

1.0 INTRODUCTION

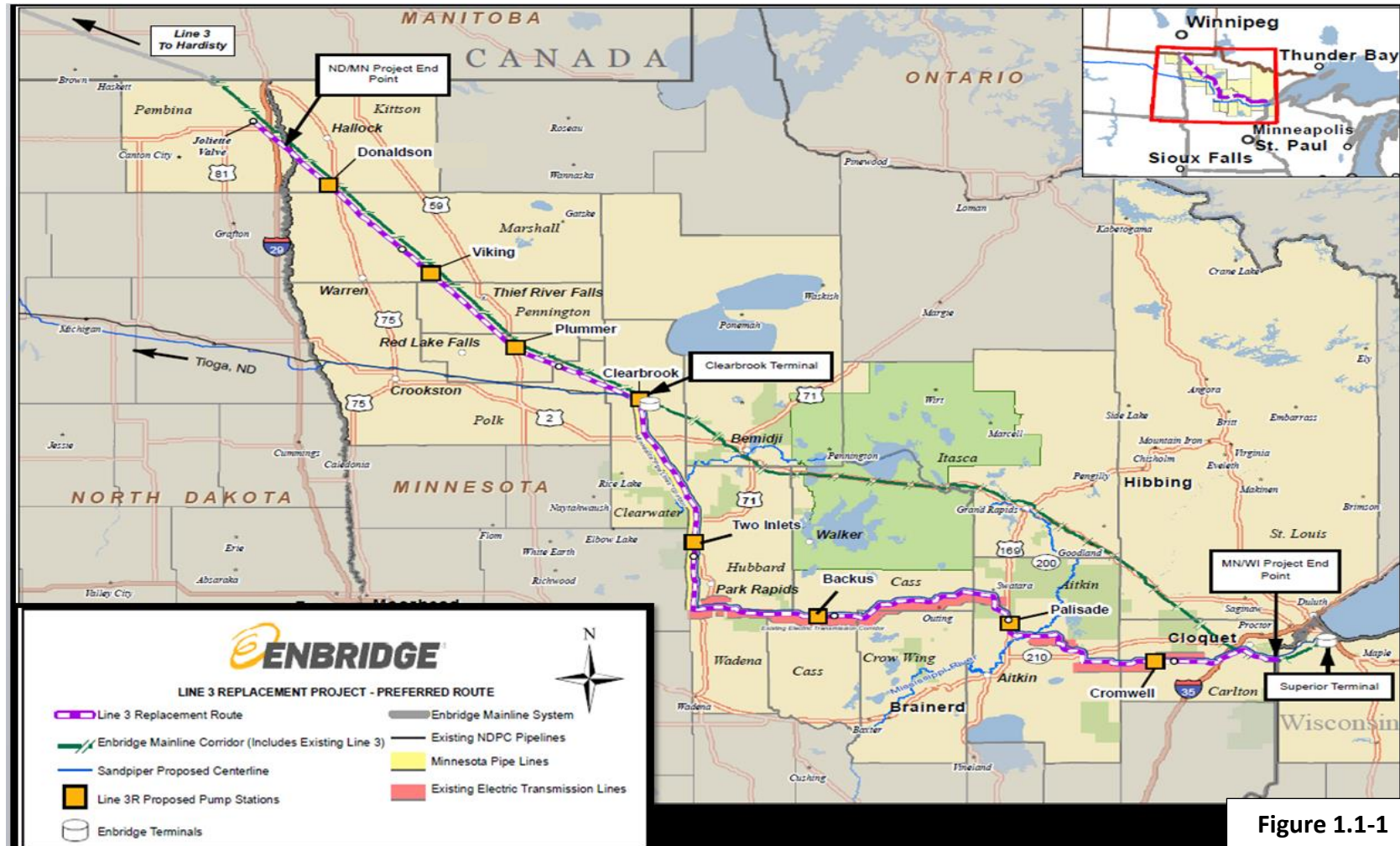
1.1 Overview of Line 3 Replacement Project

Enbridge Energy, Limited Partnership (Enbridge or Applicant) hereby respectfully submits this Application for a Certificate of Need for the replacement of Line 3 in Minnesota (the Project). The Project is a major component of Enbridge's Line 3 maintenance driven replacement program (the Replacement Program) in the United States (U.S.). The Replacement Program will replace the existing Line 3 pipeline from Alberta, Canada to Superior, Wisconsin at an estimated cost of approximately \$7.5 billion. The proposed replacement pipeline will serve the same purpose and need as the existing Line 3, which is the transportation of crude oil from Canada to Enbridge's Clearbrook Terminal near Clearbrook, Minnesota and to the Superior Terminal facility near Superior, Wisconsin. The replacement pipeline is generally expected to serve the same markets and transport the same products, as the existing Line 3 has done throughout its operating history. Upon replacement, the annual average capacity of Line 3 will be 760,000 barrels per day (bpd).

The Project is the Minnesota portion of the Replacement Program and includes the replacement of approximately 282 miles of the existing 34-inch diameter Line 3 pipeline with approximately 337 miles of 36-inch¹ diameter pipeline and associated facilities between the North Dakota/Minnesota border and the Minnesota/Wisconsin border at a cost of approximately \$2.1 billion. In Minnesota, the Project will cross Kittson, Marshall, Pennington, Polk, Red Lake, Clearwater, Hubbard, Wadena, Cass, Crow Wing, Aitkin, and Carlton counties. The existing Line 3 pipeline will be permanently deactivated in-place after the Replacement Program has received all regulatory approval, and the 36 inch replacement pipeline is constructed, tested, and placed into service. See Figure 1.1-1 for a Project overview map.

¹ 36-inch diameter steel pipeline is a more standard size pipeline than 34-inch in the industry and among the Enbridge Mainline System. The decision to replace with a 36-inch diameter pipeline makes pipe, pipefitting, valves, and maintenance equipment more readily available. As discussed in Sections 3 and 5, a 36-inch pipeline is more energy efficient than a 34-inch pipeline.

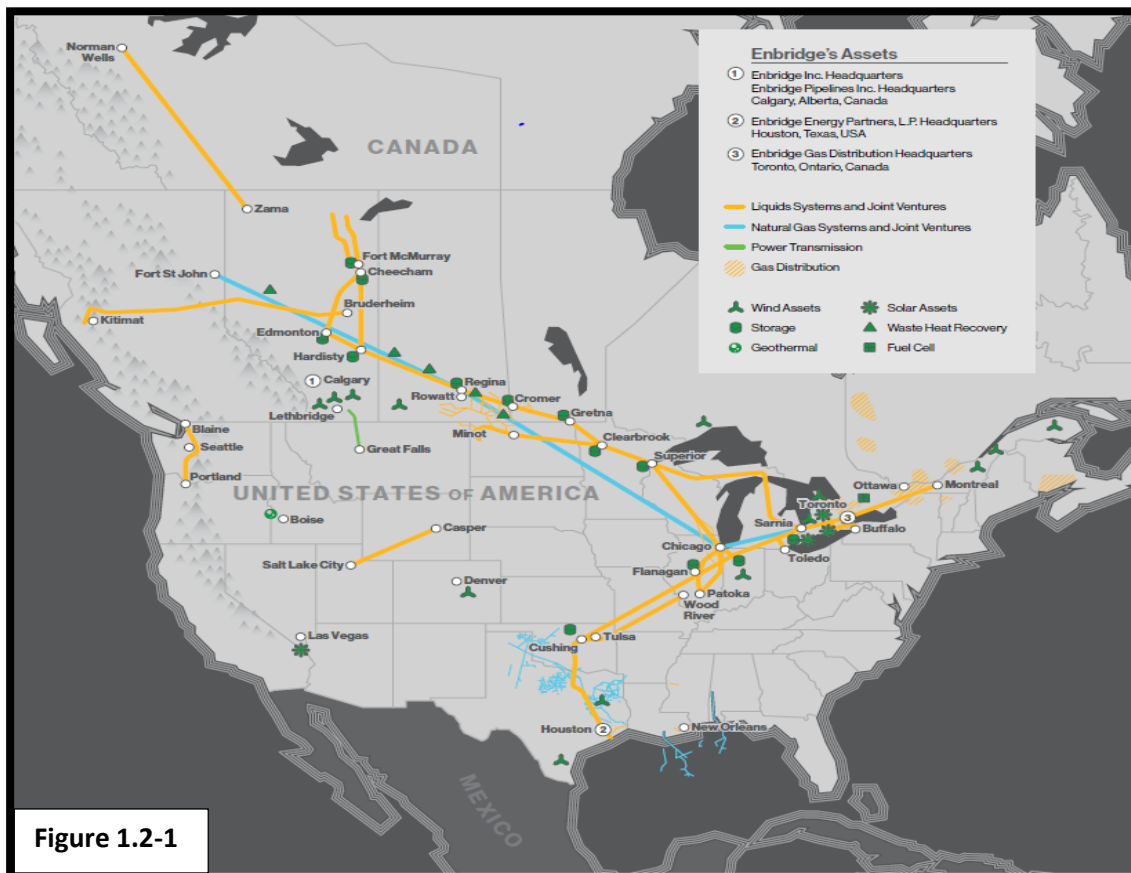
Figure 1.1-1: Project Overview Map (A full size copy of the Project Overview Map is enclosed at Appendix A.)



1.2 About Enbridge

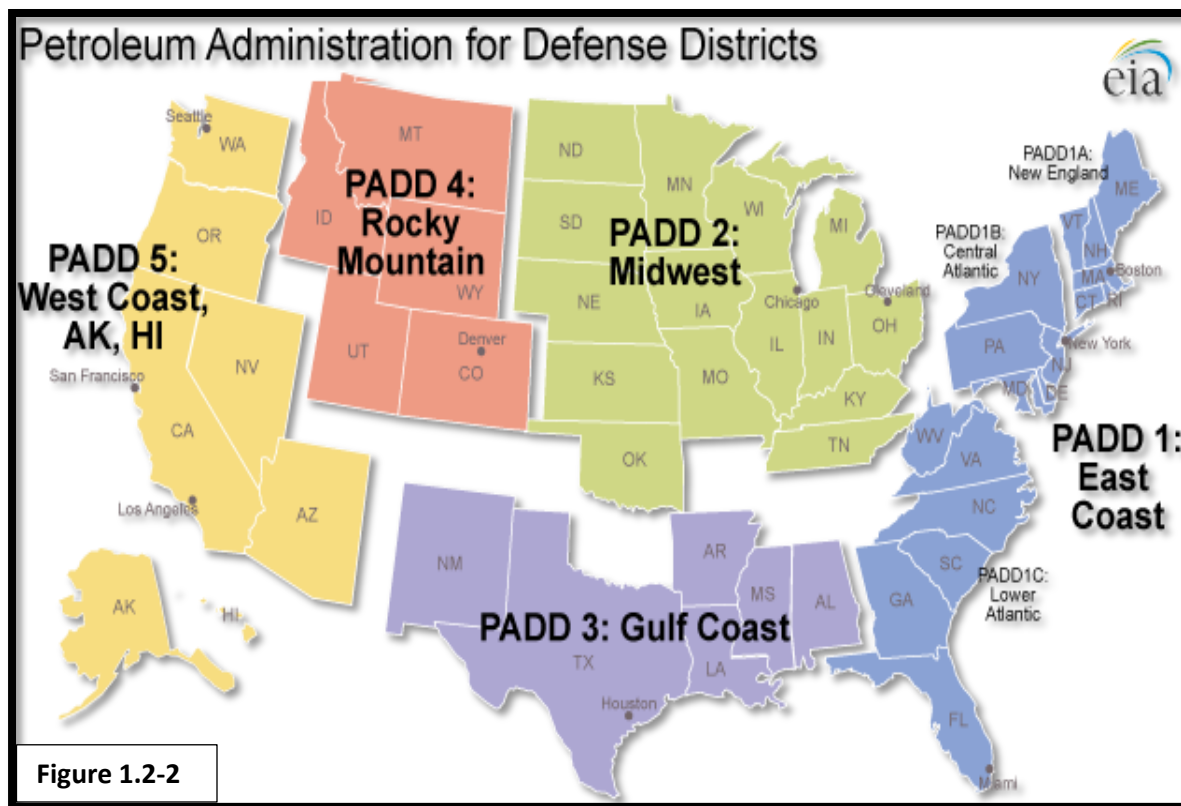
The Applicant is part of the Enbridge family of companies that are primarily located in the U.S. and Canada (Enbridge Companies) which together make Enbridge one of the industry leaders in the transportation and distribution of energy in North America. Collectively, they own and operate liquids and natural gas pipelines, wind farms, solar plants and a large local gas distribution company (see Figure 1.2-1). In particular, the Enbridge Companies own and operate a system of liquids pipelines collectively referred to as the Enbridge Mainline System. The Enbridge Mainline System transports crude oil from the Western Canadian Sedimentary Basin (WCSB) to markets in the U.S. and Eastern Canada. The Enbridge Mainline System is made up of the Canadian mainline system, which transports crude oil from the WCSB to the international border near Neche, North Dakota, and the Lakehead System. The Lakehead System is the U.S. portion of the Enbridge Mainline System and consists of pipelines in North Dakota, Minnesota, Wisconsin, Illinois, Indiana, Michigan, and New York. The Enbridge Companies also own and operate several market extension pipelines that serve various refinery markets in the Midwest and the Gulf Coast.

Figure 1.2-1: Enbridge Overview Map



Together, the Enbridge Mainline System and Enbridge's market extension pipelines comprise approximately 15,795 miles of liquid petroleum pipelines and constitute the world's longest crude petroleum and petroleum liquids pipeline network. In 2014 Enbridge's pipelines transported over 53 percent of total U.S-bound Canadian crude oil production, which accounts for 15 percent of total U.S. imports of crude oil. Moreover, in 2014 Enbridge transported over 74 percent of the crude oil imported from Canada and consumed in the Midwest, or what is known as the Petroleum Administration for Defense District Section (PADD) II, which consists of North Dakota, South Dakota, Nebraska, Missouri, Minnesota, Iowa, Oklahoma, Kansas, Illinois, Tennessee, Wisconsin, Michigan, Ohio, Indiana, and Kentucky.² Figure 1.2-2 below is from the U.S. Government's Energy Information Administration (EIA) website and depicts the five PADD regions in the U.S.³

Figure 1.2-2: Petroleum Administration for Defense Districts

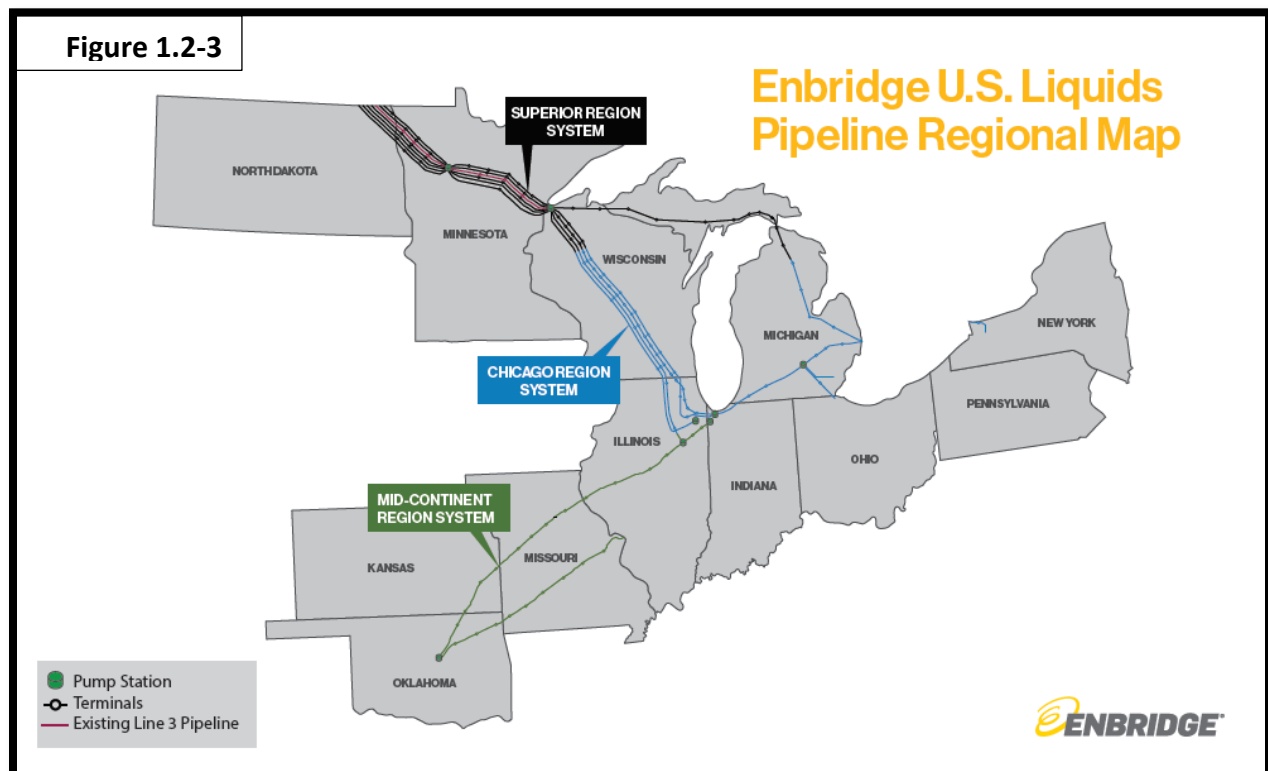


² U.S. Securities and Exchange Commission Form 10-k; Annual Report, February 12, 2015, p. 10.

³ <http://www.eia.gov/todayinenergy/detail.cfm?id=4890>; visited 04/07/2015.

As described in more detail below, for decades Line 3 has been an essential component of Enbridge's pipeline transportation network to deliver the crude oil needed by refiners. The replacement of Line 3 will ensure that Enbridge can continue to transport the crude oil required by refiners in Minnesota, other PADD II states, Eastern Canada, and the Gulf Coast. As with the existing Line 3, the Project, will be operationally integrated as part of the Enbridge Mainline System and will continue to transport crude oil from Alberta, Canada to Superior, Wisconsin. See Figure 1.2-3 below for a regional map of the U.S. portion of the Enbridge Mainline System, including the Lakehead System.

Figure 1.2-3: Enbridge Liquids Pipelines Regional Map in the U.S.



1.3 History of Line 3

The existing Line 3 is a 34-inch outside diameter, 1,097 mile long pipeline that extends from Alberta, Canada to Superior, Wisconsin. Construction of Line 3 began in 1962 as 34-inch parallel loops to Enbridge's Line 2 pipeline to create additional Enbridge Mainline System capacity. Additional loops were constructed annually until a continuous 34-inch line, referred to as Line 3, was completed and separated from Line 2 in 1969. The types of crude oil that have been transported on Line 3 have varied significantly over its many years of operation based on type

of crude produced, shipper demand and system operations. When the line was originally placed into service in 1968, the line transported only light crude oil.⁴

In the early 1980's, Line 3 began to transport medium crudes in addition to light crudes. By the mid-1980's through 2002, the line was used to transport predominantly heavy crudes. During the period from 2002 to 2005, Line 3 once again transported primarily light crudes, and from 2005 to 2011, the line was used for mixed service (light, medium and heavy crudes). Since 2011, the line has been used for light service. The line is physically designed to transport all grades of crude oil, and the type of crude oil transported in the future (as in the past) will be based on shipper demand.

The annual average capacity of Line 3 has likewise varied greatly over its years of operation. Since it began operating in the late 1960s, the annual average capacity of the line has varied between a low of 390 kbpd, which is the current operating capacity of the line, and a much higher capacity, which is highly dependent on the type of crude oil transported through the line and the presence or absence of safety-related pressure restrictions on the pipeline.⁵ The annual average capacity of the Project will be approximately 760 thousand barrels per day (kbpd), which is based on an assumption that the pipeline will transport a mixture of heavy and light crude. At various times in the past, including when the Presidential Permit was issued in 1991, the line transported volumes of crude oil in the same range of 760 kbpd.

Due to its geographic location, Line 3 has played and continues to play an important and integral role in delivering crude oil to (i) Minnesota Pipe Line Company's interconnecting facilities at Clearbrook, for ultimate redelivery to Minnesota refineries, and (ii) the Superior Terminal, for ultimate delivery to other refineries in the U.S. and Canada. The Project is generally expected to serve the same markets and transport the same products as the existing Line 3 has done throughout its operating history.

⁴ Before 1980, most of the bitumen produced was transported by truck, but trucking is seasonally restricted and relatively inefficient and expensive compared to pipeline transport. However, bitumen in its undiluted state is too viscous and dense to be transported by pipeline. To create a fluid capable of transportation by pipeline, bitumen must be mixed with a fluid that has much lower viscosity and will keep bitumen from precipitating out of the mixture. This mixture is referred to as "dilbit." By 1985 Alberta Energy Company was operating pipelines to transport dilbit from Cold Lake to Edmonton. Dilbit is now also transported by rail. Harrison, Lynda (September 2011). ["Riding the Rails, Oil companies climb aboard potential alternative to pipelines"](#). *Oil & Gas Inquirer* (Calgary, Alberta: JuneWarren-Nickle's Energy Group). Viewed 14 Mar 2012.

⁵ A pipeline is capable of transporting greater volumes of light crude than medium or heavy crude. At various times in the past when Line 3 was used exclusively for light crude transport, and before any safety-related pressure restrictions were implemented, over 960 kbpd of light crude oil was transported through the pipeline.



Over the years, Enbridge's pipeline maintenance program has revealed corrosion growth and other pipe material flaws that have impacted the operating capabilities of the pipeline. Subsequently, Enbridge's pipeline maintenance program for Line 3 has become increasingly complex requiring successive pressure restrictions⁶ to be voluntarily imposed and an increasing number of investigatory digs and repairs to be undertaken. These maintenance activities allow for the continued safe operation of the pipeline and are an important component of Enbridge's "integrity management" program for Line 3, but are costly and will not lift the pressure restrictions once completed.

1.4 Background on Line 3's Integrity Management Program

Safe and reliable operations are the foundation of Enbridge's business, and maintaining pipeline safety through its integrity management program is essential. Enbridge's pipeline operations are vast and complex. Over the last decade, Enbridge has transported almost 12 billion barrels of crude oil, and has done so with a safe delivery record better than 99.999 percent. However, Enbridge strives to reach a 100 percent safe delivery record, with the goal of preventing all crude oil spills. Integrity management, including the inspection, repair and maintenance of its pipelines, is one of several programs Enbridge has implemented to ensure the safety and integrity of its pipeline system.

Enbridge's pipeline maintenance program is designed to provide a comprehensive, measured, and individualized approach to integrity analysis that identifies each pipeline's current, and predicts its future, integrity risks. All pipelines in the Enbridge Mainline System undergo regular and systematic inspections and preventive maintenance activities to ensure their integrity and safe operation (see Section 3.0 of this Application for a further discussion of these integrity activities).

Enbridge has gathered extensive integrity data on Line 3 throughout its years of operation. The integrity data shows a high number of integrity anomalies – specifically, corrosion and long seam cracking. Line 3 has also experienced a number of failures during its more than 50-year history. As a result, Line 3 requires a high level of integrity monitoring and an extensive on-going integrity dig and repair program to maintain safe operation of the line. For example, approximately 4,000 integrity digs in the U.S. alone are currently forecasted for Line 3 over the next 15 years to maintain its current level of operation. This would result in year-after-year

⁶For example, to ensure safe and reliable operation of Line 3, in 2008, Enbridge implemented a voluntary long-term pressure reduction on the discharge of all pump stations along Line 3. In 2010, Enbridge extended the pressure restriction across all of Line 3 to further increase the line's operating safety margin. Finally, in 2012, Enbridge voluntarily derated Line 3's maximum operating pressure (MOP) to align with the pressure restriction.

impacts to landowners and the environment, and would likely result in repeated impacts to the same landowners and environmental features.

Moreover, while Line 3 could continue to be safely operated through the current maintenance plan, the dig and repair program will not restore the operating capability of the line. Due to the extent of the integrity digs forecasted, as well as the associated impacts of on-going integrity digs on landowners and the environment, Enbridge concluded that the replacement of Line 3 is the optimal solution to restore Line 3 to its historical operating capabilities.

1.5 The Line 3 Replacement Program

As noted above, Enbridge determined that the most efficient and least-invasive approach to maintaining Line 3's integrity was to replace the pipeline. The analysis Enbridge undertook in concluding that it should replace versus continuing its dig and repair integrity program is consistent with the decision process and criteria recommended in the Kiefner Report filed on March 11, 2015, with the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA).⁷

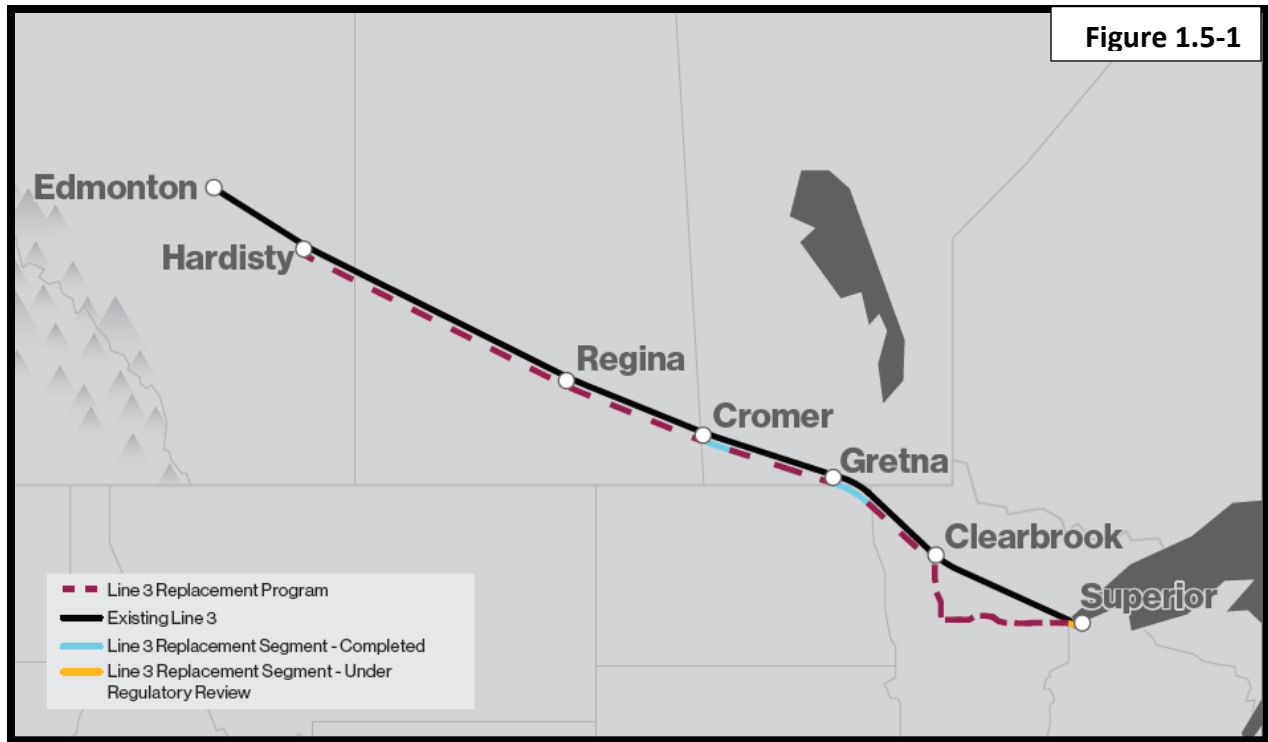
The Replacement Program includes the replacement of the existing Line 3 pipeline between Hardisty Terminal in Alberta, Canada and Superior, Wisconsin. For maintenance related purposes, the Line 3 Replacement Program has already commenced. In Canada two sections have been replaced: (1) a 1.7-mile segment from Gretna, Manitoba to the Canadian/U.S. border; and (2) a 12.5-mile segment downstream of Cromer, Manitoba. The remaining portion of the Line 3 replacement in Canada is currently under review by the NEB.⁸ In the U.S., a 15.3-mile segment has been replaced from the Canadian/U.S. border to the Joliette Valve in Pembina County, North Dakota. An additional 13-mile segment will be replaced between the Joliette Valve and the North Dakota/Minnesota border in approximately 2017. The segment from the Minnesota/Wisconsin border to Superior, Wisconsin is currently under review by the Wisconsin Public Service Commission.⁹ Finally, as a result of filing this Application, the last segment of the Line 3 Replacement Program, the Project, will be under review by the Minnesota Public Utility Commission (MPUC or Commission). See Figure 1.5-1 for a map depicting the entire Line 3 Replacement Program.

⁷ Final Report on Repair/Replace Considerations for Pre-Regulation Pipelines to U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration by JF Kiefner and M. Van Auker on March 11, 2015.

⁸ National Energy Board File No. OF-Fac-Oil-E101-2014-11 02 Line 3 Replacement Program filed 11/05/2014.

⁹ Wisconsin Public Service Commission Docket 9300-GF-184 Public Interest Determination Application filed 03/14/2014.

Figure 1.5-1: Line 3 Replacement Program Overview Map



1.6 The Project Provides Numerous Benefits to the State of Minnesota and Neighboring States in PADD II

The Project provides numerous benefits to the State of Minnesota and refiners in PADD II, Eastern Canada, and the Gulf Coast:

- First, the Project addresses Line 3's existing integrity risks by replacing a pipeline with a large number of integrity anomalies with a new pipeline constructed with the latest technology and materials. The Project will eliminate the large number of integrity digs currently forecasted to be required on Line 3 over the next 15 years, and the resulting impacts to landowners and the environment.
- Second, the Project will reduce on-going and forecasted apportionment¹⁰ to the refining industry in PADD II, Eastern Canada, and the Gulf Coast, including Flint Hills and Northern Tier Energy in Minnesota.

¹⁰ Apportionment occurs when the total nominations of a specific crude type exceed the capacity to transport that crude type and all shippers nominations are reduced pro-rata, i.e., by the same percentage.



- Third, the restored capabilities will allow Enbridge to more efficiently operate the Enbridge Mainline System, optimize its pipeline system, and reduce power utilization on a per barrel basis.

For these reasons, Enbridge and its customers have agreed to fund a multi-billion dollar infrastructure rehabilitation project and Enbridge respectfully requests that the Commission grant it a certificate of need for the Project.