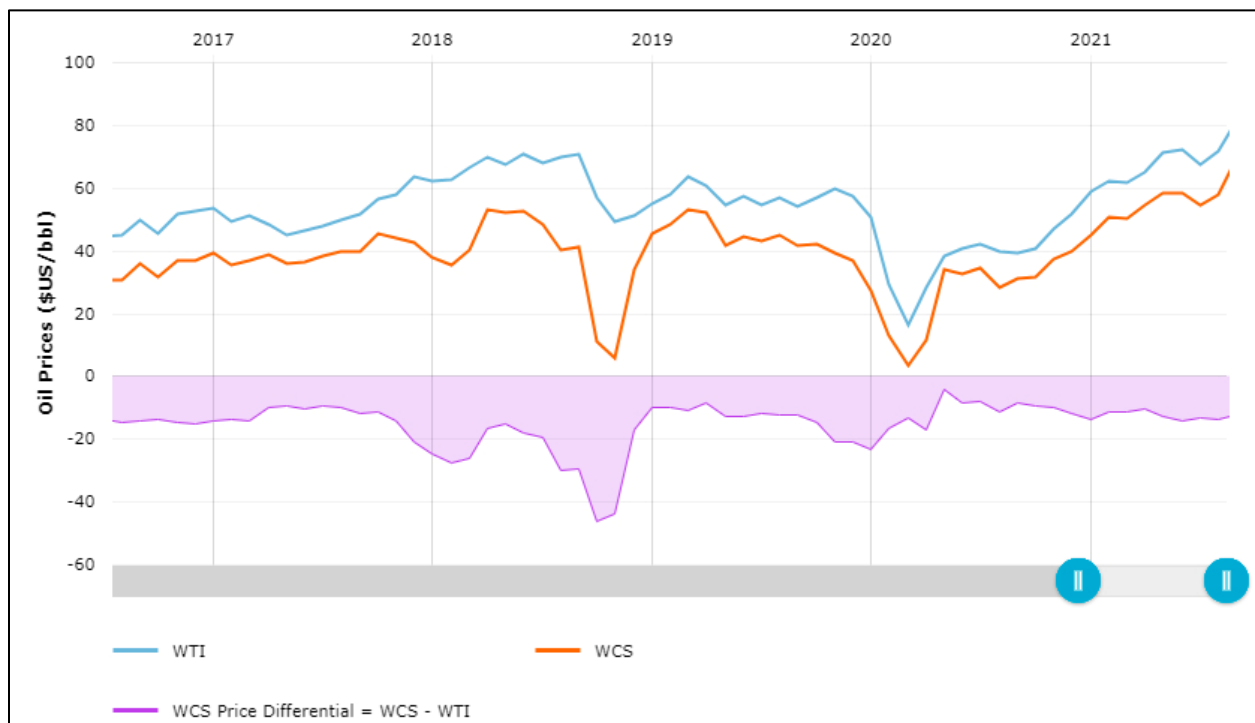


CANADIAN OIL EGRESS – LATEST DEVELOPMENTS AND WHAT DO LINE 3 + CAPLINE REVERSAL MEAN FOR CANADIAN OIL PRODUCERS.

February 13, 2022

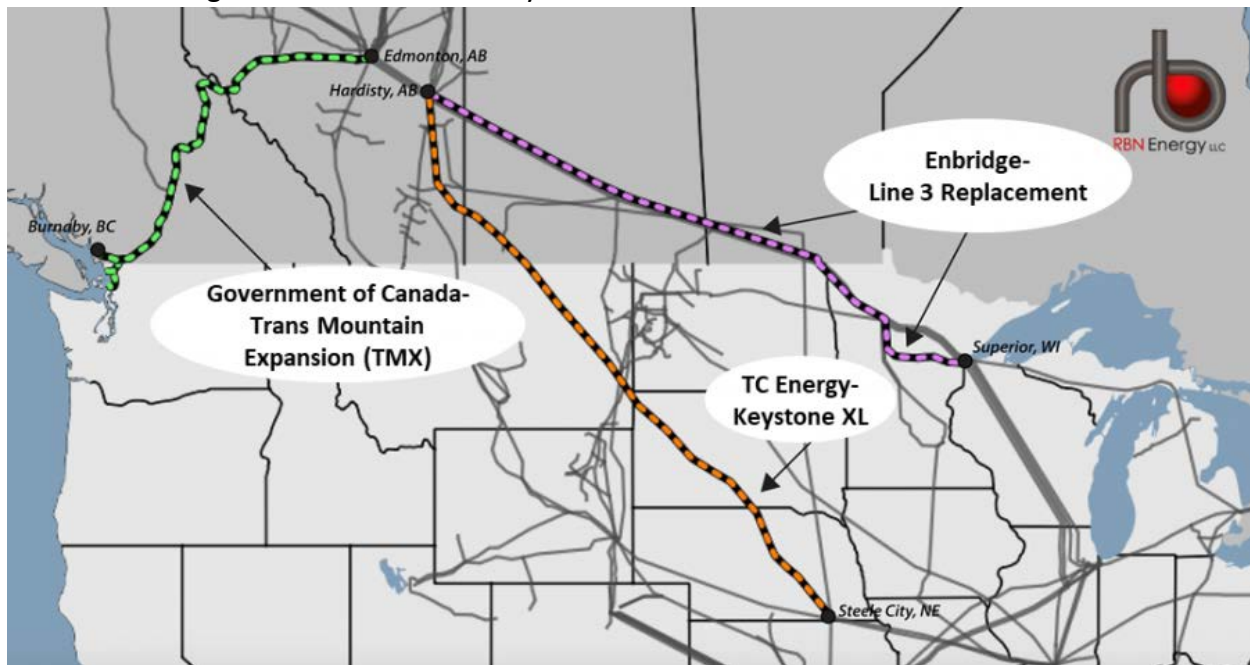
Increasing production of oil and especially bitumen from Alberta coupled with lack of egress and export capacity has greatly affected Canadian oil producers in the last 3 years. Producers have been at the mercy of volatile differentials of their oil to WTI pricing due to a variety of reasons such as US refining maintenance, temporary pipeline shutdowns, lack of crude-by-rail capacity, and constant delays in new export pipeline construction and start-up. The most recent example of this was Canadian heavy and light oil differentials blowing out on shutdown of the TransMountain pipeline due to significant flooding in late-2021 along the pipeline route in British Columbia. A more extreme scenario occurred in December 2018 when lack of export capacity along with longer-than-normal seasonal refinery maintenance combined to collapse differentials to a point where WCS crude was trading at less than \$10/barrel and WTI crude was trading at more than \$50/barrel.



5-year WTI, WCS, and Differential pricing. Source: [Alberta Economic Dashboard](#)

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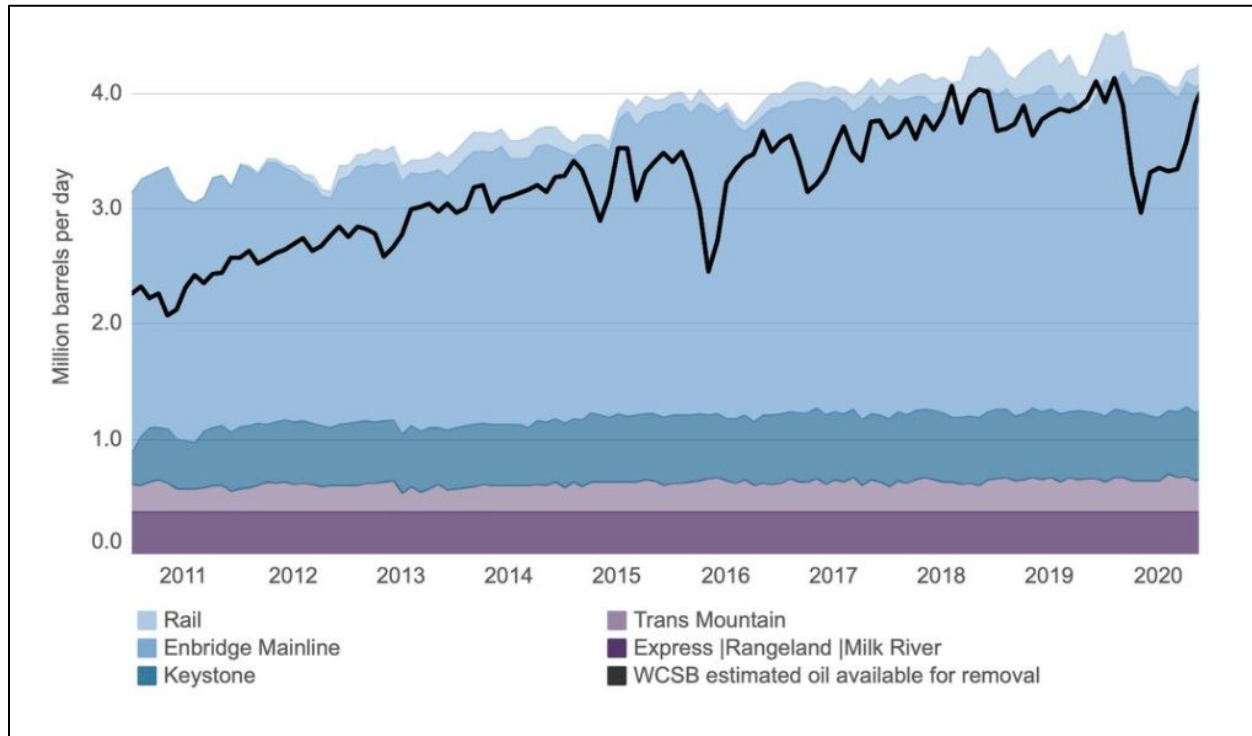
In order to alleviate these issues, Canadian midstream companies have been working on adding export capacity to the system through development of new pipelines and optimization of existing pipelines. New pipeline projects relevant to 2021 include Enbridge Line 3 Replacement (+370,000 bbl/d) which was completed and put in-service as of October last year, TransMountain Expansion (+590,000 bbl/d) scheduled to be in-service by late-2023, and Keystone XL (+830,000 bbl/d) which was scrapped by TransCanada due to regulatory issues after TC working on it for more than 13 years.



Map of L3R, TMX, and KXL projects. Source: [RBN Energy](https://www.rbnenergy.com)

Along with these new projects, companies are actively optimizing their current in-service pipelines with additional pumping, pressure reduction techniques, drag-reducing agents, and increased tankage at terminal stations. All these initiatives are necessary to keep up with increasing demand for oil egress out of Alberta which has stayed in a tight supply/demand range despite some egress additions over the last several years including crude-by-rail.

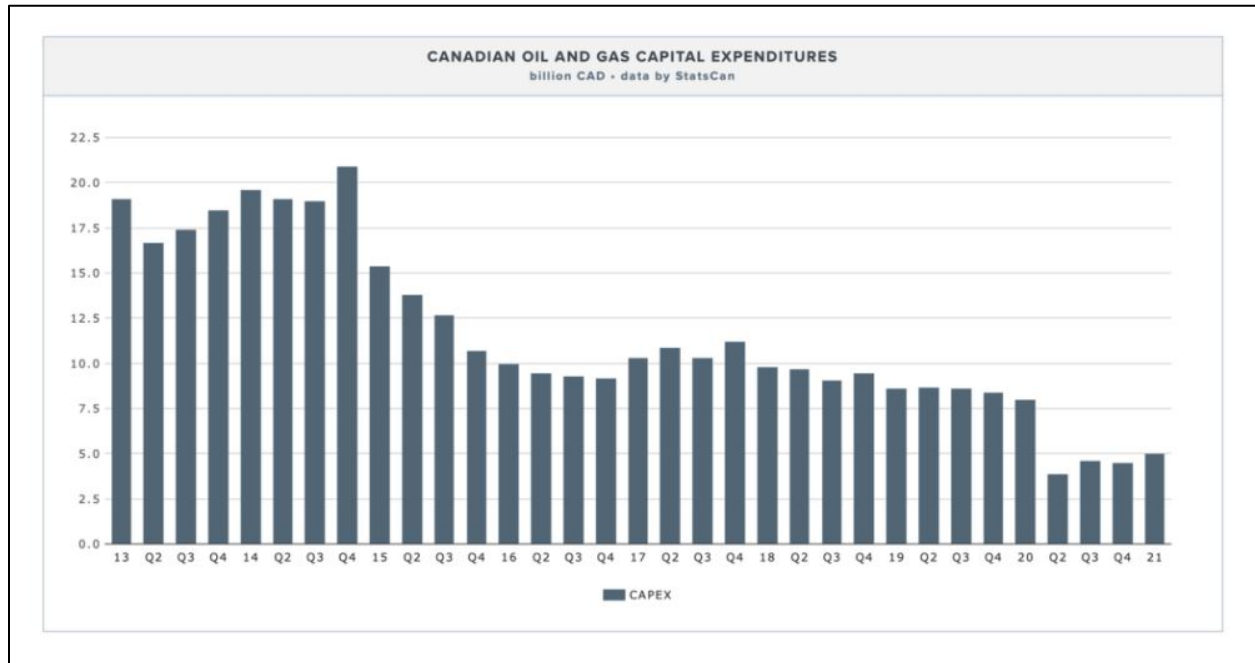
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WCSB Oil Egress Capacity. Source: [Alberta Energy Outlook](#)

Production growth out of the WCSB (Western Canadian Sedimentary Basin) has slowed over the last couple of years as companies have not invested heavily into new oilsands mining and SAGD development since the collapse in oil prices in early 2015. As these projects are capital-intensive and take multiple years to build before coming online, many projects which were put into production during the 2015-2021 years were actually sanctioned in the WTI \$80+ period during 2010-2014 on the assumption of continued pricing in this range when the projects were to finish construction and start producing. However, the subsequent unconventional/shale oil boom put oil pricing in a sustained lower-for-longer cycle which seriously affected the profit generation potential and payback periods of these oilsands projects. Due to this, we have seen substantially reduced appetite for further investments into these oilsands projects and other oil projects in general within Alberta.

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Canadian Oil & Gas Capital Expenditures. Source: [Alberta Energy Outlook](#)

This brings us to today's current situation where 2 important catalysts have recently impacted the industry with Enbridge's Line 3 Replacement coming online in October and Capline Pipeline (54% Plains All American, 33% Marathon, 13% BP Ownership) reversal which began linefill with light Bakken oil in late October and switched to transporting heavy oil earlier in the new year.

Line 3 increases the capacity of Enbridge's system to export Canadian oil by roughly 370,000 bbl/d and transports oil from Alberta's Hardisty oil terminal (35MM barrels storage capacity) to Enbridge's Superior oil terminal in Wisconsin. Superior is a crucial hub for American crude oil distribution and maintains 13MM barrels storage capacity along with serving 10 pipelines which total 2.8MMbpd of throughput capacity.

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Enbridge Line 3 Replacement Map. Source: [Oil Sands Magazine](#)

Once this oil reaches Superior, it has a variety of routes to various destinations including multiple other terminals within the United States and also back into Canada to Sarnia, Ontario where Suncor and Imperial Oil combined own roughly 200,000 barrels per day of refining capacity. Another route for oil from Superior is on the Southern Access pipeline (Line 61) that Enbridge has been working on behind-the-scenes and has recently commissioned an expansion on from 1.0 MMbpd to 1.2 MMbpd. This expanded Line 61 is now in-service with increased pumping horsepower and takes oil from Superior to Enbridge's Flanagan Oil terminal in Pontiac, Illinois.

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Flanagan Oil Terminal Map. Source: [Enbridge Flanagan Terminal Handout](#)

Line 61

- Inbound from Superior, WI
- 42-inch pipeline

Line 55

- Outbound to Cushing, OK
- 22-inch pipeline

Line 59

- Outbound to Cushing, OK
- 36-inch pipeline

Line 62

- Outbound to Schererville, IN
- 22-inch pipeline

Line 63

- Outbound to Patoka, IL
- 24-inch pipeline

Line 78

- Outbound to Griffith, IN
- 36-inch pipeline

Flanagan is another one of America's crucial crude oil terminals which has vital connections to 2 outbound pipelines to Cushing, Oklahoma and 1 outbound pipeline to Patoka, Illinois. Along with holding 13% of US commercial crude oil storage capacity, Cushing is the physical delivery location for the most actively traded crude oil futures contract in the world (WTI Light Sweet Oil futures). On the other hand, Patoka is a hub for Midwest crude oil transportation including being the endpoint for the 570,000 bbl/d Dakota Access Pipeline (DAPL) which brings over 50% of Bakken oil production to Patoka and one of the endpoints for TransCanada's Keystone pipeline system which transports ~600,000 bbl/d oil from Hardisty to various locations including Patoka, Cushing, and refineries in Texas.

The outbound pipeline from Flanagan to Patoka known as Southern Access Extension (Line 63) has capacity of 300,000 bbl/d and will be the pipeline which Canadian heavy oil producers will utilize to first move their oil to Patoka and then into the Capline which carries it to St. James, Louisiana, an oil terminal with access to 3 MMBpd of refining capacity and export capacity across the world.

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Originally moving imported oil from LOOP (Louisiana Offshore Oil Port) to multiple refineries around America, the 1.2 MMbpd capacity Capline has lost importance in recent years as American domestic production has grown significantly along with increasing availability of heavy oil imports from Canada. At the time of final decision to reverse Capline in 2019, it was operating at less than 10% of capacity and changing production trends across North America meant it could have become totally empty in short order.

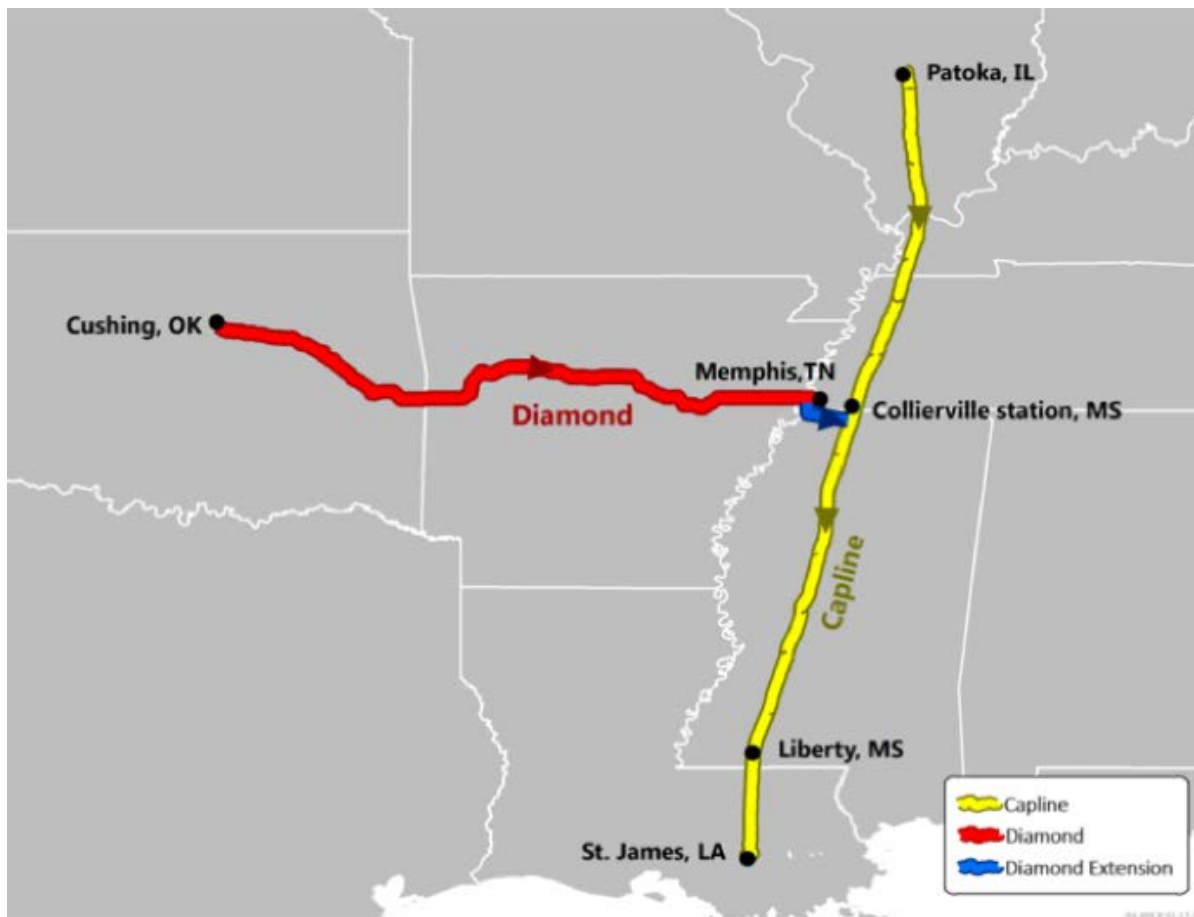


Capline Reversal Map. Source: [MPLX Website](https://www.mplx.com)

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Looking for better revenue-generation options for this pipeline, the owners opted to take advantage of expanding export terminals and thus, decided to reverse the pipeline. This reversed pipeline went into service in early January 2022 taking oil from Patoka, Illinois to St. James, Louisiana at an initial throughput of 100,000 barrels per day and maximum capacity of 200,000 barrels per day. On Cenovus Energy's most recent Q4 results conference call, they mentioned that Cenovus' oil has been going down the Capline and into St. James which gave investors concrete proof that Canadian oil is actually using the pipeline for its intended use and there is potential to expand this use further.

Although this reversed Capline is actively transporting oil, the current throughput is not much more than the throughput of the pipeline before it was reversed and thus, revenues have not increased materially. Owners of Capline are banking on future throughput growth as Canadian oilsands production grows and American export capacity grows alongside it.

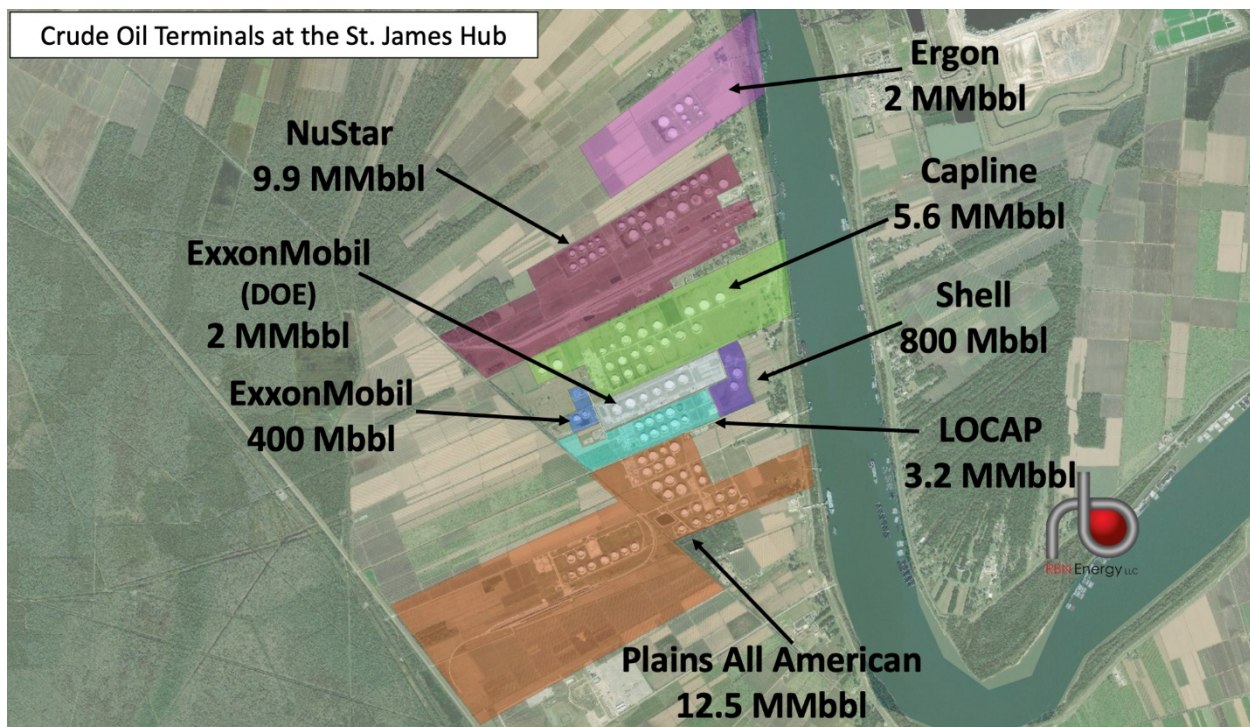


Capline and Proposed Diamond Pipeline Map. Source: [Marathon Pipeline Website](https://www.marathonpipeline.com/)

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Capline owners were also banking on a second source of oil on the Capline when they made the decision to reverse it. This would be ~420,000 barrels per day that would have come from Cushing, Oklahoma via the Diamond pipeline, entered a new Diamond Extension pipeline which was projected to be completed in late-2021, and then into the Capline which would've taken this oil from Cushing down to St. James as well. Unfortunately, this critical Diamond extension project ran into opposition, delays, and eventually was cancelled in mid-2021 thus impacting a major source of revenue for Capline owners and leaving the Capline in its current state with mostly just Canadian oil from Patoka using the pipeline.

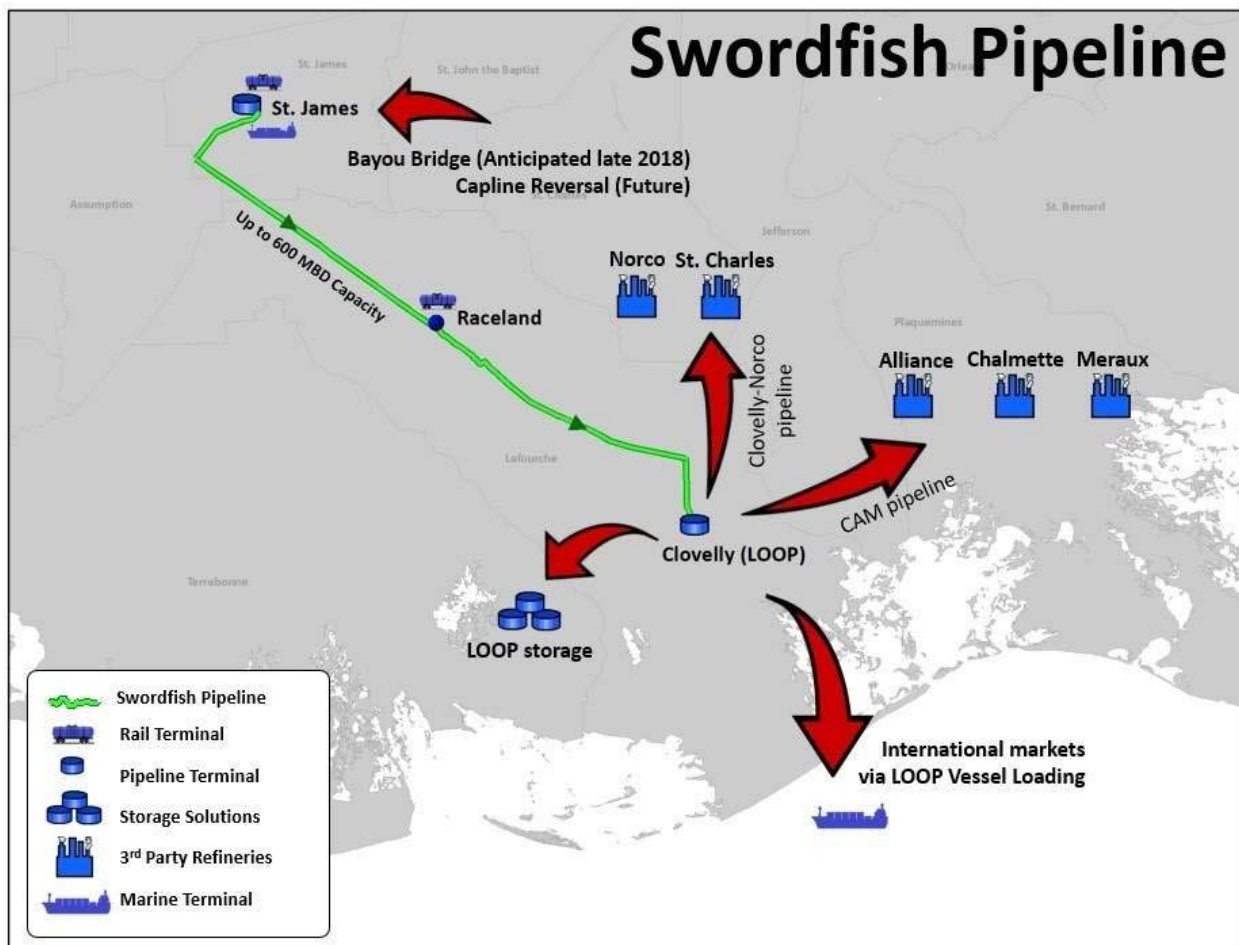
Once this Canadian oil reaches St. James, it has access to plenty of refineries on the Mississippi river and within Louisiana along with export capacity on the river on Aframax vessels carrying upto 800,000 barrels per vessel. This additional market that Canadian oil now has access to has further shrunk the WCS differential as refineries and export terminals compete for the same barrels of oil which were previously locked within the Chicago Midwest refining area.



St. James Terminal Map. Source: [RBN Energy](https://www.rbnenergy.com)

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Additionally, getting oil to St. James gives Canadian producers options to transport this crude further south on the Swordfish pipeline, a line with 600,000 barrels per day of capacity and taking oil to Clovelly where the LOOP (Louisiana Offshore Oil Port) terminal is built. This port further adds connections to another handful of refineries and more importantly, allows offloading onto Suezmax vessels carrying upto 1 million barrels per day and VLCC vessels capable of carrying upto 2 million barrels per day to markets around the world. With American domestic refining capacity decreasing, this Line 3 expansion and Capline reversal works well in Canadian producers' favor to allow access to markets where international refining capacity is increasing including in large petroleum demand growth markets such as India, Nigeria, and the Middle East.

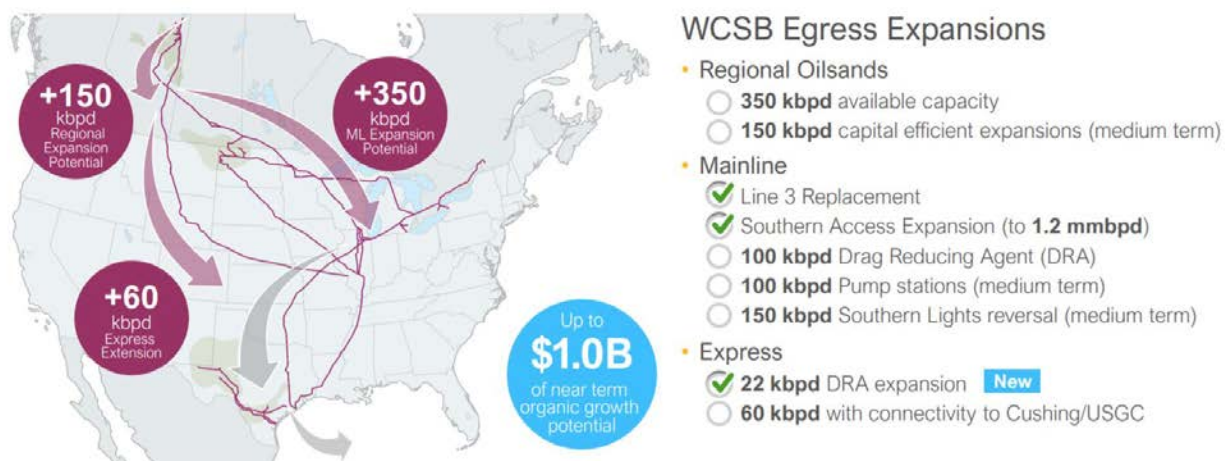


Swordfish Pipeline and LOOP Map. Source: [NS Energy](http://www.nseenergy.com)

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Looking into the future, there are further sources of egress that Canadian oil producers have access to in short-time or will have access to within the next couple of years. One of these is the often-discussed TransMountain Expansion (+590,000 bbl/d) which is scheduled to be in-service by late-2023 and will offer additional export capacity from Canada's west-coast to international markets. Enbridge on the other hand has 200,000 barrels per day of optimization potential on their Mainline through the use of Drag Reducing Agents and adding pump stations.

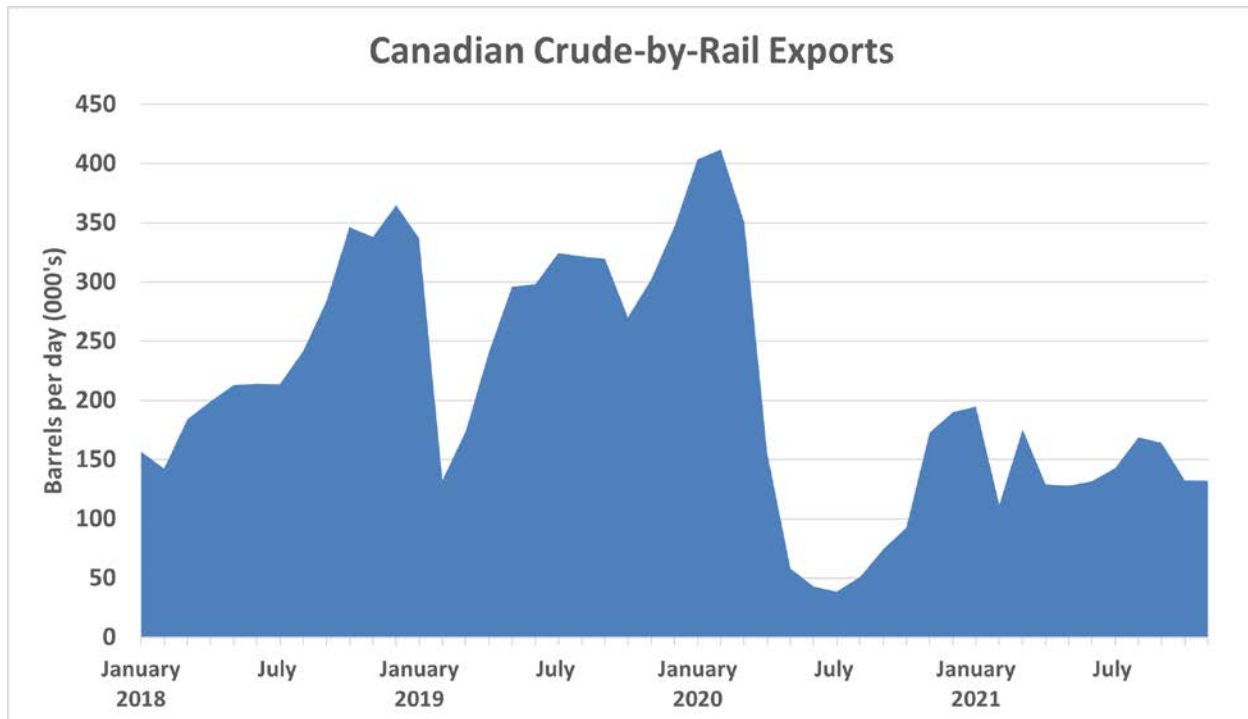
Moreover, Enbridge could also sanction reversal of the Southern Lights pipeline which currently brings condensate from the United States into Canada but could be reversed to carry oil from Canada down to the States. This Line 13 Southern Lights pipeline reversal is more of a medium term project according to Enbridge but can be sanctioned if Canadian oil production increases significantly and Enbridge can find committed shippers for long-term contracts on this line.



Enbridge WCSB Egress Expansions. Source: [Enbridge 2021 Investor Day Presentation](#)

Lastly, crude-by-rail is another option available to Canadian producers and remains an emergency option with significant export capacity should the need arise. Currently sending only ~150,000 barrels per day down to the USA, crude-by-rail was called upon heavily in the 2018 WCS differential blowout and has been comfortably able to ship upto 400,000 barrels per day in the past meaning that about 250,000 barrels per day of capacity remains in rail. Since economics of sending oil by rail are inferior to sending it by pipeline in most cases, rail remains a secondary but nonetheless very important egress option for Canadian oil producers.

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Canadian Crude-by-Rail Export History. Source: [Author using data from Canada Energy Regulator](#)

Canadian producers are finally enjoying stable and competitive pricing for their oil production after years of suffering from widening differentials due to periods of heavy refinery maintenance, hitting export capacity and constant pipeline uncertainty. A lack of new upstream projects or production coming online combined with increased egress from Enbridge Line 3 and Capline reversal have tilted the market in favor of Canada for the moment. Additional egress capacity in the near future from TransMountain Expansion, Enbridge line optimizations, and crude-by-rail opens the door for Canadian producers to maintain their production base and even increase production slightly without worry of hitting limits once again.

With rising WTI pricing due to worldwide declining inventories and a structural supply-demand deficit, Canadian producers are already getting excellent pricing for their oil. Stability of the WCS differential adds increasing strength and cash flow to their bottom lines along with taking out most of the uncertainty associated with investing in Canadian oil.

Overall, Canadian oil producers are poised to take full advantage of this bullish oil market and rising commodity pricing with their low-debt, low-decline, long reserve-life, and excellent cash-flow generating assets that are finally bearing fruit for management and investors alike!