NORTH DAKOTA PUBLIC SERVICE COMMISSION

APPLICATION OF

ENBRIDGE PIPELINES (NORTH DAKOTA) LLC

To Amend

ROUTE PERMIT FOR A CRUDE OIL PIPELINE

NORTH DAKOTA SYSTEM EXPANSION PHASE 6 PROJECT
February 2008

Prepared by

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SECTION B

LOCATION

B.1. APPLICANT'S POLICIES AND COMMITMENTS TO LIMIT ENVIRONMENTAL IMPACT

It is Enbridge Pipelines (North Dakota) LLC's ("EPND") policy to protect the environment as an integral element in the conduct of its business. Environmental protection efforts will span the entire project, from planning through construction, restoration, and into full operation.

B.1.a Construction

In this application, EPND is proposing to optimize its system capacity through the construction of the next phase of its system expansion program referred to hereinafter as the North Dakota System Expansion Phase 6 (NDSE6) Project. The NDSE6 Project involves the injection of a drag reducer agent (DRA) and the installation of appropriate facility upgrades at the existing Alexander, Trenton, Beaver Lodge, Stanley, Blaisdell, Minot, Denbigh, Pleasant Lake, Penn, Bartlett and Larimore Pump Stations sites. All station upgrades will be constructed on lands already owned by EPND at the existing station sites and no new land will be required. EPND also proposes to install one new storage tank at its existing Beaver Lodge Tank Farm Facility. This installation will require new land, which EPND plans to acquire in fee. No new pipeline will be required as part of the North Dakota System Expansion 6 Project (NDSE6) other than minor station piping that may be necessary at existing station sites. The proposed station upgrades will result in temporary short-term impacts, but is not expected to result in significant long-term change to the environment.

Planning, design, construction, and restoration will incorporate the equipment and measures discussed in section B.6 and B.9. Environmental monitoring, in the form of ongoing inspection, will be conducted during and following construction. Inspectors will monitor compliance with required environmental protection measures, permit conditions, and specifications, and provide ongoing oversight for day-to-day issues that may arise during construction. Contract specifications will incorporate environmental protection and mitigation measures, and contractors will be expected to implement these measures in the field. Contractor training and project orientation will also be provided by EPND.

Environmental data collected to date includes cultural resources, wetland and protected species. EPND will continue to work with appropriate regulatory agencies and will continue to gather comprehensive information during the permitting process.

B.1.b Ongoing Pipeline Operation

The North Dakota System has been in operation for many decades and is regulated by the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration under 49 CFR Part 195 (and other codes). EPND has developed a comprehensive set of operating and maintenance procedures that assure pipeline inspection and commitment to pipeline safety. Additionally, EPND has a continuing commitment to conduct its operations in an environmentally responsible manner. Substantial, continual effort is placed on pipeline integrity, operational safeguards, emergency response, and landowner relationships, all of which reduce the impact of the pipeline to the environment. Moreover, EPND has personnel responsible for environmental, maintenance and internal pipeline integrity plans for monitoring compliance with various pipeline safety and environmental regulations, and company policy. EPND also has a review program in place to ensure policies and procedures are effective and compliant.

B.1.c Energy Conservation Considerations

The completion of the NDSE6 Project will result in approximately 51,600 bpd of incremental pipeline capacity on the North Dakota system.

Energy conservation is a major concern at EPND since energy/power costs represent the largest single recurring expense in pipeline operation. Attention is continually being directed toward energy conservation.

EPND continually works with its individual energy providers to assure economical and efficient use of power for its North Dakota pipeline system. EPND also continuously reviews and tracks firm and non-firm power requirements, and works closely with electrical utilities in planning for transmission and generation needs.

EPND's energy conservation goal is to minimize power/energy unit costs, through the implementation of internal programs directed at continuous improvement of energy utilization efficiency.

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

B.1.c.(1) Pipeline Diameter

Efficiency through optimization of existing pipeline system through the injection of DRA and installation of new pumping units at existing station sites.

B.1.c.(2) Variable Frequency Drives (VFDs)

The installation of variable frequency induction motor drives is a program that has been in place for approximately 16 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 (PCVs). VFDs, however, do introduce energy losses and therefore are considered only when there is a range of operating conditions (primarily flow rate, density and viscosity) that would often require dissipation of pressures produced by the pumps. Ideally if operating conditions were constant, the pump would deliver constant pressures eliminating the need for pressure dissipation. Therefore, operating conditions play a key role in designing the pumping stations for optimum efficiency.

B.1.c.(3) 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 an optimum 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.

B.1.c.(4) Energy Efficient Pumps and Motors

For new installations, EPND purchases high efficiency pumps and motors at a premium initial cost in an effort to conserve long range energy requirements. 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 kW. Increasing the efficiency by only 1% translates into 170,000 kWh of

energy savings. With this substantial potential for energy savings, it is desirable to optimize efficiency. Pumps are hydraulically designed and selected to obtain a high best efficiency point (BEP) at the desired flow rates. The forecasts are continually being evaluated and if the flow rate is outside the BEP range, impeller changes are typically implemented for improved efficiency.

B.1.c.(5) Electric Service Agreements

EPND is presently working with its various energy providers to renegotiate, if applicable, new electric service agreements for its NDSE6 Project.

B.1.c.(6) Drag Reducer Agent (DRA)

Injections of DRA will be one of the methods used to increase the pipeline capacity of the North Dakota system. Injection of DRA reduces flow turbulence of liquid hydrocarbons which results in reduced pressure loss between stations. This allows a high 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. The flexibility further provides opportunities to shift power use to improve economics or accommodate the utilities. 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.

B.2. DISCUSS THE FACTORS LISTED IN SECTION 49-22-09 NDCC TO AID THE COMMISSION'S EVALUATION OF THE PROPOSED PIPELINE ROUTE

Factors which the North Dakota Public Service Commission (NDPSC or Commission) considers in evaluating the designation of corridors and routes include the following:

B.2.a Available Research and Investigations Relating to the Effects of the Location, Construction, and Operation of the Proposed Facility on Public Health and Welfare, Natural Resources, and the Environment

A discussion of the effects of the location, construction, and operation of the proposed NDSE6 Project on public health and welfare, natural resources, and the environment is included in Section B of the Application to amend Certificate of Corridor Compatibility. Research and investigation relating to these effects have included cultural resource reviews, protected species and sensitive area reviews, and field wetland delineation studies. Other environmental studies are also available in EPND's previous applications for its existing facilities in the counties of McKenzie, Williams, Mountrail, Ward, McHenry, Benson, Ramsey, and Grand Forks. (See the Commission's Findings of Fact, Conclusions of Law and Order in Case Number 10,472; Certificate of Site Compatibility No. 40 and Route Permit No. 49 dated October 11, 1983; Certificate of Site Compatibility No. 93 and Route Permit No. 103 dated August 23, 2006 and Certificate of Site Compatibility No. 95 and Route Permit No. 105 dated September 20, 2006.)

B.2.b The Effects of New Energy Conversion and Transmission Technologies and Systems Designed to Minimize Adverse Environmental Effects

The project does not include new energy conversion or transmission technologies that are expressly designed to minimize adverse environmental effects. As described in the Enbridge Environmental Guidelines for Construction (EGC), which EPND adopts herein, current construction techniques and mitigation measures will be employed to minimize the effect of construction on environmental resources (see Exhibit G). These measures are also discussed in Section B.6 below.

B.2.c The Potential for Beneficial Uses of Waste Energy from a Proposed Energy Conversion Facility

The project does not involve new energy conversion facilities; no usable waste energy will result from the project.

B.2.d Adverse Direct and Indirect Environmental Effects, Which Cannot be Avoided Should the Proposed Site or Route be Designated

Unavoidable adverse direct and indirect environmental effects may include short-term or temporary effects on vegetation, wildlife, and noise levels as described in Section D.2. of the Application to amend Certificate of Corridor Compatibility. Additionally, EPND will implement thorough mitigation measures to minimize these impacts as described in Enbridge's EGC (see Exhibit G).

B.2.e Alternatives to the Proposed Site, Corridor or Route, Which are Developed During the Hearing Process and Which Minimize Adverse Effects

Alternatives that EPND considered when planning the project are discussed in Section C.2 of the Application to amend Certificate of Corridor Compatibility.

B.2.f Irreversible and Irretrievable Commitments of Natural Resources Should the Proposed Site, Corridor or Route be Designated

The proposed upgrades will be installed on land already owned by EPND with the exception of the land EPND will acquire in fee for the new storage tank at the Beaver Lodge Tank Farm Facility. Thus only minimal irreversible or irretrievable commitments of natural resources will result from the NDSE6 Project.

B.2.g The Direct and Indirect Economic Impacts of the Proposed Facility

B.2.g.(1) The NDSE6 Project presents an optimization of existing pipeline capacity with the addition of DRA and station upgrades to meet the needs for additional liquid petroleum transportation in this region.

B.2.g.(2) The NDSE6 Project has significant economic benefits.

- Provides a stable source of crude oil supplies to the refining regions of PADD II and supports a healthy economic environment throughout the entire Upper Midwest.

- Current property taxes in North Dakota are approximately $0.6 million. The total assessed value resulting from the NDSE6 Project will increase the estimated property taxes by approximately $1.6 million.

B.2.h Existing Plans of the State, Local Government, and Private Entities for Other Developments at or in the Vicinity of the Proposed Site, Corridor, or Route

EPND is not aware of other development by state, local or governmental entities at or in the vicinity of the proposed project corridor.

EPND is aware of another proposed petroleum transmission system, the Keystone Pipeline, which is located in eastern North Dakota and runs north to south across the state. The proposed Keystone Pipeline Project does not relate to or otherwise affect the routing, construction or operation of the NDSE6 Project.

B.2.i The Effect of the Proposed Site or Route on Existing Scenic Areas, Historic Sites and Structures, and Paleontological or Archaeological Sites

Please refer to Sections B of the Application to amend Certificate of Corridor Compatibility for a discussion of the effects of the proposed project on existing scenic areas, historic sites and structures and Paleontological or Archaeological Sites.

B.2.j The Effect of the Proposed Route on Areas Which Are Unique Because of Biological Wealth or Because They are Habitats for Rare and Endangered Species

On November 26, 2007, EPND sent a letter to the North Dakota Game and Fish Department (NDGFD) to determine whether the proposed project would have significant adverse effects on unique or rare animal or plant species. A response from the NDGFD was received on December 21, 2007 stating that the project would not result in significant adverse impacts on wildlife or wildlife habitat, including endangered species. A copy of the NDGFD response is enclosed herewith as Exhibit E.

B.2.k Problems Raised by Federal Agencies, Other State Agencies, and Local Entities

EPND consulted with the following federal, state and local agencies to identify potential environmental resources in the project area. No other problems or concerns have been raised by commenters or identified by EPND.

Here is a list of the agencies with which EPND have consulted and their findings.

B.2.k.(1) North Dakota Public Service Commission

The North Dakota Public Service Commission has not yet concluded its evaluation of the proposed project. To date, no concerns have been expressed to EPND. .

B.2.k.(2) North Dakota Department of Health

The North Dakota State Health Department did not identify concerns with the proposed project; however, applications for hydrostatic test water discharge permits and storm water discharge permits have not yet been submitted to the department.

B.2.k.(3) North Dakota Game and Fish Department

The North Dakota Game and Fish Department indicated that they do not have wildlife concerns with the proposed project. (See Exhibit E.)

B.2.k.(4) State Historical Society of North Dakota (State Historic Preservation Office)

The State Historical Society of North Dakota has not identified concerns with the proposed project. A discussion regarding cultural resource investigations are discussed in Section B.1 of the Application to amend Certificate of Corridor Compatibility. (See Exhibit C.)

B.3. IDENTIFY AND MAP CRITERIA LEADING TO PROPOSED PIPELINE ROUTE LOCATION WITHIN CORRIDOR

The following criteria, which include but are not limited to the criteria required by North Dakota Administrative Code (North Dakota Rules) Chapter 69-06-08-02, were considered in evaluating the location of the proposed pipeline route: Exclusion and Avoidance Areas, Selection and Policy Criteria, Design and Construction Limitation, Economic Considerations, Human Environment, Soils, Vegetation/Wildlife, Land Use, Water Resources, and Cultural Resources. Detailed discussions of these criteria, including descriptions, potential impacts,

and mitigation measures where appropriate are provided in Sections D.2, D.3, D.4 and D.5 of the Application to amend Certificate of Corridor Compatibility.

B.4. RELATIVE VALUE AND EFFECTS UPON EACH CRITERION INCLUDING LOCATION, CONSTRUCTION, AND OPERATION OF THE FACILITY

See Section D.3 of the Application to amend Certificate of Corridor Compatibility.

B.5. THE CRITERIA TO BE EVALUATED SHALL INCLUDE AT A MINIMUM ALL OF THE FOLLOWING, WHICH ARE WITHIN THE DESIGNATED CORRIDOR:

- Exclusion Areas;
- Avoidance Areas;
- Selection criteria;
- Policy criteria;
- Design and construction limitations; and
- Economic considerations

Complete descriptions, potential impacts, and mitigation measures relevant to the six criteria cited above are provided in Section D.2 of the Application to amend Certificate of Corridor Compatibility

B.6. MITIGATION MEASURES

See Section D.5 of the Application to amend Certificate of Corridor Compatibility.

B.7. QUALIFICATIONS OF PERSONS CONTRIBUTING TO THE STUDY

See Section D.6 of the Application to amend Certificate of Corridor Compatibility.

B.8. MAPS

See Section D.7 of the Application to amend Certificate of Corridor Compatibility.

B.9. Other Matters

The information provided below is in accordance with North Dakota Century Code 49-22-08.1 Sections 1.e, 1.f, and 1.g.

B.9.a.(1) Right-of-Way Preparation, Construction and Reclamation Procedures

With regard to right-of-way preparation, construction and reclamation procedures, EPND proposes to adopt its Environmental Guidelines for Construction (EGC), which is enclosed herewith as Exhibit G. EPND's EGC provides a more detailed discussion of the guidelines and mitigation measures that EPND would implement on this project. All upgrades involving the installation of new pumping units will be construction within the existing sites on land already owned by EPND with the exception of the land EPND will acquire in fee for the installation of its new storage tank at the Beaver Lodge Tank Farm Facility.

B.9.a.(2) Hydrostatic Testing

All new facilities will be factory and field pressure tested as required by federal pipeline safety regulations and industry codes. Station piping that will be needed as a result of the station upgrades will be tested as appropriate under these regulations and codes. The testing process will be implemented in accordance with EPND's EGC and permits issued by the North Dakota Department of Health.

B.9.b Landowner Issues

As stated above, EPND will be performing its work activities on land already owned by EPND and such necessary land for the new storage tank at Beaver Lodge will be acquired in fee.

As stated in Section D.2.b (1) of the Application to amend Certificate of Corridor Compatibility, two landowners and four businesses are located within 500 feet of Penn Station. EPND is in the process of obtaining waivers from the residents and business owners.

B.9.c Operations and Safety

B.9.c.(1) Pipeline Operation and Control.

The EPND's pipeline control center is located in Estevan, Canada.

The Control Center is manned by pipeline operators 24 hours a day. A computerized pipeline control system allows these operators to remotely monitor and control the pipeline and related facilities. The Control Center also serves as an emergency center to receive calls from employees, the public or public officials reporting unusual conditions or pipeline failures. The computerized pipeline control system has been designed to control the pipeline within pre-established minimum and maximum operating pressures. Both the computer system and operating practices include procedures for abnormal operating conditions, including emergency shutdown and isolation of the pipeline and notification procedures in the event of suspected emergencies

B.9.c.(2) Communications Capabilities

Land-lines are used to exchange the necessary computerized data for pipeline monitoring and control. EPND maintains a UHF radio system, supplemented by cellular phones as needed, to facilitate personnel communications during operation, maintenance, or emergency activities.

B.9.c.(3) Protection of the Pipe from Damage

EPND has an aggressive program in educating excavators and the public about the presence of the pipeline and preventing damage to the pipeline from excavating equipment. EPND has joined and supports the North Dakota One-Call system and other one-call systems in the states where they exist.

The pipeline is protected from corrosion in a number of ways. Pipelines are covered with a protective coating. In addition, all buried or submerged metallic structures (pipeline systems) are under a cathodic protection system, as required by Pipeline Safety Regulations.

B.9.c.(4) Inspections.

EPND conducts routine inspections of the pipeline and facilities to ensure that the system is operating properly, in compliance with CFR 49 Part 195.

Each calendar year (not to exceed a 15-month interval), the cathodic protection system is monitored by taking pipe/structure-to-soil and line current (where possible) readings. 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 rectifier and critical cathodic protection interference bond to foreign structures is inspected and corrective measures taken, if needed.

In addition, EPND periodically evaluates the effectiveness of its cathodic protection system by conducting supplemental close interval surveys (*e.g.*, close interval pipe to soil, etc.) of the system. Although not required by regulation, this method allows EPND to assess overall effectiveness of the pipeline system.

The pipeline route is patrolled by air at least 26 times per year to inspect the surface conditions of land on or adjacent to the pipeline right-of-way. 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 leak, it is important for valves to close properly to isolate the section of pipeline and minimize the amount of petroleum 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 under 49 CFR Part 195. These inspections are conducted with the use of an electronic inspection tool – called "instrument pigs." These devices travel through the inside of the pipeline and are used to examine the condition (dents, gouges, corrosion, or cracks) of the pipe by on-board computers. Results of the inspection are then analyzed, and the pipe inspected to verify preliminary findings and then repaired as required.

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.

Periodically, inspectors from the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration ("DOT-PHMSA") inspect the EPND's compliance with applicable government regulations. Inspections of the EPND's written procedures, records, and facilities are also periodically conducted.

B.9.c.(5) Maintenance

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

B.9.c.(6) Training of Personnel

EPND has established a comprehensive orientation, technical, safety, emergency, and on-the-job training program that is in compliance with the Operator Qualification rules issued by the DOT-PHMSA under 49 CFR Part 195. As personnel progress in pipeline operation and maintenance positions, they receive hundreds of hours of formal and on-the-job training. Demonstrations of competence are shown through review of job performance, periodic pipeline control system simulators, emergency exercises, welding certification tests, and other functions required to continue safe pipeline operation and maintenance.

B.9.c.(7) Public Awareness Program

EPND conducts a comprehensive public education program to ensure that the affected public (those who work and live along the pipeline), excavators, local public officials, and emergency units of government 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/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.

B.9.c.(8) Emergency Preparedness

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