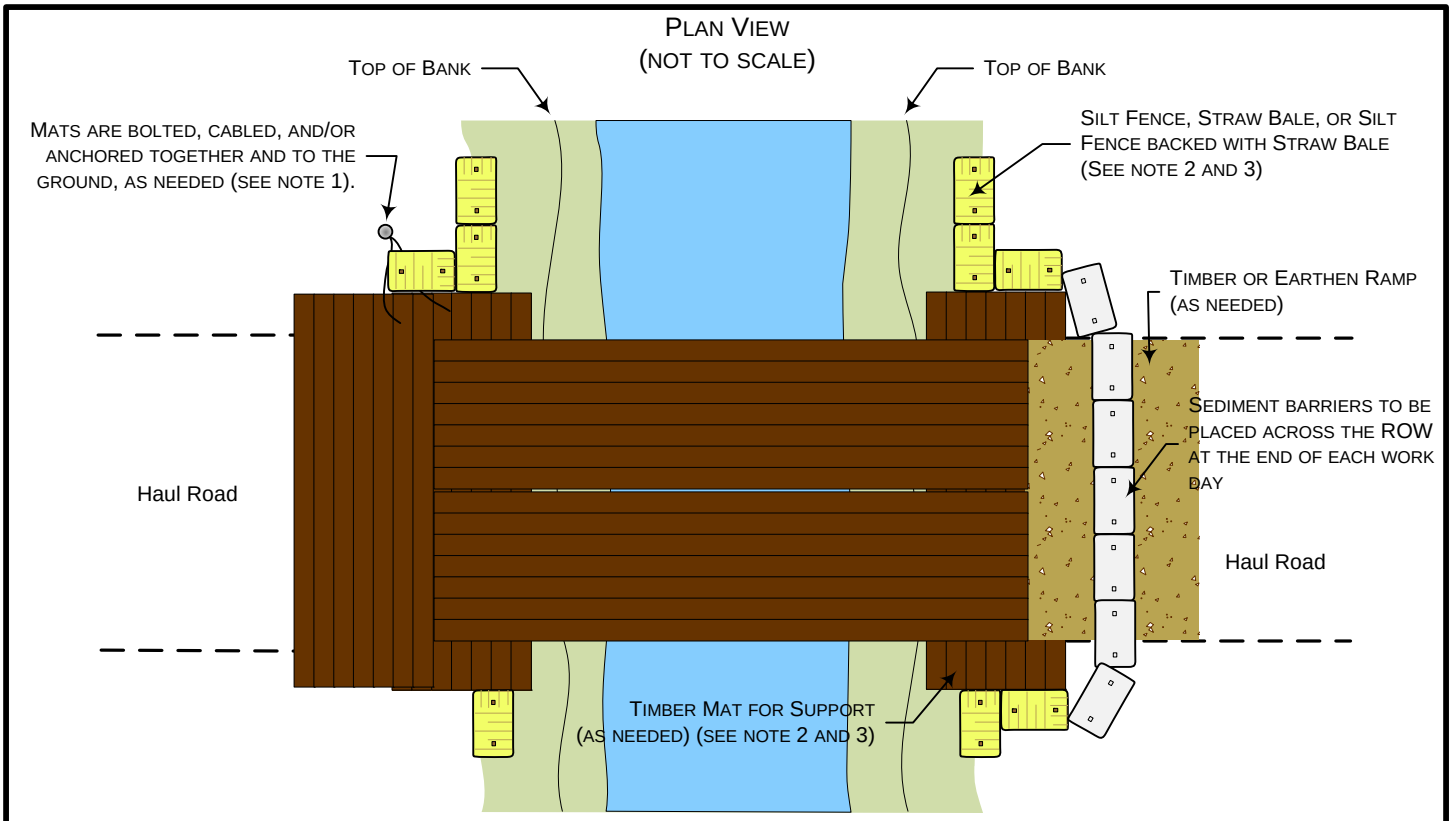
ENBRIDGE

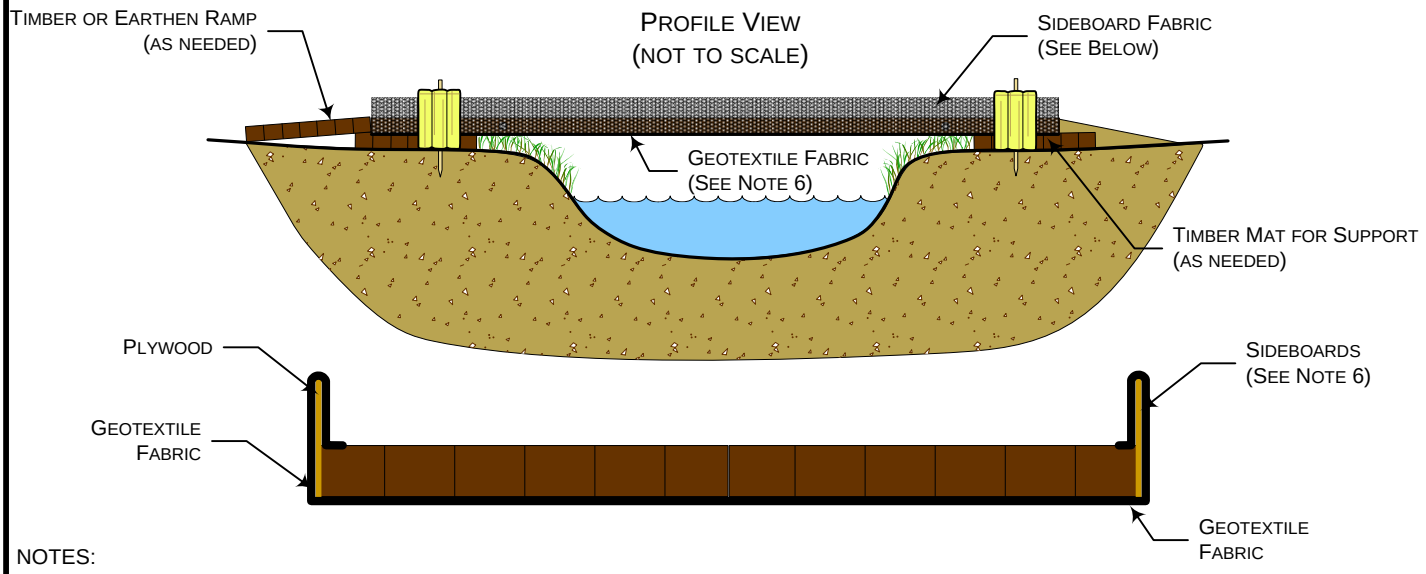
Exhibit 2.1
Typical Horizontal
Directional Drill

Environmental Mitigation Plan
Berthold Station Expansion Project

Drawn by: merjent

11/30/2011





NOTES:

1. THE BRIDGE MUST BE FIRMLY ANCHORED TO PREVENT IT FROM BEING TRANSPORTED DOWNSTREAM DURING HIGH FLOW.
2. THE BRIDGE MUST SPAN FROM TOP OF BANK TO TOP OF BANK.
3. ADDITIONAL SUPPORT MUST BE ADDED ON TOP OF BANK IF INITIAL SUPPORT STARTS TO SETTLE.
4. INSPECT BRIDGE ELEVATION SO BRIDGE REMAINS SUPPORTED ABOVE HIGH BANK AND DOES NOT SINK INTO BANK.
5. INSPECT BRIDGE OPENING PERIODICALLY AND FOLLOWING RAIN EVENTS. REMOVE ANY DEBRIS RESTRICTING FLOW AND DEPOSIT IS AT AN UPLAND SITE OUTSIDE THE FLOODPLAIN.
6. SIDEBOARDS WILL BE INSTALLED ON TEMPORARY BRIDGESTO MINIMIZE SEDIMENT TRANSPORT INTO WATER FEATURES. SIDEBOARDS MAY BE CONSTRUCTED OUT OF PLYWOOD OR AN EQUIVALENT AND AFFIXED TO THE OUTER SIDES OF THE BRIDGE SO AS NOT TO ALLOW THE TRANSPORT OF SEDIMENT OFF THE BRIDGE EDGES. GEO-TEXTILE FABRIC OR AN EQUIVALENT MUST ALSO BE ADEQUATELY SECURED TO THE UNDERSIDE OF THE BRIDGE TO PREVENT SEDIMENT TRANSPORT 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 AS DEPICTED ABOVE.

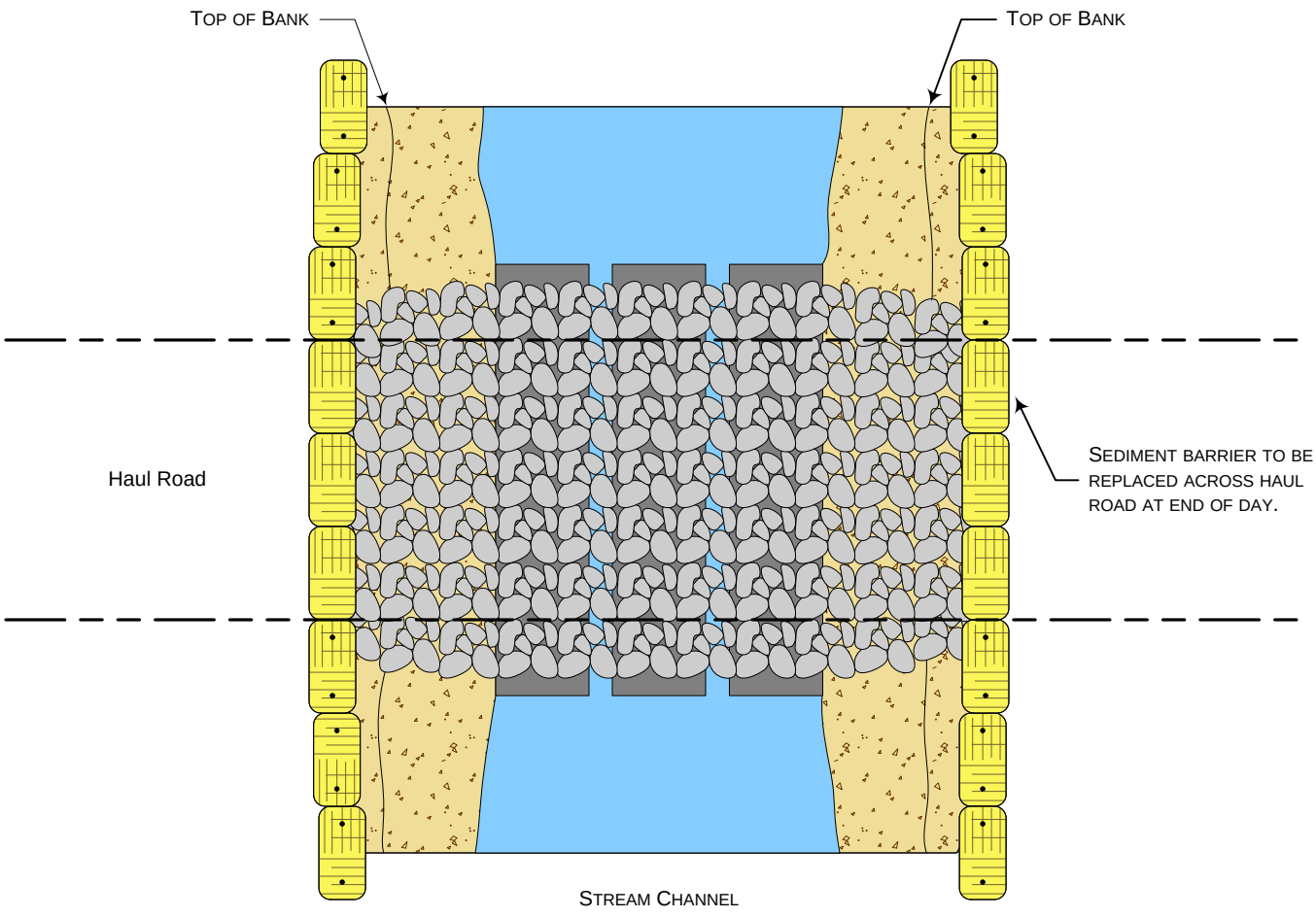
ENBRIDGE

Exhibit 2.2
Typical Span Bridge

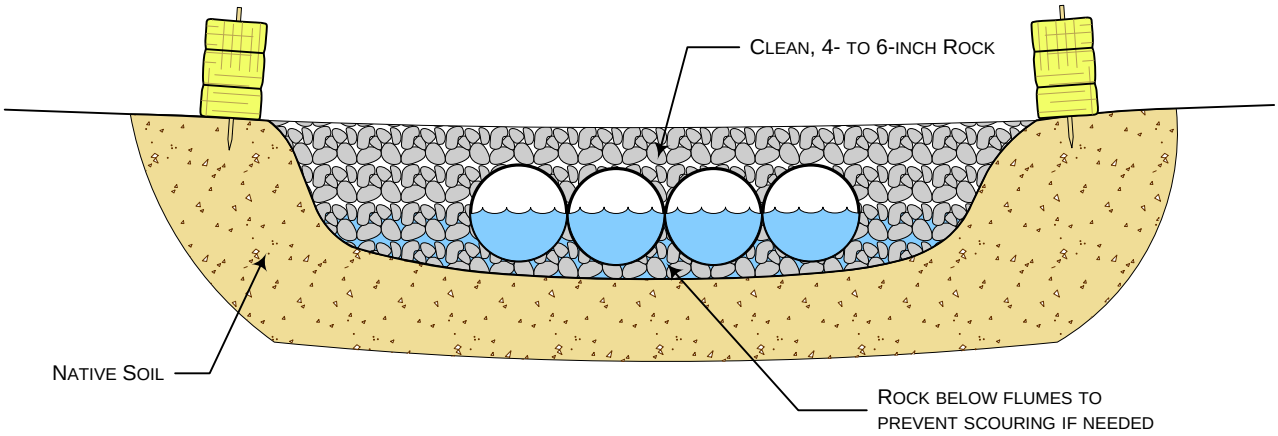
Environmental Mitigation Plan
Berthold Station Expansion Project

Drawn by: merjent

11/30/2011



PLAN VIEW
(NOT TO SCALE)



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.

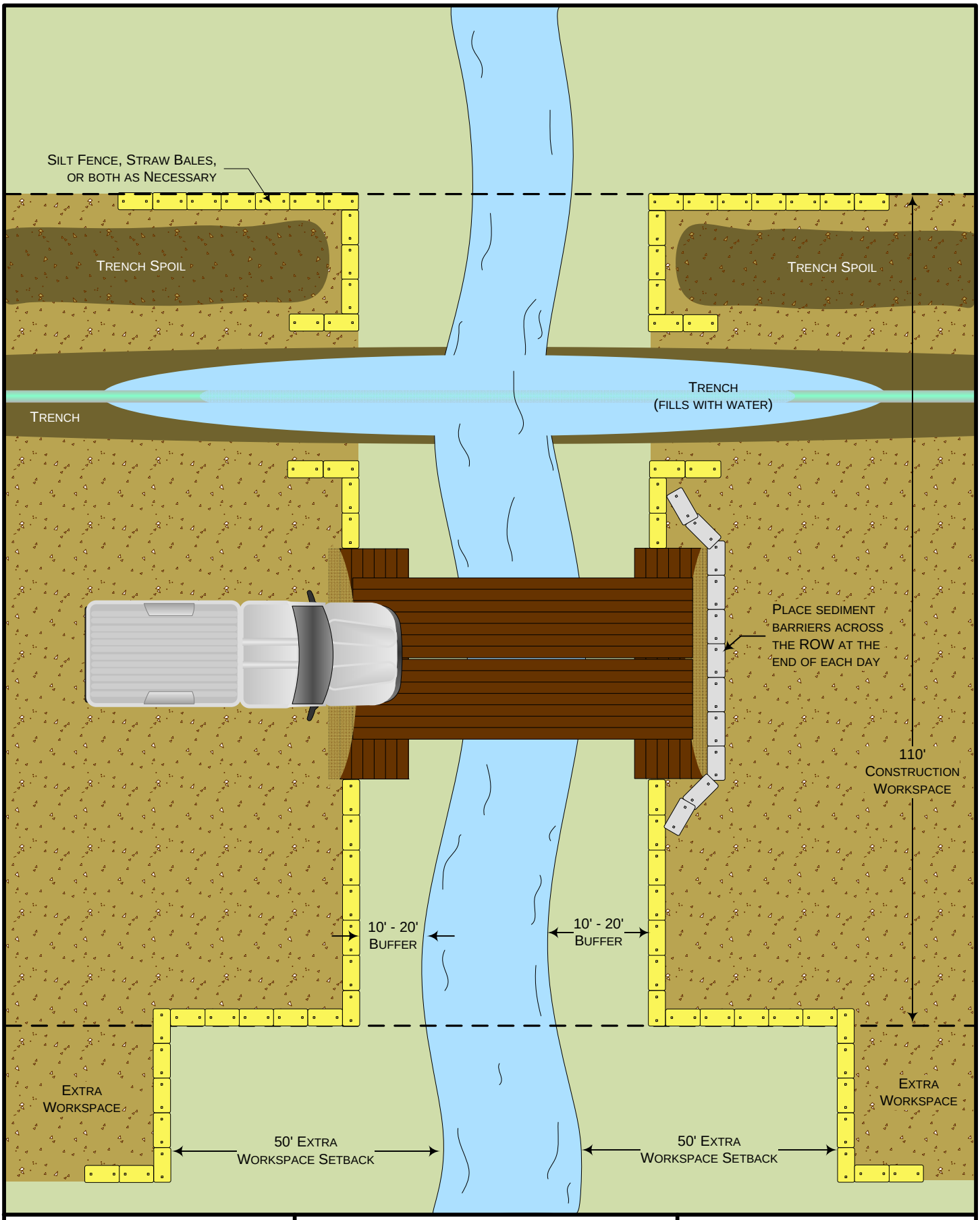
ENBRIDGE

Exhibit 2.3
Typical Rock Flume Bridge

Environmental Mitigation Plan
Berthold Station Expansion Project

Drawn by: merjent

11/30/2011



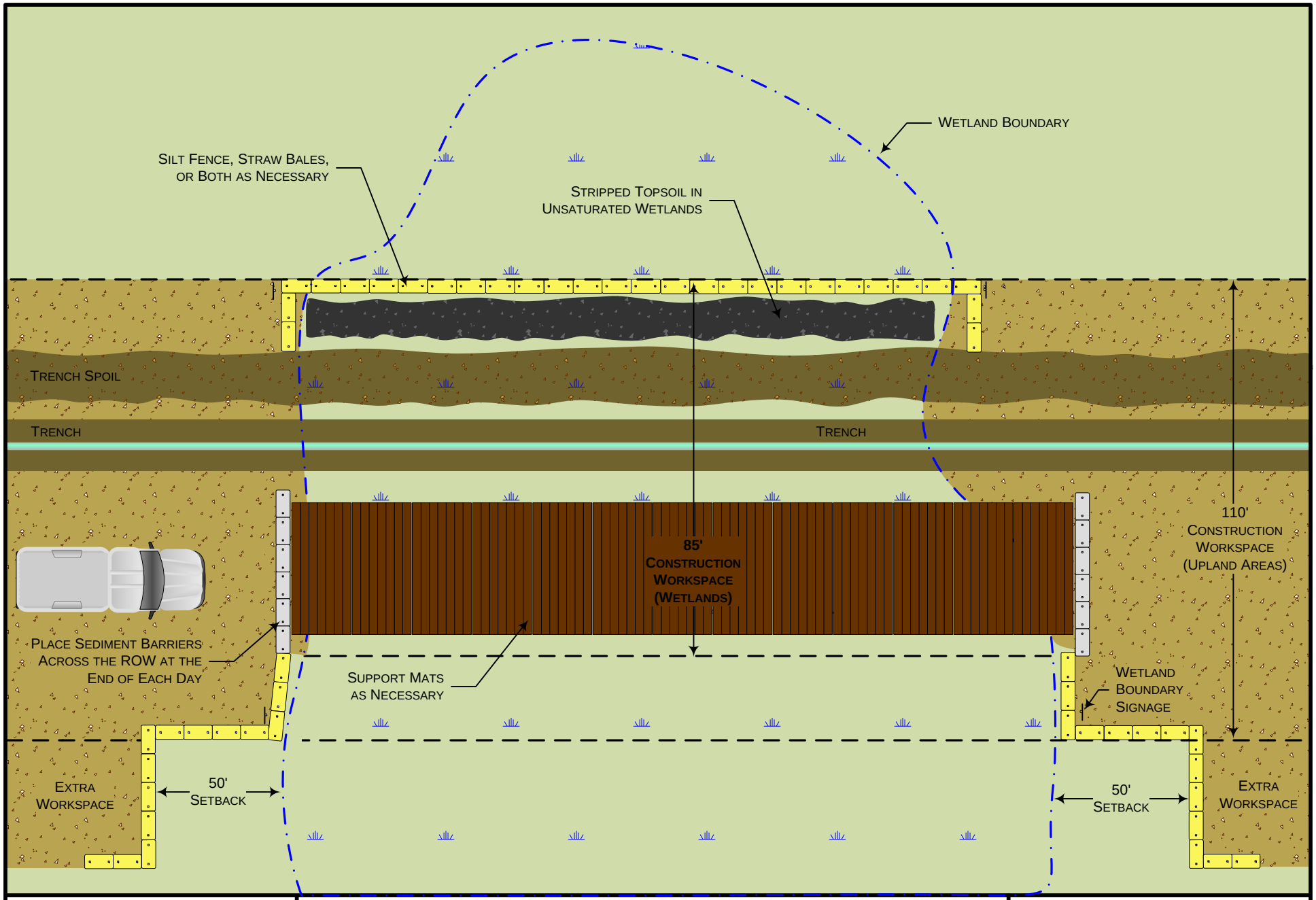
ENBRIDGE

Exhibit 2.4
Typical Waterbody Crossing
Wet Trench Method

Environmental Mitigation Plan
Berthold Station Expansion Project

Drawn by: merjent

11/30/2011



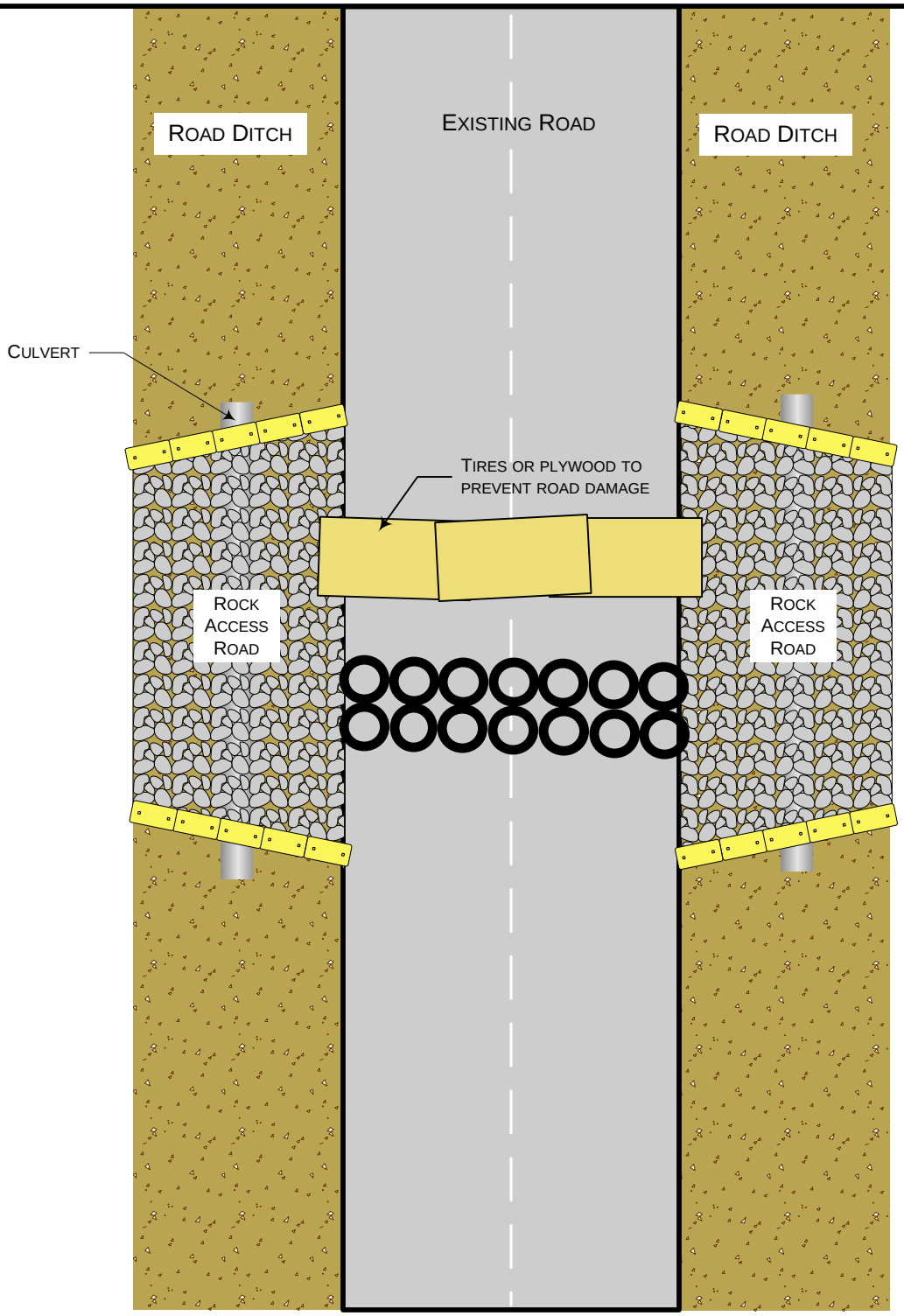
ENBRIDGE

Exhibit 3.1
Typical Wetland Crossing

Environmental Mitigation Plan
Berthold Station Expansion Project

Drawn by: merjent

11/30/2011



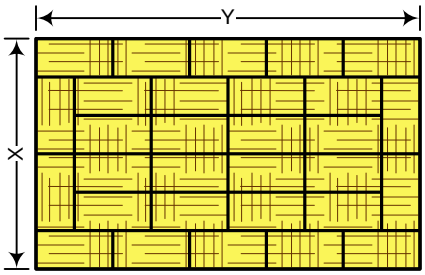
NOTES:

1. ACCESS RAMPS, AS ILLUSTRATED ABOVE, ARE TO BE INSTALLED ADJACENT TO EXISTING ROADS AT LOCATIONS IDENTIFIED ON THE PROJECT.
2. CONTRACTOR SHALL KEEP ROAD SURFACES IN CLEAN AND SAFE DRIVING CONDITION.
3. PRIOR TO PERMANENT SEEDING, CONTRACTOR SHALL REMOVE ALL IMPORTED FILL MATERIAL AND CULVERT (IF INSTALLED) AND RESTORE THE GROUND TO NATURAL CONTOURS UNLESS OTHERWISE DIRECTED.
4. DIAMETER OF CULVERT TO BE IN ACCORDANCE WITH STATE, COUNTY OR TOWNSHIP REQUIREMENTS.
5. STRAW BALES SHALL BE INSTALLED PER EXHIBIT 1.7.
6. MONITOR CULVERTS FOR SEDIMENT BUILD-UP AND CLEAN AS NECESSARY.

ENBRIDGE

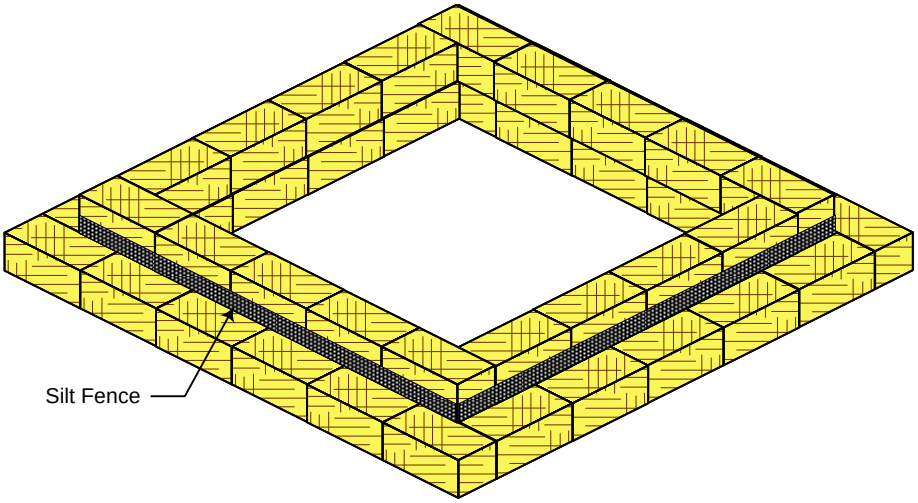
Exhibit 4.1
Typical Road Crossing – Sediment Control

Environmental Mitigation Plan
Berthold Station Expansion Project
Drawn by: Merjent
11/30/2011

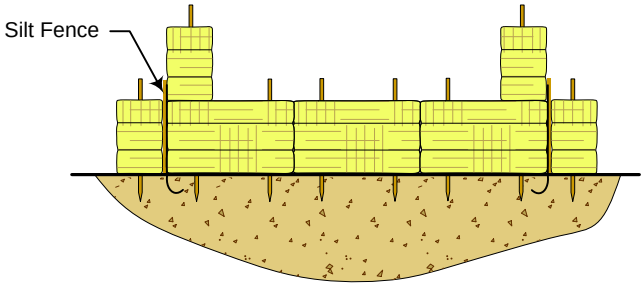


NOTES:

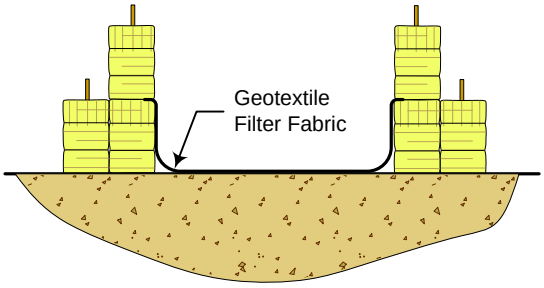
1. ARRANGE THE STRAW BALES TO THE X AND Y DIMENSIONS AS SPECIFIED BELOW.
2. IF BOTTOM OF STRUCTURE IS NOT LINED WITH STRAW BALES (OPTION 1), LINE ENTIRE STRUCTURE WITH GEOTEXTILE FILTER FABRIC.



PERSPECTIVE VIEW



OPTION 1



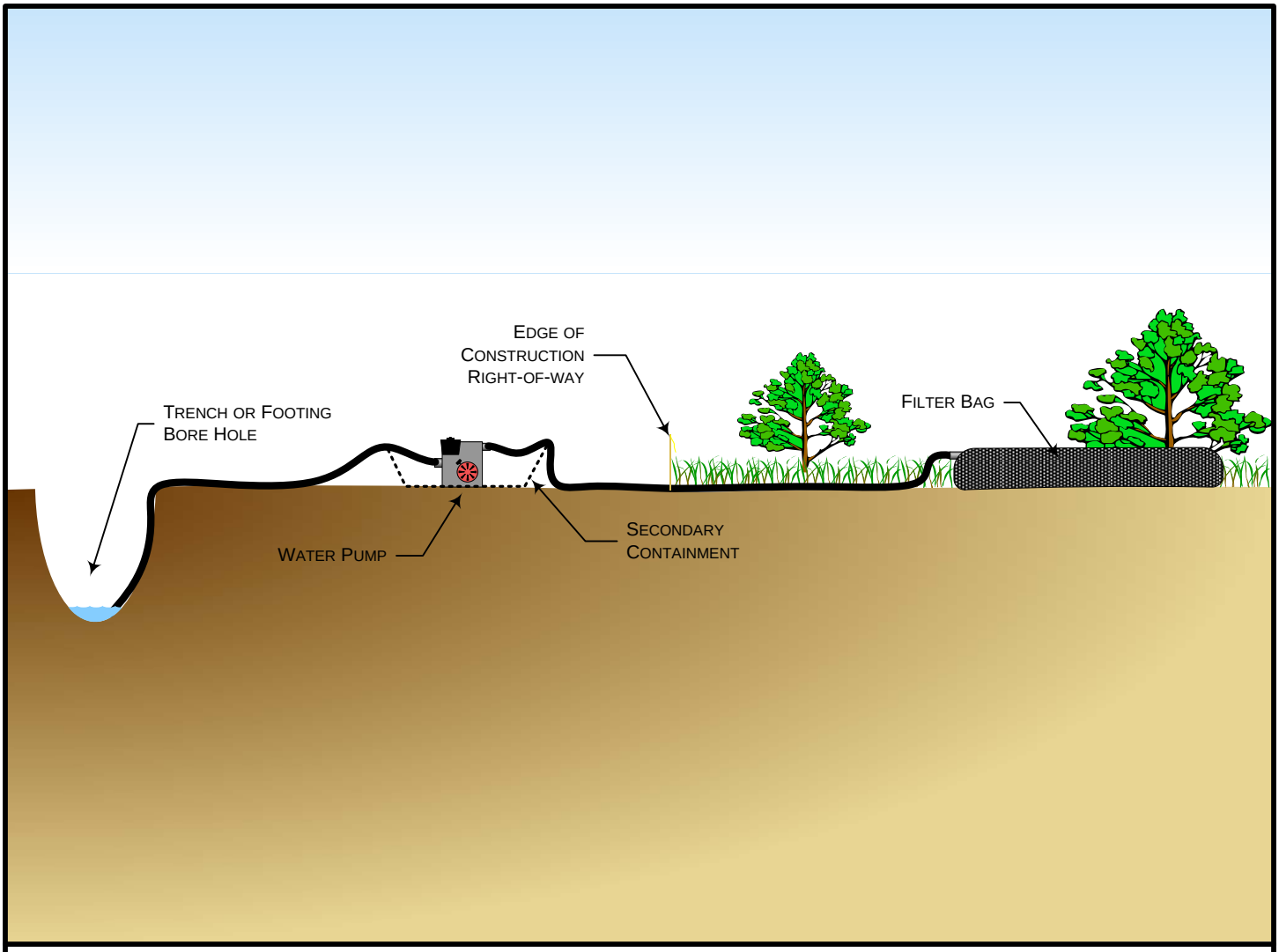
OPTION 2

MINIMUM SUMP DIMENSIONS (FEET)		MAXIMUM PUMPING RATE
X	Y	GALLONS PER MINUTE
10	20	300
15	20	350
20	20	400
20	25	450
25	25	500
25	30	550
30	30	660

ENBRIDGE

Exhibit 5.1
Typical Straw Bale Dewatering Structure

Environmental Mitigation Plan
Berthold Station Expansion Project
Drawn by: merjent
11/30/2011



NOTES:

1. WATER PUMPS SHALL BE CONTAINED WITHIN SECONDARY CONTAINMENT DEVICES WHILE WORKING IN WETLAND AREAS.
2. WATER DISCHARGES WILL BE DIRECTED TO WELL VEGETATED UPLAND AREAS.

ENBRIDGE

Exhibit 5.2
Typical Dewatering to Filter Bag

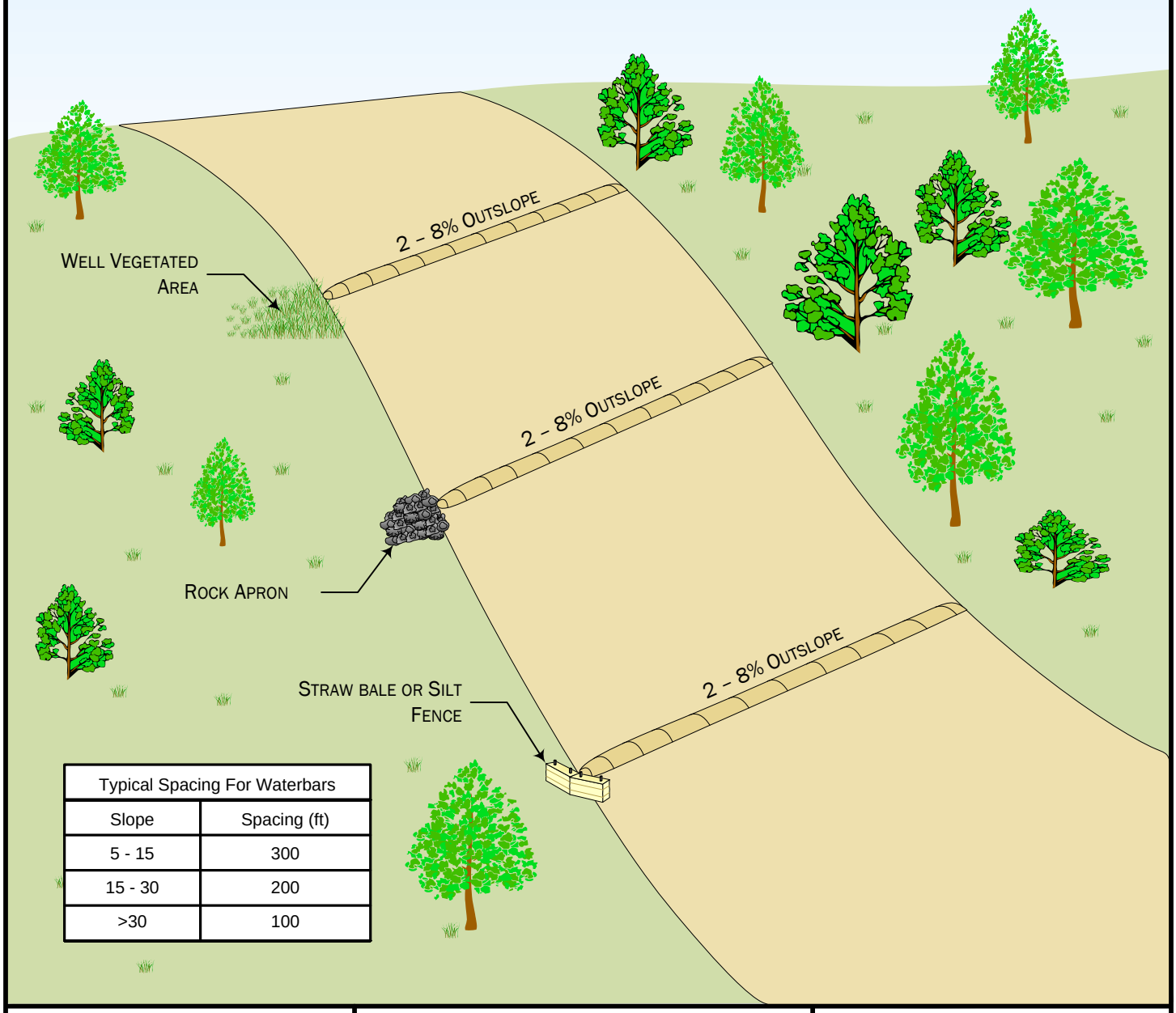
Environmental Mitigation Plan
Berthold Station Expansion Project

Drawn by: merjent

11/30/2011

NOTES:

1. SLOPE BREAKERS ARE PERMANENT EROSION CONTROL STRUCTURES.
2. STRAW BALES OR SILT FENCE SHALL BE REMOVED AFTER VEGETATION IS ESTABLISHED.



Typical Spacing For Waterbars	
Slope	Spacing (ft)
5 - 15	300
15 - 30	200
>30	100

ENBRIDGE

Exhibit 7.1
Typical Permanent Slope Breakers (Perspective View)

Environmental Mitigation Plan
Berthold Station Expansion Project
Drawn by: Merjent
11/30/2011