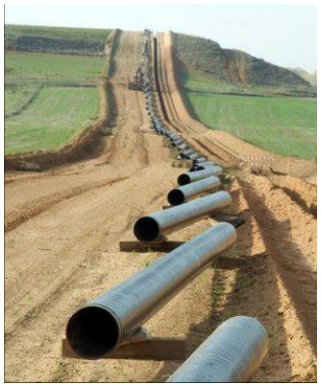
Enbridge Pipelines (North Dakota) LLC
Before the Minnesota Public Utilities Commission
Docket No. PL-6668/CN-13-473
November 2013

Application for Certificate of Need



Sandpiper Pipeline Project

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Beverly Jones Heydinger	**Chair**
Dr. David C. Boyd	**Commissioner**
Nancy Lange	**Commissioner**
J. Dennis O'Brien	**Commissioner**
Betsy Wergin	**Commissioner**

In the Matter of the Application of Enbridge Pipelines (North Dakota) LLC For a Certificate of Need for the Sandpiper Pipeline Project

MPUC Docket No. PL-6668/CN-13-473

APPLICATION SUMMARY

Enbridge Pipelines (North Dakota) LLC ("EPND")[1] is proposing to construct a new 612-mile 24-inch and 30-inch diameter crude oil pipeline as part of its ongoing efforts to meet North America's needs for reliable and secure transportation of petroleum energy supplies. EPND is submitting an application for a pipeline routing permit from the Minnesota Public Utilities Commission pursuant to Minnesota Rule 7853.0200.

The project, known as the Sandpiper Pipeline Project ("Project" or "Sandpiper"), will transport Bakken and Three Forks crude oil from growing production regions in the Williston Basin[2] of eastern Montana and western North Dakota. The Project begins at EPND's Beaver Lodge Station, south of Tioga, North Dakota and extends to a new terminal facility to be constructed at Clearbrook, Minnesota, and then on to an Enbridge affiliate's terminal and tank farm facility in Superior, Wisconsin. From the Superior terminal, the crude oil volumes will be transported to other refining markets via the Enbridge Mainline System. Approximately 299 miles of the Project will cross Minnesota. The preferred route for the Project is co-located, to the extent practicable, with EPND's existing right-of-way or other third-party rights-of-way in Minnesota. The preferred route in Minnesota will traverse Polk, Red Lake, Clearwater, Hubbard, Cass, Crow Wing, Aitkin, and Carlton counties.

In addition to the new pipeline, the Project involves adding a new terminal with two 150,000 barrel tanks and a new pump station near Clearbrook, Minnesota; mainline valves at major waterbody crossings and over the length of the preferred route; and Pipeline Inspection Gauge launcher and receiver traps along with one of the mainline valves at a site near Pine River, Minnesota.

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[1] Enbridge Pipelines (North Dakota) LLC, is a limited liability company duly organized under the laws of the State of Delaware and is referred to as "EPND" in this document. EPND is a wholly owned subsidiary of Enbridge Energy Partners, L.P. ("EEP") which is a Delaware master limited partnership. Enbridge Energy, Limited Partnership, a wholly owned subsidiary of EEP and an affiliate of Enbridge Inc., owns and operates the U.S. portion of the existing Enbridge Mainline System. Collectively, the affiliated entities excluding EPND are referred to as "Enbridge" in this document.

[2] The Bakken formation is currently the largest contributor to the total crude oil production in the Williston Basin, the oil industry refers to all of the crude oil production in the Williston Basin as "Bakken crude oil".

The Project's purpose is to transport growing supplies of oil produced in North Dakota to the terminals in Clearbrook, Minnesota and Superior, Wisconsin. From these terminals, the crude oil can be shipped on various other pipelines, ultimately providing refineries in Minnesota, other states in the Midwest, upper Great Lake regions and the East Coast with crude oil. The Project will provide up to 225,000 barrels per day of new crude oil capacity from North Dakota to meet the demand for safe and economical transportation capacity.[3]

Pending regulatory approval by the Minnesota Public Utilities Commission, the Project would be in service in the first quarter of 2016. The Project is in the public interest because it provides the timely addition of incremental capacity necessary to connect the increasing Bakken production to refining centers in the Midwest and beyond. The Project's additional pipeline capacity will help alleviate the lack of crude oil pipeline infrastructure from the Williston Basin to premium refinery and marketing hubs, thereby serving the public interest by providing improved refinery access to an abundant, secure, and reliable source of crude oil supply.

[3] The Project will have a capacity of 375,000 bpd between Clearbrook, Minnesota and Superior, Wisconsin. Total new capacity, however, is 225,000 bpd as the 150,000 bpd that will enter Sandpiper at Clearbrook is currently transported to Clearbrook on EPND's existing Line 81 and to Superior, Wisconsin on the Enbridge Mainline System.

SANDPIPER PIPELINE PROJECT

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ACRONYMS

APP	Agricultural Protection Plan
bbl	Barrels
BEP	Best efficiency point
bopd	Barrels of Oil Per Day
bpd	Barrels Per Day
CCO	Control Center Operations
C.F.R.	Code of Federal Regulations
CN	Certificate of Need
DRA	Drag reducing agents
ECC	Estevan Control Center
EEP	Enbridge Energy Partners, L.P.
EFRT	External Floating Roof Storage Tank
EIA	U.S. Energy Information Administration
EIR	Environmental Information Report
EPA	Environmental Protection Agency
EPND	Enbridge Pipelines (North Dakota) LLC
EPP	Environmental Protection Plan
FERC	Federal Energy Regulatory Commission
GIS	Geographic Information System
GWh	Giga Watt Hours
HAZWOPER	Hazardous Waste Operations and Emergency Response
HP	Horse Power
Kbpd	Thousand barrels per day
kW	Kilowatt
kWh	Kilowatt hours
MAOP	Maximum Allowable Operating Pressure
Mbpd	Million Barrels Per Day
MNOPS	Minnesota Office of Pipeline Safety
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MW	Megawatts
NDPA	North Dakota Pipeline Authority
NGL	Natural Gas Liquids
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NTSB	National Transportation Safety Board
OD	Outside Diameter
OSHA	Occupational Safety and Health Administration
PAA	Plains All American Pipeline LP

ACRONYMS

PADD	Petroleum Administration for Defence Districts
PHMSA	Pipeline and Hazardous Materials Safety Administration
PIG	Pipeline Inspection Gauge
PLM	Pipeline Maintenance
ppmw	Parts per Million by Weight
Project	Sandpiper Pipeline Project
psi	Pounds Per Square Inch
psig	Pounds per Square Inch Guage
QMS	Quality Management System
RSPA	Research and Special Programs Administration
SHPO	Minnesota State Historic Preservation Office
SSURGO	Soil Survey Geographic
STATSGO2	State Soil Geographic
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
VFD	Variable Frequency Drives
VOC	Volatile Organic Compounds
WAN	Wide Area Network
WIDNR	Wisconsin Department of Natural Resources

7853.0230 GENERAL INFORMATION SECTION

Subpart 1. Content of section. Each application shall contain a general information section that shall include the following information:

Enbridge Pipelines (North Dakota) LLC ("EPND") proposes to construct, own and operate a crude oil pipeline referred to herein as the Sandpiper Pipeline Project. The Sandpiper Pipeline Project ("Project" or "Sandpiper") will transport crude oil from EPND's Beaver Lodge Station, south of Tioga, North Dakota to Clearbrook, Minnesota and then on to an existing EPND affiliated terminal in Superior, Wisconsin. The Project will be approximately 612 miles long, of which approximately 299 miles of 24-inch outer diameter ("OD") pipe will be in North Dakota, 299 miles in Minnesota (75 miles of 24-inch OD pipe and 224 miles of 30-inch OD pipe), and 14 miles of 30-inch OD pipe in Wisconsin.

A. the applicant's complete name, address, telephone number, and standard industrial classification codes;

The Applicant is:

Enbridge Pipelines (North Dakota) LLC
1100 Louisiana, Suite 3300
Houston, Texas 77002
(713) 821-2000

The standard industrial classification code for crude oil pipelines is 4612.

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

EPND's contact information is:

EPND Senior Legal Counsel	EPND External Counsel
James Watts	Kevin Walli
Enbridge Pipelines (North Dakota) LLC	Fryberger, Buchanan, Smith & Frederick
119 N. 25th Street E.	332 Minnesota Street, Suite W1260
Superior, Wisconsin 54880	St. Paul, Minnesota 55101
218-464-5600	651-221-1044
james.watts@enbridge.com	kwalli@fryberger.com

C. a brief description of the nature of the applicant's business and of the products that are manufactured, produced, or processed, or of the services rendered;

The applicant, Enbridge Pipelines (North Dakota) LLC, is a limited liability company duly organized under the laws of the State of Delaware and qualified to do business in Minnesota. EPND is a wholly owned subsidiary of Enbridge Energy Partners, Limited Partnership ("EEP"), a Delaware master limited partnership headquartered at 1100 Louisiana, Suite 3300, Houston, Texas 77002. Enbridge Energy, Limited Partnership, a wholly owned subsidiary of EEP, and an affiliate of Enbridge Inc., owns and operates the United States portion of the existing Enbridge Mainline System. Collectively, these affiliated entities, *excluding* EPND, are referred to as "Enbridge."[1] The Enbridge Mainline System is the U.S. portion of an operationally integrated pipeline system spanning 3,300 miles across North America to connect producers and shippers of crude oil and natural gas liquids in western Canada with markets in the United States and eastern Canada.

EPND owns and operates a crude oil gathering and interstate pipeline transportation system that gathers crude oil from points near producing wells in North Dakota and Montana. The EPND System is commonly referred to as the North Dakota Pipeline System. Shippers on the EPND System currently have the ability to transfer their product to the Enbridge Mainline System at Clearbrook, Minnesota. Once on the Enbridge Mainline System, shippers have access to most major crude oil refinery markets in the Midwest (which is described by the Department of Energy as Petroleum Area Defense District ("PADD") 2), Canada and as far south as Cushing, Oklahoma and the Texas Gulf Coast. Additionally, at Clearbrook, Minnesota shippers have access to refineries in the Minneapolis/St. Paul area via interconnections with Minnesota Pipe Line Company, a third-party crude oil pipeline.

Information about EPND is available on the Company's website at www.enbridgeUS.com. EPND and Enbridge have a proven track record which demonstrates their ability to successfully design and execute pipeline projects in the United States such as the one proposed herein, and have efficiently and reliably operated crude oil and liquid petroleum pipeline facilities since 1950.

[1] Enbridge Energy, Limited Partnership was formerly known as Lakehead Pipe Line Company, Limited Partnership.

D. a brief description of the proposed facility, its complete address (if known) or general location, a brief description of its planned use, its estimated cost, its planned in service date, and its design capacity in gallons (LPG storage) or its maximum design throughput in barrels per day and its size in Mbpd-miles (petroleum pipeline);

D.1. A brief description of the proposed facility and the area to be served:

The Sandpiper Pipeline Project consists of approximately 612 miles of 24-inch and 30-inch OD crude oil pipeline, including all associated valves and appurtenances. In Minnesota, the Project comprises 75 miles of 24-inch OD pipe west of Clearbrook, Minnesota and 224 miles of 30-inch OD pipe east of Clearbrook.

This Project will originate at EPND's Beaver Lodge Station, near Tioga, North Dakota, and extend to a new terminal facility to be constructed at Clearbrook, Minnesota, and then on to an EPND affiliated terminal and tank farm facility in Superior, Wisconsin. Approximately 299 miles will be located in North Dakota, beginning at EPND's Beaver Lodge Station, near Tioga, North Dakota, and extending east to cross the North Dakota and Minnesota border approximately 2 miles south of Grand Forks, North Dakota. Approximately 299 miles will be located in Minnesota, beginning at the North Dakota border south of Grand Forks, North Dakota in Polk County, and extending east to Clearbrook, Minnesota. At Clearbrook, the preferred route will turn south and generally follow the existing Minnesota Pipe Line Company right-of-way to a point near Hubbard, Minnesota. From Hubbard, the preferred route turns east, following parts of existing third-party rights-of-way, where practicable, to the Wisconsin border in Carlton County, Minnesota. The preferred route will traverse Polk, Red Lake, Clearwater, Hubbard, Cass, Crow Wing, Aitkin, and Carlton Counties in Minnesota. The last 14 miles of the Project will be located entirely within Douglas County, Wisconsin where the pipeline will end at Enbridge's tank farm and terminal facility near Superior, Wisconsin.

As part of the Project, EPND also plans to develop a terminal facility near Clearbrook, Minnesota, which will include two (2) crude oil storage tanks holding approximately 150,000 barrels ("bbls") each, two (2) 500 horse power ("HP") injection pumps to move up to 150,000 barrels per day ("bpd") from the existing EPND Line 81 into Sandpiper, two (2) 650 HP transfer pumps for delivery to EPND, meters, terminal piping, interconnections, valves, manifold, sumps, electrical substation and associated facilities, a storage building and a maintenance building.

Additionally, EPND also plans to construct one new pump station near Clearbrook, Minnesota (See Appendix G.3 of the Environmental Information Report ("EIR") for a schematic drawing of the proposed terminal and pump station). The Clearbrook Pump Station will be located within the footprint of the new EPND Clearbrook Terminal. Aboveground launcher/receiver traps will be constructed near Pine River, along with block (isolation) valves and a small enclosure to house power and control systems for valve control.

EPND anticipates that the permanent right-of-way and temporary workspace land requirements will vary along the preferred route in order to accommodate landowner, environmental or constructability concerns. Table 7853.0230-1-D.1-1 details the anticipated land requirements in Minnesota.

Table 7853.0230-1-D.1-1
Land Requirements

Route	Permanent Right-of-Way (ft)	Temporary Workspace (ft)	Total Land Requirements (ft)
Co-Located Route from North Dakota Border to Clearbrook	55[A] (~25 new)	65 (upland)	120 (upland)
		40 (wetland)	95 (wetland)
Co-Located Route from East of Clearbrook to Wisconsin Border	50	70 (upland)	120 (upland)
		45 (wetland)	95 (wetland)
Greenfield Areas in Minnesota	50	70 (upland)	120 (upland)
		45 (wetland)	95 (wetland)

[A] A portion of the permanent right-of-way will include the existing EPND and Enbridge permanent easements.

Permanent right-of-way will be needed for the Project to accommodate the new pipeline and provide sufficient space for a buffer zone from any existing pipeline or utility, as well as to maintain a buffer zone for safety on either side of the pipeline. Typical drawings depicting right-of-way requirements are included in Appendix F of the EIR. A final determination of the project's right-of-way requirements will be made following completion of field surveys and preliminary engineering design activities.

D.2. Purpose and planned use:

The Project will transport growing supplies of North Dakota crude oil to refining centers in the Midwest and the East Coast. The Project will be operationally integrated with the EPND System, and will be used to transport crude oil to the Enbridge Superior terminal facilities for subsequent delivery of crude oil supplies on the Enbridge Mainline System. To meet the need for safe and economical transportation capacity, the Project will provide up to 225,000 barrels per day ("bpd") of new crude oil capacity from North Dakota.[2] Additionally, the Project will have the ability to deliver crude oil at the new Clearbrook Terminal as redundant service[3] for EPND's existing Line 81.

Enbridge's shippers will use the pipeline for the transportation of crude oil to Enbridge's breakout tankage facilities at Clearbrook, Minnesota or Superior, Wisconsin. At Clearbrook, the crude oil will be delivered to interconnected facilities operated by Minnesota Pipe Line Company for delivery to Minnesota refineries. At Superior, the crude oil will be delivered into the Enbridge Mainline System and other third-party pipelines for delivery to refineries in the Midwest and the East Coast.

D.3. An estimate of the total cost of construction:

EPND estimates the cost of constructing the proposed 24- and 30-inch pipeline to be $2.6 billion, including $1.2 billion in Minnesota.

D.4. Anticipated construction and operation schedule:

EPND plans to begin construction of the Project in the fourth quarter of 2014 with an anticipated completion and in-service date of first quarter 2016.

D.5. Design capacity:

The Project will have an annual capacity of 250,000 bpd in North Dakota between Beaver Lodge and Berthold, an annual capacity of 225,000 bpd from Berthold, North Dakota to Clearbrook, Minnesota, and an annual capacity of 375,000 bpd from Clearbrook, Minnesota to Superior, Wisconsin. Within Minnesota, the 24-inch-diameter segment from the

[2] The Project will have a capacity of 375,000 bpd between Clearbrook, Minnesota and Superior, Wisconsin. Total new capacity, however, is 225,000 bpd as the 150,000 bpd that will enter Sandpiper at Clearbrook is currently transported to Clearbrook on EPND's existing Line 81 and to Superior, Wisconsin on the Enbridge Mainline System.
[3] Redundant service is indicative of system design that allows for duplication of delivery if one component is unavailable.

North Dakota border to Clearbrook, Minnesota will have an annual average capacity of 225,000 bpd. In Minnesota, this computes to 18,450 Million barrel per day-miles ("Mbpd-miles") between the North Dakota border and Clearbrook, Minnesota and 83,250 Mbpd-miles between Clearbrook and the Wisconsin border.

At Clearbrook, Minnesota, Sandpiper will receive up to an additional 150,000 bpd from the existing EPND Line 81. The segment from Clearbrook, Minnesota to the Wisconsin border will be a 30-inch diameter pipeline and will have an annual average capacity of 375,000 bpd. Additionally, Sandpiper will have the ability to provide redundant service at Clearbook to the existing EPND Line 81 in order to ensure reliable deliveries of 60,000 bpd annual capacity into the Minnesota Pipe Line Company System for delivery to Minnesota refineries.

Liquids pipelines are generally designed at a specified capacity for a known liquid. Most liquids pipelines transport a variety of liquids. The change in fluid characteristics (e.g., density and viscosity) of the transported liquids will affect the capacity of the pipeline. Liquids are also batched, meaning that different liquids, or in this case, grades of crude oil, are shipped at different times, generally in a repeatable sequence. Both the fluid characteristics and batch sequence will affect the capacity of the pipeline. Table 7853.0230-1-D.5-1 provides design data pertinent to the new 24-inch and 30-inch portions of the Project.

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

- **Design Capacity**: The theoretical capacity of the pipeline and pumping facilities, at its current or proposed design state for given types of liquids and their batch sequence. Design Capacity is calculated assuming theoretically ideal operating conditions.

- **Annual Capacity**: The average sustainable pipeline throughput over a year. Annual Capacity is calculated assuming historic average annual operating conditions. These operating conditions include scheduled and unscheduled maintenance, normal operating issues, and crude supply availability. Annual Capacity of a pipeline is typically 90% of Design Capacity.

Table 7853.0230-1-D.5-1 Sandpiper Pipeline Project Capacity Definitions			
		24" Pipeline from Berthold, ND to Clearbrook, MN (bpd)	**30" Pipeline from Clearbrook, MN to Superior, WI (bpd)**
Ultimate Design Capacity	Maximum economic expansion capacity of individual line. Requires additional pumping horsepower over current design to meet this capacity.	406,000	711,000
Ultimate Annual Capacity	Maximum economic expansion capacity of individual pipeline that is sustainable average daily rate per day over a year.	365,000	640,000
Initial Design Capacity	Theoretical capacity	250,000	417,000
Initial Annual Capacity (90%)	Average sustainable rate: average barrels per day over a year (90% of Design Capacity)	225,000	375,000

E. the total fee for the application as prescribed by part 7853.0210, and the amount of the fee submitted with the application; and

The total fee for the application as prescribed by part 7853.0210, Subpart 1.B. is $50,000 and is based on the following formula and a total fee cap of $50,000.

Base payment of $5,000.00, plus $1.00 per Mbpd (Design Capacity) times the number of miles of pipeline in Minnesota.

The computation of the above formula is as follows:

West of Clearbrook
$5,000 + ($1.00 x (250 Mbpd x 75))
$5,000 + ($1.00 x 18,750)
$5,000 + $18,750 = $23,750

East of Clearbrook
$5,000 + ($1.00 x (417 Mbpd x 224))
$5,000 + ($1.00 x 93,408)
$5,000 + $93,408 = $98,408

Minnesota Total: $122,158

EPND is submitting herewith $50,000 as required by part 7853.0210.

F. the signatures and titles of the applicant's officers or executives authorized to sign the application, and the signature of the preparer of the application if prepared by an outside agent.

This application is submitted by Enbridge Pipelines (North Dakota) LLC.

Joel W. Kanvik
Assistant Secretary
Enbridge Pipelines (North Dakota) LLC

Subpart 2. List of government authorities. Each application shall contain a schedule in the general information section, which shall list all known federal, state, and local agencies or authorities with which the applicant must file for the proposed facility. The following information shall be included on the schedule:

A. the names of all known federal, state, or local agencies or authorities with which the applicant must file;

B. the title of each required permit or certificate issued by the authorities named in response to item A and needed by the applicant;

C. for each permit or certificate listed in response to item B, the date an application was filed or the projected date of future application;

D. for each permit or certificate listed in response to item B, the actual date a decision was made on the application, or the anticipated decision date; and

E. for each permit or certificate listed in response to item B for which an application was filed, the disposition or status of the permit or certificate.

Table 7853.0230-2.1 lists the government agencies or authorities with which EPND must file for the Sandpiper Pipeline Project. This table lists the title of each permit or certificate issued, anticipated application and decision dates, and status of the permit or certificate.

In addition to this Certificate of Need ("CN") application, EPND will also be filing an application for a Pipeline Routing Permit with the Minnesota Public Utilities Commission ("MPUC"). Public meetings will be held which will provide local governmental units and landowners with information about EPND's preferred route.

Table 7853.0230-2.1
Preliminary List of Government Authorities and Titles of Permits/Approvals
(Minnesota Portion of Sandpiper Pipeline Project Only)

Name of Agency	Title of Permit/Approval	Date of Application [a]	Date of Decision [b]	Status
United States Army Corps of Engineers ("USACE") – St. Paul District and Minnesota Pollution Control Agency	Section 10/404 Individual Permit and associated state 401 Individual Water Quality Certification	December 2013	December 2014	Preliminary Application reviewed with USACE October 2013
United States Fish and Wildlife Service	Section 7 Endangered Species Act Consultation (Federal endangered species)	April 2013	December 2014	Initial consultation in April 2013. Further consultation pending identification of a lead federal agency
Minnesota Public Utilities Commission	Pipeline Routing Permit	November 2013	November 2014	Application submitted
	Certificate of Need	November 2013	November 2014	Application submitted
Minnesota Department of Natural Resources	License to Cross Public Waters	September 2013	August 2014	Preliminary Application submitted
	License to Cross Public Lands	September 2013	August 2014	Preliminary Application submitted
	Water Appropriation General Permit (hydrostatic test water and trench dewatering)	2015	2015	Pending submittal
	State Endangered Species Consultation	April 2013	September 2014	Consultation initiated
Minnesota Pollution Control Agency	Clearbrook Station New Source Performance Standards Notifications and Submittals	February 2014	June 2014	Pending submittal
	NPDES Individual Construction Stormwater, Hydrostatic Test, and Trench Dewatering Permit – Pipeline Construction	March 2014	October 2014	Consultation initiated, pending submittal
	NPDES General Construction Stormwater Coverage – Pipeyards and Contractor Yards	December 2013	April 2014	Consultation initiated, pending submittal

Table 7853.0230-2.1
Preliminary List of Government Authorities and Titles of Permits/Approvals
(Minnesota Portion of Sandpiper Pipeline Project Only)

Name of Agency	Title of Permit/Approval	Date of Application [a]	Date of Decision [b]	Status
Minnesota State Historic Preservation Office	Cultural Resources Consultation, NHPA Section 106 Clearance	April 2013	December 2014	Consultation initiated. Further consultation pending identification of a lead federal agency
Minnesota Department of Agriculture	Agricultural Protection Plan	April 2013	November 2014	Consultation initiated
Minnesota Department of Transportation	Road Crossing Permits	October 2014	April 2015	Pending submittal
Mississippi Headwaters Board	Local Land Use Review	July 2013	September 2014	Consultation initiated
Red Lake and Wild Rice Watershed Districts	Watershed District Permit	February 2014	April 2014	Consultation initiated, pending submittal
Local Government Units	Wetland Conservation Act Utility Exemption	December 2013	December 2014	Consultation initiated; concurrent with USACE application
Local/County	Permits pertaining to off-right-of-way yard use	October 2014	April 2015	Pending submittal

[a] Actual date of initial consultation/anticipated dates for submission.
[b] Projected dates of action.

7853.0240 NEED SUMMARY

Each application shall contain a section that summarizes the major factors that justify the need for the proposed facility. The summary shall not exceed, without the approval of the commission, 15 pages in length, including text, tables, schedules, graphs, and figures.

A. Planned Use and Purpose for the Sandpiper Pipeline Project

The Sandpiper Pipeline Project is an approximately 612-mile 24-inch and 30-inch OD crude oil pipeline that will transport Bakken and Three Forks crude oil from growing production regions in the Williston Basin[1] of eastern Montana and western North Dakota. As described in more detail in Section 7853.0230, the Project begins at EPND's[2] Beaver Lodge Station, south of Tioga, North Dakota and extends to a new terminal facility to be constructed at Clearbrook, Minnesota, and then on to an affiliated Enbridge terminal and tank farm facility in Superior, Wisconsin. From the Superior terminal, the crude oil volumes can be transported to other refining markets via the Enbridge Mainline System or other third-party pipelines. Approximately 299 miles of the Project will cross Minnesota.

This Project is part of EPND's ongoing efforts, as the operator of an interstate common-carrier crude oil pipeline system, to continuously evaluate and respond to short- and long-term crude oil supply and demand patterns in North America. As part of this effort, EPND has worked diligently with its shippers, refiners, and industry members. Refineries need access to secure and reliable crude oil supplies produced in North America to meet their feedstock requirements while reducing reliance on crude oil imported from less-friendly, non-North American sources. This shift in supply source will help reduce the United States' reliance on crude oil imports from less stable regions of the world. Refineries also need efficient, cost-effective, and safe transportation systems for the crude oil used to create refined products. The Project meets these demands.

EPND developed the Project based on consultations with shippers and refiners and through careful evaluation of alternatives and regional infrastructure. EPND concluded that the Project is the most prudent and cost effective solution to meet its shippers' near-term transportation requirements

[1] The Bakken formation is currently the largest contributor to the total crude oil production in the Williston Basin, the oil industry refers to all of the crude oil production in the Williston Basin as "Bakken crude oil". The Williston Basin spans parts of western North Dakota, eastern Montana and parts of Saskatchewan and Manitoba.

[2] Enbridge Pipelines (North Dakota) LLC, is a limited liability company duly organized under the laws of the State of Delaware and is referred to as "EPND" in this document. EPND is a wholly owned subsidiary of Enbridge Energy Partners, L.P. ("EEP") which is a Delaware master limited partnership. Enbridge Energy, Limited Partnership, a wholly owned subsidiary of EEP and an affiliate of Enbridge Inc., owns and operates the U.S. portion of the existing Enbridge Mainline System. Collectively, the affiliated entities excluding EPND are referred to as "Enbridge" in this document.

while providing a long-term capacity solution. The Project also provides flexibility and potentially scalable incremental capacity expansions, subject to demand and permitting requirements, to satisfy potential additional future demand from shippers and refiners for crude oil produced in the Bakken region.

The Project will expand the capacity of the existing EPND System between Beaver Lodge, North Dakota and Clearbrook, Minnesota and then extend the EPND system to Superior, Wisconsin. The Project will have an initial annual capacity of 225,000 bpd of crude oil into Clearbrook, Minnesota and an initial annual capacity of 375,000 bpd from Clearbrook, Minnesota to Superior, Wisconsin. The incremental 150,000 bpd that is transported between Clearbrook and Superior results from injection of Bakken crude oil from EPND's Line 81 into Sandpiper at Clearbrook. The current Line 81 connection to the Enbridge Mainline System at Clearbrook will be terminated once the Project is placed in service.

The Project will also be able to deliver an annual capacity up to 60,000 bpd of crude oil at the new Clearbrook Terminal. As a result, Sandpiper will provide redundant service for deliveries to the Minnesota Pipe Line Company's facilities during routine maintenance activities on EPND's existing Line 81, or to satisfy additional demand from refineries connected to the Minnesota Pipe Line System. EPND's existing Line 81 currently delivers crude oil to the Minnesota Pipe Line System, which then transports the crude oil to refiners in the Minneapolis/St. Paul area (Northern Tier Energy and Flint Hills Resources). Minnesota's refiners rely heavily on EPND's Line 81 and its affiliated Enbridge Mainline System for deliveries at Clearbrook, as these deliveries provide the majority of the crude oil required by Minnesota's refineries. The Project provides a significant benefit to the Minnesota refiners, as it not only expands their access to secure domestic crude oil supplies but it also ensures such crucial supplies are delivered at Clearbrook to meet their feedstock requirements.

The Project will deliver to the existing terminal facility in Superior, Wisconsin, which is owned and operated by an EPND affiliate. From Superior, shippers will have access to refinery markets that are directly or indirectly served via the Enbridge Mainline System, or through other affiliated or nonaffiliated interconnecting pipelines.

EPND designed the Project to allow for future expandability without installing a new pipeline. The Project is scalable up to an ultimate design capacity of 406,000 bpd from Berthold, North Dakota to Clearbrook and 711,000 bpd from Clearbrook to Superior, Wisconsin. These expansions would be made through the addition of pumping stations as necessitated by future growth of Bakken crude production and corresponding demand by refineries in the Midwest and the East Coast. Such an expansion plan is not under active consideration or pending approval. EPND and its customers, however, continuously assess

demand and supply patterns and various other pipeline infrastructure development projects to determine if and when future expansions or changes are needed to meet market demand.

B. Petroleum Supply and Demand in the United States

North American light crude oil supply is expected to continue to grow for at least the next decade, and then remain well above historical levels for many more years. The breakthrough in technological advances in unconventional[3] crude oil production has resulted in rapidly changing petroleum supply and demand trends in North America. According to the most recent statistics available from the United States Energy Information Administration ("EIA"),[4] now accessible shale formations have helped increase United States crude oil production from 5,652 thousand barrels per day ("kbpd") in 2011 to 6,488 kbpd in July 2013.[5] At the same time, United States crude oil reserves increased from 25.2 billion barrels in 2010 to 29.0 billion barrels in 2011.[6]

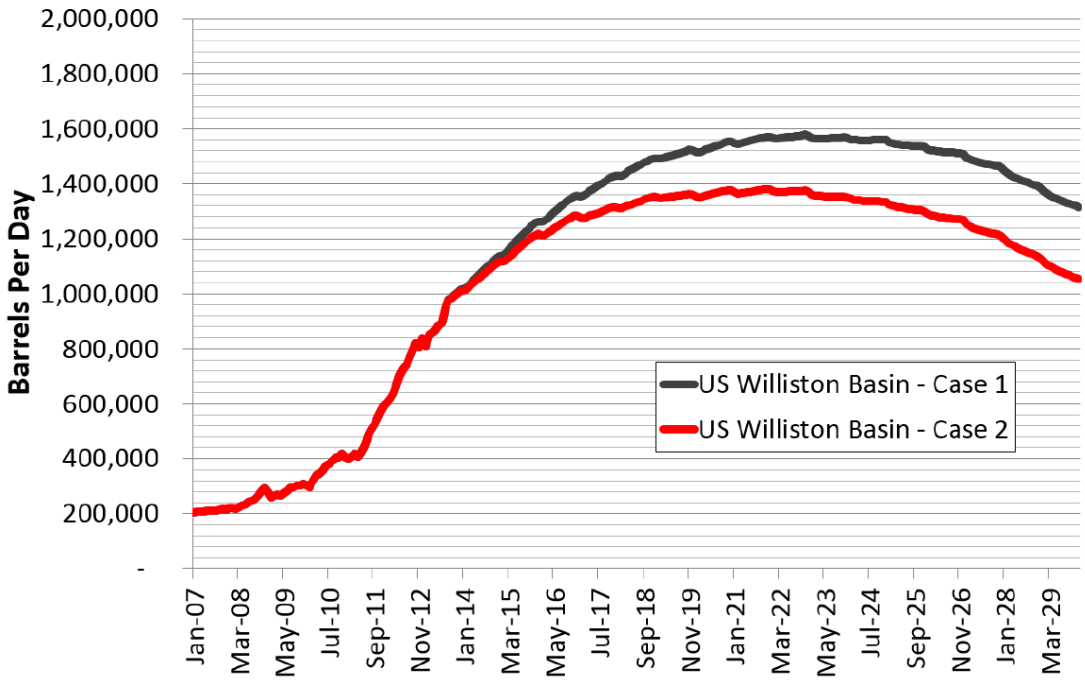
The Williston Basin, which includes the Bakken and Three Forks formations, is one of the major sources of the United States unconventional crude oil supply. The Williston Basin spans parts of western North Dakota, eastern Montana and parts of Saskatchewan and Manitoba. The subsurface Bakken and Devonian Three Forks formations are the direct or indirect source for most of the crude oil currently produced in the Williston Basin. Since the Bakken formation is currently the largest contributor to the total crude oil production in the Williston Basin, the oil industry refers to all of the crude oil production in the Williston Basin as "Bakken crude oil." The United States Geological Service ("USGS") estimates that the Three Forks formation holds about 3.73 billion barrels of technically recoverable crude oil and that the Bakken formation holds 3.65 billion barrels of technically recoverable crude oil. This 2013 combined estimate of the approximately 7.4 billion barrels for the Three Forks and the Bakken formations almost doubles the initial assessment the USGS made back in 2008.[7]

Crude oil production in North Dakota has significantly increased over the last six years, rising from 138,000 bpd in January 2008 to 911,000 bpd in August 2013.[8] Supply forecasts from the North Dakota Pipeline Authority ("NDPA") predict continued growth in Bakken production over the next 8 to 10 years and then a gradual decline over the next 10 years before moderating at production

[3] Unconventional crude oil includes tight oil deposits, extra-heavy oil and bitumen, and oil shales. Tight oil is conventional oil that is found within reservoirs with very low permeability such that the oil will not flow to the wellbore at economic rates without assistance from technologically advanced drilling and completion processes.
[4] The statistical arm of the United States Department of Energy.
[5] EIA energy data at http://www.eia.gov/.
[6] EIA Summary Report at http://www.eia.gov/naturalgas/crudeoilreserves/?src=Petroleum-f2.
[7] USGS at http://www.doi.gov/news/pressreleases/usgs-releases-new-oil-and-gas-assessment-for-bakken-and-three-forks-formations.cfm?renderforprint=1& .
[8] North Dakota DMR at http://northdakotapipelines.com.

levels above 1 million bpd (See Figure 7853.0240-B.1). For example, production is expected to peak between 1.3 and 1.5 million bpd in 2022 and gradually decline to 1.10 million bpd in 2029.[9]

Figure 7853.0240-B.1
Forecasting Williston Basin Oil Production (bopd)[10,11]



Existing long-haul pipeline capacity will not be sufficient to accommodate growth in crude oil production from the Williston basin as early as 2017.[12] Rail could be used to move these incremental volumes but Minnesota lies between the Bakken formation and refinery locations in the Midwest and the East Coast. Significant amounts of Bakken crude are already transported through Minnesota by rail as the crude oil is shipped to refineries throughout the United States. Most of the Bakken crude oil moved on freight railroads in Minnesota passes through major population centers on tank cars as part of large unit trains. The Project provides an alternative means of transporting Bakken crude oil to refineries that is safer, less environmentally harmful, and more economical. For example, transportation cost analysis indicates that pipeline transport is roughly sixty percent (60%) of the cost of rail transport. Pipeline transportation incurs far lower labor and energy costs and produces fewer

[9] NDPA Energy Development and Transmission Committee Presentation at https://www.dmr.nd.gov/pipeline/.
[10] *Id.*
[11] Case 1 is the base case from the NPDA forecast and Case 2 is the high forecast.
[12] NDPA House Energy and Natural Resources Committee Presentation on January 11, 2013 at https://www.dmr.nd.gov/pipeline/.

greenhouse gas emissions than other competing transportation modes, and only pipeline transportation avoids the need to return an empty shipping container back to the point of origination (the impacts of rail alternatives are further addressed in Section 7853.0540).

C. The Project provides refiners access to secure and reliable domestic production supplies to meet rising refinery demands

The increased supply of crude oil being produced in the Bakken region is addressing a corresponding rise in demand from refineries in the Midwest and the East Coast for crude oil produced in North America. Refineries are reducing reliance on other foreign production regions, specifically countries outside North America, which are often more unstable and less reliable.

The 2013 Index of United States Energy Security Risk Annual Report published by the Institute for 21st Century Energy, an affiliate of the United States Chamber of Commerce, commented that the "impacts of the unconventional oil and natural gas boom lowered United States energy security risks in 2012 by increasing supply security, reducing net imports, and putting downward pressure on energy costs and expenditures."[13] Adequate transportation infrastructure to move the oil to market is necessary in order to continue to realize the benefits of the unconventional oil boom in the United States. This Project meets this national objective as it links the prolific producing regions of the Bakken and Three Forks formations to premium refineries and major marketing centers that may otherwise have to rely on unstable sources of crude oil supplies to meet their feedstock requirements.

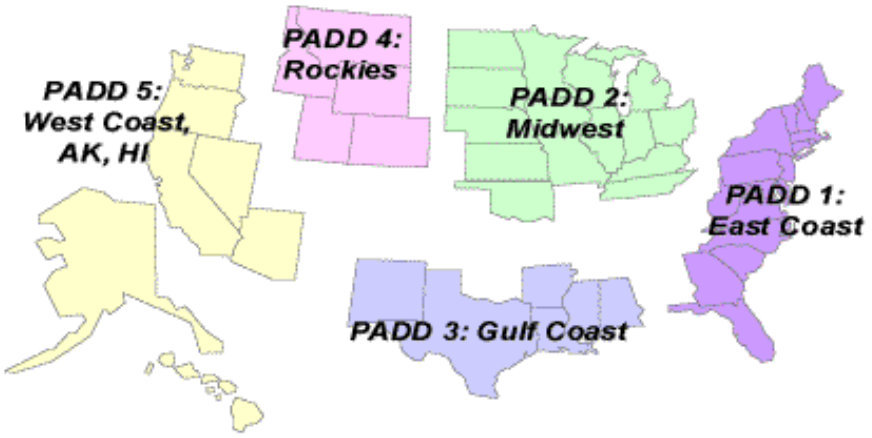
The origin of the Project is geographically located within the "Big Five" counties of North Dakota,[14] which is the largest producing area of the Williston Basin. This gives United States refineries and shippers a competitive advantage for access to abundant, safe, and long-term stable sources of crude oil supplies to meet their feedstock requirements.

The transportation of crude oil to regional refineries by pipeline is an essential component of the supply chain that delivers refined petroleum products to Midwestern consumers. In fact, pipelines deliver almost all of the crude oil processed by Midwestern refineries. Minnesota's two refineries, together with other Midwestern refineries that supply refined product to Minnesota, fall within the Petroleum Administration for Defense District ("PADD") 2, (see Figure 7853.0240-C.1, below). More than 434 million barrels of crude were transported by pipeline into PADD 2 from other PADDs in 2012.[15]

[13] 2013 Index of U.S. Energy Security Risk Annual Report at http://www.energyxxi.org/2013-us-index-of-energy-security-risk.
[14] The "Big Five" counties are Divide, McKenzie, Williams, Mountrail, Dunn.
[15] EIA energy data at http://www.eia.gov/.

Moreover, the Midwest (PADD 2), like other PADDs, is increasing its reliance on North American crude oil as a safer and more reliable source. In 2012, the PADD 2 refining area imported 82.9% less crude oil from outside North America (primarily the Middle East) than in 2007.[16] The Project will support the shift from non-North American crude oil by providing critical access that links rapidly increasing production in the Williston Basin to Minnesota's refineries. Other refinery and marketing centers in the Midwest and East Coast will also be connected to the Bakken supplies via EPND's affiliated Enbridge Mainline System and other interconnecting third-party pipelines. In 2012 Enbridge delivered approximately seventy-nine percent (79%) of the crude oil to meet refinery demand in Minnesota, eighty-five percent (85%) in Wisconsin and seventy-five percent (75%) in the greater Chicago area.

Figure 7853.0240-C.1
Petroleum Administration for Defense Districts



PADDs are very interdependent. Although the Midwest (PADD 2) is increasing its consumption of North American crude oil over non-North American sourced crude oil, refineries in the Midwest are unable to meet 100% of the demand for refined products in this region. Accordingly, the refineries in other PADD regions continue to supply the Midwest with the necessary refined petroleum products demanded by Americans in the Midwest.

As a result, there is significant interdependence between PADD regions, with both crude oil and refined products transported between PADDs. The Midwest historically has been significantly net short refined product, meaning that it consumes more petroleum than it refines, with the shortfall met by refineries located on the Gulf Coast. The Midwestern supply-demand

[16] *Id.*

balance has become more even in recent years, but the Midwest continues to receive sizable volumes of refined product from the Gulf Coast.

According to the EIA, the petroleum-using public in the Midwest consumed over 4.42 million bpd of refined petroleum products in 2012, which includes gasoline, diesel, jet fuel, asphalt, heating fuel and petrochemical products. PADD 2's total 2012 refining capacity was 3.72 million bpd, which represents a shortfall of approximately 700,000 bpd.[17]

This Project will provide connectivity at Clearbrook, Minnesota and Superior, Wisconsin to the following refineries that are accessible either directly or indirectly off the Enbridge Mainline System as shown on Table 7853.0240-C.1.

The Project is needed to meet the transportation requirements of the Bakken oil producers and refineries. The additional pipeline capacity to be provided by the Project will help alleviate the lack of crude oil pipeline infrastructure from the Williston Basin to premium refinery and marketing hubs. That serves the public's interest by providing improved, cost-effective and safe refinery access to an abundant, secure, and reliable source of domestic crude oil. That will, in turn, allow the refineries to satisfy local and national consumer demand for refined products.

Table 7853.0240-C.1
Refineries Served Directly or Indirectly by Enbridge Systems

Refinery	Location	Capacity (cubic meters/day)	Capacity (barrels/ day)	Connected Directly from Enbridge	Connected Indirectly
PADD II - Minnesota and Wisconsin					
Northern Tier Energy	St. Paul Park, Minnesota	11,765	74,000		Yes - Minnesota Pipeline
Flint Hills Resources	Rosemount, Minnesota	50,876	320,000		Yes - Minnesota Pipeline
Calumet	Superior, Wisconsin	5,247	33,000	Yes	
Total		**67,888**	**427,000**		
PADD II - Illinois and Indiana					
ExxonMobil Refining & Supply Co.	Joliet, Illinois	38,157	240,000	Yes	

[17] *Id.*

Table 7853.0240-C.1 Refineries Served Directly or Indirectly by Enbridge Systems					
Refinery	**Location**	**Capacity (cubic meters/day)**	**Capacity (barrels/ day)**	**Connected Directly from Enbridge**	**Connected Indirectly**
Citgo Petroleum Corp.	Lemont, Illinois	25,279	159,000	Yes	
BP PLC	Whiting, Indiana	64,390	405,000	Yes	
Total		**127,826**	**804,000**		
PADD II - Kentucky and Southern Illinois and Indiana					
Marathon Petroleum Co.	Robinson, Illinois	32,751	206,000		Yes - Mustang/Marathon
WRB Refining	Wood River, Illinois	56,599	356,000		Yes - Mustang/Capwood
Countrymark Cooperative	Mt. Vernon, Indiana	4,293	27,000		Yes - Mustang/Marathon
Marathon Petroleum Co.	Catlettsburg, Kentucky	38,157	240,000		Yes - Mustang/Marathon
Total		**131,800**	**829,000**		
PADD II - Michigan and Ohio					
BP PLC	Toledo, Ohio	24,166	152,000	Yes	Yes - Sun Pipeline
PBF Energy Co.	Toledo, Ohio	27,028	170,000		Yes - Sun Pipeline
Marathon Petroleum Co.	Detroit, Michigan	19,079	120,000	Yes	Yes - Sun Pipeline
Marathon Petroleum Co.	Canton, Ohio	12,719	80,000		Yes - Mustang/Marathon
Husky	Lima, Ohio	25,756	162,000		Yes - Mustang/Marathon
Total		**108,747**	**684,000**		
PADD I - Pennsylvania					
United Refining	Warren, Pennsylvania	11,129	70,000		Yes - Kantone
Ontario					
Imperial Oil	Nanticoke, Ontario	18,125	114,000	Yes	

Table 7853.0240-C.1
Refineries Served Directly or Indirectly by Enbridge Systems

Refinery	Location	Capacity (cubic meters/day)	Capacity (barrels/ day)	Connected Directly from Enbridge	Connected Indirectly
Imperial Oil	Sarnia, Ontario	18,920	119,000	Yes	
Shell Canada	Corunna, Ontario	11,288	71,000	Yes	
Suncor Energy Products	Sarnia, Ontario	13,514	85,000	Yes	
Nova Chemicals (Canada)	Corunna, Ontario	12,719	80,000	Yes	
Total		**74,565**	**469,000**		
PADD III - Cushing					
Coffeyville Resources	Coffeyville, Kansas	19,079	120,000	Yes	
WRP Refining	Borger, Texas	23,212	146,000		Yes-Spearhead
ConocoPhillips	Ponca City, Oklahoma	30,208	190,000		Yes-Spearhead
Holly Frontier	El Dorado, Kansas	21,145	133,000		Yes-Spearhead
NCRA	McPherson, Kansas	13,196	83,000	Yes	
Holly Frontier	Tulsa, Oklahoma	19,873	125,000	Yes	
Valero Energy Corp.	Ardmore, Oklahoma	14,627	92,000		Yes-Spearhead
Valero Energy Corp.	Sunray, Texas	27,028	170,000		Yes-Spearhead
CVR Refining	Wynnewood	11,129	70,000		Yes-Spearhead
Total		**179,497**	**1,129,000**		
PADD III – United States Gulf Coast					
PRSI	Pasadena, Texas	18,602	117,000	Yes - Seaway	
Shell	Deer Park, Texas	51,989	327,000	Yes - Seaway	
ExxonMobil	Houston, Texas	89,192	561,000	Yes - Seaway	
LyondellBasell	Houston, Texas	42,927	268,000	Yes - Seaway	
Valero	Houston, Texas	25,438	160,000	Yes - Seaway	

Table 7853.0240-C.1 Refineries Served Directly or Indirectly by Enbridge Systems					
Refinery	**Location**	**Capacity (cubic meters/day)**	**Capacity (barrels/ day)**	**Connected Directly from Enbridge**	**Connected Indirectly**
Valero	Texas City, Texas	38,952	245,000	Yes - Seaway	
BP	Texas City, Texas	71,703	451,000	Yes - Seaway	
Marathon	Houston, Texas	12,719	80,000	Yes - Seaway	
Total	Port Arthur, Texas	26,869	169,000		Yes - Mustang/Pegasus
ExxonMobil	Port Arthur, Texas	54,692	344,000		Yes - Mustang/Pegasus
Motiva	Port Arthur, Texas	104,932	660,000		Yes - Mustang/Pegasus
Valero	Port Arthur, Texas	49,286	310,000		Yes - Mustang/Pegasus
Total		**587,301**	**3,692,000**		

D. Applicant's proposed Projects benefit Minnesota general public

D.1. Increased amounts of secure supply of discounted crude oil produced in the Bakken region is economically attractive to regional refineries

Minnesota's refinery capacity somewhat exceeds demand for refined products within the state However, Minnesota exports refined products to neighboring states, while also importing refined products from neighboring states. This is not uncommon in the United States because the refined product distribution system seeks to efficiently connect refineries with various demand centers to minimize transportation costs. North Dakota and Wisconsin also simultaneously import and export refined products. Neighboring states are highly interdependent with regard to delivery of refined products from refineries to the consuming public.

Minnesota serves as a key supplier of refined petroleum products to the public in the Midwest. A secure supply of crude oil to Minnesota refineries, and refineries in other parts of the Midwest and East Coast, is essential to meet the public's need for secure supplies of refined products. The EIA reports the refined product yield for the four refineries in the Refining

District of North Dakota, South Dakota, Minnesota, and Wisconsin.[18] Taken together, Minnesota and three of its neighboring states are net short refined products, meaning that the refineries in these four states produce less refined products than the consuming public requires.

This is exacerbated because there is considerable variability in the monthly production volume of the refineries in the four-state area. Even if the refined product supply and demand in the four-state area was balanced on an annual average basis, the public in Minnesota, North Dakota, South Dakota, and Wisconsin would experience periodic shortfalls in refined product supply, with the corresponding price spikes, when local supply falls short of local demand. The refined product pipeline interconnectivity with neighboring states and regions enables Minnesota, North Dakota, South Dakota and Wisconsin to manage periodic supply shortfalls. That, in turn, minimizes refined product price volatility.

Refineries must have adequate and reliable access to crude oil to produce the refined products required by the public in Minnesota and neighboring states. The Project better ensures that refineries in Minnesota and in neighboring states have that access. If pipeline capacity does not exist, Bakken crude can be transported by rail refineries throughout the United States. In Minnesota, the impact of insufficient pipeline capacity would most likely be greater rail transportation, since most freight railroad routes from North Dakota to the Midwest and the East Coast pass through Minnesota. As Bakken production increases, so would train traffic carrying crude oil through Minnesota.

A further benefit is that Sandpiper will provide redundant service for increased reliability to the existing EPND deliveries via Line 81 at Clearbrook. Sandpiper will have the ability to deliver an annual capacity of 60,000 bpd into the EPND Clearbrook Terminal, which will be interconnected with Minnesota Pipe Line's nearby terminal. The volumes delivered into the Minnesota Pipe Line provide feedstock to the two Minnesota refineries. At the completion of the Project there will be two EPND pipelines (Line 81 and Sandpiper) which could be used to effectuate these deliveries.

The Project will directly benefit the entire Midwest, including Minnesota consumers and manufacturers, by better ensuring secure supplies of crude are available to refineries. The Project also provides additional pipeline take-away capacity to Superior, Wisconsin, where the shippers have connectivity to EPND's affiliated Enbridge Mainline System. From Superior, shippers have direct or indirect access to premium refinery and marketing hubs serving the Midwest and the East Coast (see Table 7853.0240-C.1).

[18] The two Minnesota refineries comprise 77 percent (77%) of the total crude oil refining capacity in the four-state area. Accordingly, Minnesota provides the bulk of the refined products produced in the District.

D.2. Local Economic Benefits from the Project

The primary purpose and benefit of the Project is to provide an efficient and cost effective transportation solution that links the rapidly rising production regions of the Bakken and Three Forks formations to premium refineries wanting access to secure and reliable sources of crude oil supplies to meet their raw feedstock requirements. However, there are also secondary benefits associated with EPND's expansion.

Regional refineries that stay competitive contribute to the regional economy. They help maintain a stable employment rate in the communities where facilities are located. Refinery expansions and upgrades also contribute to the regional and local economy through increased temporary and permanent employment, along with increased investments in goods and services.

EPND also anticipates that the Project will provide temporary beneficial impacts on the local economy during construction. Using the Regional Input-Output Modeling System[19] as developed and maintained by the United States Department of Commerce, Bureau of Economic Analysis, EPND estimates that approximately 17,315 person-years[20] of temporary construction jobs will be created for the duration of construction. Depending on the availability of local skilled workers, the general pipeline contractor typically draws workers for projects of this type from Minnesota and surrounding states.

The total economic benefit of the Project is estimated at $2.4 billion during construction. Table 7853.0240-D.2-1 summarizes the local economic benefits generated by this Project. Unemployment in the area would be temporarily reduced and payroll taxes would temporarily rise. Local businesses would also benefit from the temporary demand for goods and services generated by the workforce's need for food, lodging and supplies. EPND expects to locally purchase some of the materials necessary for construction of the Project, including consumables, fuel, equipment, and miscellaneous construction-related materials.

EPND estimates that the cost of the Project will be approximately $2.6 billion. Based on the anticipated Project cost and current tax schedules, EPND estimates it could pay as much as approximately $24.9 million in additional annual property taxes in Minnesota beginning in 2016 (estimated taxes are $37.1 million occurring in 2025), subject to assessments by local government units.

Operations are expected to begin in 2016, with the Project yielding another 2,069 person-years of jobs and generating another $450 million in economic impact. Typical operations from 2017 to 2025 are estimated to

[19] http://www.bea.gov/regional/rims/
[20] Person-years is the equivalent of one-person working full-time for one year.

lead to 3,352 full-time-equivalent jobs and create an additional $725 million per year in economic impact.

Pipelines are a very capital-intensive business and EPND already has a large United States and Midwest-based workforce. However, operation of the Project will likely require EPND to hire some additional new full-time permanent employees.

Table 7853.0240-D.2-1
Local Economic Benefits Generated from Project

Component	Estimated Total Project Costs [A]	Estimated Tax Benefits [A,B]	No. of Temporary or Permanent Jobs Created	Total Economic Benefits [A]
During construction work of proposed facilities as described in Section 7853.0230	$1.2 B [c]	$8.5 M	17,315 person-years	$2.4 B
During Operation of the Sandpiper Pipeline Project				
2016		$24.9 M	2,069 person-years	$450 M
2017 - 2025		$28.1 - $37.1 M	3,352 person-years	$725 M

[A] M represents "million", B represents "billion".
[B] Tax benefits start in year 2016. Taxes are estimated for each year from 2016 to 2036 and the minimum and maximums for this period are included in the table. The estimated tax benefit could range between the amounts specified.
[C] The total Project Cost in the table is indicative of the Project cost in the State of Minnesota. Total Project cost for the Sandpiper Pipeline Project is $2.6 billion.

E. Other Expansions on the EPND and Enbridge Systems

E.1. Future EPND Expansion Plans

EPND has operated liquid pipelines and related facilities in the states of Montana, North Dakota and Minnesota since 1962. EPND's experience in managing construction and operation of pipeline systems in a manner that protects the environment and the public's health and safety is demonstrated by its safe and successful expansion and operation of this system over the years.

In the past seven years, EPND has responded to market demand by expanding its capabilities to export more than seven times the crude oil volumes originally transported in 2005. This approach has provided shippers in the Williston Basin a cost effective and timely transportation solution that links the increasingly prolific petroleum producing Bakken and Three Forks formations to premium refinery and marketing hubs throughout the Midwest and East Coast. EPND's long-term planning to better serve its shippers' increasing pipeline capacity requirements is an ongoing effort

requiring EPND to work closely with its shippers and assess various forecasts of production activity.

At this time, EPND has no other expansion projects being developed other than the Project described herein. Upon completion of this Project, EPND will have 580,000 bpd of pipeline export capacity, linking the Williston Basin production volumes to premium markets throughout the Midwest and East Coast via EPND's affiliated Enbridge Mainline System and other interconnecting third-party pipeline companies.

E.2 Future Enbridge Expansion Plans

Since beginning operations in 1950, Enbridge as a whole has expanded the Enbridge Mainline System a number of times to increase transport capability to Minnesota, and across the United States.

Enbridge has a number of expansion projects underway on its mainline system. Details of these projects are on Enbridge's website at www.enbridge.com

F. Summary

The Sandpiper Pipeline Project provides a safe, competitive and timely solution to the critical need for increased transportation capacity out of the Bakken region in response to increased oil production expected over the next twenty years. The Project is driven by the combination of increased oil production from this region in the near future and continually rising demand from refineries in the Midwest and the East Coast for access to secure and reliable sources of domestic crude oil.

The planned 2016 in-service date for the Project meets the industry's needs. It also provides for flexible system expansions in the future that can be implemented in stages, meeting future shipper demands for additional pipeline capacity without the need to install an additional pipeline.

EPND's Sandpiper Pipeline Project affords shippers access to a wide variety of refinery hubs via EPND's affiliated Enbridge Mainline System and other third party pipelines at Superior, Wisconsin, creating an integrated crude oil pipeline system extending across North America. These options ensure access to refinery markets in the Midwest and the East Coast. The Project will ultimately provide a reliable, efficient and cost effective system to deliver the large volumes of crude oil needed by the United States Midwestern refiners.

The construction and operation of the Project is in the public interest.

7853.0250 SUMMARY OF ADDITIONAL CONSIDERATIONS

Each application shall contain a section that discusses the socioeconomic considerations listed below. The applicant shall explain the relationship of the proposed facility to each of the following:

A. Socially beneficial uses of the output of the facility, including its uses to protect or enhance environmental quality;

A.1. Public Health and Safety

EPND has operated crude oil pipeline facilities in the states of Montana, North Dakota and Minnesota since 1962. In 2005, EPND began its expansion program to add incremental pipeline capacity to its existing system. This expansion was driven by the rising demand for transportation capacity from the Williston Basin to refinery centers throughout PADD 2 and beyond.

EPND has constructed and operated its pipeline network as a common-carrier that responds to the requests of its shippers for incremental transportation capacity. EPND's experience in managing construction and operation of pipeline systems in a manner that protects the environment and the public's health and safety is demonstrated by its safe and successful expansion and operation of this system over the years. EPND leveraged that experience, as well as lessons learned from incidents occurring on EPND affiliated facilities, to enhance the safety and operational oversight of its system, as discussed in Section 7853.0270.

A.2. Causes of and Prevention of Accidents on Pipelines

The major cause of pipeline releases in the United States is third-party strikes (i.e., excavation damage), followed by corrosion (both internal and external), pipe or weld failure, operational issues, or natural causes (e.g. floods or other outside forces). To minimize these failures, EPND will construct and maintain the Project to meet or exceed industry and government requirements and standards.

As an interstate pipeline, the Project will be regulated for design, construction, operation, maintenance and emergency preparedness by the United States Department of Transportation, Pipeline and Hazardous Materials Safety Administration ("PHMSA") under 49 Code of Federal Regulations ("C.F.R.") Parts 190-199.

As a safety factor, the Sandpiper pipeline is designed to withstand pressures over and above its normal operating pressures and will operate according to all codes and regulations. All pipe is inspected and integrity-tested at the factory and then transported to the construction site in accordance with the highest technical standards. The pipe will be manufactured with a fusion-bonded epoxy coating to protect against corrosion. Once installed, the pipeline will be subjected to careful testing to verify its integrity and compliance with specifications. Additional construction, operation and maintenance procedures used to protect the integrity of the pipeline system are summarized in Section 7853.0270 of this application.

Minnesota Office of Pipeline Safety ("MNOPS") inspection staff has been delegated authority by PHMSA to serve as agents of PHMSA to perform inspections of EPND's operational practices and construction. The proposed facilities will go into service only after inspection by both EPND and MNOPS to verify compliance with all construction standards and requirements.

A.3. Baseline Transportation Accident Rates

Interstate liquid petroleum pipeline releases must be reported to PHMSA as required by 49 C.F.R. Part 195 Subpart B. Currently, the federal regulations require reporting of all releases of 5 gallons or more (if other threshold reporting criteria are met). In addition, Enbridge is required by North Dakota, Minnesota and Wisconsin state rules to report releases to the North Dakota Department of Health, Minnesota Pollution Control Agency ("MPCA") and Wisconsin Department of Natural Resources ("WIDNR"), respectively.

Pipelines operate more safely than any other mode of crude oil transportation. Table 7853-0250-A.3 shows the accident rates of other modes of transportation in comparison to a hazardous liquid pipeline. According to the Manhattan Institute,[1] road and rail have higher rates of serious incidents and injuries than pipelines, even though more road and rail incidents go unreported. Hazardous liquid pipelines transport 94% more billion ton-miles[2] of shipments than are transported by road and 96% more billion ton-miles of shipments than are transported by rail but have the lowest incident rate. Road transport has the highest rate of

[1] Manhattan Institute. Pipelines Are Safest for Transportation of Oil and Gas. Issue Brief No. 23. June 2013. http://www.manhattan-institute.org/html/ib_23.htm

[2] A unit of freight transportation measurement equivalent to a ton of freight transported one mile.

incidents, with 19.95 per billion ton-miles per year followed by rail, with 2.08 per billion ton-miles per year. Hazardous liquid pipelines are the safest, with 0.58 serious incidents per billion ton-miles.

Table 7853-0250-A.3
Comparative Statistics for Petroleum Incident Rates:
Onshore Transmission Pipelines vs. Road and Railway (2005 – 2009)[3]

Mode	Avg. Billions Ton-Miles Shipment Per Year	Avg. Incidents Per Year	Incidents Per Billion Ton-Miles
Road*	34.8	695.2	19.95
Railway*	23.9	49.6	2.08
Hazardous Liquid Pipeline	584.1	339.6	0.58
Natural Gas Pipeline	338.5	299.2	0.89

*Only incidents involving and ton-mileage carrying those products carried by pipeline (petroleum products, liquid natural gas, etc.) are counted for road and railway

Sources: Ton-Mileage values are based on Tables 1-50 (for Natural Gas Pipeline) and 1-61 (all others) of the Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics "National Transportation Statistics", available at http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/index.html, accessed April 2013. Incident and release volume data for Road and Railway were extracted from the Office of Hazardous Materials Safety "Incident Reports Database Search" at https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/, accessed April 2013. HL Pipeline release volumes were extracted from the Pipeline and Hazardous Material Safety Administration "Hazardous Liquid Accident Data - 2002 to 2009" file available at http://phmsa.dot.gov/portal/site/PHMSA/menuitem.ebdc7a8a7e39f2e55cf2031050248a0c/?vgnextoid=fdd2dfa122a1d110VgnVCM1000009ed07898RCRD&vgnextchannel=3430fb649a2dc110VgnVCM1000009ed07898RCRD&vgnextfmt=print, accessed April 2013.

A.4. Pipeline Accident Rates

An analysis of the historical record shows that the liquid petroleum pipeline industry's safety performance has improved significantly over the last 20 years. These improvements correlate with advancements in technology, as well as increased environmental awareness. Over the last 20 years the number of significant[4] incidents has decreased by nearly 25% from an industry average of 162 in the first five years (1993-97) to the recent five year (2008-12) running average of 121 incidents nationwide.[5] According to data on PHMSA's website, the median size of a release has greatly decreased. The annual volume of oil released from

[3] Manhattan Institute. Pipelines Are Safest for Transportation of Oil and Gas. Issue Brief No. 23. June 2013. http://www.manhattan-institute.org/html/ib_23.htm

[4] PHMSA defines Significant Incidents as those incidents reported by pipeline operators when any of the following specifically defined consequences occur: 1) fatality or injury requiring in-patient hospitalization; 2) $50,000 or more in total costs, measured in 1984 dollars; 3) highly volatile liquid releases of 5 barrels or more or other liquid releases of 50 barrels or more, or 4) liquid releases resulting in an unintentional fire or explosion.

[5] http://primis.phmsa.dot.gov/comm/reports/safety/PSI.html

pipeline systems has fallen by about 30%, based on five year running averages.[6]

B. Promotional activities that may have given rise to the demand for the facility; and

As a common-carrier, EPND responds to shipper demand. EPND cannot create demand for crude oil, and has not undertaken activities that have promoted increased demand for refined petroleum products nor the crude oil used by refineries to meet public energy needs. EPND has worked diligently to meet shippers' demand for crude oil produced from the Bakken formation in North Dakota and Montana to which Sandpiper will be connected. Refineries are demanding this crude oil to reduce reliance on crude oil sources from other regions, including countries outside North America that are less secure, less friendly, and potentially more volatile. Enbridge transported approximately 35% of North Dakota crude oil production in 2012. This market share is primarily attributable to the relatively low cost of transportation on the EPND System. The system's capacity is insufficient to meet the forecasted transportation demands in the future, as detailed in Section 7853.0520.

C. The effects of the facility in inducing future development.

The Project will result in increased access to expanding volumes of Bakken production for refineries in the Midwest and East Coast. Refiners require access to reliable and economical supplies of raw materials to remain competitive, evaluate potential expansions of their facilities and remain financially sound. A financially sound refinery is better able to maintain employment and product supplies and will have a positive economic impact on its region. The Project connects North Dakota shippers to a variety of markets while providing access to a long-term, stable and reliable source of crude oil for the United States and its refineries.

[6] Comparison of the past 20 years of significant incidents utilizing five year averages (1993-1997 and 2008-2012) http://primis.phmsa.dot.gov/comm/reports/safety/PSI.html

7853.0260 CONSERVATION PROGRAMS

Each application shall contain a section that relates to the conservation of energy. Separate responses are required from each person submitting a joint application.

A. Does the applicant have an energy committee or an individual responsible for determination or coordination of its energy needs?

EPND has an Energy Management Department that is responsible for negotiating contracts and allocating power to assure economical and efficient use of power for the EPND System. This department also continuously reviews and tracks firm and non-firm power requirements, and works closely with electrical utilities in planning for transmission and generation needs.

Energy conservation is a major concern for EPND because power costs represent the largest single recurring expense in pipeline operation. EPND routinely evaluates processes, designs and other factors for the most efficient use of energy while minimizing cost.

B. Has the applicant defined energy or conservation goals or objectives?

EPND's energy conservation goal is to minimize power/energy unit costs, through internal programs directed at continuous improvement of energy utilization efficiency, as outlined below. Enbridge also has a voluntary goal to maintain a neutral footprint for new projects.

C. What major energy efficiency or conservation programs has the applicant considered?

EPND has considered several energy efficiency and conservation programs. The following provides a brief explanation of the programs reviewed during development of the Project.

C.1 Engineering Design

Pipeline Diameter

Utilization of larger pipeline diameters reduces fluid velocities, resulting in reduced hydraulic line loss due to friction, which translates into lower per unit energy consumption and consequent lower power costs to move the crude oil. EPND prefers to minimize the line losses, ultimately reducing the overall operating cost. This, however, must be balanced with the capital cost for the Project (funded by the shippers through tariff

payments) and batch quality degradation associated with lower fluid velocities.

Variable Frequency Drives (VFDs)

The use of variable frequency induction motor drives ("VFD") is a program that has been in place on the EPND System for approximately six years. VFDs allow the pipeline operator to vary the pump rotation speed, thereby controlling the pressure produced to match the desired flow rate. This eliminates the need to dissipate or waste pressure (energy) with pressure control valves. Operating conditions play a key role in designing the pumping stations for optimum efficiency.

Use of Larger Diameter Pipe than Initial Capacity Requirements:

The Project has an annual capacity of approximately 225,000 bpd in Minnesota between the North Dakota border and Clearbrook, Minnesota and an annual capacity of approximately 375,000 bpd from Clearbrook, Minnesota to the Wisconsin border. These annual capacities could have been met with pipe size diameter less than 24- and 30-inches. However, with this design, EPND (and its customers) will realize power savings in the initial years and allow for future expandability, with merely the addition of pump stations, should capacity requirements continue to increase.

Energy Efficient Pumps and Motors

For new installations, EPND utilizes high efficiency pumps and motors to minimize power requirements over the long term. Specifically, a high polish is used on the pump impeller, and motors are custom-designed for high efficiency. For example, a fully loaded 2,500 horsepower pump and motor unit, operating 300 days per year at 80% efficiency, will consume 17 million kilowatt hours ("kWh") of energy annually and sets a demand of 2,331 kilowatts ("kW"). Increasing the efficiency by only 1% translates into 170,000 kWh of energy savings. Pumps are hydraulically designed and selected to obtain a high best efficiency point ("BEP") at the desired flow rates. The throughput and commodity forecasts are continually being evaluated and, if the flow rate is outside the BEP range, impeller changes are typically implemented for improved efficiency.

Drag Reducing Agents ("DRA")

Injections of DRA have been periodically used within the EPND System for over seven years. Injection of DRA reduces flow turbulence of liquid hydrocarbons adjacent to the pipeline wall, which results in reduced pressure loss between stations. This allows a higher flow rate (increased throughput) at the same operating pressure, or a decrease in operating pressure while maintaining flow rate. These two scenarios allow

increased throughput or decreased power use. This flexibility allows power utilization to be shifted to improve economics or accommodate the utility load management. In these cases, the economic benefits realized with the implementation of the DRA program have outweighed the material cost of the DRA. As a result, lower unit energy costs and greater efficiency have occurred.

C.2 Pipeline Control Center

EPND pipeline control operators are trained in applied hydraulics and pipeline control through the use of a computerized pipeline control simulation system. They are trained to operate the pipeline at a natural flow rate using efficient combinations of pumps, thereby minimizing energy consumption. Operators have the capability to start and stop pumps and monitor pipeline operating conditions to assist in achieving an energy efficient operation.

C.3 Neutral Footprint

EPND, along with other Enbridge affiliates, has set a voluntary goal to work toward a neutral footprint for new projects. The goal attempts to limit Enbridge's environmental footprint to 2009 levels as operations expand. Enbridge intends to achieve this by conserving an acre of wilderness land for every acre permanently impacted, planting a tree for every merchantable tree that must be removed to build new facilities, and generating one kWh of renewable energy for every kWh of energy that pipeline operations consumes. Enbridge intends to fulfill its commitment as soon as practicable, but no later than five years after the in-service date of the projects creating impacts. Enbridge will work with key land-trust organizations within the United States that work for the direct protection of biodiversity through the purchase, donation or establishment of conservation easements on ecologically significant land.

Enbridge's conservation efforts will not always take place in the right-of-way or impacted area for new projects. For example, Enbridge provided financial support to help the Wisconsin Department of Natural Resources, The Lyme Timber Company and The Conservation Fund secure a unique working forest conservation easement that protects 44,618 acres of the Brule-St. Croix Legacy Forest. This effort exemplifies the ongoing commitment through the Enbridge Neutral Footprint Fund to conserve significant forest, wetland and native prairie habitats.

Additionally, Enbridge is currently the second largest wind energy generator in Canada and continues to grow its fleet of renewable energy projects in North America. Enbridge's renewable energy interests include 1,724 megawatts ("MW") of renewable and alternative energy generating capacity. Enbridge's renewable energy portfolio includes investments in wind farms (1,552 MW capacity), solar energy operations (150 MW capacity), and a geothermal facility (22 MW capacity).

D. What major accomplishments in energy efficiency or conservation have been made by the applicant within the past five years?

All of the programs discussed above in 7853.0260, Part C continue to be utilized and refined to improve energy efficiency.

In the effort to achieve a neutral footprint, Enbridge has voluntarily achieved the following milestones since 2009:

1. 594,877 Trees Removed for New Projects
   601,830 Trees Planted

2. 2,434 Acres Disturbed
   51,543 Acres Conserved

3. 2,668 Giga watt hours ("GWh") of forecast consumption through 2015
   3,654 GWh of forecast generation from renewables

Specific achievements in the United States include Enbridge, as a 100% owner or joint venture partner, bringing the following power plants online:

1. Cedar Point Wind Farm: 250 MW located in Limon, Colorado, commissioned in fourth quarter of 2011.

2. Silver State Solar Power North: 50 MW located in Primm, Nevada, commissioned in second quarter of 2012.

3. Neal Hot Springs Geothermal Facility: 22 MW located in Malheur County, Oregon, commissioned in fourth quarter of 2012

E. What major energy efficiency or conservation programs will be implemented within the next five years?

EPND will continue to consider all programs identified in 7853.0260.C above and continue to incorporate recent and evolving energy conservation/efficiency technology and operating practices as deemed prudent and economic.

Energy efficiency programs being investigated for future implementation include:

- Enhancements to the pipeline control system to allow further energy use optimization; and
- Coordination of Enbridge's energy use between utilities for mutual benefit.

7853.0270 OTHER DATA FILED WITH APPLICATION

A. EPND is committed to constructing a structurally sound pipeline and ensuring the line's safe operation.

This commitment drives EPND's careful management of the various phases of design and construction in order to provide a safe and reliable operating system.

Design and construction of pipeline-related facilities are subject to detailed and thorough requirements. All parts of the facilities to be constructed will be subject to rigorous material specifications reflecting experience gained over time by EPND and the petroleum pipeline industry. The Project will also meet the design and construction standards of the American Petroleum Institute, the pipeline industry, state and federal regulatory agencies, and internal EPND standards that are frequently more stringent than those of the regulatory agencies. These standards establish the quality of all pipe, pipe coating, valves, and other materials. Qualified inspectors will monitor key elements of the manufacturing process of the components to ensure that quality control requirements and engineering specifications are met. Inspection methods will include destructive testing of certain components to verify their integrity. Nondestructive techniques, such as x-ray radiography, ultrasonic inspection, visual inspection, and other techniques, will also be employed to verify the integrity of materials and construction practices.

Specifications will be issued to contractors and employees for proper handling of these materials beyond the manufacturing process. These specifications will describe the care necessary in shipping and handling the materials. These specifications will also be augmented by close inspection of material-loading, -transportation, and -handling activities.

The use of sound in-the-field construction practices, closely monitored by qualified personnel, will ensure that all materials installed as part of the pipeline provide the fitness for service for which they are intended. Key construction phases will be subjected to special scrutiny. For example, 100% of the pressurized field welded joints will be x-ray tested. This EPND requirement greatly exceeds regulatory standards. The completed system will ultimately undergo hydrostatic testing prior to placing the system in service.

Within one year of the in-service date, a voltage gradient survey will be conducted to confirm the integrity of the pipe coating by detecting anomalies within the pipe coating. These anomalies are investigated and repaired as

necessary. The level of scrutiny applied both during and immediately after construction will ensure that a safe system is completed.

B. Pipeline design, construction and operation are regulated by the U.S. Department of Transportation, Pipeline and Hazardous Material Safety Administration.

The Project will be part of the EPND System, an interstate crude oil pipeline. The design, construction, maintenance and operation functions of the Project are regulated by the United States Department of Transportation under 49 C.F.R. Part 195 – Transportation of Hazardous Liquids by Pipeline. Accordingly, PMHSA is responsible for oversight of EPND's operations, pursuant to the Hazardous Liquid Pipeline Safety Act, 49 U.S.C. 2001 et seq. EPND complies with the regulations issued by that agency. EPND also works directly with various regional, state, and local agencies, landowners, and other interests to address the concerns of stakeholders and of the communities in which EPND operates.

In 1991, MNOPS was designated as an inspector on behalf of the PMHSA. Findings, reports and recommendations from MNOPS inspectors are referred to PMHSA for review and action.

EPND has developed comprehensive written procedures for the operation and maintenance of the pipeline in order to establish standards and guidelines for Enbridge personnel, as well as to comply with 49 C.F.R. Part 195 and other government regulations. Company procedures and activities meet and generally exceed these government requirements. The following paragraphs provide a very general overview of operation and maintenance practices.

B.1. Pipeline Operation and Control

Sandpiper will be monitored by the EPND control center located in Estevan, Saskatchewan.

The Control Center is staffed by pipeline operators 24 hours per day. A computerized pipeline control system allows these operators to remotely monitor and control the pipelines and related facilities. The computerized pipeline control system has been designed to control the pipeline within pre-established minimum and maximum operating pressures. Pressure transmitters are installed at pump stations and provide pressure data to the control system for safe operation of the pipeline and facilitate in the quick shutdown of the pipeline in the event that pressures fall outside range of normal operating pressures. Additionally, pressure transmitters

will be installed at each of the mainline remotely controlled valves. These transmitters provide a remote monitoring point for pressure on the mainline that is strategically located along the pipeline and can potentially facilitate a quicker response. Both the computer system and operating practices include procedures for abnormal operating conditions, including emergency shutdown, isolation of the pipeline and notification procedures in the event of suspected emergencies. The Control Center also serves as an emergency center to receive calls from employees, the public or public officials reporting unusual conditions or pipeline failures.

In 2010, EPND developed a new Control Room Management Plan. The plan was fully implemented by August 2012 and is in compliance with federal regulations. EPND also revised and enhanced its procedures pertaining to decision making, handling pipeline startups and shutdowns, release detection system alarms, communication protocols, and suspected column separations. EPND has enhanced its organizational structures to better support pipeline operators and workloads.

B.2. Communications Capabilities

A Frame Relay Wide Area Network ("WAN") provides the primary communications exchange for pipeline monitoring and control. A dial-up back-up system or satellite system is used during primary communication failures. Communications to monitor and control remote valves utilize frame relay land line connection, spread spectrum radios, or cellular based radios to connect to the WAN. EPND supplements communications with the use of cellular phones, as needed, to facilitate personnel communications during operation, maintenance, or emergency activities.

B.3. Protection of the Pipe from Damage

EPND has an aggressive program in educating excavators and the public about the presence of the pipelines and preventing damage to the pipelines from excavating equipment. EPND has joined and supports the Minnesota Gopher State excavation damage prevention system.

The pipeline is protected from corrosion in a number of ways. The pipe is covered with a modern, fusion-bonded protective coating. All buried or submerged metallic structures (pipeline systems) are under a cathodic protection system as required by pipeline safety regulations. The cathodic protection system induces a very mild electrical current to prevent corrosion of the steel pipeline and related structures.

B.4. Inspections

EPND conducts routine inspections of the pipelines and facilities to verify that the system is operating properly and in compliance with 49 C.F.R. Part 195.

The cathodic protection system is monitored by taking pipe/structure-to-soil and line current readings (where possible) each calendar year (not to exceed a 15-month interval). Additionally, each rectifier and anode groundbed used to impose cathodic protection on the pipeline is inspected to ensure proper operation. Repairs and adjustments to the cathodic protection system are either made during the annual survey or during later maintenance activities. At least six times per year, each critical cathodic protection interference bond to foreign structures is inspected and corrective measures are implemented, as needed.

EPND also periodically evaluates the effectiveness of its cathodic protection system by conducting supplemental close interval surveys of the system. Although not required by regulation, this method allows EPND to assess overall effectiveness of the pipeline protection system.

The EPND System, is patrolled by air biweekly (26 times a year not to exceed 3 weeks between flights) to inspect surface conditions of land on or adjacent to the pipeline right-of-way. This inspection includes aerial observation of stations and surrounding areas. If weather and other conditions permit, this aerial inspection is conducted weekly. Line walking inspection of the right-of-way is sometimes used to supplement aerial inspections in congested areas. This inspection also assists in identifying unknown construction or other unsafe activity on the pipeline right-of-way.

Isolating valves are checked at least twice per year to ensure proper operation. In the event of a release, it is important for valves to close properly to isolate the section of pipeline and minimize the amount of crude oil that may escape. Other components of the pipeline, such as tanks and pump stations are also routinely inspected.

EPND periodically inspects the transmission segments of its pipeline system, in accordance with the integrity management standards of 49 C.F.R. Part 195. These inspections are conducted by a combination of hydrostatic testing, direct assessment, and internal integrity inspections

with the use of electronic inspection tools called Pipeline Inspection Gauges ("PIG") (commonly called "smart pigs"). These devices travel through the inside of the pipeline and use on-board sensors and computers to look for and examine any unusual conditions (dents, gouges, corrosion, or cracks) in the pipe. Results of the inspection are then analyzed, and if features are detected, the pipeline is inspected to verify preliminary findings and repaired as required.

Per federal pipeline regulations, EPND implemented an Integrity Management Program that requires, among many things, pipelines located in certain higher consequence areas to be internally inspected at prescribed intervals.

All overpressure safety devices capable of limiting, regulating, controlling and/or relieving operating pressures are inspected and tested to ensure the device is in good mechanical condition and functioning properly.

Inspectors from PHMSA (and their agents from MNOPS for the Minnesota portion of the system) periodically inspect EPND's compliance with applicable government regulations. Inspections of EPND's written procedures, records, and facilities are also periodically conducted by EPND and these agencies.

B.5. Maintenance

Many other maintenance activities are performed on the pipelines and related facilities. EPND has a comprehensive preventative maintenance program that meets and, in many cases exceeds, federal safety standards set forth in 49 C.F.R. Part 195. Comprehensive standards for the design and installation of new or replacement facilities are provided in both EPND procedure manuals and contract specifications. Repair pipe is pre-tested and other components used to repair the pipelines meet national standards and all applicable regulatory requirements. Other activities, such as welding, movement of the pipe, coating repair, corrosion control, and tank maintenance are guided by written procedures which have been reviewed by the PHMSA and MNOPS inspectors.

B.6. Training of Personnel

EPND has established and implemented a comprehensive orientation, technical, safety, emergency, and on-the-job training program that is in compliance with the Operator Qualification rules issued by the PHMSA under 49 C.F.R. Part 195. EPND personnel receive hundreds of hours of

formal and on-the-job training as they progress in pipeline operation and maintenance positions. Demonstrations of competence are shown through a variety of measures that may include review of job performance, periodic use of pipeline control system simulators, emergency exercises, welding certification tests, and other functions required to continue safe pipeline and station facility operation and maintenance.

B.7. Public Awareness Program

EPND conducts a comprehensive public education program to ensure that the affected public (those who work and live along a pipeline), excavators, local public officials, and emergency responders are aware of how to recognize and avoid or respond to a pipeline emergency. EPND has also been active at the local, county, and state level in emergency response planning and joint training and exercises to prepare all potential responders to deal with emergencies. The public awareness program includes liaison with emergency responders in communities that host EPND station facilities. EPND also provides annual employee training for field employees to ensure they are prepared to work with the public and are effective in ensuring the public is aware of activities along the pipeline.

For the public's awareness of underground pipelines, the pipeline right-of-way is marked at all public road and railway crossings, at a minimum. Additional markings are posted at valves, other pipeline facilities, and stations along the pipeline route.

B.8. Emergency Preparedness

EPND's operating and maintenance practices are aimed at preventing emergencies or releases from facilities at stations. However, it is imperative that EPND be prepared to respond to an emergency or release should one occur. In addition to the preventative activities described above, EPND's emergency response program has been prepared in compliance with PHMSA rules under 49 C.F.R. Part 194. The Emergency Response Plan has been approved by PHMSA and includes pre-planning, equipment staging, emergency notifications, and emergency and release containment procedures.

EPND's closest response assets and personnel are located at each manned area office. ENPD has developed an emergency response directory that includes a list of release response contractors and heavy equipment operators. These contractors and equipment operators are located at various points along the route of the EPND System, ensuring that

response assets will be available quickly at any given location. EPND has also developed a cross-business unit response team for large-scale events requiring more resources than a single region can provide, and created a dedicated Emergency Response group in Operation Services for increased regional support.

B.9. Crude quality specifications

All of EPND's operations, including its standards for quality of the oil it can accept for shipment, are set forth in EPND's tariff which is filed with and approved by the Federal Energy Regulatory Commission ("FERC") in accordance with the Interstate Commerce Act of 1887. The tariff requires a shipper to deliver crude oil to EPND with certain standards, including safety and quality standards, designed to protect the integrity of the pipeline and the safety of the public and environment. EPND verifies that the oil entering its system meets those standards, and a shipper is required to provide EPND with a certificate that sets out the specifications of the oil it submits to EPND. One of the many quality standards set in the tariff is that crude oil on the EPND System can contain no more than 0.5%, by volume, of sediment or water. Additionally, EPND's tariff limits hydrogen sulfide (H_2S) vapor phase content of 5 parts per million or less. Also, hydrochloric acid can form in crude oil if organic chlorides are under high heat conditions in the presence of hydrogen. The EPND tariff restricts the presence of organic chlorides in crude accepted into the EPND system, EPND requests certificates from shippers confirming the crude oil meets the quality specifications, and EPND runs random tests to confirm adherence to the specifications. Thus EPND, to the best of its knowledge, does not transport crude that contains organic chloride. Other quality control aspects of the tariff relate to temperature, viscosity, density, and various physical characteristics of the oil. Additionally, EPND always has the ability to reject a shipment or remove a shipper's oil if it does not meet EPND's standards or if it poses a risk to EPND's facilities.

C. Release History

In the United States, PHMSA requires reporting of certain pipeline releases on liquid petroleum pipelines. PHMSA criteria are based on a financial impact (releases greater than $50,000), a volume impact of 5 gallons, or other impact criteria as detailed in 49 C.F.R. Part 195. If any of these criteria are met, the release must be reported. Tables 7853.0270-3.1 and 7853.0270-3.2 below list those liquid petroleum pipeline releases reported by EPND and Enbridge US to PHMSA that occurred after January 1, 2008 on the EPND and Enbridge Mainline Systems, respectively.

The majority of the incident costs incurred by EPND are in the response, containment, repairs and remediation of the release site, rather than damages to private property. If private property is affected, EPND completes remediation (e.g. recovery of oil and removal of soils impacted, groundwater monitoring, etc.) under the oversight of State and Federal environmental agencies. These remedial activities are performed using modern environmental practices, and the various regulatory agencies provide oversight of cleanup until environmental impacts are mitigated. Should the incident be negligently caused by a third-party (such as unsafe excavation), Enbridge's first priority is to address all cleanup, restoration and compensation. Only thereafter does Enbridge concern itself with cost recovery.

Typically, the majority of free oil released from the pipeline is recovered within hours or days of an incident. This is represented in Tables 7853.0270-3.1 and 7853.0270-3.2, below, as "Bbls Recovered". Following recovery, contaminated soil is removed and disposed of or treated in a manner approved by the overseeing environmental authorities. Pipeline repair, cleanup and restoration activities are typically done in parallel. Cleanup and restoration of an area affected by a release is an ongoing activity that begins immediately and continues for as long as it takes to ensure removal of soil or other appropriate remediation has been completed in consultation with the jurisdictional environmental agency and affected landowner(s). All actions are done under the close oversight of appropriate environmental agencies until such time the agency concurs that cleanup has been completed.

TABLE 7853.0270-3.1
PHMSA Reportable Incidents Since January 1, 2008
Pipeline Releases Reportable to the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
For the EPND System

Date	Mainline or Facility	Cause or Description	Bbls Out	Bbls Recovered	Location (City/State)	Mile Post	Cost of Clean-Up and/or Remediation	Remediation Status	Fines Levied	Authority Levying Fine or Violation	Citation of Violation of Law
07/22/2013	Mainline	Mechanical Failure of Pipe or Weld (through wall defect - integrity dig)	0.166	0.166	Rugby, ND	54.4	$108,824.82**	Pending Closure	N/A	N/A	N/A
07/15/2013	Mainline	Mechanical Failure of Pipe or Weld (through wall defect - integrity dig)	2	2	York, ND	79	** combined with 07/22/13 release	Pending Closure	N/A	N/A	N/A
05/07/2013	Mainline	Mechanical Failure of Pipe or Weld (through wall defect - integrity dig)	2	2	Grand Forks, ND	197	$42,548	Pending Closure	N/A	N/A	N/A
05/02/2013	Mainline	Mechanical Failure of Pipe or Weld (through wall defect - integrity dig)	1.428	1.428	Knox, ND	80	$173,253	Pending Closure	N/A	N/A	N/A

TABLE 7853.0270-3.1
PHMSA Reportable Incidents Since January 1, 2008
Pipeline Releases Reportable to the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
For the EPND System

Date	Mainline or Facility	Cause or Description	Bbls Out	Bbls Recovered	Location (City/State)	Mile Post	Cost of Clean-Up and/or Remediation	Remediation Status	Fines Levied	Authority Levying Fine or Violation	Citation of Violation of Law
01/26/2013	Mainline	Mechanical Failure of Pipe or Weld (through wall defect - integrity dig)	0.238	0.238	Penn, ND	95	$41,000	Pending Closure	N/A	N/A	N/A
12/21/2012	Facility	Equipment Failure (valve not seated - 1/2" plug released in manifold area)	0.238	0.238	Tioga, ND	-	$45,020	Pending Closure	N/A	N/A	N/A
11/13/2012	Facility	Corrosion Failure (inlet/outlet line to Tank 6006)	130	130	Minot, ND	-	$2,094,362	Open	N/A	N/A	N/A
09/25/2011	Facility	Equipment Failure (tubing used to test relief valves cracked)	10	10	Berthold, ND	-	$314,193	Pending Closure	N/A	N/A	N/A

TABLE 7853.0270-3.1
PHMSA Reportable Incidents Since January 1, 2008
Pipeline Releases Reportable to the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
For the EPND System

Date	Mainline or Facility	Cause or Description	Bbls Out	Bbls Recovered	Location (City/State)	Mile Post	Cost of Clean-Up and/or Remediation	Remediation Status	Fines Levied	Authority Levying Fine or Violation	Citation of Violation of Law
02/25/2011	Facility	Incorrect Operations (sump overflowed)	0.238	0.238	Minot, ND	-	$3,000	Closed	N/A	N/A	N/A
08/20/2010	Facility	Corrosion Failure (internal corrosion)	0.381	0.381	Sherwood, ND	-	$8,862	Closed	N/A	N/A	N/A
06/07/2010	Facility	Mechanical Failure of Pipe or Weld (cracked weld on pump manifold)	1	1	Grenora, ND	-	$22,056	Closed	N/A	N/A	N/A
03/01/2010	Facility	Incorrect Operations (operator error – delivery valve inadvertently transitioned)	5	5	Clearbrook, MN	-	$23,112	Closed	N/A	N/A	N/A

TABLE 7853.0270-3.1
PHMSA Reportable Incidents Since January 1, 2008
Pipeline Releases Reportable to the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
For the EPND System

Date	Mainline or Facility	Cause or Description	Bbls Out	Bbls Recovered	Location (City/State)	Mile Post	Cost of Clean-Up and/or Remediation	Remediation Status	Fines Levied	Authority Levying Fine or Violation	Citation of Violation of Law
11/05/2009	Facility	Equipment Failure (booster pump seal failure)	10	10	Alexander, ND	-	$20,725	Closed	N/A	N/A	N/A

TABLE 7853.0270-3.2
PHMSA Reportable Incidents Since January 1, 2008
Pipeline Releases Reportable to the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
For the Enbridge Mainline System

Date	Mainline or Facility	Cause or Description	Bbls Out	Bbls Recovered	Location (City/State)	Mile Post	Cost of Clean-Up and/or Remediation	Remediation Status	Fines Levied	Authority Levying Fine or Violation	Citation of Violation of Law
8/3/2013	Facility	Griffith Terminal Meter 3 Drain Plug	160	160	Griffith, IN	-	$5,000	Pending Closure	-	-	-
7/22/2013	Facility	Deer River Station Line 4 Sending Trap Door O-Ring	3.33	3.33	Deer River, MN	995.91	$11,000	Pending Closure	-	-	-
6/6/2013	Facility	Flanagan Terminal Line 61 Sump Overflow	0.6	0	Pontiac, IL	-	$10,000	Closed	-	-	-
6/5/2013	Facility	Mackinaw Station 3/4" Nipple - NGL	0.48	0.48	Mackinaw City, MI	1479	$7,000	Closed	-	-	-
5/3/2013	Facility	Plummer Station Line 1 Stem Packing	0.6	0.6	Plummer, MN	877.32	$75,000	Pending Closure	-	-	-
4/23/2013	Facility	Viking Station Line 2 Whistle	33.33	33.33	Viking, MN	848.26	$125,000	Pending Closure	-	-	-

TABLE 7853.0270-3.2
PHMSA Reportable Incidents Since January 1, 2008
Pipeline Releases Reportable to the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
For the Enbridge Mainline System

Date	Mainline or Facility	Cause or Description	Bbls Out	Bbls Recovered	Location (City/State)	Mile Post	Cost of Clean-Up and/or Remediation	Remediation Status	Fines Levied	Authority Levying Fine or Violation	Citation of Violation of Law
11/20/2012	Facility	Chicap Mokena Relief Line	900	900	Mokena, IL	-	$5,500,000	Pending Closure		Illinois EPA	Release to lands of the State of IL
7/27/2012	Mainline	Line 14 Mainline Failure	1729	1100	Grand Marsh, WI	232	$10,500,000	Closed	-	-	-
5/24/2012	Facility	Tank 16 Superior Terminal - Tank Mixer Seal	1.19	1.19	Superior, WI	-	$20,000	Closed	-	-	-
4/7/2012	Facility	Clearbrook Term Seal failure Unit 2.4	0.60	0.60	Clearbrook, MN	-	$0	Closed	-	-	-
3/22/2012	Facility	Clearbrook Term Line 3 Valve 3TSV1	0.24	0.24	Clearbrook, MN	-	$15,000	Closed	-	-	-
3/20/2012	Mainline	Line 3 MP 951 Integrity Dig	0.02	0.02	Cass Lake, MN	951.67	$0	Closed	-	-	-
3/3/2012	Mainline	New Lenox Sending Trap	1500	255	New Lenox, IL	455.71	$5,004,359 (2)	Closed		Illinois EPA	Release to lands of State of Illinois

TABLE 7853.0270-3.2
PHMSA Reportable Incidents Since January 1, 2008
Pipeline Releases Reportable to the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
For the Enbridge Mainline System

Date	Mainline or Facility	Cause or Description	Bbls Out	Bbls Recovered	Location (City/State)	Mile Post	Cost of Clean-Up and/or Remediation	Remediation Status	Fines Levied	Authority Levying Fine or Violation	Citation of Violation of Law
2/21/2012	Facility	Hartsdale Terminal Tank 1607	24	24	Schererville, IN	-	$34,000	Closed	-	-	-
2/17/2012	Mainline	Line 6 MP 461 Casing/RR Crossing	0.01	0.01	Dyer, IN	461	$0	Closed	-	-	-
2/16/2012	Facility	Walworth Pump Seal Unit 14-1	5	5	Walworth, WI	341	$3,000	Closed	-	-	-
2/15/2012	Mainline	Line 5 MP 1606 Integrity Dig	20	20	Sterling, MI	1606	$128,000	Pending Closure	-	-	-
11/20/2011	Facility	Tank 64 North Tank Mixer	0.48	0.48	Clearbrook, MN	-	$2,000	Closed	-	-	-
11/8/2011	Facility	Line 67 Clearbrook Terminal Sump Reinjection Whistle	10	10	Clearbrook, MN	-	$2,000	Closed	-	-	-
10/12/2011	Facility	Hartsdale Terminal Tank 1607	398	398	Schererville, IN	-	$177,500	Closed	-	-	-

TABLE 7853.0270-3.2
PHMSA Reportable Incidents Since January 1, 2008
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For the Enbridge Mainline System

Date	Mainline or Facility	Cause or Description	Bbls Out	Bbls Recovered	Location (City/State)	Mile Post	Cost of Clean-Up and/or Remediation	Remediation Status	Fines Levied	Authority Levying Fine or Violation	Citation of Violation of Law
9/25/2011	Facility	Line 14 Superior Terminal Seal Failure, Booster pump 143	15	15	Superior, WI	-	$585,026 (2)	Closed	-	-	-
8/17/2011	Facility	Superior Terminal SW Corner of Tank 12	0.95	0.95	Superior, WI	-	$387,281 (2)	Closed	-	-	-
4/4/2011	Facility	Tank 8 Berm Area	0.29	0.29	Superior, WI	-	$50,000 (2)	Closed	-	-	-
12/31/2010	Facility	Line 66 Lockport Station MsPCV Stem Seal	5	5	Lockport, IL		$35,000	Closed	-	-	-
12/1/2010	Facility	Line 5 North Branch Station	0.24	0.24	North Branch, MI	1685.9	$10,000	Closed	-	-	-
11/11/2010	Facility	Line 3 MP 1044.33 Floodwood	0.36	0.36	Floodwood, MN	1044.3	$25,000	Closed	-	-	-
9/23/2010	Facility	Line 67 Deer River	0.24	0.24	Deer River, MN	995.8	$15,000	Closed	-	-	-

TABLE 7853.0270-3.2
PHMSA Reportable Incidents Since January 1, 2008
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9/11/2010	Mainline	MP 658 - Incorrect operation during pipeline integrity work	0.24	0.24	Fowlerville, MI	658.69	$2,500	Closed	-	-	-
9/9/2010	Mainline	Line 6A Romeoville	7538	7538	Romeoville, IL	424.1	$48,000,000	Pending Closure		Illinois EPA	Release to lands of State of Illinois
7/29/2010	Facility	Line 2 N Cass Lake Flange	155	155	Cass Lake, MN	-	$756,181 (2)	Open	-	-	-
7/28/2010	Mainline	Line 1 Valve Packing - Equipment failure	0.23	0.23	Cass Lake, MN	958.33	$14,852	Closed	-	-	-

TABLE 7853.0270-3.2
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7/26/2010	Mainline	Line 6B Marshall MI MP 608	20082	18245	Marshall, MI	608.24	$1,039,000,000 (2)	Open	$3,699,200	PHMSA	**§195.452** Pipeline integrity management in high consequence areas **§195.401** General requirements **§195.402** Procedural manual for operations, maintenance, and emergencies **§195.440** Public awareness **§195.52** Telephonic notice of certain accidents **§195.54** Accident reports **§195.505** Qualification program

TABLE 7853.0270-3.2
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7/2/2010	Facility	Deer River Line 4 36" Trap Door	10	10	Deer River, MN	995.9	$78,000	Closed	-	-	-
6/8/2010	Mainline	Line 6A Marshfield WI MP 168.3 - Material failure of pipe or weld	1	1	Marshfield, WI	168.3	$852,000 (2)	Open	-	-	-
4/17/2010	Mainline	Line 2 Deer River MP 997.79 - Material failure of pipe or weld	5	4	Deer River, MN	997.79	$226,673 (2)	Closed	-	-	-
3/11/2010	Facility	Superior Terminal (Near Tank 15)	0.75	0.75	Superior, WI	1097	$2,000	Closed	-	-	-
1/8/2010	Mainline	MP 774.18, Neche ND Pembina County - Material failure of pipe or weld	3748	1547	Neche, ND	774.18	$4,500,000 (2)	Closed	-	-	-

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For the Enbridge Mainline System

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1/6/2010	Facility	Line 4 Manifold Relief Valve Area Frost Heave	0.48	0.48	Superior, WI	1097	$0	Closed	-	-	-
12/21/2009	Facility	PCV Bypass Valve	0.24	0.24	Lewiston, MI	1548.6	$45,000 (1,2)	Open	-	-	-
11/13/2009	Facility	Line 14 Mokena Station PCV Building	0.6	0.6	Mokena, IL	437.39	$50,000 (1)	Open	-	-	-
10/9/2009	Facility	Superior Terminal Tank 22	0.12	0	Superior, WI	-	$55,298 (1,2)	Closed	-	-	-
10/1/2009	Facility	Station Piping Discharge Valve Unit #1	5	5	Fenton, MI	678.2	$79,388 (1)	Closed	-	-	-
6/9/2009	Mainline	MP 1056.2 Gowan	5	0	Gowan, MN	1056.2	$43,600 (1)	Closed	-	-	-

TABLE 7853.0270-3.2
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5/21/2009	Facility	Line 61 Superior Terminal	154	140	Superior, WI	-	$116,557	Closed	$118,700	PHMSA	**§195.52** Immediate notice of certain accidents **§195.402** Procedural manual for operations, maintenance, and emergencies
5/10/2009	Facility	Floodwood Station Unit 4.3	4	4	Floodwood, MN	-	$5,000 (1)	Closed	-	-	-
4/25/2009	Facility	Line 61 Batch Pig	1	1	Superior, WI	-	$0	Closed	-	-	-
4/13/2009	Facility	Floodwood Station Flange Failure	2	2	Floodwood, MN	-	$5,000 (1)	Closed	-	-	-
3/22/2009	Facility	Line 61 Superior Station	0.12	0.12	Superior, WI	-	$15,000 (1)	Closed	-	-	-
3/13/2009	Facility	Clearbrook Terminal	1.19	1.19	Clearbrook, MN	-	$0	Closed	-	-	-

TABLE 7853.0270-3.2
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2/27/2009	Facility	Viking Line 13 MP 847.91	0.12	0.12	Viking, MN	847.91	$4,000 (1)	Closed	-	-	-
2/12/2009	Mainline	Line 61 SA Linefill Batch Pig Trap Launch Pin	2	1	Superior, WI	-	$25,000 (1)	Closed	-	-	-
11/21/2008	Facility	Line 61 Unit 2	0.24	0	Superior, WI	-	$1,600 (1)	Closed	-	-	-
8/25/2008	Facility	Superior Terminal Tank 9 Pad	115	108	Superior, WI	-	$48,000 (1)	Closed	-	-	-
5/27/2008	Mainline	Line 6 Deactivated Loop Line	6	0	New Carlisle, IN	519	$100,000	Closed	-	-	-
4/15/2008	Facility	Tank 79 Inlet Line	260	260	Griffith, IN	-	$192,002 (1)	Closed	-	-	-
4/8/2008	Facility	Gonvick Densitometer Site	6	4	Gonvick, MN	904.89	$15,500	Closed	-	-	-
3/30/2008	Facility	Edgewater Gas Alarm Warning Unit 3 Line 14	5	4	Edgewater, WI	69.81	$0	Closed	-	-	-

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For the Enbridge Mainline System

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3/20/2008	Facility	Donaldson Station Seal Replacement	4	3	Donaldson, MN	814	$1,500	Closed	-	-	-

(1) For the years 2008 and 2009, the PHMSA Form 7000-1 did not specifically request clean-up costs. Therefore, the amounts listed for these years reflect a combined cost for both repairs and clean-up.

(2) The amount listed includes remediation costs.

It is important to consider releases in the context of the industry and Enbridge's place in it. EPND and its Enbridge affiliates operate 10% of the total length of all domestic crude oil and refined product pipelines, with over 14,900 miles of liquid pipelines in the United States and Canada.[1] Enbridge is the largest pipeline operator in the United States, delivering 13% of the crude oil imported each year. For the last decade, it has delivered hundreds of millions of barrels of liquid petroleum each year with very few releases. In fact, over the last 10 years, Enbridge has safely delivered an average of 99.9992% of the annual volume it transported in its liquid pipelines throughout North America. If releases within Enbridge's facilities are excluded, that figure rises to 99.9997%.[2]

Enbridge's release record is better than the industry average in both the United States and Canada. In Canada, from 2002 to 2009, Enbridge had 0.5 releases per 1,000-kilometers (622-miles) of federally-regulated pipeline while the rest of the industry averaged 7.43 releases per 1,000-kilometers (622-miles) of pipeline.[3] In the United States, Enbridge experienced 0.005 releases per billion barrel-miles, compared to an average of 0.021 releases per billion barrel-miles for the rest of the industry.

EPND's goal is zero incidents. It does, however, accept responsibility for releases and remediation, including the cost and work to perform cleanup operations and provide compensation.

D. Marshall, Michigan Incident and Implementation of NTSB Recommendations

In July 2010, Enbridge's Line 6B failure released crude oil into Talmadge Creek and the Kalamazoo River near Marshall, Michigan.

EPND offers the Commission some information on a number of enhancements Enbridge (including EPND) has made in its system, practices and procedures as a result of Enbridge's and the federal government's investigation into this incident.

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[1] Enbridge Liquid Pipelines: http://www.enbridge.com/DeliveringEnergy/OurPipelines/LiquidsPipelines.aspx and http://www.enbridgeus.com/Delivering-Energy/Pipeline-Systems/Liquids-Pipelines/

[2] Enbridge 2012 Corporate Social Responsibility Report: Environmental Performance, p. 51, available online at http://csr.enbridge.com/Downloads.aspx.

[3] Enbridge 2012 Corporate Social Responsibility Report: Environmental Performance, p. 52, available online at http://csr.enbridge.com/Downloads.aspx.

On July 10, 2012 the National Transportation Safety Board ("NTSB") adopted the Pipeline Accident Report NTSB/PAR-12/01, PB2012-916501 for the incident. Enbridge has worked closely and cooperatively with the NTSB throughout its investigation. Enbridge began implementing operational and procedural changes soon after the incident. The summary below describes Enbridge's actions taken as a result of this internal investigation related to the NTSB's recommendations. The actions undertaken by Enbridge are being completed under the oversight of PHMSA and its applicable regulations.

D.1. Pipeline Integrity

The cause of failure on Line 6B was rooted in the type of external coating applied to the pipeline when it was constructed in 1967. Since the Line 6B incident, Enbridge has implemented numerous changes to its pipeline integrity management program to assure improvements to long-term monitoring and mitigation policies. Each of the items identified by the NTSB has been addressed through changes to inspection frequencies, repair methodologies, quality assurance programs, detailed procedure enhancements, additional technologies, and organizational restructuring. Some of the NTSB recommendations required Enbridge to develop new industry models for integrity assessments of its pipelines. Enbridge has committed to leading the development of those improvements and work is ongoing. Enbridge (inclusive of EPND) has accomplished the following:

- Heightened the importance of its pipeline and facility integrity program to assure broader company involvement and commitment to integrity management with increased integration of planning and issue resolution formalized through new committees and planning processes.

- Re-organized the functional areas that are responsible for pipeline and facility integrity bringing additional leadership and focused resources on traditional, new and emerging areas of pipeline integrity management. Specifically, this re-organization has resulted in approximately doubling the number of positions dedicated to integrity management.

- Increased the number of in-line inspection programs and integrity digs (including excavation, examination, maintenance and repair by welded sleeve or pipe segment replacements). The in-line inspection program has been increased by more than 50% compared with pre-2010 levels. Additionally, the number of integrity digs more than doubled over that same time period.

Pipeline integrity management spending was increased to over $450 million in each of 2011 and 2012.

- Strengthened its focus on the tools, technologies and strategies needed to ensure that pipeline networks have the strength and operating fitness to perform safely, reliably and in an environmentally responsible manner.

- Revised and improved numerous procedures within its Integrity Management Program. Specifically, process and procedure enhancements have been implemented to ensure that a feature similar to the one that led to the Line 6B Marshall incident, should it exist elsewhere on the pipeline system, will be identified and repaired.

Enbridge (inclusive of EPND), and the industry as a whole, continues to improve accuracy and develop new technology for pipeline integrity assessments. Enbridge has worked with the Association of Oil Pipelines and Pipeline Research Consortium International in launching further research to improve the ability of inspection tools to gather certain information from pipelines, and enhance techniques for pipeline operators to interpret information the tools collect.

D.2. Release Detection and Pipeline Control

Following the July 2010 incident on Line 6B in Michigan, Enbridge (including EPND) also accomplished the following:

Release Detection

- Implemented additional release detection analysis procedures. These procedures include improvements to the release detection escalation process, shift change transitions, alternate release detection procedures, and analysis and communication procedure. Enbridge also formalized best practices for its Standard Operating Procedures.

- Formalized a Quality Management System ("QMS") that will ensure the effective execution of critical work activities that meet pre-defined quality objectives.

- Established a Pipeline Control Systems and Release Detection department, increasing the number of employees and contractors dedicated to release detection and pipeline control.

- Enhanced the following aspects of the Release Detection Analyst Training Program: on-the-job training, training program layout, readiness assessment, and communications with control center operations ("CCO") personnel.

- Completed assessments and planning of instrumentation additions to and upgrades required to improve the performance of the release detection system. Enbridge implemented a Release Detection Instrumentation Improvement Program to add and upgrade instrumentation across its system based on the assessments. It reviewed and restructured its maintenance management program. This work has enhanced Enbridge's existing program by formalizing the inventory and management of critical release detection equipment.

- Made changes to its Pipeline Control Systems. Enbridge has initiatives underway to improve controller decision support systems. This work includes developing tools to further support the analysis of column separation and potential releases, and implementing expert systems to support alarm analysis. Enbridge is making ongoing improvements to its historical data storage and retrieval at most of its terminal and pump stations, resulting in the archiving of critical data at a resolution frequency of approximately one second. Enbridge is evaluating its current communication mechanisms, including its remote terminal unit infrastructure.

Pipeline Control (including CCO)

- Developed and implemented corporate and CCO/Estevan Control Center ("ECC")-specific "Golden Rules" (safe operating, when in doubt- shutdown, emergency procedures).

- Revised and enhanced all of its procedures pertaining to decision-making, handling pipeline start-ups and shutdowns, release detection system alarms, communication protocols, and suspected column separations.

- Enbridge has initiatives underway to revise a number of documents associated with its newly revised processes and procedures including pipeline maneuvers, start-up and shutdown documents, operating standards maneuvers, operating standards and procedures, QMS, CCO on-call handbook and CCO/ECC Fatigue Risk Management Handbook.

- Augmented its CCO/ECC staff, technical support, engineering and operator positions and enhanced its organizational structure to better support operators and workloads.

- Enhanced its training programs in a number of areas including hydraulics, column separation analysis, incident investigation for all managers, technical services, engineers, supervisors and training staff, introduction to Lifesaving Rules training, enhanced emergency response training, fatigue management training, enhanced mentor selection process and training and material balance system training and formalized communication protocols.

- The EPND Control Center in Estevan, Saskatchewan, Canada also includes design features that address worker fatigue, a growing concern for companies with shift work employees. It has sit/stand consoles, improved lighting, noise reduction and facilities to address fatigue management to create an environment that meets all of the regulatory requirements related to control room management.

- Ensures that everyone in the EPND ECC understands that if they are ever in doubt, they must shut the line down and leave it down until the situation is fully understood. Enbridge's clear message is that it operates its pipelines safely. Enbridge will shut a pipeline down and will not restart it if Enbridge is not satisfied with operational safety. Enbridge will not sacrifice safety for throughput or expediency or the ability to return a line to service.

D.3. Pipeline Public Awareness Program and Emergency Response

To bolster its existing public awareness and emergency response programs, Enbridge has or is in the process of:

Public Awareness

- Developing an online and in-person training tool that will enable it to give Enbridge-specific information to emergency responders in its host communities.

- Added Community Relations positions in key locations along Enbridge liquid pipeline routes to build relationships with

community members, emergency responders and local government.

Emergency Response

- Spending about $50 million between 2012 and 2013 to improve its equipment and capabilities, develop better tools to deal with particular waterborne releases and improve training programs.

- Created and began specialized training for a cross-business unit response team to respond to large-scale events anywhere in North America that would require more resources than a single Enbridge liquid pipeline operating region or business unit could provide. The response team will be conducting major training exercises involving all business units, Emergency Response contractors and consultants, and emergency response agencies at all levels of government.

- Conducting an emergency response preparedness assessment to identify additional strategic equipment purchases (e.g., sorbent boom, containment boom, fire boom, skimmers, boats, bladders, etc.) to enhance capabilities to more rapidly respond and contain a significant release anywhere in the Enbridge or EPND Systems.

- Adding personnel to each Enbridge liquid pipeline operating region to improve emergency preparedness planning and coordination.

E. The Products Transported by EPND

Currently, EPND transports light sweet crude oil, as discussed in Section 7853.0510.

There is potential for the Project to move almost any commodity that is transported on the EPND System, if such a business case were established based on a number of factors that include, but are not limited to, system connectivity, line usage, product type, and contracts.

F. Right-of-Way Preparation, Construction and Reclamation Procedures

With regard to worksite preparation, construction and reclamation procedures, EPND has prepared an Environmental Protection Plan ("EPP") (see Appendix A of the EIR). EPND's EPP provides a more detailed

discussion of the guidelines and mitigation measures that EPND would implement on this project.

G. Hydrostatic Testing

All new pressurized piping and components will be factory tested, rated and as required, field pressure tested in accordance with federal pipeline safety regulations, industry codes, and EPND's requirements. The hydrostatic test water discharges will be for the new piping and new tankage at the Clearbrook Terminal.

The hydrotest pressures that will be utilized along Sandpiper will vary based on elevation and other factors. The table below details the range of hydrotest pressures that will be utilized on the Project.

Table 7853.0270-7.1
Hydrotest Pressures

Pipe Size	Hydrotest Pressure (psi)
24-inch	1850 to 2308 psi
30-inch	1850 to 2308 psi

The minimum hydrotest pressures that will be utilized will represent a safety margin of at least 25% above the maximum allowable operating pressure ("MAOP") that was utilized during the design of Sandpiper. The testing process will be implemented in accordance with EPND's procedures. The appropriation and discharge of test water will be conducted in accordance with EPND's EPP and permits issued by the appropriate regulatory agencies.

7853.0510 HISTORICAL ENERGY DATA

Subpart 1. Products, usage, and suppliers. For the geographical area to be served by the proposed facility, the applicant shall provide the following:

A. a list of the petroleum products by major categories (such as crude oil, gasoline, fuel oil, and so forth) transported or distributed by the applicant in that geographical area during the five most recent calendar years;

Sandpiper will be operationally integrated as part of the EPND System. This section provides historical data for the crude oil products transported on the EPND System, which is owned and operated by EPND.

As defined in its FERC Tariff on Rules and Regulations, EPND transports Light Sweet Crude Oil (SW).

B. for each category listed in response to item A and for each of the five most recent calendar years, a list of the annual and peak day quantities transported or distributed in the appropriate units of measure;

Table 7853.0510-B.1 provides the historical annual daily average volumes for each of the years 2007 to 2012 by the crude types listed in response to Subpart 1.A above.

In 2011, EPND announced that it would no longer accept Light Sour Crude Oil (SO) for transport on the EPND System. Table 7853.0510-B.1 reflects the volumes of light sour crude oil that were transported from 2007 to 2011.

Table 7853.0510-1-B.1 Disposition of Crude Oil in the State of Minnesota on the EPND System						
Average Daily Volumes entering Minnesota						
(000) bpd	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
SO	9.41	7.54	5.17	5.40	0.63	---
SW	80.61	96.96	104.45	157.62	182.68	187.43
Average Total Daily Volumes	90.02	104.51	109.62	163.02	183.32	187.43
Average Daily Volumes delivered in-state from the EPND System						
(000) bpd	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
SO	2.79	3.03	2.32	2.43	0.24	---
SW	23.78	23.85	34.93	56.34	49.21	58.77
Average Total Daily Volumes	26.57	26.88	37.25	58.77	49.45	58.77
Percentage of in-state delivery	29.52%	25.72%	33.98%	36.05%	26.97%	31.36%
SO	3.10%	2.90%	2.12%	1.49%	0.13%	---
SW	26.42%	22.82%	31.86%	34.56%	26.84%	31.36%

C. a list of sources of supply of petroleum products for transportation or distribution during the five most recent calendar years, designated as either in-state or as out-of-state, the dates and durations of the contracts with the 25 largest suppliers or shippers, the categories of petroleum products and quantities involved, and for sources of crude oil, the geographical areas of origin of the crude oil; and

The primary source of supply for the EPND System is the Bakken and Three Forks formations, which spans portions of North Dakota and Montana,.

D. for each of the five most recent calendar years and for each category of petroleum product, the percentage of in-state delivery of the annual amounts given in response to item B.

Table 7853.0510-1-B.1 above provides the volumes entering the State of Minnesota and in-state crude oil deliveries at Clearbrook on an annual average basis. As noted, all of the annual amounts identified on Table 7853.0510-1-B.1 are in-state deliveries at the Enbridge Clearbrook, Minnesota terminal. Currently, the EPND volumes that are not delivered in Minnesota are delivered to the Enbridge Mainline System and transported to the Superior, Wisconsin terminal. The current EPND connection to the Enbridge Mainline System at Clearbrook will be terminated once the Project begins operation and EPND volumes will be transported to the Superior Terminal on Sandpiper.

Subpart 2. Facilities; maps.

List each large oil or LPG storage facility location, gas plant, large pipeline facility, and oil refinery associated with the transportation or distribution of the categories of petroleum products named in response to subpart 1, item A. Provide maps that represent the locations and interconnections of these facilities.

Table 7853.0510-2.1 lists the crude oil breakout tankage facility locations on the EPND System. Table 7853.0510-2.2 provides the current configuration of EPND's pipeline facilities. Appendix G.2 of the EIR shows the location of these facilities as well as interconnecting receipt and delivery locations.

Table 7853.0510-2.1
EPND Crude Oil Breakout Tankage Facilities

Location	Number of Tanks	Total Volume (Barrels)
Alexander Station	2	75,000
Beaver Lodge Station	4	360,000
Berthold Station	3	240,000
Berthold Rail & West Station	2	300,000
Glenburn Station	1	5,000

Table 7853.0510-2.1 EPND Crude Oil Breakout Tankage Facilities		
Location	**Number of Tanks**	**Total Volume (Barrels)**
Grenora Station	2	70,000
Reserve Station	1	5,000
Little Muddy Station	2	60,000
Maxbass Station	2	15,000
Minot Station	3	280,000
Sherwood Station	1	5,000
Stanley Station	3	190,000
Trenton Station	2	40,000
Clearbrook, MN [A]	9	1,315,000
Superior, WI [A]	40	8,745,152

[A] These terminals are associated with the Enbridge Mainline System. All other facilities are located in North Dakota.

Table 7853.0510-2.2 EPND System Configuration			
Location	**Line Number**	**OD (Inches)**	**Length (Miles)**
Reserve Station to Grenora Station	83	6.625	23.7
Flat Lake to Reserve Station	83	6.625	29.4
Grenora Station to Beaver Lodge Station	83	10.75	53
Alexander Station to Beaver Lodge Station	84	8.625	64.5
Trenton Station to Beaver Lodge Station	86	10.75	51.7
Little Muddy Station to East Fork Station	88	10.75	5.9
Beaver Lodge Station to Berthold Station	82	12.75	54.7
Beaver Lodge Station to Berthold Station	87	16	55.5
Berthold Station to Minot Station	82	16	26
Minot Station to Clearbrook Station	81	16	282.9
Sherwood Station to Maxbass Station	85A	6.625	29.7
Newburg Station to Maxbass Station	85	6.625	13.4

Table 7853.0510-2.2 EPND System Configuration			
Location	**Line Number**	**OD (Inches)**	**Length (Miles)**
Maxbass Station to Minot Station	85	6.625	33.8
Canadian Border to Berthold Station	26	12.75	64.5

Subpart 3. Use of design capacity.

For each large energy facility or location listed in response to subpart 2, located in Minnesota and owned or operated by the applicant, provide the average percentage of use of its full design capacity during the summer season and during the winter season.

Table 7853.0510-3.1 lists the average percentage of use for the EPND System in Minnesota during the summer and winter season.

Table 7853.0510-3.1 EPND System 2012 Percentage of Annual Capacity (Minnesota)		
	Summer	**Winter**
Line 81	94.8%	86.8%

PUBLIC VERSION

Trade secret and privileged information has been excised from this section of the Certificate of Need Application in order to make it available to the public. Redaction of trade secret information is designated by brackets, bold text in a different color, as follows: **[Redacted]**.

7853.0520 FORECAST DATA

For the geographic area to be served by the proposed facility, the applicant shall provide the following:

A. a list of the categories of petroleum products the applicant expects to transport or distribute in that geographical area during the first six forecast years, the 11th forecast year (the tenth year after the year of the application), and the 16th forecast year;

The Sandpiper Pipeline Project will be operationally integrated with the EPND System. The forecast data provided in this section is reflective of the petroleum products transported on the EPND System. The Project is expected to transport Light Sweet Crude Oil (SW) in all forecast years.

B. for each category listed in response to item A and for each of the first six forecast years, the 11th forecast year, and the 16th forecast year, a list of the annual and peak day quantities expected, using the appropriate units of measure;

EPND prepared a forecast of North Dakota produced crude oil supply in its evaluation of future pipeline capacity needs. The forecast predicts the volume of crude oil available for transportation on the EPND System based on production forecasts prepared by the NDPA, as well as proprietary production forecasts developed by EPND. The crude oil supply available for transportation on the EPND system is calculated by taking all supply available to the market then subtracting non-EPND demand. Table 7853.0520-B.1 shows the volumes that would be available to Enbridge.

Table 7853.0520-B.1
Total Bakken Supply Available to Enbridge (Thousand bpd)[1]

	2013	2014	2015	2016	2017	2018	2023	2028
SW	[REDACTED]							

[1] All volumes shown are assumed to be Bakken crude volumes accruing solely to Enbridge. Only deliveries of crude oil to destinations downstream of Beaver Lodge, North Dakota are considered.

Based on the information provided in the above table, Enbridge anticipates that the applied for capacity will be fully utilized, as demonstrated by the increasing volumes of available crude oil.

C. a discussion of the methods, assumptions, and factors employed for purposes of estimation in response to items A and B;

C.1. Supply

As demonstrated in Section 7853.0240, the Bakken and Three Forks formations have an estimated 7.4 billion barrels of crude oil reserves.[2] Data from the NDPA indicates that crude oil production from North Dakota has significantly increased, rising from 138,000 bpd in January 2008 to 911,000 bpd in August 2013.[3] The most recent NDPA forecasts project production to peak between 1.3 and 1.5 million bpd in 2022, then production gradually declines to 1.10 million bpd in 2029.[4]

EPND's internal forecast corresponds closely with the NDPA forecast. EPND's forecast is slightly more conservative than the NDPA forecast, projecting peak production at **[REDACTED]**. However, EPND projections indicate that the decline in production will be more gradual than the NDPA forecast with **[REDACTED]**. EPND projects that average production from 2014 to 2029 will be **[REDACTED]**. EPND forecasts production above **[REDACTED]** while the NDPA forecast doesn't **[REDACTED]**. See Figure 7853.0520-C.1.

Figure 7853.0520-C.1
Williston Basin Region Forecast Comparisons: EPND vs. NDPA

[REDACTED]

The EPND forecast methodology consists of:

[REDACTED]

Some of the high-level assumptions in the EPND forecast are as follows:

[REDACTED]

[2] USGS at http://www.doi.gov/news/pressreleases/usgs-releases-new-oil-and-gas-assessment-for-bakken-and-three-forks-formations.cfm?renderforprint=1&.
[3] North Dakota DMR at http://northdakotapipelines.com.
[4] NDPA Energy Development and Transmission Committee Presentation at https://www.dmr.nd.gov/pipeline/.

C.2. Disposition

The Project will deliver crude oil into the Enbridge terminal facilities at Superior, Wisconsin (the terminus of the Project) and will provide redundant service for deliveries from EPND's existing Line 81 at Clearbrook, Minnesota. From Superior, shippers can continue on the Enbridge Mainline System or on other affiliated and non-affiliated pipeline systems for delivery into PADD 2 or eastern Canadian refinery markets. From Clearbrook, shippers can move oil to Minnesota's two refineries via the unaffiliated Minnesota Pipe Line Company pipeline.

D. a discussion of the effect on the forecast of possible changes in the key assumptions and key factors requested in item C; and

There are several factors that could affect the projected supply from the Bakken, including but not limited to the following:

- The outlook for domestic crude oil production depends on the production profiles of individual wells over time, the costs of drilling and operating those wells, and the revenues they generate. Exploration and development of tight oil continues to move into areas with little or no production history. Because many wells drilled in tight formations or shale formations using the latest technologies have less than two years of production history, the impacts of recent technology advances on the estimate of future recovery cannot be fully ascertained.[5]
- Data suggest that wells have a high initial production rate that declines rapidly in the first 36 months. Wells then maintain stable productivity for decades. If these decline rate assumptions are incorrect, actual production may be greater than or less than forecasted production.
- There are numerous factors that will place constraints on development in the Bakken, including: damage to road infrastructure due to the volume of truck traffic; practical considerations such as need for increased housing, utilities, and social welfare; increased burden on government agencies to complete drilling and other project application reviews; and increased need for resources.
- If gas flaring variances are not extended beyond December 2013, future production may be constrained.
- There is evidence that a shortage of skilled workers is developing as the workforce ages and overall demand for labor increases. Many of the oil and gas industry's most experienced and skilled workers will be retiring in the next decade. This challenge is being addressed through a number of government and industry initiatives, but a potential labor

[5] EIA AEO 2013 at www.eia.gov/forecasts/aeo.

shortage may increase construction costs and the pace of oil development.

- Industry and governments in many jurisdictions are currently examining issues related to multi-stage hydraulic fracturing. These include the amount of fresh water used in the fracturing process, maintaining the separation between fracturing fluids and ground water, and the chemical composition and safe disposal of fracturing fluids. There is potential for these developments to affect the pace and level of production.

E. considering the forecast, a discussion of other facilities, if any, planned by the applicant to supply the forecast demand.

The forecasted demand for capacity to transport the oil produced in the Bakken Formation requires a solution designed to meet the current confirmed near-term needs of crude oil shippers. At this time, EPND has no other expansion projects being developed other than the Project described herein. Upon completion of this Project, EPND will have 580,000 bpd of pipeline export capacity, linking the Williston Basin production volumes to premium markets throughout the Midwest and East Coast via EPND's affiliated Enbridge Mainline System and other interconnecting third-party pipeline companies.

Enbridge has a number of expansion projects underway on its mainline system. Details of these projects are on Enbridge's website through links on www.enbridge.com.

7853.0530 DESCRIPTION OF PROPOSED FACILITY

Subpart 1. Design. The applicant shall provide the following information pertaining to the design of the proposed construction of a large petroleum pipeline:

A. if known, the complete name and address of the engineer and firm to be responsible for the design:

Company Engineering Managers	
Barry Simonson	Greg Schelin
Enbridge Energy, Limited Partnership	Enbridge Energy, Limited Partnership
1409 Hammond Ave., Ste. 200	1409 Hammond Ave., Ste. 200
Superior, WI 54880	Superior, WI 54880

B. the estimated tariffs, capital cost, annual operating and maintenance costs, and economic life;

B.1. Estimated Tariff

As an interstate common-carrier of crude oil and natural gas liquids, the applicable rates, tariffs, and accounting practices for the pipeline are subject to the regulatory authority of the FERC under the Interstate Commerce Act. EPND plans to file its tariff for the Project approximately 60 days prior to placing the facilities in-service. Additionally, the current EPND tariffs are available on the FERC website and are also posted on the company web site at http://www.enbridgeus.com/Informational-Postings/North-Dakota/North-Dakota-Tariffs-and-Tolls/ no less than 30 days prior to the pipeline going into service.

B.2. Capital Cost

EPND estimates the cost of constructing the proposed 24- and 30-inch pipeline to be $2.6 billion, including $1.2 billion in Minnesota.

B.3. Operating and Maintenance Costs

The EPND System has an established operation and maintenance program and will share other expenses, including labor costs, with Sandpiper. EPND expects any new operating and maintenance expenses to be vastly less than the operation expenses and cost of additional labor associated with alternatives to the Project, such as rail or truck transportation, as detailed in Section 7853.0540. The cost of the Project, including operating

and maintenance costs, will be recovered through the tariff filed with FERC no less than 30 days prior to the pipeline going into service.

Further, EPND does not yet have the final cost of the Project, only the estimates disclosed in this Application. The tariff will be filed with the FERC no less than 30 days before the Project is placed into operation. Including a preliminary FERC filing at this time would prejudice EPND's future filing with the FERC, which has exclusive jurisdiction over the tariff.

B.4. Economic Life

The anticipated economic life for the Sandpiper Pipeline Project will be no less than 30 years.[1]

C. a list of the categories of petroleum products the large pipeline is intended to transport;

Sandpiper is expected to transport Light Sweet Crude Oil.

[1] The economic life of a pipeline or pump station is not the same as the physical life of the facility, which is indefinite with proper construction and maintenance practices.

D. its initial and ultimate design capacities in barrels per day, its diameter, length in Minnesota, maximum number of pumping stations in Minnesota, and nominal station spacing; and

Table 7853.0530-1-D.1
Sandpiper Pipeline Project Capacity Definitions

		24" Pipeline from Berthold, ND Clearbrook, MN (bpd)	30" Pipeline from Clearbrook, MN to Superior, WI (bpd)
Ultimate Capacity	Maximum economic expansion capacity of individual line. Requires additional pumping horsepower over current design to meet this capacity	406,000	711,000
Ultimate Annual Capacity	Maximum economic expansion capacity of individual pipeline that is sustainable average daily rate per day over a year	365,000	640,000
Initial Design Capacity	Theoretical capacity	250,000	417,000
Initial Annual Capacity (90%)	Average sustainable rate: average barrels per day over a year (90% of Design Capacity)	225,000	375,000

Length in Minnesota:

The Project length will be 299 miles in Minnesota.

Maximum number of pumping stations:

EPND plans to install one new pump station near Clearbrook, Minnesota.

Nominal station spacing:

The distance from the North Dakota/Minnesota border to the Clearbrook Station is approximately 75 miles. The distance from the Clearbrook Station to the Minnesota/Wisconsin border is approximately 224 miles.

E. Engineering data, including the following:

E(1). a pipeline system map showing the route, mileage, location of pumping stations, mainline valves, petroleum storage facilities and interconnections;

As depicted on the route maps (see Exhibit G.5 of the EIR), in Minnesota the preferred route follows the EPND System from the North Dakota border south of Grand Forks, North Dakota to Clearbrook, Minnesota. The preferred route then turns south and generally follows the existing Minnesota Pipe Line Company right-of-way to Hubbard, Minnesota. From Hubbard, the preferred route turns east, following parts of existing electrical transmission and railroad lines, including some greenfield parcels, before terminating in Superior, Wisconsin. The preferred route in Minnesota traverses Polk, Red Lake, Clearwater, Hubbard, Cass, Crow Wing, Aitkin, and Carlton counties.

As stated above, one new pump station will be installed near Clearbrook, Minnesota. Station plat maps depicting the location of the new pump station are included in Appendix G.3 of the EIR.

Approximately 15 mainline valves will be installed in Minnesota. The preliminary engineering design complies with industry standards, federal regulations, and the operational needs of the EPND System. Valves will be near major rivers, other environmentally sensitive areas, population centers, and pumping stations. Proposed valve locations are depicted on the attached route maps (see Appendix G.5 of the EIR). The number and location of the valves may change as a result of a detailed engineering study currently underway.

In Minnesota, the only interconnection with other pipeline systems will be located at Enbridge's existing Clearbrook Terminal, where the existing EPND System delivers crude oil into the Minnesota Pipe Line Company System (see Appendix G.3 of the EIR). EPND's existing Line 81 currently makes crude oil deliveries via this interconnection and Sandpiper will provide redundant service for the Line 81 deliveries. This connection allows crude oil deliveries to Minnesota refineries.

E(2). specifications for pipe (diameter, length, wall thickness, grade) and valves (diameter and American National Standards Institute rating) with the maximum allowable operating pressure for each;

Table 7853.0530-1-E.2-1
Sandpiper Pipeline Project Pipe Specifications

Explanation	ND Border to Clearbrook, MN	Clearbrook, MN to WI Border
Diameter	24-inch outside diameter (NPS 24)	30-inch outside diameter (NPS 30)
Length	75 miles	224 miles
Wall Thickness	0.375 inch	0.469 inch
Coating	Fusion Bond Epoxy	Fusion Bond Epoxy
Specified Minimum Pipe Yield Pressure	1,480 psig	1,480 psig
Grade	X70 Carbon steel pipe manufactured according to American Petroleum Institute (API) Specifications 5L PS2	X70 Carbon steel pipe manufactured according to American Petroleum Institute (API) Specifications 5L PS2

Table 7853.0530-1-E.2-2
Sandpiper Pipeline Project Valve Specifications

Explanation	ND Border to Clearbrook, MN	Clearbrook, MN to WI Border
Diameter	24-inch outside diameter (NPS 24)	30-inch outside diameter (NPS 30)
ANSI Rating	ANSI Class 600	ANSI Class 600

The valves to be installed will be 24-inch and 30-inch ANSI 600, weld end by weld end, full port, rising stem gate valves. These valves will be manufactured in accordance with API Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service". The MAOP of the valve will be 1,480 psig.

E(3). for the pumps, representative specifications including diameter, allowable maximum operating pressures, and maximum capacities; and

As stated in Section 7853.0230, EPND proposes to install new pumping units at the pump station near Clearbrook, Minnesota. The specifications of the proposed new unit are provided in Table 7853.0530-1-E.3:

Table 7853.0530-1-E.3
Sandpiper Pipeline Project Pump Station Specifications
Clearbrook Pump Station

Unit	Inlet Diameter (Inches)	Impeller Diameter (Inches)	Pump Maximum Allowable Operating Pressure (psig)	Maximum Annual Capacity (kbpd)	Maximum Power Capacity of Motors (hp)
1	24	28.45	1,480	640	5,500
2	24	28.45	1,480	640	5,500
3	24	28.45	1,480	640	5,500
4	24	28.45	1,480	640	5,500

E(4). for the prime movers, representative specifications including type, allowable maximum power capacity in horsepower, efficiency, allowable maximum and minimum operating temperatures, and energy requirement in Btu per barrel per mile of petroleum product pumped.

The maximum power capacity of the prime movers is shown in Table 7853.0530-1-E.3. All prime movers are 4,160 volt, three-phase electrical motors. The minimum design efficiency of these motors is 96% at 100% load. They are designed to operate (both start and run) at ambient temperatures of 104°F to -49°F. The energy requirement to operate these motors is approximately 13 Btu/barrel/mile. This is based on an annual throughput of 375,000 bpd for the 30-inch pipeline.

Subpart 2. Construction

The applicant shall provide the following information pertaining to the proposed construction of the facility:

A. if known, the complete name and address of the company to be responsible for the construction;

The construction contractor(s) will be determined by competitive bid, considering only qualified mainline pipeline contractors.

B. the proposed date for commencement of construction and the proposed in-service date; and

Construction is anticipated to commence in the fourth quarter of 2014, and to be complete on or before the first quarter of 2016. The proposed in-service date is the first quarter 2016.

C. an estimate of the in-service date if the construction were to be on a fully expedited basis.

If construction were on a fully expedited basis, the estimated in-service date is fourth quarter 2015.

Subpart 3. Operation.

The applicant shall provide the following information pertaining to the operation of the proposed facility:

A. the expected average percentage of use of the full design capacity of the proposed facility during each of the five years of operation;

EPND expects that the annual capacity will be fully utilized over each of the first five years of operation.

B. the expected maximum operating pressure and capacity of the proposed facility at peak demand;

The maximum annual flow capacity is 225,000 bpd and 375,000 bpd (west and east of Clearbrook, respectively) using a MAOP of approximately 1,480 psig at the Clearbrook pump station. Controls are in place so that the mainline MAOP is not exceeded.

C. the expected power requirement from the prime movers at each station at peak demand (in kilowatts, thousands of cubic feet per hour, or gallons per hour);

One new pump station will be installed near Clearbrook, Minnesota. The expected power requirement from the prime movers at this station at peak demand is:

Table 7853.0530-3-C.1
Power Requirement for the Prime Movers

Minnesota Station	Power Requirement (MVA)
Clearbrook	8,950

D. a list of expected sources of supply or shippers of petroleum products for transportation during the first five calendar years of operation, designated either as in-state or as out-of-state, the expected dates and durations of the contracts with the 25 largest suppliers or shippers, the categories of petroleum products and quantities expected to be involved, and for sources of crude oil, the expected geographical areas of origin of the crude oil; and

All of the crude oil that will be transported on Sandpiper originates outside Minnesota. The pipeline will be an open access common-carrier pipeline. Through an open season process, Sandpiper will enter into contracts with shippers for a specified capacity to be transported (or paid for) over a 10-year term. The remaining capacity will be offered on a month-to-month basis and each month shippers will nominate the crude oil volumes they seek to transport. The tolls and tariff will be subject to FERC's approval. The primary geographical source for the light sweet crude oil, referenced in Subpart 1(C) above, is the Williston Basin region of North Dakota.

E. a list of expected recipients of the transported petroleum products during the first five calendar years of operation, designated either as in-state or as out-of-state, the expected dates and durations of the contracts with the 25 largest recipients, and the categories of petroleum products and quantities expected to be involved.

As a common carrier pipeline, the recipients of the crude oil transported by the Project could be any number of directly or indirectly connected refineries shown in Table 7853.0240-C.1 in Section 7843.0240. The product type is described above in 7853.0530 Subpart 1.C. The Project

will have interconnecting facilities at Clearbrook, so a portion of the volume transported can be redirected through the Clearbrook Terminal and into Minnesota Pipe Line facilities as redundant service for EPND's existing Line 81 to better serve Minnesota refineries. There are no other points of receipt or delivery in the State of Minnesota. Table 7853.0510-1-B.1 provides the historical in-state and out-of-state crude oil deliveries on an annual average basis.

7853.0540 ALTERNATIVES

The applicant shall provide information pertaining to the alternatives that have been considered, and the information shall be presented in the following format:

A. a description of the alternative, including:

(1) a discussion of the design and the geographical area affected;

(2) an estimate of the in-service date;

(3) a discussion of the method of operation;

(4) its costs;

(5) its economic life; and

(6) its reliability; and

EPND performed an alternative analysis that involved consideration of environmental, engineering and economic factors. The alternatives to the Project that were considered are discussed below. Additional information on these alternatives can be found in Section 2.0 of the EIR.

A. Sandpiper Project

The Sandpiper Pipeline Project is a new 612-mile, 24-inch and 30-inch diameter crude oil pipeline that expands the capacity of the EPND System. The Project will transport crude oil from EPND's Beaver Lodge Station, south of Tioga, North Dakota to Clearbrook, Minnesota and then on to an existing EPND affiliated terminal in Superior, Wisconsin. The Project will provide capacity in a timely manner, as required by the market to meet the transportation capacity requirements of domestic oil producers and the refined product needs of the public served by the refineries that will process the crude oil transported by the Project.

To review reasonable alternatives to building the Project, it is important to review the scope of the Project against which each alternative needs to be compared.

- Ability to Utilize and Follow Existing Pipeline and Utility rights-of-way. Approximately 360 miles of pipeline is located generally along an existing pipeline right-of-way and pre-disturbed rights-of-way across North Dakota, Minnesota, and Wisconsin. Of that total, approximately 212 miles are co-located in Minnesota.
- Five pump stations, booster pumps, and manifold connections in North Dakota and Minnesota. Of these, one is located in Minnesota near Clearbrook.

- Integration at Clearbrook, Minnesota for delivery of an annual capacity of 60,000 bpd as redundant service for EPND's existing Line 81 and receipt of 150,000 bpd from the existing Line 81 for transportation to Superior.
- Ability to interconnect new pipeline facilities at the Superior Terminal with other petroleum pipelines east and south of Superior to maximize potential markets served and flexibility for shippers.

EPND investigated a number of alternatives, including other pipeline projects under development and alternate transportation modes, before determining that the Project was the most economic and feasible expansion available to provide flexibility and capacity out of the Bakken and into Midwest and East Coast markets.

A.1. No-Action Alternative

The Project objectives would not be met under the No-Action Alternative. In light of the overall increase in Bakken production and the need to increase pipeline capacity, the "no-action" alternative is unacceptable to EPND and to the petroleum-consuming public, which requires secure and reliable sources. EPND, its shippers, and residents of Minnesota and neighboring states will be negatively impacted without the capacity expansion afforded by this Project. The "no-action alternative" is not an option as EPND would not be able to meet its shippers' near-term or future transportation requirements.

A No-Action alternative would require producers and shippers to seek other transportation means that are less safe and more costly than the proposed pipeline or reduce production of petroleum-based products. The only other alternatives for shippers delivering into the EPND System would be to (1) truck or rail all or portions of the increased Bakken production to refineries outside North Dakota with attendant problems noted below or (2) transport crude oil on non-EPND pipeline systems that are also at capacity, and thus, would require new pipe or facilities to be constructed.

While the No-Action alternative would avoid environmental impacts on the Project's route because EPND would not construct the Project, other companies would likely construct similar projects or rail transportation through Minnesota would quickly increase because of the known demand for transportation capacity out of the Bakken formation. These alternative projects could require the construction of additional and/or new pipeline facilities in the same or other locations in order to transport the crude oil volumes proposed for Sandpiper. These projects would generate environmental impacts that would likely be equal to or greater than those described for the Project.

The crude oil produced in the Bakken Formation could continue to be shipped by rail or truck; those alternatives, however, have their own significant environmental impacts as discussed below.

A.2. Plains Bakken North Pipeline Project

A.2.(1) a discussion of the design and the geographical area affected;

On November 3, 2010, Plains All American Pipeline L.P. ("PAA") announced its plans to reverse its Wascana pipeline system and build a new pipeline, Bakken North, to provide additional takeaway capacity for growing Bakken crude production.

The Bakken North pipeline, consisting of approximately 79 miles of new 12-inch diameter pipeline, extends from Trenton, North Dakota to the southern terminus of Plains' Wascana System, located approximately 2.5 miles north of the town of Outlook in Sheridan County, Montana. The new pipeline will have an initial design capacity of 48,000 bpd, with a maximum capacity of up to 75,000 bpd. PAA plans to reverse the flow of its Wascana System in order to provide further transportation service to Regina, Saskatchewan. At Regina, PAA connects to third-party carriers providing access to Cushing, Oklahoma and PADD 2 delivery points.

Public information about the project can be found on its website at http://www.paalp.com. The website also provides links to news releases.

A.2.(2) an estimate of the in-service date;

No in service date is available. North Dakota Public Service Commission filings show construction completed in late 2012. EPND is not aware if the pipeline has been placed in service as of this date.

A.2.(3) a discussion of the method of operation;

As an interstate common carrier crude oil pipeline, Bakken North will be operated and maintained in accordance with extensive federal and state regulations, specifically 49 C.F.R. Parts 194 and 195 of the PHMSA Rules and Regulations, and any applicable national technical standards.

A.2.(4) its costs;

In the public announcement, PAA estimates the project cost (to the 75,000 bpd capacity) at $160-200 million.

A.2.(5) its economic life; and

Current information is not available to EPND. Based on the current production forecast from the Bakken region, EPND estimates the project life would be approximately 30 years.[1]

A.2.(6) its reliability.

EPND assumes that the new pipeline will be constructed, operated and maintained in accordance with all applicable federal/state rules and regulations and industry standards as an interstate common carrier crude oil pipeline.

A.3. High Prairie Pipeline Project

A.3.(1) a discussion of the design and the geographical area affected;

The proposed High Prairie Pipeline Project would consist of approximately 450 miles of new 16-inch diameter pipeline, beginning north of Alexander, North Dakota in McKenzie County and ending near Clearbrook, Minnesota in Clearwater County. High Prairie is also proposing to construct two laterals: a 17-mile lateral originating at Johnsons Corner, North Dakota in McKenzie County and connecting with the High Prairie Pipeline, and an 8-mile lateral beginning near Robinson Lake, North Dakota in Mountrail County and connecting with the High Prairie Pipeline. The new pipeline will have an initial design capacity of 150,000 bpd and end at Clearbrook, Minnesota. Public information about the project can be found on its website at http://www.sbpipeline.com. The website also provides links to news releases.

A.3.(2) an estimate of the in-service date;

The anticipated in-service date is the fourth quarter of 2013; however, EPND is not aware that construction has commenced as of this date.

A.3.(3) a discussion of the method of operation;

As an interstate common carrier crude oil pipeline, High Prairie will be operated and maintained in accordance with extensive federal and state regulations, specifically 49 C.F.R. Parts 194 and 195 of the PHMSA Rules and Regulations, and any applicable national technical standards.

A.3.(4) its costs;

The estimated cost is $650 million.

[1] The economic life of a pipeline or pump station is not the same as the physical life of the facility, which is indefinite with proper construction and maintenance practices.

A.3.(5) its economic life; and

Current information is not available to EPND. Based on current production forecast from the Bakken region, EPND estimates the project life would be approximately 30 years.

A.3.(6) its reliability.

EPND assumes that the new pipeline will be constructed, operated and maintained in accordance with all applicable federal/state rules and regulations and industry standards as an interstate common carrier crude oil pipeline.

A.4. Koch Pipeline Company Dakota Express Pipeline

A.4.(1) a discussion of the design and the geographical area affected;

The Dakota Express Pipeline ("Dakota Express") is a proposed pipeline project with a capacity of 250,000 bpd. The proposed pipeline will transport Bakken crude oil from western North Dakota to Hartford, Illinois and Patoka, Illinois. Koch Pipeline Company also intends to explore a connection at Patoka, Illinois, to the Eastern Gulf Crude Access Pipeline, which would be capable of delivering Bakken crude oil to refineries located near the eastern United States Gulf Coast. The new pipeline will be constructed, owned and operated by Koch Pipeline Company. In July 2013, Koch announced a 45-day nonbinding open season to gauge interest from potential shippers in the proposed project.

Public information about the project can be found on its website at http://www.kochpipeline.com. The website also provides links to news releases.

A.4.(2) an estimate of the in-service date;

According to recent news releases, Koch Pipeline Company states an in-service date in 2016.

A.4.(3) a discussion of the method of operation;

As an interstate common carrier crude oil pipeline, Dakota Express will be operated and maintained in accordance with extensive federal and state regulations, specifically 49 C.F.R. Parts 194 and 195 of the PHMSA Rules and Regulations, and any applicable national technical standards.

A.4.(4) its costs;

Current cost information is not available to EPND.

A.4.(5) its economic life; and

Current information is not available to EPND. Based on current production forecast from the Bakken region, EPND estimates the project life would be approximately 30 years.

A.4.(6) its reliability.

EPND assumes that the new pipeline will be constructed, operated and maintained in accordance with all applicable federal/state rules and regulations and industry standards as an interstate common carrier crude oil pipeline.

A.5. Trucking Alternative

There is insufficient truck capacity to transport the total annual capacity of 375,000 barrels of crude oil per day that would be moved by the Project. A trucking alternative would significantly overburden current public road capacity. Even if the truck capacity issue could be resolved, EPND or its shippers would need to expand truck loading/unloading facilities in North Dakota, Minnesota, and Wisconsin. While trucks are a vital part of the crude oil 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 loading/unloading capacity is not known. The reliability of this alternative in northern climates is compromised by periodic restrictions on truck traffic due to winter storms, spring road restrictions, other weather conditions or road weight capacity restrictions.

A.5.(1) a discussion of the design and the geographical area affected;

For the purpose of this analysis, EPND assumes that a trucking company will optimize the use of its trucking fleet to transport the same crude oil volumes as this Project. EPND further assumes that the trucking company will divide its transportation requirements into three individual truck hauls that will make round-trips between specified locations: two beginning at the Beaver Lodge Station near Tioga, North Dakota and ending at Berthold, North Dakota or Superior, Wisconsin and a third that begins at Clearbrook, Minnesota and ends at Superior. To achieve maximum optimization of its trucking operations, EPND also assumes that a fleet of trucks would be scheduled to run round-trip deliveries between the following three locations:

- Leaving Beaver Lodge Station near Tioga, North Dakota to deliver 25,000 bpd at Berthold, North Dakota; returning empty from Berthold back to Beaver Lodge;

- Leaving Beaver Lodge to deliver 225,000 bpd at Superior, Wisconsin; returning empty from Superior back to Beaver Lodge; and
- Leaving Clearbrook, Minnesota to deliver up to 150,000 bpd at Superior Wisconsin; returning empty from Superior back to Clearbrook.

In order to transport the same incremental 25,000 bpd of crude oil from Beaver Lodge to Berthold, 225,000 bpd from Beaver Lodge to Superior, and 150,000 bpd from Clearbrook to Superior as proposed by EPND, a fleet of 4,354 trucks would be required as detailed below:

Computation of Trucking Requirements (Beaver Lodge, ND to Berthold, ND):
Crude oil volumes = 25,000 bpd
Per Truck capacity = 200 barrels per truck
Number of trucks required = 25,000 / 200 = 125 trucks per day
Assume each truck requires loading, in-transit full (0.25 day), in-transit empty (0.25 days) and unloading time
Number of trucks in transit = 125 X 0.25 day = 32 trucks
Number of trucks returning empty = 125 x 0.25 = 32trucks
20% of the in-transit trucks loading and unloading = 13 trucks
Total truck requirements = 32+32+13 = 77 trucks
(ignoring scheduled/unscheduled down time)

Computation of Trucking Requirements (Beaver Lodge, ND to Superior, WI):
Crude oil volumes = 225,000 bpd
Per Truck capacity = 200 barrels per truck
Number of trucks required = 225,000 / 200 = 1,125 trucks per day
Assume each truck requires loading, in-transit full (1.25 days), in-transit empty (1.25 days) and unloading time
Number of trucks in transit = 1,125 X 1.25 days = 1,407 trucks
Number of trucks returning empty = 1,125 x 1.25 = 1,407 trucks
20% of the in-transit trucks loading and unloading = 563 trucks
Total truck requirements = 1,407 +1,407 +563 = 3,377 trucks
(ignoring scheduled/unscheduled down time)

Computation of Trucking Requirements (Clearbrook, MN to Superior, WI):
Crude oil volumes = 150,000 bpd
Per Truck capacity = 200 barrels per truck
Number of trucks required = 150,000 / 200 = 750 trucks per day
Assume each truck requires loading, in-transit full (0.5 days), in-transit empty (0.5 days) and unloading time
Number of trucks in transit = 750 X 0.5 days = 375 trucks
Number of trucks returning empty = 750 x 0.5 = 375 trucks
20% of the in-transit trucks loading and unloading = 150 trucks
Total truck requirements = 375+375+150 = 900 trucks
(ignoring scheduled/unscheduled down time)

In order to facilitate this alternative, significant truck loading and offloading terminal facilities would have to be constructed at Beaver Lodge, North Dakota; Berthold, North Dakota; Clearbrook, Minnesota; and Superior, Wisconsin. In addition, it is likely that substantial upgrades and ongoing maintenance would be required (at public expense) to the connecting roadways along the entire route.

A.5.(2) an estimate of the in-service date;

While it is possible that the terminal facilities could be constructed on the same timeline as the Project, EPND does not have an estimate of the time that would be required to acquire the trucking fleet described above, how long it would take to recruit and train the associated drivers, nor how extensive the roadway upgrade program would be.

A.5.(3) a discussion of the method of operation;

This operation would be highly labor intensive, with a significant workforce required at all terminal locations to meet the constant loading and offloading requirements. This option would require a significant driver pool to maintain the constant movement of the entire truck fleet.

A.5.(4) its costs;

EPND is not aware of any trucking operation capable of transporting on a scale equivalent to this Project that could provide cost comparisons. However, the trucking costs for this alternative could be anticipated to be in the hundreds of millions of dollars per year range (ignoring the costs of maintaining and replacing vehicles over the economic life of the project, fuel, additional overhead costs such as general administration, and necessary public and private infrastructure).

For example, the base capital investment needed to order a fleet of 4,354 trucks for transporting 375,000 bpd of crude oil is estimated to be $870,800,000, assuming each trucking rig would cost approximately

$200,000. Annual wages are estimated to be approximately $384,588,820 which assumes 4,354 drivers are on the road 365 days per year at the rate of $242 per day per driver. This means the initial capital investment for the first year of operation would be $1,255,388,820 for just the fleet of trucks and its drivers. Additionally, the $870,800,000 cost of the 4,354 trucks will be accrued at least 5 more times over the life of the project, assuming the economic life of the truck will not exceed 5 years as discussed in A.5.(5).

A.5.(5) its economic life; and

With mileage that the trucks would incur in steady service, EPND estimates that the economic life of a truck would not exceed 4 to 5 years. The truck loading and unloading terminals would have an estimated economic life of 30 years. EPND does not have an assessment of the impact that this amount of incremental truck traffic would have on the various roadways.

A.5.(6) its reliability.

This operation would be inherently much less reliable than Sandpiper as truck traffic is affected by weather conditions, mechanical failure, manpower (driver shortages), and road maintenance or closures. According to the NTSB, trucks have a significantly higher rate of accidents affecting driver and public safety than pipelines.

Trucking cannot compete with pipelines for volumes over long distances given physical limitations on trucks, roads, and the loading/unloading facilities that are required to sustain operations of this scale. As discussed in 7853.0250, truck hazmat incidents occur more frequently than pipeline accidents.

A.6. Rail Alternative

Sufficient rail tanker car capacity does not exist to transport the incremental annual capacity to be provided by the Project. This alternative would require the construction (by EPND or its shippers) of rail car loading and off-loading facilities. Construction of new lateral aboveground rail service lines would be required and would pose additional risk and impacts to landowners and the public. While rail tanker cars are a vital part of the short-haul distribution network for crude oil, pipelines are a safer and more economic transportation alternative. The potential in-service date of additional truck-to-rail, rail tanker 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 required to deliver crude oil to rail facilities due to winter storms and spring road restrictions or other weather related or road capacity restrictions.

A.6.(1) a discussion of the design and the geographical area affected;

For the purpose of this analysis, EPND assumes rail transportation providers will optimize the use of their rail tank cars to transport the same crude oil volumes as the Project. EPND also assumes that the rail service provider will use long-haul unit or manifest trains with deliveries at intermediate stops between Beaver Lodge Station and Superior, Wisconsin. EPND also assumes that the numerous manifest or unit trains would be required to make the following deliveries equivalent to this Project:

- Leaving Beaver Lodge Station near Tioga, North Dakota with a rail fleet capacity of 250,000 bpd, and the ability to offload deliveries of 25,000 bpd of crude oil supplies at Berthold, North Dakota; no guarantee that empty rail tank cars would return to Beaver Lodge for reloading;
- Leaving Berthold with a rail fleet capacity of 225,000 bpd and the ability to offload entire capacity of rail fleet at Superior, Wisconsin; no guarantee that empty rail fleet would return to Beaver Lodge for reloading; and
- Leaving Clearbrook, Minnesota with a rail fleet capacity up to 150,000 bpd, and the ability to offload entire capacity of rail fleet at Superior, Wisconsin; no guarantee that empty rail fleet would return to Clearbrook for reloading.

In order to transport the same incremental 25,000 bpd of crude oil from Beaver Lodge to Berthold, 225,000 bpd from Beaver Lodge to Superior, and up to 150,000 bpd from Clearbrook to Superior as proposed by EPND, a fleet of rail 2,052 cars would be required as detailed below:

<u>Computation of Railcar Requirements (Beaver Lodge, ND to Berthold, ND)</u>
Crude oil volumes = 25,000 bpd
Rail car capacity = 600 barrels per rail car
Tank cars required = 25,000/600 = 42 rail cars per day
Estimated time to move each rail car from Beaver Lodge to Berthold (various carriers and through various rail assembly yards) = 1 day
Number of cars in transit = 42 X 1 day = 42
Number of cars returning empty = 42 x 1 = 42
20% of the in-transit cars loading and unloading = 17 cars
Total tank car requirements = 42+42+17=101 cars

Computation of Railcar Requirements (Berthold, ND to Clearbrook, MN)
Crude oil volumes = 225,000 bpd
Rail car capacity = 600 barrels per rail car
Tank cars required = 225,000/600 = 375 rail cars per day
Estimated time to move each rail car from Beaver Lodge to Berthold (various carriers and through various rail assembly yards) = 1.5 days
Number of cars in transit = 375 X 1.5 days = 563
Number of cars returning empty = 375 x 1.5= 563
20% of the in-transit cars loading and unloading = 225 cars
Total tank car requirements = 563+563+225=1,351 cars

Computation of Railcar Requirements (Clearbrook, MN to Superior, WI)
Crude oil volumes = 150,000 bpd
Rail car capacity = 600 barrels per rail car
Tank cars required = 150,000/600 = 250 rail cars per day
Estimated time to move each rail car from Beaver Lodge to Berthold (various carriers and through various rail assembly yards) = 1 days
Number of cars in transit = 250 X 1 days = 250
Number of cars returning empty = 250 x 1 = 250
20% of the in-transit cars loading and unloading = 100 cars
Total tank car requirements = 250+250+100=600 cars

Approximately 1,710 rail cars (this includes both full and empty railcars in transit and excludes the 20% loading/unloading) would have to be in route each day, making the roundtrip between Beaver Lodge, North Dakota; Berthold, North Dakota; Clearbrook, Minnesota; and Superior, Wisconsin. In order to facilitate this operation, significant spur lines, rail sidings, and terminal facilities would have to be constructed at Beaver Lodge, North Dakota; Berthold, North Dakota; Clearbrook, Minnesota; and Superior, Wisconsin. In addition, substantial upgrades and ongoing maintenance would be required to the connecting railways.

A.6.(2) an estimate of the in-service date;

More recently, rail deliveries have become more significant due to lack of pipeline capacity to move production to market or the ability for rail to reach market centers that provide a higher net back to producers. For the U.S. as a whole, crude oil deliveries by rail comprised 0.6% of the total deliveries in 2012, which is up five-fold from the 2011 rail deliveries. The current demand for crude-by-rail transportation has resulted in the tank car construction industry being at 100% capacity. Crude shipments by rail are continuing to increase, creating a shortage of supply of new tank cars. According to data from the Freight Transportation Research Associates, available through the Bloomberg service, tank car manufacturers have a

backlog of roughly 47,000 tank car orders. The timeline to process an order and receive delivery of such tank cars is now estimated at 15-18 months.[2] Therefore, EPND concluded that the timeline necessary to manufacture 2,052 new tank cars makes the crude-by-rail alternative no longer a viable option, since it would far exceed the in-service date for this Project. Finally, EPND does not have an estimate of the time required to construct the necessary upgrades associated with the railway infrastructure

A.6.(3) a discussion of the method of operation;

This operation would be highly labor intensive, with a significant workforce required at both terminal locations to allow for the constant loading and offloading requirements and railcar operation.

A.6.(4) its costs;

EPND is not aware of any rail operation on the same scale of this Project that could provide guidance on estimating the capital costs required for rail service of this magnitude. EPND also is unsure if rail carriers have or would provide a joint rail tariff(s) for the service contemplated. The rail costs for this alternative could be anticipated to be in the hundreds of millions of dollars per year (without considering the costs of new rolling stock and infrastructure facilities necessary). For example, the base capital investment needed to order a fleet of 2,052 tank cars is estimated to be $285,228,000. This estimate is based on the latest specific new-build prices that range from $139,000 to $143,000 for a 25,500 gallon/600 barrel coiled/insulted tank car.[3] Therefore, an initial capital investment of $285.2 million would be needed to move 375,000 bpd by rail. This cost estimate does not include new rail infrastructure, railway maintenance, labor costs, fuel, or other associated expenses.

A.6.(5) its economic life; and

With mileage that the cars would incur in steady service, EPND estimates that the economic life of a rail car would not exceed 10 to 15 years. The rail loading and unloading terminals would have an estimated economic life of 30 years.

A.6.(6) its reliability.

This operation would be inherently much less reliable than Sandpiper. The entire operation would be subject to weather related delays, delays caused by scheduling conflicting rail traffic, and a significant mechanical/maintenance requirement based on the number of rail cars involved in this operation.

[2] http://wire.kapitall.com/investment-idea/tank-car-manufacturers-to-benefit-from-crude-by-rail.
[3] http://www.rbnenergy.com/i-can-see-for-miles-and-miles-and-miles-and-miles-tank-cars, Page 2.

The transportation of crude oil by rail has increased due to the urgent need for additional pipeline infrastructure and transportation capacity. However, EPND's transportation cost analysis indicates that pipeline transport is roughly 60% of the cost of rail transport. Additionally, rail accidents result in fires and/or explosions about 2 times more frequently per barrel of oil transported per mile.[4]

B. a summary of the conclusions reached with respect to the alternative and the reason for its rejection.

Based on the forecast of demand and supply for crude oil discussed in Section 7853.0240, EPND has determined, and shippers have supported, the need to construct the Sandpiper Pipeline Project to meet the increasing demand for additional pipeline capacity from the Williston Basin region.

EPND evaluated the various alternative transportation options which are limited to rail, truck and pipelines. Based on factors considered for each alternative, it was determined that:

- "No-Action" Alternative: Not acceptable to EPND and its shippers because additional pipeline capacity is needed to meet shippers' current and future transportation requirements in a timely, safe, and economical manner.
- Alternate Pipeline Systems: Based on the supporting forecast studies discussed in Section 7853.0540 of this Application, EPND determined that Sandpiper and other potential pipeline projects are not competing for the same production volumes, and are needed to meet the market demand for additional pipeline export capacity. New and increasing production volumes will be apportioned if additional pipeline capacity is not available, or shippers would seek other modes of transportation to market. These other methods, such as truck or rail, are more costly to producers, based on the current pricing at key marketing hubs, and are less reliable with increased safety risks.

  Pipelines still remain the safest and most cost-effective modes of transporting crude oil to market. According to EIA data, over the last 10 years, pipelines have made 99.4% of the total crude oil deliveries to PADD 2 refineries. In 2012, pipelines delivered 98.5% of the total crude oil processed by PADD 2 refineries.
- Truck and Rail: Alternative modes of transportation, such as trucking and rail options are cost-prohibitive and impose higher public safety and environmental costs than the Project.

[4] Source: *Allegro Energy Group as posted on the Association of Oil Pipelines website,* comparison was based on calculated rates per ton-mile.

EPND concluded that this Project provides a cost effective and efficient system that will:

- provide a long-term transportation solution for moving Bakken and Three Forks production to Midwest and East Coast refineries and marketing hubs;
- increase the pipeline capacity of the EPND System from Beaver Lodge, North Dakota to Superior, Wisconsin to meet the current and future transportation requirements of EPND's shippers;
- provide redundant capacity for deliveries from the existing Line 81 at Clearbrook, Minnesota;
- help reduce the current reliance on long haul truck deliveries and rail transportation options; and
- help reduce the transportation costs borne by Williston Basin producers who currently must resort to non-pipeline transport options, allowing their savings to be immediately re-directed towards further development of oil and gas resources.

As proposed, this Project minimizes environmental impacts to the extent possible and, when integrated with the existing EPND System, provides the safest, most efficient and cost-effective alternative to bridge the gap between the growing demand for crude oil supplies in the Midwest and East Coast and the increased and reliable domestic supplies from North Dakota. Thus, all other alternatives discussed herein were rejected.

EPND next evaluated route alternatives, a discussion of which is included in Section 2.0 of the EIR.

7853.0600 INFORMATION REQUIRED

Each applicant shall provide environmental data for the proposed facility and for each alternative discussed in response to part 7853.0540, to the extent that such data is reasonably available. Environmental data for each pipeline considered shall conform to the format given in parts 7853.0600 to 7853.0640. Information for each of the other types of alternatives considered shall include:

A. a list of the natural and cultural resources, as given in part 7853.0610, subpart 2, items G to K, that would be directly impacted; and

General information reasonably available for direct impacts to natural and cultural resources from the alternatives discussed in Section 7853.0540 is provided below.

A.1. No-Action Alternative

The no-action alternative would have no environmental impact along the Project's route. This alternative, however, will not meet the needs of EPND's shippers and will not meet the public demand for safe and economical increased, secure supplies of crude oil to be refined into products in high demand. It also is likely that another pipeline company would develop a similar project because of the established demand for transportation capacity out of the Bakken formation. These other projects would likely have similar or greater environmental impacts than those resulting from Sandpiper.

A.2. Alternate Pipeline Projects

A.2.1. Plains Bakken North Pipeline Project

Detailed route maps of the Plains Bakken North Pipeline are not publicly available for the entire project at this time. Route maps for the North Dakota portion of the project are available through the North Dakota Public Service Commission. Because the entire project route is not available, EPND is not able to completely quantify the natural and cultural resources that would be directly impacted. It is highly likely that the Plains Bakken North Pipeline would cross: lakes, streams and wetlands; transportation routes; and state-owned or -managed lands and resources. It also is possible that the pipeline would cross resources of national interest.

A.2.2. High Prairie Pipeline Project

Detailed route maps of the proposed High Prairie Pipeline Project are not publicly available at this time. Therefore, EPND is not able to quantify the natural and cultural resources that would be directly impacted. Based on publicly available documents, the High Prairie Pipeline would likely impact the same resources as the Project between the North Dakota border and Clearbrook, Minnesota.

A.2.3. Koch Pipeline Company Dakota Express Pipeline

Maps of the proposed Dakota Express Pipeline are not publicly available at this time. Therefore, EPND is not able to quantify the natural and cultural resources that would be directly impacted. It is highly likely that the Dakota Express Pipeline would cross: lakes, streams and wetlands; transportation routes; and state-owned or –managed lands and resources. It also is possible that the pipeline would cross resources of national interest.

A.3. Trucking Alternative

Table 7853.0600-A.3 lists the number of trucks that would be needed to transport the same incremental 25,000 bpd of crude oil from Beaver Lodge to Berthold, 225,000 bpd from Beaver Lodge to Superior, and 150,000 bpd from Clearbrook to Superior as proposed by EPND.

Table 7853.0600-A.3
Total Truck Requirements

	Crude oil volume (bpd)	Number trucks in transit	Number trucks returning empty	Number trucks loading and unloading	Total truck requirements
Beaver Lodge, ND to Berthold, ND	25,000	32	32	13	77
Beaver Lodge, ND to Superior, WI	225,000	1,407	1,407	563	3,377
Clearbrook, MN to Superior, WI	150,000	375	375	150	900
				TOTAL	4,354

As discussed in Section 7853.0540, moving the volumes of crude oil proposed by the Project could place an additional 3,628 trucks and trailers (this includes both full and empty trucks and trailers in transit and excludes the 20% loading/unloading) on the roads of North Dakota, Minnesota and Wisconsin around the clock, every day of the year. The environmental impacts of this alternative would include fugitive emissions from thousands of semi-tractors in constant operation. In addition, the vastly increased vehicle traffic on roads would be extremely disruptive to the populace and wildlife of the region. Finally, new unloading facilities would be required at the Superior Terminal.

EPND cannot describe the natural and cultural features that would be impacted by this alternative because of the varying routes that trucks could travel between Beaver Lodge, North Dakota and Superior, Wisconsin. Additional information is not immediately available.

A.4. Rail Alternative

Moving the same volume of crude oil by rail could require the construction of a new railroad link in Minnesota, including loading/unloading facilities in North Dakota, Minnesota, and Wisconsin and rail car unloading facilities in Minnesota or Wisconsin. A rail alternative in Minnesota that meets the same objectives as the Project would, at a minimum, require full rail transportation from western Minnesota to eastern Minnesota, new rail facilities at Clearbrook, and possibly requiring new or improved rail lines.

Table 7853.0600-A.4 lists the number of rail cars that would be needed to transport the same incremental 25,000 bpd of crude oil from Beaver Lodge to Berthold, 225,000 bpd from Beaver Lodge to Superior, and 150,000 bpd from Clearbrook to Superior as proposed by EPND.

If loading or unloading were to occur in Minnesota, the construction necessary for such loading and unloading facilities would require new land acquisition. The construction process would have environmental impacts, as would the constant flow of rail cars once the railroad link was placed into operation. At any one time, 1,710 (this includes both full and empty railcars in transit and excludes the 20% loading/unloading) rail cars transporting crude oil could be in transit through North Dakota, Minnesota, and Wisconsin (see Table 7853.0600-A.4). Environmental impacts of this alternative would likely

include habitat and wetland loss during the construction of the rail link and the fugitive emissions from constant train engine operation.

Table 7853.0600-A.4
Total Rail Requirements

	Crude oil volume (bpd)	Number rail cars in transit	Number rail cars returning empty	Number rails cars loading and unloading	Total rail car requirements
Beaver Lodge, ND to Berthold, ND	25,000	42	42	17	101
Beaver Lodge, ND to Superior, WI	225,000	563	563	225	1,351
Clearbrook, MN to Superior, WI	150,000	250	250	100	600
				TOTAL	2,052

Impacts to natural and cultural features cannot be described because EPND has not identified a feasible rail route through Minnesota, or preferred loading and unloading options. Acquiring this information would be unreasonable under the current circumstances.

It is also possible that this rail traffic would follow other, existing routes through Minnesota if the shippers do not choose to utilize the Enbridge mainline system at Superior, Wisconsin.

B. a discussion of those applicable areas of environmental concern that are detailed in parts 7853.0620 to 7853.0640.

Environmental data for the Project is provided in Sections 7853.0620 to 7853.0640.

Some detailed environmental information regarding the alternatives analyzed in Section 7853.0540 of this application is not reasonably available to EPND

due to the scope of the alternatives. However, what information is available is presented in the following subsections.

B.1. No-Action Alternative

The no-action alternative would not create any environmental impacts. This alternative, however, will not meet the needs of EPND's shippers and will not meet public demand for increased, secure supplies of crude oil. It also is likely that another pipeline company would develop a project because of the known demand for transportation capacity out of the Bakken formation. These other projects would likely have similar or greater socioeconomic and environmental impacts than those resulting from Sandpiper.

B.2. Alternate Pipeline Projects

For all environmental impacts presented below, impacts of the Bakken North Pipeline, High Prairie Pipeline, and Dakota Express Pipeline would be similar in nature to those of Sandpiper, as they are all linear pipeline projects. Please see Sections 7853.0620, 7853.0630, and 7853.0640 of this Application for additional discussion of the environmental data presented for the proposed Project. However, because the specific location of the Alternate Pipeline Projects is not known definitively, EPND cannot assess or conduct a comparative analysis of the environmental impacts.

B.2.a. Wastewater, Air Emissions and Noise Sources

<u>Point Discharges to Water</u>

The Alternate Pipeline Projects would create point discharges to water for trench dewatering and hydrostatic test discharges, similar to Sandpiper. Discharges also may result from releases. Because there is not publicly-available information on the Alternate Pipeline Projects, EPND cannot quantify the location or amount of such discharges. It is likely that Alternate Pipeline Projects would prepare documents to specify steps to control discharges. In addition, the Alternate Pipeline Projects would likely develop release plans to identify the precautions and measures to be taken in the event of a release. The Alternate Pipeline Projects would be required to obtain state and potentially federal permits related to water discharges.

Area Runoff

Construction stormwater runoff would occur as a result of the Alternate Pipeline Projects and would be received by waterbodies along their respective routes, similar to Sandpiper. The Alternate Pipeline Projects would likely implement necessary erosion control measures during and after construction, where appropriate, to minimize erosion and sedimentation, as well as surface runoff from the facility. The Alternate Pipeline Projects would be required to obtain state and potentially federal permits related to stormwater management.

Point Sources of Airborne Emissions

Construction of the Alternate Pipeline Projects and associated facilities would result in intermittent and short-term fugitive emissions similar to Sandpiper. These emissions would include dust from soil disruption and combustion emissions from the construction equipment. The fugitive dust emissions would depend on the moisture content and texture of the soils that would be disturbed. In addition, associated facilities (i.e., terminals and pump stations) may be subject to state air permitting requirements found in Minnesota Administrative Rules Chapter 7007. New facilities may contribute to an increase in emissions, similar to the proposed Project.

Noise

The heavy equipment needed to construct the Alternate Pipeline Projects would have a short-term impact on noise levels in the vicinity of the construction right-of-way. Typical pipeline construction equipment (e.g., bulldozers, loaders, backhoes and sideboom tractors) generate between 80 to 90 decibels within 50 feet of the equipment. Noise would not be generated along the pipeline right-of-way during normal operation; however, new terminals or pump stations associated with the project would result in additional noise in the immediate vicinity of the facility.

B.2.b. Pollution Control and Safeguards Equipment

Air Pollution Controls

Construction of the Alternate Pipeline Projects and associated facilities would result in intermittent and short-term fugitive emissions. These emissions would include dust from soil disruption and combustion emissions from the construction equipment. Emissions from the gasoline and diesel engines would be minimized because the engines must be built to meet the standards for mobile sources established by the Environmental Protection Agency (“EPA”) mobile source emission

regulations. It is likely that the Alternate Pipeline Projects would implement control measures to minimize these emissions, similar to Sandpiper.

Water Pollution Controls

The Alternate Pipeline Projects would likely develop standardized erosion control and restoration measures to minimize and mitigate potentially adverse environmental effects resulting from right-of-way preparation, construction, operation, and maintenance of the respective projects. The Alternate Pipeline Projects also would likely comply with applicable federal, state, and local rules and regulations and take appropriate precautions to protect against pollution of the environment. In addition, the Alternate Pipeline Projects would likely retain their own Environmental Inspectors (along with third-party Environmental Inspectors reporting to federal and/or state regulatory agencies) to verify that environmental protection measures, environmental permit conditions, and other environmental specifications are implemented appropriately by the contractor during construction.

Oil Release, Fire, and Explosion Safeguards

The Alternate Pipeline Projects would likely develop standardized emergency response measures to prevent and plan response for oil releases, fires, or explosions related to operation of the respective projects. The pipelines would be subject to similar federal and state oversight as the proposed Project, and the Project sponsors would require their workers and contractors to be trained in appropriate recognition and response techniques.

Other Safeguards and Controls

EPND is not aware of any other safeguards and controls that would be implemented by the Alternate Pipeline Projects because other safeguards and controls (in addition to those listed above) are company-specific.

B.2.c. Induced Developments

Utility Use

Because detailed information about the Alternate Pipeline Projects is not available, EPND is not aware if operation of the pipelines and associated facilities would require new utilities or additional electric utility infrastructure.

Water Use

It is likely that the Alternate Pipeline Projects would require hydrostatic testing of the new pipelines and any associated tankage to verify integrity prior to placing the facilities in service. The Alternate Pipeline Projects would be required to obtain state and potentially federal permits for water appropriation and discharge.

Vehicular Traffic

Similar to the proposed Project, short-term impacts on local transportation systems would result from construction of the Alternate Pipeline Projects across roads and railroads; movement of construction equipment and material to work areas; and daily commuting of the construction workforce to work sites. Some increased traffic would likely occur in localized areas for operational activities, but these instances would likely be infrequent and of short duration.

Agriculture

It is highly likely that the Alternate Pipeline Projects would cross agricultural land, including cultivated and pasture land. The pipelines would require excavation in agricultural lands and would likely cross farms and drainage ditches.

Construction activities would likely temporarily utilize active cropland within construction work areas. Construction activities also would interfere with center-pivot irrigation systems, planting or harvesting, depending on the construction season. Agricultural land in the construction right-of-way would generally be taken out of production for one growing season and would be restored to previous uses following construction. Landowners likely would be compensated for crop losses and other damages caused by construction activities.

Relocation of Persons

Because detailed information about the Alternate Pipeline Projects is not available, EPND is not aware if the pipeline and associated facilities would result in relocation of persons. However, since construction and operation of the pipeline would likely require acquisition of additional property, the projects could result in the relocation of persons.

B.3. Trucking Alternative

Please see Section 7853.0540, part A.5 of this Application for additional discussion of the trucking alternative.

B.3.a. Wastewater, Air Emissions and Noise Sources

Point Discharges to Water

The trucking system alternative would create point discharges to water at the loading and unloading facilities. Discharges would come from washing vehicles and tank trailers, and may result from releases caused by accidents. EPND cannot quantify the location or amount of such discharges. EPND would prepare an Environmental Protection Plan that would specify steps to ensure correct handling of site stormwater. In addition, a Spill Prevention Plan would be developed to identify the precautions and measures to be taken in the event of a release.

Area Runoff

Area runoff adjacent to the expanded and/or new loading/unloading facilities would increase as a result of the Trucking Alternative. Truck loading/unloading sites have not been identified. If facilities were located in Minnesota at or near Sandpiper facilities, runoff could impact those waters identified in Section 7853.0610 Subpart 2(G), as well as waters adjacent to facilities requiring expansion. EPND would implement necessary erosion control measures during and after construction, where appropriate, to minimize erosion and sedimentation as well as surface runoff from the facility. In addition, if EPND were to operate a trucking facility, it would develop the necessary Emergency Response Plan for the facility and incorporate the facility into its ongoing operations practices and emergency response planning.

Area runoff would be expected from roadway treatment with sand and anti-ice chemicals. EPND is unable to quantify the discharge from such road treatments by state and local governments.

Point Sources of Airborne Emissions

The trucks themselves would be the largest source of airborne emissions for the trucking alternative.

The trucks required to transport the crude oil would consume millions of gallons of fuel per year, with subsequent exhaust emissions as shown in Table 7853.0600-B.3 below.

Table 7853.0600-B.3
Trucking Alternative Airborne Emissions

Emission Source Description	Pollutant Emissions (tpy)						
	NO_X	CO	SO_2	HC	PM_{10}	$PM_{2.5}$	GHG (CO_2e)
On-road vehicle diesel combustion emissions	4,130	6,573	11	1,336	73	69	1,101,880
Particulate matter emissions from paved roads	-	-	-	-	22,246	5,460	-
Total	4,130	6,573	11	1,336	22,320	5,529	1,101,880

- Emissions are calculated based on 577,247,500 vehicle miles traveled per year.
- Transport of crude oil in trucks will result in diesel engine emissions and particulate matter from the trucks driving on paved roads.
- Truck emissions are calculated based on vehicle miles driven and EPA emission factors.
- The trucking emission only quantifies emissions from truck operation to Superior, WI. Emissions from truck idling and emissions from the loading of crude oil into the transport trucks have not been included.
- This transportation method would require the construction of truck loading/unloading facilities in Tioga and Berthold, ND and truck unloading facilities in Clearbrook, MN and Superior, WI.

Noise

The Trucking Alternative would contribute to noise levels from traffic on local and Minnesota highways as approximately 3,628 trucks would be in transit per day. Tractor trailer rigs would be required to meet all federal and state noise abatement requirements for operation on public roadways.

Noise levels for construction related to the expansion of truck loading/unloading facilities would be similar to those described for the proposed Project in Section 7853.0620 Subpart 4.

B.3.b. Pollution Control and Safeguards Equipment

Air Pollution Controls

Equipment installed on the trucks themselves would be the primary means of air pollution control for the trucking alternative. Every truck used would be subject to the air emissions standards under applicable EPA and Department of Transportation regulations.

Air pollution controls for construction related to the expansion of the facilities would be similar to those described for the proposed Project in Section 7853.0630 Subpart 1.

The trucks required to transport the crude oil would consume millions of gallons of fuel per year, with subsequent exhaust emissions. Despite the standards established by the EPA mobile source emission regulations (Title 40 C.F.R. Part 85) and the maximum sulfur content of diesel fuel for highway vehicles reduction, the Trucking Alternative would increase air pollution levels. Dust control measures would not be necessary for the Trucking Alternative as paved highways would be the primary transportation route.

Water Pollution Controls

Water pollution controls for construction related to the expansion of the facilities would be similar to those described for the proposed Project in Section 7853.0630 Subpart 2.

Oil Release, Fire, and Explosion Safeguards

The principal risk of oil releases, fire, and explosions associated with the trucking alternative would be associated with loading and unloading of the trucks and traffic accidents. Safeguards during loading and unloading operations would include vapor control measures and containment barriers, as well as adherence to rigorous safety protocols.

As discussed in 7853.0250, truck hazmat incidents occur more frequently than pipeline accidents. Safeguards would include proper vehicle maintenance, extensive driver training, and following all applicable safety statutes, rules and regulations.

Other Safeguards and Controls

The trucking alternative would be subject to safeguards and controls required of commercial drivers under U.S. Department of Transportation, Federal Motor Carrier Safety Administration Regulations and state laws. These include drug testing, special training, insurance requirements and mandatory driver rest periods. Additional safeguards would come through enforcement of traffic regulations and a vigorous maintenance program.

B.3.c. Induced Developments

Utility Use

The trucking alternative is not expected to have any impact on utility use outside of the loading and unloading facilities. EPND has not designed such facilities, and is, therefore, unable to estimate power consumption.

Water Use

The trucking alternative is not expected to require significant water use.

Vehicular Traffic

The primary routes between Beaver Lodge, North Dakota and Superior, Wisconsin would make use of two major roads across Northern Minnesota. The first, U.S. Highway 2, stretches from Grand Forks, North Dakota through Duluth, Minnesota to Superior, Wisconsin. The major population centers along this route include Grand Forks, Bemidji, Grand Rapids and Duluth. A significant portion of this route is two-lane and crosses through the Mississippi Headwaters State Park, the Chippewa National Forest and the Leech Lake Reservation. U.S. Highway 2 is a heavily-used travel path for commercial and private traffic in northern Minnesota.

The second route across the state would follow I-94 until just east of Fargo, North Dakota, where it would move to Highway 10 until hitting Detroit Lakes. It would then continue on Highway 34 through Park Rapids, Minnesota, until it joined Highway 200 just south of Walker, Minnesota. From Walker, it would pass through Remer, Minnesota and Hill City, Minnesota, before joining Highway 2 just north of Floodwood, Minnesota. It would then follow Highway 2 through the cities of Hermantown and Duluth, Minnesota. This is also a predominately two-lane road and this route crosses the Leech Lake Reservation and multiple state and national forests. Like U.S. Highway 2, I-94 is a heavily-used travel path for commercial and private traffic in northern Minnesota.

The Trucking Alternative would place 3,628 trucks and trailers on the roads of North Dakota, Minnesota and Wisconsin every day of the year. This traffic would be moving 24 hours per day.

The increased traffic on existing highways between Beaver Lodge, North Dakota and Superior, Wisconsin could increase wear on the

existing highway infrastructure and result in highway repairs potentially being required sooner than if the additional traffic were not to occur on the highways. In addition, there may be additional demand for public safety officers as more trucks on the road will create more opportunities for traffic accidents.

EPND believes that use of the trucking alternative would place an unacceptable burden on the road infrastructure along these routes and be extremely disruptive to the communities that would be impacted.

Agriculture

While EPND cannot calculate or quantify the impacts increased truck traffic may have on agricultural operations, it is anticipated that delays, increased accident rates and the greatly increased need for road maintenance work would hinder these operations. The volume of trucks on the road would impact agricultural operations through increased traffic, but EPND is unable to quantify what impact the additional traffic would have. Such impacts cannot be calculated, but would result from delays, increased accident rates and greatly increased need for road maintenance work.

Relocation of Persons

EPND does not expect that persons would need to be relocated for daily operation of the trucking alternative. However, the greatly increased traffic noise and volume may result in some voluntary population changes along the route.

Construction and operation of the trucking facility at the Clearbrook Terminal in Minnesota may require acquisition of additional property. This could result in the relocation of persons. Design work has not been completed on a trucking alternative; therefore, the potential impacts associated with relocation cannot be assessed.

B.4. Rail Alternative

Implementation of the rail alternative would require construction of new lateral rail lines in as-yet unidentified locations. Accordingly, EPND cannot give specific details of some aspects of this alternative. Please see Section 7853.0540, part A.6 of this Application for additional discussion of the rail alternative.

Rail traffic would also distribute the impacts discussed below across existing rail routes through the State of Minnesota if the Project is not constructed.

B.4.a. Wastewater, Air Emissions and Noise Sources

Point Discharges to Water

The Rail Alternative would require the construction of rail car loading and off-loading facilities including construction of new aboveground lateral service lines to reach the rail cars. Discharges may result from releases caused by accidents. A Spill Prevention Plan would be developed to identify the precautions and measures to be taken in the event of a release. In addition, EPND would prepare an Environmental Protection Plan that would outline steps to ensure correct handling of site stormwater.

Area Runoff

Area runoff adjacent to the constructed rail car loading and off-loading facilities would increase as a result of the Rail Alternative. If facilities were located in Minnesota at or near Sandpiper facilities, runoff could impact waters identified in Section 7853.0610 Subpart 2(G), as well as waters adjacent to newly constructed facilities. EPND would implement necessary erosion control measures during and after construction, where appropriate, to minimize erosion and sedimentation. In addition, EPND would develop the necessary Emergency Response Plan for the facility and incorporate the facility into its ongoing operations practices and emergency response planning.

Point Sources of Airborne Emissions

Airborne emissions would come from two sources. The loading and unloading facilities would present the risk of volatile organic compounds ("VOC") emitted during the loading and unloading process, as well as from storage tanks.

Additional gaseous and particulate emissions would occur from train engines, as shown below in Table 7853.0600-B.4.

Table 7853.0600-B.4 Rail Alternative Airborne Emissions							
Emission Source Description	**Pollutant Emissions (tpy)**						
	NO_X	**CO**	**SO_2**	**HC**	**PM_{10}**	**$PM_{2.5}$**	**GHG (CO_2e)**
Railroad diesel combustion emissions	11,629	1,145	139	429	286	278	437,416
• Emissions are calculated based on 42,755,574 total rail car ton-miles/day per rail car per day. • Emissions from the loading/unloading of crude oil have not been included. • The transportation method would require the construction of the large railcar loading and unloading facilities at the North Dakota stations, Clearbrook, MN and Superior, WI.							

Noise

Rail traffic is a source of noise pollution. As noted in Section 7853.0540, part A.6 of this Application, 1,710 rail cars could pass each point along whatever route was used each day.

Noise levels related to the construction of rail car loading and off-loading facilities as well as construction of new lateral aboveground rail service lines would be similar to those described for the proposed Project in Section 7853.0620 Subpart 4. EPND anticipates that the rail transporters will obtain the necessary permits for operation of the additional trains and that operation will be in compliance with the Railroad Noise Emission Standards established in 49 C.F.R. 210. However, the increased rail traffic could increase the noise along the respective rail routes every day of the year.

B.4.b. Pollution Control and Safeguards Equipment

Air Pollution Controls

Air pollution controls for construction related to the construction of rail car loading and off-loading facilities, as well as construction of new lateral aboveground rail service lines, would be similar to those described for the proposed Project in Section 7853.0630 Subpart 1. Operational air emissions related to the rail alternative would likely be controlled with vapor recovery systems. EPND anticipates that the rail transporters will obtain the necessary permits for operation of the additional trains.

Water Pollution Controls

The risk of water pollution from the rail alternative comes from daily operations at the loading and unloading facilities, as well as from accidents during transportation.

Water pollution at the loading and unloading facilities could result from releases caused by loading and unloading operations or from general surface runoff.

Oil Release, Fire, and Explosion Safeguards

As discussed in 7853.0250, rail hazmat incidents occur more frequently than pipeline accidents. The loading and offloading facilities would need to be equipped with release containment, fire suppression equipment, and potentially with vapor recovery systems. Specific details of these systems would be developed during the design phase of the project.

Rail safety is regulated by the Federal Railroad Administration, part of the U.S. Department of Transportation, which includes divisions governing the following:

- hazardous material transportation;
- locomotive and freight car safety inspections;
- operating practices, including carrier and employee training, safety rules, hours of service, accident reporting, and employee qualifications;
- track signals; and
- Federal track safety standards.

Any rail transportation developed as an alternative to the Project would be subject to and in compliance with federal safety regulations and industry standards.

Other Safeguards and Controls

EPND's Environmental Policy states that protection of the environment is an integral element of the conduct of company business. Inspections of the rail car loading and off-loading facilities including new lateral above ground rail service lines would be conducted.

B.4.c. Induced Developments

Utility Use

Utility use would involve electrical power use at the loading and unloading facilities. EPND, however, has not designed these facilities and is unable to estimate the required electrical power.

The Rail Alternative would at least require the construction of new lateral rail service lines. However, the rail lines would be privately

owned and, therefore, would not require any additional utility or other public services.

Water Use

The rail alternative is not expected to require significant water use.

Vehicular Traffic

Impacts to vehicular traffic would be created by trains crossing roadways. As noted in Section 7853.0540 Part A.6, approximately 855 rail cars would need to move in each direction past each point along whatever route was used every day. Accordingly, every road along a rail route would have 1,710 rail cars crossing each day, at all times of the day, throughout the year. This would cause traffic delays. Since trains are required to travel at reduced speeds through developed areas, the traffic delays could be of long duration.

Agriculture

Construction of new lateral above-ground rail service lines has the potential to significantly affect agricultural lands. Permanent right-of-way would be required for any new rail line and, if routed through agricultural lands, would have permanent effects on agricultural productivity. Estimates on the number of farms affected and construction activities within farm fields would be dependent upon establishing a route.

Daily operations of the rail alternative would not be expected to impact agricultural operations, other than through traffic delays caused by 1,710 rail cars traveling through agricultural areas and crossing roads each day in each direction. Around the clock train noise may also have an impact on livestock, although EPND does not possess information to quantify that impact.

Relocation of Persons

EPND does not expect that persons would need to be relocated for daily operation of the rail alternative. However, the alternative may result in some voluntary population changes along the route.

Construction and operation of potential rail facilities in Minnesota may require acquisition of additional property. This could result in the relocation of persons. Design work has not been completed on a rail alternative; therefore, the potential impacts associated with relocation cannot be assessed.

7853.0610 LOCATION

Subpart 1. Land description. If a particular route has been selected for the new (sections of) pipeline, indicate that route on an appropriate map. If no particular route has been selected, indicate on an appropriate map each possible route that has been given serious consideration.

An overview map of the preferred route in Minnesota is included as Appendix G.1 of the EIR. A more detailed route map book is included in Appendix G.5 of the EIR.

Subpart 2. Description of environment. For each route identified in response to subpart 1, list:

A. the names of cities or population centers through which the route passes;

In general, the preferred route avoids population centers and residential areas. However, five municipalities are located within approximately 1 mile of the route. No municipal boundaries would be crossed by the route (see Table 7853.0610-2.A). Most of the cities within 1 mile of the route have populations less than 3,000. The largest community is the City of Crookston in Polk County, with a population of 7,891 persons.

Section 3.0 of the EIR provides details regarding socioeconomic conditions in areas associated with the Project.

Table 7853.0610-2.A Municipalities within 1.0 Mile of the Sandpiper Pipeline Project		
County Municipality	Approximate Milepost	Population (2010)[a]
Polk		
Crookston	318.0	7,891
Clearwater		
Clearbrook	375.0	510
Bagley	386.0	1,392
Aitkin		
Palisade	533.0	2,692
McGregor	546.0	391

[a] U.S. Census Bureau, http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

B. the number of miles of the route that pass through, respectively, federal lands, state lands, county or tax-forfeit lands, incorporated areas, and private land outside incorporated areas;

As shown in Table 7853.0610-2.B, the preferred route predominantly crosses private lands located outside of municipal areas (229 miles or approximately 76.6 percent of the route). The preferred route also crosses state lands (26 miles or approximately 8.7 percent of the route) and county lands (44 miles or approximately 14.7 percent of the route). County land includes tax-forfeited parcels. No federal lands or incorporated areas are crossed by the pipeline.

Refer to Section 4.2.1 in the EIR for additional details regarding land ownership.

Table 7853.0610-2.B Ownership of Lands Crossed by the Sandpiper Pipeline Project Preferred Route		
Ownership	Crossing Length (miles)	Percentage of Route
State Lands	26	8.7
County Lands	44	14.7
Private Lands	229	76.6
Total	**299**	**100.0**

Source:
MNDNR 2008 GAP Stewardship Data. Available at: http://deli.dnr.state.mn.us/metadata.html?id=L390005860201. The Applicant continues to consult with state agencies regarding the location of state-administered lands crossed by the preferred route.

C. the general soil types along the route and the approximate percentage of each;

Table 7853.0610-2.C provides a summary of significant soil characteristics identified along the preferred route by county. Detailed soil characteristics along the majority of the preferred route were identified and assessed using Soil Survey Geographic ("SSURGO") data; however, SSURGO data was not available for Crow Wing County; therefore, EPND used Natural Resources Conservation Service ("NRCS") State Soil Geographic ("STATSGO2") data.

Refer to Section 6.0 in the EIR for additional information on soils in the Project area.

Table 7853.0610-2.C
Soil Characteristics in the Sandpiper Pipeline Project Area

County	Total Acres in County [a]	Prime Farmland	Hydric Soils	Compact. Prone	Highly Erodible		Reveg. Concerns	Stony/ Rocky	Shallow to Bedrock
					Water	Wind			
		Percent of Total Acres in County)[b]							
Polk	863.0	84.4	48.7	33.9	3.2	56.7	16.5	0.0	0.0
Red Lake	169.8	77.7	97.9	3.7	1.5	68.8	22.3	0.0	0.0
Clearwater	699.3	81.0	27.8	13.8	18.8	44.2	21.4	0.0	0.0
Hubbard	938.3	49.5	27.8	11.5	27.5	94.3	54.3	0.0	0.0
Cass	823.9	51.2	18.7	12.3	21.3	86.4	48.8	0.0	0.0
Crow Wing	85.8	N/A	N/A	0.0	N/A	100.0	N/A	0.0	0.0
Aitkin	888.5	44.6	61.9	42.9	7.2	83.9	48.1	0.0	0.0
Carlton	667.9	51.0	25.6	29.2	16.0	48.1	47.1	0.0	0.0
Total	**5,136.5**	**59.4**	**37.3**	**23.0**	**14.9**	**71.4**	**38.6**	**0.0**	**0.0**

N/A Data not available from the STATSGO2 database for Crow Wing County.

[a] Acreage is based on a 120-foot-wide construction right-of-way and does not include access roads, additional temporary workspace, or open water, and does not account for reductions in the width of the right-of-way that EPND will implement in wetlands.

[b] Percentages will not add-up to 100 percent, as soils may have more than one characteristic listed in the table.

D. the general terrain along the route;

Topography across the preferred route varies widely given the variable nature of glacial deposition. The interrupted drainage of glacial terrain can be of low relief and include wetlands, lakes, and gently rolling to undulating hills and ridges, as well as hummocky areas of high relief with steep hills and ridges associated with glacial end moraine deposits. Additionally, glacial erosion can remove unconsolidated deposits and scour bedrock, and glacial meltwater can incise significant valleys into bedrock. Elevations in the Project area range from approximately 882 feet to 1,681 feet above mean sea level.

Refer to Section 5.1 in the EIR for additional information on terrain and geology.

E. the types of vegetation along the route (including forest, brush, marsh, pasture, and cropland) and the approximate percentage of each;

Approximately 38 percent of the area affected by the construction right-of-way will involve forest land, consisting of deciduous, evergreen, and mixed forests. Approximately 34 percent of the area affected by the construction right-of-way will be agricultural land. This land consists of pastures or hay fields and cultivated crops such as corn, soybeans, wheat, oats, wild rice, and dry edible beans. Potatoes, sugar beets, vegetables, sod, and Christmas trees are also common crops in the counties crossed by the Project. The construction right-of-way will affect wetlands/open water (approximately 16 percent), open land (approximately 12 percent), and developed land (less than 1 percent). The wetlands include emergent herbaceous wetlands, woody wetlands, marshes, and open water; the open land consists of maintained rights-of-way, shrub/scrub areas, grasslands, developed open space, and barren land.

Refer to Section 7.1, Table 4.2-1, and Table 4.2-2 in the EIR for additional details regarding vegetation along the preferred route.

F. the predominant types of land use along the route (such as residential, forest, agricultural, commercial, and industrial) and the approximate percentages of each;

Construction along the approximately 299-mile-long segment across Minnesota will affect approximately 5,137 acres of land. The predominant land use identified along the preferred route is forested land, which covers 1,946 acres (or 38 percent) of the total construction area. Agricultural land

accounts for 1,761 acres (or 34 percent) of the total construction area. Of the agricultural land affected, approximately 1,058 acres is cultivated and the remaining 703 acres is pasture land. Other land uses are developed land (commercial and industrial) (15 acres or less than 1 percent), open land (590 acres or 12 percent), and wetland/open water (824 acres or 16 percent). The preferred route does not cross any heavily developed residential areas.

Refer to Section 4.2 in the EIR for additional details regarding land use.

G. the names of major lakes or streams and the number of wetlands of five acres or more through which the route passes, as well as any others into which liquid contaminant from the pipeline could flow;

The preferred route will cross numerous rivers and streams. Milepost locations and waterbody names for each waterbody crossing are provided in Appendix E of the EIR. Minnesota Public Waters Inventory watercourses, wetlands, and basins are presented in Sections 9.2.2 and 9.3.2 of the EIR.

EPND initiated wetland surveys in 2013 and will conclude these surveys in 2014. Approximately 48.5 percent of the preferred route in Minnesota was surveyed for wetlands as of August 11, 2013. Through a combination of NWI and field data, EPND determined that the preferred route will cross a total of 1,565 wetlands. This number does not distinguish between those wetlands that will be crossed more than once, and will be further refined as surveys progress. A summary of the wetlands crossed by the pipeline are provided in Tables 9.3.1-2 and 9.3.2-1 of the EIR.

Refer to Sections 9.2 and 9.3 in the EIR for detailed information regarding waterbodies and wetlands.

H. trunk highways, railroads, and airports along the route;

Sandpiper will cross federal, state, county, city/township, and private/commercial roads, and railroads. In total, the preferred route will cross 373 roads as summarized in Table 7853.0610-2.H. A complete list of road crossings is included in Appendix B of the EIR.

Table 7853.0610-2.H Number of Roads Crossed by the Sandpiper Pipeline Project			
County	State or Federal	County/City	Private/Commercial
Polk	4	52	6
Red Lake	1	10	0
Clearwater	3	34	10
Hubbard	4	38	38
Cass	4	27	36
Crow Wing	0	2	6
Aitkin	2	24	31
Carlton	4	24	13
Total	**22**	**211**	**140**

Sandpiper will cross the Burlington Northern Santa Fe and the Canadian Pacific Railways at seven locations in Polk, Clearwater, and Aitkin counties. EPND plans to cross most railroads by boring beneath them. Three crossings of the Burlington-Northern Santa Fe Railroad (one in Polk County at MP 306.6, one in Clearwater County at MP 386.9, and one in Aitkin County at MP 548.9) will be crossed by HDD. Both of these construction methods will allow the railroads to remain operational during construction.

Several airports are located within 1-mile of the preferred route in Minnesota. The airports include the Crookston Municipal Airport, the Bagley Airport, McGregor Municipal, and private airpark Sky Manor Aero Estates. EPND will consult with the Federal Aviation Association and any other appropriate agencies regarding construction techniques and restoration of this area during the permitting process.

Refer to Section 4.3.6 in the EIR for additional details on highways, railroads, and airports.

I. national natural landmarks, national wilderness areas, national wildlife refuges, national wild and scenic rivers, national parks, national forests, national trails, and national waterfowl production areas through which the route passes, as mapped on the inventory of significant resources by the State Planning Agency;

Sandpiper will not cross any national natural landmarks, wilderness areas, wildlife refuges, parks, forests, or waterfowl production areas.

Sandpiper will cross the North Country Trail, a National Scenic Trail. Sandpiper will cross four Minnesota rivers that are listed on the National Rivers Inventory. None of these are federally designated as a National Wild and Scenic River.

Refer to Section 11.1 in the EIR for additional details on federal areas.

J. state critical areas, state wildlife management areas, state scientific and natural areas, state wild, scenic, and recreational rivers, state parks, state scenic wayside parks, state recreational areas, state forests, state trails, state canoe and boating rivers, state zoo, designated trout lakes through which the route passes, as mapped on the inventory of significant resources by the State Planning Agency; and

Sandpiper will not cross any state critical areas, scientific and natural areas, state wild, scenic, and recreational rivers, parks, scenic wayside parks, recreational areas, zoos, or designated trout lakes.

However, the preferred route will cross four state Wildlife Management Areas, seven state forests, two state trails, and five canoe and boating rivers. The route also will cross two state Aquatic Management Areas and three designated scenic byways.

Refer to Section 11.2 in the EIR for additional details on state areas.

K. national historic sites and landmarks, national monuments, national register historic districts, registered state historic or archaeological sites, state historical districts, sites listed on the National Register of Historic Places, and any other cultural resources through which the route passes, as indicated by the Minnesota Historical Society.

EPND reviewed the Minnesota State Historic Preservation Office's ("SHPO") site files to identify previously recorded cultural resources within the Project's 250- to 450-foot-wide environmental survey area. Based on this review, five previously recorded archaeological sites and one archaeological site lead are likely located within the environmental survey area. An additional three sites and three site leads may intersect the environmental survey area; the exact location of these sites is unclear from the available records, but they are likely in the immediate vicinity and warrant consideration during review of the Project area and execution of the inventory survey. Two of these previously recorded sites have been determined not eligible for listing on the National Register of Historic Places ("NRHP"). With one exception, the

remaining sites have not been evaluated for eligibility. No national historic sites and landmarks, NRHP-listed historic districts, or national monuments are known within the Project area.

EPND is currently conducting cultural resources Phase I reconnaissance surveys for the Project area. In addition, EPND is using statistically-based Geographic Information Systems ("GIS") predictive (sensitivity) models during the Phase I reconnaissance survey. If survey identifies any archaeological sites or historic structures in the Project area that are eligible for listing in the NRHP, EPND will consult with the appropriate agencies, including Minnesota SHPO to avoid any historic properties. If avoidance is not possible, EPND will design measures to minimize or mitigate impacts on these sites.

Refer to Section 10.0 and the Unanticipated Discoveries Plan (Appendix D) in the EIR for additional information regarding cultural resources.

7853.0620 WASTEWATER, AIR EMISSIONS, AND NOISE SOURCES

Subpart 1. Point discharges to water. Indicate the location, route, and final receiving waters for any discharge points. For each discharge point indicate the source, the amount, and the nature of the discharge (provide quantitative data if possible).

Potential discharges related to pipeline construction include hydrostatic test water discharges and trench dewatering discharges. All discharges will be implemented in accordance with EPND's EPP and permits issued by the appropriate regulatory agencies. Table 7853.0620-1 presents typical source, amount, and nature of point discharges to water that could be expected for the Project.

Table 7853.0620-1
Source, Amount and Nature of Point Discharges

Source	Estimated Amount	Nature of Discharge
Trench Dewatering Discharges	Between 25,000 and 1.4 million gallons over the duration of the Project at each discharge location. Volume will be dependent on precipitation and groundwater levels.	Dewater excavated trenches that fill with rain water or infiltrated groundwater during construction.
Hydrostatic Test Water Discharges	Between 3.5 million and 5.7 million gallons at each discharge location. Volume will be dependent on the amount of new piping or tankage involved in the test/discharge.	The discharge of water used to pressure test the new piping and tankage.

Water used for hydrostatic testing will most likely be appropriated from local streams, rivers, or lakes and/or groundwater sources, such as high-capacity irrigation wells or municipal wells along the preferred route. EPND has not selected specific streams, rivers, or lakes used for test water at this time. A list of major waterbodies that could potentially be used as sources of hydrostatic test water is provided in Appendix E of the EIR.

The water will typically be returned to the waterbody where it was appropriated; however, depending on site-specific conditions, engineering constraints, and permit conditions, the water may be discharged to land or a different waterbody after hydrostatic testing is completed. If test water is

discharged directly into a waterbody, energy dissipation devices such as splash pups will be used to reduce the discharge energy and to minimize stream bottom scouring. If the water is discharged to an upland area, energy dissipation devices, such as staked straw bale structures and controlled discharge rates, will be used to minimize soil erosion and subsequent release of sediments to nearby waterbodies and wetlands.

Testing of the pipeline will likely be conducted in segments and the water will be discharged at various times and locations. Rate and quantity of individual discharges will be dependent on the length of the pipeline segment tested and on applicable permit conditions.

The other type of potential point discharge to surface waters associated with pipeline construction is the discharge of water during trench dewatering activities. EPND cannot predict the locations of discharge from trench dewatering at this time. The need for trench dewatering will be dependent on local weather conditions, groundwater conditions, and construction constraints. Trench dewatering will be conducted in accordance with applicable permit requirements. Filtering devices, such as geotextile filter bags and/or straw bale structures, will be used as needed to reduce the amount of suspended solids in the discharge water.

Subpart 2. Area runoff. Indicate the area from which runoff may occur, potential sources of contamination in the area, and receiving waters for any runoff.

The construction right-of-way, additional temporary workspaces, pipeyards and contractor yards are potential areas for stormwater runoff along the pipeline route. During construction, potential sources of pollutants in runoff from these areas will be primarily associated with the erosion of soil in disturbed areas and the deposition of sediments in adjacent waterbodies. Potential receiving waters for stormwater runoff include those waterbodies crossed by or adjacent to the pipeline route, pipeyard, or contractor yard. A list of major waterbodies that could potentially be receiving waters is provided in Appendix E of the EIR. EPND will implement appropriate erosion control measures during and after construction to minimize erosion and sedimentation. These control measures are discussed in Section 7853.0630. Applicable state and local permits related to erosion and sediment control will be obtained for the project.

EPND accessed a MPCA database to identify sites with known or potential contamination within 0.5 mile of the Project. EPND identified 16 such sites. Based on MPCA information and review of aerial photographs, all 16 of the

sites were determined to be more than 500 feet from the preferred route and are not anticipated to impact or be impacted by the Project. Prior to construction of the Project, EPND will assess the potential for encountering contaminated groundwater near any additional sites that are identified within 500 feet of the preferred route. If necessary, appropriate avoidance or mitigation measures will be developed and implemented in accordance with applicable state or federal regulations.

Table 7853.0270-3.1 provides a 5-year recordable pipeline incident record on the EPND System. EPND will be conducting a desktop analysis to determine if historic releases are identified along the preferred route. If identified, the contractor will be notified of the locations of these previous releases.

EPND is currently developing procedures to be implemented in the unlikely event contaminated soils are encountered during construction. These procedures and mitigation measures will be provided to the contractor.

Potential sources of contamination are discussed in Section 8.3 in the EIR.

Subpart 3. Point sources of airborne emissions. Estimate the quantity of gaseous and particulate emissions that would occur during full operation of the pipeline from each emission source and indicate the location and nature of the release point.

The Project will include the construction of additional external floating roof storage tanks ("EFRT") at a new Clearbrook facility adjacent to the existing Clearbrook Terminal. EPND will not be required to obtain an air permit prior to commencing construction activities at the Clearbrook Terminal. The Clearbrook Terminal currently operates under an "Option A" registration permit and will remain eligible for this permit after the Project. EPND will complete the required New Source Performance Standards ("NSPS") notifications and submittals for the new storage tanks. The increase in potential emissions at the Clearbrook Terminal will be VOCs from new external floating roof storage tanks, piping component fugitive emissions, and pipeline operations equipment and is estimated to be approximately less than 24 tons of VOC per year.

Airborne emissions are discussed in Section 12.0 of the EIR.

Subpart 4. Noise. Indicate the maximum noise levels (in decibels, A scale) expected along the route. Also, indicate the expected maximum increase over ambient noise levels.

Pipeline Construction

The heavy equipment needed to construct the pipeline will have a short-term impact on noise levels in the vicinity of the construction right-of-way. Typical pipeline construction equipment (e.g., bulldozers, loaders, backhoes and sideboom tractors) generate between 80 to 90 decibels within 50 feet of the equipment. This equipment noise will be limited to the period of construction. Because the preferred route crosses predominantly rural and undeveloped areas, the general public should experience limited nuisance noise. In the vicinity of residential areas, the contractor will take all reasonable measures to control construction-related noise.

Ongoing Operations

Noise is not generated along the pipeline right-of-way during normal operation. The new Clearbrook terminal will result in additional operational noise in the immediate vicinity of the terminal. EPND's standards restrict the noise levels (due to Company equipment) around neighboring dwellings and industrial facilities to 40 decibels, measured at a distance of 50 feet from the affected structure, unless state regulations allow higher noise levels. Noise control is incorporated into the design if these levels are exceeded. EPND will conduct pre-construction and post-construction noise surveys at the Clearbrook terminal.

7853.0630 POLLUTION CONTROL AND SAFEGUARDS EQUIPMENT

EPND will comply with applicable federal, state, and local rules and regulations and take appropriate precautions to protect against pollution of the environment. In addition, EPND will retain Environmental Inspectors to verify that environmental protection measures, environmental permit conditions, and other environmental specifications are implemented appropriately by the contractor during construction

Subpart 1. Air pollution controls. Indicate types of emission control devices and dust control measures that would be used.

Construction of the pipeline and associated facilities will result in intermittent and short-term fugitive emissions. These emissions would include dust from soil disruption and combustion emissions from the construction equipment.

Fugitive dust emissions would depend on the moisture content and texture of the soils that would be disturbed. Emissions from fugitive dust are not expected to cause or significantly contribute to violation of an application ambient air quality standard. EPND's EPP (Appendix A of the EIR) specifies that the contractor will take all reasonable steps to control dust near residential areas and other areas as directed by EPND. Control practices may include wetting soils on the right-of-way, limiting working hours in residential areas, and/or additional measures as appropriate based on site-specific conditions. The use of dust suppression techniques would minimize fugitive dust emissions during construction of the project, thereby minimizing potential air quality impacts on nearby residential and commercial areas.

Emissions from equipment combustion engines are not expected to cause or significantly contribute to a violation of an applicable ambient air quality standard because the construction equipment would be operated on an as-needed basis, primarily during daylight hours. Emissions from the gasoline and diesel engines would be minimized because the engines must be built to meet the standards for mobile sources established by the EPA mobile source emission regulations (40 C.F.R. Part 85). In addition, the EPA required the maximum sulfur content of diesel fuel for highway vehicles be reduced from 500 parts per million by weight ("ppmw") to 15 ppmw by mid-2006, making lower sulfur diesel available nationwide.

Subpart. 2. Water pollution controls. Indicate types of pollution control equipment and runoff control measures that would be used to comply with applicable state and federal rules, regulations, and statutes.

EPND has developed standardized erosion control and restoration measures to minimize and mitigate potentially adverse environmental effects resulting from right-of-way preparation, construction, operation, and maintenance of the proposed pipeline. These measures are described in EPND's EPP (Appendix A of the EIR). The EPP also describes planning, prevention and control measures to minimize impacts of construction-related releases.

Erosion control measures specified in the EPP will be used to control stormwater runoff from the construction right-of-way and to minimize soil erosion.

The EPP also outlines construction measures at waterbody and wetland crossings. When a watercourse, basin, or wetland is identified on the Minnesota Public Waters Inventory, work will be conducted in accordance with the EPP and the requirements of the License to Cross Public Waters issued by the MNDNR.

Good housekeeping practices will be enforced during construction. Waste will be collected and removed from the site promptly. Work areas will be kept clean and free of rubbish and debris that may enter waterbodies. Fuel and all other hazardous materials will be stored a minimum of 100-feet from streams and wetlands. Refueling will generally be in upland areas, a minimum of 100-feet from streams or wetland boundaries. Where this is not possible, site-specific control measures will be implemented. Procedures and responsibility for reporting and response for accidental releases during construction are clearly identified in the EPP (Appendix A of the EIR). Detailed discussion of emergency response for pipeline operation is provided in Section 7853.0630 Subpart 3.

Subpart. 3. Oil spill, fire, and explosion safeguards. Describe measures that would be taken to prevent oil spills, fires, and explosions or to minimize the environmental impact of spill, a fire, or of an explosion.

EPND's emergency response program is comprised of four basic elements: prevention, planning, resources, and training. Each of these critical elements is supported and coordinated through a clearly defined emergency response plan that is continuously being evaluated and updated to ensure its effectiveness. Within the emergency response program, EPND has identified and planned for potential incidents that could affect public and employee

safety and/or the environment, including fires, explosions and releases. Due to the nature of EPND's operations, an unintentional release of crude oil from the pipeline is ultimately the greatest risk and receives utmost attention.

Prevention

Pipelines are monitored continuously by trained personnel. Computer controlled backups and stringent operating procedures provide additional safeguards. In the event of an emergency, these control centers (manned round-the-clock) also serve as the nucleus for receiving emergency information, serve as the center for shutdown and isolation of the pipeline, and serve as the center to initiate a response and make appropriate notifications.

EPND has a comprehensive preventative maintenance program that meets, and in many cases exceeds, minimum federal safety standards set forth in 49 C.F.R. Part 195. The MNOPS, acting as an agent for the U.S. Department of Transportation's Office of Pipeline Safety, performs periodic inspections of EPND's facilities to monitor compliance with the aforementioned regulations.

Planning

EPND submitted its emergency response plan for approval, as mandated by the Oil Pollution Act of 1990, to the Department of Transportation, Research and Special Programs Administration ("RSPA"). The plan, which was subsequently approved by RSPA, demonstrates EPND's response capabilities in accordance with the interim final rule set forth in 49 C.F.R. Part 194.

EPND's plan is also influenced by requirements set forth in the Occupation Safety and Health Administration's ("OSHA") final rules on Hazardous Waste Operations and Emergency Response (29 C.F.R. Part 1910.120(q)) ("HAZWOPER"). The plan addresses compliance with public and employee safety issues, including implementation of the Incident Command System, training of response personnel, personal protection requirements, site control procedures and decontamination.

The plan is maintained at all manned facilities in the EPND System. In addition, EPND's company employees are provided a copy of an Emergency Response Directory that provides checklists, summaries from the plan, internal and external contacts and notification/reporting procedures.

Customized USGS quadrangle maps depicting the entire pipeline system and surrounding environment serve an integral role in the planning process. These maps also provide the framework to evaluate areas according to public

and environmental sensitivities, and where appropriate, develop site-specific plans.

EPND conducts a comprehensive public awareness program to inform residents, public officials, area excavation contractors, and emergency units of government, how to recognize and avoid or respond to a pipeline emergency. EPND 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.

Resources

As mandated by 49 C.F.R. Part 194, EPND is required to have resources in place to respond, to the maximum extent practicable, to a worst case discharge from the pipeline system. The company employs ten pipeline maintenance ("PLM") crews strategically located along the pipeline system. Each PLM employee is trained and equipped to respond to an emergency. Each maintenance facility has mobile response units and heavy equipment at its disposal. This is in addition to numerous locations where pre-staged containment and recovery equipment is maintained and available.

EPND owns mobile response units, including containment and recovery equipment for both land and water based releases. Response boats, vacuum trucks, command trailers, decontamination facilities and incipient stage firefighting equipment are also maintained and available for response.

EPND has pre-selected response contractors to supplement company-owned resources. Additionally, the company is active in several industry and government co-operatives and mutual aid groups.

Training

Personnel are trained in safety and emergency response procedures through a program that employs numerous classroom and practical training sessions aimed at ensuring that the employees can demonstrate knowledge and proficiency in their required responsibilities. Employees who are available for emergency response operations are trained in accordance with OSHA's HAZWOPER training requirements. Specifically, all pipeline maintenance, electrical and mechanical staff is trained to a "Hazardous Materials Technician" designation or higher.

As part of this training program, each pipeline maintenance crew is involved in at least two emergency response exercises per year. These may consist of written exercises (table-tops), communication exercises, announced and unannounced deployment exercises or other simulations. On-sight fire-fighting exercises and natural gas liquid ("NGL") flaring demonstrations are also performed. EPND's exercise and drilling requirements are governed by, and consistent with the requirements of federal safety rules set forth in 49 C.F.R. Part 194.

EPND's resources and response capabilities are subject to periodic evaluation by agencies with jurisdiction to enforce 49 C.F.R. Part 194, through on-site inspections or performance of unannounced drills called by the appropriate federal or state agency.

Construction-Related Releases

As mentioned in 7853.0630 Subpart 2, EPND has developed an EPP that describes planning, prevention, and control measures to minimize impacts resulting from construction-related releases. The EPP specifies minimum standards for handling and storing regulated substances and cleaning up releases. EPND will require the pipeline contractor to implement proper planning and preventative measures to minimize the likelihood of releases and to quickly and successfully clean-up a release should one occur.

EPND actively monitors contractor compliance with the EPP.

Subpart. 4. Other safeguards and controls. Indicate any other equipment or measures, including erosion control, which would be used to reduce the impact of the pipeline. Indicate the types of environmental monitoring, if any, that are planned for the facility and describe relevant environmental monitoring data already collected.

EPND's Environmental Policy states that protection of the environment is an integral element in the conduct of company business. Environmental protection efforts will span the entire Project, from planning through construction, restoration, and into full operation.

Construction

Planning, design, construction and restoration will incorporate the previously discussed equipment and measures, including those for erosion control (see Section 7853.0630, Subparts 1 and 2). Environmental inspection will be conducted during and following construction to monitor compliance with required environmental protection measures, permit conditions, and specifications. These specifications will also allow ongoing oversight for any

unforeseen day-to-day issues. Inspectors will be trained and well-versed in environmental issues and field implementation. Contractors will be expected to have necessary training. Training or briefings will also be provided by EPND.

Most of the preferred route is on private land and landowner concerns will be addressed at all phases of the project, including final restoration efforts. Land agents assigned to the project will work closely with landowners.

Field environmental data collected to date includes information on wetlands, streams and rivers, cultural resources, and sensitive plant and animal species. EPND will continue to work with appropriate regulatory agencies and obtain the necessary environmental data to complete the various permitting processes.

As noted previously, this Project involves maximizing co-location with other pipelines and utilities by installing the new pipeline on or adjacent to an existing right-of-way when possible. Construction of the new pipeline will cause temporary disruption, but should result in minimal long-term change to the environment.

Ongoing Pipeline Operation

The pipeline system is a permanent, ongoing system; as such, EPND has an ongoing commitment to ensure that operations are conducted in an environmentally responsible manner. Substantial, continual effort is placed on pipeline integrity, operational safeguards, emergency response, and landowner relationships, which reduces the impact of the pipelines on the environment.

7853.0640 INDUCED DEVELOPMENTS

Subpart 1. Utility use. Indicate the extent to which the facility would create or add to the need for expanded utilities or public services.

Operation of the Project will require new utilities to be routed to the new Clearbrook terminal.

Subpart 2. Water use. Indicate the amount of water that would be appropriated for use in connection with the pipeline, the expected source of water, and the manner in which the water would be used.

EPND will hydrostatically test the new pipe to verify its integrity prior to placing it in service. Hydrostatic testing will be conducted in accordance with the PHMSA regulations. The procedure consists of filling a section of pipe with water and maintaining a prescribed pressure for a prescribed period of time. Hydrostatic testing takes place prior to the pipeline being placed into service.

EPND is evaluating potential sources for appropriating hydrostatic test water, including major waterbodies crossed by or adjacent to the proposed pipeline and/or groundwater sources, such as high-capacity irrigation wells or municipal wells. EPND is also evaluating transferring water from one test section to another to minimize the total quantity of water needed to complete the hydrostatic test. EPND will obtain applicable water appropriation and discharge permits for hydrostatic testing activities. EPND anticipates that between 3.5 million and 5.7 million gallons of water will be used for each test segment, and up to 6 million gallons of water could be used to test new tanks at the Clearbrook terminal. Exact volumes are not currently available and will be dependent on the amount of new piping and the size of tankage involved in each hydrostatic test. A list of major waterbodies that could potentially be used as sources of hydrostatic test water is provided in Appendix E of the EIR.

Water used for hydrostatic testing will be discharged on land, returned to the waterbody where it was appropriated, or discharged to a different waterbody after hydrostatic testing is completed, depending on the Project's National Pollutant Discharge Elimination System ("NPDES") permit conditions. If the water is discharged to an upland area, energy dissipation devices, such as straw bale structures and controlled discharge rates, will be used to minimize the potential for erosion and subsequent release of sediment into nearby surface waters and wetlands. If hydrostatic test water is discharged directly into waterbodies, energy dissipation devices will be used to reduce the

discharge energy to prevent stream bottom scour. EPND will develop site-specific discharge plans for each waterbody that receives hydrostatic test discharges. At this time, EPND is not aware of any chemical additives that will be introduced to the hydrostatic test water or chemicals that will be used to dry the pipelines following the hydrostatic testing.

Subpart 3. Vehicular traffic. Estimate the amounts and types of vehicular traffic that would be generated by the facility due to construction activity and, later, operational needs.

Short-term impacts on local transportation systems may result from: construction of the pipeline across roads and railroads; movement of construction equipment and material to work areas; and daily commuting of the construction workforce to work sites. These impacts are not expected to be significant.

EPND typically will construct the pipeline underneath paved roadways and railroads using road-boring equipment. EPND plans to cross three railroads using the HDD method. Both of these methods allow EPND to install the pipeline beneath the road without closing it, thereby avoiding 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 will temporarily disrupt road traffic as the pipe trench is excavated across the roadway. To minimize traffic delays at open-cut crossings, EPND will establish traffic detours before excavating the roadbed. If no reasonable detours are feasible, at least one traffic lane of the road will be maintained, except for brief periods when road closure is essential to install the pipeline. EPND will minimize the duration of open-cut crossings. EPND will work with local authorities to notify local residents prior to road closures and will attempt to avoid closing roads during peak traffic hours.

To maintain safe conditions, EPND will direct its construction contractors to adhere to local weight restrictions and limitations for construction vehicles, and to remove soil that is left on the road surface by the crossing of construction equipment. In addition, when it is necessary for construction equipment to move across paved roads, mats or other appropriate measures will be used to minimize damage to the road surface.

EPND anticipates up to eight truckloads of 24-inch pipe and up to 14 truckloads of 30-inch pipe will be needed per mile of pipeline over area roads to deliver the pipe along the construction route. Truck traffic associated with transporting this pipe, as well as other construction-related travel associated

with the Project, may increase the workload of local authorities to assist with traffic control. In addition, local authorities may need to assist with short-term detours at pipeline road crossings or delays in traffic flow from large, slow-moving vehicles. EPND does not anticipate that these project-related demands on local authorities will be significant.

The movement of construction personnel, equipment, and materials from contractor and pipeyards to the construction work area will result in additional short-term impacts on local transportation systems. Several construction-related trips will be made each day to and from the job site. Traffic will remain fairly consistent throughout the construction period, and will typically peak during early morning and evening hours. EPND anticipates that road congestion will increase during these peak hours but will not significantly disrupt the normal flow of traffic in the Project area.

Incremental road congestion could be caused by construction workers commuting to and from work sites on a daily basis. Notable increases in rush hour traffic, however, are not anticipated because of the generally rural location of the Project. Pipeline construction is also generally scheduled to take full advantage of daylight hours with most workers commuting during off-peak hours (i.e., early morning and evening). In addition, construction workers typically leave their personal vehicles at contractor yards and participate in shared rides to work sites. This will help reduce road congestion. Finally, workers will generally be dispersed along the entire length of the pipeline route, as opposed to concentrating at a single work site, thereby reducing impacts on traffic at any one location.

For the most part, day-to-day operational traffic related to Sandpiper would not be noticeable. EPND and its contractors would access the pipeline right-of-way and aboveground facilities as required to perform vegetation maintenance and monitoring activities. Some increased traffic will occur in localized areas of pipeline maintenance activities, but these instances will be infrequent and of short duration.

Subpart 4. Agriculture. Estimate the number of farms and the number of acres of cropland and pasture land that would be affected by construction of the pipeline. Indicate known circumstances with regard to the pipeline that would tend to reduce agricultural productivity along the route. Estimate the amount of excavation, backfilling, grading, soil compaction and soil mixture, and ditching to be done in farm fields. Estimate the number of drainage ditches to be impacted by the pipeline.

Agricultural land accounts for 1,761.4 acres (or 34 percent) of the total

construction area (see Table 4.2-1 of the EIR). Of the agricultural land affected, approximately 1,058.6 acres is cultivated and the remaining 702.8 acres is pasture land. The total excavation/grading of topsoil in agricultural lands will comprise approximately 4.6 million cubic yards of topsoil. The total excavation of trench in agricultural lands will comprise approximately 1.6 million cubic yards of soil. EPND has not yet determined the number of farms that would be affected by Project construction. Approximately 28 drainage ditches will be crossed by the new pipeline.

Construction activities will temporarily utilize active cropland within construction right-of-way and additional temporary workspaces. Construction activities may also interfere with center-pivot irrigation systems, planting or harvesting, depending on the construction season. Following construction, agricultural activities will resume within the temporary and permanent pipeline right-of-way. EPND will maintain access to fields, storage areas, structures, and other agricultural facilities during construction, and will maintain irrigation and drainage systems that cross the right-of-way to the extent practicable. Agricultural land in the construction right-of-way will generally be taken out of production for one growing season and will be restored to previous uses following construction. Landowners will be compensated for crop losses and other damages caused by construction activities. Losses and disturbances to production, harvesting, irrigation, and drainage systems will be identified and measures will be taken to avoid, mitigate, minimize, or otherwise address those effects in accordance with the Agricultural Protection Plan ("APP") (Appendix C of the EIR).

EPND will implement measures to avoid, minimize, or mitigate potential impacts on soil productivity in accordance with the APP (Appendix C of the EIR). These measures include topsoil segregation, stone removal, and measures to avoid compaction or loosen compacted soils. To prevent soil compaction, drainage alteration, and damage to crops, operation of maintenance equipment on agricultural lands will be limited to access routes agreed to with landowners.

EPND will also take appropriate measures to accommodate livestock operations during construction. To minimize short-term disruption to livestock operations, EPND will minimize the length of time that the trench is open and will coordinate with landowners to minimize disruption of access. Where appropriate, EPND will maintain temporary access ways across the trench as necessary to allow the passage of livestock, and will erect temporary fences (including gates) as necessary to contain and protect livestock from

construction-related hazards. After completing construction, fences and gates will be rebuilt to their former condition or better.

Refer to Section 4.2 of the EIR for additional discussion regarding impacts on agricultural lands.

Subpart 5. Relocation of persons. Estimate the number of people that would have to relocate if the pipeline were constructed.

Since construction and operation of the pipeline will require acquisition of additional property, the project could result in the relocation of persons.