



# INDUSTRIAL COMMISSION OF NORTH DAKOTA

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## NORTH DAKOTA PIPELINE AUTHORITY

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Attorney General  
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Agriculture Commissioner  
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### **Williston Basin Crude Oil Transportation Dynamics**

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This is an update of the "Williston Basin Crude Oil Transportation White Paper" originally prepared by Lynn Helms and Ron Ness. This report will update information provided in that report and elaborate on what has taken place since July 2006.

#### **Regulatory Background**

Most oil pipelines operate as common carriers governed by the requirements of the Interstate Commerce Act (ICA). The pipelines do not own the products they transport. Producers, marketers or others desiring service typically contract with the pipeline company to ship their products on the pipeline. If the requests for shipments exceed the pipeline's capacity, the space must be allocated among them in a non-discriminatory manner. This usually occurs on what is called a "pro rata" basis. The pipeline company is required to allocate their capacity in a non-discriminatory manner to all shippers who meet the terms of their pipeline tariff, also known as conditions of service.

The Federal Energy Regulatory Commission (FERC) regulates the rates charged, the terms of service, and apportionment policies of those pipelines that operate in interstate commerce. For pipelines that operate strictly in an intrastate capacity, their rates and tariffs are regulated by state agencies such as public service commissions. There can be times when both requirements may apply.

In North Dakota, the Public Service Commission (PSC) regulates the construction of a common carrier's facilities.

Pipeline safety is regulated by both the Federal Department of Transportation (DOT) and the applicable state agency. This too is usually differentiated by interstate or intrastate operation. In North Dakota, the Public Service Commission is responsible for pipeline safety matters on intrastate facilities.

There are many other state and federal agencies who must issue permits for the actual construction of facilities. Some examples are: air and water quality permits, wildlife agency permits, historical society permits, public land permits, and many more.

#### **Current Production**

The US portion of the Williston Basin is currently producing approximately 210,000 barrels of oil per day (bpd). North Dakota is producing 121,000 bpd and Richland County in eastern Montana is producing approximately 55,000 to 57,000 bpd, along with about 30,000 bpd from southeastern Montana and South Dakota.

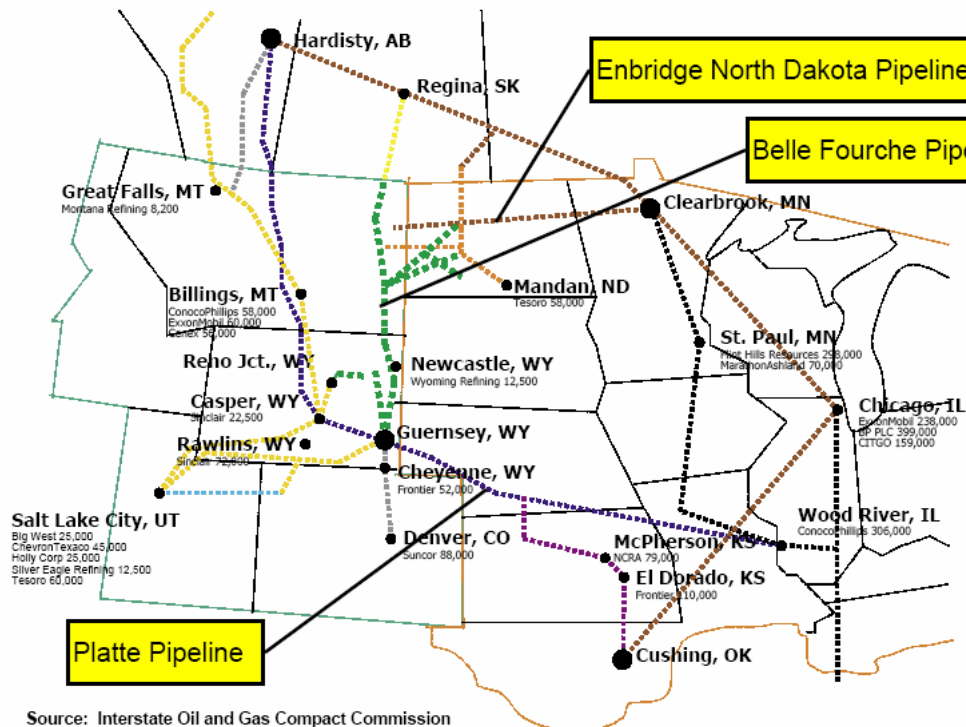
Last year production of crude oil from Richland County, Montana reached 60,000 bpd. That production now appears to have peaked with current levels at about 57,000 bpd. At this point we cannot predict at what rate that production will decline.



### An Update of Progress on Improving North Dakota Crude Oil Export Capacity

There are only two significant interstate export pipeline systems serving North Dakota's crude oil complex. Most Richland County, Montana and northern North Dakota produced crude oil currently is delivered to Clearbrook, Minnesota via the Enbridge North Dakota pipeline system. Enbridge's North Dakota system is full and has been in apportionment since early 2006. In May 2007, Enbridge put in place a new apportionment policy aimed at curbing over-nomination of its pipeline capacity. That policy has not been successful so Enbridge has recently been working to come up with a new apportionment policy that will be acceptable to its current and historical shippers as well as new shippers who are planning to access Enbridge with production from their new drilling efforts. Effective September 1, the FERC approved Tariff 52 which should settle this matter.

### **Rocky Mountain Region Pipelines and Refineries**



As mentioned before, a large share of the Richland County production comes into the Enbridge system. As this source levels off, or perhaps decreases, an increasing share of Enbridge's pipeline capacity will become available to other production. Several companies have significant drilling programs planned for northwestern North Dakota and this crude oil will likely be headed to Enbridge for shipment east.

Most of the crude oil produced in southwestern North Dakota, southeastern Montana, and northwest South Dakota continues to be shipped by the Belle Fourche, Bridger, and Butte pipelines to Guernsey, Wyoming. From there it is shipped either to Rockies area refiners or east to Wood River, Illinois on the Platte Pipeline.

### Capacity Improvements on Enbridge North Dakota

Since 2004, Enbridge has made a series of expansions on its North Dakota system. In 2006, Enbridge undertook their Phase 5 expansion. It was designed to increase their crude oil capacity from Minot to Clearbrook to 110,000 bpd. According to Enbridge representatives, Phase 5 construction is on schedule and expected to become available to shippers by year end 2007.

The extra capacity created in Phase 5 was almost immediately spoken for so Enbridge, in consultation with their customers, decided an additional expansion was needed. Phase 6, as originally proposed, is a \$130 million dollar expansion that would increase capacity by an additional 45,000 bpd for a total of 155,000 bpd. The Phase 6 proposal is currently in an extended “open season” where Enbridge is soliciting shipper and producer interest in the project and trying to balance the interests of those customers by developing an expansion design and tariff structure that meets customer demand. There is strong support for further expansion of Enbridge's capacity with several interested parties requesting firm service. Most of the disagreement concerns the amount of capacity allocated to firm shippers and the duration of the contract term.

Once Enbridge is able to define the requirements of the project, a new proposal for expansion will require regulatory approval. The FERC will have to approve any new rates, tariff terms, and proration policies. The North Dakota PSC must approve the facility installations - like tank farms, pump stations and new pipe. After completion of the proposed Phase 6 expansion, Enbridge will have nearly doubled their pre-Phase 5 crude carrying capacity of about 80,000 bpd.

### **Improvements on Belle Fourche Pipeline**

Belle Fourche Pipeline is exploring ways to reconfigure their pipeline system serving western North Dakota. By reversal of traditional north to south flow on one of its pipelines and the construction of a 35-mile loop into the Alexander area, Belle Fourche hopes to create addition outlets for southwestern North Dakota-produced crude oil. In conjunction with other regional pipelines, Belle Fourche is working to make other changes to their operations that will create multiple market outlets for all Williston Basin crude oil.

Similar to the Enbridge situation, the changes planned by Belle Fourche will require approval from the FERC for the new tariff and service agreements and the PSC for the installation of the facilities. The matter is currently before the FERC and will be formally filed with the PSC early in September.

### **Platte Pipeline**

When flow on the Platte Pipeline reached its capacity and shipments went into apportionment in 2005, additional Williston Basin crude production sought new ways to the market. That is when the capacity pressure on the Enbridge North Dakota system came into being.

The Platte Pipeline was constructed in the 1950s. It is not known if owner Kinder Morgan Canada has any plans for expansion or improvements to this line but it remains a bottleneck to regional production. There have been alternative pipeline proposals considered for the region but no definite plan has emerged yet.

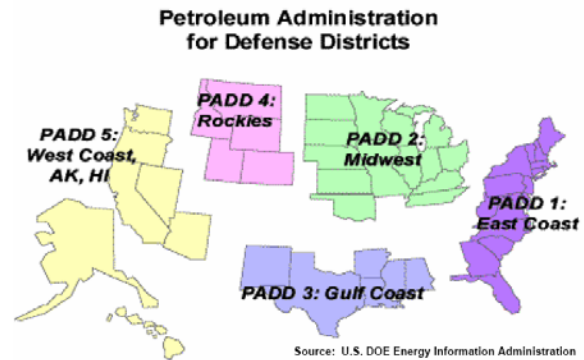
### **Non-Pipeline Movements of Crude Oil**

#### **Truck**

Trucking of crude oil in North Dakota has become a significant factor. Largely driven by pricing structures and the lack of pipeline capacity, some believe nearly one-third of North Dakota's production is being moved around by truck. Records at the NDIC Oil and Gas Division indicate about 35% of North Dakota production leaves the lease by truck. In addition, small amounts of Western Canadian Sour (WCS) crude oil are occasionally trucked into North Dakota and blended with Williston Basin sweet (primarily Bakken) crude. On occasion, some North Dakota oil is also trucked to Canada to enter their transportation network.

## Rail

Currently none of North Dakota's production leaves the state by rail. Availability of tank cars and loading/unloading facilities is very limited. Cost for rail shipment is nearly as high as trucking and provides much less flexibility. Several companies have evaluated using rail cars to ship their product and found it didn't make economic sense. According to U.S. Department of Energy's Energy Information Administration (EIA), no crude oil is shipped by rail in PADD 2 or PADD 4. PADD 1, 3, and 5 report some rail shipments of crude oil.

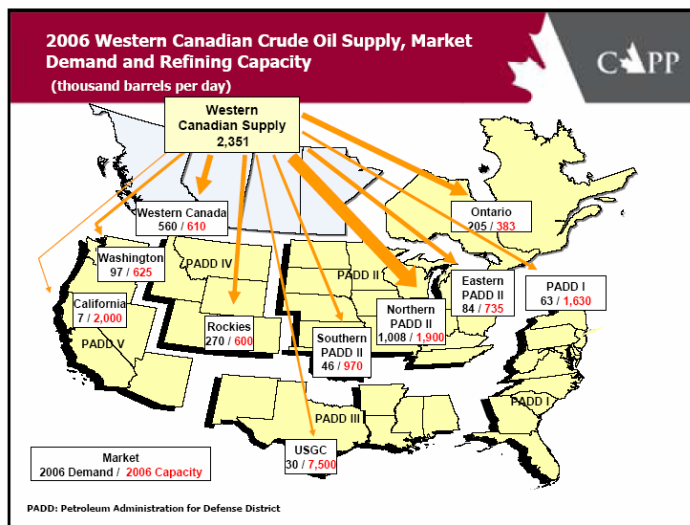


## Refinery Expansions

There hasn't been a new refinery built in the United States since 1976. Several reasons for this are environmental permitting difficulties, public unpopularity, and the huge investments required with small margins for profitability. Refining capacity in the U.S. has improved over the last 5 years without the construction of new plants. This has been done by expansions and improvements at existing facilities. According to the EIA there has been about a 4% improvement in total U.S. refining capacity since 2002. Most of that improvement has been in PADD 3 – the Gulf Coast region. Refining capacity in PADD 2 – the Midwest region, has not increased in the last five years, perhaps even decreased slightly. In PADD 4 – the Rocky Mountain region, there has been about a 4% improvement.

Several refineries in the U.S. have made changes to handle the heavier crude oils from western Canadian sources and more are planning the switch. The 437,000 bpd BP refinery in Whiting, Indiana has announced plans to increase from a 30% Canadian inlet crude stream to 90% this fall. However, BP's refinery changes have been met with opposition by environmental groups over concerns for Lake Michigan water quality. This large facility, and others like it, provides significant markets for western Canadian crude. Several Canadian firms are considering large oil pipeline expansions to the Midwest and southern U.S.

## Improving Market Access in the U.S. to Growing Supplies of Crude Oil from Western Canada



Source: Canadian Association of Petroleum Producers

The United States imports about 66% of its crude oil from foreign countries. About one-fifth of that comes from Canada. Canadian imports are viewed as a stable and secure source of supply. The growing U.S. demand for oil shows no signs of leveling off. Numerous large pipelines originate in Alberta and Saskatchewan and cross the U.S. to access refineries in the Rockies and Midwest. If this Canadian oil travels through pipelines used by North Dakota producers it can occupy valuable capacity. For this reason it makes sense for North Dakota to support the large "express" pipelines that are being constructed from Canada to the major U.S. crude refinery markets. For that same reason it makes

sense to urge those Canadian pipelines to push south past PADD 2 market centers and on to PADD 3 and the Gulf Coast refining centers.

A few Canadian projects will cross North Dakota on their way to U.S refining centers. The Keystone Pipeline will traverse about 218 miles of eastern North Dakota. At maximum design it will be capable of carrying up to 590,000 bpd of heavy Canadian crude oil. This project is presently before the North Dakota Public Service Commission and waiting for their approval. Three public input hearings on the project have been held. Keystone hopes to have the pipeline in service by year end 2009.

Two other large crude oil projects will partly cross North Dakota. Enbridge Canada's Southern Lights and Alberta Clipper will parallel existing Enbridge lines in Pembina County on their way from Hardisty, Alberta to Clearbrook, Minnesota. The Alberta Clipper is initially designed to carry 400,000 bpd and be expandable up to 800,000 bpd. Southern Lights will carry diluted bitumen and heavy crude. This line will replace an existing pipeline that is being reversed to ship diluent (a thinning agent) northwest to Hardisty. These projects are presently in the regulatory approval queue.

A possible direct advantage to North Dakota producers could be provided by these new pipelines if actual connection was made to them allowing for shipments south and east to Midwest markets. The challenge is that these pipelines are located in the eastern part of the state while production is in the west.

### **Refinery Turnarounds**

At any particular point in time refineries are out of service for various reasons, some planned some not. Large planned shutdowns for maintenance on one or more process units are called turnarounds. These are typically scheduled for "slow" times in the spring and fall. During these shutdowns, incoming crude oil is rerouted to tank storage facilities or to other pipelines. There has been discussion about whether or not refinery shutdowns affect oil and refined product prices. At the request of U.S. Senator Jeff Bingaman of New Mexico, in March of this year EIA undertook a statistical analysis of refinery outages' affect on oil and refined product prices. They concluded generally there was no significant price impact. However during periods of already low supply, a significant loss of refinery capacity could have some regional price impacts. Hurricanes Katrina and Rita demonstrated how the loss of significant refinery capacity in the Gulf could affect prices.

This fall refineries in both PADD 2 and 4 will be performing maintenance on their facilities. Eight refineries in PADD 2 will have their capacities reduced in various amounts. These facilities comprise about 13% of the 3,587,220 bpd refining capacity of PADD 2. Four refineries in PADD 4 will also be down to some extent. This is expected to reduce the 598,350 bpd refining capacity in PADD 4 by about 27%.

### **Tesoro Mandan**

The crude oil unit at the Tesoro refinery in Mandan has a nameplate capacity of 60,000 bpd. With the changes completed to meet the new ultra low sulfur fuel requirements for U.S. vehicles, that unit is now able to process 58,000 bpd. They have been running at full capacity for some time. Tesoro's refinery yield is about 60% gasoline, 35% diesel fuel and the rest is various other fuels. Currently Williston Basin-produced crude oil supplies nearly 100% of Tesoro's refining needs. However not all the crude oil produced there can be utilized by the refinery. Some crudes have qualities that are incompatible with their facilities. Tesoro's last major outage for maintenance work was in 2003 and none is planned again until 2009.

Under normal circumstances, North Dakota consumers cannot use all Tesoro's refined product output. Therefore much of it is shipped via pipeline to Minnesota. Because the Minnesota market is usually well supplied from various sources, there is little incentive for Tesoro to make the large expenditures required to send more refined product to Minnesota. However, they have considered increasing their throughput. While some minor improvements could be made to existing facilities, to add significant capacity would require major investment in a new process train. To justify such expansion there would need to be significant change in the regional market for refined products and improvements to the transportation system delivering them. This will be the subject of a future report on refined products.

### **New Refineries**

There has been discussion about construction of new refineries in our region. Hyperion, a Texas energy group, is considering a 400,000 bpd facility near Sioux Falls, South Dakota. That facility is currently in the early permitting stage.

In North Dakota, the Three Affiliated Tribes of the Fort Berthold Indian Reservation have been considering the construction of a 15,000 bpd facility. However they plan to use Canadian syncrude as their supply and this won't benefit North Dakota producers or ease pipeline bottlenecks. EPA air and water permits are pending on that project.

There has been consideration of a refinery near Williston located adjacent to the proposed ethanol facility. That project is in the early market evaluation phase.

However, even if one of these facilities is able to get off the drawing board it would be years before North Dakota producers realize any benefit from them.

### **Consideration of Quality Restriction on the Enbridge Pipeline in North Dakota**

In 2006 the North Dakota Petroleum Council and the North Dakota Oil & Gas Research Council contracted with Purvin & Gertz, Inc. to study whether quality restrictions on area pipelines could improve the delivery options for light sweet North Dakota-produced crude oil. That study concluded that in the Enbridge North Dakota case, quality restriction on sour crude shipments would improve sweet crude prices after completion of the Phase 5 expansion, but traditional quality bank mechanisms would not likely increase pipeline capacity. However, in the future quality restrictions coupled with increased flow capabilities might be beneficial.

### **Creation of the North Dakota Pipeline Authority**

In April of 2007, North Dakota Governor Hoeven signed into law HB-1128 creating the office of Pipeline Authority within the North Dakota Industrial Commission. The stated purpose of the Pipeline Authority is to "Diversify and expand the North Dakota economy by facilitating development of pipeline facilities to support the production, transportation and utilization of North Dakota energy-related commodities, thereby increasing employment, stimulating economic activity, augmenting sources of tax revenue, fostering economic stability, and improving the state's economy."

In May the Industrial Commission appointed Mark Makelky as the Director of the Pipeline Authority. Since that time Pipeline Authority staff have been gathering information, meeting with government agencies, industry representatives, and individual companies attempting to identify areas where it may provide assistance in developing pipeline infrastructure for crude oil, natural gas, CO<sub>2</sub>, refined products and renewable energy commodities. The Authority has also advised members of the North Dakota Industrial Commission on oil and gas transportation matters.

### **Production Apportionment**

Apportioning the production of crude oil in North Dakota has been considered to determine if it would relieve transportation bottlenecks for producers. The State of North Dakota calculates each well's allowable production according to published rules. Those rules are outdated, having originated in the 1950s, so they do not address Enhanced Oil Recovery units or other major changes in production. The North Dakota Oil and Gas Division is currently amending its apportionment rules and final rules will not be adopted until January 2008 or later.

Apportionment has the advantage of ensuring that all wells are allowed to produce some amount of oil. The amount of production allocated is based on market demand with the goal being to protect the correlative rights of working and mineral interest owners.

The disadvantages of North Dakota production apportionment still outweigh its advantages. Limiting North Dakota production's share of a pipeline's capacity creates an opportunity for crude from other sources to fill that vacated capacity. Public hearings on a very competitive and controversial topic are required. Assuming Montana adopted similar apportionment rules, both states would have the complicated task of coordinating their respective apportioned volumes every month to prevent one state transporting more oil at the expense of operators in the other state.

### **Conclusion**

Growing oil production in the Rocky Mountain region continues to surpass existing transportation capacity and producers continue to see their ability to market crude restricted. The severe price differentials of \$30 per barrel in March 2006 have decreased to current differentials of about \$5 per barrel. Some price differential in our area should be expected due to our distance from large market and refinery centers. The crude oil pipeline complex serving the region remains overloaded and therefore very price sensitive to any upsets such as might be encountered with major refinery outages, pipeline operational interruptions, or significant swings in production volumes.

The original White Paper proposed eleven potential solutions to North Dakota's transportation bottleneck:

- Enbridge Pipeline expansion
- Transport crude by rail
- Expand the Tesoro Mandan refinery
- Increase quality restriction on Enbridge North Dakota's pipeline
- Build new refineries
- Improve market access in U.S. to Canadian supplies
- Access Keystone Pipeline
- Create a Pipeline Authority
- Place a tariff or tax on Canadian imports
- Review FERC apportionment policies
- Apportion crude production in North Dakota/Montana

This report has presented an update of all these matters except tariffs on Canadian imports. Those were discussed in the previous white paper and found to be impractical under current laws.

The goal should be to continue looking for ways to maximize the capacity of the pipeline system serving North Dakota production while not overbuilding those facilities resulting in idle capacity when production has peaked. A key component for maximizing the value of Williston Basin crude production is for every producing area to have multiple competing markets with affordable transportation to them. That will be best accomplished by staying informed of market conditions and keeping interested stakeholders advised so that they may take appropriate action.

### **Recommended Action Items for the North Dakota Pipeline Authority**

- Stay abreast of problems confronting the crude oil complex serving North Dakota to avoid potential bottlenecks
- Report findings to the North Dakota Industrial Commission on a quarterly basis and to applicable legislative committees
- Facilitate communications and actions among producers, pipeline companies, and government agencies to minimize capacity bottlenecks
- Look for opportunities to streamline state permit approval processes
- Provide assistance to IOGCC and other state entities in their efforts to improve the regional situation