



Enbridge Pipelines (Southern Lights) L.L.C.
 MN-PUC Application April 2007
 Docket No. PL9/PPL-07-360

TABLE OF CONTENTS

<u>EXPLANATION</u>	<u>TAB</u>
<p>Routing Permit</p> <ul style="list-style-type: none"> Section 4415.0115 General Information Statement of Ownership Section 4415.0120 Description of Proposed Pipeline and Associated Facilities Section 4415.0125 Land Requirements Section 4415.0130 Project Expansion Section 4415.0135 Right-of-Way Preparation Procedures and Construction Activity Sequence Section 4415.0140 Location of Preferred Route and Description of Environment Section 4415.0145 Environmental Impact of Preferred Route Section 4415.0150 Right of Way Protection and Restoration Measures Section 4415.0160 Operation and Maintenance Section 4415.0165 List of Government Agencies and Permits Section 4415.0170 Evidence of Consideration of Alternative Routes 	A
<p>Exhibits to Routing Permit</p> <ul style="list-style-type: none"> Exhibit A – County Maps 	B
<p>Environmental Assessment Supplement</p>	C
<p>Appendices for Environmental Assessment Supplement</p> <ul style="list-style-type: none"> Appendix A – Schematics Depicting Typical Temporary Extra Workspace Locations and Dimensions Appendix B – Environmental Mitigation Plan Appendix C – Spill Prevention, Control, and Countermeasure Plan Appendix D – Roads Crossed by the LSr Pipeline Project Route Appendix E – Agricultural Mitigation Plan Appendix F – Petroleum-Contaminated Soil Management Plan Appendix G – Drilling Mud Containment, Response, and Notification Plan Appendix H – USGS Quad and Aerial Maps of Proposed LSr Project 	D

4415.0115 GENERAL INFORMATION

Subpart 4. Background Information

Each application must contain the following information:

A. the applicant's complete name, address and telephone number:

This application is sponsored by:

Enbridge Pipelines (Southern Lights) L.L.C.
1100 Louisiana, Suite 3300
Houston, Texas 77002
(713) 821-2000

B. the complete name, title, address, and telephone number of the authorized representative or agent to be contacted concerning the applicant's filing:

Joel Kanvik, Senior Counsel
Enbridge Energy Company, Inc.
1100 Louisiana, Suite 3300
Houston, Texas 77002
(713) 821-2110
Joel.kanvik@enbridge.com

Kevin Walli
Fryberger, Buchanan, Smith & Frederick
332 Minnesota St., Suite W1260
St. Paul, Minnesota 55101
(651) 221-1044
Kwalli@fryberger.com

C. the signatures and titles of persons authorized to sign the application, and the signature of the preparer of the application if prepared by an outside representative or agent;

This application is submitted by Enbridge Pipelines (Southern Lights) L.L.C.

Joel W. Kanvik
Senior Counsel & Assistant Secretary,
Enbridge Energy Company, Inc.

D. a brief description of the proposed project which includes:

(1) general location;

The proposed project consists of approximately 313 miles of 20-inch outer diameter pipeline including all valves and appurtenances. This new line will originate at Enbridge's existing facilities in Cromer, Manitoba, Canada and extend southeasterly to end at Enbridge's terminal and tank farm facility in Clearbrook, Minnesota. Of that total mileage, approximately 28 miles will be located in the county of Pembina, North Dakota, beginning at the Canada boundary near Neche, North Dakota and extending southeast leaving North Dakota at the Minnesota border approximately 2 miles northeast of Bowsmont, North Dakota. The remaining 108 miles of 20-inch pipeline will be located in Minnesota, beginning at the North Dakota border in Kittson County, and extending to the southeast to end at Enbridge's existing tank farm and terminal facility near Clearbrook, Minnesota in Clearwater County. As proposed, Enbridge plans to install the proposed 20-inch pipeline generally within or immediately adjacent to Enbridge's existing multiple line right easements through the Minnesota Counties of Kittson, Marshall, Pennington, Red Lake, Polk and Clearwater. As part of this proposed project, Enbridge also plans to modify pumping units at its existing Donaldson and Plummer station sites. Enbridge further submits that no surface facilities will be installed other than block valves and possible small enclosures to house power and electric systems, if the valves are capable of remote operation.

(2) planned use and purpose;

The purpose of this proposed pipeline is to transport crude oil supplies from western to serve the increasing demand for crude oil in Midwestern markets and beyond. Moreover, the capacity provided by this new pipeline segment provides independent utility to Enbridge and its customers, who will use the pipeline for the transportation of crude petroleum to the Clearbrook tankage facilities for subsequent delivery to interconnected existing pipeline systems to the south, via Minnesota Pipeline, which is owned by others, and to the east of the Clearbrook terminal via existing Enbridge pipelines.

(3) estimated cost;

The estimated cost for the Minnesota portion of the LSr Pipeline is \$125.5 million (2006 U.S. dollars)

(4) planned in-service date; and

Enbridge plans to begin construction of the proposed pipeline in the second quarter of 2008, with an anticipated completion and in-service date by the end of the fourth quarter of 2008.

(5) general design and operational specifications for the type of pipeline for which an application is submitted.

The proposed 20-inch crude line will add an incremental capacity of the pipeline system of approximately 186,000 bpd on an annual average. This computes to 20,088 mbpd miles. Table 4415.0115-A shows the annual capacity of the pipeline system before and after the proposed expansion, and Figure 4415.0115-A is a graphic depiction of the existing Enbridge system in the project area, including line numbers, pipe diameters, and the capacities after the construction of the proposed project.

TABLE 4415.0115-A			
LAKEHEAD SYSTEM CAPACITIES			
U.S. BORDER TO SUPERIOR, WISCONSIN			
Line No.	Pre LSr Project	Post LSr Project	Increase in Capacity
1	237,000	237,000	0
2	409,000	442,000	33,000
3	503,000	503,000	0
4	793,000	793,000	0
13	172,000	172,000	0
LSr Project	---	186,000	186,000
Total	2,114,000	2,333,000	219,000

Figure 4415.0115-A
Lakehead System Capacities
U.S. Border to Superior, Wisconsin

Line Number, Pipe Diameter and Post-installation Capacities (bpd)

Existing Lines	Line 2, 26-inch outer-diameter pipeline, 442,000 bpd
	Line 13, 18-inch outer-diameter pipeline, 172,000 bpd
	Line 3, 34-inch outer-diameter pipeline, 503,000 bpd
	Line 4, 36-inch outer-diameter pipeline, 793,000 bpd or Line 1, 20-inch outer diameter pipeline, 237,000 bpd
	Line 4, 48-inch outer-diameter pipeline, 793,000 bpd or Line 1, 20-inch outer diameter pipeline, 237,000 bpd
	LSr Project, 20-inch outer-diameter pipeline, 186,000 bpd

Generally, liquids pipelines are designed at a specified capacity for a known liquid. Most liquids pipelines transport a variety of different liquids. The change in fluid characteristics (density, viscosity, etc.) of the transported liquids will affect the capacity of the pipeline. Liquids are also batched in a pipeline generally in a repeatable sequence. Both fluid characteristics and batch sequence will affect the capacity of the pipeline.

Two definitions are used to describe pipeline capacity, Design Capacity and Annual Capacity.

- Design Capacity is the theoretical capacity of the pipeline for a given types of liquids and their batch sequence. Design Capacity is calculated assuming theoretically ideal operating conditions.

- Annual Capacity is the average sustainable throughput rate over a year. Annual Capacity is calculated assuming historic average annual and operating conditions. These operating conditions include scheduled and unscheduled maintenance, normal operating problems and crude supply ratability. Annual Capacity of a pipeline is typically 90% of Design Capacity. Table 4415.0115-B, Capacity Definitions summarizes these key issues and provides design data pertinent to the proposed new 20-inch pipeline.

TABLE 4415.0115-B CAPACITY DEFINITIONS		
		LSr Project Capacities (bpd)
Ultimate Capacity	Maximum economic expansion capacity of individual line. Requires additional pumping horsepower over current design to meet this capacity	300,000
Design Capacity	Theoretical capacity	207,000
Annual Capacity	Average sustainable rate over a year	186,000
Operating Factor	Historical percentage of full system utilization	90%

4415.0120 DESCRIPTION OF PROPOSED PIPELINE AND ASSOCIATED FACILITIES

Subpart 1. Pipeline Design Specifications.

The specifications for pipeline design and construction are assumed to be in compliance with all applicable state and federal rules or regulations unless determined otherwise by the state or federal agency having jurisdiction over the enforcement of such rules or regulations. For public information purposes, the anticipated pipeline design specifications must include but are not limited to:

- A. pipe size (outside diameter) in inches;**
20 inches

- B. pipe type;**
Steel

- C. nominal wall thickness in inches;**
0.250 inch

- D. pipe design factor;**
API 5L Grade X70

- E. longitudinal or seam joint factor;**
1.00

- F. class location and requirements, where applicable;**
Not applicable (applies to natural gas pipelines)

- G. specified minimum yield strength in pounds per square inch (psi); and**
70,000 psi

- H. tensile strength in pounds per square inch.**
82,000 psi

Subpart 2. Operating Pressure.

Operating pressure must include:

A. operating pressure (psi);

1,250 psi

B. maximum allowable operating pressure (psi).

1,260 psi

Subpart 3. Description of associated facilities.

For public information purposes, the applicant shall provide a general description of all pertinent associated facilities on the right-of-way.

Existing pumping facilities will be utilized at two Enbridge Station sites: one near Donaldson, Minnesota and the other near Plummer, Minnesota. A schematic drawing of the new pumping units within the existing station sites are depicted on station plat drawings under Tab 1 of the USGS Map Book enclosed herewith as Appendix H.

Thirteen mainline valves will be installed in Minnesota based on preliminary engineering design which complies with industry code, federal regulations and the operational needs of the Enbridge Mainline System. Specifically, locations of valve installation will be near major rivers, other environmentally sensitive areas, population centers, and pumping stations. Proposed valve locations are depicted on the attached route maps. A detailed engineering study will be performed and adjustments to the number and locations of valves could be made.

The only interconnections in Minnesota are at Enbridge's existing Clearbrook Tankage Facility with Enbridge Pipelines (North Dakota) L.L.C., (known as the Enbridge Pipelines North Dakota System and formerly Portal Pipeline), Enbridge Energy, Limited Partnership and Minnesota Pipe Line Company.

Subpart 4. Product capacity information.

The applicant shall provide information on planned minimum and maximum design capacity or throughput in the appropriate unit of measure for the types of products shipped as defined in part 4415.0010.

The annual design capacity of the proposed 20-inch pipeline will be 207,000 barrels per day. Annual capacity will be 186,000 barrels per day. Annual capacity, as defined in this paragraph, is the average daily rate over the course of one year, and equates to 90% of design capacity. Currently there are no plans to add facilities to increase the initial capacity of the Proposed Pipeline.

Subpart 5. Product description.

The applicant shall provide a complete listing of products the pipeline is intended to ship and a list of products the pipeline is designed to transport, if different from those intended for shipping.

The proposed 20-inch crude oil pipeline is expected to transport the following liquid petroleum products:

Light Crude Petroleum, and
Medium Crude Petroleum.

Subpart 6. Material safety data sheet.

For each type of product that will be shipped through the pipeline, the applicant shall provide for public information purposes the material identification, ingredients, physical data, fire and explosive data, occupational exposure limits, health information, emergency and first aid procedures, transportation requirements, and other known regulatory controls.

Material Safety Data Sheet for typical petroleum crude oil that will be transported through the proposed pipelines is attached.

Attachment Section 4415.0120
Product MSDS's

4415.0125 LAND REQUIREMENTS

For the proposed pipeline, the applicant shall provide the following information:

A. permanent right-of-way length, average width, and estimated acreage:

Enbridge will maintain a 40-foot-wide permanent right-of-way for operation of the pipeline. For the 107.7-mile-long portion of the pipeline that will cross Minnesota, approximately 522 acres of new permanent right-of-way will be acquired for the project. No additional land will be acquired for aboveground facilities because all work of this nature will occur within the boundaries of existing Enbridge aboveground facilities.

B. temporary right-of-way (workspace) length, estimated width, and estimated acreage:

The proposed pipeline will be constructed using a 100-foot-wide construction right-of-way and additional temporary extra workspaces at feature crossings (e.g., roads, waterbodies). For the 107.7-mile-long portion of the pipeline that will cross Minnesota, construction will affect approximately 1,305 acres of land. No pipe storage yards or private or new access roads have been identified at this time. This information will be filed when available, approximately July 2007.

C. estimated range of minimum trench or ditch dimensions including bottom width, top width, depth, and cubic yards of dirt excavated:

Trenches will be dug using a backhoe or crawler-mounted wheel type ditching machine. Typically, the ditch depth will be a minimum of 56 inches deep to allow for a minimum of 36 inches of ground cover to the top of the pipe. Trench width will be a minimum of 36 inches. The total excavation will consist of approximately 1.7 million cubic yards of soil.

D. minimum depth of cover for state and federal requirements:

In accordance with federal requirements (49 CFR Part 195.248), the depth of cover between the top of the pipe and the ground level, road bed, or river bottom will range between 18 to 48 inches, depending on the location of the pipe and the presence of rock.

State law requires that a minimum depth of cover of 54 inches be maintained in certain areas unless waived by the landowner.

Since the adjacent pipelines are buried in accordance with federal requirements, both safety and land use considerations have led Enbridge to propose the installation with a minimum 36-inch depth of cover. This approach will:

- minimize the amount of soil excavated and therefore reduce the total acreage temporarily impacted;
- avoid the potential perception by future excavators that all other parallel pipes are also at a depth of 54 inches;
- create no additional limits on deep plowing, because the other pipelines within the existing right-of-way already present limitations on depth of plowing;
- facilitate crossings of pipelines at similar depths by other facilities.

To implement the proposed depth of installation, where necessary, landowners will be asked to waive the 54-inch minimum cover requirement, as was done during the 1994, 1998, and 2002 expansion projects.

E. right-of-way sharing or paralleling: type of facility in the right-of-way, and the estimated length, width, and acreage of the right-of-way:

The proposed pipeline will be constructed within and/or adjacent to existing right-of-way and parallel to existing facilities described in Section 4415.0120 Subpart 3, Description of Proposed Pipeline and Associated Facilities. No other facilities owned by other parties share the existing route. However, the proposed route often parallels other railroads, pipelines, highways, and other utilities.

4415.0130 PROJECT EXPANSION

If the pipeline and associated facilities are designed for expansion in the future, the applicant shall provide a description of how the proposed pipeline and associated facilities may be expanded by looping, by additional compressor and pump stations, or by other available methods.

Enbridge is currently planning to convert its existing 18-inch-diameter liquid petroleum pipeline, designated as Line 13, by reversing the flow along 136 miles between Clearbrook, Minnesota, and the Canadian border near Neche, North Dakota. This pipeline would remain in liquid petroleum service but would be converted to export service with light petroleum hydrocarbons into Canada. Minimal environmental impact would result from the reversal of pump units, which would take place within existing fenced station facilities.

Additionally, Enbridge is planning to construct, own, and operate a new 325-mile-long, 36-inch-diameter crude oil pipeline, commercially known as the Alberta Clipper Pipeline Project (Alberta Clipper). The pipeline would originate in Alberta and terminate at Enbridge's existing tank farm located in Superior, Wisconsin. Alberta Clipper would be constructed generally within or immediately adjacent to the existing Enbridge pipeline right-of-way. Enbridge is planning a proposed in-service date of December 2009.

An additional 40-foot-wide permanent easement would typically be necessary for the Alberta Clipper Pipeline (the same area to be utilized for the 20-inch-diameter LSr Project pipeline). The 20-foot-wide temporary workspace to be used for the LSr pipeline would be re-used during construction of Alberta Clipper, as well as an additional 60 feet of temporary workspace. This additional 60 feet of temporary workspace is required due to the larger pipe diameter for Alberta Clipper and the associated need to use larger construction equipment for the larger pipeline, and to account for the separation distance between the LSr Project and Alberta Clipper Pipelines (typically 15 to 25 feet, depending on field conditions).

The planned Alberta Clipper pipeline would be constructed adjacent to the proposed LSr Project pipeline for the entire distance from the international border to Clearbrook, MN. In addition, Alberta Clipper would primarily be located within or immediately adjacent to existing Enbridge right-of-way from Clearbrook to Superior, Wisconsin. Construction of the LSr Project must be complete prior to the Line 13 reversal, and is anticipated to be completed prior to construction of Alberta Clipper.

**4415.0135 RIGHT-OF-WAY PREPARATION PROCEDURES AND CONSTRUCTION
ACTIVITY SEQUENCE**

Each applicant shall provide a description of the general right-of-way preparation procedures and construction activity sequence anticipated for the proposed pipeline and related facilities.

First, the right-of-way is surveyed, staked, and prepared for clearing. The right-of-way is then cleared and graded to the extent needed to provide construction access and safe movement of equipment and personnel during construction. Appropriate safety measures are implemented before excavation begins, including notification of the One-Call system to ensure foreign utilities are properly marked, and marking of the adjacent pipelines. Pipe, valves, and fittings are transported to the right-of-way by truck and placed along the right-of-way by side boom tractors or mobile cranes. After individual pipe sections are strung along the right-of-way, they are bent to conform to the contours of the trench and terrain. The pipe is then lined up, welded, field coated, and inspected. Trenching may occur before or after the pipe has been welded. Trenching is typically conducted using a backhoe or crawler-mounted, wheel-type trenching machine. Where appropriate, topsoil is segregated. Prepared pipe is lowered into the trench and, where applicable, tied into existing facilities. During backfilling, first the subsoil, then the topsoil is replaced. Precautions, such as padding, are taken during backfilling to protect the pipe from rock damage. Prior to the line being filled with petroleum and placed into service, the pipeline is hydrostatically tested to ensure its integrity. Following installation and testing, the right-of-way is cleaned up and restored as nearly as practicable to preconstruction conditions. Restoration includes implementing temporary and permanent stabilization measures such as slope breakers, mulching and seeding.

Section 1.3 of the Environmental Assessment Supplement provides a description of construction activities along with a diagram depicting typical construction sequence.

4415.0140 LOCATION OF PREFERRED ROUTE AND DESCRIPTION OF ENVIRONMENT

Subpart 1. Preferred route location. The applicant must identify the preferred route for the proposed pipeline and associated facilities, on any of the following documents which must be submitted with the application:

- A. United States Geological Survey topographical maps to the scale of 1:24,000, if available;**
- B. Minnesota Department of Transportation county highway maps; or**
- C. Aerial photos or other appropriate maps of equal or greater detail in items A and B. The maps or photos may be reduced for inclusion in the application. One full-sized set shall be provided to the board.**

Enbridge is enclosing herewith as Appendix H, its USGS quad maps, MN-DOT county highway maps, and aerial photo maps for the proposed pipeline route from the North Dakota state line in Kittson County to Enbridge's Clearbrook Terminal Facility in Clearwater County, Minnesota.

Subpart 2. Other route locations.

All other route alternatives considered by the applicant must be identified on a separate map or aerial photos or set of maps and photos or identified in correspondence or other documents evidencing consideration of the route by the applicant.

In developing the proposed pipeline route, Enbridge studied a variety of alternatives for routing the proposed pipeline. These alternatives consist of system alternatives, route alternatives, and route variations. Enbridge evaluated and compared several factors, including the ability to meet project objectives, technical and economic feasibility, and potential environmental impacts for each alternative.

Section 2.0 of the Environmental Assessment Supplement provides a detailed analysis of all alternatives considered, and Section 4415.0170 of this application provides a summary of this analysis.

Subpart 3. Description of environment.

The applicant must provide a description of the existing environment along the preferred route.

Enbridge has prepared an Environmental Assessment Supplement for the LSr pipeline project that provides a description of the existing environment along the

proposed route, an analysis of potential human and environmental impacts, and a discussion of measures that will be taken to protect and restore the right-of-way and to mitigate adverse impacts. A summary of the existing environmental conditions along the pipeline route is provided below. A summary of potential environmental impacts and mitigative measures is provided in Section 4415.0145 of this application.

Socioeconomics

County population levels within the project area range from a low of 4,317 persons in Red Lake County, to a high of 31,133 persons in Polk County. In general, population levels are low in the northern counties. Population density (an indicator of the extent of development) in the counties affected by the project averages 11 people per square mile. This number is lower than the statewide average of 64 people per square mile and reflects the generally rural character of much of the proposed pipeline route. The December, 2006 unemployment rate in the project area varied from 4.6 percent in Polk County to 11.3 percent in Clearwater County (compared to a statewide average of 4.2 percent). Employment in the project area is concentrated in the manufacturing, accommodation and food services, healthcare and social services, and retail trade industries. Educational, health and social service, manufacturing and retail trade are the top employment industries. Agriculture remains an important industry in the counties along the pipeline route. Per capita income in 2004 ranged from a low of \$22,715 in Red Lake County to a high of \$32,284 in Pennington County. The pipeline route generally avoids populated centers and residential areas, with nine municipalities located within approximately one mile.

Section 3.0 of the Environmental Assessment Supplement provides details regarding socioeconomic conditions in areas associated with the LSr Project.

Land Use

Using the U.S. Geological Survey (USGS) Land Use and Land Cover Classification System, Enbridge identified land use along the pipeline route and classified it into the following five categories based on prevalent land use and vegetation cover types: open lands, forest lands, agricultural lands, developed lands, and wetlands/open water. The predominant land use identified along the proposed pipeline route is agricultural land, which accounts for 1,299 acres (or 89.5 percent) of the total construction area. Of the agricultural land affected, approximately 87.4 percent (or 1,135 acres) is cultivated and the remaining 12.6 percent (or 164 acres) is pasture land. Other land uses are forest land (81 acres or 5.6 percent), wetland/open water (56 acres or 3.9 percent), and developed land (10 acres or 0.7 percent).

The pipeline route predominantly crosses private lands located outside of municipal areas (1,393 acres or approximately 96 percent of the route). The route also crosses county lands (4 acres) and incorporated areas (50 acres). County

lands consist of tax-forfeited parcels. Incorporated areas crossed by the pipeline include the Cities of Plummer, Oklee, and Trail. No federal or state lands are crossed by the proposed pipeline route.

Section 4.0 of the Environmental Assessment Supplement provides details regarding land uses associated with the LSr Project.

Terrain and Geology

The project area is located within the Western Lake section of the Central Lowlands Physiographic Province. The area's topography is characterized by large, gently rolling till plains, hilly areas formed by glacial moraines, and outwash plains. Bedrock along the pipeline route consists of mostly granite, sandstone, and basalt, with the depth to bedrock exceeding 450 feet in some locations. No part of the route crosses areas with bedrock at depths of less than 5 feet; therefore, blasting and other methods required for construction in bedrock are not anticipated for the LSr pipeline project.

There is a low probability for earthquakes of significant intensity or other seismic events in the project area, and no Quaternary-age faults are crossed by the project route.

Few sand and gravel quarry operations are present within the counties along the pipeline route, and no gavel pits or active mining operations were identified within 1,500 feet of the proposed pipeline route.

Section 5.0 of the Environmental Assessment Supplement provides details regarding geological resources associated with the LSr Project.

Soils

The dominant soils crossed by the proposed LSr pipeline route are classified as Udalfs. These deep, well to moderately well drained soils have a medium texture, a frigid temperature regime, and mixed mineralogy. Udalf soils are generally resistant to water erosion, with less than 1 percent of soils along the pipeline route being highly susceptible to water erosion, and only 19% being highly susceptible to wind erosion. Approximately 73% of the soils within the project area are considered prime farmland, 61% are hydric, 25% pose re-vegetative concern, and no soils contain bedrock within 5 feet of the surface.

Section 6.0 of the Environmental Assessment Supplement provides details regarding soil resources associated with the LSr Project.

Vegetation, Wildlife, and Fisheries

The proposed pipeline will be constructed through multiple biomes, including the deciduous and conifer-hardwood forest zones and the prairie zone. Wildlife

habitats within these areas are diverse and include open areas, wetlands, and forested areas. Since the pipeline route crosses predominantly agricultural lands within these zones, wildlife habitat is more limited and confined primarily to the undeveloped areas. Within agricultural land, some of the species commonly present include white-tailed deer, pheasant, and raccoon; as well as a few bird species such as starlings, crows, eastern meadowlark, and sparrows.

The emergent wetlands provide habitat for a variety of aquatic wildlife, including muskrat, beaver, mink, waterfowl, wading birds, and numerous species of reptiles and amphibians. The scrub-shrub wetlands and forested wetlands provide additional habitat for terrestrial wildlife, such as the white-tailed deer, moose, gray wolf, fox, bear, porcupine, and a variety of small mammals and songbirds.

Some of the common mammalian species in deciduous forests include white-tailed deer, bear, eastern cottontail rabbit, woodchuck, raccoon, skunk, gray and fox squirrel, gray and red fox, and several species of bat. The structural diversity of the forest provides a variety of habitats that can support a large number of avian species, including songbirds, hawks, and owls.

The pipeline route crosses 14 perennial streams, 33 intermittent streams, and 19 canals/ditches in Minnesota. Most of these waterbodies contain warm water fisheries. The LSr Project does not cross any waterbodies designated as trout fisheries. Game fish that may occur in stream crossings in the project area include: walleye, sauger, northern pike, muskellunge, sunfish, crappie, perch, channel catfish, bluegill, largemouth and smallmouth bass. Other fish that may occur within the project area include: carp, bullhead, suckers, sculpin, burbot, redhorse, minnows, and other forage fish.

The MNDNR and the U.S. Fish and Wildlife Service (USFWS) were consulted on the presence of threatened and endangered species in the vicinity of the project. The MNDNR conducted a review of the Minnesota Natural Heritage database to determine if any federally or state-listed species are known to occur within approximately one mile of the project. The Minnesota Natural Heritage database indicated 8 known occurrences of rare species or native plant communities in the area searched. The USFWS indicated that the home ranges of two other federally listed species (gray wolf and Canada lynx) are located in the vicinity of the project but no known occurrences of these species have been recorded in the project area.

Section 7.4 of the Environmental Assessment Supplement provides detailed information about protected species consultations for this project.

Water Resources – Groundwater

Groundwater along the proposed route occurs in surficial aquifers and buried drift aquifers. Surficial aquifers occur above bedrock in unconsolidated sediments deposited by glaciers, streams, and lakes. Buried drift aquifers occur in well sorted

sands and gravels deposited in bedrock valleys, alluvial channels, and outwash plains. Of the two types, surficial aquifers are most susceptible to impacts from construction because of the relatively shallow depth of the water table and coarse texture of the material overlying the aquifer.

Enbridge identified one domestic water supply well within 200 feet of the pipeline route. No public water supply wells are located within 100 feet of the pipeline route. The pipeline route will not cross any aquifers that are designated by the US Environmental Protection Agency (EPA) as sole-source aquifers. The LSr Project crosses one Drinking Water Supply Management Area (DWSMA). The proposed route would cross about 0.4 mile of the DWSMA near MP 886.4 in the vicinity of Oklee, MN. The Minnesota Department of Health rates the vulnerability of the Oklee area as low. The route does not cross any Wellhead Protection Areas.

Enbridge accessed a Minnesota Pollution Control Agency database to identify sites with known or potential contamination within 0.5 mile of the proposed project. Enbridge identified five sites including four unpermitted dumps and one permitted landfill. Based on MPCA information and review of aerial photographs, three of the five sites were determined to be more than 500 feet from the proposed route and, therefore, are not anticipated to affect the project. Prior to construction of the project, Enbridge will assess the potential for encountering contaminated groundwater near the sites that are within 500 feet of the proposed route. If necessary, appropriate avoidance or mitigation measures will be developed and implemented in accordance with applicable state or federal regulations.

Section 8.0 of the Environmental Assessment Supplement provides details regarding groundwater resources associated with the LSr Project.

Water Resources – Surface Water

The LSr Project pipeline route will cross portions of one major drainage basin, the Red River of the North Basin. The Red River of the North Basin encompasses a 35,530-square-mile surface drainage area to the main stem of the Red River of the North within the United States. The LSr Project pipeline route will cross three watershed management districts, the Two Rivers, Middle-Snake-Tamarac, and Red Lake districts. The primary purpose of these watershed districts and organizations is to conserve the natural resources of the state through land use planning, flood control, and other conservation practices.

Enbridge reviewed existing maps, USGS 7.5-minute-series topographic maps, NWI Maps, MDNR Protected Waters and Wetlands Maps, and Minnesota Public Recreation Information Maps, and aerial photography to identify waterbodies (lakes, streams, rivers, and drainage ditches) crossed by the proposed pipeline route. This review identified 66 waterbodies crossed by the proposed pipeline route, including 14 perennial streams and 33 intermittent streams, and 19 canals/ditches or artificial paths. Ten of these waterbodies are designated as Protected Waters by the MDNR.

For routing and planning purposes, Enbridge used National Wetland Inventory (NWI) data to estimate the number, size, and locations of wetlands along the pipeline route. A total of 68 wetlands were identified within a 150-foot-wide survey corridor along the pipeline route. A total of approximately 4.6 linear miles of wetlands will be crossed by the pipeline route. The pipeline route will cross one wetland (public water wetland) listed on the MDNR Protected Waters Inventory.

Section 9.0 of the Environmental Assessment Supplement provides details regarding surface water resources associated with the LSr Project.

Cultural Resources

Enbridge reviewed the Minnesota State Historic Preservation Office's (SHPO's) site files to identify previously recorded cultural resources within the proposed construction right-of-way. This review identified a single archaeological site located within the proposed LSr Project construction corridor. This site (21MA39) has been determined eligible for listing in the National Register for Historic Places (NRHP). Enbridge is currently conducting field surveys to identify cultural resources along the pipeline route. If the survey identifies any sites that are eligible for listing in the NRHP, Enbridge will consult with the appropriate agencies including Minnesota SHPO to identify measures to avoid, minimize, or mitigate adverse effects on these sites.

Refer to section 10.0 in the Environmental Assessment Supplement for detailed information regarding cultural resources.

Federal, State, and County Recreational Areas

The LSr Project pipeline route will not cross any national parks or forests, state parks or forests, wildlife management areas, county parks, state- or county-designated trails, or designated scenic byways. However, the proposed pipeline route will cross two state-designated canoe and boating routes as discussed in section 11.1 of the Environmental Assessment Supplement.

4415.0145 ENVIRONMENTAL IMPACT OF PREFERRED ROUTE

The applicant must also submit to the board [PUC] along with the application an analysis of the potential human and environmental impacts that may be expected from pipeline right-of-way preparation and construction practices and operation and maintenance procedures. These impacts include but are not limited to the impacts for which criteria are specified in part 4415.0040 or 4415.0100.

Enbridge has prepared an Environmental Assessment Supplement for the LSr pipeline project that provides a description of the existing environment along the proposed route, an analysis of potential human and environmental impacts, and a discussion of measures that will be taken to protect and restore the right-of-way and to mitigate adverse impacts. A summary of the potential human and environmental impacts is presented below. A summary of the existing environment along the proposed route is provided in Section 4415.140 of this application. More detailed information on the human environmental impacts and mitigative measures is provided in the Environmental Assessment Supplement.

Socioeconomics

During pipeline construction, Enbridge will employ approximately 1,000 local and non-local workers. Enbridge, through its construction contractors and subcontractors, will attempt to hire local workers where the local workforce possesses the required skills. Construction personnel hired from outside the project area will augment the local workforce and consist of supervisors, environmental inspectors, and highly skilled mechanical, electrical, and instrumentation/control tradesmen. Non-local workers will relocate to the project area for the duration of construction. All workers will generally be dispersed along the length of the construction corridor rather than concentrated at a single work site. Non-local workers will reside in the vicinity of the project for short periods, typically unaccompanied by family members. As a result, incremental demand from non-local workers for public services will be small.

Construction of the pipeline may temporarily affect transportation systems along the pipeline route. Enbridge will typically construct the pipeline across paved roadways and railroads using road-boring equipment to avoid disruptions to vehicular or railcar movement and physical impacts on road/railroad beds. Unpaved roadways will typically be crossed by boring or by using the open-cut method. The latter method could temporarily disrupt road traffic as the pipe trench is excavated across the roadway. To minimize traffic delays at these crossings, Enbridge will establish traffic detours or maintain at least one traffic lane except for brief periods when road closure is essential to lay the pipe. Enbridge will minimize the duration of open-cut crossings, and in most cases, will complete these road crossings in one day or less.

The movement of construction personnel, equipment, and materials from contractor and pipe storage yards to the construction work area will result in additional short-term impacts on the local transportation system. Enbridge anticipates that road congestion will increase during early morning and evening peak hours, but will not significantly disrupt the normal flow of traffic in the project area.

Construction and operation of the project will benefit local economies through expenditures for wages, purchase of materials, and annual taxes. Construction will create temporary jobs for both local and non-local workers. No new jobs will be created as a result of the operation of the pipeline.

Land Use

In general, the proposed LSr pipeline will be constructed within a 100-foot wide right-of-way to allow for temporary storage of topsoil and spoil and to accommodate safe operation of construction equipment. Temporary extra workspaces will be needed where the route crosses features such as waterbodies, roads, railroads, sideslopes, and other special circumstances. These temporary extra workspaces are construction areas that are needed outside of the typical construction right-of-way to stage equipment and stockpile spoil material. Construction of the Minnesota portion of the project will temporarily affect approximately 1,452 acres of land.

Enbridge classified land use along the pipeline route into the following five categories: agricultural lands, developed lands, forest lands, wetlands/open water, and open lands. The following table provides a summary of land use categories affected by pipeline construction and operation.

Land Use Affected by Construction and Operation of the Proposed Pipeline				
	Land Area Affected By Construction		Land Area Affected By Operation	
	Acres	Percent	Acres	Percent
Agricultural Lands	1299.7	89.5%	470.9	90.2%
Developed Lands	9.8	0.7%	2.4	0.5%
Forest Lands	81.1	5.6%	24.3	4.7%
Wetlands/Open Water	56.1	3.9%	22.2	4.2%
Open Lands	5.3	0.4%	2.0	0.4%
Total	1452.0	100%	521.8	100%

Pipeline construction will temporarily disturb approximately 1,300 acres of agricultural land, or approximately 89% of the total land affected. Of the agricultural land affected, approximately 87.4% (1,135 acres) is cultivated and the remaining 12.6% (164 acres) is pasture land. Other land uses are forest land (81 acres or 5.6%), wetland/open water (56 acres or 4%), and developed land (10 acres or >1%). Construction activities also may interfere with planting or

harvesting, depending on the timing of construction. Impacts on agricultural areas will be minimized by implementation of Enbridge's Agricultural Mitigation Plan (Appendix E to the Environmental Assessment Supplement).

Impacts on residential and commercial areas may result and will generally be short term. Short term impacts on residences and buildings could result from dust generated from construction equipment and excavation, increased ambient noise levels, and increased vehicular traffic.

To facilitate installation of the pipeline, trees and brush will be removed from the construction right-of-way and temporary extra workspaces. Following construction, the right-of-way will be restored and revegetated. Consistent with standard industry practices, the new permanent right-of-way in forest lands will be maintained in an herbaceous state to facilitate aerial inspection of the pipeline; however, the remainder of the construction right-of-way and the temporary extra workspaces will be allowed to revert to their natural forested state. Where the pipeline route parallels Enbridge's existing pipeline corridor, an additional 15-foot-wide strip adjacent to the existing maintained corridor will be maintained permanently in an herbaceous state to facilitate inspection of the pipeline.

Open land consists of areas classified as bare rock, sand, or clay; quarries, strip mines or gravel pits; transitional; shrublands; grasslands or herbaceous areas; cleared portions of existing rights-of-way; and urban or recreational grasses. Open lands will be temporarily disturbed during grading, trenching, backfilling, and restoration. Once construction is complete, open land will be restored and revegetated.

Terrain and Geology

Construction and operation of the proposed pipeline will result in minor impacts of topography and geology. Enbridge will minimize impacts by restoring contours to pre-construction conditions to the extent practicable and by implementing the erosion control measures described in its EMP (Appendix B to the Environmental Assessment Supplement). The proposed route does not cross areas with shallow bedrock; therefore, it is not anticipated that blasting will be required during construction of the pipeline. Enbridge does not anticipate impacts associated with seismic activity within the project area. The proposed pipeline will be installed adjacent to existing pipelines and primarily within existing maintained right-of-way; therefore, any sand and gravel deposits in the project area will be unavailable for mining.

Soils

Pipeline construction activities such as clearing, grading, trench excavation, and backfilling, as well as movement of construction equipment along the right-of-way, will affect soil resources. Enbridge will minimize or avoid these impacts on soils by implementing the mitigation measures described in the EMP, AMP, and SPCCP

(Appendices B, E, and C to the Environmental Assessment Supplement). These measures will include topsoil segregation, compaction alleviation, removal of excess rock, restoration of agricultural drainage systems, and the installation of temporary and permanent erosion control structures. Enbridge will also revegetate disturbed areas, with the exception of active cropland, following final grading.

Vegetation, Wildlife, and Fisheries

During construction, existing vegetation will be removed from within the construction right-of-way and temporary workspace areas to facilitate the installation of the pipeline. The impact of clearing and the time required to achieve recovery of vegetation communities will depend on the size and age of the pre-existing vegetation. Active revegetation measures and rapid colonization by annual and perennial herbaceous species in the disturbed areas will restore most vegetative cover within the first growing season. In general, long-term impacts will be greatest in forest lands because forest vegetation is more structurally complex than other vegetation types and takes longer to become re-established.

Impacts on vegetation adjacent to the project area will be minimized through adherence to soil erosion control specifications and by confining clearing activities to the approved right-of-way and temporary extra workspaces, and by implementing revegetative measures in accordance with Enbridge's EMP (Appendix B to the Environmental Assessment Supplement). Where the pipeline route parallels the existing pipeline corridor, construction areas will overlap the existing maintained right-of-way, thereby reducing the amount of forest and shrub lands that will be cleared prior to, and during, construction.

Operation and maintenance of the proposed pipeline facilities will have additional effects on vegetation after site clearing and right-of-way restoration are complete. To facilitate inspection of the pipeline, the permanent right-of-way periodically will be cleared of trees and shrubs to facilitate aerial inspection of the pipeline and maintain visibility of pipeline markers located at property lines and crossings of roads and waterbodies.

Construction and operation of the project is not expected to have a significant impact on wildlife. Temporary impacts will occur during construction due to clearing of vegetation and disturbance of soils in the right-of-way. Most wildlife will disperse from the project area as construction activities approach. Displaced species may recolonize in adjacent, undisturbed areas, or re-establish in their previously occupied habitats after construction is complete and suitable habitat is re-established. Long-term impacts will be limited to a loss of forest habitat due to clearing of the temporary construction right-of-way and extra workspaces that are located in forested areas and long-term effects on wildlife species will be limited since the pipeline will be co-located with the existing pipeline corridor.

Pipeline construction will result in temporary impacts on streams being crossed by

the proposed route. Some potential impacts on fisheries resources, such as sedimentation and turbidity, removal of streambank cover, introduction of water pollutants, or entrainment and impingement of aquatic organisms could result from construction activities. Overall, impacts from construction on fish and other aquatic organisms are expected to be localized and temporary. To minimize the potential for adverse impacts on the fisheries at river and stream crossings, Enbridge will implement erosion and sediment control measures specified in the EMP (Appendix B of the Environmental Assessment Supplement) and limit the duration of construction in these waterbodies.

Enbridge has consulted with The MNDNR and the U.S. Fish and Wildlife Service (USFWS) on the presence of threatened and endangered species in the vicinity of the project. Enbridge will continue to consult with the MNDNR and USFWS on the status of mitigative strategies for these species. If any of the species are identified in the construction right-of-way during the surveys, Enbridge will work with these agencies to develop mitigation plans to avoid and minimize impacts on the potentially affected species.

Water Resources – Groundwater

Construction of the LSr pipeline is not expected to have long-term impacts on groundwater resources. Ground disturbance associated with pipeline construction is primarily limited to the upper 10 feet, which is above the water table of most of the regional aquifers. Enbridge does not anticipate the necessity for blasting since no areas of shallow bedrock have been identified within the project area.

The introduction of contaminants to groundwater due to accidental spills of construction related chemicals, fuels, or hydraulic fluid could have an adverse affect on groundwater quality, most notably near shallow water wells. Enbridge's Spill Prevention, Containment, and Control Plan (SPCCP) describes measures that will be implemented to prevent accidental releases of fuels and other hazardous substances. The SPCCP also outlines response, containment, and cleanup procedures. By implementing the protective measures set forth in the SPCCP, long term contamination due to construction activities is not anticipated. Enbridge's SPCCP can be found in Appendix C of the Environmental Assessment Supplement.

Surface Water Resources

Pipeline construction across rivers and streams can result in temporary and long-term adverse environmental impacts if not mitigated. Temporary impacts from in-stream trenching could include an increase in the sediment load downstream of the crossing location. Sustained periods of exposure to high levels of suspended solids have been shown to cause fish egg and fry mortality and other deleterious impacts on fisheries and other aquatic resources. Surface runoff and erosion from the cleared right-of-way also can increase in-stream sedimentation during

construction resulting in the shallowing of pools and a reduction of the quality of spawning beds and benthic substrate. Enbridge's proposed waterbody construction methods, specifically with respect to erosion control, bank stabilization, and bank revegetation, will minimize short- and long-term impact on the waterbodies along the pipeline route.

Long-term impacts on water quality can result from alteration of the streambanks and removal of riparian vegetation. Soil erosion associated with surface runoff and streambank sloughing can also result in the deposition of sediments in waterbodies. Sediments deposited on stream bed gravel could result in fish egg mortality and damaged spawning habitat. Removal of riparian vegetation also can lead to increased light penetration into the waterbody, causing increased water temperature, which potentially could be detrimental to coldwater fisheries.

Enbridge will avoid and minimize impacts on waterbodies by implementing the erosion and sediment control measures described in the EMP (Appendix B of the Environmental Assessment Supplement). Enbridge also will limit the duration of construction within waterbodies and limit equipment operation within waterbodies to the area necessary to complete the crossing. Disturbed areas at crossings will be restored and stabilized as soon as practical after pipeline installation.

Alternative construction techniques (such as HDD or dry crossing methods) may be used at selected waterbodies to avoid and minimize impacts on these waterbodies. The HDD method is a well-established construction technique for installing pipeline under large waterbodies that avoids impacts associated with conventional open-cut methods. HDD installations have the potential to affect waterbodies, however, through inadvertent releases of drilling mud during construction. If HDD is used to cross waterbodies, Enbridge will follow the provisions of its Drilling Mud Containment, Response, and Notification Plan (see Appendix G of the Environmental Assessment Supplement) to prevent an inadvertent release of drilling mud or to minimize environmental effects in the event that a release occurs.

Spills from refueling operations, fuel storage, or equipment failure in or near a waterbody could affect aquatic resources and contaminate the waterbody downstream of the release point. Enbridge will minimize the potential impact of spills of hazardous materials by adhering to the relevant provisions in its SPCCP (see Appendix C of the Environmental Assessment Supplement).

The proposed pipeline route will cross close to one wetland designated as an Outstanding Resource Value Water (ORVW) by the MDNR, the Viking Fen near MP 844.3 (based on review of MDNR Protected Waters and Wetlands Inventory Maps and consultation with the MDNR Natural Heritage Inventory System). ORVW are provided an additional level of protection to preserve their values for recreational, cultural, aesthetic, or scientific resources. Enbridge has consulted with the MDNR (see Environmental Supplement for records of consultations) and will discuss appropriate mitigation techniques for construction in this area.

Cultural Resources

Enbridge initiated consultation with the St. Paul District of the Army Corps of Engineers (COE) and has reviewed the Minnesota State Historic Preservation Office's (SHPO's) site files to identify previously recorded cultural resources within the proposed construction right-of-way. The U.S. Department of State (DoS) and the COE will determine which federal agency will assume the lead role with overall responsibility for compliance with Section 106 requirements. It is expected that either the DoS or the COE will initiate consultation with the SHPO. Enbridge's initial review of SHPO's site files identified a single archaeological site located within the proposed LSr Project construction corridor. This site (21MA39) has been determined eligible for listing in the National Register for Historic Places (NRHP). Enbridge will consult with the lead federal agency and SHPO to identify measures to avoid, minimize, or mitigate adverse effects to this site. These measures may include routing the pipeline around identified sites; installing the pipeline beneath the sites using conventional bore or HDD technology; fencing sites or portions of sites to ensure that they are not disturbed during construction; monitoring of construction activities by an archaeologist; or archaeological data recovery at the sites.

Enbridge will also develop and implement an unanticipated discoveries plan. This plan will describe measures to be followed in the event that a previously undocumented cultural resource site is discovered during construction activities. These measures will include documenting and evaluating the site; consulting with the lead federal agency and SHPO; and implementing measures to avoid, minimize, or mitigate adverse effects to the site if the site is eligible for listing on the NRHP.

4415.0150 RIGHT-OF-WAY PROTECTION AND RESTORATION MEASURES

Enbridge has developed standardized erosion control and restoration measures to minimize potentially adverse environmental effects resulting from right-of-way preparation, construction, and maintenance of the proposed pipeline. These measures are described in Enbridge's Environmental Mitigation Plan (EMP), which is provided in Appendix B of the Environmental Assessment Supplement. Enbridge has also developed a construction Spill Prevention, Containment and Control Plan (SPCCP) that describes planning, prevention and control measures to minimize impacts of construction-related spills. The SPCCP is provided in Appendix C of the Environmental Assessment Supplement.

Enbridge will comply with applicable federal, state, and local rules and regulations and take appropriate precautions to protect against degradation of the environment. Enbridge will retain third-party Environmental Inspectors to verify that environmental protection measures, environmental permit conditions, and other environmental specifications are implemented appropriately by the contractor during construction of the proposed facilities. Environmental Inspectors will have peer status with all other construction inspectors and will have the authority to stop construction activities if necessary.

Subpart 1. Protection.

The application must describe what measures will be taken to protect the right-of-way or mitigate the adverse impacts of right-of-way preparation, pipeline construction, and operation and maintenance on the human and natural environment.

Measures that will be taken to protect the right-of-way or mitigate the adverse impacts of right-of-way preparation, pipeline construction, and operation and maintenance on the human and natural environment are describe in detail in the EMP, SPCC, and AMP in appendices B, C, and E, respectively, in the Environmental Assessment Supplement. A summary of the primary protective measures to be implemented during construction on the LSr pipeline project is provided below:

- Topsoil in active cropland will be removed from either the trench and spoil storage areas or the trench area, and replaced after the trench is backfilled;
- Topsoil in pasture land will be removed from the trench area and replaced after the trench is backfilled;
- Drain tiles encountered during trenching activities will be marked and identified for repair following pipeline installation;
- Temporary erosion control measures will be installed and maintained to minimize erosion and sediment from entering waterbodies and wetlands to the extent practicable;
- Temporary bridges will be used, where necessary, to transport construction equipment across perennial streams and rivers.

- Construction across flowing streams and rivers will be conducted as quickly as possible;
- Hazardous materials, chemical, fuels, and lubricating oils will not be stored near waterbodies, wetlands, or water supply wells;
- Construction mats, or low ground pressure equipment will be used in wetlands to minimize disturbance of the wetlands;
- Major highways and most paved secondary roads will be crossed using boring equipment where practicable to minimize disruption of traffic, and to avoid disturbance of the road surface; and
- Near residences, mitigation measures will be implemented to minimize construction-related dust.

Subpart 2. Restoration.

The applicant must describe what measures will be taken to restore the right-of-way and other areas adversely affected by construction of the pipeline.

Measures that will be taken to restore the right-of-way and other areas adversely affected by construction of the pipeline are described in detail in the Environmental Mitigation Plan (EMP) and the Agricultural Mitigation Plan (AMP), in appendices B and E, respectively, in the Environmental Assessment Supplement. A summary of the primary restoration measures to be used during restoration of project areas is provided below.

The EMP specifies:

- Permanent erosion control measures to be implemented in upland areas, stream banks, drainage ditches, and intermittent streams disturbed by the project;
- Soil compaction treatment in fields and any other areas where project activity has resulted in severely compacted or rutted soils;
- Removal of excess stones larger than four inches in diameter from the upper 12 inches of soil;
- Installation of off-road vehicle control measures as requested by Landowners or as directed by land management agencies;
- Permanent seeding on non-cultivated areas disturbed by the project;
- Repair of private roads and lanes damaged from equipment movement or right-of-way access;
- Restoration to preconstruction conditions, to the extent practicable, of damaged soil conservation practices; and
- Restoration of the right-of-way to its preconstruction elevation and contour to the extent practicable.

The AMP Specifies:

- Procedures for repair of drain tiles encountered and damaged during trenching;
- Rock Removal practices;
- Removal of construction debris;
- Compaction, Rutting, Fertilization, Liming, and Soil Restoration Procedures; and
- Procedures for determining construction-related damages and providing compensation.

4415.0160 OPERATION AND MAINTENANCE

Pipeline operations and maintenance are assumed to be in compliance with all applicable state and federal rules or regulations, unless determined otherwise by the state or federal agency having jurisdiction over the enforcement of such rules or regulations. For public information purposes, the applicant must provide a general description of the anticipated operation and maintenance practices planned for the proposed pipeline.

As an interstate crude petroleum and natural gas liquids pipeline, the Company's design, construction, maintenance and operation functions are regulated by U.S. Department of Transportation in Title 49 CFR Part 195 – Transportation of Hazardous Liquids by Pipeline. As such, oversight of operations is controlled by the federal Pipeline and Hazardous Materials Safety Administration (PMHSA) pursuant to the Hazardous Liquid Pipeline Safety Act, 49 U.S.C. 2001 et seq. Enbridge abides by all regulations issued by that agency. To a lesser extent, the Company works directly with various regional, state, and local agencies; landowners; and other interests to ensure its programs meet the needs of the community in which it operates.

The federal agency charged with enforcement of Part 195 is the U.S. Department of Transportation, PMHSA. In 1991, the Minnesota Office of Pipeline Safety (MnOPS) was designated as an inspector on behalf of the PMHSA. Findings, reports and recommendations from MnOPS inspectors are referred to the PMHSA for review and action.

In order to establish standards and guidelines for Company personnel, as well as to comply with Part 195 and other government regulations, the Company has developed comprehensive written procedures for the operation and maintenance of the pipeline. Company procedures and activities meet and generally exceed these government requirements. The following paragraphs provide a general overview of operation and maintenance practices.

Pipeline Control Center

The Enbridge pipeline control center for Enbridge Liquids Pipelines is located at a central control center in Edmonton, Alberta.

The Control Center is manned by pipeline operators 24 hours a day. A computerized pipeline control system allows these operators to remotely monitor and control the pipeline and related facilities. The Control Center also serves as an emergency centers to receive calls from employees, the public or public officials reporting unusual conditions or pipeline failures.

The computerized pipeline control system has been designed to control the pipeline within pre-established minimum and maximum operating pressures. Both the computer system and operating practices include procedures for abnormal operating conditions, including emergency shutdown and isolation of the pipeline and notification procedures in the event of suspected emergencies.

Pipeline Integrity and Reliability Program

With the volumes transported and the size of its lines and therefore the risk associated with a spill, the Company continues to be diligent in its program to ensure its lines are safe. Over the past five years, Enbridge has spent on average, approximately \$20 million annually on pipeline maintenance and protection.

While the Company has made significant strides to avoid pipeline failures, no mechanical system can be made absolutely failure free. Although failures have occurred, many of the historical reasons for failures have been recognized and through various construction and maintenance practices have been lessened or eliminated.

Enbridge, as well as others in the industry, have implemented preventative measures to avoid the occurrence of a spill and lessen its impact, should one occur. Enbridge has incorporated these improvements to assist in preventing, detecting, and repairing potential failures before they occur. Many of these improvements have occurred simultaneously with improvements in information system technology, allowing better information recognition, processing, and management.

In addition to a comprehensive internal inspection program, the Company has incorporated significant enhancements to pipeline integrity practices as a result of these improvements. Some of the changes include:

- In the past (prior to the use of new technology to internally inspect the pipeline) the Lakehead System was hydrostatically tested in certain segments which had prior failures to test these segments to high test pressures.
- As noted previously, the Company now utilizes internal inspection instruments to inspect the inside of the pipeline for defects such as corrosion, cracks or dents, so that injurious defects can be repaired before a failure occurs.
- Development of ongoing improvements to the computer pipeline control and monitoring system which enhances the pipeline operator's ability to remotely operate and monitor the pipeline.
- Requiring pipeline control operators to shut down the pipeline if they cannot justify abnormal pressure conditions of the pipeline within a specific, limited time period.

These programs are extensive. Each has been developed over years of pipeline operation, and many continue to be improved.

The Company's operating and maintenance practices are aimed at preventing emergencies on the pipeline. However, it is imperative that the Company be prepared to respond to an emergency should one occur. In addition to preventative activities described above, the Company's emergency response program includes pre-planning, equipment staging, notifications, emergency, and leak containment procedures.

Training

The Company has established a comprehensive orientation, technical, safety, emergency, and on-the-job training program. As personnel progress in pipeline operation and maintenance positions, they receive hundreds of hours of formal and on-the-job training. Demonstrations of competence are shown through review of job performance, periodic pipeline control system simulators, emergency exercises, welding certification tests, and other functions required to continue safe pipeline operation and maintenance.

Enbridge has implemented an "Operator Qualification" program for workers performing critical tasks as required by federal pipeline regulations.

Public Outreach

The Company conducts a comprehensive public awareness program to inform residents, public officials, area excavation contractors, and emergency units of government of how to recognize and avoid or respond to a pipeline emergency. The Company has also been active at the local, county, and state level in emergency response planning and joint training/exercises to prepare all potential responders to deal with emergencies.

The pipeline route is marked at all public road and railway crossings (at a minimum) to increase the public's awareness of the underground pipeline. Additional markings are posted at valves, other pipeline facilities, and stations along the pipeline route.

Right-of-Way Maintenance

Many maintenance activities are performed on the pipeline and related facilities. The Company has a comprehensive preventative maintenance program that meets and, in many cases exceeds, minimum federal safety standards set forth in 49 CFR Part 195. When facilities are added or replaced, there are comprehensive standards for their design and installation in both Company procedure manuals and contract specifications. Repair pipe is tested and other components used to repair the pipeline meet national standards and regulatory requirements. Welding procedures have been tested to ensure they are sound. Other procedures, such as movement of the pipe, coating repair, corrosion control and tank maintenance are all guided by regulations, industry standards and company written procedures which have been reviewed by the Federal and Minnesota Office of Pipeline Safety inspectors.

4415.0165 LIST OF GOVERNMENT AGENCIES AND PERMITS

Each application must contain a list of all the known federal, state, and local agencies or authorities and titles of the permits they issue that are required for the proposed pipeline and associated facilities.

The following table provides a list of government agencies or authorities, which Enbridge must file, the title of each permit or certificate issued, anticipated application and decision dates, and status of the permit or certificate.

**PRELIMINARY LIST OF GOVERNMENT AUTHORITIES AND TITLES OF PERMITS/APPROVALS
 (Minnesota Portion of Project Only)**

Name of Agency	Title of Permit/Approval	Date of Application ^a	Date of Decision ^b	Status
United States Department of State	Presidential Border Crossing Permit	April 2007	April 2008	Pending submittal
United States Army Corps of Engineers	Section 10 Permit (navigable waters)	June 2007	January 2008	Pending submittal
	Section 404 Permit (waters of the U.S., including wetlands)	June 2007	January 2008	Pending submittal
United States Fish and Wildlife Service	Section 7 Consultation (Federal endangered species)	August 2006	n/a	Consultation initiated
Minnesota Public Utilities Commission	Partial Exemption and Routing Permit	March 2007	April 2008	Pending submittal
	Certificate of Need	March 2007	April 2008	Pending submittal
Minnesota Department of Natural Resources	License to Cross Public Waters	June 2007	January 2008	Pending submittal
	License to Cross Public Lands	June 2007	January 2008	Pending submittal
	Water Appropriation Permit (hydrostatic test water)	September 2007	May 2008	Pending submittal
	Water Appropriation Permit (trench dewatering)	September 2007	May 2008	Pending submittal
	State Endangered Species Consultation	August 2006	n/a	Consultation initiated
Minnesota Pollution Control Agency	§ 401 Water Quality Certification	June 2007	January 2008	Pending submittal
	NPDES Construction Stormwater General Permit	October 2007	May 2008	Pending submittal
	NPDES Construction Dewatering Discharge Permit	October 2007	May 2008	Pending submittal
	NPDES Hydrostatic Test Water Discharge Individual Permit	October 2007	May 2008	Pending submittal

Name of Agency	Title of Permit/Approval	Date of Application ^a	Date of Decision ^b	Status
	NPDES Stormwater Discharge Permit for Pipe Yards	October 2007	May 2008	Pending submittal
Minnesota Historical Society	Section 106 Consultation	March 2007	April 2008	Pending submittal
Minnesota Department of Agriculture	Agricultural Mitigation Plan	March 2007	April 2008	Pending submittal
Minnesota Department of Transportation	Road Crossing Permit	February 2008	May 2008	Pending submittal
Kittson County	Conditional Use Permit	October 2007	May 2008	Pending submittal
Marshall County	Land Alteration Permit	October 2007	May 2008	Pending submittal
	Conditional Use Permit	October 2007	May 2008	Pending submittal
	Shoreland Management Ordinance	June 2007	May 2008	Pending submittal
Pennington County	Grade and Fill Permit	October 2007	May 2008	Pending submittal
	Conditional Use Permit	October 2007	May 2008	Pending submittal
Red Lake County	Conditional Use Permit	October 2007	May 2008	Pending submittal
Polk County	Conditional Use Permit	October 2007	May 2008	Pending submittal
	Land Alteration Permit	October 2007	May 2008	Pending submittal
Clearwater County	Shoreland Management Ordinance: Type II Grading and Filling Permit	June 2007	May 2008	Pending submittal
	Conditional Use Permit	October 2007	May 2008	Pending submittal
Red Lake Watershed District, Middle-Snake-Tamarac Rivers Watershed District, and Two Rivers Watershed District	Watershed District Permit	October 2007	May 2008	Pending submittal
^a Actual date of initial consultation/anticipated dates for submission. ^b Projected dates of action.				

4415.0170 EVIDENCE OF CONSIDERATION OF ALTERNATIVE ROUTES

If the applicant is applying for a pipeline routing permit under parts 4415.0045 to 4415.0100, the applicant shall provide a summary discussion of the environmental impact of pipeline construction along the alternative routes consistent with the requirements of parts 4415.0140 to 4415.0145 and the rationale for rejection of the route alternatives.

Enbridge has considered alternatives to the proposed pipeline within the context of the need to increase long term, reliable pipeline capacity downstream of Alberta, Canada to efficiently and cost-effectively transport the forecast growth and required crude oil batch configuration for crude oil production to meet the demands of refineries in the U.S.

In order to receive light and medium crude volumes into the system at Cromer, Manitoba, it is necessary to stop upstream movements from Alberta. For the duration of time it takes to inject these Cromer receipts into the pipeline, long haul capacity is lost on the upstream system. These receipts, along with the severity of the bottleneck, have increased in recent years. To alleviate this bottleneck, Enbridge is proposing a new 20-inch diameter 186,000 bpd pipeline originating at Cromer and terminating at Clearbrook, Minnesota that would be dedicated to transporting those forecast volumes to be received at Cromer. With the elimination of injections into long haul pipelines at Cromer, existing upstream system capacity will be rendered fully utilizable. In addition, Enbridge's Line 2, which runs from Edmonton to Superior, Wisconsin, will be expanded by 100,000 bpd in the Edmonton to Cromer section and by 33,000 bpd downstream of Cromer. Coupled with the proposed pipeline, this will result in a total capacity expansion from Cromer to Clearbrook of 219,000 bpd.

De-bottlenecking the crude pipeline system involves removal of the requirement for injection of crude petroleum at Cromer and therefore allows the system upstream to operate, unconstrained, at its annual capacity.

A rational and defensible alternative analysis for new pipeline facilities involves consideration of environmental, engineering and economic factors in a multi-disciplinary and iterative fashion. The following alternatives to the proposed pipeline were considered:

No Action Alternative: In light of the overall increase in Canadian production, the requirements by shippers to maintain batch quality segregation and the current bottleneck on this portion of the Enbridge pipeline system a "no action" alternative is unacceptable to Enbridge and its shippers.

Trucking Alternative: Currently there is not sufficient tanker car truck capacity to transport 186,000 bpd. Moreover, the trucking alternative puts constraints on current public road capacity. Additionally, should the truck capacity issue be resolved, Enbridge or its shippers would need to expand trucker loading/unloading facilities at suitable locations to allow receipt into the Enbridge pipeline system. While trucks are a vital part of the crude gathering and distribution network, pipelines are a safer and more economical alternative for transporting this volume

of crude oil for these distances. The potential in-service date of additional trucking, road and off-loading capacity is not known. The reliability of this alternative in northern climates is compromised by periodic restriction in truck traffic due to winter storms and spring road restrictions or other weather related or capacity availability restrictions. Further, the reliability of trucking this volume of crude oil across the international border is hampered by the available border-crossing points and periodic backup at these crossings due to traffic or security reasons. As this alternative is therefore, considered infeasible, the costs and economic life for this alternative have not been estimated.

Rail Alternative: Currently there is not sufficient rail car capacity to transport 186,000 bpd along this segment of the Enbridge system to allow continued transport at Clearbrook to Minnesota refineries or east of Clearbrook to other Midwest refineries. The rail car alternative would require the construction (by Enbridge or its shippers) of rail car loading and off-loading facilities, and potentially the construction of new lateral aboveground rail service that poses additional risk and impact to landowners and the public. The transit time on pipelines operationally integrated with the Enbridge system is not acceptable. While rail cars are a vital part of the short-haul distribution network for refined products, pipelines are a safer and more economically alternative. The potential in-service date of additional truck-to-rail, rail car, rail line, and off-loading capacity is not known. The reliability of this alternative in northern climates is compromised by periodic restriction in truck traffic to deliver to rail due to winter storms and spring road restrictions or other weather related or capacity availability restrictions. As this alternative is therefore, considered infeasible, the costs and economic life for this alternative have not been estimated.

Pipeline System Alternatives: An alternate pipeline route does exist through the Enbridge Pipelines (North Dakota) L.L.C. system (“Enbridge North Dakota System”) to Clearbrook, Minnesota through what is known as the “Portal Link” crossing the international border near Estevan, Saskatchewan. This system is currently at full capacity and is not designed for the required volumes of crude oil. The alternative of a full looping or twinning of this line to provide the requisite capacity was rejected on the basis of a longer route, larger environmental footprint and higher cost to shippers.

The TransCanada Keystone Pipeline, LLC (Keystone) is proposing the construction of a new 1,833-mile pipeline from Alberta through North Dakota, South Dakota and on to Patoka, Illinois. The Keystone Pipeline is not an alternative system as the proposed pipeline does not connect to the Minnesota, Wisconsin and greater Chicago area markets that the Enbridge system serves.

Alternative Enbridge Pipeline Route: A full route alternative analysis was completed by Enbridge. Enbridge identified and evaluated several options for routing its project. These studies were designed to define a preferred route that achieves project objectives, is technologically and economically feasible to construct, and minimizes impacts on landowners and the environment. Based on this assessment Enbridge constrained the examination of routing alternatives for the proposed pipeline to a route generally within or adjacent to existing Enbridge right of way. This constraint also allowed Enbridge the benefit of utilizing existing

pumping station and equipment at existing Enbridge fee-owned pump station sites to further reduce the proposed pipeline's environmental and public impact.

Enbridge next evaluated this existing pipeline route for the optimum configuration and determined to locate the proposed pipeline generally on the southwestern edge of the existing right-of-way, which requires the least amount of additional new permanent right-of-way to be needed. Enbridge identified no major route deviations required away from its existing pipeline route.

Alternative Pipeline Design/Size: Based on the crude petroleum forecast and discussions with shippers and producers, Enbridge determined that an annual capacity of 186,000 bpd would be required and sufficient for the purpose intended. The alternatives examined with respect to sizing the proposed pipeline to efficiently and cost effectively provide 186,000 bpd of crude petroleum annual capacity included 16-, 20-, and 24-inch diameters. The 20-inch design provides the most efficient and cost effective combination of capital cost and pumping horsepower requirements for the required capacity.

- The in-service date for the proposed pipeline is December 2008.
- The proposed pipeline operations will be operationally integrated with the existing Enbridge system.
- The cost of the Minnesota portion of the proposed pipeline is \$125.5.
- The economic life of the proposed pipeline for this purpose is based on a 25 year depreciation, however the functional life of this pipeline is indefinite following normal maintenance and inspection practices of the federal regulated interstate pipeline system.
- The reliability of the proposed pipeline includes a system that operates year-round, round-the-clock, with the exception of planned system down time for inspection, maintenance or repair purposes or unplanned down time due to interruptions in receipts or refinery outages and/or operational disruptions caused by regional power outages or other reasons.

The objective of providing a cost effective and facility efficient de-bottlenecking of crude oil transportation downstream of Alberta, Canada is met by the proposed pipeline as presented in this application. The proposed pipeline routing minimizes environmental and landowner impact and, when integrated with the existing Enbridge pipeline system, provides the most cost-efficient pipeline transport tariff rate for shippers. The de-bottlenecked mainline capacity plus the capacity of the proposed pipeline itself, provide an economic increment of new pipeline capability to link the growing U.S. Midwest demand for crude oil with increased and reliable Canadian supply. The safest, most efficient and cost effective alternative for accomplishing this objective is to install the new 20-inch pipeline as proposed herein.