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# 2020 Liquids Pipelines Customer Handbook

Enbridge Liquids Pipelines  
Customer Handbook  
February 2020





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## Forward-looking Information

This booklet includes references to forward-looking information. Although Enbridge believes these forward-looking statements are reasonable, based on the information available on the date such statements are made, they are not guarantees of future performance or outcomes.

**At Enbridge, we exist to help fuel the quality of life for millions of people across North America. We are North America's premier energy infrastructure company, connecting supply with growing markets through our liquids pipelines, natural gas pipelines, and utilities and power businesses.**

Enbridge transports about 20% of the natural gas consumed in the U.S. and about 25% of the crude oil produced in North America. We operate North America's third-largest natural gas utility by consumer count; we were an early investor in renewable energy, and have a growing offshore wind portfolio.

#### **Liquids Pipelines**

Enbridge operates the world's longest and most complex crude oil and liquids transportation system—with approximately 17,000 miles (27,400 kilometers) of active crude pipeline across North America—and delivers more than 3 million barrels of crude oil and liquids, safely and reliably, every day.

#### **Natural Gas Pipelines**

Enbridge's gas transmission and midstream pipelines cover about 24,500 miles (39,400 km) in 31 U.S. states, five Canadian provinces and offshore in the Gulf of Mexico. We transport more than 19 billion cubic feet per day (Bcf/d) of natural gas through an array of long-haul pipelines, and have about 438 billion cubic feet (Bcf) of natural gas storage capacity across North America.

#### **Utilities and Power**

Enbridge's natural gas utility is the largest in North America by volume, distributing more than 2.5 Bcf/d of natural gas and serving about 3.8 million residential, commercial, institutional and industrial customers in Ontario and Quebec.

Our renewable energy portfolio includes wind, solar, geothermal and waste heat recovery facilities. These projects, either operating or under construction, have the capacity to generate nearly 2,000 megawatts (MW) net of zero-emission energy, and meet the electricity needs of nearly 900,000 homes.

Enbridge was named to the Thomson Reuters Top 100 Global Energy Leaders in 2018; we were selected to Bloomberg's 2020 Gender Equality Index; and we have been ranked among the Best 50 Corporate Citizens in Canada for 16 years running, through 2018.

Enbridge Inc. is headquartered in Calgary, Canada. We have a workforce of about 13,600 people, primarily in Canada and the United States. Enbridge (ENB) is traded on the New York and Toronto stock exchanges.

## **The Energy You Count On, the Reliability You Expect**



**Vern Yu**  
President,  
Liquids Pipelines,  
Enbridge Inc.

Enbridge's liquids system is the largest network of crude oil pipelines and terminals in North America. Our integrated system connects producers to key markets and refiners to critical feedstock through a safe and reliable pipeline operation at competitive rates.

The Mainline System, a complex network of parallel pipelines moving multiple commodities, is directly connected to the U.S. Midwest and Eastern Canada, which has been our historical core market. Over the years, we've extended our system further south to connect to the Cushing and Patoka markets as well as the important U.S. Gulf Coast market and export infrastructure in the region. Due to this complexity and unparalleled connectivity to several premium markets we can optimize throughput and accommodate the changing needs in the market, which provides a unique competitive advantage for our customers. We continue to deliver on low-cost, high impact opportunities to provide additional pipeline egress for our diverse customer base.

With recent mainline optimizations and bringing Line 3 Canada into service, we can now further enhance our mainline throughput, which is good for our customers – but more importantly it improves the safety and reliability of our pipeline network. Over the next year, we have several market access options coming into service, including Express pipeline expansion,

further mainline optimizations, and of course our largest project, the US portion of the Line 3 Replacement project. The expansion of the Dakota Access Pipeline and completion of the Gray Oak Pipeline will provide incremental egress capacity out of the Bakken and Permian basins, respectively.

Looking forward, our efforts are focused on expansion opportunities that increase our footprint, with the goal of extending our integrated value chain through to the Gulf Coast infrastructure and export market. These projects include a Seaway pipeline expansion and development of the Enbridge Houston Oil Terminal, which will facilitate interconnection between Seaway and the Gulf Coast refineries as well as to existing and planned export facilities. With respect to the latter, we recently announced a plan to partner with Enterprise in the development of the SPOT project, which is a deep-water VLCC loading project just south of Houston.

We are focused on ensuring our customers continue to have attractive market access options while also listening to our diverse customer base as we progress a new contract tolling arrangement for the Mainline. In addition to toll stability and certainty to serve refining markets, there is strong demand from our customers to align Mainline capacity with their refinery, production or downstream pipeline contracts on a long-term basis with priority access.

Just as our customer service is a critical pillar to our competitive position, so too is our commitment to safety and operational reliability. We're leaders in driving research and innovation that continue to enhance the safety and operability of our system.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Vern Yu'.



## Providing safe and reliable solutions for our customers is our foundation.

For nearly 70 years, Enbridge has grown from a single pipeline to the largest, longest and most complex petroleum pipeline system in the world, delivering over 3 million barrels per day (bpd) to markets in Canada and the United States. Our relationship with our customers remains one of our top priorities and we continue to deliver solutions that meet customers' needs and drive growth in our Liquids Pipelines business. Our assets and expertise are well positioned to provide value to customers by delivering infrastructure projects near supply basins, increasing available Mainline capacity and improving on market access to meet the growing needs of the industry.

We are listening to the needs of our customers and looking ahead to anticipate market demands with the objective of providing transportation solutions that are cost effective, efficient and timely. With six separate lines connecting Western Canada to the United States and further to Eastern Canada, we offer our customers economy, flexibility, reliability, safety and innovation in delivering their products to market.

Our focus is to continue optimizing our expansive network of assets to provide customers with additional capacity and

superior service. As we progress on our Line 3 Replacement U.S. Program and Seaway Expansion, we are committed to stakeholder engagement and timely project completion. Even beyond these capacity expansions, we continue to believe that the low-cost, staged options to expand our Mainline capacity through highly executable solutions with reduced regulatory requirements will provide opportunity for us to bring significant value to our customers. Enbridge remains committed to finding creative solutions for providing highly competitive transportation options to premium markets in North America, while also focusing on creating competitive alternatives for our customers to access international markets.

In all the years of change and growth, one certainty has remained: delivering safe and reliable solutions for our customers is our foundation. Enbridge is committed to providing increased optionality for our customers while continuing to deliver the exceptional service our customers have come to expect from us.





Global supply outpaced demand for the first half of 2019 until volatility with U.S. sanctions against Iran and Venezuela along with escalating trade negotiations with China affected production. In December 2019, OPEC+ countries committed to deepen production cuts by a further 400,000 bpd, bringing their total reduction commitments to 1.7 MM bpd to balance against growing non-OPEC supply and maintain higher crude oil prices. Heading into 2020, Brent is near \$68 per barrel.

WTI discounts to Brent have been volatile. Surging Permian and other North American oil production have outstripped pipeline capacity causing considerable price dislocations for virtually all inland crude oil grades for part of 2019. In the second half of the year, new pipeline capacity from the Permian, including Enbridge's interest in the Gray Oak pipeline, started to come on stream with differentials between Midland, Cushing and the USGC narrowing. The incremental new capacity should support prices to further production growth in the region as more barrels reach export terminals to increase competition with international grades. According to the U.S. Energy Information Administration, the Permian basin alone added over 800,000 bpd of supply through 2019 with a potential to repeat in 2020.

Western Canadian Sedimentary Basin (WCSB) producers have been particularly hard hit by infrastructure constraints. Physical supply from the WCSB increased and exceeded pipeline capacity resulting in

large storage builds and, correspondingly, significant price discounting. This led the government of Alberta to adopt two policies: 1) to purchase 120,000 bpd rail capacity; and 2) interim production curtailment initially at 325,000 barrels per day, then ratcheting downwards through 2020 when incremental pipeline and rail capacity is anticipated. Despite the challenges faced by WCSB producers from a lack of new pipeline capacity, production is expected to continue growing.

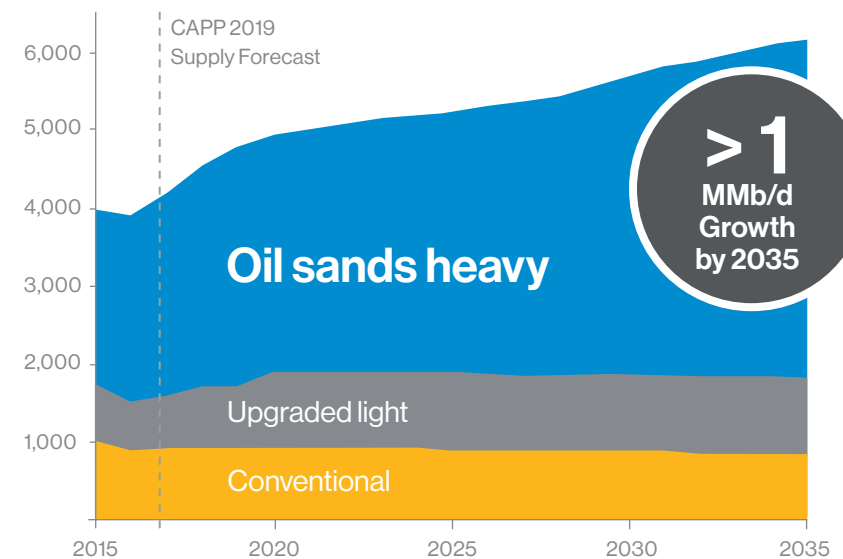
The 2019 Canadian Association of Petroleum Producers (CAPP) forecast (Figure 1) illustrates that WCSB supply will continue to add over 1 million bpd of supply by 2035, necessitating additional pipeline capacity. The Canada Energy Regulator (CER), in its latest Canada's Energy Future 2019 report, shows an even more robust forecast of future incremental raw oil sands production of around 1.3 MM bpd in the same time frame.

Notably, key producers are reducing costs and emissions by improving operations and developing new technology. Advancements like solvent-assisted steam-assisted gravity drainage (SA-SAGD) will lower both breakeven production costs and emissions per barrel. Future WCSB production will continue to grow efficiently and sustainably. The need for crude oil transportation infrastructure remains strong. Access to low-cost transportation to premium markets is fundamental in supporting the Western Canadian petroleum industry.

The U.S. Geological Survey has estimated that the Bakken and Three Forks deposits in eastern Montana and North Dakota hold at least 7.4 billion barrels of technically recoverable oil, although many industry experts believe this is a conservative figure. Production in the Bakken region has grown from about 200,000 bpd in early 2007 to around 1.4 million bpd by the end of 2019.

Incremental pipeline capacity from the region supported continued development. Crude prices have strengthened, and the current view is that these higher and more stable prices will provide the economic incentive for increased activity and continued production growth in the Bakken/Three Forks region.

### WCSB Oil Supply (kbpd)



> Figure 1









## The Enbridge Mainline

### Recent Expansions (continued)

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In Minnesota, permits are required before L3RP construction can begin. In early 2020, Enbridge achieved another milestone when the Minnesota Public Utilities Commission approved the revised Final Environmental Impact Statement for the L3RP and reaffirmed the project's Certificate of Need and Route Permit. The L3RP has strong support in Minnesota, including from communities along the route. Enbridge remains actively involved in the ongoing state and federal permitting processes; remaining requirements are progressing, and Enbridge is expecting to complete the project as expeditiously as possible upon receipt of all outstanding permits.

#### Upstream of Superior System Enhancements

Beyond Enbridge's secured slate of projects, the Mainline system is well positioned to offer scalable, low-cost and highly executable expansion projects to meet the transportation needs of industry, particularly in this time of uncertainty. Given the multi-pipeline configuration of the Mainline system, several low-cost system optimization and expansion options are available. These system enhancements can be achieved by employing new crude slates and drag reducing agent injections, as well as minimizing delivery windows across our system. These system enhancements could potentially provide incremental capacity of up to 350,000 bpd ex-WCSB.

#### Downstream of Superior System Enhancements

To fully utilize the potential of the entire suite of secured and future Mainline expansions, additional capacity from Superior to Flanagan will be required. Enbridge is currently exploring multiple options that could bring on the required capacity, ranging from building new infrastructure to utilizing existing pipeline infrastructure in that corridor.

Enbridge plans to further develop both upstream and downstream options and to engage with shippers in commercial discussions at a suitable time.



## Enbridge continues to review its system configuration to maximize value to customers.

With the significant pressure to add egress out of Western Canada, Enbridge has placed a key focus on increasing pipeline capacity. Since 2015, significant progress has been made to optimize system performance and capacity out of Western Canada, increasing capacity by 600,000 bpd. This includes incremental capacity of 165,000 bpd offered in 2019 from capacity recoveries on Lines 4 and 2A, putting Canadian Line 3 in service and window optimizations.

The optimization process examines several factors including:

- Overall system capacity
- Expected throughput/capacity by commodity/crude slate
- Maintenance aligned with customer maintenance
- System reliability
- Current pressure restrictions
- Product quality
- Line-fill requirements
- Facility interconnection capabilities
- Power and integrity costs
- Maximizing scheduling windows
- Drag Reducing Agent (DRA)

Improvements made on these factors have increased the system operating efficiency and overall throughput offered to industry. The Enbridge Mainline offers a one-of-a-kind system related to shipper optionality and flexibility across North America, which allows quick response to supply/demand disruptions via its multiple pipelines, terminal facilities and access to several markets. Enbridge will continue to optimize the above factors to maximize throughput offered to the market.

## Maintaining toll certainty and competitiveness for our customers is a significant focus for Enbridge.

The Enbridge Canadian Mainline system is currently tolled as per the Competitive Tolling Settlement (CTS), a 10-year tolling agreement with shippers that expires June 30, 2021. The CTS provides for a U.S. dollar denominated International Joint Tariff (IJT) for crude oil shipments originating in Canada on the Enbridge Pipelines Inc. (EPI) system and delivered in the U.S. off the Lakehead system. Local rates for service on the U.S. portion of the Mainline system are not affected by the CTS and continue to be established by Lakehead's existing tolling agreements. Replacing the expired CTS will be a new tolling arrangement that will have a U.S. dollar denominated IJT while providing priority access on a contract basis on the Canadian Mainline. Contracts offered will be available for term lengths of up to 20 years and contain flexible commercial terms for all shippers while providing long-term toll stability and certainty.

The new commercial framework will reserve a minimum 10% of the Canadian Mainline capacity as spot service. Enbridge has submitted the application for the new tolling arrangement to the CER and expects a decision in Q1 2021 at which time Enbridge will hold a subsequent Open Season.



The **Athabasca Terminal**, located north of Fort McMurray, provides operational receipt tankage for multiple products. The terminal is the initiation point for injections onto both the Athabasca Pipeline and the Wood Buffalo Pipeline. Athabasca Terminal has a total tank storage capacity of approximately 3.4 million barrels.

The **Cheecham Terminal**, located south of Fort McMurray, acts as a major hub, providing operational tankage to facilitate receipt of product from oil sands customers. Additionally, Cheecham Terminal provides connectivity for injections onto the Waupisoo Pipeline, Athabasca Pipeline, and the Wood Buffalo Extension Pipeline. The Norlite Diluent Pipeline is connected to Cheecham Terminal for the receipt of condensates. Cheecham Terminal expanded to the west of the existing terminal with the acquisition of two additional tanks, land and connecting facilities in 2019; the total tank storage capacity of Cheecham terminal has reached approximately 3.3 million barrels.

The **Athabasca Pipeline** runs from Athabasca Terminal to the Hardisty area. The 30" pipeline has an average annual capacity of 570,000 bpd.

The **Athabasca Pipeline Twin** runs from Kirby Lake Terminal to the Hardisty area. The 36" pipeline has an average annual capacity of 800,000 bpd.

The **Wood Buffalo Pipeline Extension** runs from Cheecham and Kirby Lake where it connects to the Athabasca Pipeline Twin and delivers to the Hardisty area. The 36" pipeline has an average annual capacity of 800,000 bpd.

The **Waupisoo Pipeline** runs from Cheecham Terminal to the Edmonton area. The 30" pipeline has an annual average capacity of 550,000 bpd.

The **Woodland Pipeline**, a joint venture partnership with Imperial Oil and ExxonMobil, provides transport services from the Kearl Oil Sands Project to the Edmonton area. The 36" pipeline has an average annual capacity of 379,000 bpd and is expandable to 800,000 bpd.

The **Wood Buffalo Pipeline** runs from Athabasca Terminal to Cheecham Terminal. The 30" pipeline has an average annual capacity of 550,000 bpd.

The **Norealis Pipeline** provides terminalling and transportation services from the Husky Sunrise Oil Sands Project to Cheecham Terminal. The 24" pipeline has an average annual capacity of 90,000 bpd, and is expandable to 270,000 bpd.

The **Norlite Diluent Pipeline**, a joint venture partnership with Keyera Partnership, has the capability to bring diluent from the Edmonton/ Fort Saskatchewan area to the oil sands region. The 24" pipeline has an annual average capacity of 218,000 bpd, and is expandable to 465,000 bpd.

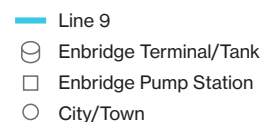
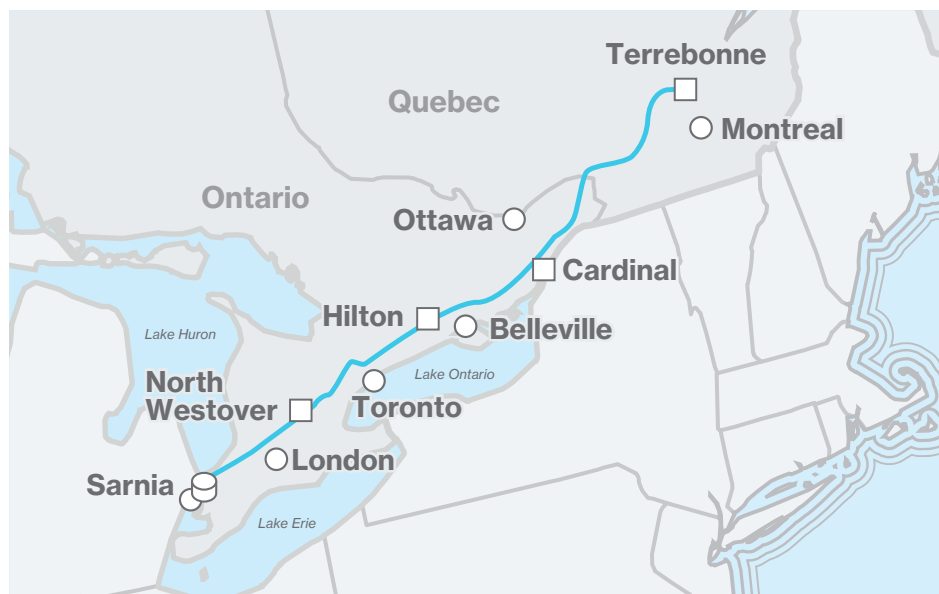
## **The Regional Oil Sands System provides connectivity from several oil sands customers to the Edmonton and Hardisty areas with a total annual average capacity of approximately 2.5 million bpd.**

Enbridge continues to identify and develop new pipeline infrastructure and use existing capacity to ensure production growth from the region can reach Alberta market hubs in a safe, reliable and efficient manner.

Enbridge has expanded an existing meter manifold to provide further flexibility and receipt capacity from the Norlite Diluent Pipeline into the Cheecham Terminal.

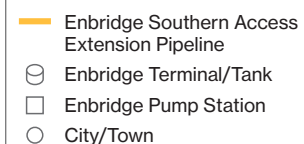
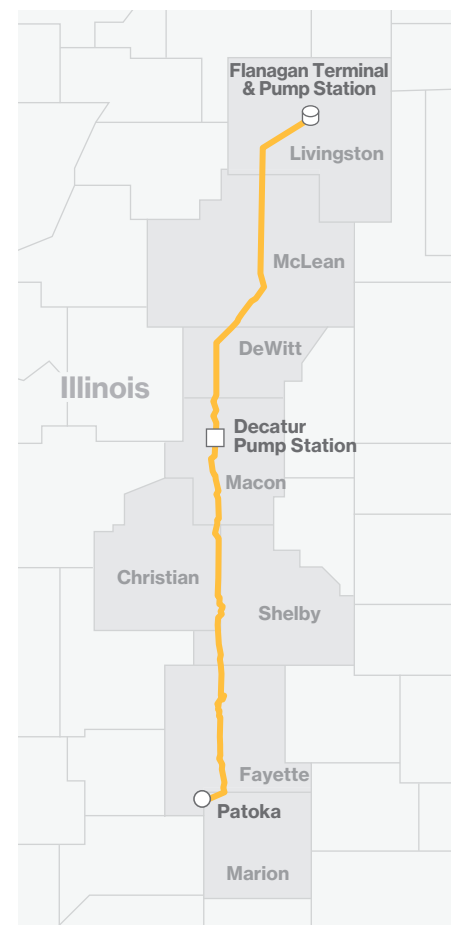
With its joint venture partners, Imperial Oil Resources Limited and ExxonMobil Canada Properties, Enbridge is working to expand the Woodland Pipeline capacity to 570,000 bpd. This includes pump modifications and a new intermediate pump station at Abee. The target in-service date is mid-2021. The Expansion Project provides incremental throughput and will support long-term growth in the oil sands.





### Eastern Access

Line 9, an 832-kilometre (517-mile), 30" pipeline, transports crude oil from Sarnia, Ontario to Montreal, Quebec with an average annual capacity of 300,000 bpd. Enbridge continues to work with stakeholders to ensure safe and reliable delivery of crude oil to refineries in Eastern Canada.



### Southern Access Extension

The Southern Access Extension Pipeline (SAX), a 270-kilometre (168-mile), 24" pipeline, transports crude oil from the Enbridge Flanagan Terminal near Pontiac, Illinois, to Patoka, Illinois. Since its in-service date in January 2016, the pipeline has provided customers with timely, economical and reliable transportation service to the strategic Patoka hub. SAX has an average annual capacity of 300,000 bpd and has expansion capability of 100,000 bpd for incremental access to the Patoka market.





### Spearhead Pipeline

The Spearhead Pipeline is a 973-km (583-mile) pipeline comprised of 22" and 24" sections. It transports crude from the Enbridge Flanagan Terminal near Pontiac, Illinois to Enbridge's Cushing Terminal in Cushing, Oklahoma. The capacity of the Spearhead pipeline is 193,000 bpd and one midpoint injection location at Key Station near the Platte Salisbury Terminal is available for limited capacities of crude.







### U.S. Gulf Coast Access

Together, the Flanagan South Pipeline and the Seaway Pipeline System allow crude oil transported on the Enbridge Mainline system to access key U.S. Gulf Coast refining centers in Houston and Port Arthur, Texas. The Flanagan South Pipeline, a 954-kilometre (593-mile), 36" interstate crude oil pipeline that originates at the Enbridge Flanagan Terminal in Illinois and

- Flanagan South Pipeline
- Dakota Access Pipeline
- Energy Transfer Crude Oil Pipeline
- - - Gray Oak Pipeline (proposed)
- Seaway Pipeline System
- - - Texas COLT (proposed)
- Other Enbridge Pipelines
- Offshore Platform
- Crude Oil Storage
- City/Town

terminates in Cushing, Oklahoma, came into service in Q4 2014 and has an average annual capacity of 585,000 bpd.

The Seaway Pipeline system has an annual average capacity of 950,000 bpd and consists of two 846-kilometre (526-mile), 30" pipelines between Cushing, Oklahoma and the Freeport, Texas area that deliver into Jones Creek Terminal. The pipelines can deliver into Freeport and Texas City docks or the ECHO Terminal as well as continuing on to Beaumont/Port Arthur where the Seaway system connects to three terminals: Sunoco Nederland, Enterprise Beaumont Marine West and Phillips 66 Beaumont.

Enbridge continues to evaluate growth opportunities to expand capacity into the U.S. Gulf Coast. Expansions of the Flanagan South Pipeline and Seaway Pipeline can create up to 250,000 bpd of incremental access into the U.S. Gulf Coast market.

The Gray Oak pipeline is a 1,368-kilometre (850-mile) pipeline with an average annual capacity of 900,000 bpd stretching from the Permian basin to the U. S. Gulf Coast. Once completed, it will connect production in the Permian and Eagle Ford to market centers in Corpus Christi, Sweeny and Freeport, Texas. The first stage of the project came into service in November 2019 and it is expected that Gray Oak pipeline will be fully in service by Q2, 2020.



Enbridge, through the Seaway Pipeline System, has two existing docks for export on the Gulf Coast at Freeport and Texas City. Freeport has a draft of 42 feet and can load at 20,000 barrels per hour and Texas City has a draft of 45 feet and can load at 35,000 barrels per hour. Texas City also has the capability to partially load a VLCC. Enbridge has negotiated an option to buy a portion of the Seaport Oil Terminal (SPOT). SPOT will provide direct loading capabilities into VLCCs which will provide a more efficient export solution. With a design loading rate of 85,000 barrels per hour, SPOT will be able to fully load a VLCC in 24 hours. SPOT is expected to receive permits in 2020 and be in service in 2023. Texas COLT will remain an option to be pursued should the market demand warrant.

The Express Pipeline delivers crude oil from Hardisty, Alberta to Casper, Wyoming. In early 2020 the capacity of the Express Pipeline was expanded to 287,000 bpd with the installation of drag reducing agent injection skids and optimization of pump stations. Further optimization efforts will increase the capacity to 310,000 bpd by Q3 2020. Deliveries can be made in Montana and Wyoming and on to a connecting facility servicing Utah. Express Pipeline also interconnects with Platte Pipeline, which transports both WCSB and domestic production into PADD II. The ratio of WCSB and light domestic production influences Platte Pipeline system capacity; however, average annual capacity is approximately 164,000 bpd between Casper and Guernsey, Wyoming and 145,000 bpd

between Guernsey, Wyoming and Wood River, Illinois. Along this route, deliveries can be made in Wyoming and Illinois and on to connecting facilities servicing Colorado, Kansas and Oklahoma.

The Platte to Spearhead Connection went in to service in April 2018, allowing Express-Platte barrels to access Cushing from Platte's Salisbury Terminal via the Spearhead Pipeline.

The Platte Pipeline between Casper and Guernsey is expandable up to an incremental 70,000 bpd of capacity with pump station optimization and construction of new pump stations. Work is ongoing to establish ISD and refined scope.

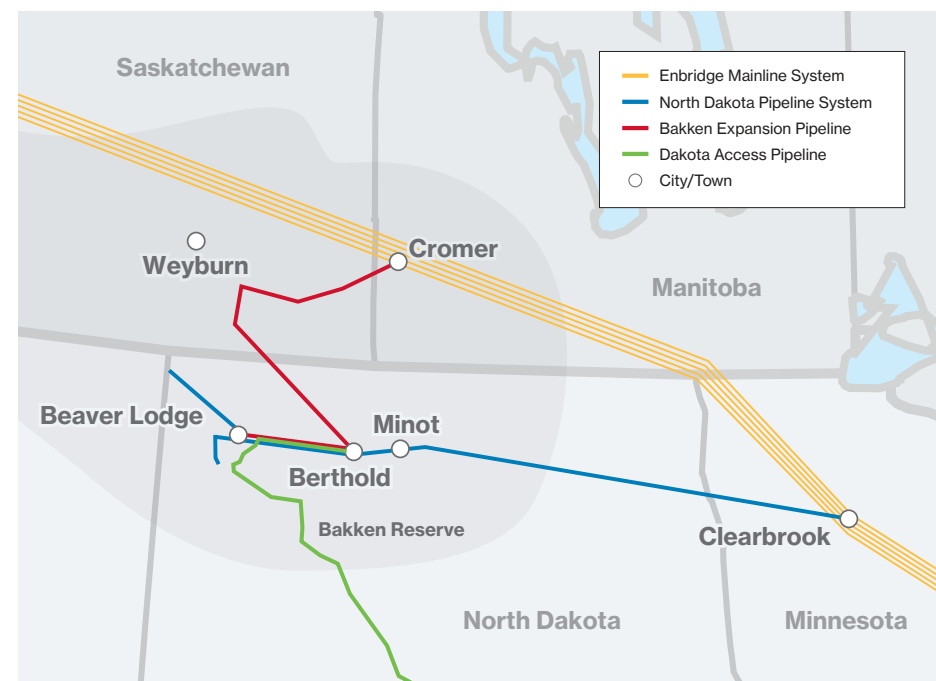


## Enbridge's extensive infrastructure in the Bakken region makes it ideally situated to accommodate both current and planned growth.

The North Dakota system, including the Bakken Expansion Pipeline, gathers crude oil from points in North Dakota for delivery to the Enbridge Mainline, which in turn provides access to multiple refineries in the U.S. Midwest, Gulf Coast and Eastern Canada. The current annual average system capacity out of the North Dakota Bakken is approximately 360,000 bpd.

In February 2017, Enbridge and Marathon finalized an agreement to acquire a 49% equity interest in the holding company that

owns 75% of the Bakken Pipeline System. The Bakken Pipeline System consists of both the Dakota Access Pipeline, which delivers Bakken production to the Patoka, Illinois hub, and the Energy Transfer Crude Oil Pipeline, which provides access to the USGC market. Enbridge is evaluating synergies between its existing network and the Bakken Pipeline System to provide increased optionality and enhanced market access for producers and shippers in the Bakken region.





## Enbridge has established a significant presence in contract storage in recent years, largely driven by increasing production of Western Canadian crude oil.

Currently, Enbridge is operating, or has under construction, contract storage at the following locations:

Location	Storage capacity in operation or under construction (million barrels)
Hardisty, AB	10.5
Cushing, OK	18
Other	9.1
<b>Total</b>	<b>37.6</b>

### Hardisty

Hardisty, Alberta is the most important crude oil storage hub in Canada. Enbridge operates approximately 3 million barrels of salt cavern storage at Hardisty Caverns, and 7.5 million barrels of above ground storage at Hardisty Contract Terminal, with both facilities well connected, providing customers with the much-needed optionality they require. Both facilities are currently completely subscribed. Enbridge is continuing to evaluate additional service options and growth opportunities to maximize the value of these facilities for both Enbridge and its customers.

### Cushing

Cushing, Oklahoma is one of the most important crude oil storage hubs in the world and the location of the settlement of

the New York Mercantile Exchange West Texas Intermediate (NYMEX WTI) contract. With approximately 18 million barrels of working storage capacity, Enbridge has one of the largest and most well-connected terminals in the Cushing area. Enbridge continues to develop customer-initiated projects, as well as explore organic growth opportunities, to optimize and increase its infrastructure in Cushing.

### Houston Oil Terminal

Enbridge is developing a new terminal in the Houston area that will be fully integrated into the Seaway system with access to all delivery points, and could have future connectivity to both SPOT and Texas COLT. The location supports up to 15 million barrels of tankage and is expected to be in service in 2022.

### Other

The oil sands have various operational contract tanks throughout the system totaling more than 7 million barrels. Additionally, Enbridge has contract storage locations throughout the North Dakota system, 480,000 barrels of leased storage at Platte Pipeline's Casper, Wyoming facility, and 400,000 barrels of storage at Patoka, Illinois with a large footprint for future development. Enbridge continues to actively investigate and develop future opportunities to add merchant storage all across our network.







# The Southern Lights Pipeline transports diluent supply from various sources through the U.S. Midwest to Western Canada's heavy oil production regions.

### Southern Lights

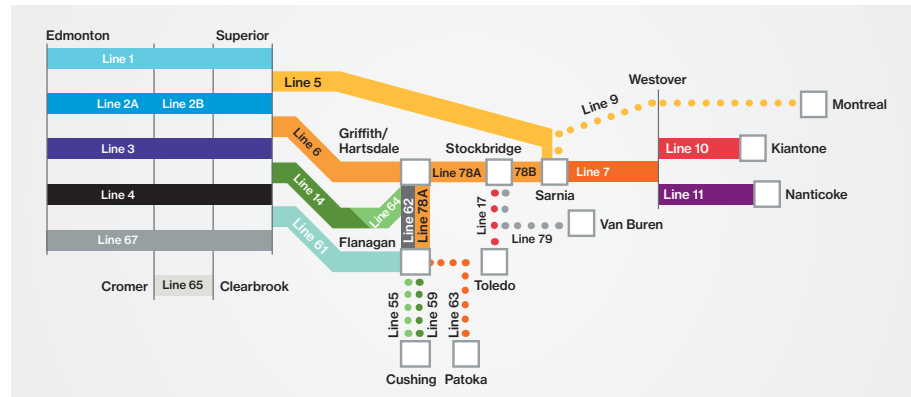
Originating from Manhattan, Illinois, Southern Lights sources its diluent from the U.S. Gulf Coast, mid-continent and Midwest refineries via interconnections to existing crude and refined products pipelines and delivers it to Western Canada's crude oil hubs. Southern Lights receives product from three connecting carriers at the Manhattan Terminal in Illinois—BP, Enterprise and Explorer pipelines. At the terminus of the system in Edmonton, Alberta, Southern Lights has direct delivery connections to the CRW pool, Keyera, Gibson, Pembina, Plains and Access pipelines. Currently, there is also a direct delivery connection to the Enbridge Mainline at Hardisty, Alberta, and to Plains at Kerrobert, Saskatchewan. The annual average capacity of Southern Lights is 180,000 bpd, of which 162,000 bpd is secured by long-term contracts. As referenced in the Oil Sands Infrastructure Development section, the Norlite Project is a key component of Enbridge's overall diluent strategy, extending diluent delivery into the Oil Sands region.



## Pipeline System Configuration

Q1, 2020

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<b>Line 1</b> 37,600 m³/d (237 kbpd) 18"/20" – 1,767 km (1,098 mi) - NGL - Refined Products - Light	<b>Line 6</b> 106,000 m³/d (667 kbpd) 34" – 748 km (465 mi) - Light - Medium - Heavy	<b>Line 10</b> 11,800 m³/d (74 kbpd) 12"/20" – 143 km (89 mi) - Light - Medium - Heavy
<b>Line 2A</b> 70,300 m³/d (442 kbpd) 24" – 966 km (600 mi) - Condensates - Light	<b>Line 7</b> 28,600 m³/d (180 kbpd) 20" – 193 km (120 mi) - Light - Medium - Heavy	<b>Line 11</b> 18,600 m³/d (117 kbpd) 16"/20" – 76 km (47 mi) - Light - Medium - Heavy
<b>Line 2B</b> 70,300 m³/d (442 kbpd) 24"/26" – 808 km (502 mi) - Light	<b>Line 78A</b> 90,600 m³/d (570 kbpd) 36" – 425 km (264 mi) - Light - Medium - Heavy	<b>Line 62</b> 37,400 m³/d (235 kbpd) 22" – 121 km (75 mi) - Heavy
<b>Line 3</b> 68,400 m³/d (430 kbpd) 34" – 1,767 km (1,098 mi) - Light	<b>Line 78B</b> 79,500 m³/d (500 kbpd) 30"/36" – 175 km (109 mi) - Light - Medium - Heavy	<b>Line 14/64</b> 54,600 m³/d (343 kbpd) 24" – 784 km (487 mi) - Light - Medium
<b>Line 4</b> 126,500 m³/d (796 kbpd) 36"/48" – 1,770 km (1,100 mi) - Heavy - Medium (Ex-Clearbrook) - Light (Ex-Clearbrook)	<b>Line 65</b> 29,500 m³/d (186 kbpd) 20" – 504 km (313 mi) - Light - Medium	<b>Line 61</b> 158,351 m³/d (996 kbpd) 42" – 744 km (462 mi) - Light - Medium - Heavy
<b>Line 5</b> 85,900 m³/d (540 kbpd) 30" – 1,038 km (645 mi) - NGL - Light		<b>Line 67</b> 127,200 m³/d (800 kbpd) 36" – 1,790 km (1,112 mi) - Heavy

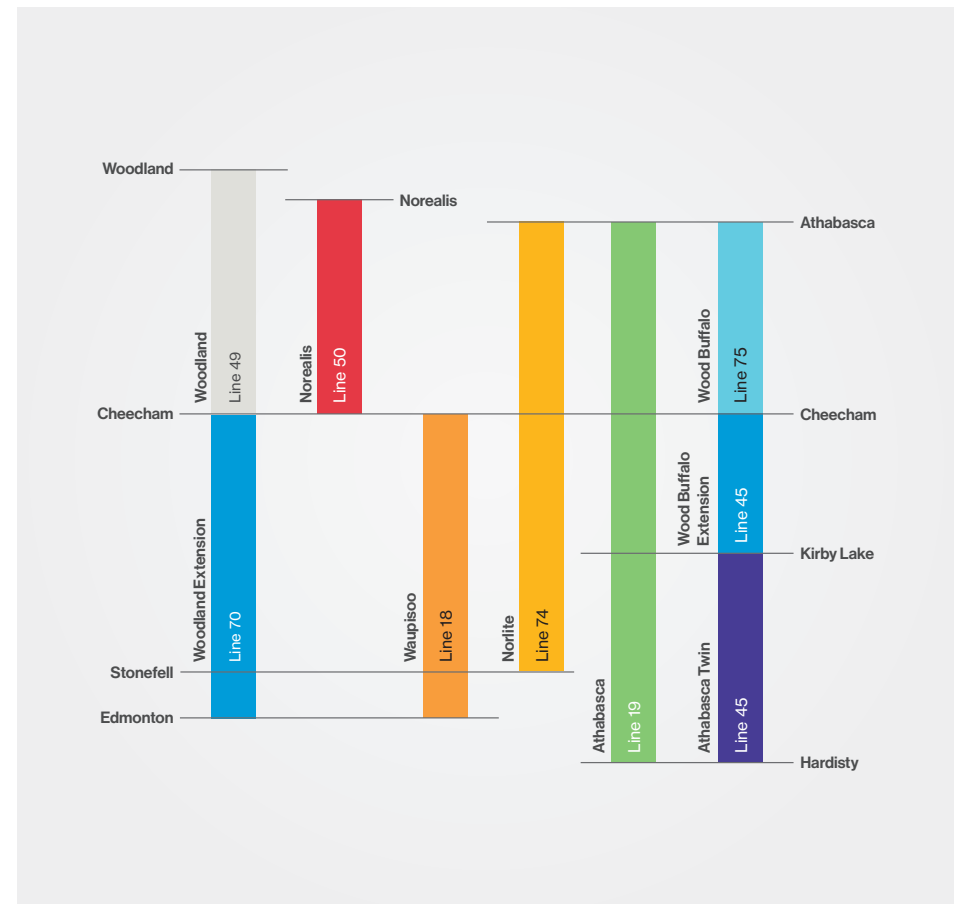
### Not part of the Enbridge Mainline System

<b>Line 9</b> 47,700 m³/d (300 kbpd) 30" – 832 km (517 mi) - Light - Medium - Heavy	<b>Line 59</b> 93,000 m³/d (585 kbpd) 36" – 954 km (593 mi) - Light - Medium - Heavy
<b>Line 17</b> 16,000 m³/d (100 kbpd) 16" – 142 km (88 mi) - Light - Medium - Heavy	<b>Line 79</b> 12,700 m³/d (80 kbpd) 20"/16" – 98 km (61 mi) - Light - Medium - Heavy
<b>Line 55</b> 30,700 m³/d (193 kbpd) 22"/24" – 938 km (583 mi) - Light - Medium - Heavy	<b>Line 63</b> 47,700 m³/d (300 kbpd) 24" – 270 km (168 mi) - Light - Medium - Heavy

## Oil Sands Regional System Configuration

Q1, 2020

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**Line 18 — Waupisoo Pipeline**  
550 kbpd  
30" – 380 km (236 mi)

**Line 75 — Wood Buffalo Pipeline**  
550 kbpd  
30" – 96 km (59 mi)

**Line 19 — Athabasca Pipeline**  
570 kbpd  
30" – 542 km (337 mi)

**Line 45 — Athabasca Twin Pipeline**  
800 kbpd  
36" – 347 km (215 mi)

**Line 45 — Wood Buffalo Extension**  
800 kbpd  
36" – 107 km (66 mi)

**Line 74 — Norlite Diluent Pipeline**  
218 kbpd (Expandable to 465 kbpd)  
24" – 447 km (278 mi)

**Line 49 — Woodland Pipeline**  
379 kbpd (Expandable to 800 kbpd)  
36" – 138 km (86 mi)

**Line 70 — Woodland Extension**  
379 kbpd (Expandable to 800 kbpd)  
36" – 387 km (240 mi)

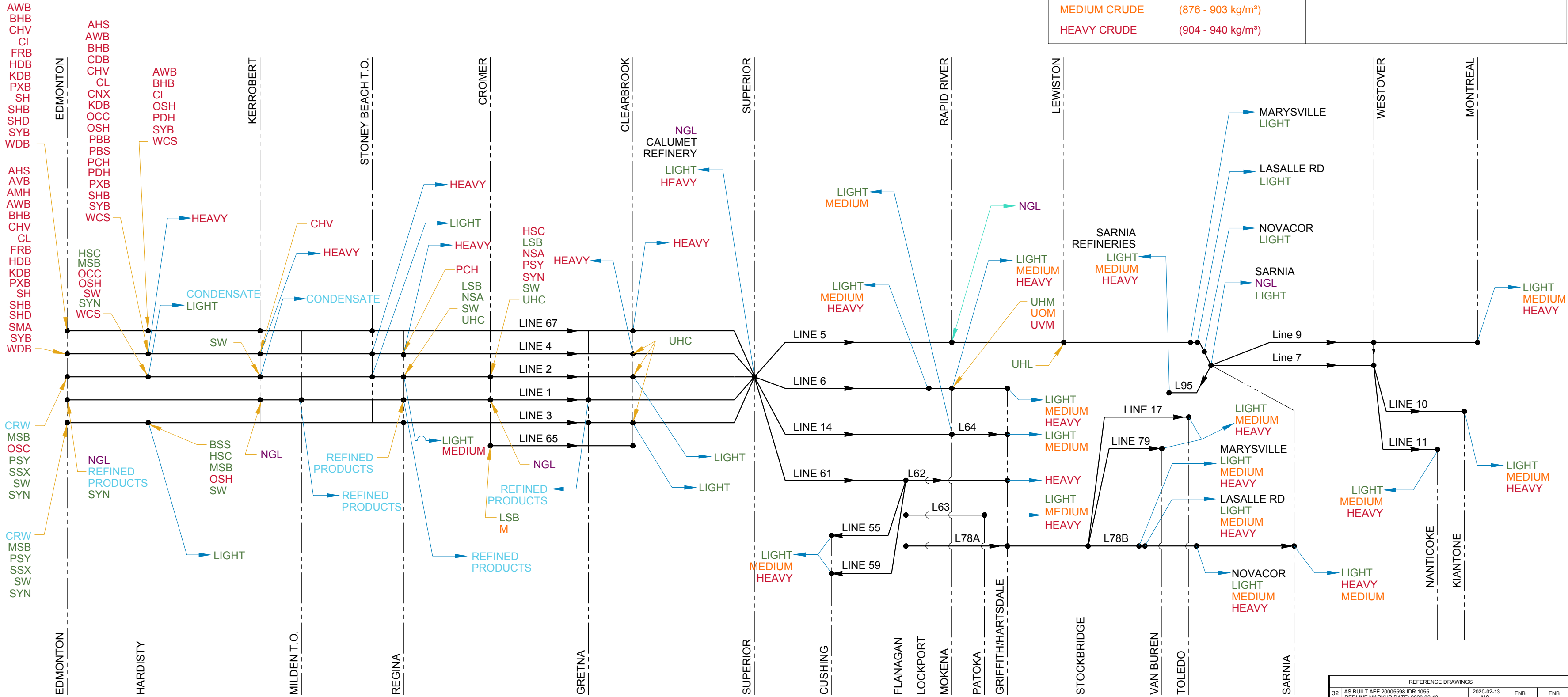
**Line 50 — Norealis Pipeline**  
270 kbpd (Expandable to 360 kbpd)  
24" – 113 km (70 mi)





PIPELINE COMMODITY MOVEMENT MAP

QUARTER 1, 2020



COMMODITY IDENTIFIER / CRUDE NAME LEGEND									
AHS	ALBIAN HEAVY SYNTHETIC	CL	COLD LAKE	NSA	NEWGRADE SYNTHETIC BLEND A	SHB	SURMONT HEAVY BLEND	UVM	U.S. HEAVY - MOKENA
AMH	ALBIAN MUSKEG RIVER HEAVY	CNX	CONDENSATE BLEND	OCC	SUNCOR - CUSTOM CRACKED	SHD	SURMONT HEAVY DILBIT	WCS	WESTERN CANADIAN SELECT
AVB	ALBIAN VACUUM GAS OIL BLEND	CRW	CONDENSATE BLEND	OSC	SUNCOR LIGHT SYNTHETIC	SMA	SURMONT MIX A	WDB	WESTERN CANADA DILBIT
AWB	ACCESS WESTERN BLEND	FRB	FORT HILLS REDUCED CARBON LIFE CYCLE DILBIT BLEND	OSH	SUNCOR - H	SSX	SHELL SYNTHETIC BLEND		
BHB	BOREALIS HEAVY BLEND	HDB	HANGINGSTONE DILBIT BLEND	PBB	PINE BLEND BUFFER	SW	MIXED BLEND SWEET		
BSS	BP SWEET SYNTHETIC BLEND	HSC	HARDISTY SYNTHETIC CRUDE	PBS	PINE BLEND SPECIAL	SYB	SYNTHETIC BITUMEN BLEND		
CDB	CHRISTINA LAKE DILBIT BLEND	KDB	KEARL DILBIT	PCH	PREMIUM CONVENTIONAL HEAVY	SYN	SYNCRUDE		
CHV	CONVENTIONAL HEAVY	LSB	LIGHT SOUR BLEND	PDH	LONGLAKE HEAVY DILBIT BLEND	UHC	US HIGH SWEET		
CHS	CANADIAN HEAVY SWEET	M	MIDALE BLEND	PSY	PREMIUM SYNTHETIC	UHL	U.S. HIGH SWEET - LEWISTON		
CHT	CANADIAN HEAVY DILBIT	MSB	MEDIUM SOUR BLEND	PXB	PETRO CHINA BLEND	UHM	U.S. HIGH SWEET - MOKENA		
CHY	CANADIAN HEAVY SYNBIT	NGL	NATURAL GAS LIQUIDS	SH	SEAL HEAVY	UOM	U.S. HIGH SOUR MOKENA		

REFERENCE DRAWINGS				
32	AS BUILT AFE 20005598 IDR 1055	2020-02-13	MS	ENB
31	REDLINE MARKUP DATE: 2020-02-13	2018-05-03	MM	BB
30	AS BUILT AS PER IDR 375	2017-01-24	KF	SH
29	REVISD AS PER PIPELINE COMMODITY MAPS MARK UP DRAWING	2017-01-09	MR	SKE/KP
28	REVISD AS PER PIPELINE COMMODITY MAPS MARK UP DRAWING	2016-01-19	ME	SKE/AE
27	REVISD AS PER SCHEDULING OPTIMIZATION Q1 INFO	2015-04-23	YZ	DRD/RB
REV NO	REVISION DESCRIPTION	DATE BY	CHK	APPR

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ENBRIDGE PIPELINES INC.  
COMMODITY MOVEMENT MAP

BY:AMJ

CHK: CAL

ENG.: PBONTKES/DB

ENB APPR: EGH

DATE: 2000-05-17

SCALE: NTS

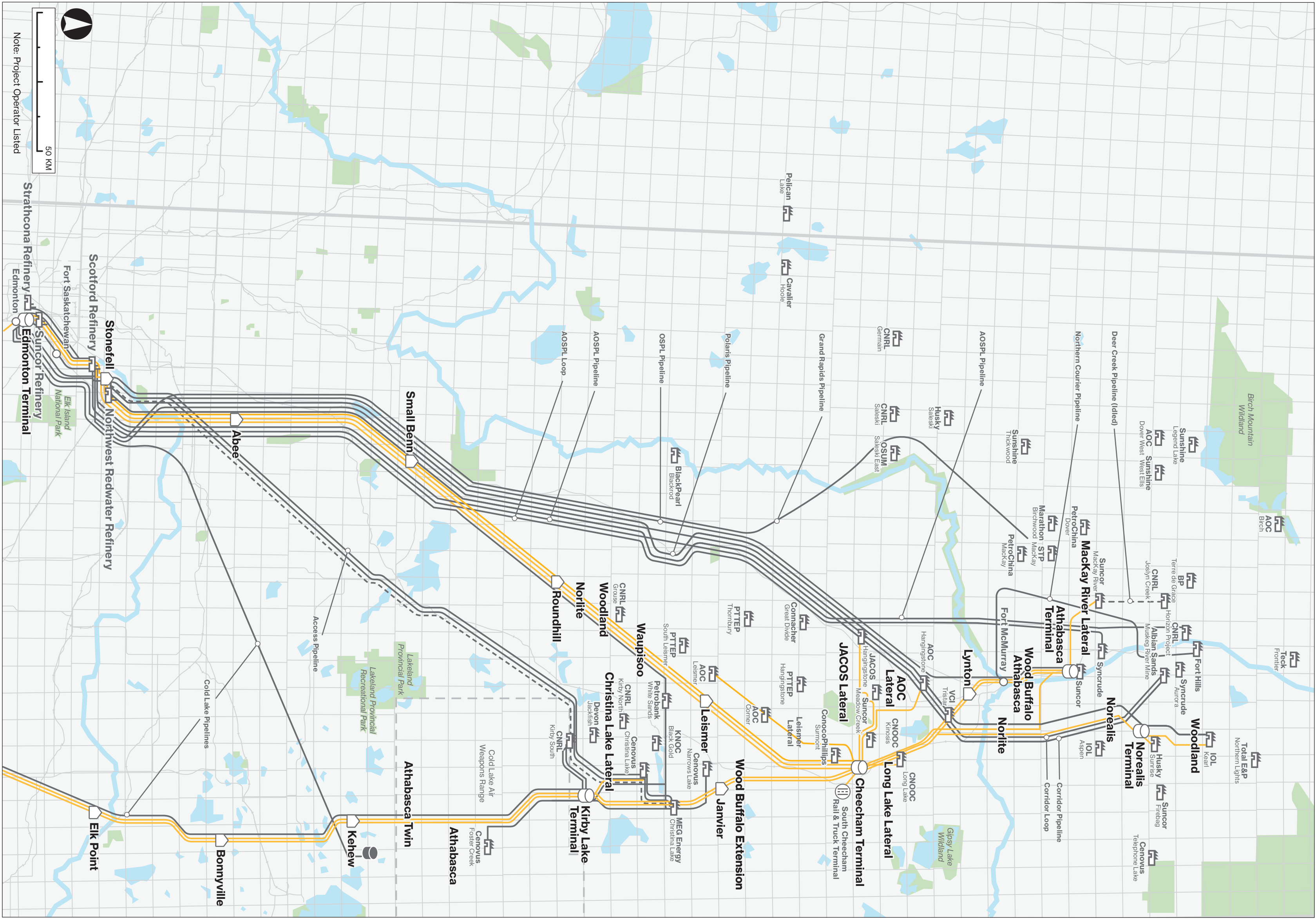
STATUS: AS BUILDING

DWG NO:

REV NO:

D-0.0-1812-0

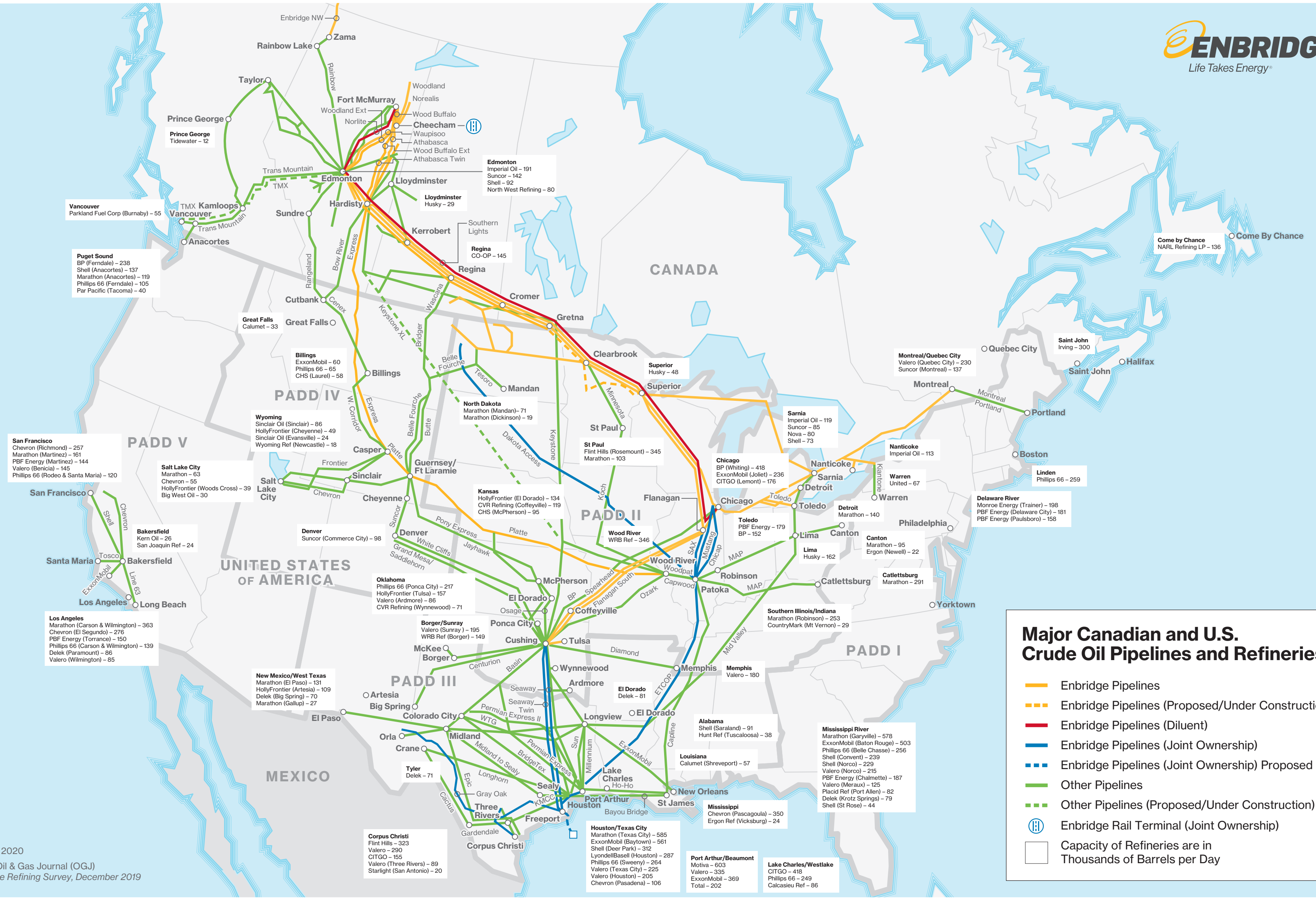
32.A



ATHABASCA REGION

## Major Pipelines





### Major Canadian and U.S. Crude Oil Pipelines and Refineries

- Enbridge Pipelines
- Enbridge Pipelines (Proposed/Under Construction)
- Enbridge Pipelines (Diluent)
- Enbridge Pipelines (Joint Ownership)
- Enbridge Pipelines (Joint Ownership) Proposed
- Other Pipelines
- Other Pipelines (Proposed/Under Construction)
- Enbridge Rail Terminal (Joint Ownership)
- Capacity of Refineries are in Thousands of Barrels per Day