ENVIRONMENTAL ASSESSMENT WORKSHEET

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at: http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item, or can be addressed collectively under EAW Item 19.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an Environmental Impact Statement ("EIS").

1. **Project title:** Line 3 Replacement Project ("L3R")

2. **Proposer:** Enbridge Energy, Limited Partnership ("Enbridge")

Contact person: Arshia Javaherian
Title: Senior Legal Counsel
Address: 4628 Mike Colalillo Drive
City, State, ZIP: Duluth, Minnesota 55807
Phone: 218-464-5702
Email: Arshia.Javaherian@enbridge.com

Contact person: Claudia Schrull
Title: Sr. Manager Regulatory Pipeline Development
Address: 1100 Louisiana, Ste. 3300
City, State, ZIP: Houston, TX 77002
Phone: 713-821-2000
Email: Claudia.Schrull@enbridge.com

3. **RGU: Minnesota Public Utilities Commission**

Contact person: Scott Ek
Address:121 7th Place East, Suite 350
City, State, ZIP: St. Paul, MN 55101
Phone: 651-201-2255
Fax: N/A
Email: scott.ek@state.mn.us

Contact person: Jamie MacAlister
Address: 85 7th Place East, Suite 500
City, State, ZIP: St. Paul, MN 55101
Phone: 651-539-1775
Fax: 651-539-0109
Email: Pipeline.Comments@state.mn.us

4. **Reason for EAW Preparation:** (check one)

Required:	Discretionary:
X EIS Scoping	☐ Citizen petition
☐ Mandatory EAW	☐ RGU discretion – Minn. R. 4410.2000, subp. 3(B)
	☐ Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

4410.4400 Subp. 24 - Pipelines

5. Project Location: See Section 6.

County: Kittson, Marshall, Pennington, Red Lake, Polk, Clearwater, Hubbard, Wadena, Cass, Crow Wing, Aitkin, and Carlton counties

City/Township: See detailed route maps in Appendix A.

PLS Location (¼, ¼, Section, Township, Range): See detailed route maps in Appendix A.

Watershed (81 major watershed scale): See Section 11a.i.

GPS Coordinates: N/A

Tax Parcel Number: See tax parcel list in Appendix B. Information is provided for parcels within the 750-foot-wide requested route width centered on the L3R centerline.

At a minimum attach each of the following to the EAW:

- **County map showing the general location of the project;**
- **U.S. Geological Survey ("USGS") 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and**
- **Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.**

Figure 5-1 presents an overview map depicting the counties crossed by L3R in Minnesota. Appendix A presents three sets of detailed route maps that show:

- The proposed L3R centerline;
- The L3R construction workspace;
- The 750-foot-wide requested route width centered on the L3R pipeline and widened route widths in specific areas;
- Clearbrook Terminal[1] and pump stations[2];
- Locations of mainline valves[3] and cathodic protection systems[4];
- Temporary and permanent access roads[5];
- The L3R environmental survey area[6];

[1] Terminal: A terminal facility is an aboveground facility with large tanks for the temporary containment of crude oil. The crude oil is transported from the terminal to customers or storage facilities via road or rail tankers or other pipeline systems.

[2] Pump station: A pump station is an aboveground facility that includes pumps and other equipment for pumping product through the pipeline.

[3] Valve: A valve is a piece of equipment used to control the flow of crude oil inside the pipeline. The valve acts as a gateway that can be opened and closed. A *mainline valve* describes an entire aboveground facility on the pipeline that is equipped with *shutoff valves* capable of stopping pipeline flow in the event of an emergency or for maintenance. A *slide gate valve* is a particular type of shutoff valve that operates by sliding a steel plate across the entire diameter of the pipe to seal off flow.

[4] Cathodic protection: Cathodic protection is a method for safeguarding the pipeline against corrosion. In a cathodic protection system, the metal to be protected (the pipeline) is connected to a metal that corrodes more easily (*anode array* or *anode groundbed*). The metal that corrodes more easily corrodes instead of the pipeline. Cathodic protection can be achieved by using reactive anode metals that are electrically connected to the pipeline (also known as a *galvanic anode* systems) or by using inert anode metals and impressing an electric current on the system (also known as an *impressed current* system). Enbridge's proposed cathodic protection system includes anode arrays installed in conventional beds near the ground surface as well as in deeper wells.

[5] Access road: An access road is a road used to access the pipeline construction workspace, permanent ROW, or associated facility. Access roads can be public roads or private drives and can be existing, modified, or newly constructed.

[6] Environmental survey area: The environmental survey area describes the area where environmental surveys, such as wetland and waterbody delineations, archaeological investigations, and threatened and endangered species inventories, were conducted for L3R. The environmental survey area is generally inclusive of and larger than the proposed construction footprint, although not all types of environmental surveys are required in all areas.

- The locations and boundaries of state environmental resources accessed from the Minnesota Geospatial Commons website (MNGeo 2016); tribal lands accessed from the Minnesota Department of Transportation ("MNDOT") (MNDOT 2016); and federal lands accessed from the U.S. Geological Survey ("USGS") (USGS 2014). Parcel ownership for L3R was determined using information primarily from Enbridge's landowner tracking database; and
- The proposed North Dakota Pipeline Company LLC ("NDPC") Sandpiper Pipeline Project ("SPP") centerline, where co-located.

The three sets of detailed route maps are, more specifically:

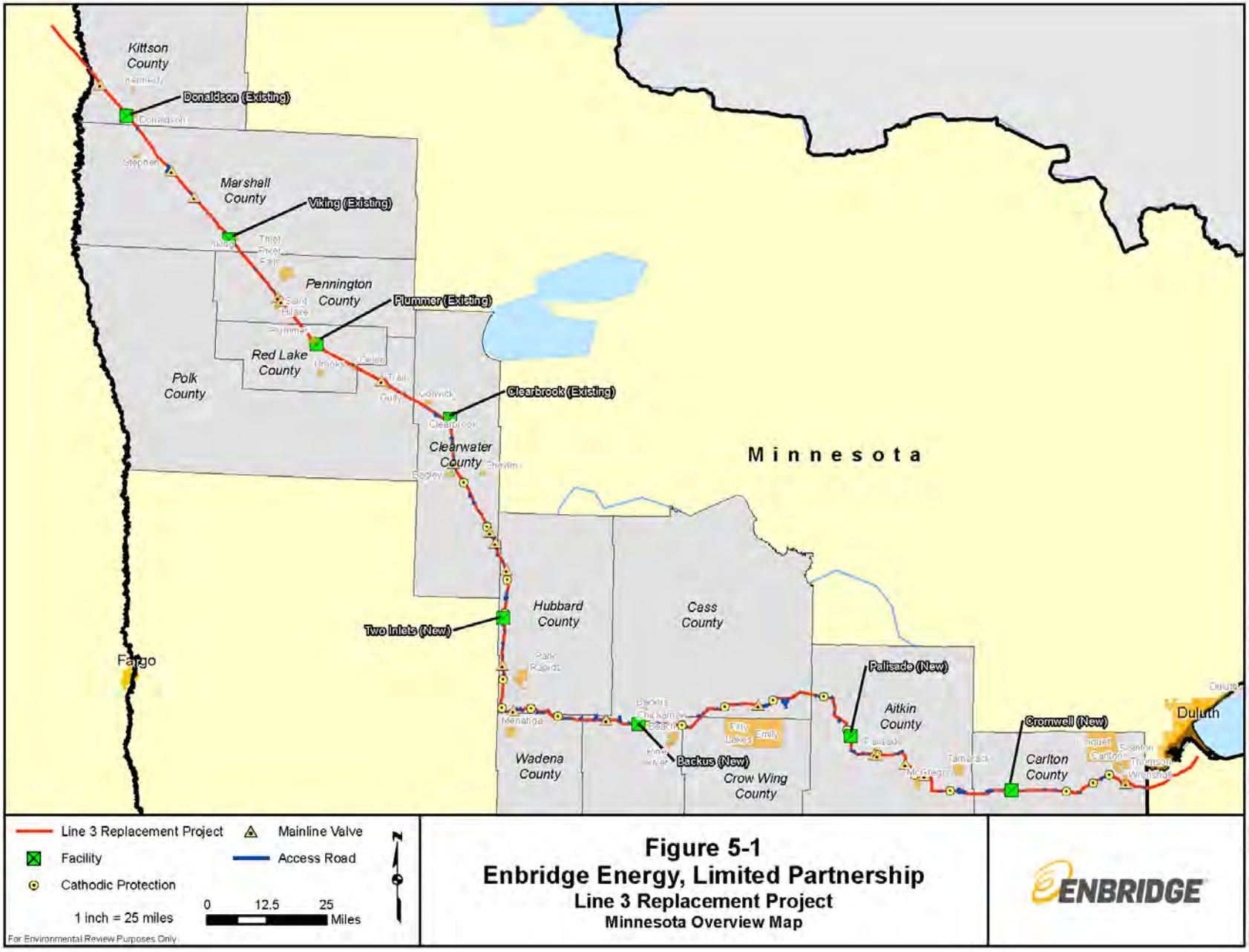
- Topographic Maps: This map set presents L3R components overlain on a USGS 7.5 minute, 1:24,000 scale topographic basemap as required by the EAW filing criteria. The map set depicts the items listed above as well as the boundaries of publicly-available environmental resources crossed by and in the vicinity of L3R;

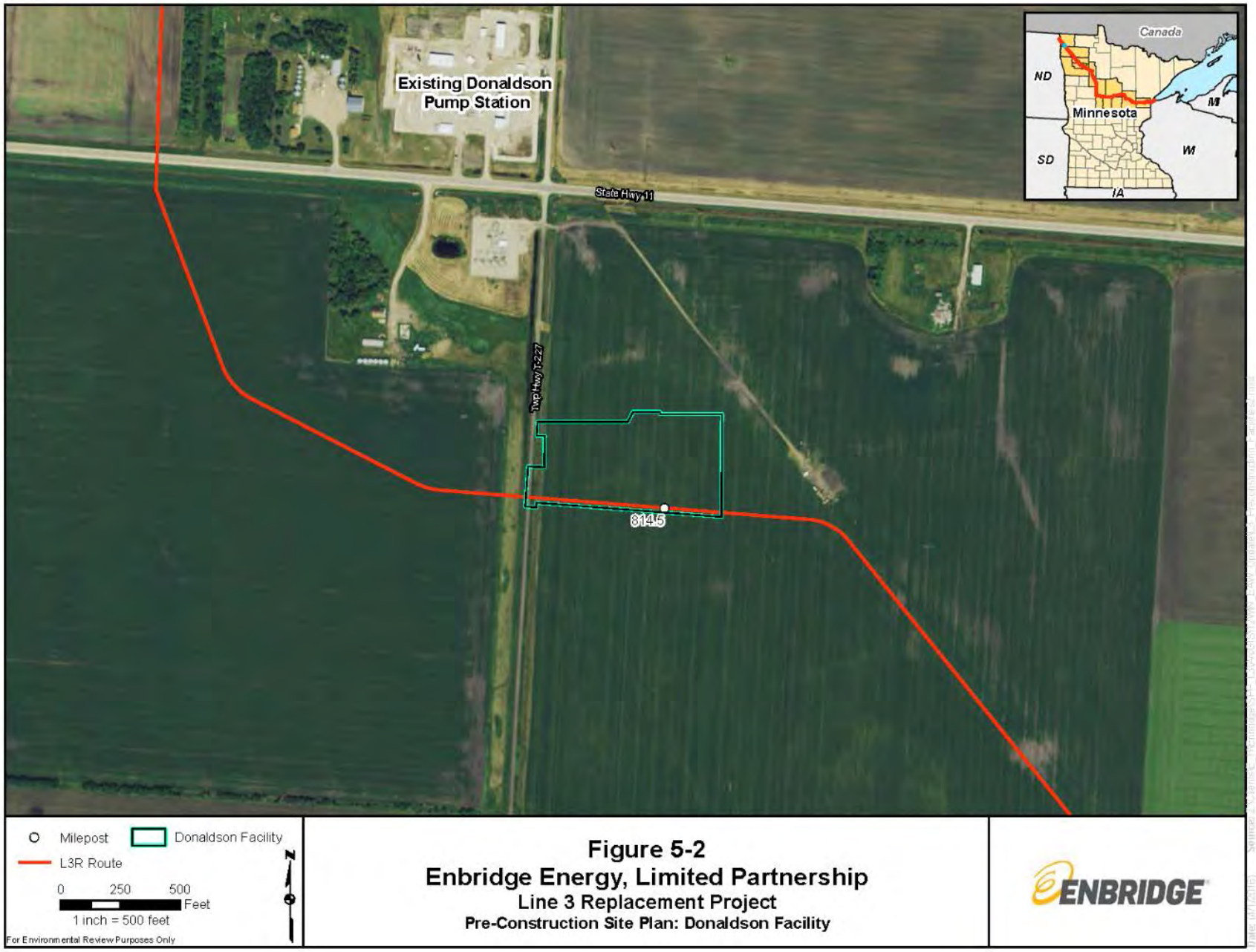
- Aerial Survey Maps: This map set presents L3R components overlain on a 1:12,000 scale aerial view. The map set depicts the items listed above as well as survey results and sensitive noise receptors[7]; and

- Aerial Soils Maps: This map set presents L3R components overlain on a 1:12,000 scale aerial view. The map set depicts the items listed above as well as publicly-available soil survey information.

Figures 5-2 through 5-9 present pre-construction conditions of the land to be used for the improvements and construction of a new pump station at Enbridge's existing Clearbrook Terminal; expansion of the existing Donaldson, Viking, and Plummer pump stations; and construction of the new Two Inlets, Backus, Palisade, and Cromwell pump stations, respectively. Figures 5-10 through 5-18 present post-construction site plans for the Clearbrook Terminal and pump stations.

[7] Categories for sensitive noise receptors include: 1) private (residences and garage/barns); 2) public (schools, churches, cemeteries, and hospitals); 3) commercial/industrial (businesses and industries); and 4) other.


Kittson County
Donaldson (Existing)
Marshall County
Viking (Existing)
Pennington County
Plummer (Existing)
Red Lake County
Polk County
Clearbrook (Existing)
Clearwater County
Minnesota
Hubbard County
Two Inlets (New)
Cass County
Fargo
Palisade (New)
Aitkin County
Cromwell (New)
Duluth
Wadena County
Backus (New)
Crow Wing County
Carlton County
Line 3 Replacement Project
Mainline Valve
Facility
Access Road
Cathodic Protection
1 inch = 25 miles
0 12.5 25
Miles
For Environmental Review Purposes Only
Figure 5-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Minnesota Overview Map
ENBRIDGE


Existing Donaldson
Pump Station
State Hwy 11
Twp Hwy T-227
8145
Canada
ND
Minnesota
SD
IA
M
W
Milepost
Donaldson Facility
L3R Route
0 250 500
Feet
1 inch = 500 feet
For Environmental Review Purposes Only
N
Figure 5-2
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Pre-Construction Site Plan: Donaldson Facility
ENBRIDGE

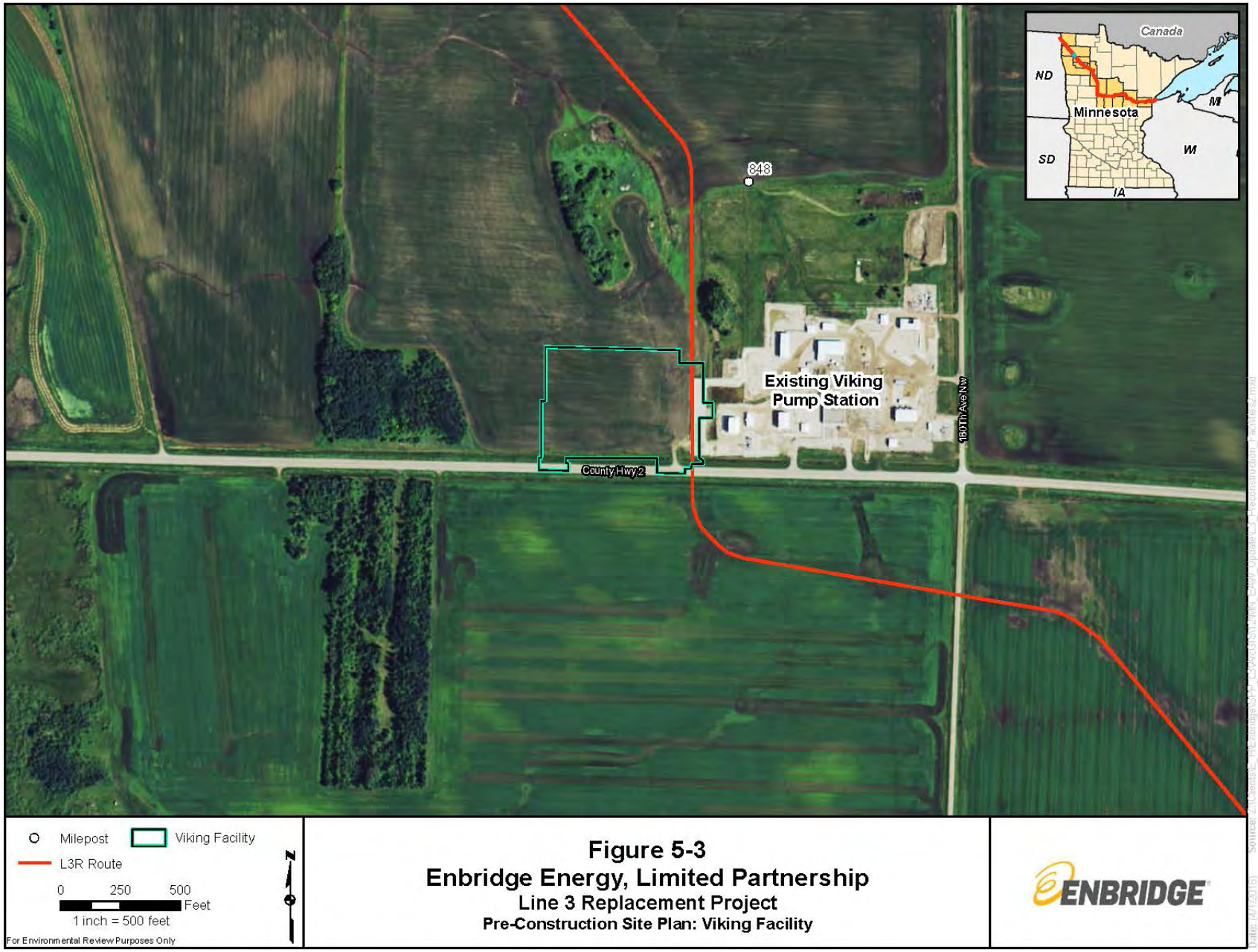


Figure 5-3
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Pre-Construction Site Plan: Viking Facility

ENBRIDGE

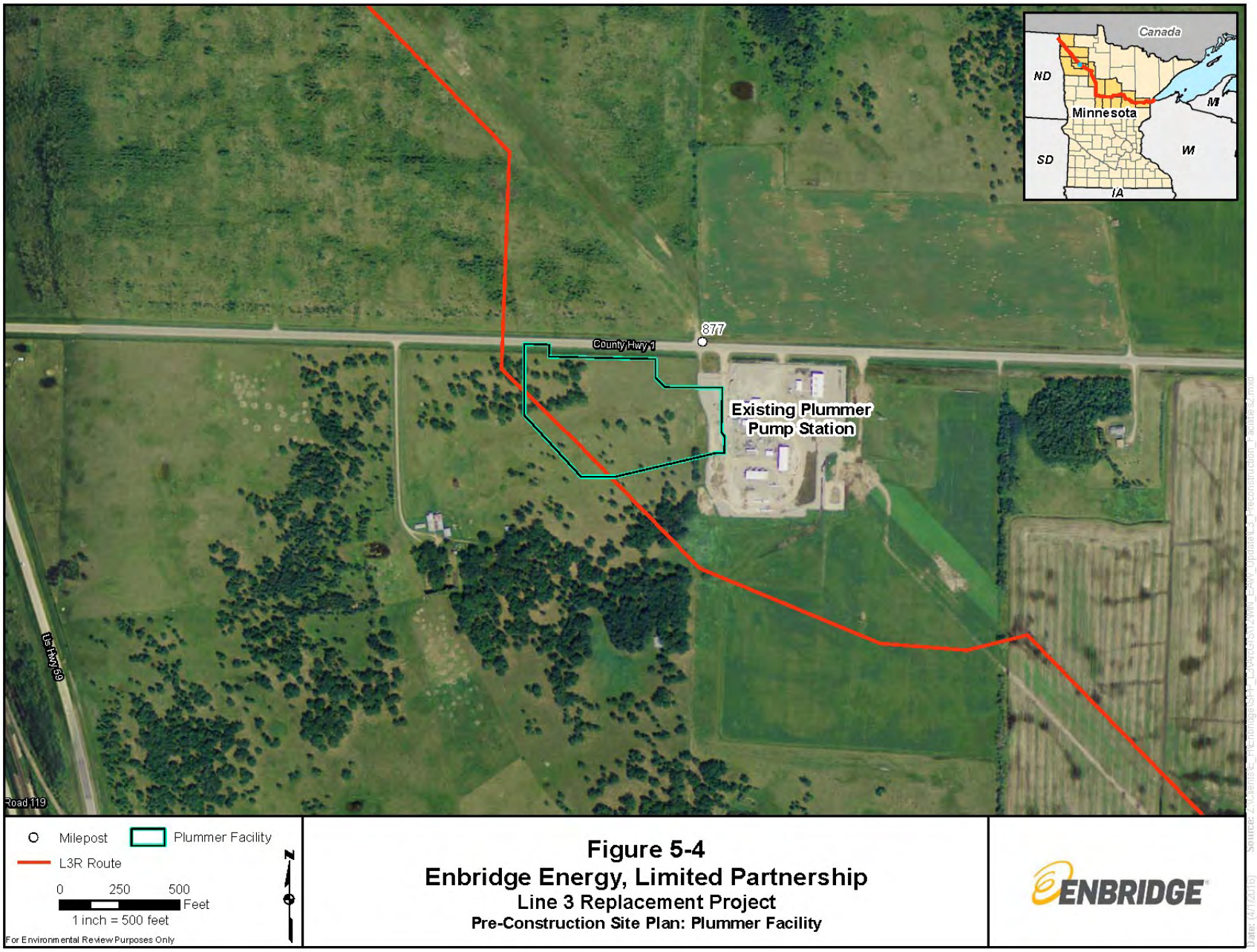


Figure 5-4
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Pre-Construction Site Plan: Plummer Facility

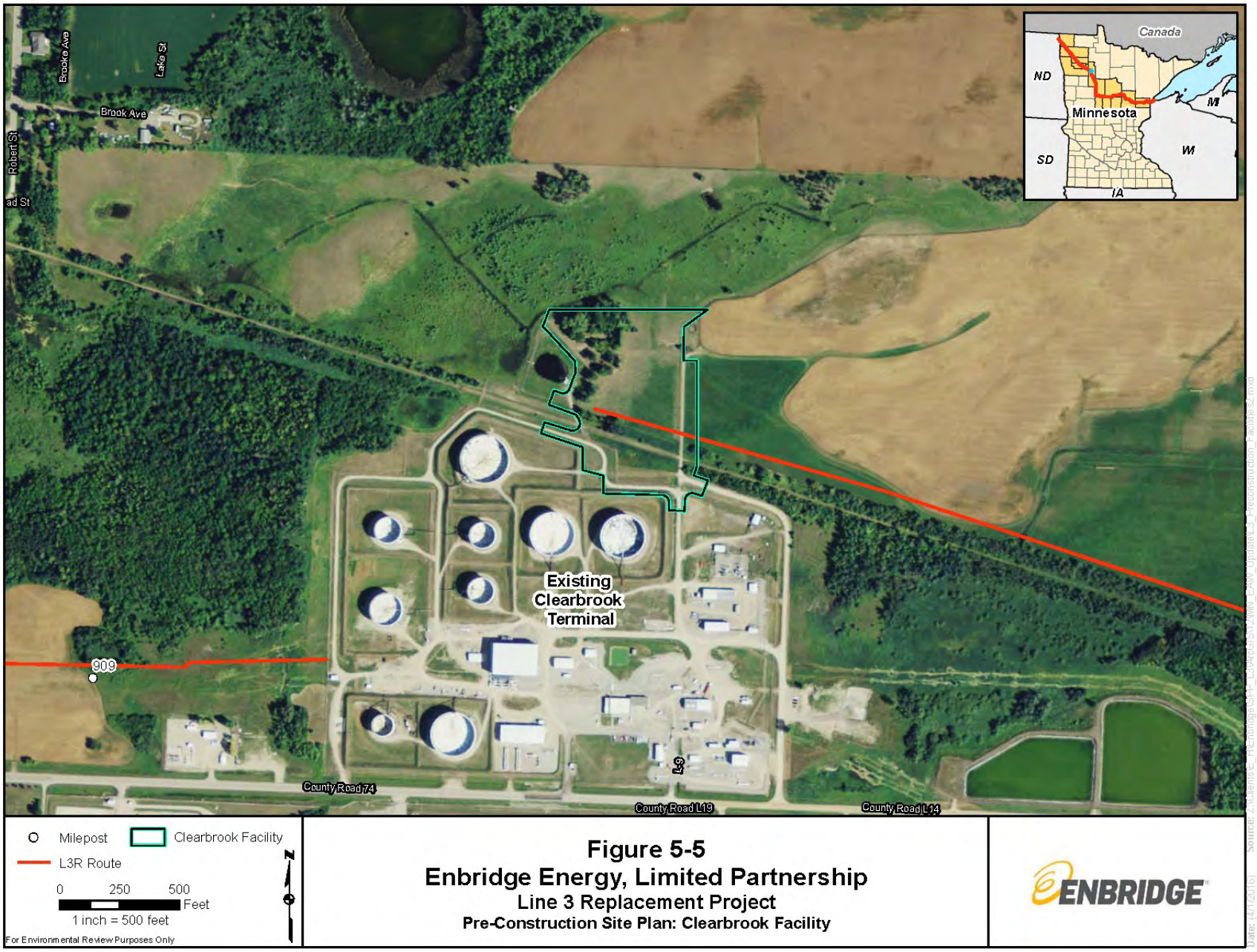
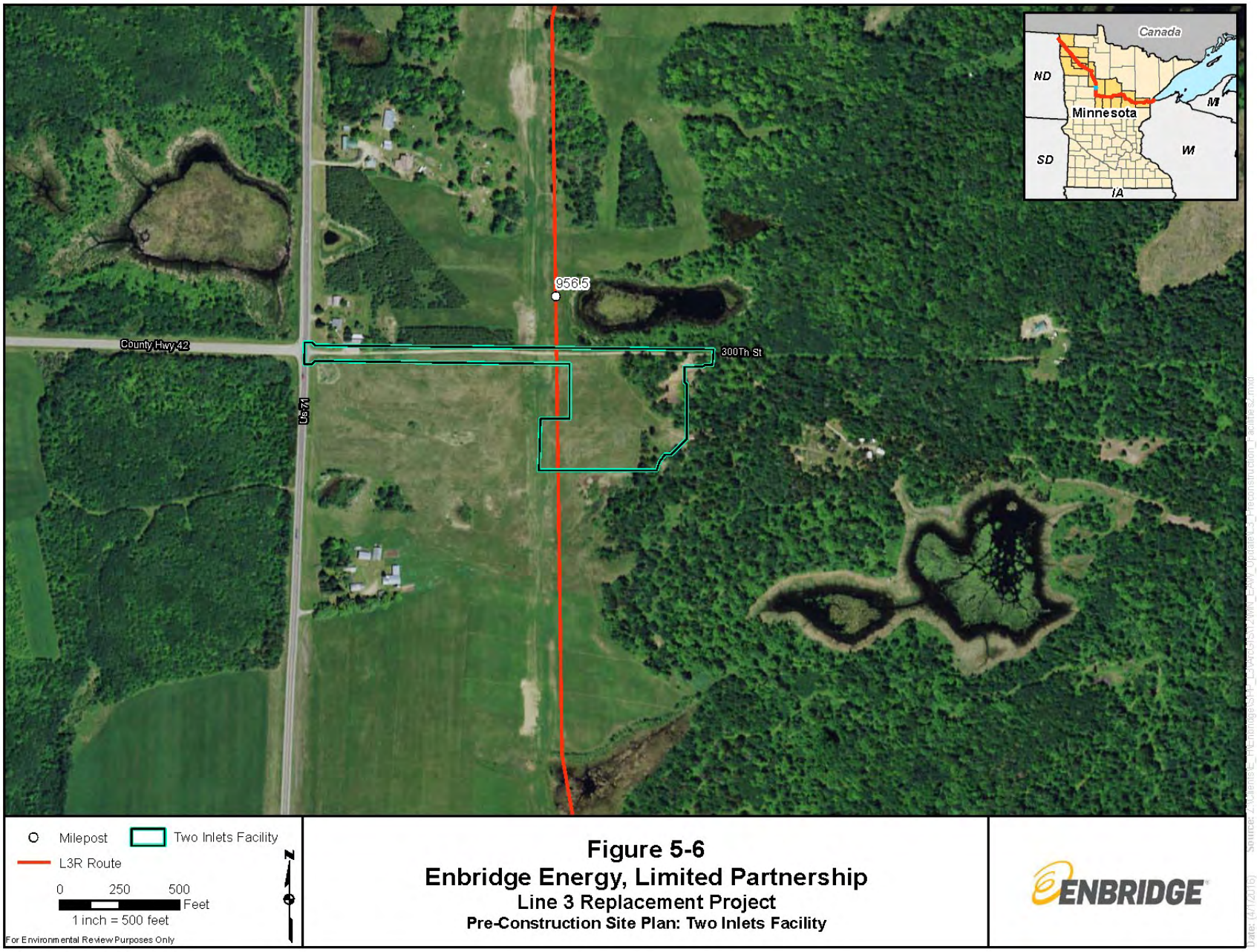


Figure 5-5
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Pre-Construction Site Plan: Clearbrook Facility


Canada
ND
Minnesota
SD
IA
WI
MI
9565
County Hwy 42
300Th St
Us 71
Milepost
Two Inlets Facility
L3R Route
0 250 500
Feet
1 inch = 500 feet
For Environmental Review Purposes Only
N
Figure 5-6
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Pre-Construction Site Plan: Two Inlets Facility
ENBRIDGE

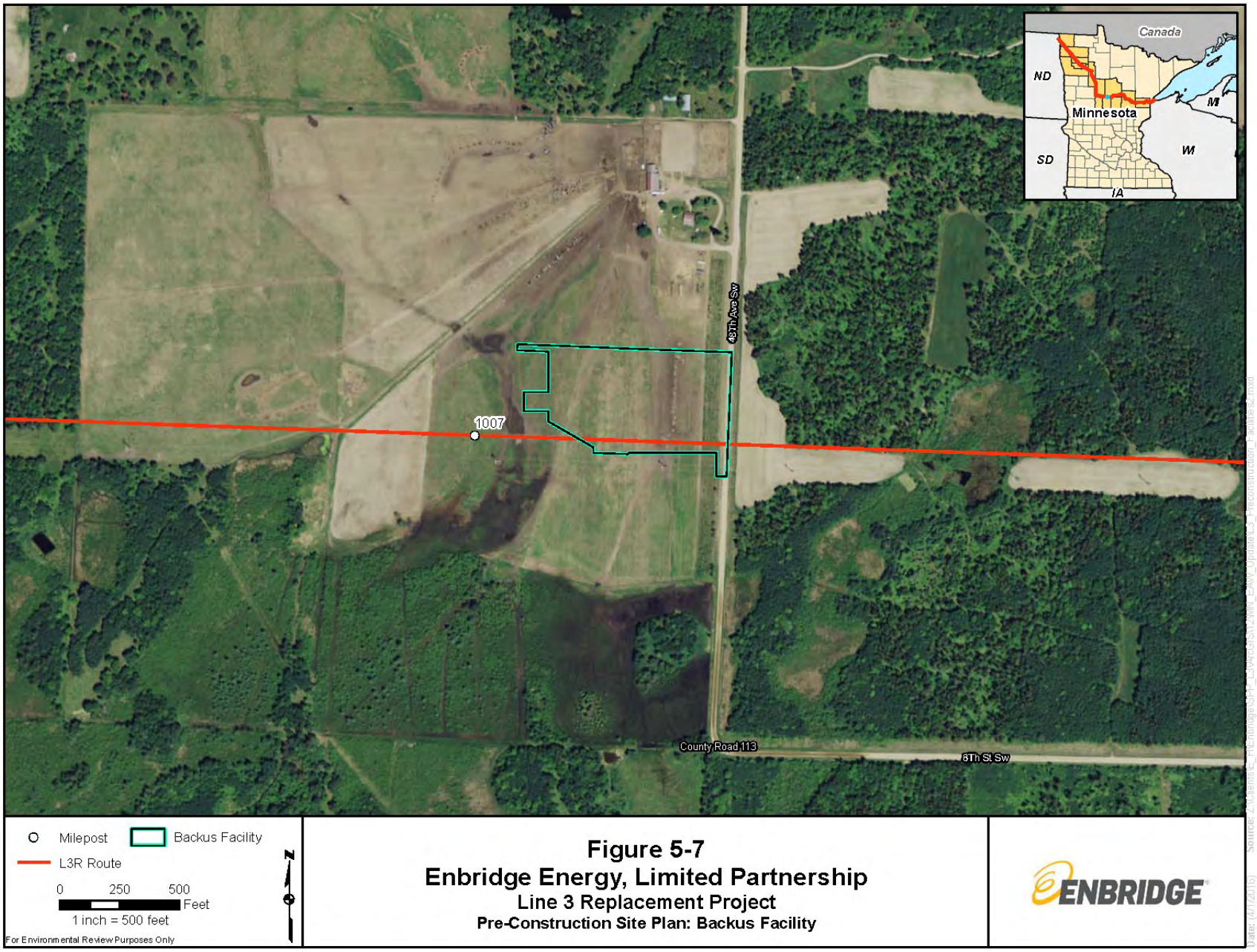


Figure 5-7
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Pre-Construction Site Plan: Backus Facility

ENBRIDGE

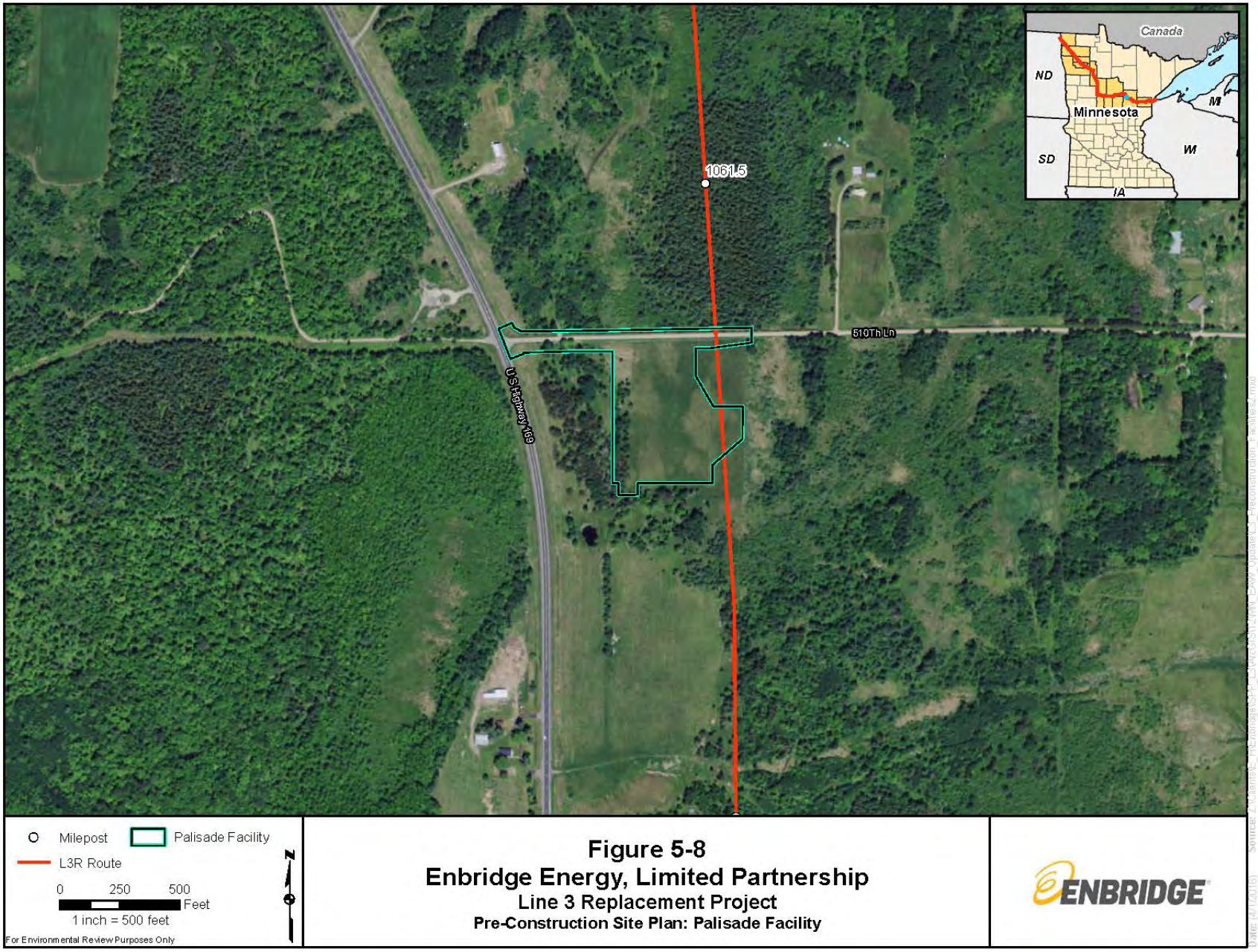


Figure 5-8
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Pre-Construction Site Plan: Palisade Facility

ENBRIDGE

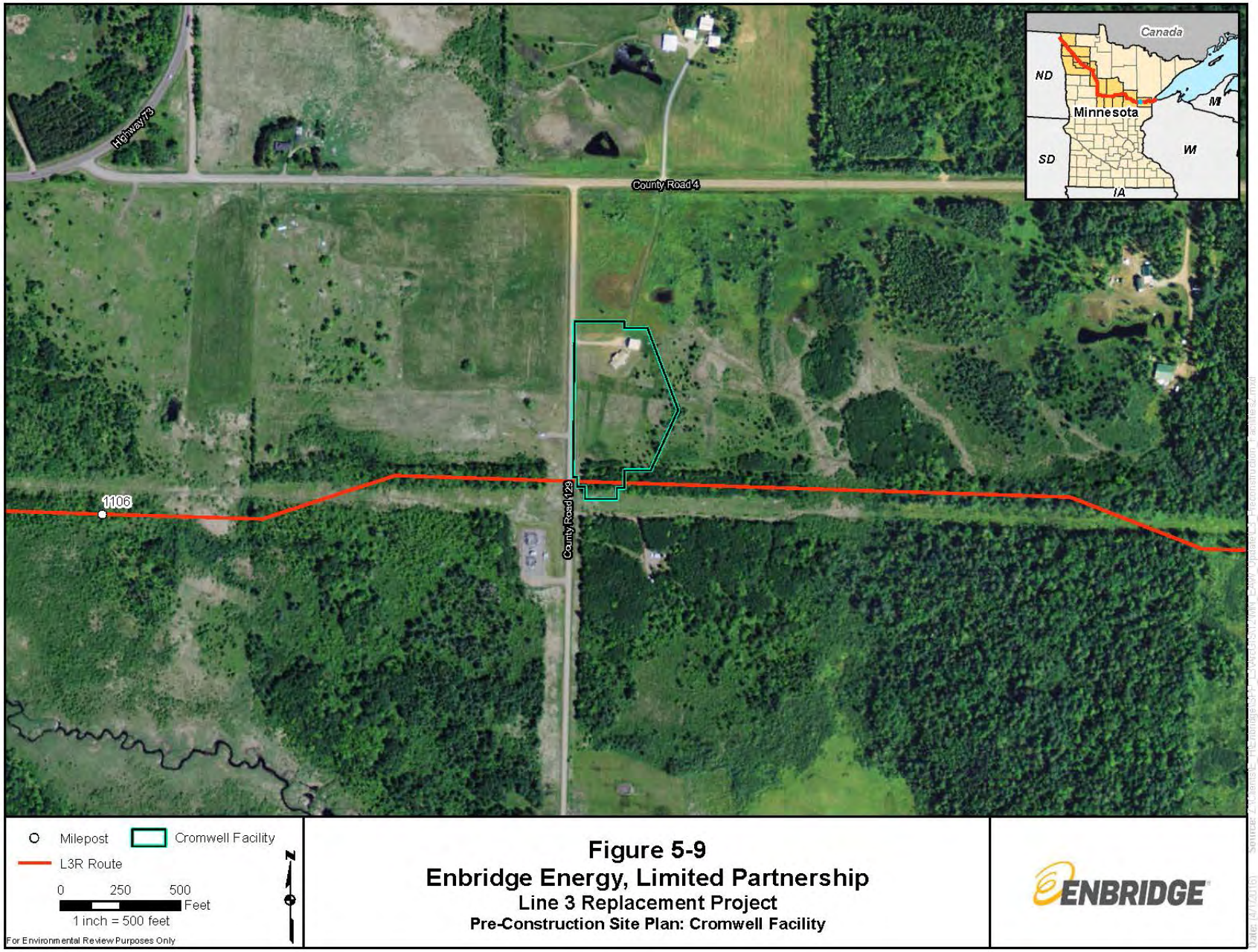
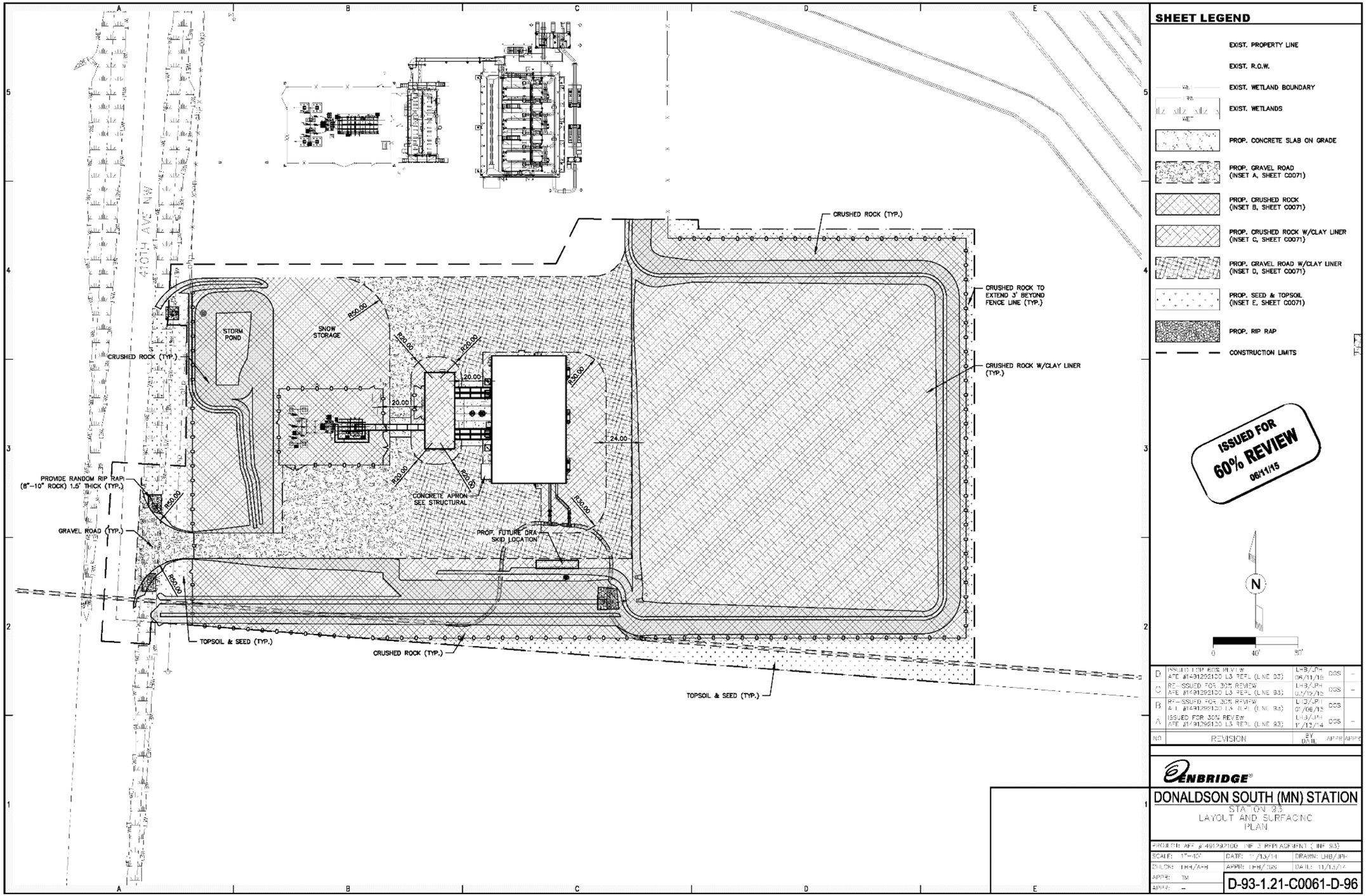


Figure 5-9
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Pre-Construction Site Plan: Cromwell Facility



SHEET LEGEND

- EXIST. PROPERTY LINE
- EXIST. R.O.W.
- EXIST. WETLAND BOUNDARY
- EXIST. WETLANDS
- PROP. CONCRETE SLAB ON GRADE
- PROP. GRAVEL ROAD (INSET A, SHEET C0071)
- PROP. CRUSHED ROCK (INSET B, SHEET C0071)
- PROP. CRUSHED ROCK W/CLAY LINER (INSET C, SHEET C0071)
- PROP. GRAVEL ROAD W/CLAY LINER (INSET D, SHEET C0071)
- PROP. SEED & TOPSOIL (INSET E, SHEET C0071)
- PROP. RIP RAP
- CONSTRUCTION LIMITS

ISSUED FOR 60% REVIEW 06/11/15

N

0 40' 80'

NO	REVISION	BY DATE	APPR	APPR
D	ISSUED FOR 60% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 06/11/15	DGS	–
C	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 01/12/15	DGS	–
B	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 01/06/15	DGS	
A	ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 12/12/14	DGS	–

ENBRIDGE

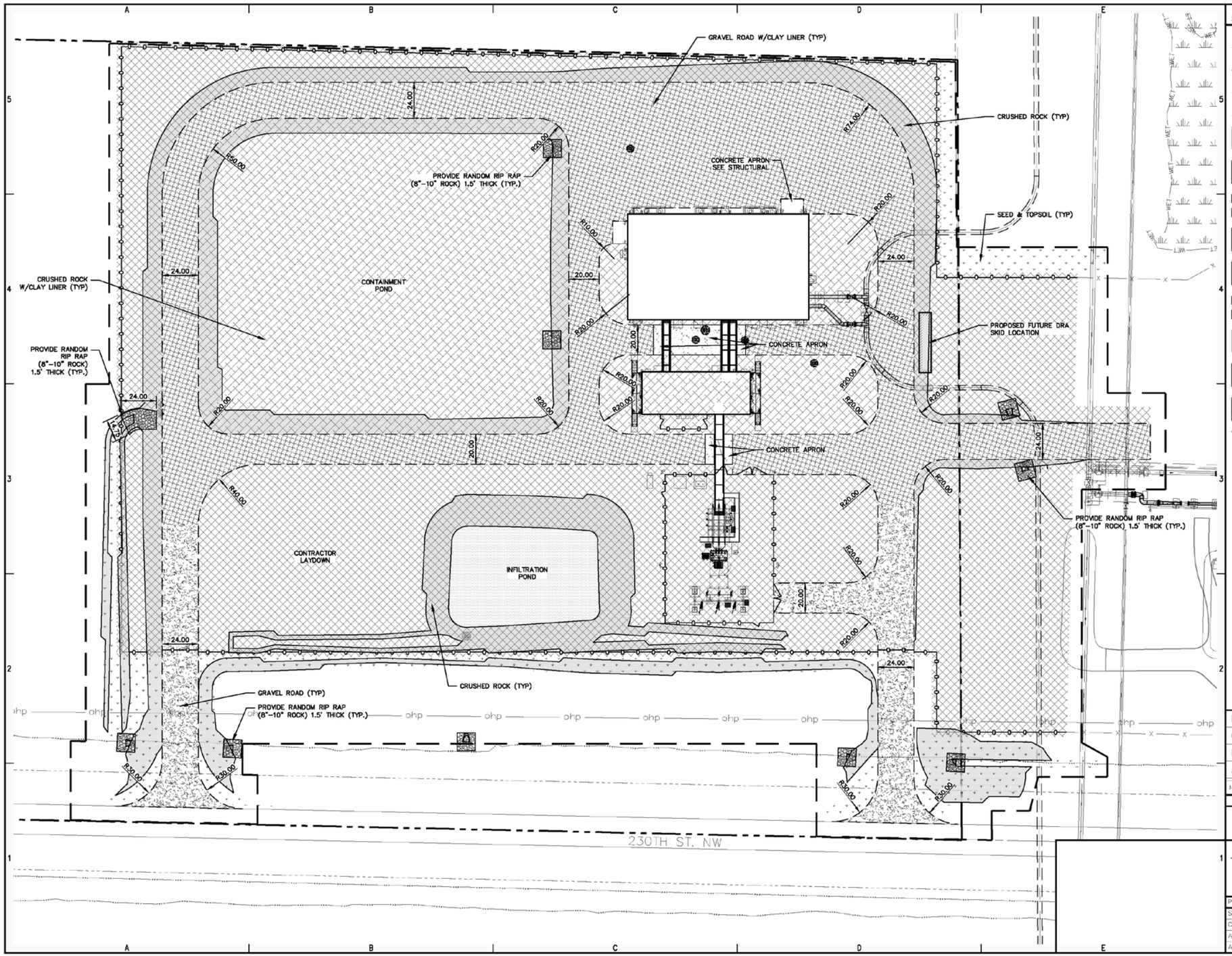
DONALDSON SOUTH (MN) STATION

STATION 93
LAYOUT AND SURFACING PLAN

PROJECT: AFE # 491292100 - INF 3 REPLACEMENT (LINE 93)

SCALE: 1"=40'	DATE: 11/13/14	DRAWN: LHB/JPH
CHCK: LHB/AHB	APPR: LHB/DGS	DATE: 11/13/14
APPR: TM		
APPR: –		

D-93-1.21-C0061-D-96


GRAVEL ROAD W/CLAY LINER (TYP)
CRUSHED ROCK (TYP)
CONCRETE APRON SEE STRUCTURAL
SEED & TOPSOIL (TYP)
PROVIDE RANDOM RIP RAP (8"–10" ROCK) 1.5' THICK (TYP.)
CONTAINMENT POND
CRUSHED ROCK W/CLAY LINER (TYP)
PROPOSED FUTURE DRA SKID LOCATION
CONCRETE APRON
CONCRETE APRON
PROVIDE RANDOM RIP RAP (8"–10" ROCK) 1.5' THICK (TYP.)
CONTRACTOR LAYDOWN
INFILTRATION POND
CRUSHED ROCK (TYP)
GRAVEL ROAD (TYP)
PROVIDE RANDOM RIP RAP (8"–10" ROCK) 1.5' THICK (TYP.)
230TH ST. NW
SHEET LEGEND
EXIST. PROPERTY LINE
PROP. PROPERTY LINE
EXIST. R.O.W.
EXIST. WETLAND BOUNDARY
EXIST. WETLANDS
PROP. CONCRETE SLAB ON GRADE
PROP. GRAVEL ROAD (INSET A, SHEET C0071)
PROP. CRUSHED ROCK (INSET B, SHEET C0071)
PROP. CRUSHED ROCK W/CLAY LINER (INSET C, SHEET C0071)
PROP. GRAVEL ROAD W/CLAY LINER (INSET D, SHEET C0071)
PROP. SEED & TOPSOIL (INSET E, SHEET C0071)
PROP. INFILTRATION POND
PROP. RIP RAP 12' X 12' AREA UNLESS NOTED OTHERWISE
CONSTRUCTION LIMITS
ISSUED FOR 60% REVIEW 06/25/15
N
0 30' 60'
D ISSUED FOR 60% REVIEW AFE #1491292100 L3 REPL (LINE 93) LHB/JPH 06/25/15 DGS –
C RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93) LHB/JPH 02/12/15 DGS –
B RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93) LHB/JPH 01/06/15 DGS –
A ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93) LHB/JPH 11/20/14 DGS –
NO REVISION BY DATE APPR APPR
ENBRIDGE
VIKING (MN) STATION
STATION 93
LAYOUT AND SURFACING PLAN
PROJECT: AFE #1491292100 LINE 3 REPLACEMENT (LINE 93)
SCALE: 1"=30' DATE: 11/20/14 DRAWN: LHB/JPH
CHECK: LHB/AFB APPR: LHB/DGS DATE: 11/20/14
APPR: TM
APPR: –
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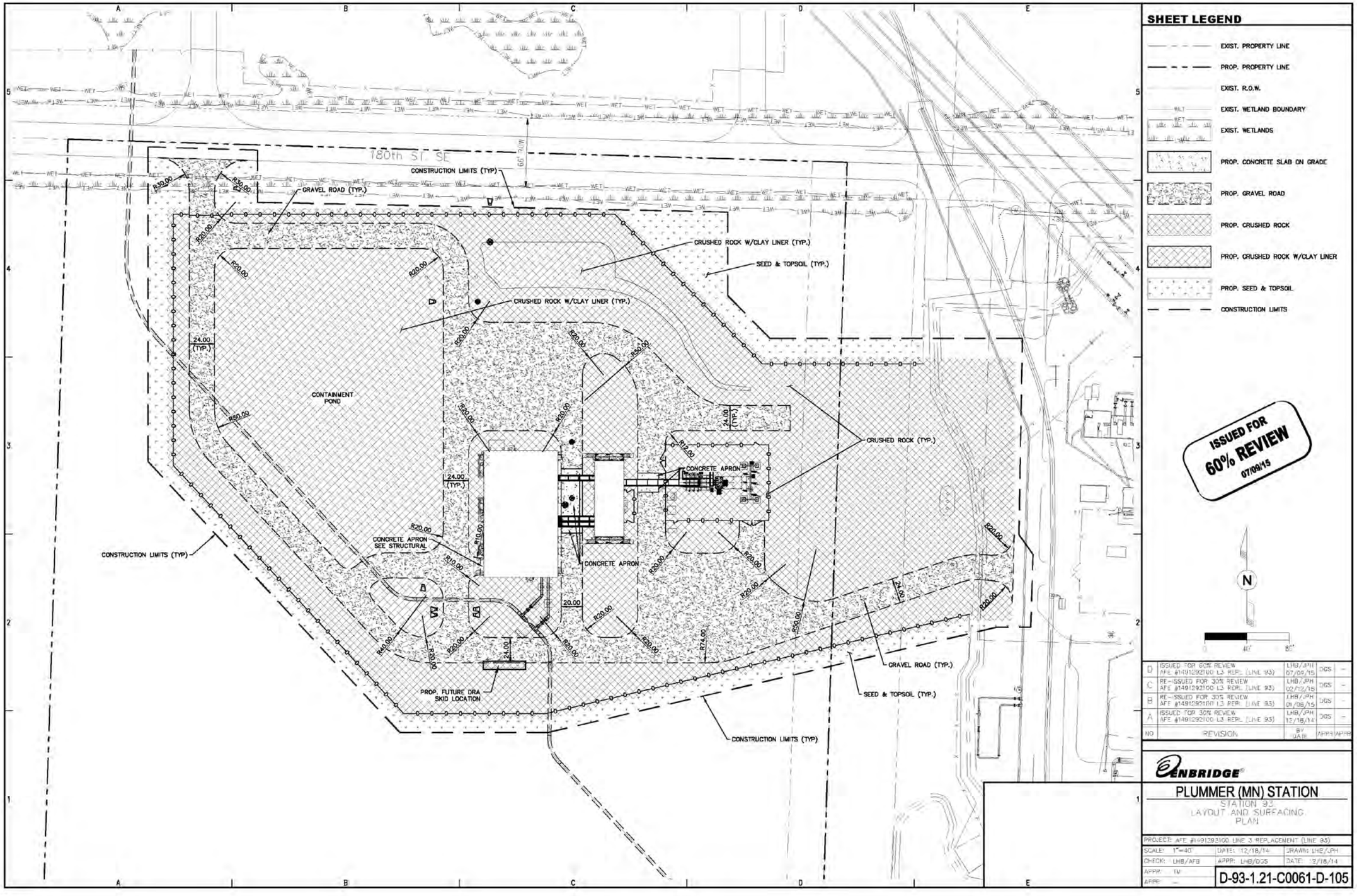

SHEET LEGEND

- EXIST. PROPERTY LINE
- PROP. PROPERTY LINE
- EXIST. R.O.W.
- EXIST. WETLAND BOUNDARY
- EXIST. WETLANDS
- PROP. CONCRETE SLAB ON GRADE
- PROP. GRAVEL ROAD
- PROP. CRUSHED ROCK
- PROP. CRUSHED ROCK W/CLAY LINER
- PROP. SEED & TOPSOIL
- CONSTRUCTION LIMITS

ISSUED FOR 60% REVIEW 07/09/15

N

0 40' 80'

NO	REVISION	BY / DATE	APPR/APPR
D	ISSUED FOR 60% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 07/09/15	DGS –
C	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 02/02/15	DGS –
B	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 01/06/15	DGS –
A	ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 12/18/14	DGS –

ENBRIDGE

PLUMMER (MN) STATION

STATION 93
LAYOUT AND SURFACING PLAN

PROJECT: AFE #1491293100 LINE 3 REPLACEMENT (LINE 93)

SCALE: 1"=40'	DATE: 12/18/14	DRAWN: LHB/JPH
CHECK: LHB/AFB	APPR: LHB/DGS	DATE: 12/18/14
APPR: TM		
APPR: –		

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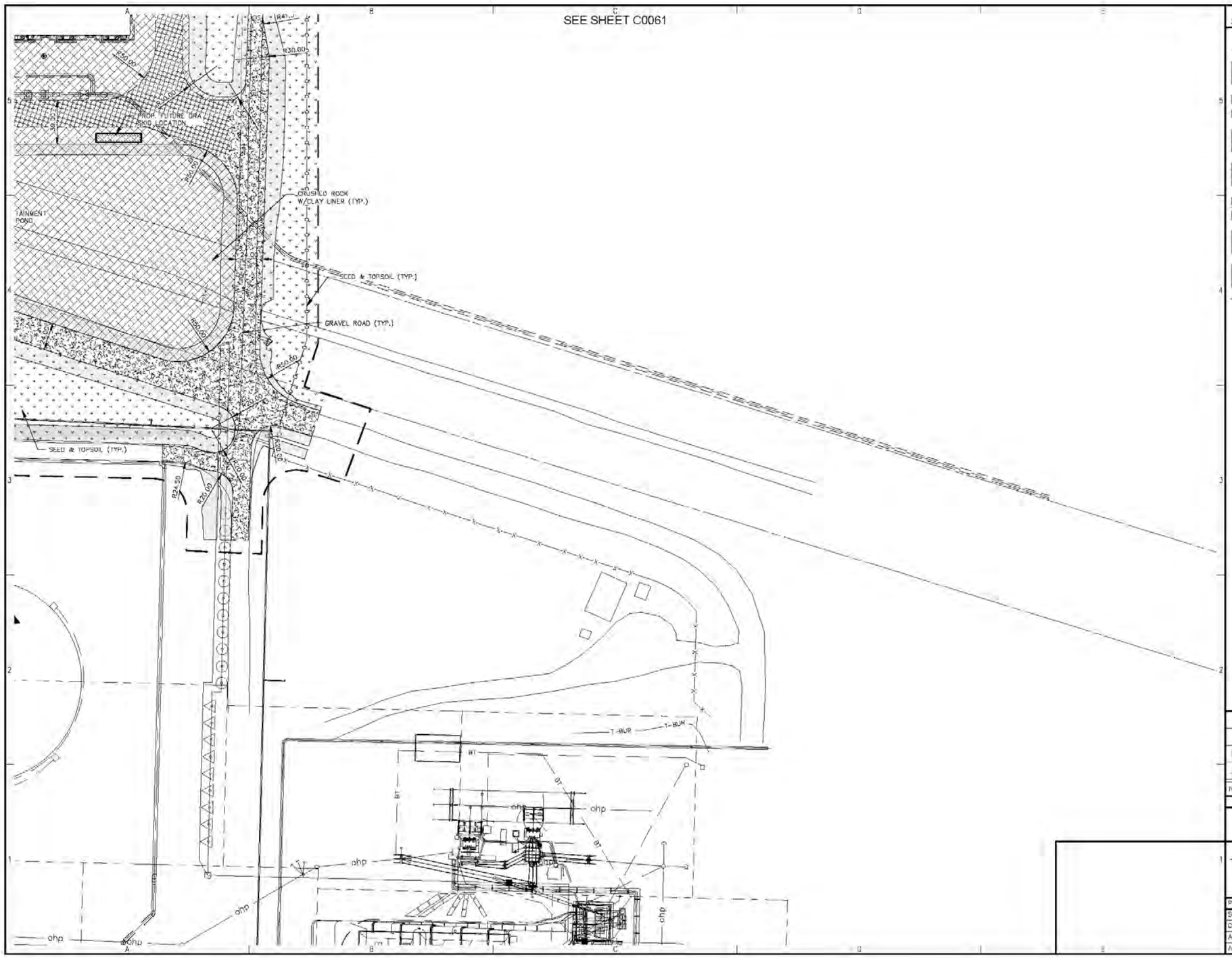


SHEET LEGEND

- EXIST. PROPERTY LINE
- PROP. CONCRETE SLAB ON GRADE
- PROP. GRAVEL ROAD
- PROP. CRUSHED ROCK
- PROP. CRUSHED ROCK W/CLAY LINER
- PROP. GRAVEL ROAD W/CLAY LINER
- PROP. SEED & TOPSOIL
- PROP. AREAS OF 3:1 OR GREATER SLOPE
- CONSTRUCTION LIMITS

ISSUED FOR 60% REVIEW 07/09/15

N

0 40' 80'

NO	REVISION	BY DATE	APPR	APPR
B	ISSUED FOR 60% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 07/09/15	DGS	–
A	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 02/12/15	DGS	–

ENBRIDGE

CLEARBROOK (MN) TERMINAL

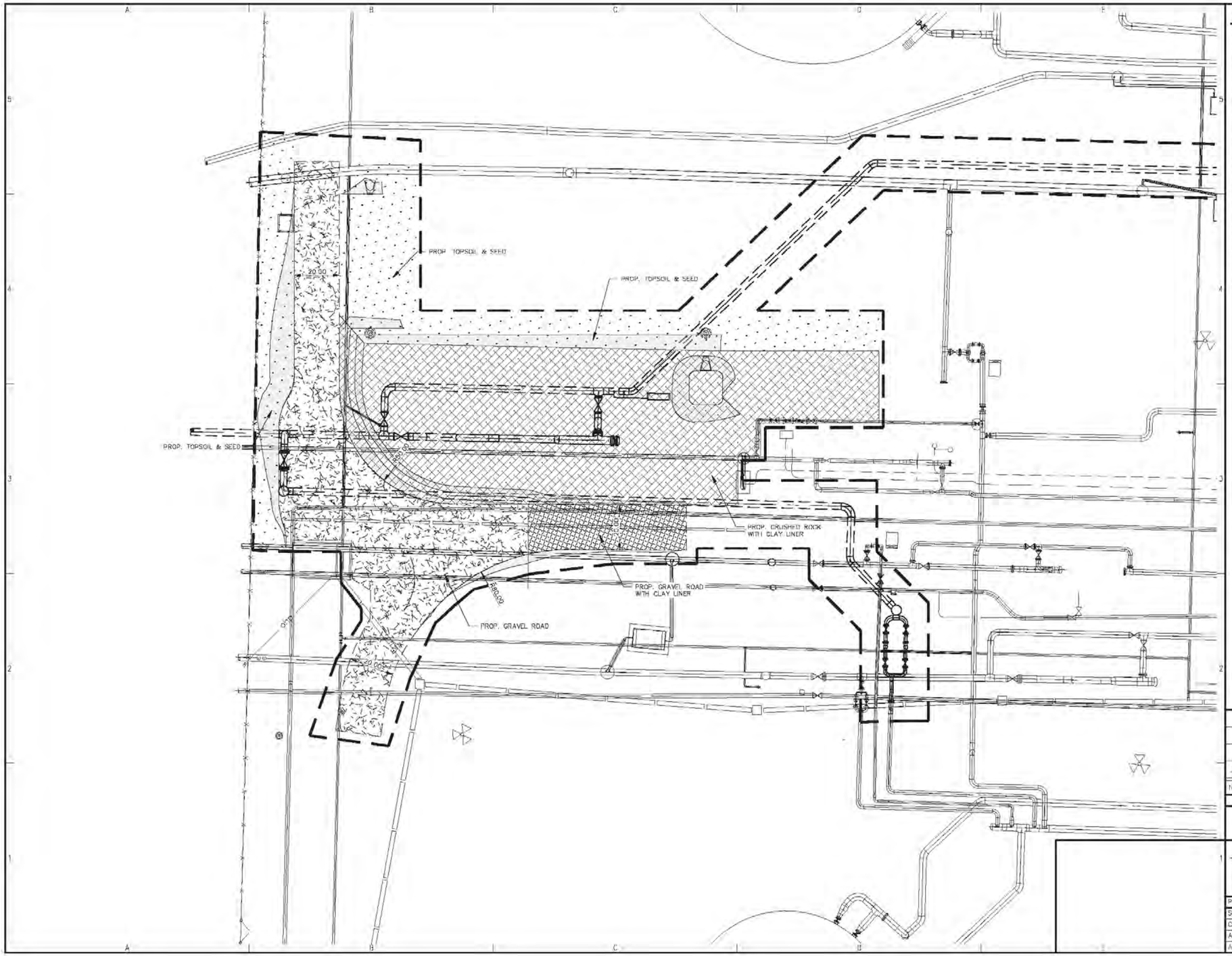
STATION 93

LAYOUT AND SURFACING PLAN

PLAN

PROJECT: AFE #1491292100 LINE 3 REPLACEMENT (LINE 93)

SCALE: 1"=40'	DATE: 02/12/15	DRAWN: LHB/JPH
CHECK: LHB/APH	APPR: LHB/DGS	DATE: 02/12/15
APPR: TM		
APPR:		D-93-1.21-C0062-B-110



SHEET LEGEND

- PROP. PROPERTY LINE
- EXIST. R.O.W.
- PROP. CONCRETE SLAB ON GRADE
- PROP. GRAVEL ROAD
- PROP. GRAVEL ROAD W/CLAY LINER
- PROP. AREA OF 3:1 OR GREATER SLOPE
- PROP. CRUSHED ROCK W/CLAY LINER
- PROP. SEED & TOPSOIL
- CONSTRUCTION LIMITS

ISSUED FOR 60% REVIEW 07/09/15

N

0 40' 80'

NO.	REVISION	BY DATE	APPR	APPR
A	ISSUED FOR BOS REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 07/09/15	DGS	-

ENBRIDGE

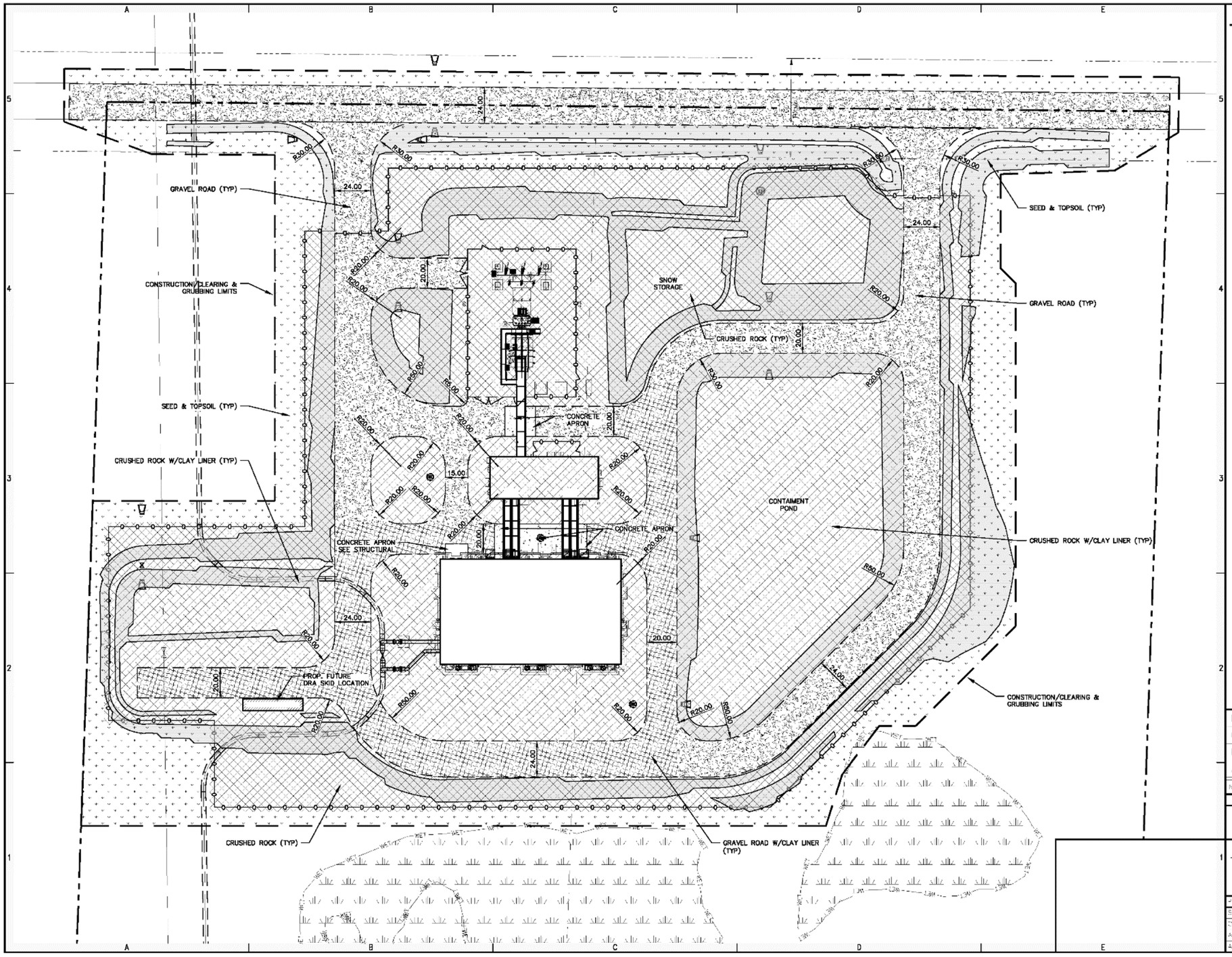
CLEARBROOK (MN) TERMINAL

MANIFOLD AREA PIPING LAYOUT AND SURFACING PLAN

PROJECT: AFE #1491292100 LINE 3 REPLACEMENT (LINE 93)

SCALE: 1"=40'	DATE: 07/09/15	DRAWN: DEAN
CHECK: AFB	APPR: RJS	DATE: 07/09/15
APPR: TM		
APPR: JWH		

D-1.21-C0031-A-110



SHEET LEGEND

- PROP. PROPERTY LINE
- EXIST. R.O.W.
- EXIST. WETLAND BOUNDARY
- EXIST. WETLANDS
- PROP. CONCRETE SLAB ON GRADE
- PROP. GRAVEL ROAD
- PROP. CRUSHED ROCK
- PROP. CRUSHED ROCK W/CLAY LINER
- PROP. GRAVEL ROAD W/CLAY LINER
- PROP. SEED & TOPSOIL
- CONSTRUCTION LIMITS

ISSUED FOR 60% REVIEW 07/09/15

N

0 30' 60'

NO	REVISION	BY DATE	APPR	APPR
D	ISSUED FOR 60% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 07/09/15	DGS	–
C	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 04/10/15	DGS	–
B	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 01/06/15	DGS	
A	ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 12/11/14	DGS	–

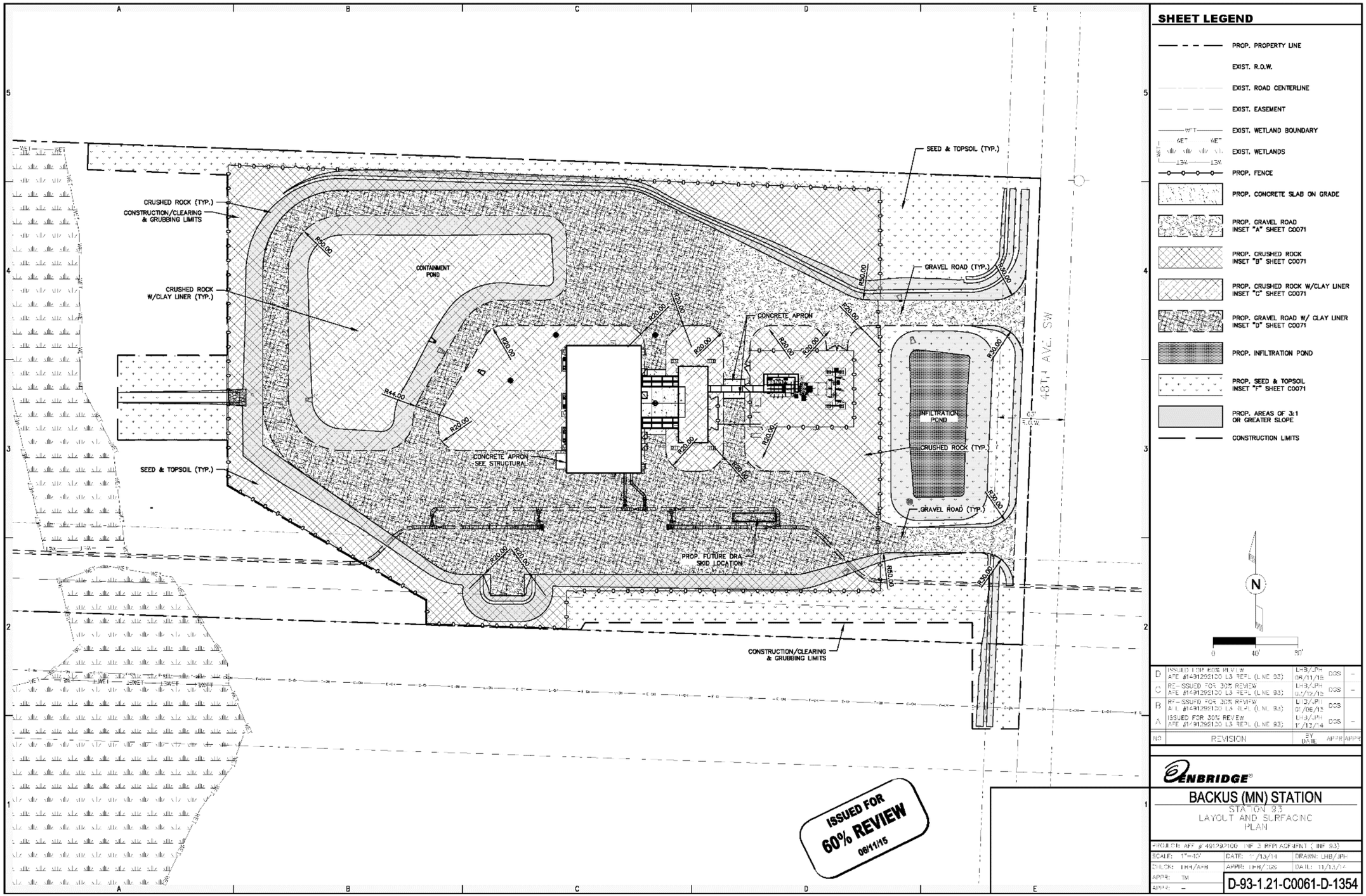
ENBRIDGE

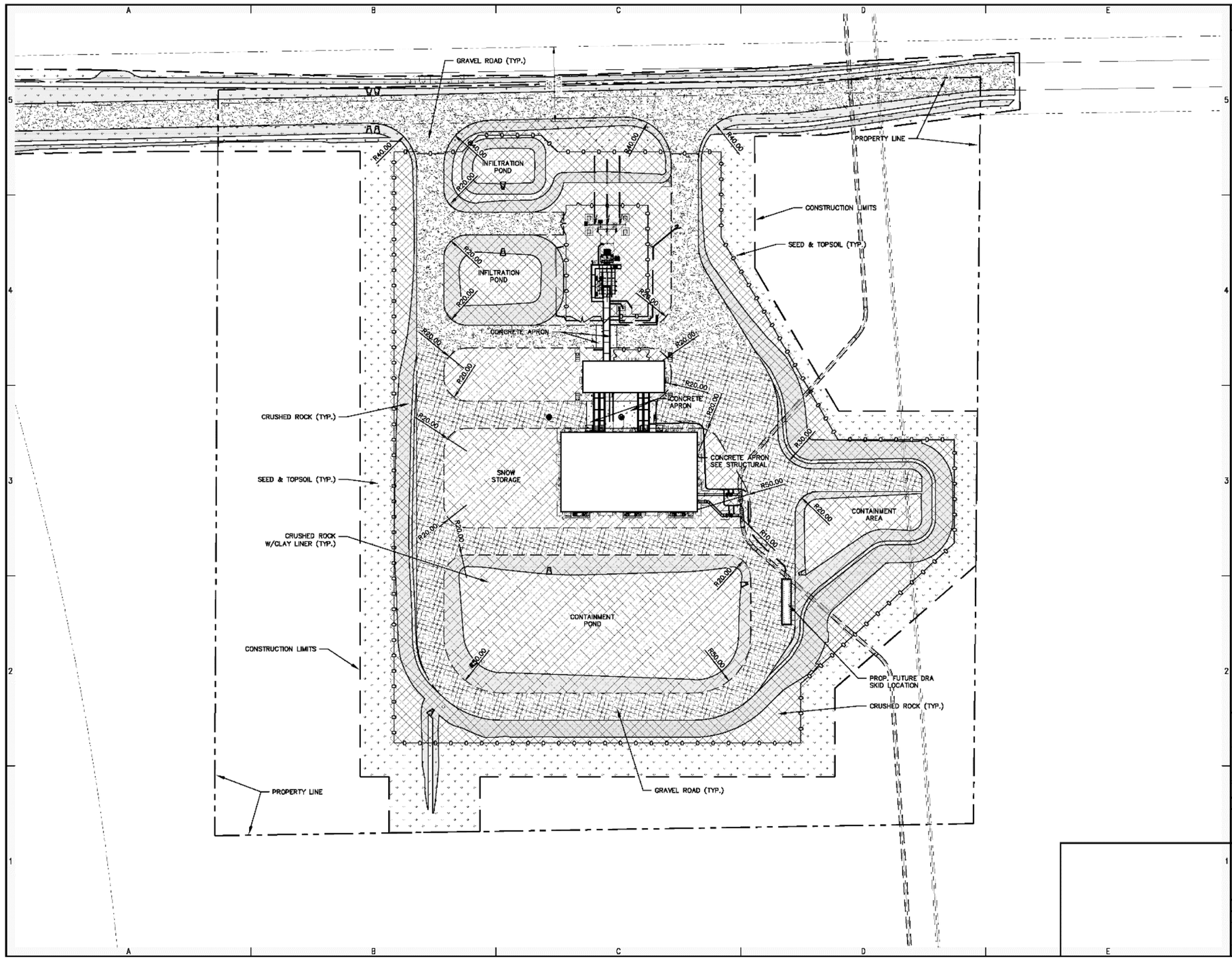
TWO INLETS (MN) STATION

STATION 93
LAYOUT AND SURFACING PLAN
PLAN

PROJECT: AFE # 1491292100 LINE 3 REPLACEMENT (LINE 93)

SCALE: 1"=30'	DATE: 12/11/14	DRAWN: LHB/JPH
CHECK: TEH/AHB	APPR: TEH/DGS	DATE: 12/11/14
APPR: TM		
APPR: –		D-93-1.21-C0061-D-1352


CRUSHED ROCK (TYP.)
CONSTRUCTION/CLEARING & GRUBBING LIMITS
CRUSHED ROCK W/CLAY LINER (TYP.)
CONTAINMENT POND
SEED & TOPSOIL (TYP.)
GRAVEL ROAD (TYP.)
CONCRETE APRON
CONCRETE APRON SEE STRUCTURAL
INFILTRATION POND
CRUSHED ROCK (TYP.)
GRAVEL ROAD (TYP.)
48TH AVE. SW
PROP. FUTURE DRA. SKID LOCATION
CONSTRUCTION/CLEARING & GRUBBING LIMITS
ISSUED FOR 60% REVIEW 06/11/15
SHEET LEGEND
PROP. PROPERTY LINE
EXIST. R.O.W.
EXIST. ROAD CENTERLINE
EXIST. EASEMENT
EXIST. WETLAND BOUNDARY
EXIST. WETLANDS
PROP. FENCE
PROP. CONCRETE SLAB ON GRADE
PROP. GRAVEL ROAD INSET "A" SHEET C0071
PROP. CRUSHED ROCK INSET "B" SHEET C0071
PROP. CRUSHED ROCK W/CLAY LINER INSET "C" SHEET C0071
PROP. GRAVEL ROAD W/ CLAY LINER INSET "D" SHEET C0071
PROP. INFILTRATION POND
PROP. SEED & TOPSOIL INSET "F" SHEET C0071
PROP. AREAS OF 3:1 OR GREATER SLOPE
CONSTRUCTION LIMITS
N
0
40'
80'
D ISSUED FOR 60% REVIEW AFE #1491292100 L3 REPL (LINE 93) LHB/JPH 06/11/15 DGS –
C RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93) LHB/JPH 01/12/15 DGS –
B RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93) LHB/JPH 07/06/15 DGS –
A ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93) LHB/JPH 12/12/14 DGS –
NO. REVISION BY DATE APPR. APPR.
ENBRIDGE
BACKUS (MN) STATION
STATION 93
LAYOUT AND SURFACING PLAN
PROJECT: AFE # 1491292100 LINE 3 REPLACEMENT (LINE 93)
SCALE: 1"=40'
DATE: 11/13/14
DRAWN: LHB/JPH
DESIGN: LHB/AHB
APPR: LHB/DGS
DATE: 11/13/14
APPR: TM
APPR: –
D-93-1.21-C0061-D-1354



SHEET LEGEND

- PROP. PROPERTY LINE
- EXIST. R.O.W.
- PROP. CONCRETE SLAB ON GRADE
- PROP. GRAVEL ROAD
- PROP. GRAVEL ROAD W/CLAY LINER
- PROP. CRUSHED ROCK
- PROP. CRUSHED ROCK W/CLAY LINER
- PROP. SEED & TOPSOIL
- CONSTRUCTION LIMITS

ISSUED FOR 60% REVIEW 07/09/15

N

0 40' 80'

NO	REVISION	BY DATE	APPR	APP'D
D	ISSUED FOR 60% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 07/29/15	DGS	–
C	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 04/12/15	DGS	–
B	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 01/06/15	DGS	
A	ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 12/18/14	DGS	–

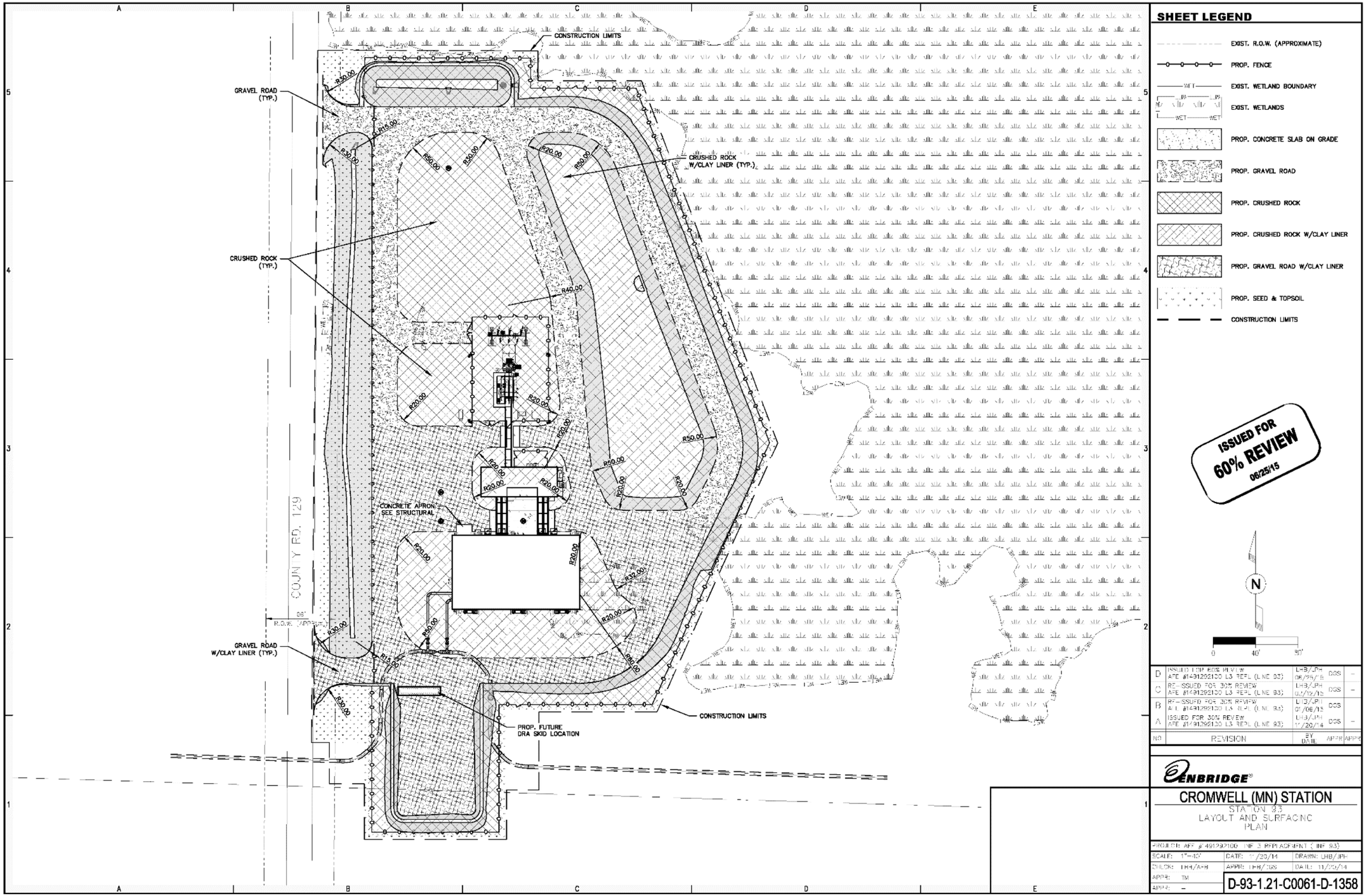
ENBRIDGE

PALISADE (MN) STATION

STATION 83
LAYOUT AND SURFACING PLAN

PROJECT: AFE #1491292100 - LINE 3 REPLACEMENT (LINE 93)

SCALE: 1"=40'	DATE: 12/18/14	DRAWN: LHB/JPH
CHKD: LHB/A-B	APPR: LHB/DGS	DATE: 12/18/14
APPR: TM		D-93-1.21-C0061-D-1356
APPR: –		



SHEET LEGEND

- EXIST. R.O.W. (APPROXIMATE)
- PROP. FENCE
- EXIST. WETLAND BOUNDARY
- EXIST. WETLANDS
- PROP. CONCRETE SLAB ON GRADE
- PROP. GRAVEL ROAD
- PROP. CRUSHED ROCK
- PROP. CRUSHED ROCK W/CLAY LINER
- PROP. GRAVEL ROAD W/CLAY LINER
- PROP. SEED & TOPSOIL
- CONSTRUCTION LIMITS

ISSUED FOR 60% REVIEW 06/25/15

N

0 40' 80'

NO	REVISION	BY DATE	CHKD	APPR
D	ISSUED FOR 60% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 06/25/15	DGS	–
C	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 01/12/15	DGS	–
B	RE-ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 01/06/15	DGS	
A	ISSUED FOR 30% REVIEW AFE #1491292100 L3 REPL (LINE 93)	LHB/JPH 11/20/14	DGS	–

ENBRIDGE

CROMWELL (MN) STATION

STATION 93
LAYOUT AND SURFACING PLAN

PROJECT: AFE # 491292100 LINE 3 REPLACEMENT (LINE 93)

SCALE: 1"=40'	DATE: 11/20/14	DRAWN: LHB/JPH
CHECK: LHB/AHB	APPR: LHB/DGS	DATE: 11/20/14
APPR: TM		
APPR: –		

D-93-1.21-C0061-D-1358

6. Project Description:

a. Provide the brief project summary to be published in the *EQB Monitor,* (approximately 50 words).

PROJECT SUMMARY

L3R is a replacement project required by the condition of the existing Line 3. Construction of the replacement would consist of a new pipeline and associated facilities[8] in place of Enbridge's existing Line 3 pipeline, which currently transports crude oil from the Joliette Valve in Pembina County, North Dakota to Clearbrook, Minnesota, and then on to an existing terminal in Superior, Wisconsin. The L3R route[9] is approximately 363 miles long, 337 of which are in Minnesota. L3R would include a new pump station and improvements at the existing Clearbrook Terminal, expansion of other existing pump stations west of Clearbrook, and the addition of four new pump stations in Minnesota east of Clearbrook.

b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

EIS SCOPING DOCUMENTS

The information and data analysis presented in this Scoping EAW are for the applicant's preferred alternative. Other alternatives will also be considered as part of the EIS scoping process. All projects requiring an EIS must have an EAW filed with the RGU. The EAW shall be the basis for the scoping process. (MN Rule pt. 4410.2100). The Scoping EAW is a companion document to the Draft Scoping Decision Document (DSDD). The DSDD will identify alternatives to the proposed project, a tentative schedule, a proposed outline for the EIS, and impacts of any alternatives to be addressed in the EIS.

PROJECT DESCRIPTION

L3R consists of approximately 363 miles of new 36-inch diameter pipeline, traversing the states of North Dakota, Minnesota, and Wisconsin and terminating at the existing Enbridge Superior station and terminal facility near Superior, Wisconsin. L3R would entail construction and operation of the following infrastructure in Minnesota:

Pipeline

Approximately 337.1 miles of new 36-inch diameter, underground crude oil (light, medium, and heavy crude) pipeline would be constructed along the L3R route between the North Dakota/Minnesota border and the Minnesota/Wisconsin border. The increased diameter from the current 34-inch diameter pipeline would restore the line to its historic intended operating

[8] Associated facilities: Associated facilities are those components of a pipeline system, other than the physical pipeline itself, needed to transport product in the pipeline or construct, operate, or maintain the system. For the purpose of this application, associated facilities are defined as the Clearbrook Terminal, pump stations, mainline valves, cathodic protection systems, pipe/material storage yards, contractor yards, and access roads.

[9] L3R route: The L3R route refers to the L3R pipeline and construction workspace, inclusive of ATWS and the permanent ROW.

capacity of 760,000 barrels per day (bpd) from its current capacity of 390,000 bpd. The L3R route would cross portions of Kittson, Marshall, Pennington, Red Lake, Polk, Clearwater, Hubbard, Wadena, Cass, Crow Wing, Aitkin, and Carlton counties. Table 6b-1 summarizes the length of pipeline in each county.

Table 6b-1
Location and Length of the Line 3 Replacement Project in Minnesota

County	Milepost ("MP") Range [a]	Pipeline Length (miles)
Kittson	801.8 – 816.9	15.3
Marshall	816.9 – 851.7	35.3
Pennington	851.7 – 871.4	19.7
Red Lake	871.4 – 886.9	15.7
Polk	886.9 – 900.5	14.0
Clearwater	900.5 – 943.3	42.6
Hubbard	943.3 – 987.8	44.5
Wadena	987.8 – 994.9	7.1
Cass [b]	994.9 – 1016.3	21.4
	1021.1 – 1047.2	26.1
Crow Wing	1016.3 – 1021.1	4.8
Aitkin	1047.2 – 1098.1	50.9
Carlton	1098.1 – 1137.7	39.7
	Total [c]	**337.1**

[a] MPs are used for reference and are not a true representation of linear distances.

[b] Two MP ranges are presented for Cass County as the route exits Cass County into Crow Wing County before entering Cass County again.

[c] The sum of addends may not total due to rounding.

West of Clearbrook, the L3R route would generally follow the existing Enbridge Mainline Corridor and would be installed approximately 25 feet from the existing Line 67 pipeline. East of Clearbrook, the L3R would generally follow NDPC's proposed SPP route and other existing third-party pipelines, electric transmission corridors, and transportation corridors. For much of the route east of Clearbrook, L3R would be installed approximately 25 to 40 feet away from the SPP pipeline.

Associated Facilities

Clearbrook Terminal Expansion

As part of L3R, Enbridge would modify equipment within the existing Clearbrook Terminal as well as construct a new pump station located near MP 909.4 in Clearwater County, Minnesota. Improvements at the existing Enbridge Clearbrook Terminal include:

- A new pump station, including four 7,000 horsepower ("HP") motor and pump units, two 7,000 HP variable frequency drives[10], valves, sump[11] and crude oil reinjection pump,

[10] Variable frequency drive: A variable frequency drive is a set of equipment that provides a means of adjusting the speed of a mechanical load coupled to a motor.

metering, instrumentation and monitoring equipment, and associated electrical facilities including a substation with redundant utility transformers and breakers. A 36-inch pipeline inspection gauge ("PIG") launcher[12], pump station to terminal interconnections[13] and associated terminal piping[14];

- A 36-inch PIG receiver, valves, pressure relief system, metering, instrumentation and monitoring equipment, terminal piping, manifold interconnections[15], and associated electrical facilities; and
- A 16-inch meter manifold run would be added to the existing meter manifold 152 with associated valves, interconnections, piping, instrumentation, electrical facilities, and sample system.

Pump Stations

As described in Table 6b-2, Enbridge would construct three new pumps adjacent to existing pump stations west of Clearbrook, and a new pump station at the Clearbrook Terminal. The four new pump station sites would be located east of Clearbrook. Mainline valves, metering, monitoring equipment, and associated electrical facilities would also be installed at all facilities. In addition, Enbridge would install new PIG launcher and receiver traps at the Backus Pump Station.

Table 6b-2
Line 3 Replacement Project Minnesota Pump Stations

County	Facility	MP	Description
WEST OF CLEARBROOK			
Kittson	Donaldson	814.5	Expansion of pump capacity at existing Donaldson Pump Station
Marshall	Viking	848.2	Expansion of pump capacity at existing Viking Pump Station
Red Lake	Plummer	877.0	Expansion of pump capacity at existing Plummer Pump Station
Clearwater	Clearbrook Terminal	909.4	Installation of terminal connectivity, the new Clearbrook Pump Station, PIG receiver and launcher traps, and injection from existing tanks 61, 62, 63 and 64
EAST OF CLEARBROOK			
Hubbard	Two Inlets	956.6	New Pump Station
Cass	Backus	1007.1	New Pump Station and PIG receiver and launcher traps
Aitkin	Palisade	1061.7	New Pump Station
Carlton	Cromwell	1106.4	New Pump Station

Mainline Valves

Valves are placed along the pipeline to protect populated areas, major waterbody crossings, drinking water sources, and environmentally sensitive areas. A valve is a remotely controlled shutoff mechanism that would be used to isolate a segment of pipeline in the rare case of a leak. To determine the optimal valve locations, Enbridge completes an Intelligent Valve

[11] Sump: A sump is a buried tank used for containing product drained out of the system during maintenance activities or pressure relief.
[12] PIG receiver and launcher traps: A PIG is an inspection tool that is inserted into the pipeline to inspect the inside of the pipeline. The tools are propelled through the pipeline by the flow of the pipeline. The tools are inserted into and retrieved from the pipeline at aboveground receiver and launcher traps.
[13] Interconnection: An interconnection is the location where one pipeline system connects to another pipeline system.
[14] Terminal piping: Terminal piping is above- and belowground pipe at a terminal site.
[15] Manifold interconnection: A manifold interconnection is a collection of valves and interconnects that enable product to flow to and from tanks.

Placement ("IVP")[16] analysis. At each valve location, Enbridge proposes to install the following equipment:

- A slide gate valve that would be remotely controlled from the Enbridge Control Center ("Control Center") and that can be operated manually as well;
- digital pressure and temperature monitoring devices that would provide real time pressure and temperature information to the Control Center; and
- associated electrical and communications equipment required to control the valve and communicate pressure and temperature information to the Control Center.

Based on the IVP analysis and current design, Enbridge proposes to install remotely-controlled shutoff valves at the following locations relative to downstream waterbodies in Minnesota (Table 6b-3):

Table 6b-3
Waterbodies Downstream from Mainline Valves on the Line 3 Replacement Project

County	MP	Downstream Waterbody	Waterbody Type	Distance from Upstream Valve (miles)
Kittson	805.7 (New)	Unnamed Ditch	Ditch/Canal	4.3
	805.7 (Existing)	Unnamed Stream	Intermittent Stream	1.7
Marshall	829.3	Unnamed Stream	Intermittent Stream	1.7
	836.5	Red Lake River	Artificial Path	0.2
Pennington	864.1	Unnamed Stream	Intermittent Stream	1.9
	865.1	Unnamed Ditch	Ditch/Canal	1.0
Polk	892.5	Unnamed Stream	Intermittent Stream	0.5
Clearwater	920.7	Unnamed Stream	Intermittent Stream	0.5
	937.1	Bear Creek	Perennial Stream	0.4
	939.8	Unnamed Stream	Intermittent Stream	2.5
Hubbard	946.3	Unnamed Stream	Intermittent Stream	12.2
	956.6	Unnamed Stream	Intermittent Stream	2.1
	966.6	Straight River	Artificial Path	4.7
	979.3	Shell River	Artificial Path	1.8
Cass	999.9	Unnamed Ditch	Ditch/Canal	0.2
	1007.1	Pine River	Artificial Path	7.5
	1034.5	Daggett Brook	Perennial Stream	0.2
Aitkin	1061.7	White Elk Creek	Intermittent Stream	2.3
	1069.8	Mississippi River	Artificial Path	0.2
	1070.5	Unnamed Ditch	Canal/Ditch	1.0
	1078.7	Sandy River	Artificial Path	0.5
	1084.4	Sandy River	Canal/Ditch	1.7
Carlton	1132.9	Unnamed Stream	Intermittent Stream	0.8

[16] IVP: IVP is a method by which a pipeline company determines the most effective placement of valves on its pipeline. The method identifies optimal valve locations for protecting populated areas, major waterbody crossings, drinking water sources, and environmentally sensitive areas in the event of a pipeline release.

Cathodic Protection

Cathodic protection systems are installed along buried pipelines to mitigate the threat of external corrosion on pipelines. Enbridge proposes to install cathodic protection and alternating current/direct current mitigation[17] to protect the pipeline from the corrosive effects of soil and co-located utilities. To determine the cathodic protection necessary, Enbridge studied the utilities (specifically powerlines) that would be co-located with L3R in Minnesota to determine their effect on the pipeline. The Environmental Impact Statement ("EIS") will address modeling for both alternating current and direct current mitigation requirements to determine what equipment would be required.

Pipe/Material Storage Yards and Contractor Yards

Enbridge would temporarily use off-right-of-way ("ROW") areas for pipe and material storage and to receive rail deliveries (rail sidings). In addition, construction contractors would require off-ROW contractor yards to park equipment and stage construction activities. Enbridge has identified several pipeyards[18] and rail sidings[19] necessary for construction. Contractor yards would be identified as planning and engineering progresses; therefore, the impacts associated with contractor yards are unknown at this time.

Enbridge has considered sensitive environmental features when planning the placement of pipeyards. The use of pipeyards would result in no impact to sensitive environmental features. The yards are leased sites that would be restored upon the completion of L3R. Locations of pipeyards and rail sidings are presented in Table 6b-4. As discussed in Section 8, pipeyards permits are currently under review, additional information will be available in other documents.

Table 6b-4
Pipeyards and Rail Sidings Used for the Line 3 Replacement Project

County	Facility (number)	Current Use
Polk	Rail Siding (1)	Railroad
Hubbard	Rail Siding (1)	Railroad
	Pipeyard (1)	Cultivated agricultural land
Cass	Pipeyard (1)	Cultivated agricultural land
Carlton	Rail Siding (1)	Railroad
	Pipeyard (1)	Cultivated agricultural land
Red Lake	Pipeyard (1)	Cultivated agricultural land
Kittson	Pipeyard (1)	Agricultural land
	Rail Siding (1)	Railroad
Beltrami	Pipeyard (1)	Existing Contractor Laydown Yard

[17] Alternating current/direct current mitigation: Alternating current and direct current mitigation is a means of protecting the pipeline and its cathodic protection system from electromagnetic-induced voltage and stray current from nearby electric powerlines.
[18] Pipeyard: A pipeyard is a large tract of land near the pipeline ROW that is used to store pipe and other materials.
[19] Rail sidings: A rail siding is a tract of land adjacent to a railroad where pipeline and other materials are off-loaded from trains.

Access Roads

Public roads would typically be used to gain access to the construction workspace where the public roads cross the ROW. In areas where public roads are limited, existing privately-owned roads may be used. If public or privately-owned roads are not available, Enbridge may need to construct new access roads. Prior to use of private access roads, modifications to existing non-private roads, and construction of new access roads, Enbridge would obtain landowner permission, conduct environmental surveys, and obtain applicable environmental permits and clearances. Permanent access roads would be constructed to each mainline valve.

Existing Line 3 Deactivation

As discussed in Section 8.0 of the Routing Permit Application submitted to Minnesota Public Utilities Commission ("MPUC") in April 2015, once L3R is placed into service, Enbridge plans to permanently remove the existing Line 3 pipeline from service. Generally, this would involve:

- safely disconnecting Line 3 from all operating facilities such as pump stations and terminals;
- purging Line 3 of all combustibles;
- sealing the ends of the pipeline segments left in place; and
- filing a report with Pipeline & Hazardous Materials Safety Administration ("PHMSA") to identify where the pipeline is abandoned wherever it crosses over, under or through a commercially navigable waterway.

The process by which the existing Line 3 pipeline would be permanently taken out of service would adhere to all applicable statutes, rules, and regulations, and would ensure the protection of the public, the environment, current land use, adjacent Enbridge pipelines, and third-party utilities (see Appendix C) from the deactivation process and the deactivated pipeline. To achieve this goal, Enbridge would follow applicable rules, as well as minimize how much soil is disturbed. Following deactivation, Enbridge would continue to monitor the existing ROW. Monitoring would include patrolling and monitoring surface conditions, mowing brush, maintaining signage, reporting the pipeline in the one-call system, and retaining the pipeline within Enbridge's emergency response protocols.

Enbridge would permanently take the existing Line 3 out of service once L3R goes into service. The timing of the existing Line 3's disposition is dependent upon the permitting of L3R, its eventual construction, and placement of the entire pipeline into service.

Transmission Lines to Pump Stations

Enbridge requested electric service for the L3R pump stations east of Clearbrook, which include the Two Inlets, Backus, Palisade, and Crowell pump stations, from Great River Energy, in partnership with its member retail distribution cooperatives. A description of each of the proposed electric service projects and their permitting status is provided below:

Land Requirements

The following sections present the land requirements for the L3R pipeline and associated facilities, which include the expansion at the Clearbrook Terminal, pump stations, mainline valves, cathodic protection, and access roads. The total land requirements for the construction and operation of the L3R are 5,330.1 acres and 2,084.2 acres, respectively.

Pipeline

Construction Workspace and Permanent ROW

The 750-foot-wide route width would encompass the L3R construction workspace (including ATWS), Clearbrook West Terminal expansion, expansion of existing pump stations, construction of new pumpstations (Table 6b-2), mainline valves, and cathodic protection systems. Construction of L3R would generally require a 120-foot-wide construction workspace[20] in uplands[21]. This 120-foot-wide construction workspace would allow for temporary storage of topsoil and spoil, as well as accommodate safe operation of construction equipment. Enbridge would generally use a 95-foot-wide construction workspace in wetland areas. L3R would be co-located[22] with an existing Enbridge pipeline, the proposed SPP, or existing foreign utilities for 98.6 percent of the route. L3R would require the acquisition of up to 50 feet of permanent ROW and up to 70 feet of temporary workspace in uplands and 45 feet in wetlands, much of which would have been previously disturbed by SPP or other existing utility and transportation corridors. The permanent ROW would be completely located within the construction workspace. Table 6b-5 presents the typical construction workspace and permanent ROW dimensions that would be used for pipeline construction and operation in Minnesota.

Table 6b-5
Typical Construction Workspace and Permanent ROW Dimensions for the Line 3 Replacement Project

Route Segment	Permanent ROW (feet)	Temporary Construction Workspace (feet)	Total Land Requirements (feet)
North Dakota Border to Clearbrook – Co-located with existing Enbridge pipeline (Line 67)	50 (~25 new)	70 (upland)	120 (upland)
		45 (wetland)	95 (wetland)
Clearbrook to Wisconsin Border – Co-located with SPP	50	70 (upland)	120 (upland)
		45 (wetland)	95 (wetland)

West of Clearbrook, 15 feet of Enbridge's existing Line 67 permanent ROW would be utilized as temporary workspace, but would revert back to the Line 67 permanent ROW upon completion of construction (refer to Figure 6-1). Similarly east of Clearbrook, L3R would utilize the entire SPP permanent ROW (50 feet) as temporary workspace during construction. L3R would also share 25 feet of the SPP permanent ROW for a combined total permanent ROW width of 75 feet for both SPP and L3R.

During construction, topsoil would normally be placed on one side of the construction workspace, while the ditch spoil would be separated and located on the opposite side of the construction workspace. The working side (i.e., equipment work area and travel lane) would typically be 90-feet wide in uplands and 65-feet wide in wetlands.

[20] Workspace: The workspace is the area where construction activities are allowed. The main workspace area is sometimes referred to as the *construction workspace*, which consists of 1) the *permanent ROW* and 2) *temporary workspace*. The permanent ROW is the physical area that would be permanently maintained along the pipeline to facilitate the operation and maintenance of the system. The temporary workspace is located adjacent to and contiguous with the permanent ROW and is necessary to accommodate heavy construction equipment and large vehicles used during pipeline installation. The construction workspace can be further defined into three areas: the *trench* (area where the pipeline is placed); the *spoil side* (area where the soil removed from the trench is stored while the pipe is being placed); and the *working side* (area where equipment is staged and vehicles travel).

[21] Uplands: Uplands are defined as an elevated region of land lying above the level where water flows or collects in basins

[22]c Co-located: Co-located is any portion of the route that is within 250-feet from the centerline of a known utility.

Figures 6-1 and 6-2 present the temporary construction workspace and permanent ROW configurations west and east of Clearbrook in both upland and wetland conditions and when co-located with existing Enbridge pipelines. In addition, Figure 6-2 depicts how L3R would minimize construction impacts by sharing SPP construction workspace where co-located east of Clearbrook.

Figure 6-1a: L3R West of Clearbrook (Uplands – Co-located with Enbridge Line 67)

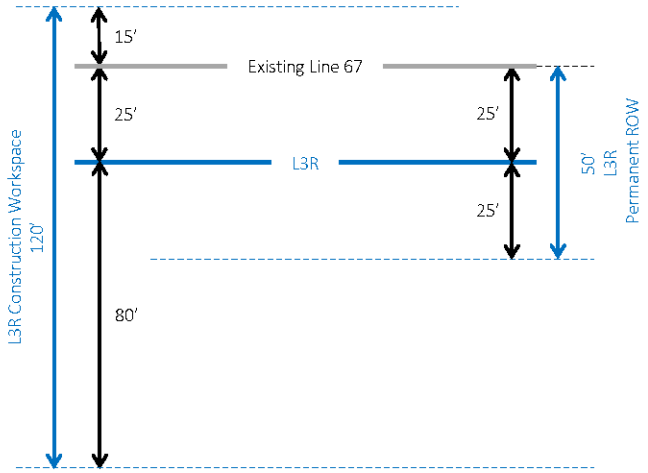


Figure 6-1b: L3R West of Clearbrook (Wetlands – Co-located with Enbridge Line 67)

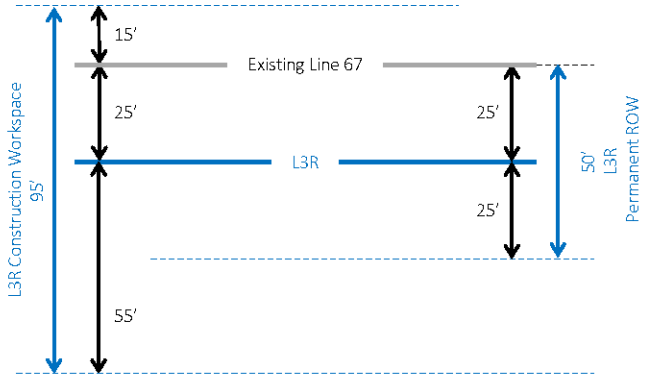


Figure 6-2a: L3R East of Clearbrook (Uplands – Greenfield)

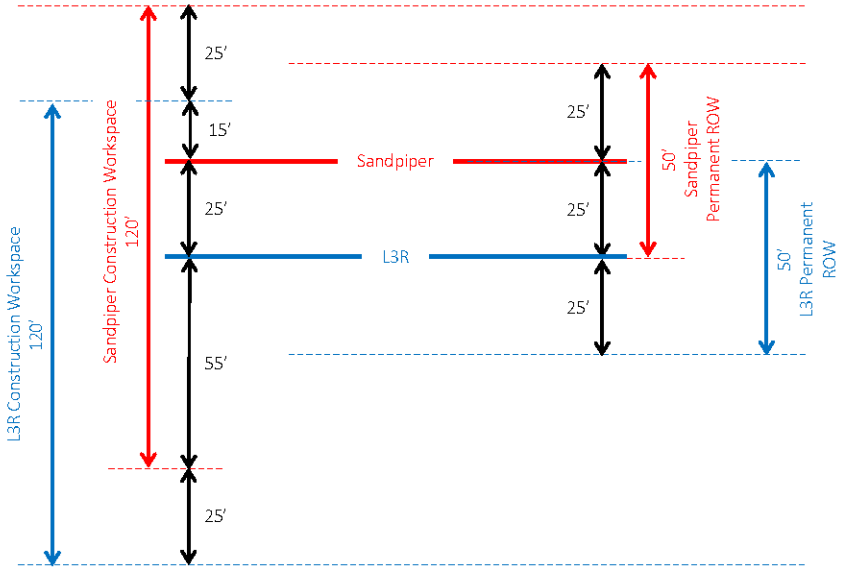


Figure 6-2b: L3R East of Clearbrook (Uplands – Co-located with Existing Third-Party Utility)

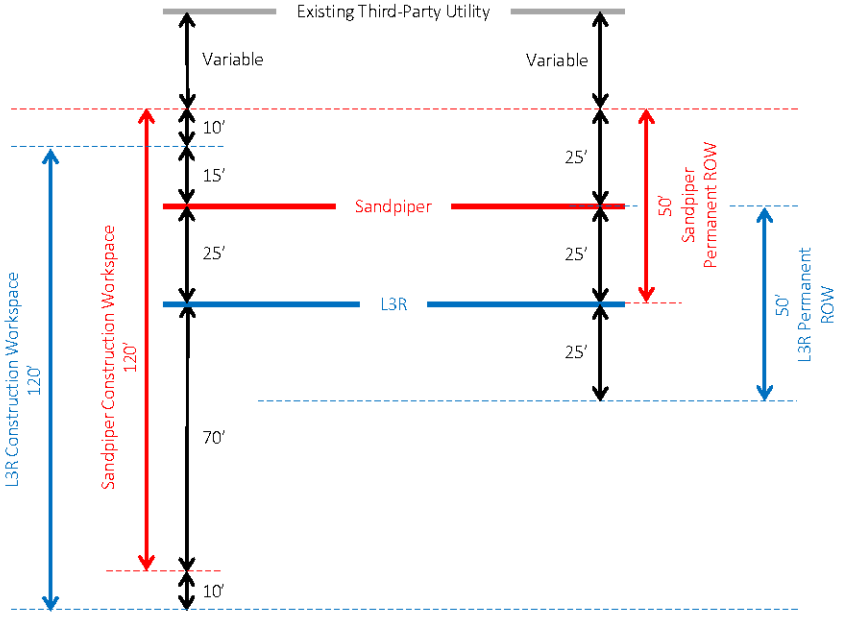


Figure 6-2c: L3R East of Clearbrook (Wetlands – Greenfield)

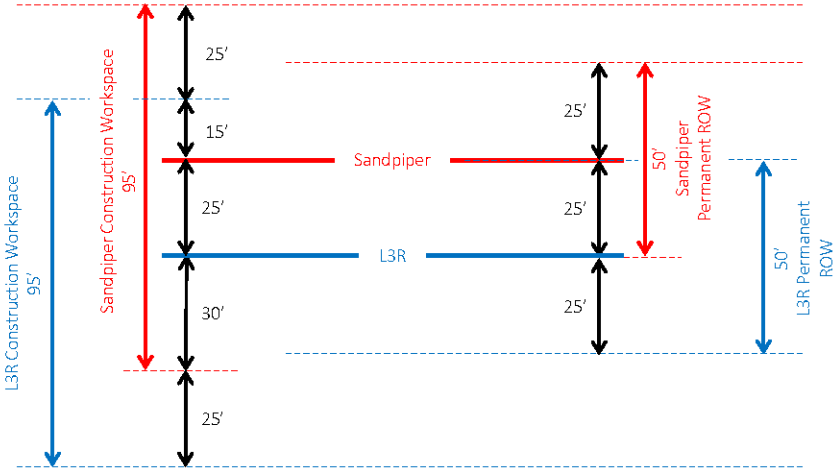


Figure 6-2d: L3R East of Clearbrook (Wetlands – Co-located with Existing Third-Party Utility)

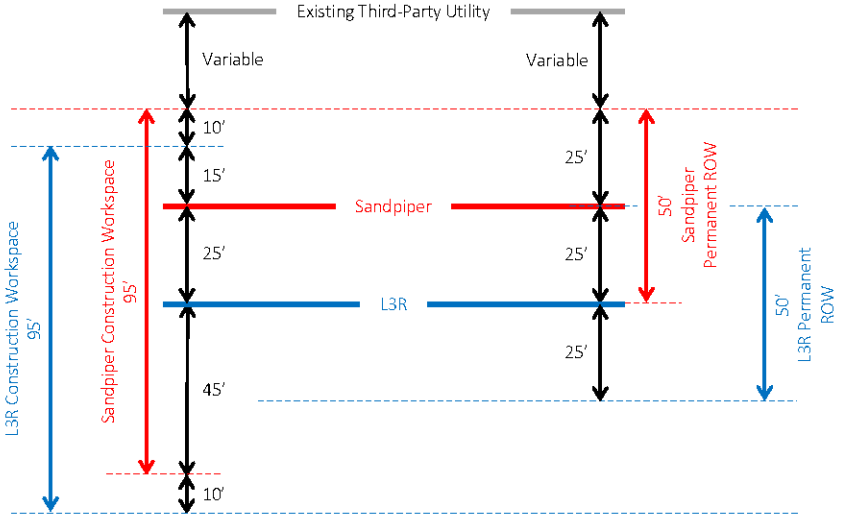


Figure 6-2e: L3R East of Clearbrook (Saturated Wetlands – Greenfield)

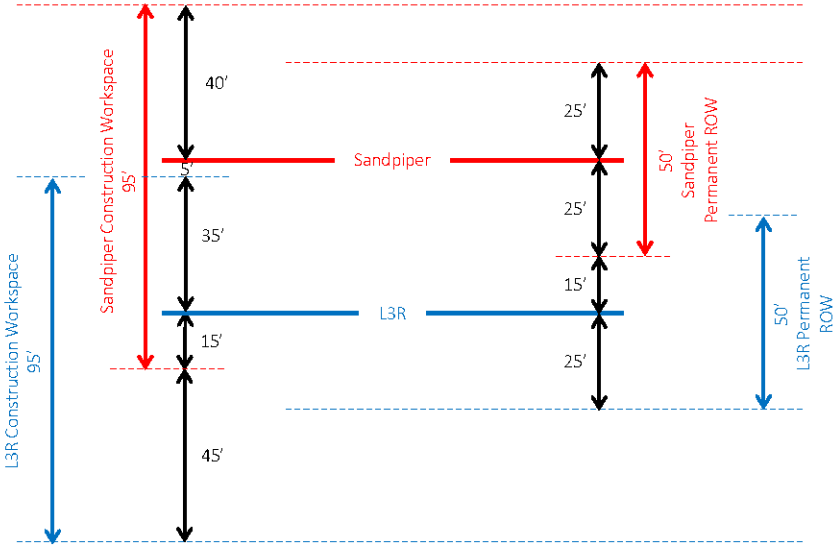
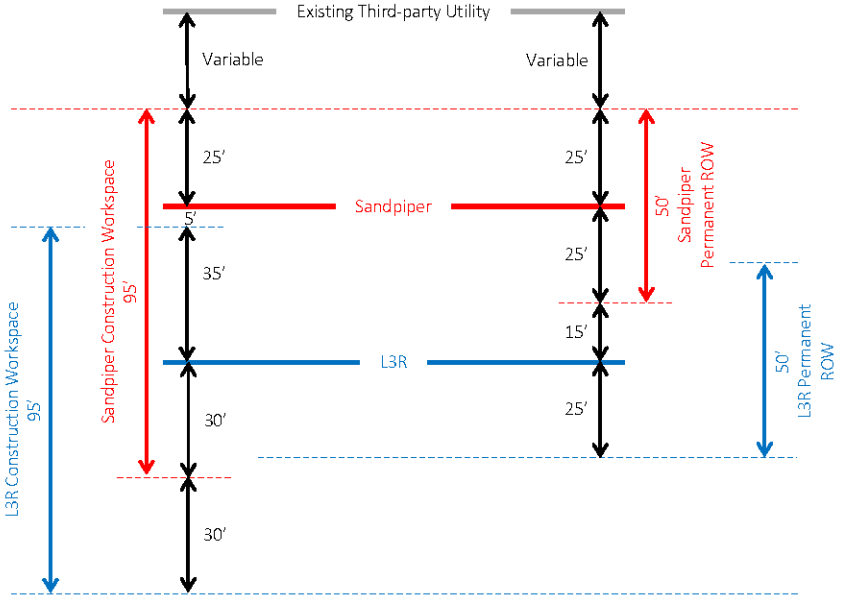


Figure 6-2f: L3R East of Clearbrook (Saturated Wetlands – Co-located with Existing Third-party Utility)



Additional Temporary Workspaces

Additional temporary workspace ("ATWS") [23] would be required outside of the typical 95- to 120-foot-wide construction workspace to facilitate specific aspects of construction. ATWS would include areas to stage equipment and hold spoil material, and would be in areas where construction methods would require additional workspace. For example, ATWS would be needed where the L3R route would cross features such as waterbodies, wetlands, roads, railroads, foreign pipelines and utilities, horizontal directional drill ("HDD") sites, and other special circumstances. Enbridge would also use ATWS to accommodate equipment and resources used for appropriating and discharging water. Dimensions of such ATWS would vary according to site-specific conditions. The EIS will include a description of planned water appropriation and discharge sites and the associated ATWS.

Table 6b-6 lists the typical dimensions of ATWS that would be used for pipeline construction.

Table 6b-6
Typical Dimensions of ATWS for the Line 3 Replacement Project

Feature	Approx. Dimensions On Each Side of Feature [a]
Open-cut Road Crossings	100 feet by 75 feet
Bored Road, Foreign Pipeline, and Utility Crossings	100 feet by 75 feet
Railroad Crossings	200 feet by 100 feet
Pipeline Cross-Unders	100 feet by 75 feet
Waterbody Crossings >50 feet wide	200 feet by 100 feet
Waterbody Crossings <50 feet wide	200 feet by 100 feet
HDD Waterbody Crossings	200 feet by 100 feet
Wetland Crossings	200 feet by 75 feet

[a] Areas are in addition to the 120-foot-wide or 95-foot-wide construction workspace.

Impacts from ATWS are assumed to be temporary; once construction has ended, Enbridge proposes to allow ATWS to revert to prior vegetation and use.

Based on the construction workspace and permanent ROW dimensions presented in Table 6b-5 and the dimensions of ATWS known at this time (Table 6b-6), the total land requirements for construction and operation of the L3R pipeline are 5,005.6 acres and 2,042.7 acres, respectively.

[23] ATWS: ATWS is typically a small piece of land (usually less than an acre) adjacent to the construction ROW used temporarily during construction to stage equipment near waterbody, wetland, road, railroad, and foreign utility crossings, steep slopes, and for specialized construction methods. Agreements are negotiated with affected landowners for use of the ATWS. ATWS is restored to its original land use following construction.

Associated Facilities

Clearbrook Terminal Expansion and Pump Stations

The Clearbrook Terminal would be expanded to accommodate a new pump station, terminal connectivity, PIG receiver and launcher traps, and injection from existing tanks 61, 62, 63 and 64, as described above. In addition, Enbridge would expand three existing pump stations and construct four new pump stations. Table 6b-7 presents the approximate location of these facilities along the L3R route and their associated permanent land requirements.

Table 6b-7
Land Requirements for Facilities for the Line 3 Replacement Project

County	Facility	MP	Permanent (acres)
Kittson	Donaldson Pump Station Expansion	814.5	6.9
Marshall	Viking Pump Station Expansion	848.2	7.3
Red Lake	Plummer Pump Station Expansion	877.0	7.6
Clearwater	Clearbrook Terminal Expansion	909.4	9.5
Hubbard	Two Inlets Pump Station	956.6	8.0
Cass	Backus Pump Station	1007.1	7.5
Aitkin	Palisade Pump Station	1061.7	7.8
Carlton	Cromwell Pump Station	1106.4	5.6
		Total [a]	**60.2**

[a] The sum of addends may not total due to rounding.

Mainline Valves

Table 6b-8 presents the permanent land requirements for each mainline valve. The footprints of all mainline valves would be located within the pipeline construction workspace; therefore the land requirements presented in Table 6b-8 have already been accounted for in the temporary land requirements identified for L3R pipeline's construction workspace. The mainline valves located east of L3R MP 912.3 (SPP MP 379.2) would be utilized for both L3R and SPP.

Table 6b-8
Land Requirements of Mainline Valves for the Line 3 Replacement Project

County	MP	Acres
Kittson	805.7 (New)	<0.1
	805.7 (Existing)	<0.1
Marshall	829.3	<0.1
	836.5	0.1
Pennington	864.1	<0.1
	865.1	<0.1
Polk	892.5	<0.1

Table 6b-8 Land Requirements of Mainline Valves for the Line 3 Replacement Project		
County	MP	Acres
Clearwater	920.7	0.1
	937.1	0.1
	939.8	0.1
Hubbard	946.3	0.1
	956.6	<0.1
	966.6	0.1
	979.3	0.1
Cass	999.9	0.1
	1007.1	<0.1
	1034.5	0.1
Aitkin	1061.7	<0.1
	1069.8	0.1
	1070.5	0.1
	1078.7	0.1
	1084.4	0.1
Carlton	1132.9	0.1
	Total [a]	**1.2**
[a] The sum of addends may not total due to rounding.		

Cathodic Protection

Table 6b-9 presents the approximate location of cathodic protection systems along the L3R route as well as the associated land requirements (see footnote 4). With the exception of a junction box and small diameter vent pipe posted above deep well beds, cathodic protection systems would be buried and the area disturbed for construction would be maintained in an herbaceous state similar to the permanent ROW (see Graphic 6b-1). Cathodic protection systems located east of L3R MP 912.3 (SPP MP 379.2) would be utilized for both L3R and SPP.

Graphic 6b-1. Aboveground component of a deep well cathodic protection system.

Table 6b-9 Land Requirements of Cathodic Protection for the Line 3 Replacement Project		
County	MP	Acres
Kittson	813.5	0.2
Clearwater	925.4	0.4
	936.1	0.4
Hubbard	948.4	0.4

Table 6b-9 Land Requirements of Cathodic Protection for the Line 3 Replacement Project		
County	MP	Acres
	955.5	0.4
	969.9	0.6
	975.9	0.4
	983.3	0.6
Wadena	989.8	0.4
Cass	999.9	0.4
	1009.1	0.4
	1016.2	0.3
	1027.3	0.2
	1038.3	0.4
Aitkin	1049.8	0.4
	1060.1	0.5
	1070.5	0.3
	1082.3	0.2
	1092.7	0.2
Carlton	1105.4	0.4
	1117.8	0.5
	1124.5	0.4
	1128.6	0.6
	1132.8 (South)	0.2
	1132.8 (North)	0.5
	Total [a]	**9.7**
[a] The sum of addends may not total due to rounding.		

Access Roads

Enbridge has compiled a preliminary list of access roads that may be used to gain access to the construction workspace; additional access roads would be identified as planning and engineering progresses. While the locations of the access roads are subject to change and the need for improvements to individual roads is not known at this time, a list of access roads proposed for use is presented in Appendix D. Temporary access roads located east of L3R MP 912.3 (SPP MP 379.2) would be utilized for both L3R and SPP. Based on current information, Enbridge anticipates approximately 249.9 acres of impacts related to access roads, assuming a standard 30-foot wide workspace centered on the road. Impacts from temporary access roads are currently assumed to be temporary.

The MPUC has required that permanent access roads be built to all mainline valves for SPP. Enbridge has voluntarily adopted this requirement for L3R, and has designed permanent access roads to the mainline valves (mainline valves are presented in Tables 6b-3 and 6b-8). Table 6b-10 provides a list of the access roads to mainline valves, as well as the associated

land requirements assuming a standard 30-foot-wide workspace centered on the road; impacts from these access roads are assumed to be permanent. The permanent access roads to mainline valves located east of L3R MP 912.3 (SPP MP 379.2) would also be used for SPP.

Table 6b-10
Land Requirements for Permanent Access Roads for the Line 3 Replacement Project

County	Mainline Valve MP	Length (feet)	Acres [a]
Kittson	805.7 (New)	195.61	0.1
	805.7 (Existing)	248.89	0.2
Marshall	829.3	201.99	0.1
	836.5	250.76	0.2
Pennington	864.1	72.9	<0.1
	865.1	61.1	<0.1
Polk	892.5	1401.1	0.5
Clearwater	920.7	183.2	0.1
	937.1	221.0	0.1
	939.8	192.2	0.1
Hubbard	946.3	106.9	0.1
	956.6	454.6	0.2
	966.6	133.7	0.1
	979.3	416.5	0.2
Cass	999.9	109.6	0.1
	1007.1	505.0	0.3
	1034.5	129.4	0.1
Aitkin	1061.7	456.6	0.2
	1069.8	591.1	0.3
	1070.5	120.9	0.1
	1078.7	92.0	0.1
	1084.4	121.5	0.1
Carlton	1132.9	186.9	0.1
		Total [b]	**3.4**

[a] Calculations are based on a 30-foot-wide workspace along permanent access roads.
[b] The sum of addends may not total due to rounding.

Construction and Operation Methods

Pipeline

Pipeline construction would follow a typical sequence as described in the following paragraphs.

First, the workspace would be surveyed, staked, and prepared for clearing. The workspace would then be cleared and graded, as necessary, to provide construction access and safe movement of equipment and personnel during construction. Silt fence[24] and other erosion control measures would be installed, and sensitive areas would be marked for avoidance. Appropriate safety measures would be implemented before excavation begins, including notification through the One-Call system to ensure third-party utilities and adjacent pipelines are properly marked. Pipe, valves, and fittings would be transported to the workspace by truck and placed along the workspace by sideboom tractors (also known as pipelayers) or cranes.

After individual pipe sections are strung along the workspace, they would be bent to conform to the contours of the trench and terrain. The pipe segments would be lined up, clamped, welded, and treated with a protective coating, and the welds would be inspected. Trenching may occur before or after the pipe has been welded. Trenching is typically conducted using a backhoe or trenching machine. Where appropriate, topsoil would be segregated according to applicable permit conditions. The prepared pipe would be lowered into the trench and, where applicable, tied into existing facilities. During backfilling, subsoil would be replaced first and then the topsoil would be replaced. Precautions, such as padding the trench with soil, would be taken during backfilling to protect the pipe from rock damage.

Once the pipeline has been welded and inspected, and the trench has been backfilled, the pipeline would be hydrostatically tested[25] to ensure its integrity prior to the line being filled with crude oil and placed into service. The construction workspace would then be cleaned up and restoration activities would commence. Restoration would include implementing temporary and permanent stabilization measures, such as slope breakers[26], mulching, and seeding.

Operation and maintenance of the pipeline would have additional effects on vegetation within the permanent ROW after site clearing and workspace restoration are complete. The permanent ROW would be initially cleared of woody vegetation (and periodically thereafter every 3 to 5 years) to facilitate aerial inspection of the pipeline and maintain visibility of pipeline markers, which would be located at property lines and crossings of roads and waterbodies. Additional information regarding planned operation and maintenance activities is provided in NDPC's revised Route Permit Application dated January 31, 2014.

[24] Silt fence: A silt fence is a sediment control device used on construction sites to protect nearby wetlands and waterbodies from stormwater runoff. A typical fence consists of a piece of synthetic fabric (sometimes referred to as geotextile fabric) stretched between a series of stakes where runoff is expected to reach wetlands or waterbodies. The fabric filters remove sediment from the water before it reaches the wetland or waterbody.

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

[26] Slope breaker: A slope breaker is an erosion control device to reduce stormwater runoff velocity and divert it from the disturbed construction area to more stable ground. A typical slope breaker consists of a ridge or channel constructed diagonally across the ROW on a hill.

Associated Facilities

Clearbrook Terminal Expansion and Pump Stations

Facility construction would follow a typical sequence as described in the following paragraphs.

First, the workspace would be surveyed, staked, and prepared for clearing. Silt fence and other erosion control measures would be installed, and sensitive areas would be marked for avoidance. The required workspace would then be cleared and graded, as necessary, to provide construction access and safe movement of equipment and personnel during construction. Appropriate safety measures would be implemented before excavation begins, including notification through the One-Call system to ensure third-party utilities and adjacent pipelines are properly marked.

Two independent four-way sweeps[27] would be conducted to positively locate any existing underground utilities. Temporary construction trailers would be placed, material laydown areas[28] prepared, and temporary utilities (e.g., power, telephone) would be installed at the site.

Piping would be installed, either by being welded on-site or by placing shop-fabricated installations. The shop-fabricated installations, in which the pipe already has been bent and welded together at the factory, are usually hydrostatically tested before arriving on site; the field fabrications would be hydrostatically tested in place. Above grade piping would be tested for 4.25 hours; below grade piping would be tested for 8.25 hours.

The electrical service building(s) ("ESB"), either modular design or built on-site, would be placed and all associated electrical and controls equipment would be installed. Power and control cables would be routed and additional pre-operational testing could begin once the system(s) are energized. Some sites would require the construction of a new electrical substation. This work may be performed by the utility supplying the power to the site or by an Enbridge contractor.

Upon completion of all pre-operational testing, the equipment would be flooded with crude oil according to the detailed flood plans developed for each site. Equipment operation would then be re-checked. Final site civil work and painting would be completed, and the site would then be cleaned up. Once all final checks have been completed, the facility would be turned over to Enbridge Operations for service.

Mainline Valves

Mainline valve construction would follow a typical sequence as described in the following paragraphs.

[27] Four-way sweep: Four-way sweep is a method of locating underground utilities. A four-way sweep involves scanning the ground with electromagnetic induction or ground-penetrating radar equipment to detect the presence of buried features; it does not involve digging or other ground-disturbing activities. The term "four-way sweep" comes from the fact that an area typically is scanned (or swept) in at least four directions.

[28] Material laydown area: A material laydown area is a piece of land where materials are stored and staged for construction.

First, the workspace would be surveyed, staked, and prepared for clearing. Silt fence and other erosion control measures would be installed, and sensitive areas would be marked for avoidance. The required workspace would then be cleared and graded, as necessary, to provide construction access and safe movement of equipment and personnel during construction. Appropriate safety measures would be implemented before excavation begins, including notification through the One-Call system to ensure third-party utilities and adjacent pipelines are properly marked. Two independent four-way sweeps would be conducted to positively locate any existing underground utilities.

The mainline pipe, valve foundation, and valve would be installed and backfilled. After backfilling is complete, the valve would be filled with water and hydrostatically tested. The ESB would be placed and all associated electrical and controls equipment would be installed. Power and control cables would be routed and additional pre-operational testing would begin once the system(s) are energized. Some sites would require the construction of a new electrical service. This work may be performed by an electric utility supplying the power to the site or by an Enbridge contractor.

Upon completion of all pre-operational testing, the valve would be ready for use. Equipment operation would be re-checked and final site civil work including fencing installation, permanent access road construction, and painting would be completed. After the final site civil work is complete, the site would be cleaned up and restored. After all final checks have been completed, the valve site would be turned over to Enbridge Operations for service.

Cathodic Beds

An Impressed Current Cathodic Protection System (see footnote 4) would be constructed for L3R. Construction of this system includes both anode arrays installed in both conventional beds near the surface as well as in deep wells. Construction of cathodic protection systems includes excavation of soils at the site of installation. Methods utilized typically involve digging a trench for a cable using a mini-excavator, or ground trenching equipment such as a Ditch Witch. The technique used to trench the cables associated with the cathodic protection system is similar to the methods used for installing fiber optic or telephone lines used for communications; which typically requires a 20- to 30-foot-wide construction workspace.

Where L3R is co-located with SPP, eight conventional surface bed type cathodic protection systems would be installed 600 feet perpendicular to the pipeline. Anodes would be installed in either vertical or horizontal fashion and cables would be trenched to connect the anodes electrically to the protected metallic structures.

Enbridge would also construct 15 deep well cathodic protection systems where L3R is co-located with SPP, where the anodes would be installed vertically in a well using construction methods similar to that of water wells. Deep well cathodic protection systems are normally installed closer to the pipeline, while the anodes themselves would be installed deeper (200-400 feet deep) than a conventional surface bed.

The eight conventional surface beds and 15 deep well cathodic protection systems located east of L3R MP 912.3 (SPP MP 379.2) would be utilized for both L3R and SPP. An additional conventional surface bed type would be constructed for L3R west of Clearbrook in Kittson County.

Both types of systems utilize native backfill for areas where trenching for the cable occurs. However, the area directly around the anodes would be backfilled with a more suitable backfill such as coke breeze[29]. Additionally, in a deep well cathodic protection system, a natural clay plug would be installed above the anodes to seal the well and prevent water from entering the hole.

Access Roads

Enbridge would use existing public and private roads to gain access to L3R. Many of the existing roads are presently in a condition that can accommodate construction traffic without modification or improvement. Some roads, however, are dirt or gravel roads that are not currently suitable for construction traffic. Enbridge is proposing to improve unsuitable dirt and gravel roads through widening and/or grading. Widening would involve increasing the width of the road bed. Grading would be confined to the existing road bed or to the footprint of the newly widened road. Enbridge has identified potential access roads for L3R (refer to Appendix D); however Enbridge is currently in the process of identifying the type of improvements or modifications that would be required for each access road.

After construction, Enbridge would return improved roads to their pre-construction condition unless the landowner or land-managing agency requests that the improvements be left in place. To return the roads to pre-construction conditions, Enbridge would re-contour the disturbed areas outside the original road footprint and seed disturbed areas with an appropriate seed mix.

As discussed above and presented in Table 6b-10, permanent access roads to the mainline valves along the L3R route would be constructed and maintained by Enbridge.

Modifications to Existing Equipment

As described above, the existing Line 3 pipeline in Minnesota would be permanently decommissioned after L3R has received all regulatory approvals, and the 36-inch replacement pipeline is constructed, tested, and entirely placed into service.

Modifications to the existing facilities at the Clearbrook Terminal, and Donaldson, Viking, and Plummer pump stations are described under the Project Description Section, and would include 115kV transmission line extensions to new substations, internal road extensions to facilitate maintenance access between stations, communication line extensions to hook into the existing SCADA (Supervisory Control And Data Acquisition) systems, site drainage and containment systems, and station fence-line extensions for security within the existing facility. Also, at the Clearbrook Terminal, modifications would be required to maintain delivery and injection capabilities to and from the storage tanks and delivery to existing customers, including Minnesota Pipe Line Company.

[29] Coke Breeze: Coke breeze is common carbonaceous backfill material used in cathodic protection. It provides a conductive path for current flow and ensures optimal effectiveness of the cathodic protection system.

Demolition

Enbridge plans to demolish approximately 38 structures to construct L3R. Enbridge has obtained voluntary agreements with all affected landowners.

Timing and Duration of Construction

Enbridge plans to commence construction of the new pipeline and associated facilities as soon as all construction related regulatory approvals have been obtained. Enbridge plans to complete construction, testing, and commissioning of the new pipeline and associated facilities in approximately 12 months. Final restoration activities would likely extend beyond 12 months.

c. Project magnitude:

PROJECT MAGNITUDE

Table 6c-1
Project Magnitude

Total Project Acreage	**Construction Impacts (Temporary): 5,330.1** Pipeline [a]: 5,005.6 acres Aboveground Facilities [b]: 61.4 acres Cathodic Beds: 9.7 acres Temporary Access Roads [c]: 249.9 acres Permanent Access Roads [d]: 3.4 acres **Operation Impacts (Permanent): 2,084.2** Pipeline [e]: 2,042.7 acres Aboveground Facilities [f]: 61.4 acres Cathodic Beds: 9.7 acres Permanent Access Roads [g]: 3.4 acres
Linear project length	337.1 miles (in Minnesota)
Number and type of residential units	N/A
Commercial building area (in square feet)	N/A
Industrial building area (in square feet)	139,392 sq ft [h]
Institutional building area (in square feet)	N/A
Other uses – specify (in square feet)	N/A
Structure height(s)	**See below**
Facility	Structure height(s) (in feet)
PIPELINE	
Mainline Valves	15
Communication Towers at Mainline Valve Sites	50
CLEARBROOK TERMINAL	
Mainline Unit Shelter	46
Mainline Unit ESB	18
Substation	61
Facility Lighting	30
Antenna	199
Receiving and Sending Traps	8 receiving; 6 sending
Densitometer/Viscometer Cabinet	6.5

Table 6c-1 Project Magnitude	
DONALDSON PUMP STATION	
Mainline Unit Shelter	46
Mainline Unit ESB	18
Substation	61
Facility Lighting	30
BACKUS PUMP STATION	
Mainline Unit Shelter	46
Mainline Unit ESB	18
Substation	61
Facility Lighting	30
Antenna	199
Receiving and Sending Traps	7 receiving, 6 sending
PLUMMER PUMP STATION	
Mainline Unit Shelter	46
Mainline Unit ESB	18
Substation	61
Facility Lighting	30
Densitometer/Viscometer Cabinet	6.5
PALISADE PUMP STATION	
Mainline Unit Shelter	46
Mainline Unit ESB	18
Substation	61
Facility Lighting	30
Antenna	199
TWO INLETS PUMP STATION	
Mainline Unit Shelter	46
Mainline Unit ESB	18
Substation	61
Facility Lighting	30
Antenna	199
VIKING PUMP STATION	
Mainline Unit Shelter	46
Mainline Unit ESB	18
Substation	61
Facility Lighting	30
CROMWELL PUMP STATION	
Mainline Unit Shelter	46
Mainline Unit ESB	18
Substation	61
Facility Lighting	30
Antenna	199
[a] Calculations based on the 120-foot-wide (uplands) and 95-foot-wide (wetlands) construction workspace and ATWS. [b] Includes the total disturbed footprint associated with the Clearbrook Terminal expansion, pump	

Table 6c-1 Project Magnitude	
	stations and mainline valves.
c	Calculations based on a 30-foot-wide workspace along temporary access roads.
d	Calculations based on a 30-foot-wide workspace along permanent access roads.
e	Calculations based on the 50-foot-wide permanent ROW.
f	Includes the permanent footprints associated with the Clearbrook Terminal expansion, pump stations, and mainline valves.
g	Calculations based on a 30-foot-wide workspace along permanent access roads to mainline valve sites.
h	Includes permanent structures associated with the improvements at the Clearbrook Terminal, the pump stations, and mainline valves.

d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

PROJECT PURPOSE

L3R is a maintenance driven project that would replace the 1960's vintage existing Line 3 in its entirety within Minnesota, from the North Dakota border to Enbridge's existing Clearbrook Terminal and continue to the Wisconsin border. L3R would accomplish three goals:

- First, L3R would address the existing Line 3's integrity risks by replacing a pipeline with a large number of corrosion and long-seam cracking, with a new pipeline constructed with modern technology and materials. To maintain the existing pipeline, Enbridge is required to perform over 4,000 excavations and repairs on Line 3 over the next 15 years.
- Second, L3R would reduce on-going and forecasted apportionment to the refining industry in PADD II, Eastern Canada, and the Gulf Coast, including the Flint Hills and Northern Tier Energy refineries in Minnesota.
- Third, the restored operational flexibility would make the Enbridge system and the replacement pipeline more energy efficient on a per barrel basis (capacity would be increased from 390,000 bpd to 760,000 bpd).

These benefits would help to ensure the future adequacy, reliability, and efficiency of energy supply to Enbridge's customers, and, as a result, to the people of Minnesota and neighboring states. The expanded diameter of L3R would restore its historic intended capacity of 760,000 bpd, therefore providing an efficient, increased volume delivery of crude oil to the region. If L3R is not approved, Enbridge would continue to operate Line 3 safely, however ongoing maintenance would not restore the operating capabilities of Line 3, leaving Enbridge's customers without adequate, reliable, and efficient transportation capacity to reduce apportionment. Further, the increasing number of integrity digs that are required would not only inconvenience landowners and impact the environment, but would be economically inefficient and likely drive refiners to either seek alternate sources of supply or alternative modes of transportation.

e. Are future stages of this development including development on any other property planned or likely to happen? X Yes ☐ No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

Under Minnesota Rule 4410.2000, Subp. 4, for proposed projects such as pipelines, utility lines, or systems where the proposed project is related to a large existing or planned network, for which a governmental unit has determined environmental review is needed, the RGU shall treat the present proposal as the total proposal or select only some of the future elements for present consideration in the threshold determination and EIS. These selections must be logical in relation to the design of the total system or network and must not be made merely to divide a large system into exempted segments. When review of the total of a project is separated under this subpart, the components or stages addressed in each EIS or supplement must include at least all components or stages for which permits or approvals are being sought from the RGU or other governmental units.

Sandpiper Pipeline Project

L3R parallels the Sandpiper route between Clearbrook and Superior. The MPUC accepted the Sandpiper Route Permit application on March 19, 2014.[30] If the Route Permit is issued, the Applicants plan to co-locate the pipelines from east of Clearbrook to the Minnesota/Wisonsin border. Sandpiper is being designed with approximately 303 miles of 24- and 30-inch diameter pipeline across Minnesota, including 73 miles of 24-inch diameter pipeline (average capacity of 225,000 bpd) between the North Dakota/Minnesota state line near Grand Forks, North Dakota, and a new terminal near Clearbrook, Minnesota and approximately 230 miles of 30-inch diameter pipeline (average capacity of 375,000 bpd) to the Minnesota/Wisconsin border. The Sandpiper Pipeline Project has a separate permitting and environmental documentation process from L3R.

Clover-Potato Lake 115 Kilovolt Project

The Clover-Potato Lake 115 kilovolt ("kV") Project is a proposed 7-mile 115 kV transmission line in Hubbard County, Minnesota. The 115 kV line would connect the new L3R Two Inlets Pump Station to the Great River Energy IM-MPT Line. The line would be constructed within a 100-foot ROW on 70- to 80-feet tall single-pole structures with spans of 350 to 400 feet and with horizontal post insulators.

The route for the Clover-Potato Lake 115 kV Project would be located in Arago and Clover townships in Hubbard County. It would follow the L3R route for 5.25 miles of its length. The remaining 1.75 miles would be greenfield[31] through wooded lowland.

[30] See Document ID: **20142-96350-01**

[31] Greenfield: The term "greenfield" refers to land that has not previously been used for another pipeline, utility, road, or railroad ROW. For the purposes of this document, the term greenfield is applied to land that is more than 250 feet away from an existing parallel pipeline, utility, road, or railroad ROW.

Clover Township granted a conditional use permit and building permit for the Clover-Potato Lake 115 kV Project on October 20, 2015, conditioned upon Enbridge receiving route approval for L3R. This project has a separate permitting and environmental documentation process from L3R; therefore, the impacts of this project are not discussed further in this EAW.

Bull Moose 115 kV Project

The Bull Moose 115 kV Project is a proposed 2.5-mile overhead 115 kV transmission line in Cass County, Minnesota that would connect the existing Minnesota Power Badoura to Pine River 115 kV transmission line and the L3R Backus Pump Station.

Great River Energy submitted a Route Permit Application to the MPUC on August 7, 2015 in Docket No. ET2/TL-15-628. The line would be constructed within a 100-foot ROW on 70- to 80-feet tall single-pole structures with spans of 350 to 400 feet and with horizontal post insulators. H-frame, 3-pole structures may be used in some locations.

The route would be located in a rural area beginning at the existing Minnesota Power 115 kV line and head northeast for approximately 0.25-mile to Minnesota Power's ±250 kV DC line. The Bull Moose 115 kV Project line route would then parallel the DC line for approximately 2.2 miles. Permitting and environmental review of the Clover-Potato Lake Transmission Line Project will be conducted pursuant to Minn. Stat. Ch. 216E and Minn. R. Ch. 7850; therefore, the impacts of the Bull MooseTransmission Line Project are not discussed further in this EAW. This project has a separate permitting and environmental documentation process from L3R.

Palisade 115 kV Project

The Palisade 115 kV Project would serve the L3R Palisade Pump Station and would consist of a new Rice River Breaker Station and approximately 13 miles of new 115 kV transmission line between the breaker station and the L3R Palisade Pump Station in Aitkin County, Minnesota.

Great River Energy submitted a Route Permit Application for the Palisade 115 kV Project to the MPUC on August 25, 2015 in Docket No. ET2/TL-15-423. The line would be constructed within a 100-foot ROW on 70- to 80-feet tall single-pole structures with spans of 275 to 450 feet and with horizontal post insulators. H-frame, 3-pole structures may be used in some locations.

The Palisade 115 kV Project would be located primarily on agricultural lands. Great River Energy has proposed two route options in its Route Permit Application; both options would follow U.S. Highway 169, but the second option provides an alternative Mississippi River crossing utilizing County Road 21 and 430th Street. Permitting and environmental review of the Clover-Potato Lake Transmission Line Project will be conducted pursuant to Minn. Stat. Ch. 216E and Minn. R. Ch. 7850; therefore, the impacts of the Palisade Transmission Line Project are not discussed further in this EAW. This project has a separate permitting and environmental documentation process from L3R.

Cromwell 115 kV Tap Project

The Cromwell 115 kV Tap Project consists of a 115 kV connection of less than 1,500 feet between the L3R Cromwell Pump Station and Great River Energy's 115 kV LC-CSX line near the Great River Energy Cromwell Substation. The Cromwell 115 kV Tap Project would be located in Carlton County south of Cromwell, Minnesota. Subject to final design, it is anticipated

that the line would be constructed within a 100-foot ROW on 70- to 80-feet tall single-pole structures with horizontal post insulators. Local permitting for this project through Carlton County has not commenced. This project has a separate permitting and environmental documentation process from L3R; therefore, the impacts of this project are not discussed further in this EAW.

Other permitted and/or planned transmission line projects that could potentially be directly associated with the proposed L3R pipeline will be identified during the planning process. If identified, the local electric utility would submit an application MPUC for a Routing Permit for the necessary facilities.

f. Is this project a subsequent stage of an earlier project? ☐ Yes X No

If yes, briefly describe the past development, timeline and any past environmental review.

If yes, briefly describe the past development, timeline and any past environmental review.

7. Cover types: Estimate the acreage of the site with each of the following cover types before and after development:

LAND COVER TYPES

Table 7-1 presents land cover types impacted by construction of L3R. This table represents how pre-construction land cover types ("Before") within the construction workspace associated with the pipeline and associated facilities (excluding temporary access roads) would be re-categorized following construction ("After").

Table 7-1
Land Cover Types Crossed by the Line 3 Replacement Project

	Before [a]	After [b]		Before [a]	After [b]
Wetlands	574.5	564.7	Lawn/landscaping/Open Space [d]	209.9	202.2
Deep water/streams	8.6	8.6	Impervious surface [e]	0.0	21.5
Wooded/forest [c]	2,239.9	1,342.6	Stormwater Pond [f]	0.0	10.8
Brush/Grassland [c]	152.1	1,039.2	Developed	9.1	41.3
Cropland	2,135.9	2,099.1			
			Total [g]	**5,330.1**	**5,330.1**

Table 7-1
Land Cover Types Crossed by the Line 3 Replacement Project

	Before [a]	After [b]		Before [a]	After [b]

[a] Acres presented in the "Before" column represent construction impacts associated with the pipeline construction workspace and ATWS, pump stations, mainline valves, cathodic protection, and temporary and permanent access roads. The locations of the temporary access roads are subject to change and the type of improvements to individual roads is not known at this time.

[b] Acres presented in the "After" column represent operational impacts associated with the permanent ROW, pump stations, mainline valves, cathodic protection, and permanent access roads. The permanent footprints associated with the pump stations, mainline valves, and permanent access roads are captured under the impervious surfaces, stormwater ponds, and developed/other categories.

[c] Following the completion of construction, wooded/forested areas within the permanent ROW and cathodic protection systems would be maintained in an herbaceous state. Temporary construction workspace areas outside of the permanent ROW that were previously wooded/forested would be allowed to regenerate and are accounted for under the "Brush/Grassland" land cover type.

[d] Less than one acre of lawn/landscaping would be maintained within the pump station fence lines. All other lawn and landscaped areas are captured under the Developed/Open Space cover type.

[e] Impervious surfaces include footprints associated with the Clearbrook Terminal expansion, pump stations, mainline valves, and permanent access roads.

[f] The stormwater ponds are associated with the pump stations.

[g] The sum of addends may not total due to rounding.

Source: Minnesota Geospatial Commons website. Available at: https://gisdata.mn.gov/ (MNGeo 2016).

GAP Land Cover data available from the Minnesota Geospatial Commons website (MNGeo 2016) was used to calculate the cover types in Table 7-1. Table 7-2 lists the GAP data categories that are included in each individual cover type shown in Table 7-1.

Table 7-2 GAP Land Cover Types Crossed by the Line 3 Replacement Project	
Land Cover Type in Table 7-1	GAP Land Cover Classification
Wetlands	Boreal Acidic Peatland Systems
	Central Interior and Appalachian Floodplain Systems
	Central Interior and Appalachian Shrub-Herbaceous Wetland Systems
	Central Interior and Appalachian Swamp Systems
	Eastern Boreal Floodplain
	Eastern Great Plains Floodplain Systems
	Eastern Great Plains Wet Meadow, Prairie, and Marsh
	Great Plains Prairie Pothole
	Laurentian-Acadian Floodplain Systems
	Laurentian-Acadian Swamp Systems
	Western Great Plains Depressional Wetland Systems
Deep Water/Streams	Open Water (Fresh)
Wooded/Forest	Boreal Aspen-Birch Forest
	Boreal Jack Pine-Black Spruce Forest
	Boreal White Spruce-Fir-Hardwood Forest
	Eastern Great Plains Tallgrass Aspen Parkland
	Laurentian Pine-Oak Barrens
	Laurentian-Acadian Northern Hardwoods Forest
	Laurentian-Acadian Northern Pine-(Oak) Forest
	North-Central Interior Dry Oak Forest and Woodland
	North-Central Interior Dry-Mesic Oak Forest and Woodland
	North-Central Interior Maple-Basswood Forest
Brush/Grassland	Harvested Forest - Grass/Forb Regeneration
	Introduced Upland Vegetation - Perennial Grassland and Forbland
	North-Central Interior Sand and Gravel Tallgrass Prairie
	Northern Tallgrass Prairie
	Recently Burned Shrubland
Cropland	Cultivated Cropland
	Managed Tree Plantation
	Pasture/Hay
Lawn/Landscaping [a]	N/A
Impervious Surface	N/A
Stormwater Pond	N/A
Other (Open Space)	Developed, Open Space
Other (Developed)	Developed, High Intensity
	Developed, Medium Intensity

Table 7-2 GAP Land Cover Types Crossed by the Line 3 Replacement Project	
Land Cover Type in Table 7-1	GAP Land Cover Classification
	Disturbed, Non-specific
N/A	This cover type is not specifically included in the GAP Land Cover Categories.
[a]	Lawns and landscaped areas are captured under the Developed, Open Space category.

Changes in cover types under each alternative will be quantified and included in the EIS. Evaluation of cover type changes will take into consideration the pipeline route and associated facilities. The EIS will further describe potential impacts to the following cover types:

- Urban Areas
- Wetlands and Deep Water/Streams
- Wooded/Forest Land
- Brush/Grassland
- Crop Land
- Lawn/Landscaping and Developed/Open Spaces
- Impervious Surfaces and Stormwater Ponds
- Developed/Other

The EIS will take into account the potential cumulative impacts of both L3R and Sandpiper Pipeline, including impacts relative to the right-of-way needed to co-locate the two lines between Clearbrook and Superior along the Applicants' preferred routes and all alternatives as well as new transmission lines proposed for new pumping stations.

8. Permits and approvals required: List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

PERMIT TABLE

Table 8-1
Permits and Approvals Required

Unit of Government	Type of Application	Status	Reason Required
USACE – St. Paul District and MPCA	Section 10/404 Individual Permit and associated state 401 Individual Water Quality Certification	Application submitted and determined complete (January 28, 2016)	Authorizes discharge of dredged and fill material into waters of the United States, including wetlands, and crossing of navigable waters of the United States
USFWS	Section 7 ESA Consultation (Federal endangered species)	Consultation ongoing	Establishes conservation measures and authorizes, as needed, take of federally protected species
	Bald Eagle Removal Permit	Pending submittal	Allows for removal of a known bald eagle nest in proximity to construction activities
MPUC	Certificate of Need	Application submitted	Determines need for the pipeline, including questions of size, type and timing
	Route Permit	Application submitted	Authorizes construction of the pipeline along a specific route, subject to certain conditions
MDNR	License to Cross Public Waters	Application submitted	50 year license that allows for crossing of public waters with proposed utility
	License to Cross Public Lands	Application submitted	50 year license that allows for crossing of public lands with proposed utility
	Water Appropriation Permit - Pipeline and Facilities	Pending submittal	Authorizes withdrawal and use of water from surface or ground sources
	State Endangered Species Permit and Avoidance Plan	Pending submittal	Outlines plans for avoidance, minimization, and mitigation of take of state-listed species
	Osprey Nest Disturbance Permit	Pending submittal	Allows for removal of a known osprey nest
	Fen Management Plan	Pending submittal	Outlines plans for avoidance, minimization, and mitigation of fens within project corridor
MPCA	Clearbrook Terminal Air Quality Permit – Synthetic-minor Individual State Operating Permit	Pending submittal	Authorizes construction and operation at the modified Clearbrook Terminal
	NPDES Individual Construction Stormwater, Hydrostatic Test, and Trench Dewatering Permit – Pipeline Construction	Pending submittal	Authorizes ground disturbance with approved protection measures to manage soil erosion and stormwater discharge on construction site; discharge of water from hydrotesting activities; and removal of water that may accumulate in pipeline trench
	NPDES General Construction Stormwater Coverage – Facilities	Pending submittal	Authorizes ground disturbance with approved protection measures to manage soil erosion and stormwater discharge on construction site

Table 8-1 Permits and Approvals Required			
Unit of Government	Type of Application	Status	Reason Required
	NPDES General Construction Stormwater Coverage – Pipeyards and Contractor Yards	Pipeyard permits received [A]	Authorizes ground disturbance with approved protection measures to manage soil erosion and stormwater discharge on construction site
Minnesota SHPO	Cultural Resources Consultation, NHPA Section 106 Clearance	Consultation ongoing	Ensures adequate consideration of impacts to significant cultural resources
MDA	APP	Consultation initiated	Establishes measures for agricultural protection
MNDOT	Road Crossing Permits	Pending submittal	Authorizes crossings of state-jurisdictional roadways
Mississippi Headwaters Board	Local Land Use Review	Consultation only (in progress)	Ensures compatibility with land use plan
Red Lake, Wild Rice, Two Rivers, and Middle-Snake Watershed Districts	Watershed District Permit	Pending submittal	Authorizes crossing of legal drains and ditches within watershed
MDH and Wrenshall, Sundsruds Court, and Oklee DWSMA	DWSMA/WHPA Consultation	Consultation only (in progress)	Ensures pipeline construction and operation are compatible with goals of relevant plans
Minnesota Board of Water and Soil Resources/WCA Local Governmental Units	Notice of Intent to Utilize Federal Approvals for Utilities Project Exemption	Notice submitted	Notice of use of exemption required
Local/County	Permits pertaining to off-ROW yard use	Pending submittal	Ensures compatibility with relevant land use plans
[A] Issuance of the NPDES General Construction Stormwater is currently under review and pending further action.			

DESCRIPTION OF PROCEDURAL HISTORY AND ROUTE CHANGES

Enbridge filed Certificate of Need and Routing Permit Applications for L3R on April 24, 2015. On August 12, 2015, the MPUC accepted the L3R Applications as complete, referred the Certificate of Need to the Office of Administrative Hearings for contested case proceedings, and authorized the Department of Commerce Energy and Environmental Review Analysis ("DOC-EERA") to conduct public information meetings and develop alternative route proposals.

On September 30, 2015, Enbridge submitted comments during the L3R scoping period describing four changes to the L3R route that extended outside the 750-foot route width originally requested in its Application. In addition, Enbridge requested a wider route width in seven areas to accommodate ATWS and 66 areas where Enbridge made minor changes to the L3R centerline to address engineering, environmental or landowner issues.

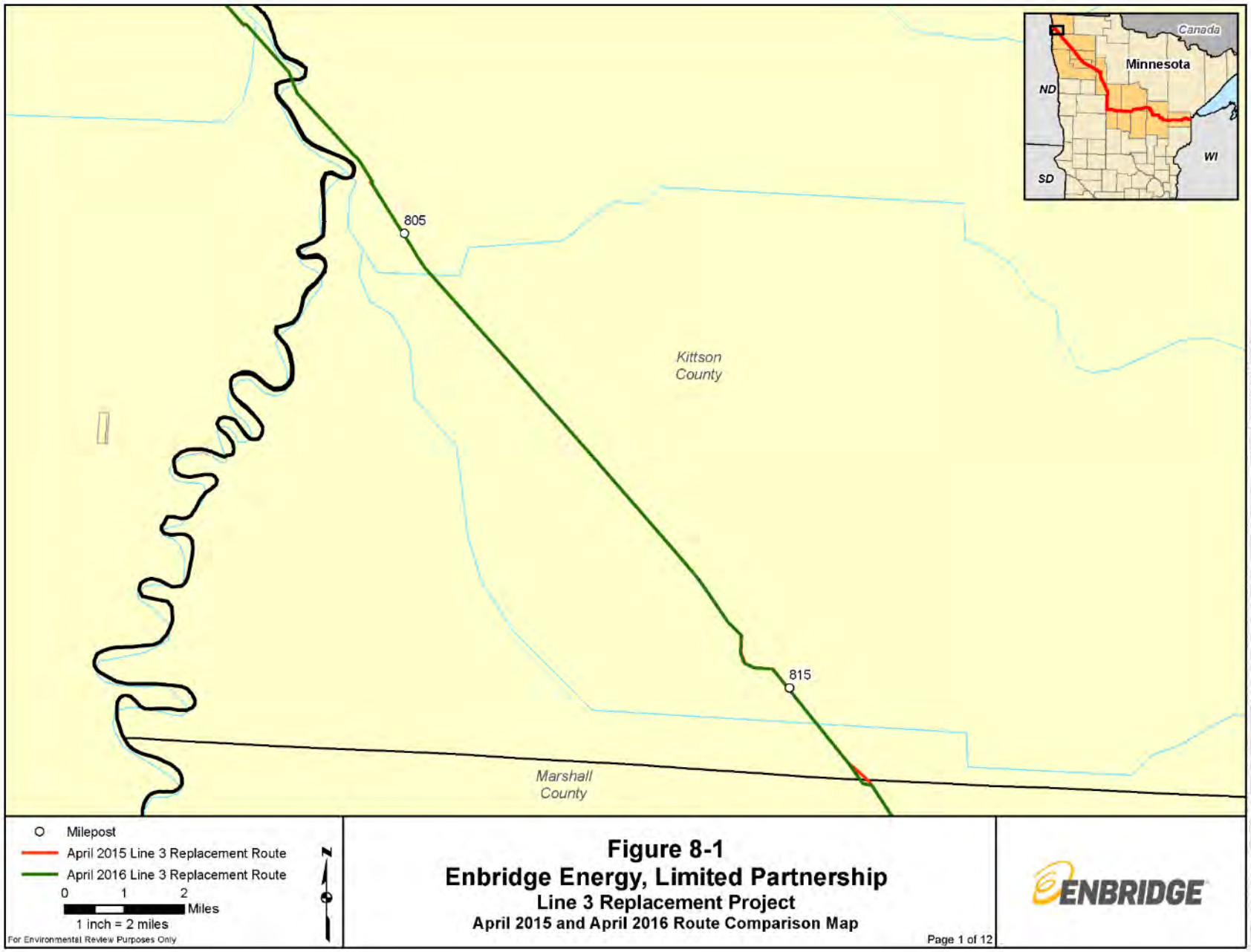
The MPUC met on December 17, 2015, and referred the Certificate of Need and Routing Permit proceedings to the Office of Administrative Hearings for joint contested case proceedings and authorized the DOC-EERA to prepare an EIS for L3R and SPP.

On February 1, 2016, the MPUC issued its written orders establishing a process for conducting the L3R hearings. In relevant part, the L3R Orders (1) joined the Certificate of Need and Routing Permit dockets, (2) authorized preparation of an EIS covering need and routing issues

pursuant to Minn. Stat. Ch. 116D and Minn. R. 4410, (3) authorized the DOC-EERA to administer the EIS process in consultation with the MPUC's Executive Secretary, and enter into an interagency agreement with the MPCA and MDNR; and (4) referred the Routing Permit docket to the Office of Administrative Hearings. This EAW is being submitted to facilitate the EIS review process.

Under Minn. R. 4410.2100, subp. 2, the purpose of this EAW is to serve as the basis of the EIS scoping process. Accordingly, this EAW reflects Enbridge's current route and supporting data to ensure the EIS scoping process is starting from the most current available information and reflects the updated route for which Enbridge is seeking a Routing Permit.

Enbridge is requesting that the MPUC evaluate a route that is generally 750-feet in width (350 feet on each side of the L3R centerline) except in certain areas where Enbridge has proposed an expanded route width. Enbridge has provided updated maps and supporting data, as required by Minn. R. 7852 and 4410 to ensure this EAW reflects the current L3R centerline and route width sought by Enbridge (see Appendix A). Figure 8-1 depicts the changes between the April 24, 2015 L3R route last analyzed in the April 2015 Routing Permit Application and the L3R route provided in this EAW.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805
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County
Marshall
County
Milepost
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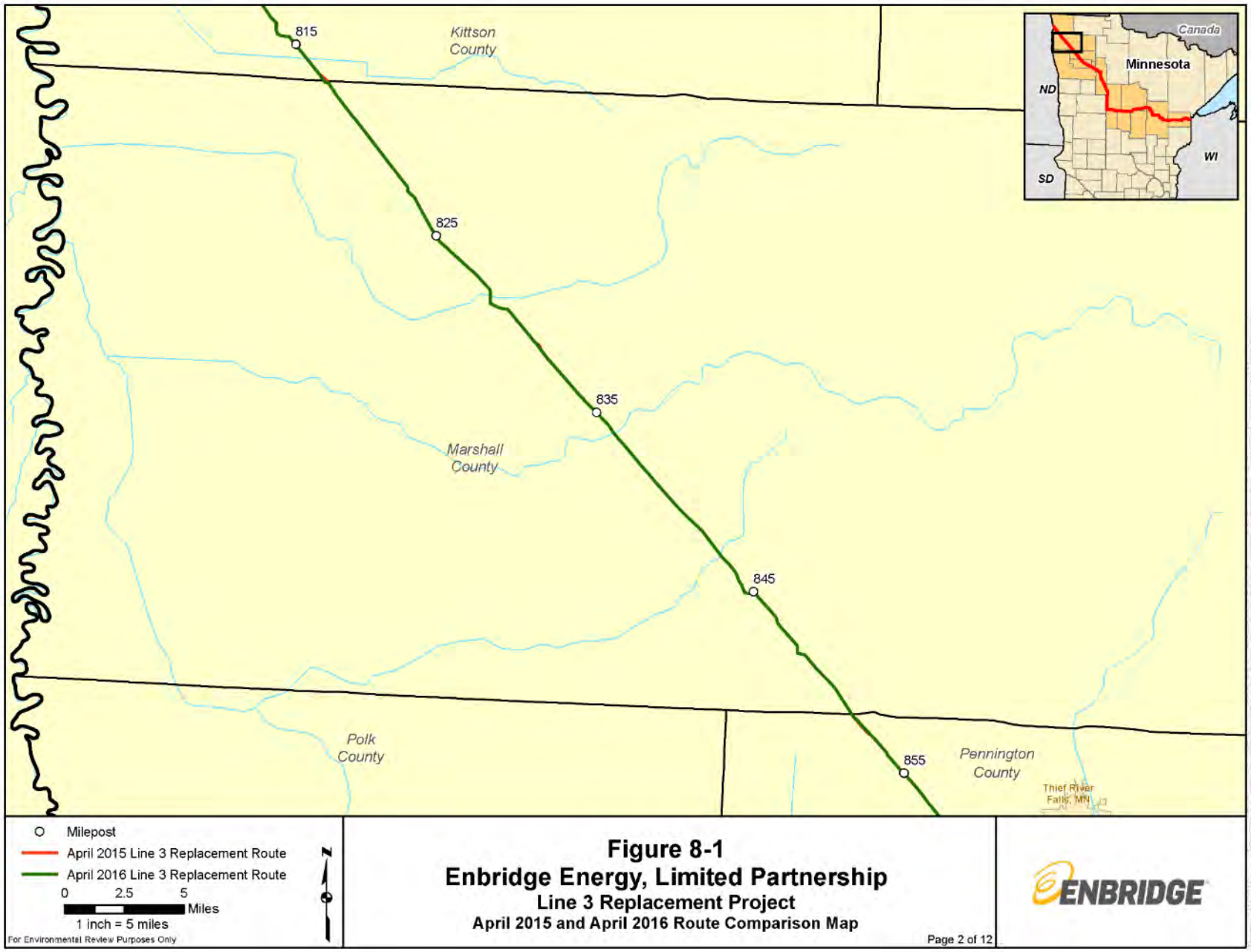
April 2016 Line 3 Replacement Route
0 1 2
Miles
1 inch = 2 miles
For Environmental Review Purposes Only
N
Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
Page 1 of 12
ENBRIDGE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Polk County
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Thief River Falls, MN
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WI
Milepost
April 2015 Line 3 Replacement Route
April 2016 Line 3 Replacement Route
0 2.5 5
Miles
1 inch = 5 miles
For Environmental Review Purposes Only
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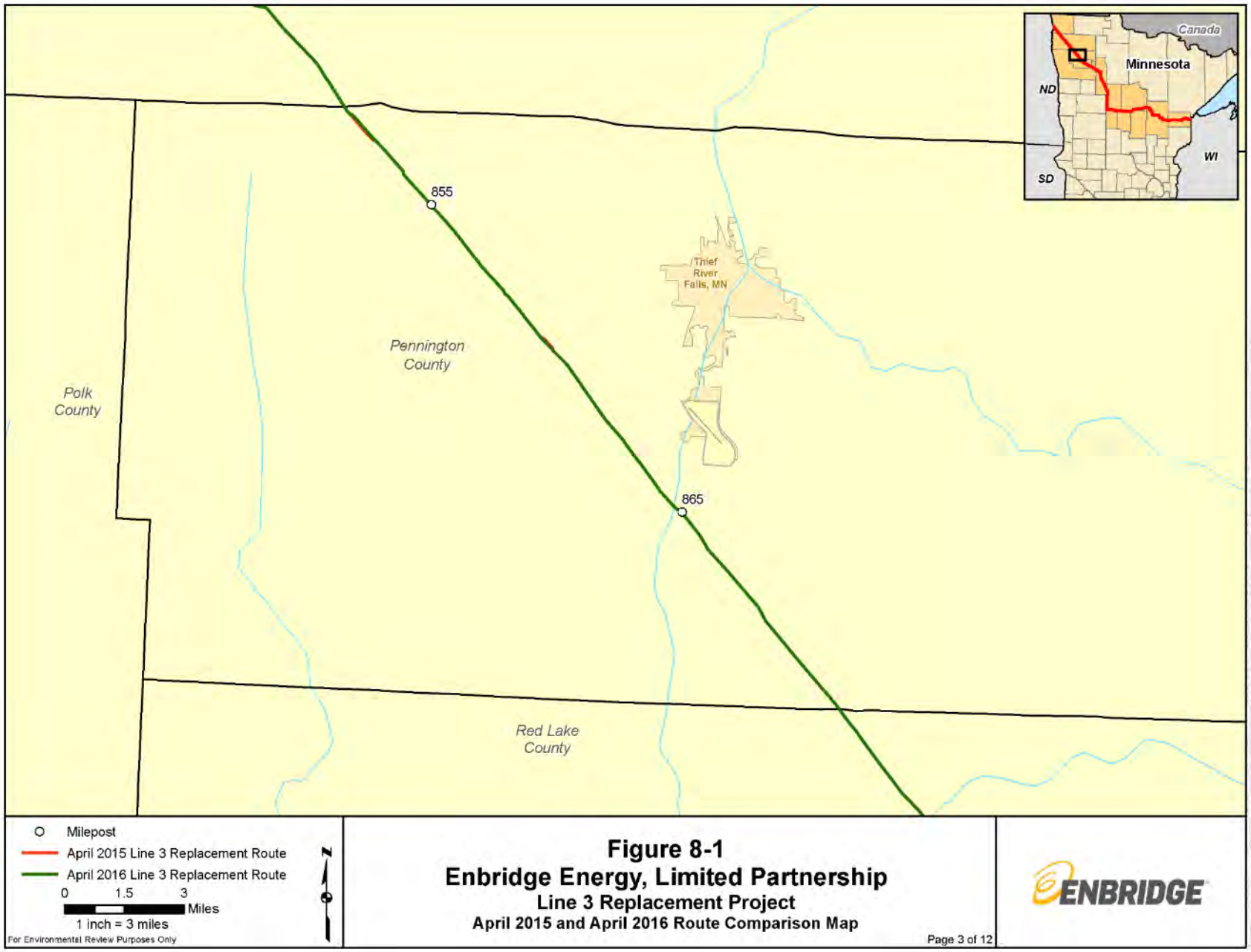
Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
Page 2 of 12
ENBRIDGE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Pennington County
Polk County
Red Lake County
Milepost
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April 2016 Line 3 Replacement Route
0 1.5 3
Miles
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For Environmental Review Purposes Only
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Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
Page 3 of 12
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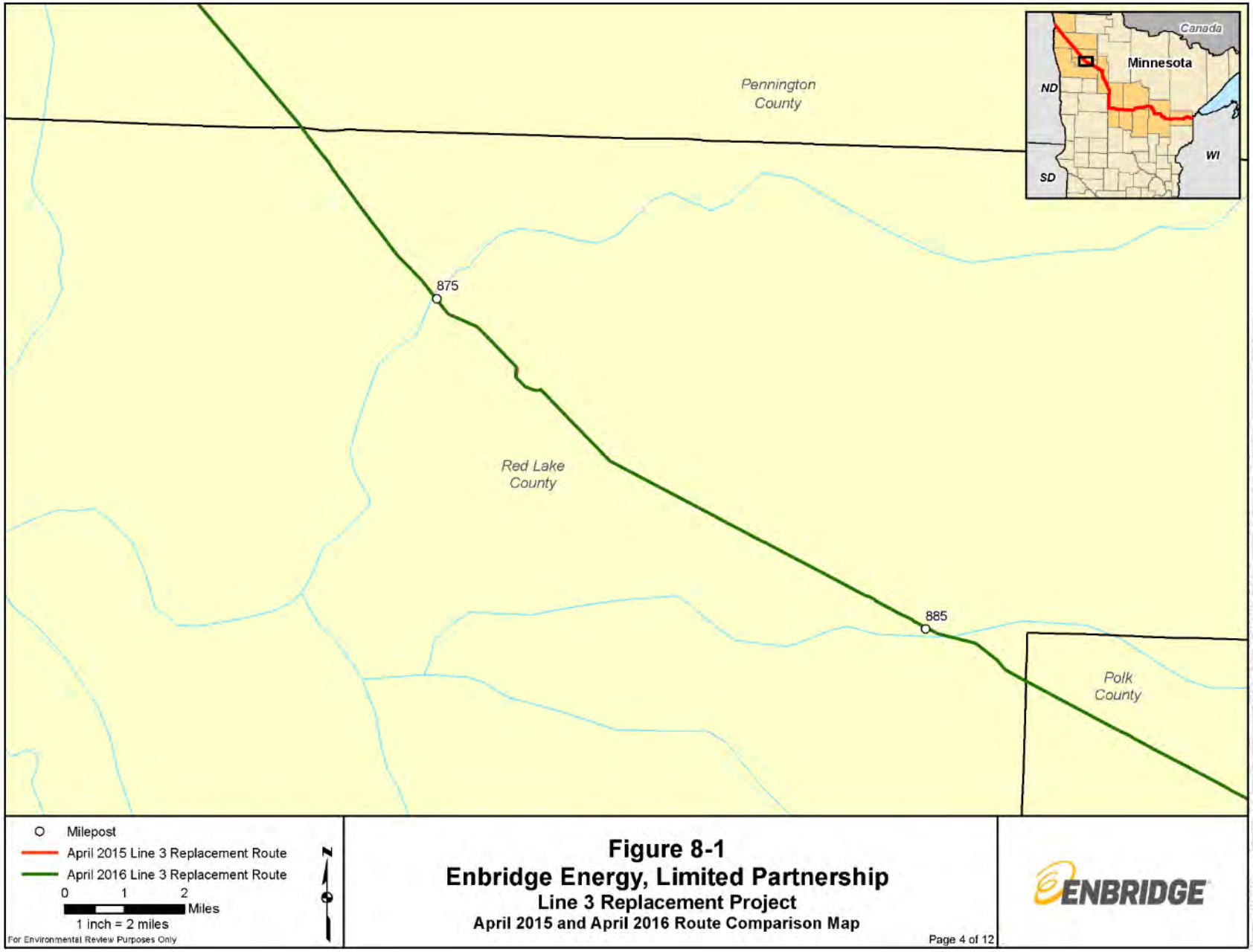
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Miles
1 inch = 2 miles
For Environmental Review Purposes Only
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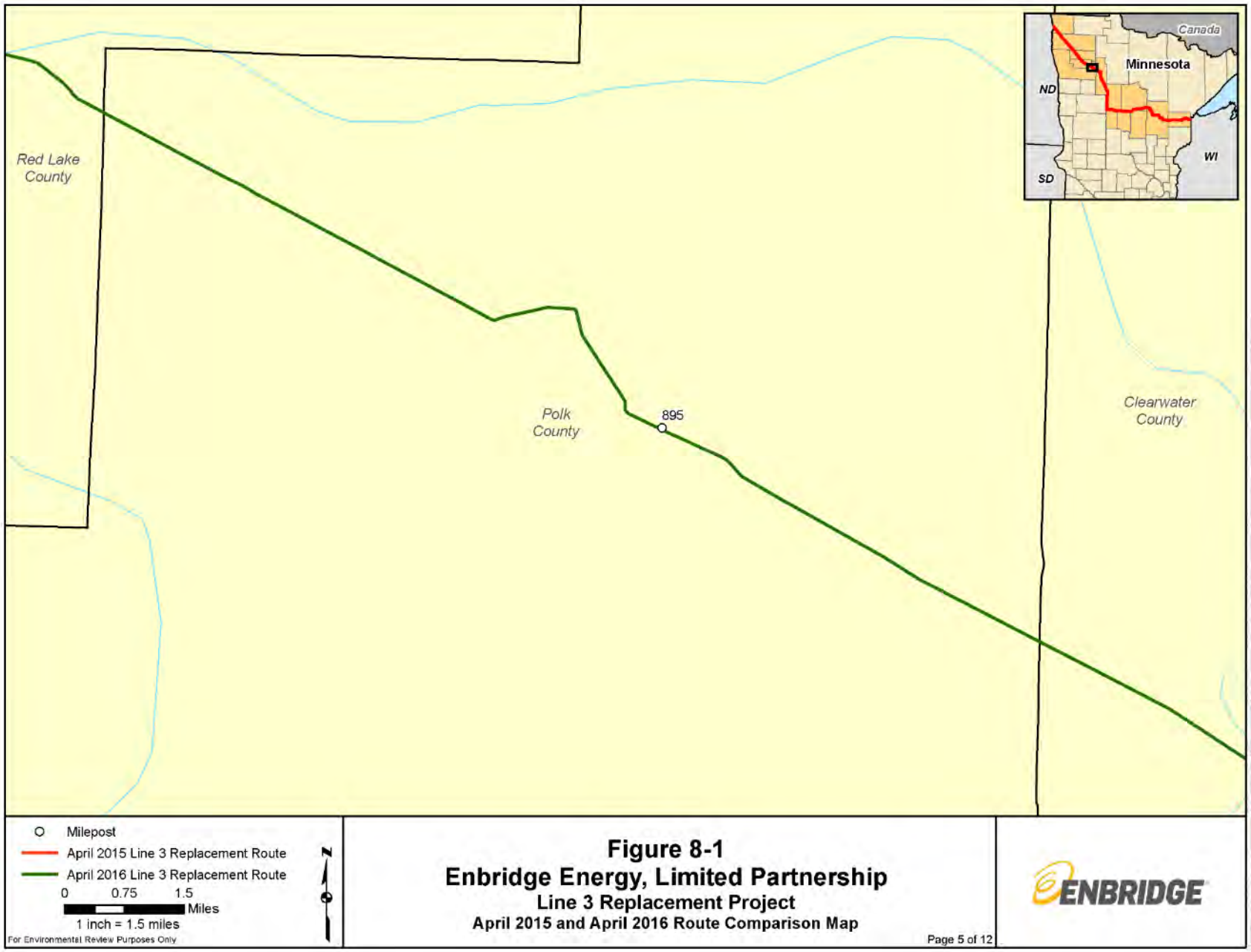
Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
Page 4 of 12
ENBRIDGE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April 2016 Line 3 Replacement Route
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Miles
1 inch = 1.5 miles
For Environmental Review Purposes Only
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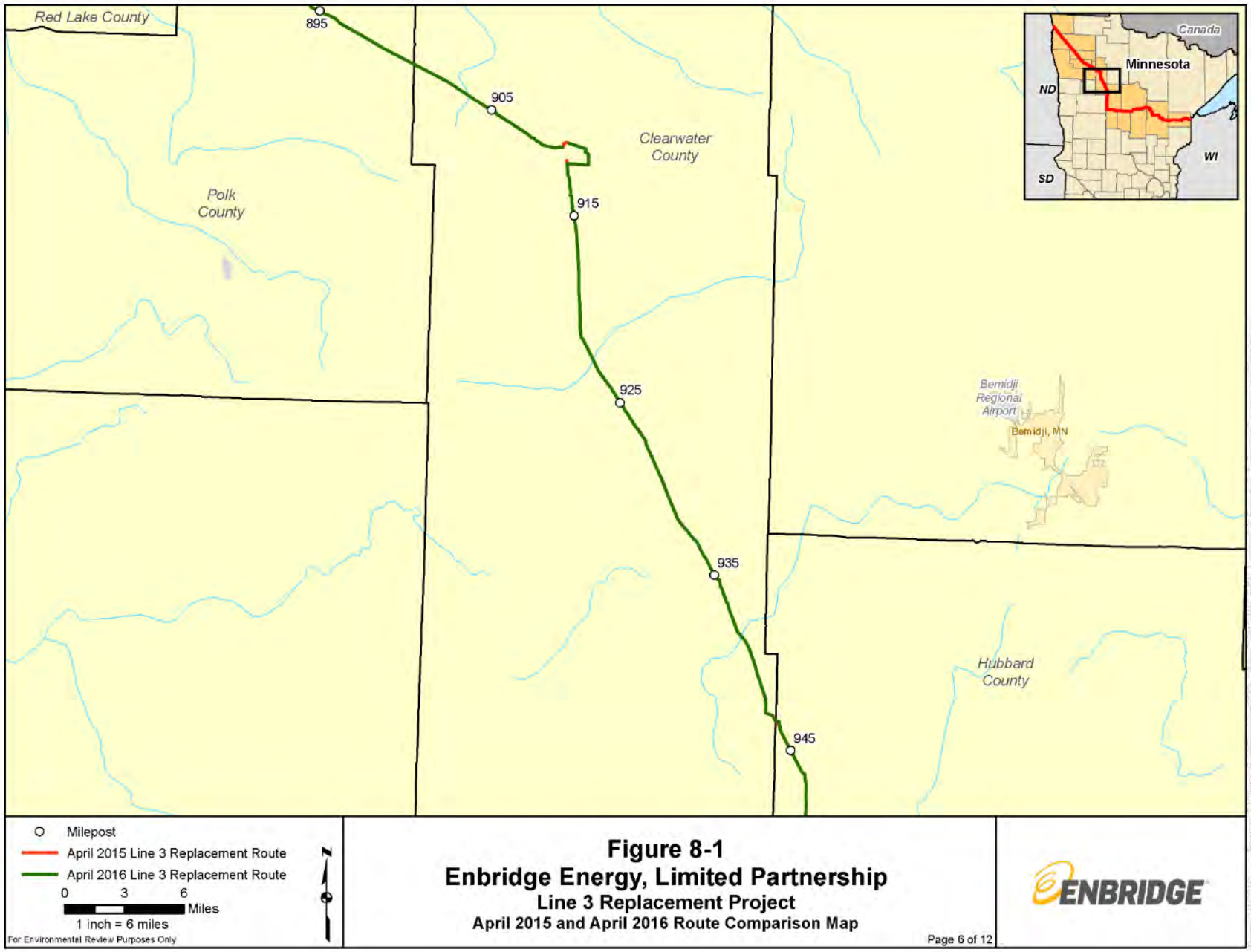
Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
Page 5 of 12
ENBRIDGE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April 2016 Line 3 Replacement Route
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Miles
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For Environmental Review Purposes Only
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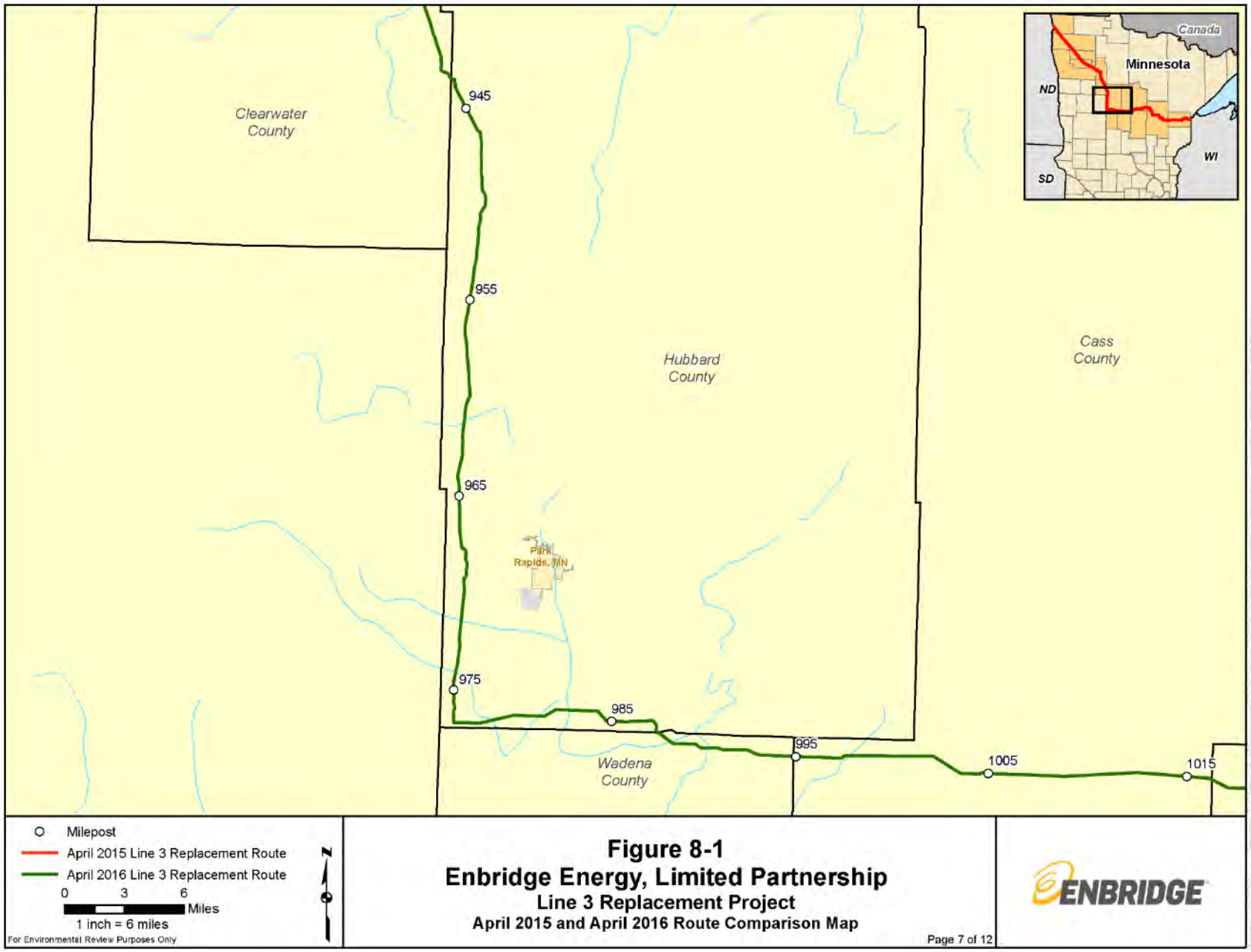
Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
Page 6 of 12
ENBRIDGE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April 2015 Line 3 Replacement Route
April 2016 Line 3 Replacement Route
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Miles
1 inch = 6 miles
For Environmental Review Purposes Only
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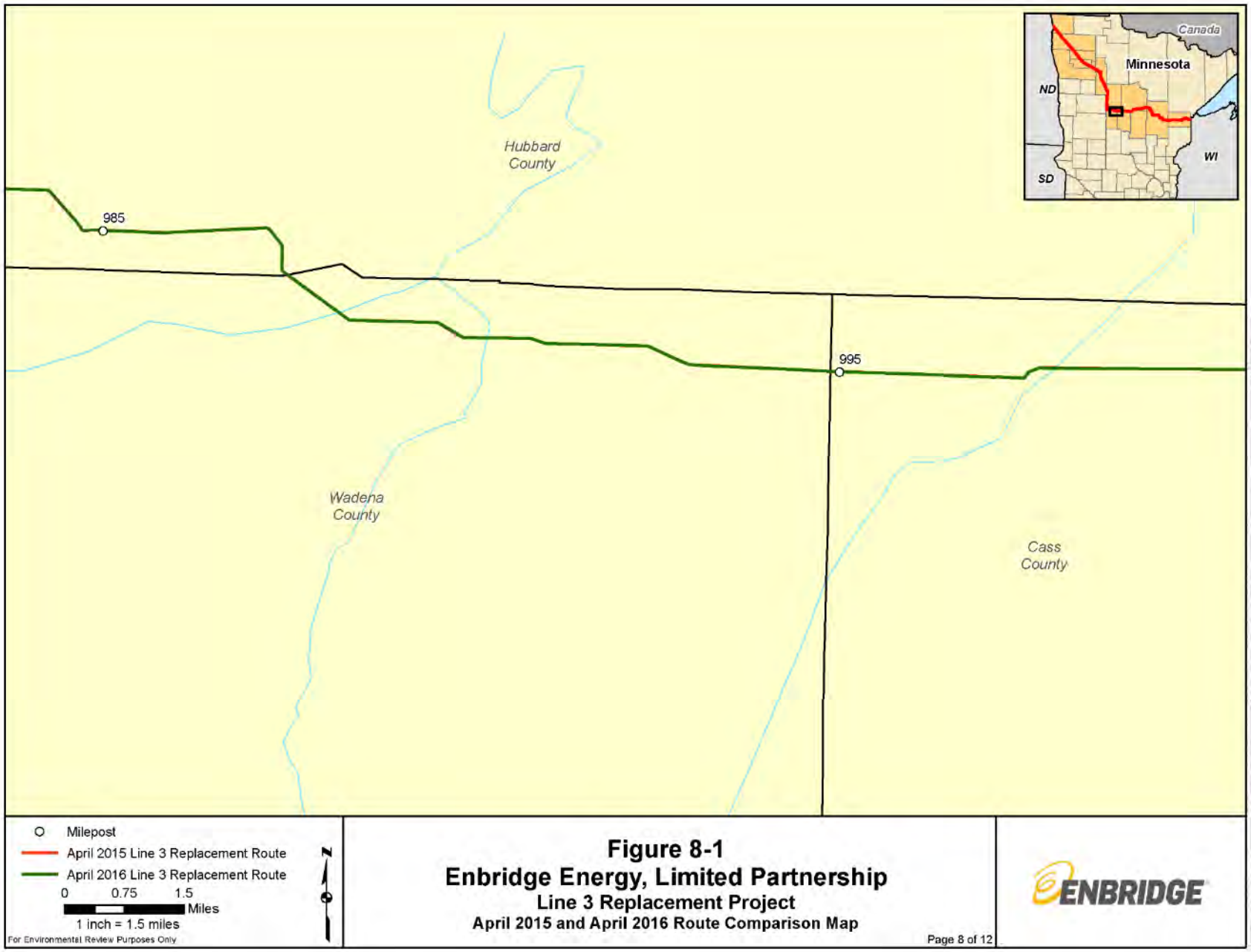
Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
Page 7 of 12
ENBRIDGE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Milepost
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April 2016 Line 3 Replacement Route
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Miles
1 inch = 1.5 miles
For Environmental Review Purposes Only
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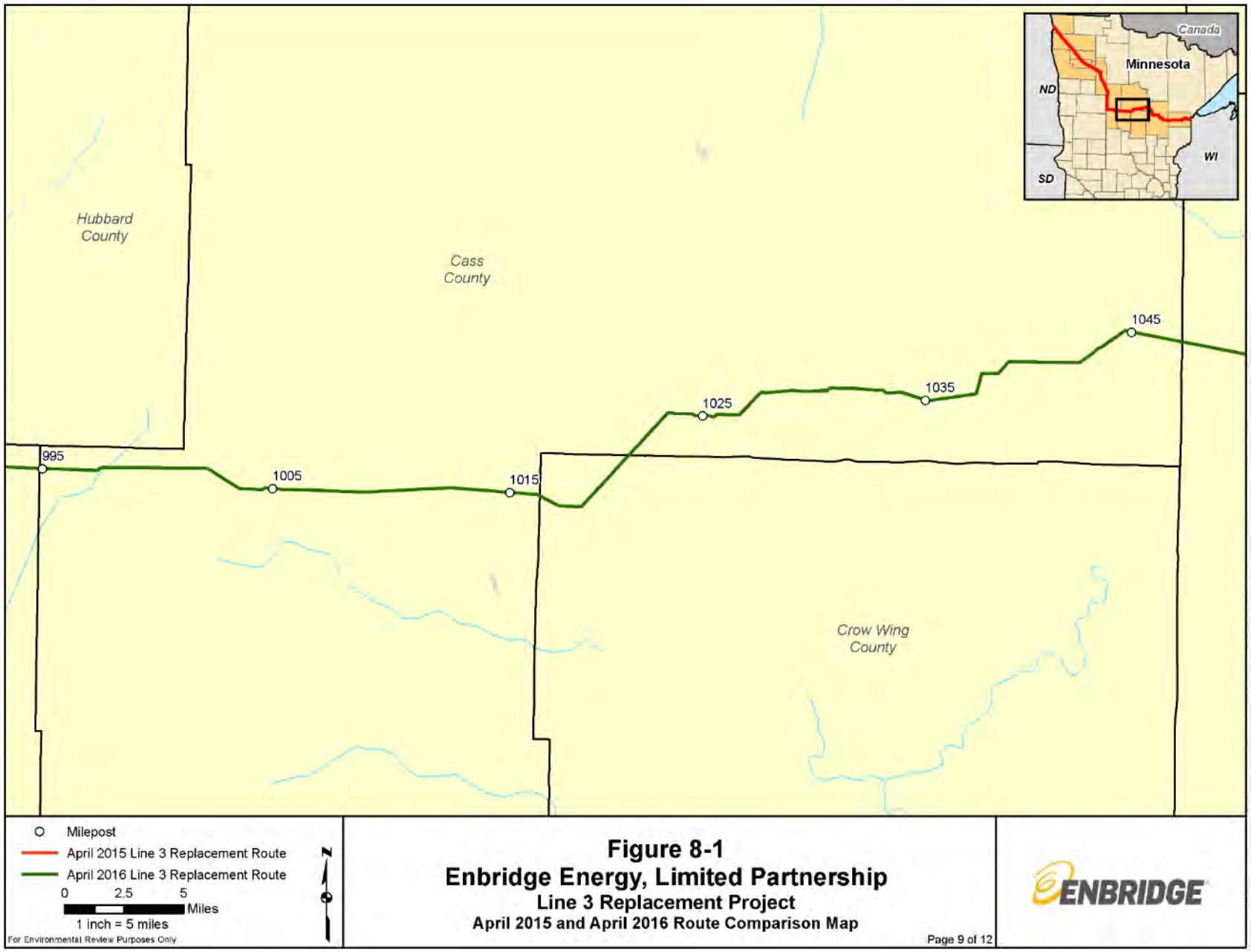
Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
Page 8 of 12
ENBRIDGE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Cass County
Crow Wing County
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Milepost
April 2015 Line 3 Replacement Route
April 2016 Line 3 Replacement Route
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Miles
1 inch = 5 miles
For Environmental Review Purposes Only
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Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
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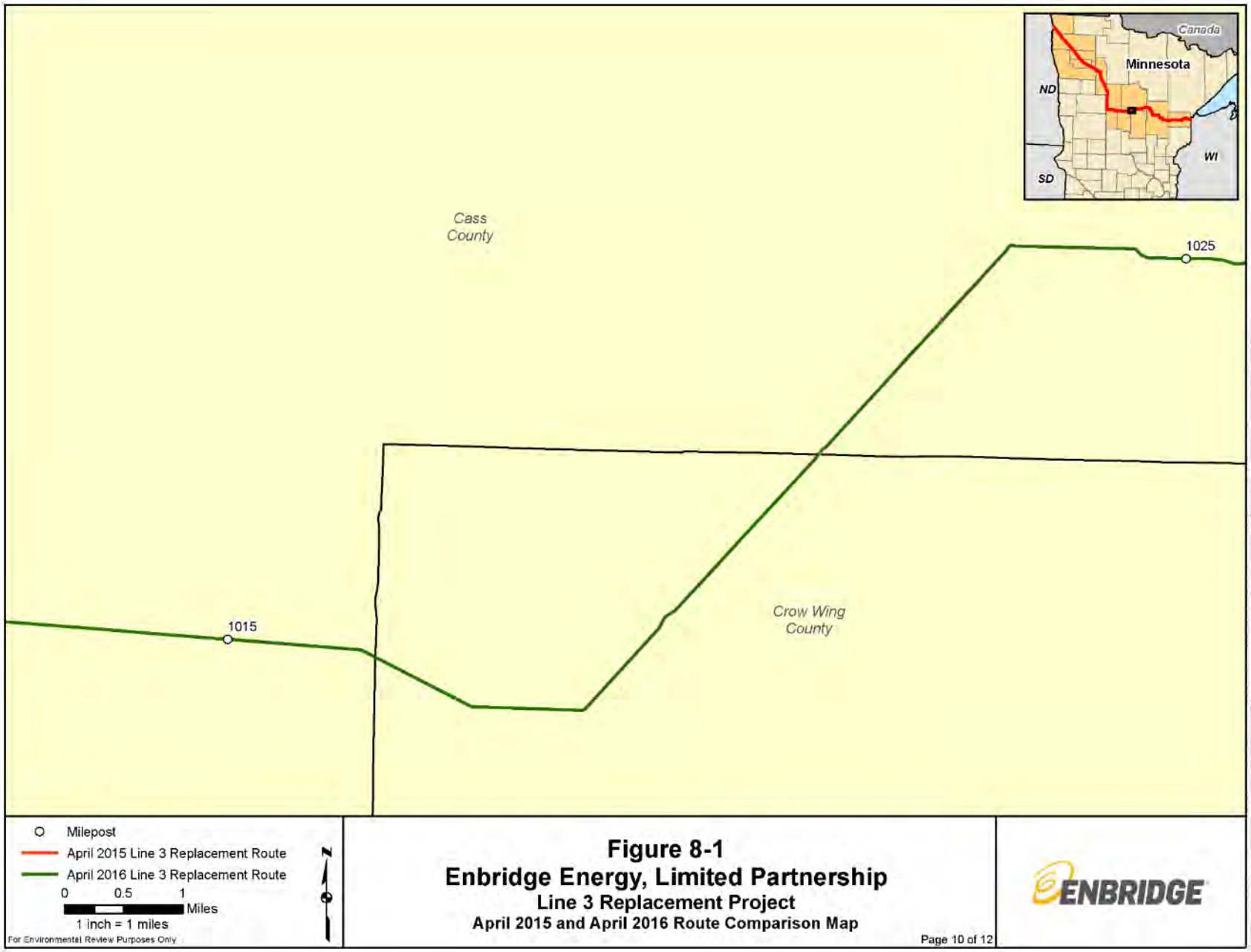
ENBRIDGE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Miles
1 inch = 1 miles
For Environmental Review Purposes Only
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Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
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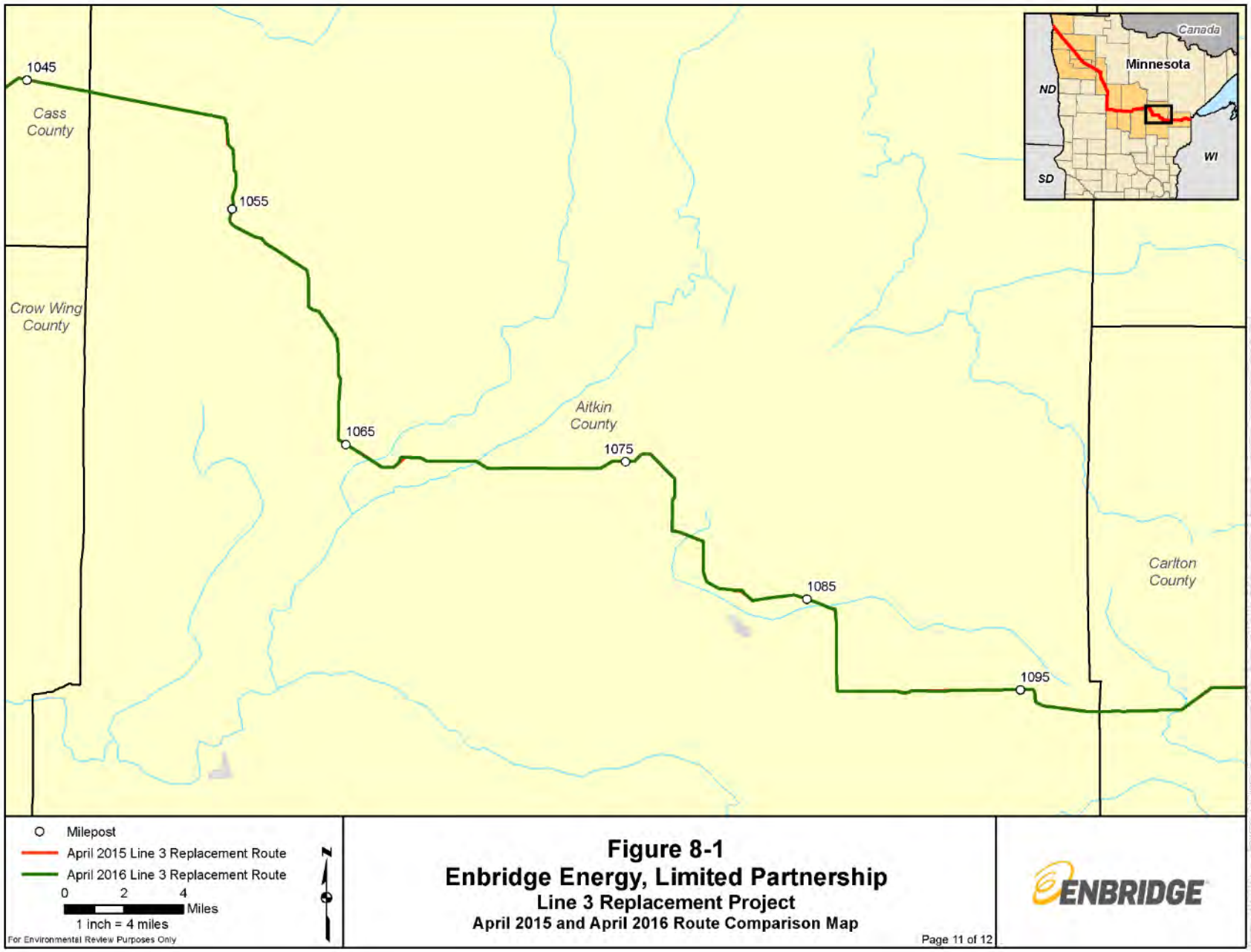
ENBRIDGE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Milepost
April 2015 Line 3 Replacement Route
April 2016 Line 3 Replacement Route
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Miles
1 inch = 4 miles
For Environmental Review Purposes Only
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Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
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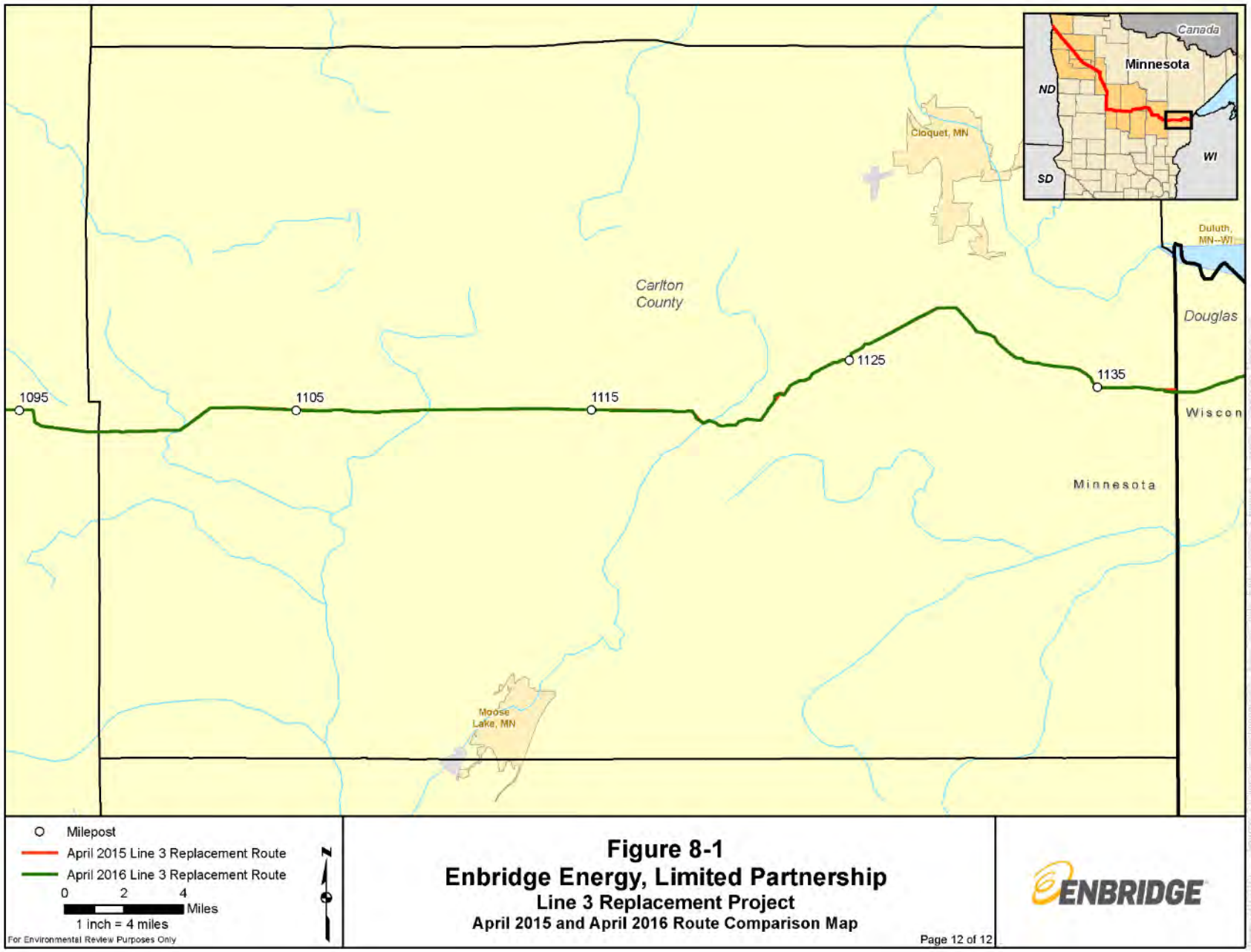
ENBRIDGE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Cloquet, MN
Duluth, MN--WI
Carlton County
Douglas
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1135
Wiscon
Minnesota
Moose Lake, MN
Milepost
April 2015 Line 3 Replacement Route
April 2016 Line 3 Replacement Route
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Miles
1 inch = 4 miles
For Environmental Review Purposes Only
N
Figure 8-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
April 2015 and April 2016 Route Comparison Map
Page 12 of 12
ENBRIDGE

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 19.

9. Land use:

a. Describe:

i. **Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.**

Existing Land Use

A description of state and county lands and recreation areas crossed by L3R is provided in Sections 7.5 and 7.6 of Enbridge's Routing Permit Application, submitted to the MPUC on April 24, 2015.

Pipeline

Table 9-1 presents the state-, private-, and county-owned or managed lands that would be crossed by the L3R route. The L3R route would predominantly cross private lands, with minor crossings of municipal lands (267.2 miles or approximately 79 percent of the route). The L3R route also would cross state lands owned and managed by various state agencies (25.6 miles or 8 percent) and county lands (44.3 miles or 13 percent). County lands include lands that may be owned by the state of Minnesota, but administered by the county (e.g., tax-forfeit lands). The L3R route does not cross any federal lands in Minnesota.

Table 9-1
Ownership of Lands Crossed by the Line 3 Replacement Project

Ownership	Crossing Length (miles)	Percentage of Route
Federal Lands	0.0	0
State Lands	25.6	8
County Lands	44.3	13
Private Lands/Other [b]	267.2	79
Total [c]	**337.1**	**100**

[a] This data was developed primarily from Enbridge's landowner tracking database.
[b] Includes municipal lands, roads, and waterbodies not assigned an ownership category.
[c] The sum of addends may not total due to rounding.

The L3R route would not cross any national parks, national forests, national landmarks, wilderness areas, wildlife refuges, waterfowl production areas, migratory waterfowl feeding and resting lakes, national wildlife management areas ("WMA"), state parks, state scientific and natural areas, or county parks. However, the L3R route would cross a National Scenic Trail located on county land, a National Scenic Byway, state and county forests, county parks, state WMAs and an aquatic management area ("AMA"), state-designated trails, designated scenic byways, and state-designated water trails as shown in Table 9-2.

Table 9-2
Recreational Areas Crossed by the Line 3 Replacement Project and Sandpiper Pipeline Project

Feature	L3R		SPP [a]	
	MP Range	Crossing Length (miles)	MP Range	Crossing Length (miles)
FEDERAL INTERESTS				
National Scenic Trails [b]				
North Country Trail	952.7	N/A	419.5	N/A
National Scenic Byways [c]				
The Great River Road (2 crossings)	938.2; 1069.9	N/A	405.1; 536.8	N/A
STATE INTERESTS				
State Forests [d]				
Mississippi Headwaters State Forest	938.8 - 939.4	0.6	405.7 - 406.3	0.6
Huntersville State Forest	988.2 - 993.9	3.0	455.1 - 460.7	3.2
Foot Hills State Forest	1003.1 - 1005.2	2.1	469.9 - 472.0	2.1
Land O' Lakes State Forest	1039.0 - 1047.2	7.6	505.9 - 514.1	7.6
Hill River State Forest	1053.3 - 1058.0 1060.2 - 1060.5	4.6	520.2 -524.8 527.1 - 527.4	4.6
Waukenabo State Forest	1060.9 - 1061.4 1065.3 - 1066.2	1.4	527.8 - 528.3 532.2 - 533.1	1.4
Savanna State Forest	1087.4 - 1088.1	0.8	554.3 - 555.0	0.8
Wildlife Management Areas [d]				
Grayling Marsh WMA	1084.5 - 1085.5	1.1	551.3 - 552.4	1.1
Lawler WMA	1092.2 - 1092.5	0.3	559.1 - 559.3	0.2
Aquatic Management Areas [d]				
La Salle Creek AMA	943.3 - 943.4	<0.1	410.1 - 410.2	<0.1
State Trails [d]				
Paul Bunyan State Trail	1009.0	N/A	475.9	N/A
Hunter Walking Trail	1056.1; 1056.4	N/A	523.0; 523.2	N/A
Willard Munger State Trail	1119.3	N/A	586.1	N/A
State Canoe and Boating Routes/Water Trails [d]				
Red River of the North	801.8	N/A	301.4	N/A
Red Lake River (1 crossing L3R; 2 crossings SPP)	864.3	N/A	307.5 327.1	N/A
Pine River	1014.6	N/A	481.5	N/A
Crow Wing River	990.6	N/A	457.4	N/A
Mississippi River (2 crossings)	938.4 1070.0	N/A	405.2 536.9	N/A
State Scenic Byways [c]				
King of Trails Scenic Byway	817.0	N/A	319.9	N/A
Lake Country Scenic Byway (2 crossings)	959.9 968.8	N/A	426.7 435.6	N/A
Veterans Evergreen Memorial Scenic Byway	1135.6	N/A	602.5	N/A

Table 9-2 Recreational Areas Crossed by the Line 3 Replacement Project and Sandpiper Pipeline Project				
Feature	L3R		SPP [a]	
	MP Range	Crossing Length (miles)	MP Range	Crossing Length (miles)

[a] Impacts provided for SPP are for the co-located portion only.

[b] The data was generated by Enbridge using publicly available data from the North Country Trail Association (http://northcountrytrail.org/trail/maps/) (2015).

[c] The data was generated by Enbridge digitizing the information by description.

[d] The source of this data is the Minnesota Geospatial Commons website. Available at: https://gisdata.mn.gov/ (MNGeo 2016).

Federally Designated Recreational Areas

National Scenic Trails

The L3R route would cross the North Country National Scenic Trail at MP 952.7 in Hubbard County.

National Wild and Scenic Rivers

The L3R route would cross the Red River of the North, Red Lake, Clearwater, Shell, Crow Wing, Moose, and Willow Rivers, which are listed on the Nationwide Rivers Inventory ("NRI"). The L3R route would not cross any river segments which are listed on the NRI as designated or potentially designated National Wild and Scenic Rivers. The Mississippi and Kettle Rivers have segments that are designated as Minnesota State Wild and Scenic Rivers; however, the L3R route does not cross either river within these designated segments.

State-Designated Recreational Areas

State Parks and Forest Lands

The L3R pipeline would not cross any state parks, but would cross approximately 20.1 miles of MDNR-administered state forest land (Table 9-2), including MDNR Division of Forestry-administered consolidated conservation and school trust lands.

State Wildlife Management Areas, Aquatic Management Areas, Scientific and Natural Areas, and Recreation Areas

The L3R route would cross the Grayling Marsh WMA from MP 1084.5 to 1085.5 and Lawler WMA from MP 1092.2 to 1092.5, both in Aitkin County.

The L3R route would cross the La Salle Creek AMA from MP 943.3 to 943.4 and would be located in the vicinity of an existing pipeline ROW at this crossing.

The L3R route would not cross any scientific natural areas ("SNA") or designated State Recreational Areas.

State-Designated Trails

The L3R route would cross two state-designated trails (Table 9-2), including the Paul Bunyan State Trail at MP 1009.0 in Cass County and the Willard Munger State Trail at MP 1119.3 in Carlton County. The state-designated Hunter Walking Trail system would be crossed twice by the L3R route at MP 1056.1 and MP 1056.4 in the Hill River State Forest in Aitkin County.

State-Designated Rivers

The Minnesota State Wild and Scenic Rivers Program was established in 1973 to protect rivers which have outstanding natural, scenic, geographic, historic, cultural, and recreational values. Six rivers in Minnesota, including the Mississippi and Kettle Rivers, have segments that are designated as wild, scenic, or recreational under the state program, and each segment has a management plan which outlines the rules and goals for that waterway. None of the segments of the Mississippi and Kettle Rivers that would be crossed by the L3R route have been designated as a Minnesota State Wild and Scenic River.

State-Designated Canoe and Boating Routes

The L3R route would cross five waterbodies listed as state-designated canoe and boating routes (MNGeo 2016) in six different locations: the Red River of the North, Red Lake River, Pine River, Crow Wing River, and the Mississippi River (twice). The MDNR manages Minnesota's canoe/boating routes.

Designated Scenic Byways

The L3R route would cross one federal- and state-designated scenic byway in two locations and three state-designated scenic byways in four locations (Table 9-2).

The Great River Road

The Great River Road Scenic Byway in Minnesota has two components: a federally designated 430-mile National Route and a 755-mile state-designated alternate route. Combined, the routes provide 1,185 miles of scenic, historic, and recreational opportunities for travelers. The L3R route would cross the Great River Road at approximate MP 938.2 in Clearwater County and approximate MP 1069.9 in Aitkin County.

King of Trails Scenic Byway

The King of Trails Scenic Byway (Minnesota State Highway 75) stretches along 414 miles of Minnesota's western border. Scenery along the byway includes prairies and farmlands. The L3R route would cross Minnesota State Highway 75 at approximate MP 817.0.

Lake Country Scenic Byway

The Lake Country Scenic Byway is approximately 88 miles long and received designation status as a State Scenic Byway in 1999. A 67-mile stretch follows Minnesota State Highway 34 between Detroit Lakes and Walker and includes a 21-mile spur on US Highway 71 stretching from Park Rapids to Itasca State Park. The L3R route would cross Minnesota State Highway 34 in two locations at approximate MP 959.9 and MP 968.8.

Veterans Evergreen Memorial Scenic Byway

The Veteran's Evergreen Memorial Scenic Byway occurs along a 50-mile stretch of State Highway 23 that runs from Banning State Park to New Duluth. The L3R route would cross Minnesota State Highway 23 at approximate MP 1135.6.

Associated Facilities

Clearbrook Terminal Expansion and Pump Stations

Enbridge would construct three new pumps adjacent to existing pump stations west of Clearbrook, and a new pump station at the Clearbrook Terminal. The existing pump stations and the Clearbrook Terminal are located on lands owned by Enbridge and, would not impact federal-, state-, or county-owned or administered lands or recreation areas. The four new pump station sites would be located on private land east of Clearbrook, and no federal, state, or county lands or recreation areas would be affected.

Mainline Valves

With one exception, mainline valve sites associated with L3R would be installed on privately-owned land and land owned by Enbridge. One mainline valve, at MP 939.8 in Clearwater County, would impact approximately 0.1 acre of county-owned land. The mainline valves would not impact federal- or state-owned or administered lands or recreation areas.

Cathodic Protection

A cathodic protection system at MP 989.8 would impact 0.3 acre of the Huntersville State Forest in Wadena County and cathodic protection systems at MP 1027.3 and MP 1124.5 would impact a combined total of less than 0.1 acre of county-owned land in Cass and Carlton counties, respectively. The remainder of the cathodic protection systems associated with L3R would be installed on privately-owned land and land owned by Enbridge. The cathodic protection systems would not impact federal- or state-owned or administered lands or recreation areas.

Access Roads

Table 9-3 presents the state-, private-, and county-owned or managed lands that would be crossed by L3R temporary access roads and permanent access roads. Temporary access roads would predominantly cross private lands (57.9 miles or 72 percent of access roads). Temporary access roads also would cross state lands owned and managed by state agencies (6.1 miles or 8 percent) and county lands (16.2 miles or 20 percent). County lands include lands that may be owned by the state of Minnesota, but administered by the county (e.g., tax-forfeit lands).

Permanent access roads would primarily impact private lands, with 0.1 mile of state conservation land crossed in Hubbard County and 0.1 mile of county and county tax-forfeit lands crossed in Cass and Clearwater County. Access roads do not cross any federal lands in Minnesota.

Table 9-3 Ownership of Lands Crossed by the Line 3 Replacement Project – Access Roads		
Ownership	Crossing Length (miles)	Percentage of Route
Temporary Access Roads		
Federal Lands	0.0	0
State Lands	6.1	8
County Lands	16.2	20
Private Lands/Other [b]	57.9	72
Total [c]	**80.1**	**100**
Permanent Access Roads to Mainline Valve Sites		
Federal Lands	0.0	0
State Lands	0.1	8
County Lands	0.1	7
Private Lands/Other [b]	1.1	85
Total [c]	**1.3**	**100**

[a] This data was developed primarily from Enbridge's landowner tracking database.

[b] Includes municipal lands, roads, and waterbodies not assigned land ownership.

[c] The sum of addends may not total due to rounding.

Table 9-4 presents the recreational areas that would be impacted by L3R access roads. L3R access roads would not cross any national parks, national forests, national landmarks, wilderness areas, wildlife refuges, waterfowl production areas, migratory waterfowl feeding and resting lakes, national WMAs, state parks, state SNAs, or county parks.

Recreational areas would not be affected by permanent access roads (refer to Table 9-4). One permanent access road to a mainline valve at MP 979.3 (refer to Table 6b-8) would be located on undesignated land in Hubbard County administered by the MDNR Forestry Division; permanent impacts of this road would be less than 0.2 acre.

Table 9-4
Recreational Areas Crossed by the Line 3 Replacement Project and Sandpiper Pipeline Project – Access Roads

Feature	L3R Temporary Access Roads		SPP [a] Temporary Access Roads	
	MP	Crossing Length (miles)	MP	Crossing Length (miles)
STATE INTERESTS				
State Forests [b]				
Mississippi Headwaters State Forest	938.7, 938.9, 939.2, 939.5, 940.7	1.9	405.6, 405.8, 406.0, 406.2, 407.4	1.9
Huntersville State Forest	985.8, 989.6, 990.7, 990.8, 991.3, 991.7, 992.0, 992.9, 994.6	2.5	452.5, 456.4, 457.4, 457.5, 458.0, 458.6, 458.8, 459.7, 461.1	2.5
Badoura State Forest	998.0	0.1	464	0.1
Foot Hills State Forest	1003.1, 1004.9	0.9	469.9, 471.5	0.9
Land O' Lakes State Forest	1029.8, 1030.5, 1034.8, 1035.8, 1036.1, 1036.2, 1036.4, 1040.8, 1041.7	1.9	496.6, 497.2, 501.8, 502.5, 502.9, 503.1 (2 access roads), 507.5, 508.5	1.9
Hill River State Forest	1052.5, 1052.8, 1053.5, 1054.9, 1055.4, 1056.9, 1058.7, 1059.0, 1059.2	1.8	519.3, 519.6, 520.2, 521.6, 522.2, 523.8, 525.7, 525.8, 525.9	1.8
Waukenabo State Forest	1065.3, 1065.4	0.5	532.1 (2 access roads)	0.5
Savanna State Forest	1087.4, 1087.7	<0.1	554.1, 554.5	<0.1
Wildlife Management Areas				
Salo Marsh WMA	1096.0; 1096.2	0.3	562.7 (2 crossings)	0.3

[a] Temporary access roads located east of L3R MP 912.3 (SPP MP 379.2) would be utilized for both L3R and SPP.

[b] The source of this data is the Minnesota Geospatial Commons website. Available at: https://gisdata.mn.gov/ (MNGeo 2016).

The EIS will further describe potential impacts to the following land use features:

- Federally Designated Recreational Areas
- State Designated Recreational Areas
    - State Parks and Forest Lands
    - State WMAs, AMAs, SNAs, and Recreation Areas
    - State Designated Trails
    - State Designated Rivers
    - Stated Designated Canoe and Boating Routes
- Designated Scenic Byways

ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

PLANNED LAND USE

The L3R route would cross the Red Lake, Wild Rice, Two Rivers and Middle-Snake Watershed Districts and twelve counties where comprehensive land use plans have been established; these are Kittson, Marshall, Pennington, Red Lake, Polk, Clearwater, Hubbard, Wadena, Cass, Crow Wing, Aitkin, and Carlton counties. In addition, almost all counties crossed by the project have water management plans which will be consulted and utilized in the evaluation of impacts. All counties will be examined for any updated land-use plans, zoning ordinances, and development codes throughout the EIS process.

While not required, each county is encouraged to prepare and implement a community-based comprehensive plan. A comprehensive plan typically includes the policies, statements, goals, and interrelated plans for private and public land and water use, transportation, and community facilities, including recommendations for plan execution, documented in texts, ordinances, and maps that constitute the guide for the future development of the county or any portion of the county. These might also include goals and objectives for the preservation of agricultural, forest, wildlife, and open space land, and minimizing development in sensitive shoreland areas (Minn. Stat. 394.231). Because counties are not required to have comprehensive plans, other plans may serve to assist with land management (e.g., Shoreland Ordinance). Additionally, L3R is located within some state and local agency jurisdictions that have adopted land use plans and/or regulations that guide the type, time, and intensity of land use specific to a feature (e.g., state forest).

The EAW has preliminarily identified planned land uses, as well as available comprehensive land use plans. Other applicable management plans, as they are discovered, will be considered in the EIS such as for regional land use, water, or resources managed by a local, regional, state, or federal agency.

iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

COUNTY ZONING AND LAND USE

Kittson County is primarily agricultural with some forested areas[32]. The Kittson County Zoning Ordinance was adopted to encourage growth of business and commerce, to expand employment throughout the county, and to promote the health, safety, and general welfare of the people of the county[33]. A Floodplain Ordinance also exists to minimize flood losses and protect the public health, safety, and general welfare[34].

Marshall County is mainly agricultural with some forested areas of public land[35]. The Land Use Plan was developed to encourage proper land use planning, maintain agricultural production, facilitate population and economic development, and promote local protection of natural resources. The Marshall County Floodplain Management Ordinance was created to minimize flood loss while protecting the public health, safety, and general welfare[36]. The county also implemented the Marshall County Shoreland Ordinance to "provide for the wise subdivision, use and development of shorelands of public waters[37]."

Pennington County is agricultural, with forested and prairie lands interspersed[38]. Both the Shoreland Ordinance and the Floodplain Ordinance were implemented to promote preservation and enhancement of the quality of surface waters, maintain economic values of shorelands, and ensure wise use of water resources[39].

While detailed land use data was not immediately available for Polk County, the county is heavily agricultural in character, leading the state of Minnesota in the production of spring wheat, dry beans, and sugar beets[40]. The Polk County Zoning Ordinance was implemented to mitigate flood hazards, promote the orderly development of shoreland and the unincorporated area of the county, as well as the sustainability of the county's livestock industry, and to enhance public health, safety, and general welfare[41].

[32] Kittson County Land Use And Cover (last visited Feb. 1, 2016), http://www.mngeo.state.mn.us/maps/LandUse/lu_kitt.pdf.
[33] Kittson County Zoning Ordinance (Feb. 4, 2014), http://co.kittson.mn.us/DocumentCenter/Home/View/248.
[34] Kittson County Floodplain Ordinance (revised Aug. 8, 2003), http://co.kittson.mn.us/DocumentCenter/Home/View/246.
[35] Marshall County Comprehensive Land-Use Plan (Sept. 2000), http://www.co.marshall.mn.us/marshallcounty/Ordinances/MC%20Comp%20Landuse%20Plan.pdf.
[36] Marshall County Flood Plain Management Ordinance (April 17, 2012), http://www.co.marshall.mn.us/marshallcounty/Ordinances/2012%20Floodplain%20Ordinance.pdf.
[37] Marshall County Shoreland Ordinance (last visited Feb. 1, 2016), http://www.co.marshall.mn.us/marshallcounty/Ordinances/MarshallCountyShorelandOrdinance.pdf.
[38] Pennington Soil and Water Conservation District (last visited Feb. 2, 2016), http://www.penningtonswcd.org/.
[39] DNR Shoreland, Pennington Soil and Water Conservation District (last visited Feb. 2, 2016), http://www.penningtonswcd.org/#!programs/vstc2=shoreland.
[40] Polk County Minnesota (last visited January 18, 2016), http://www.co.polk.mn.us/.
[41] Polk County Zoning Ordinance §§ 1.2000-.3000 (March 2014), http://www.co.polk.mn.us/vertical/sites/%7B4649BB22-31C0-4F09-8D7C-B36D1E78E519%7D/uploads/2014_Complete_Zoning_Ordinance.pdf.

Red Lake County is 77 percent cultivated, and 10 percent forested; the remainder is largely covered in water and wetlands, with sparse human habitation[42]. The Red Lake County Shoreland Ordinance was implemented to provide for the "wise subdivision, use, and development of shorelands of public waters[43]".

Clearwater County is rural in nature, with the southern portion of the county chiefly covered by forest land, the northern portion mostly covered by agricultural land, and the middle portion featuring a mixture of the two[44]. The Clearwater County Comprehensive Local Water Management Plan was enacted to protect the soil, water, and other natural resources located in Clearwater County[45]. The Clearwater County Shoreland Management Ordinance was implemented to regulate the use and development of shorelands and to provide for the wise use of waters and related land resources[46]. The Clearwater County Resource Management Plan primarily focuses on promoting the orderly management of the county's forests[47].

Hubbard County is also rural in nature; 65 percent is covered by forest, 19 percent by water and wetlands, and 14 percent by agricultural land, with a modest amount of developed, urban land[48]. The county has promulgated the Hubbard County Shoreland Ordinance No. 17[49] and the Hubbard County Local Water Management Plan[50] to promote the orderly development of its water resources.

Wadena County is also rural in character, with 42 percent covered by agricultural land, 30 percent of its area covered by wetlands, and most of the rest of the land covered by forests and sparse human habitation[51]. The Wadena County Comprehensive Plan was designed "to serve as a guide for the future development of, and use of land in, Wadena County[52]". The Wadena County Zoning Ordinance was implemented to ensure that county zoning decisions were made in conformity with the Wadena County Comprehensive Plan, and to facilitate the orderly development of land in Wadena County[53].

Much of Cass County is covered in forest, water, and wetlands[54]. The Cass County Comprehensive Plan was implemented to guide the county in making decisions related to land

[42] Red Lake Priority Concerns Scoping Document (2008), http://redlakecountyswcd.org/uploads/3/5/3/4/3534080/rlc_priority_scoping-website.pdf.
[43] Red Lake County Shoreland Ordinance (2010), http://www.co.red-lake.mn.us/vertical/sites/%7B2C807525-C262-4592-9BD4-DF75FE4B01C9%7D/uploads/Red_Lake_County_Shoreland_Ordinance.pdf.
[44] Clearwater County Comprehensive Local Water Management Plan 3-4 (2010), http://www.clearwaterswcd.org/2010.final.plan.official.pdf.
[45] *Id.*
[46] Clearwater County Shoreland Management Ordinance 5 (2010), http://www.co.clearwater.mn.us/vertical/Sites/%7BD1BE6F66-A19E-4CC1-ADD8-8DF38E31F1E3%7D/uploads/shore_ord_2010.pdf.
[47] Clearwater County Resource Management Plan 2-3 (July 2008), http://www.co.clearwater.mn.us/vertical/sites/%7BD1BE6F66-A19E-4CC1-ADD8-8DF38E31F1E3%7D/uploads/Resource_Management_Plan.pdf.
[48] Hubbard County Local Water Management Plan 6 (January 24, 2007), http://www.co.hubbard.mn.us/Environmental/Forms/HubbardCountyLWP.pdf.
[49] Hubbard County Shoreland Management Ordinance No. 17 (February 25, 2015), http://www.co.hubbard.mn.us/Ordinances/Ord%2017%20amendment%2017%2002252015.pdf.
[50] Hubbard County Local Water Management Plan (January 24, 2007), http://www.co.hubbard.mn.us/Environmental/Forms/HubbardCountyLWP.pdf.
[51] Wadena County Comprehensive Plan 50-51 (2013), http://www.co.wadena.mn.us/DocumentCenter/View/233.
[52] *Id.* at 2.
[53] Wadena County Zoning Ordinance #1 at 1 (amended August 5, 2014), http://www.co.wadena.mn.us/DocumentCenter/View/235.
[54] Cass County Comprehensive Plan 33 (2007), http://www.co.cass.mn.us/document_center/esd/Comprehensive_Plan_Update.pdf.

use[55]. The Cass County Land Use Ordinance was designed to preserve the county's natural resources and to promote orderly development in the county[56]. The Cass County Comprehensive Local Water Management Plan is a five-year strategic plan designed to achieve county water resource and management goals[57].

Crow Wing County is rural in character, with approximately 50 percent of the county covered by forests, and 28 percent covered by lakes, streams, and wetlands. Urban development is primarily clustered in the Brainerd/Baxter area[58]. The Crow Wing County Comprehensive Plan was created to promote sustainable development, environmental conservation, and economic growth[59]. Similarly, the Crow Wing County Land Use Ordinance was implemented to protect the county's natural resources and promote orderly development in the county[60]. The county has also promulgated the Unorganized Territory Comprehensive Plan, which regulates development in two parcels under the direct jurisdiction of the Crow Wing County Board[61].

Forty percent of Aitkin County is covered in wetlands or water, and an additional forty percent consists of forest[62]. The remaining land is chiefly used for agricultural or pastoral purposes, with less than one percent of land classified as urban or industrial[63]. The Aitkin County Comprehensive Land Use Management Plan seeks to encourage forestry, agriculture, residential density, economic growth, responsible resource management, and recreation[64]. Aitkin's Zoning Ordinance establishes zoning districts "with a view to encouraging the most appropriate use of land in the county[65]". Aitkin's Shoreland Ordinance is designed to balance development of shorelands with protection of the county's natural resources[66]. Aitkin County also established a Floodplain Management Ordinance to promote public health, safety, and general welfare and to minimize flood losses[67].

While Carlton County does have some urban and suburban development, primarily along the Interstate-35 corridor, the county remains primarily rural in character with approximately 64 percent of Carlton County covered in forest[68]. The Carlton County Community-Based Comprehensive Plan is designed to serve as a guide for development and redevelopment in the county, and emphasizes the county's goal of promoting sustainable economic development while preserving the quality of the county's natural resources[69]. The Carlton County Zoning

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[55] See *id*. at 3.
[56] Cass County Land Use Ordinance § 201 (amended September 5, 2005), http://www.co.cass.mn.us/document_center/ordinances/200501_landuse.pdf.
[57] See Cass County Local Water Management Plan 3-4 (January 2009), http://www.co.cass.mn.us/document_center/esd/Cass_County_Comprehensive_Local_Water_Management_Plan_2009_2014.pdf
[58] Crow Wing County Comprehensive Plan 10 (2002), http://crowwing.us/DocumentCenter/Home/View/1285.
[59] See *id.* at 5.
[60] Crow Wing County Land Use Ordinance §1.2 (April 22, 2011), http://crowwing.us/DocumentCenter/View/5397.
[61] Unorganized Territory, Crow Wing County Comprehensive Plan § 2 (June 1997), http://crowwing.us/DocumentCenter/View/1295.
[62] Aitkin County Comprehensive Land Use Management Plan 48 (April 2000), https://www.co.aitkin.mn.us/departments/enviro-svcs/compUsePlanData/comprehensive-land-use-plan.pdf.
[63] See *id.*
[64] See *id.* at 2-9.
[65] Aitkin County Zoning Ordinance §1 (amended April 9, 2013), https://www.co.aitkin.mn.us/ordinances/GenZoningOrd_2013.pdf.
[66] Aitkin County Shoreland Ordinance §1.2 (May 8, 2012), https://www.co.aitkin.mn.us/ordinances/shoreland2012amended.pdf.
[67] Aitkin County Floodplain Ordinance §1.3 (amended June 6, 2001), https://www.co.aitkin.mn.us/ordinances/floodplain99.pdf.
[68] Carlton County Community-Based Comprehensive Plan 103 (April 2001), http://www.co.carlton.mn.us/vertical/Sites/%7B315ADE76-21A3-4241-B977-F94AEE8A7F04%7D/uploads/Community_Based_Comprehensive_Plan.pdf.
[69] *Id.* at 1-8.

Ordinance was implemented "to promote the public health, safety, morals and general welfare" through the orderly development of land in a manner consistent with the county's Community-Based Comprehensive Plan[70].

WATERSHED DISTRICTS

The Red Lake Watershed District Rules are designed to keep Watershed District managers apprised of planned projects so they can advise developers and "ensure that land disturbing activity and development occurs in an orderly manner and in accordance with the overall plan for the district[71]". The Wild Rice Watershed District Rules were implemented "to promote the use of the waters and related resources within the District in a provident an orderly manner so as to improve general welfare and public health for the benefit of its present and future residents[72]".

The Rules of the Two Rivers Watershed District govern projects that affect water resources, and require permitting for any type of work which alters drainage pattern or water quality within the District[73]. The Middle-Snake-Tamarac Rivers Watershed District Rules were designed to "to promote the use of the waters and related resources within the District in a provident and orderly manner to improve the general welfare and public health for the benefit of its present and future residents[74]."

OTHER USES

A variety of conservation easements are present in Minnesota, residing with various state and federal agencies such as the Minnesota Board of Water & Soil Resources, MDNR, and United States Fish & Wildlife Service ("USFWS"). Easements can also reside with non-profit conservation groups such as Minnesota Land Trust and The Nature Conservancy ("TNC"). Additionally, easements that protect wetland mitigation sites are found throughout the state.

The L3R construction workspace would cross 42 parcels on privately-owned and state- and county-managed lands that are associated with conservation easements (see Table 9-5). An additional 10 parcels are located outside of the construction workspace but within the 750-foot-wide requested route width. The 750-foot-wide route width would encompass the L3R construction workspace (including ATWS), Clearbrook Terminal, pump stations, mainline valves, and cathodic protection systems. Temporary access roads outside of the 750-foot-wide requested route width may cross lands with conservation easements; however, impacts cannot be determined at this time as the extent of improvement on these roads is not currently known. The Applicant will coordinate closely with management entitities of the conservation easements to ensure that pipeline-associated activities are permissible in these areas. Alternative workspaces could potentially be identified if such activities are determined to be prohibited.

[70] Carlton County Zoning Ordinance #27 §3 (March 1, 2005), http://www.co.carlton.mn.us/vertical/Sites/%7B315ADE76-21A3-4241-B977-F94AEE8A7F04%7D/uploads/Zoning_Ordinance_27_(051215).pdf.
[71] Red Lake Watershed District Rules §1, http://www.redlakewatershed.org/PDF_Files/RED%20LAKE%20WATERSHED%20DISTRICT%20RULES_Adopted%208-27-15.pdf.
[72] Wild Rice Watershed District Rules §1, http://storm1.afixia.com/~wildrice/files/2013/7995/3362/rules.pdf.
[73] Overall Plan of the Two Rivers Watershed District (July 6, 2004), http://www.tworiverswd.com/pdf/Overall%20Plan%202004%20FINAL.pdf.
[74] Revised Rules of the Middle-Snake-Tamarac Rivers Watershed District Portions of Marshall, Polk, Pennington, Kittson & Roseau Counties § 1 (July 19, 2004), http://www.mstrwd.com/docs/rules04-adopted.pdf.

Table 9-5 Conservation Easements within the Line 3 Replacement Project Construction Workspace and Requested Route Width			
Within the L3R Construction Workspace		Within the L3R 750-foot-wide-Requested Route Width	
County/Pin	Easement Type	County/Pin	Easement Type
Aitkin			
50-0-007000	Forest Incentive Program	39-0-055000	Sustainable Forest
50-0-007100	Forest Incentive Program	39-0-058000	Conservation Easement
35-0-038400	Sustainable Forest		
35-0-038500	Sustainable Forest		
35-0-039700	Sustainable Forest		
35-0-039800	Sustainable Forest		
35-0-039801	Sustainable Forest		
19-0-044400	Sustainable Forest		
39-0-049000	Sustainable Forest		
22-0-028800	Overflow Easement		
30-0-004000	Sustainable Forest		
27-0-002500	Flowage Easement		
27-0-003000	Flowage Easement		
27-0-000900	Flowage Easement		
Cass			
25-006-4401	Sustainable Forest	12-018-3400	Other
25-005-3300	Sustainable Forest		
25-005-3400	Sustainable Forest		
25-005-4201	Sustainable Forest		
12-019-2100	Other		
12-019-1100	Other		
Clearwater			
03-021-0300	Forest Incentive Act	03-016-0300	Other
15-002-0300	Other	16-020-0120	Other
15-002-0450	Forest Incentive Act		
15-002-0400	Forest Incentive Act		
15-013-0300	Forest Incentive Act		
10-024-0200	Sustainable Forest		
Carlton			
69-020-3200	Sustainable Forest	81-060-5290	Other
36-010-0220	Other		
36-010-0210	Other		
72-010-0800	Sustainable Forest Incentive		

Table 9-5 Conservation Easements within the Line 3 Replacement Project Construction Workspace and Requested Route Width			
Within the L3R Construction Workspace		Within the L3R 750-foot-wide-Requested Route Width	
County/Pin	Easement Type	County/Pin	Easement Type
60-026-0940	Sustainable Forest Incentive		
60-026-0930	Sustainable Forest Incentive		
60-026-0750	Replacement Wetlands		
60-016-0180	Sustainable Forest Incentive		
60-026-0653	Other		
Hubbard			
18-19-02081	Other	25-05-00900	Other
25-06-00100	Riparian Easement	06-31-00160	Forest Incentive Act
25-07-01100	Forest Incentive Act	06-31-00150	Forest Incentive Act
		06-36-08000	Other
Wadena			
04-006-2010	Ingress/Egress		
04-005-2010	Ingress/Egress		
04-004-3010	Ingress/Egress		
04-004-1030	Ingress/Egress		

No federal or state Wild and Scenic Rivers are crossed by the L3R route. Table 9-6 identifies the 100-year floodplains that would be crossed by the L3R and SPP routes where co-located.

Table 9-6 100-Year Floodplains Crossed by the Line 3 Replacement Project and Sandpiper Pipeline Project [a]				
County [a]	L3R MP Range	Crossing Length (in miles)	SPP MP Range [b]	Crossing Length (in miles)
Kittson	801.8 – 807.2	5.4	--	--
Marshall	828.2 – 828.4	0.2	--	--
	835.9 – 836.0	0.1	--	--
Pennington	864.1 – 864.4	0.2	--	--
	864.4 – 864.6	0.2	--	--
Polk	884.7 – 884.8	0.0	--	--
	885.8 – 885.8	0.0	--	--
Wadena	988.5 – 988.6	0.1	455.3 – 455.4	0.1
	990.6 – 990.7	0.1	457.4 – 457.5	0.1
Aitkin	1056.6 – 1056.6	0.0	523.6 – 523.7	0.1
	1056.7 – 1056.8	0.2	523.8 – 524.2	0.4
	1057.0 – 1057.2	0.3	530.3 – 530.4	0.1
	1063.4 – 1063.5	0.1	530.8 – 531.5	0.7

Table 9-6 100-Year Floodplains Crossed by the Line 3 Replacement Project and Sandpiper Pipeline Project [a]				
County [a]	L3R MP Range	Crossing Length (in miles)	SPP MP Range [b]	Crossing Length (in miles)
	1063.9 – 1064.6	0.7	532.4 – 532.5	0.1
	1065.6 – 1065.6	0.1	532.6 – 533.0	0.4
	1065.7 – 1066.1	0.4	533.1 – 533.2	0.1
	1066.3 – 1066.3	0.1	535.9 – 536.1	0.1
	1069.0 – 1069.2	0.1	536.5 – 536.5	0.0
	1069.6 – 1069.6	0.0	536.6 – 536.7	0.2
	1069.7 – 1069.8	0.2	536.9 – 536.9	0.1
	1070.0 – 1070.0	0.1	545.5 – 546.3	0.7
	1078.6 – 1079.4	0.7	546.3 – 546.4	0.1
	1079.4 – 1079.5	0.1	548.1 – 548.2	0.1
	1081.2 – 1081.4	0.1	549.5 – 549.7	0.1
	1082.7 – 1084.5	1.8	549.7 – 551.3	1.7
	1085.7 – 1086.2	0.5	552.6 – 553.1	0.5
Total		**11.8**		**5.7**

[a] Impacts provided for SPP are for the co-located portion only.

[b] Floodplain data is not available for Clearwater, Hubbard, Cass, Crow Wing, and Carlton counties.

Source: Federal Emergency Management Agency data available on the Minnesota Geospatial Commons website. Available at: https://gisdata.mn.gov/ (MNGeo 2016).

b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The EIS will further analyze the Project's compatibility with existing land use, zoning and plans.

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

The EIS will further identify measures to be incorporated into the proposed project to mitigate any potential incompatibility.

10. Geology, soils and topography/land forms:

a. Geology – Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

A description of geologic features crossed by the L3R route is provided in Section 7.7 of Enbridge's Routing Permit Application, submitted to the MPUC on April 24, 2015.

BEDROCK AND SURFACE GEOLOGY

L3R primarily traverses the Interior Plain Physiographic Province, crossing into the Laurentian Upland Province – Superior Upland in the eastern portion of the L3R environmental survey area in Minnesota (USGS 2004). The geologic terrain of both of these provinces is characterized by ancient pre-Cambrian igneous and metamorphic rocks that have been uplifted and eroded to a relatively low-relief plain, forming the stable geologic core of the North American continent known as the craton. The North American craton has been tectonically stable for more than 500 million years. The Superior Upland is a southern extension of the Laurentian Upland Province. The basement rocks of this province are associated with the 2.5 billion-year-old Kenoran Orogeny, a mountain-building event, and are part of the Canadian Shield. Basement rocks of the Interior Plains Physiographic Province were generally formed from the tectonic collision of smaller continental plates over one billion years ago that resulted in continental accretion and expansion of the North American craton.

The bedrock geology underlying L3R is illustrated in Figure 10a-1 (Jirsa et al. 2011). Very limited occurrences of Paleozoic and Mesozoic sedimentary bedrock units lie randomly over the pre-Cambrian basement rocks across northern Minnesota. Ordovician sedimentary bedrock occurs in the northwestern portion of Polk County, but lies to the north of L3R. However, two relatively short segments (fewer than 20 miles) of the L3R route cross Cretaceous sedimentary bedrock in both Aitkin and Cass counties. These sediments were deposited 65 to 136 million years ago and consist of sandstone lenses near the base of predominantly gray, soft, argillaceous shale (solidified mud and clay) sections.

Regional maps of depth-to-bedrock coverage generally lack sufficient resolution to identify areas where bedrock occurs at specific depths. Accordingly, the depth to bedrock in a specific location is difficult to determine. Generally, depth to bedrock in the L3R area exceeds 30 feet and can exceed 450 feet. The only area with shallow or exposed bedrock is within a 20 mile segment in Carlton County, and the bedrock geology is dominated by graywackes, slates, and metasediments.

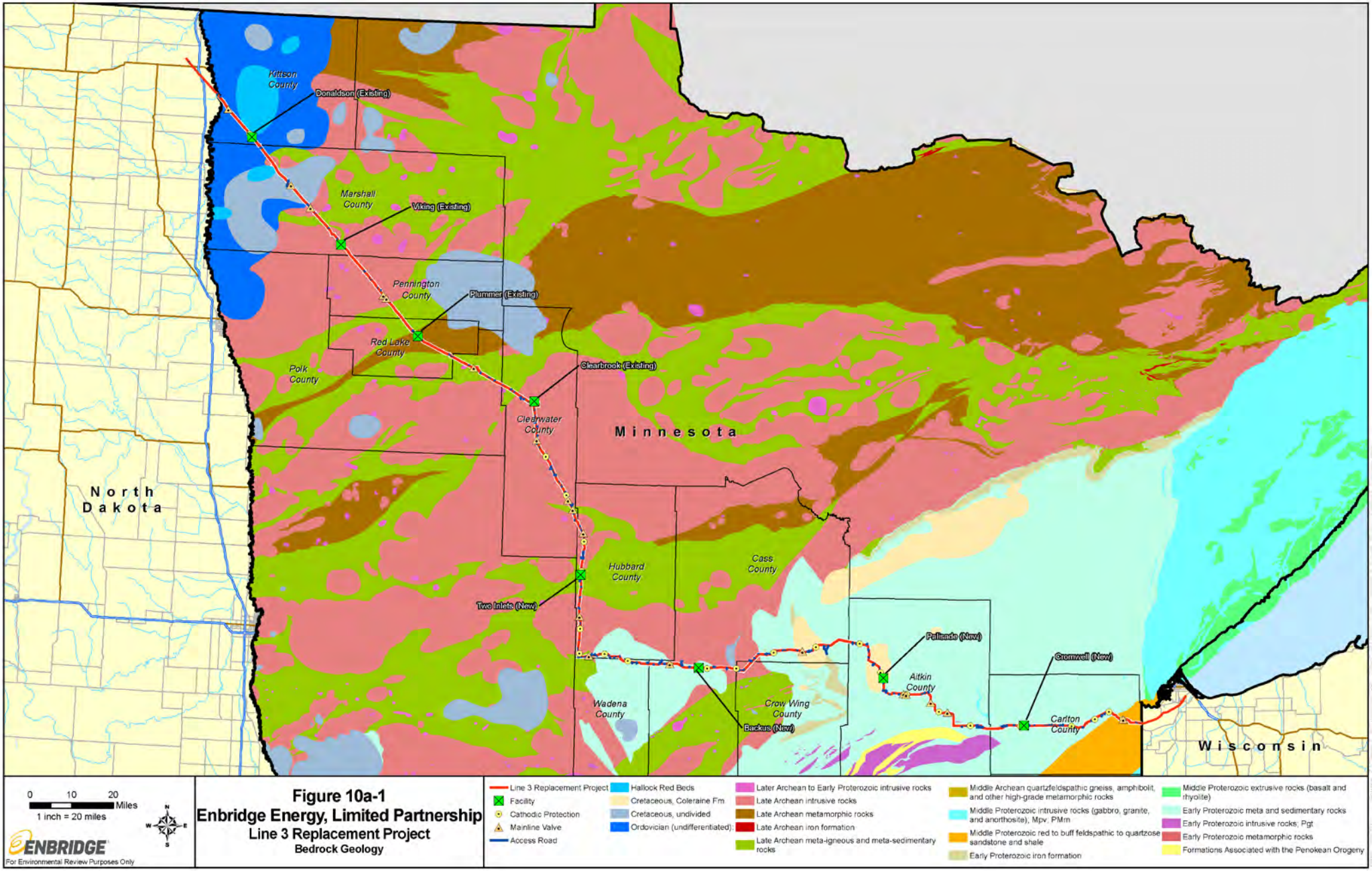
Kittson County
Donaldson (Existing)
Marshall County
Viking (Existing)
Pennington County
Plummer (Existing)
Red Lake County
Polk County
Clearbrook (Existing)
Clearwater County
Minnesota
North Dakota
Hubbard County
Cass County
Two Inlets (New)
Palisade (New)
Cromwell (New)
Aitkin County
Wadena County
Crow Wing County
Backus (New)
Carlton County
Wisconsin
0 10 20 Miles
1 inch = 20 miles
ENBRIDGE
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Figure 10a-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Bedrock Geology
Line 3 Replacement Project
Facility
Cathodic Protection
Mainline Valve
Access Road
Hallock Red Beds
Cretaceous, Coleraine Fm
Cretaceous, undivided
Ordovician (undifferentiated)
Later Archean to Early Proterozoic intrusive rocks
Late Archean intrusive rocks
Late Archean metamorphic rocks
Late Archean iron formation
Late Archean meta-igneous and meta-sedimentary rocks
Middle Archean quartzfeldspathic gneiss, amphibolit, and other high-grade metamorphic rocks
Middle Proterozoic intrusive rocks (gabbro, granite, and anorthosite); Mpv, PMm
Middle Proterozoic red to buff feldspathic to quartzose sandstone and shale
Early Proterozoic iron formation
Middle Proterozoic extrusive rocks (basalt and rhyolite)
Early Proterozoic meta and sedimentary rocks
Early Proterozoic intrusive rocks; Pgt
Early Proterozoic metamorphic rocks
Formations Associated with the Penokean Orogeny

Surficial geology in the L3R area is characterized by unconsolidated deposits from Pleistocene continental glaciation. These sediments were deposited primarily during four major episodes of glaciation. The sediments are comprised of both ground and end moraine, outwash deposits, ice-contact stratified drift (e.g., kames and eskers), and lacustrine sediments, including lake bottom and beach ridge deposits. Soils consist of deposits of clay, silt, sand, and gravel. Soil types are often mixed though some areas have stratified deposits. Additionally, there are more recent deposits of alluvium in river channels and peat in the pothole depressions that are characteristic of the interrupted drainage of glaciated terrain. These recent alluvial deposits overlie glacial sediments in the L3R area. Figure 10a-2 is a simplified map of the surficial geology in relation to L3R (Hobbs and Goebel 1982).

Topography across the L3R area varies widely given the variable nature of glacial deposition. The interrupted drainage of glacial terrain can be of low relief and include wetlands, lakes, and gently rolling to undulating hills and ridges, as well as hummocky areas of high relief with steep hills and ridges associated with glacial end moraine deposits. Additionally, glacial erosion can remove unconsolidated deposits and scour bedrock, and glacial meltwater can incise significant valleys into bedrock. Elevations in the L3R area range from approximately 760 to 1,679 feet above mean sea level (Table 10a-1).

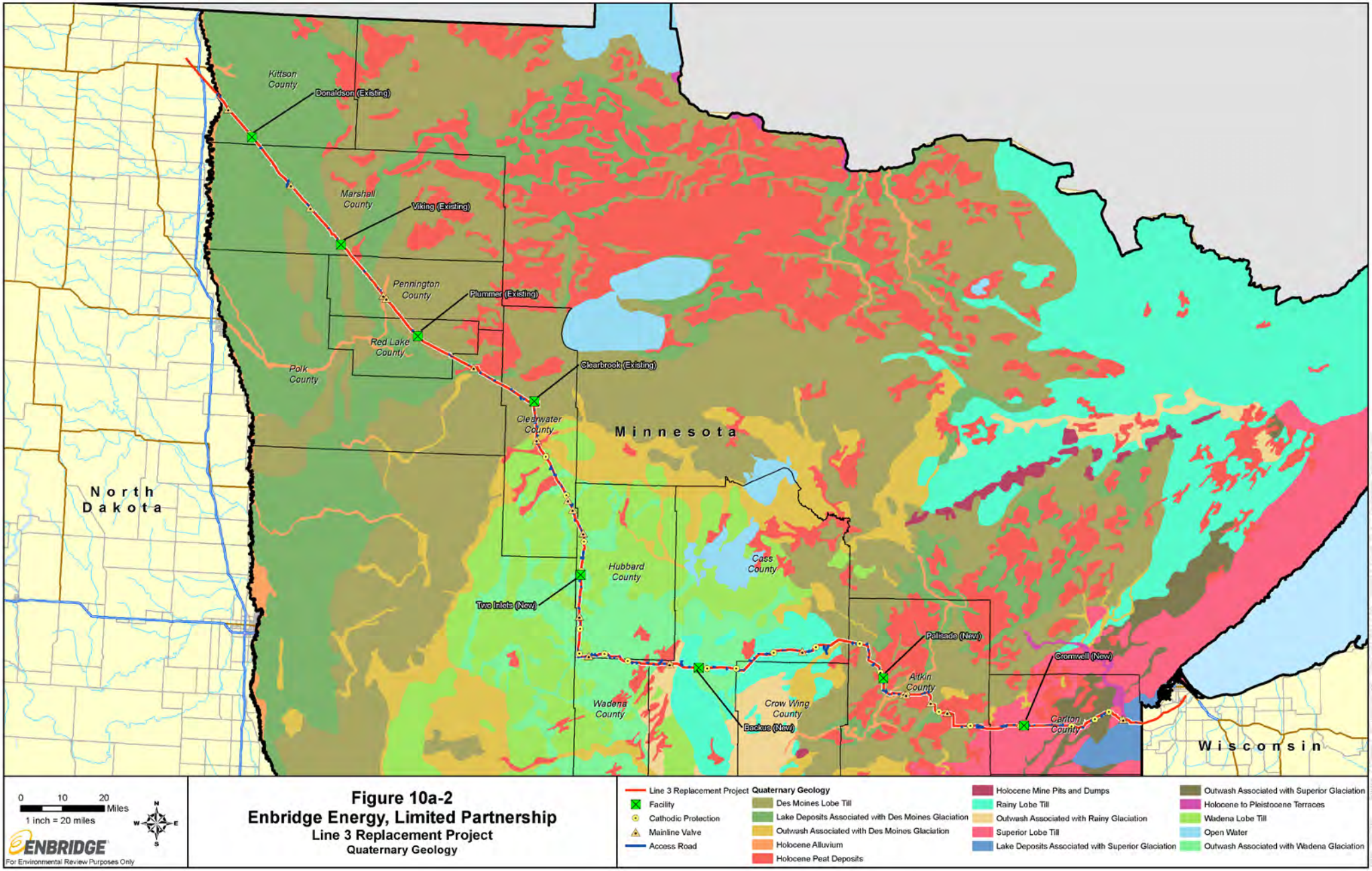
Table 10a-1
Elevation within the Line 3 Replacement Project and the Sandpiper Pipeline Project Environmental Survey Areas [a]

County	Elevation Above Mean Sea Level (feet)		
	Lowest	Average	Highest
Kittson	760	803	825
Marshall	825	931	1,073
Polk	1,150	1,214	1,338
Pennington	1,073	1,107	1,136
Clearwater	1,267	1,415	1,618
Red Lake	1,104	1,135	1,155
Cass	1,274	1,385	1,518
Hubbard	1,363	1,472	1,679
Aitkin	1,203	1,263	1,375
Wadena	1,360	1,389	1,401
Crow Wing	1,335	1,374	1,417
Carlton	909	1,197	1,321

[a] Elevation provided for SPP is for the co-located portion only.

The area impacted by L3R has been tectonically stable for over 500 million years. Therefore, there is a low probability of an earthquake of significant intensity or other seismic event (National Atlas of the United States 2014).

L3R does not impact portions of Minnesota with limestone formations, karst topography, or sinkholes, so no special design or mitigation measures are necessary to address these conditions.


Kittson County
Donaldson (Existing)
Marshall County
Viking (Existing)
Pennington County
Plummer (Existing)
Red Lake County
Polk County
Clearbrook (Existing)
Clearwater County
Minnesota
North Dakota
Hubbard County
Cass County
Two Inlets (New)
Palisade (New)
Cromwell (New)
Aitkin County
Wadena County
Crow Wing County
Backus (New)
Carlton County
Wisconsin
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1 inch = 20 miles
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ENBRIDGE
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Figure 10a-2
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Quaternary Geology
Line 3 Replacement Project
Facility
Cathodic Protection
Mainline Valve
Access Road
Quaternary Geology
Des Moines Lobe Till
Lake Deposits Associated with Des Moines Glaciation
Outwash Associated with Des Moines Glaciation
Holocene Alluvium
Holocene Peat Deposits
Holocene Mine Pits and Dumps
Rainy Lobe Till
Outwash Associated with Rainy Glaciation
Superior Lobe Till
Lake Deposits Associated with Superior Glaciation
Outwash Associated with Superior Glaciation
Holocene to Pleistocene Terraces
Wadena Lobe Till
Open Water
Outwash Associated with Wadena Glaciation

MINERAL RESOURCES AND MINERAL RESOURCE POTENTIAL

Mineral resources in Minnesota include industrial (e.g., sand, gravel, peat, and crushed stone) and metallic (e.g., iron ore, copper, nickel, and titanium) minerals. USGS topographic maps, recent aerial photography, and MDNR spatial data were reviewed for mineral leases on state lands (as of January 2016) to identify surface features associated with mining or mineral resources.

Pipeline

Table 10a-2 identifies possible mining and mineral resource areas crossed by and within 1,500 feet of the L3R centerline.

Table 10a-2
Mineral Resources within 1,500 Feet of the Line 3 Replacement Project and Sandpiper Pipeline Project – Pipeline

County	L3R MP	SPP MP [a]	Operation	Distance from L3R Centerline (feet)	Distance from SPP Centerline (feet) [a]	Source
Marshall	845.7	N/A	Gravel Pit	882	N/A	Aerial Photos
	846.6	N/A	Gravel Pit	885	N/A	Aerial Photos
Pennington	853.3	N/A	Gravel Pit	616	N/A	Aerial Photos
	853.4	N/A	Gravel Pit	1,346	N/A	Topo Maps
	853.5	N/A	Gravel Pit	42 (Crossed)	N/A	Topo Maps
Clearwater	907.8	377.0	Gravel Pit	584	980	Topo Maps
	907.8	337.0	Gravel Pit	889	1,346	Aerial Photos & Topo Maps
	918.5	385.4	Gravel Pit	993	1,018	Aerial Photos & Topo Maps
	921.0	387.8	Gravel Pit	1,199	1,222	Aerial Photos & Topo Maps
Hubbard	946.7	413.5	Gravel Pit	664	689	Aerial Photos
Cass	1015.3	482.1	Gravel Pit	603	628	Aerial Photos & Topo Maps
	1033.1	500.0	Gravel Pit	237	212	Aerial Photos & Topo Maps
	1036.2	503.1	Gravel Pit	1,437	1,462	Topo Maps
Aitkin	1051.4	518.3	Gravel Pit	304	329	Aerial Photos
	1059.8	526.7	Gravel Pit	1,399	1,424	Topo Maps
	1064.0	530.9	Sand Pit	359	384	Topo Maps
	1065.1	532.0	Gravel Pit	278	253	Topo Maps
	1067.5	534.4	Gravel Pit	0 (Crossed)	25 (Crossed)	Topo Maps
	1067.7	534.6	Gravel Pit	725 (Crossed by ATWS)	750 (Crossed by ATWS)	Aerial Photos
	1068.2	535.1	Gravel Pit	1,184	1,209	Aerial Photos & Topo Maps

Table 10a-2
Mineral Resources within 1,500 Feet of the Line 3 Replacement Project and Sandpiper Pipeline Project – Pipeline

County	L3R MP	SPP MP [a]	Operation	Distance from L3R Centerline (feet)	Distance from SPP Centerline (feet) [a]	Source
Carlton	1098.1	564.9	Metallic Mineral Exploration Lease [b]	Crossed	Crossed	MDNR 2009
	1098.4	565.3	Metallic Mineral Exploration Lease [b]	Crossed	Crossed	MDNR 2009
	1098.6	565.5	Metallic Mineral Exploration Lease [b]	Crossed	Crossed	MDNR 2009
	1098.9	565.8	Metallic Mineral Exploration Lease [b]	Crossed	Crossed	MDNR 2009
	1099.1	566.0	Metallic Mineral Exploration Lease [b]	Crossed	Crossed	MDNR 2009
	1099.4	566.3	Metallic Mineral Exploration Lease [b]	Crossed	Crossed	MDNR 2009
	1100.4	567.3	Metallic Mineral Exploration Lease [b]	Crossed	Crossed	MDNR 2009
	1101.8	568.6	Gravel Pit	346	321	Aerial Photos
	1117.9	584.8	Gravel Pit	1,013	988	Topo Maps
	1124.7	591.5	Gravel Pit	1,050	1,025	Aerial Photos
	1125.0	591.9	Gravel Pit	69 (Crossed)	94 (Crossed)	Aerial Photos
	1129.9	596.8	Gravel Pit	755	730	Aerial Photos
	1131.0	597.9	Gravel Pit	841	866	Aerial Photos & Topo Maps

[a] Impacts provided for SPP are for the co-located portion only.
[b] Parcels with active county metallic mineral leases held by Kennecott Exploration Company.

The L3R route would cross some of the bedrock greenstone belt terrain in the western portion of Minnesota (MDNR 2013). Greenstone belt terrain is characterized by variably metamorphic rock that has undergone a change in existing rock structure or composition induced by location, chemicals, or temperature. Greenstone belt terrains have the potential to contain gold mineralization. The greenstone belt terrains crossed by the L3R route do not contain any known gold mineralization or high gold potential zones and are currently unexplored due to thick overlaying glacial materials.

Associated Facilities

The Clearbrook Terminal expansion, pump stations, and mainline valves do not cross, nor are located within 1,500 feet of potential mineral resources or active mineral lease lands.

Cathodic Protection

Two cathodic protection systems that would be utilized by both L3R and SPP are located within 1,500 feet of two potential gravel pits. Cathodic protection systems are not located within 1,500 feet of active mineral lease lands.

Table 10a-3
Mineral Resources within 1,500 Feet of the Line 3 Replacement Project and Sandpiper Pipeline Project – Cathodic Protection

County	L3R MP	SPP MP [a]	Operation	Distance from Cathodic Protection	Source
Carlton	1117.8	584.7	Gravel Pit	1,154	Topo Maps
	1124.5	591.4	Gravel Pit	557	Aerial Photos

[a] Cathodic protection systems located east of L3R MP 912.3 (SPP MP 379.2) would be utilized for both L3R and SPP.

[b] Parcels with active county metallic mineral leases held by Kennecott Exploration Company.

Access Roads

Permanent access roads to the mainline valve sites do not cross, nor are located within 1,500 feet of potential mineral resources or active mineral lease lands.

PALEONTOLOGY

Based on the thickness of the unconsolidated glacial material in the L3R environmental survey area, significant paleontological resources are not likely to be encountered during construction. Despite the fact that glacial deposits in Minnesota are of Pleistocene age, megafauna fossils tend to be scarce where glacial ice was present (Mather 2009, Sloan 2005).

UNCONFINED/SHALLOW AQUIFERS

Groundwater is present in the surficial unconsolidated sediments. Unconfined aquifers are likely to exist in the L3R environmental survey area. While these aquifers may not be capable of producing sufficient quantities of water for municipal water supplies or irrigation wells, they are generally productive enough for domestic and farm (non-irrigation) supplies.

The EIS will further evaluate any effects the Project (including construction, operation, and potential accidential spills) could have on these features, as well as identify any project design or mitigation measures to address effects to geologic features.

b. Soils and topography – Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 11 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 10.

GENERAL SOIL COMPOSITION AND LANDFORMS

L3R would cross the following Major Land Resource Areas ("MLRA"): Red River Valley of the North; Northern Minnesota Gray Drift; Rolling Till Prairie; Northern Minnesota Glacial Lake Basins; Superior Lake Plain; Central Minnesota Sandy Outwash; and Wisconsin and Minnesota Thin Loess and Till, Northern part (refer to Figure 10b-1 and Table 10b-1). These MLRAs generally range from somewhat poorly drained soils with sandy to clayey textures to well or excessively drained soils and have a frigid temperature regime; an aquic or udic soil moisture regime; and mixed, smectic, or isotic mineralogy (U.S. Department of Agriculture ["USDA"] Natural Resource Conservation Service ["NRCS"] 2006).

Table 10b-1
MLRAs Crossed by the Line 3 Replacement Project and Sandpiper Pipeline Project

MLRA Name	Landscape Description	Dominant Soil Types
Red River Valley of the North	A nearly level glacial lake plain that is bordered on the east by outwash plains, gravelly beaches, and dunes.	Mollisols and Vertisols
Northern Minnesota Gray Drift	A complex pattern of moraines, outwash plains, drumlins, lake plains, and drainages.	Alfisols, Entisols, and Histosols, with some Mollisols
Rolling Till Prairie	Stagnation moraines, end moraines, glacial outwash plains, terraces, and flood plains and is mostly dominated by till-covered moraines.	Mollisols
Northern Minnesota Glacial Lake Basins	Glacial lake plains with remnants of gravelly beaches, strandlines, deltas, and sandbars.	Alfisols, Entisols, and Histosols
Superior Lake Plain	Till plains mixed with lake plains, lake terraces, beaches, flood plains, swamps, and marshes. This MLRA is also characterized by some rocky knobs, hills, and low mountains.	Alfisols, Spodosols, Inceptisols, and Entisols
Central Minnesota Sandy Outwash	Large outwash plains and stream terraces.	Mollisols and Histosols

Table 10b-1 MLRAs Crossed by the Line 3 Replacement Project and Sandpiper Pipeline Project		
MLRA Name	Landscape Description	Dominant Soil Types
Wisconsin and Minnesota Thin Loess and Till, Northern part	Gently undulating to rolling, loess-mantled till plains, drumlin fields, and end moraines mixed with outwash plains associated with major glacial drainage ways, swamps, and bogs.	Alfisols, Entisols, Histosols, and Spodosols

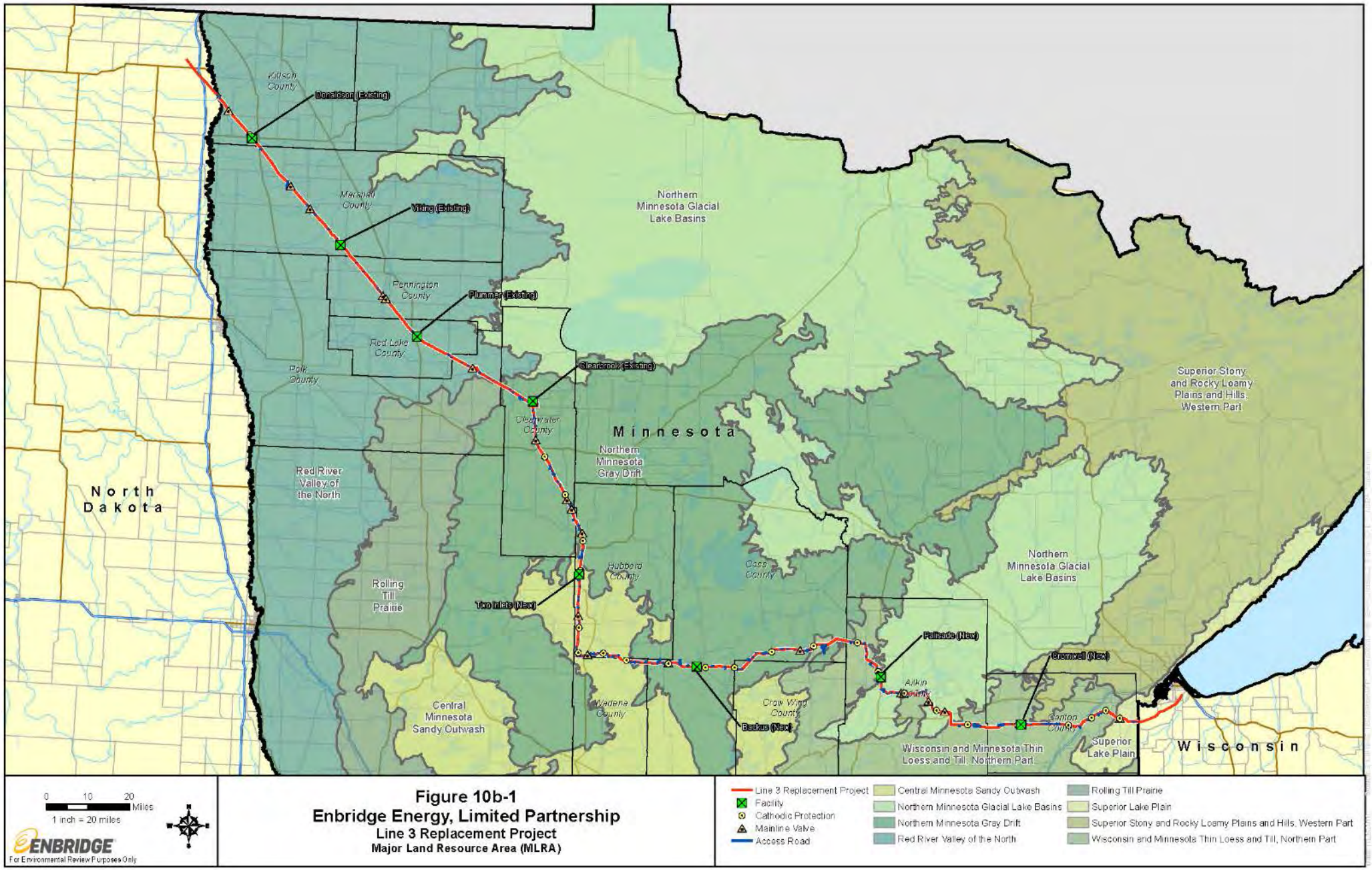
Kittson County
Donaldson (Existing)
Marshall County
Viking (Existing)
Pennington County
Plummer (Existing)
Red Lake County
Polk County
Clearbrook (Existing)
Clearwater County
North Dakota
Red River Valley of the North
Minnesota
Northern Minnesota Gray Drift
Northern Minnesota Glacial Lake Basins
Superior Stony and Rocky Loamy Plains and Hills, Western Part
Hubbard County
Cass County
Two Inlets (New)
Rolling Till Prairie
Palisade (New)
Cromwell (New)
Aitkin County
Crow Wing County
Wadena County
Central Minnesota Sandy Outwash
Backus (New)
Carlton County
Superior Lake Plain
Wisconsin and Minnesota Thin Loess and Till, Northern Part
Wisconsin
0 10 20 Miles
1 inch = 20 miles
ENBRIDGE
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Figure 10b-1
Enbridge Energy, Limited Partnership
Line 3 Replacement Project
Major Land Resource Area (MLRA)
Line 3 Replacement Project
Facility
Cathodic Protection
Mainline Valve
Access Road
Central Minnesota Sandy Outwash
Northern Minnesota Glacial Lake Basins
Northern Minnesota Gray Drift
Red River Valley of the North
Rolling Till Prairie
Superior Lake Plain
Superior Stony and Rocky Loamy Plains and Hills, Western Part
Wisconsin and Minnesota Thin Loess and Till, Northern Part

Existing Soil Characteristics

Tables 10b-2 through 10b-5 provide a summary of significant soil characteristics identified along the L3R route and associated facilities by county according to the SSURGO and STATSGO2 databases.

Pipeline

Table 10b-2 provides a summary of significant soil characteristics by county according to the SSURGO and STATSGO2 databases.

Table 10b-2
Soil Characteristics for the Line 3 Replacement Project and Sandpiper Pipeline Project – Pipeline

County	Total Footprint Acreage	Prime Farmland	Hydric Soils	Compact Prone	Highly Erodible		Reveg. Concerns	Stony/ Rocky	Shallow to Bedrock [a]
					Water	Wind			
	Acres								
Kittson									
L3R [b]	266.2	264.3	192.1	192.1	0.0	0.0	0.0	0.0	0.0
SPP [c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative [d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Marshall									
L3R [b]	580.8	412.0	249.4	180.3	38.8	356.9	69.5	0.0	0.0
SPP [c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative [d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pennington									
L3R [b]	318.4	215.7	219.4	48.5	8.3	148.2	53.4	1.5	0.0
SPP [c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative [d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Red Lake									
L3R [b]	243.2	212.6	200.2	6.4	0.0	86.8	13.7	0.0	0.0
SPP [c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative [d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Polk									
L3R [b]	211.9	81.8	113.2	45.0	53.6	186.3	101.3	0.0	0.0
SPP [c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative [d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clearwater									
L3R [b]	624.5	368.1	141.3	66.2	119.1	268.1	105.6	0.0	0.0
SPP [c]	574.1	343.2	132.2	55.8	102.4	259.9	92.7	0.0	0.0
Cumulative [d]	486.4	254.8	80.7	50.9	106.3	263.6	90.7	0.0	0.0

Table 10b-2
Soil Characteristics for the Line 3 Replacement Project and Sandpiper Pipeline Project – Pipeline

County	Total Footprint Acreage	Prime Farmland	Hydric Soils	Compact Prone	Highly Erodible		Reveg. Concerns	Stony/ Rocky	Shallow to Bedrock [a]
					Water	Wind			
	Acres								
Hubbard									
L3R [b]	660.8	44.7	61.4	44.2	210.7	640.7	321.8	0.0	0.0
SPP [c]	661.3	44.7	60.9	43.9	210.3	641.1	321.5	0.0	0.0
Cumulative [d]	729.2	48.6	71.3	52.2	231.1	706.9	357.2	0.0	0.0
Wadena									
L3R [b]	105.8	1.7	18.7	11.3	6.0	102.9	103.2	0.0	0.0
SPP [c]	104.6	1.8	19.0	11.9	6.1	101.2	101.9	0.0	0.0
Cumulative [d]	127.6	2.1	23.3	14.5	7.3	123.5	124.3	0.0	0.0
Cass									
L3R [b]	689.5	178.3	152.8	67.6	148.1	598.6	336.0	0.0	0.0
SPP [c]	690.4	178.3	155.1	69.2	147.5	598.8	337.3	0.0	0.0
Cumulative [d]	771.0	199.5	174.8	78.2	161.0	667.7	378.5	0.0	0.0
Crow Wing									
L3R [b]	71.0	16.3	20.1	0.9	4.2	50.2	37.6	9.0	0.0
SPP [c]	71.3	16.7	20.1	0.8	4.1	50.3	37.4	9.2	0.0
Cumulative [d]	76.9	17.8	21.9	1.0	4.5	54.2	40.5	9.9	0.0
Aitkin									
L3R [b]	675.0	265.8	388.0	241.9	48.1	506.0	312.7	0.0	0.0
SPP [c]	678.3	266.5	390.2	244.2	48.3	509.0	314.7	0.0	0.0
Cumulative [d]	802.8	312.3	470.5	294.4	53.7	600.1	378.5	0.0	0.0
Carlton									
L3R [b]	550.3	89.9	127.2	127.2	158.9	275.1	327.9	10.7	0.0
SPP [c]	557.3	91.2	126.5	126.5	161.4	279.1	331.8	10.8	0.0
Cumulative [d]	624.0	99.4	144.0	144.0	177.5	310.7	367.8	11.6	0.0
Total									
L3R [b]	**4997.2**	**2151.5**	**1883.8**	**1031.6**	**795.8**	**3219.8**	**1782.7**	**21.2**	**0.0**
SPP [c]	**3337.2**	**942.4**	**904.0**	**552.3**	**680.1**	**2439.5**	**1537.4**	**20.0**	**0.0**
Cumulative [d]	**3617.9**	**934.4**	**986.5**	**635.2**	**741.5**	**2726.6**	**1737.5**	**21.5**	**0.0**

[a] As stated in Section 10a, there is potential for shallow bedrock along approximately 20 miles of the L3R route between MPs 1108 and 1128. This information was not reflected in NRCS soils data.

[b] Calculations based on the L3R 120-foot-wide construction workspace (uplands) and 95-foot-wide construction workspace (wetlands) and ATWS inclusive of the L3R 50-foot permanent ROW for permanent impacts.

[c] Where co-located with L3R, calculations based on the SPP 120-foot-wide construction workspace (uplands) and 95-foot-wide construction workspace (wetlands) and ATWS inclusive of the SPP 50-foot permanent ROW for permanent impacts.

[d] Calculations based on a combined L3R and SPP 130-foot-wide construction workspace (uplands) and 105-foot-wide construction workspace (wetlands) and ATWS inclusive of the combined L3R and SPP 75-foot-wide permanent ROW.

Associated Facilities

Clearbrook Terminal Expansion and Pump Stations

Table 10b-3 provides a summary of the significant soil characteristics identified within the permanent footprint associated with aboveground facilities.

Table 10b-3
Soil Characteristics for the Line 3 Replacement Project – Facilities

County	Facility	Total Footprint Acreage	Prime Farmland	Hydric Soils	Compact. Prone	Highly Erodible		Reveg. Concerns	Stony/ Rocky	Shallow to Bedrock
						Water	Wind			
			Permanent Impacts (Acres)							
Kittson	Donaldson	6.9	6.9	6.9	6.9	0.0	0.0	0.0	0.0	0.0
Marshall	Viking	7.3	2.8	0.3	0.0	0.0	4.7	0.0	0.0	0.0
Red Lake	Plummer	7.6	7.6	6.0	0.0	0.0	1.6	0.0	0.0	0.0
Clearwater	Clearbrook Terminal	9.5	8.7	9.4	0.7	0.0	0.8	0.7	0.0	0.0
Hubbard	Two Inlets	8.0	0.3	0.0	0.0	1.0	8.0	1.0	0.0	0.0
Cass	Backus	7.5	0.0	0.0	0.0	0.0	7.5	7.5	0.0	0.0
Aitkin	Palisade	7.8	0.6	7.0	3.8	0.0	7.0	3.8	0.0	0.0
Carlton	Cromwell	5.6	0.2	0.0	0.0	5.4	0.2	5.4	0.0	0.0
Total		**60.3**	**27.1**	**29.7**	**11.4**	**6.3**	**30.0**	**18.4**	**0.0**	**0.0**

Mainline Valves and Cathodic Beds

Table 10b-4 provides a summary of the significant soil characteristics identified within the construction workspace of the cathodic protection systems and permanent footprint associated with the mainline valves.

Table 10b-4
Soil Characteristics for the Line 3 Replacement Project and Sandpiper Pipeline Project – Mainline Valves and Cathodic Protection

County	Total Footprint Acreage [a]	Prime Farmland	Hydric Soils	Compact. Prone	Highly Erodible		Reveg. Concerns	Stony/ Rocky	Shallow to Bedrock
					Water	Wind			
		Acres							
Kittson									
Cathodic Beds [a]	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Mainline Valves [b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Marshall									
Cathodic Beds [a]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mainline Valves [b]	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Pennington									
Cathodic Beds [a]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mainline Valves [b]	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 10b-4
Soil Characteristics for the Line 3 Replacement Project and Sandpiper Pipeline Project – Mainline Valves and Cathodic Protection

County	Total Footprint Acreage [a]	Prime Farmland	Hydric Soils	Compact. Prone	Highly Erodible		Reveg. Concerns	Stony/ Rocky	Shallow to Bedrock
					Water	Wind			
	Acres								
Red Lake									
Cathodic Beds [a]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mainline Valves [b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Polk									
Cathodic Beds [a]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mainline Valves [b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Clearwater									
Cathodic Beds [a]	0.8	0.6	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Mainline Valves [b]	0.2	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Hubbard									
Cathodic Beds [a]	2.5	0.4	0.1	0.1	0.5	2.3	0.6	0.0	0.0
Mainline Valves [b]	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Wadena									
Cathodic Beds [a]	0.4	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.0
Mainline Valves [b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cass									
Cathodic Beds [a]	1.7	0.0	0.3	0.0	0.0	1.6	0.8	0.0	0.0
Mainline Valves [b]	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0
Crow Wing									
Cathodic Beds [a]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mainline Valves [b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aitkin									
Cathodic Beds [a]	1.6	0.2	0.8	0.6	0.0	1.5	0.9	0.0	0.0
Mainline Valves [b]	0.3	0.1	0.2	0.1	0.0	0.3	0.2	0.0	0.0
Carlton									
Cathodic Beds [a]	2.6	0.4	0.0	0.0	0.8	2.3	1.5	0.0	0.0
Mainline Valves [b]	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Total									
Cathodic Beds [a]	**9.7**	**1.7**	**1.3**	**0.9**	**1.3**	**8.7**	**4.2**	**0.0**	**0.0**
Mainline Valves [b]	**1.2**	**0.3**	**0.3**	**0.1**	**0.0**	**1.1**	**0.4**	**0.0**	**0.0**

[a] Acreages are based on the total temporary construction footprints for cathodic systems.

[b] Acreages are based on the total permanent (impervious) footprint for mainline valve sites.