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Crude-By-Rail Evolves Into Permanent Midstream Fixture

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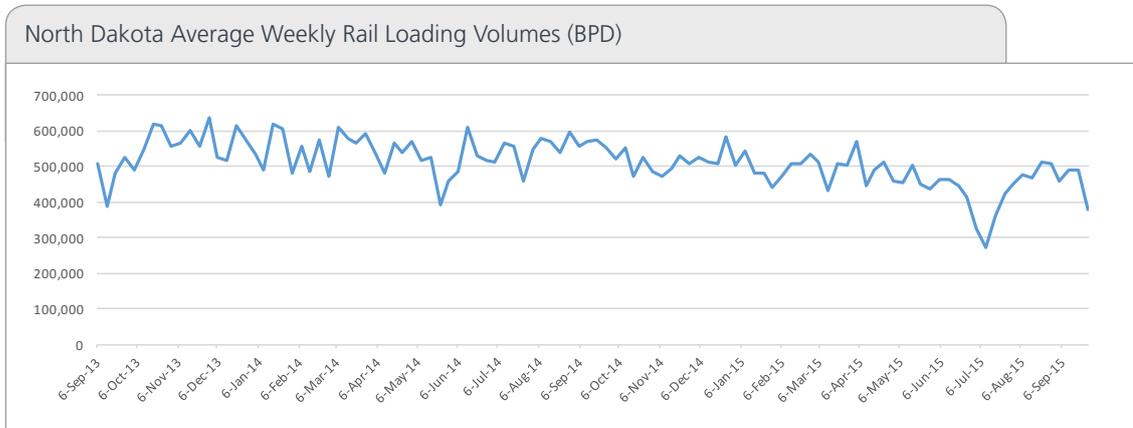
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Crude-By-Rail Evolves Into Permanent Midstream Fixture

EXECUTIVE SUMMARY



The crude-by-rail industry is completing a transformative year, evolving into a supplemental transportation method used to ship barrels in times of price arbitrage opportunities and to refining markets lacking pipeline connectivity. The relatively young industry, which thrived on the back of booming North Dakota Bakken shale crude production, has quickly become a permanent fixture of the U.S. crude midstream market.

Though Bakken production has declined, with crude prices sometimes dropping below North Dakota well breakeven costs, barrels continue to move on rail, mostly on a contract basis.

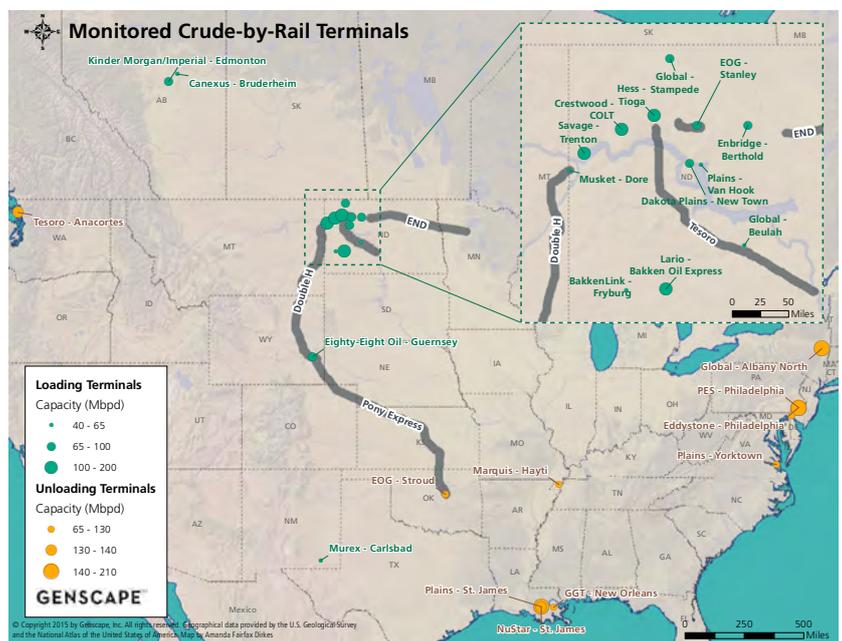
But, facing challenges from relatively narrower price spreads in a low-crude-price environment, regulatory issues and new pipeline capacity, average North Dakota crude-by-rail loading volumes have decreased so far this year versus 2014. From January through mid-September, average daily loading volumes were about 13 percent lower than all of 2014.

Many of those barrels arrived at U.S. East, West and Gulf coast unloading facilities, though average daily receipts have declined so far this year. For example, Global Partner’s Albany, NY, terminal, a key unloading facility on the East Coast, received about 34 percent less average daily crude-by-rail volumes between January and mid-September compared to all of 2014.

However, some East Coast refiners are expected to continue to source unit trains of crude from North Dakota, while West Coast developers remain committed to building new crude-by-rail unloading capacity.

“Where Bakken is desired is where pipe doesn’t go. Rail won’t go away because they take the crude where it needs to go,” Mindi Farber-DeAnda, U.S. Energy Information Administration Lead, Biofuels and Emerging Technologies, said during Genscape’s Oil and Natural Gas Symposium in late September in Houston.

This white paper summarizes how Bakken-by-rail has evolved and gives insight into its new place in the U.S. midstream market. Readers will gain a picture of recent loading and unloading volumes trends in the United States and learn about the effect of current well breakeven prices and lower production, as well as more crude imports into the East Coast.



Crude-by-Rail Evolution Sees Ups and Downs

The fast-growing crude-by-rail industry first mesmerized the market starting in 2008 with its ingenuity to move booming supplies of cheap light sweet Bakken crude from North Dakota. It opened super-wide arbitrage price spreads and was called the Wild Wild West. It attracted the attention of big players looking to make big money and coastal refiners hoping to get a piece of the ultra-cheap light sweet crude moving in trainloads.

Talk of the industry filled many large conference rooms across the United States, where eager market participants learned the secrets of the new trade. An empty tank-car could not be found. North Dakota hosted a modern Gold Rush with men and women leaving their families for large paychecks in the booming Williston Basin in North Dakota, where Bakken crude is produced.

The industry had many victories but also ran a gauntlet of headwinds including death-causing fiery train crashes that sparked social movements, new pipeline capacity that outweighed rail benefits, the crash of crude prices and the narrowing of those once never-before-seen price spreads. Unloading and loading volumes declined along with market interest.

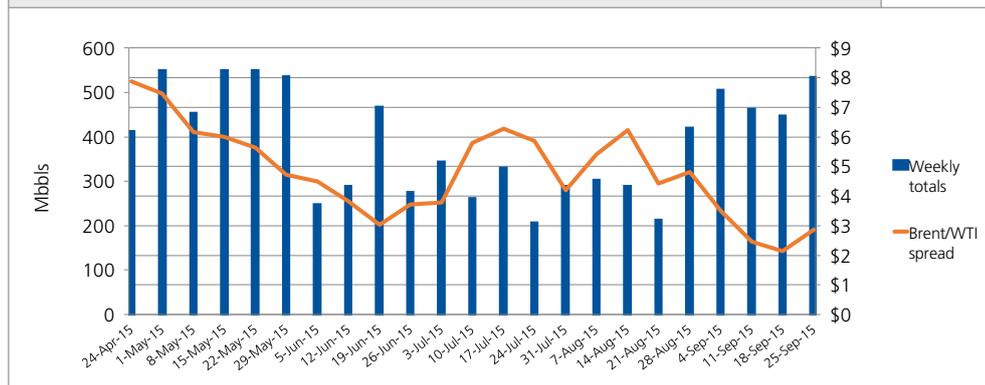
“Ultimately, the story is that this thing in 2013 was the biggest thing since sliced bread and now has it literally gone off the rail? Was it just a stopgap until they built the pipelines,” RBN Director of Energy Analytics Sandy Fielden said. “All things being equal now, rail becomes the marginal outlet when production begins to crank up.”

In 2007, there was 172,000 bpd of pipeline capacity from the Williston

continued

CRUDE-BY-RAIL CONTINUES FROM NORTH DAKOTA

Brent-WTI (\$/bbl) versus Albany Unloadings



Though much of the crude shipped from North Dakota is railed on a contract basis, marginal barrels will continue to move on trains in times of arbitrage opportunities to the East and West coasts or pipeline constraints to the Gulf Coast, analysts said.

“Even though the economics look like rubbish right now, 400,000 bpd to 500,000 bpd is still going on rail” from North Dakota, RBN Director of Energy Analytics Sandy Fielden said, noting that baseload barrels are still moving to coastal refiners.

Between January and mid-September, North Dakota crude-by-rail loading daily average loading volumes averaged 466,745 bpd, according to Genscape monitoring data. In 2014, volumes averaged 532,690 bpd. The difference of 68,171 bpd equals about one unit train of Bakken crude per day. North Dakota loadings hit a record-high of 633,820 bpd in the week ending November 29, 2013, according to Genscape data. About 372,300 bpd were loaded on July 24, 2012, the first day of monitoring when nine terminals were taken into account. Genscape currently monitors 98 percent, or 1.3 million bpd, of loading capacity in North Dakota.

In the week ending September 19, 2014, North Dakota loading volumes were 573,246 bpd, while in the corresponding week this year loading volumes were 488,942 bpd, a difference of 84,304 bpd. In the week ending September 27, 2013 (a date closer to crude-by-rail’s heyday), 524,644 bpd was loaded onto trains in North Dakota. Earlier that month in 2013, the weekly volume was 505,778 bpd.

Between September 2013 and 2015, the benchmark price spread between ICE Brent futures contract and the NYMEX Light Sweet Crude futures contract, the basis for West Texas Intermediate Crude at Cushing, OK, narrowed considerably. The spread, an important indicator of the profitability to rail inland crude to coastal markets, was near \$6.80/bbl in early September 2013, and near \$1.30/bbl in mid-September 2015. In late 2012, the spread exceeded \$20/bbl. The spread peaked this year at more than \$7/bbl in February before declining.

In turn, the spot differential price between WTI and Bakken Railhead, which represents the price of crude flowing onto North Dakota rail terminals, has narrowed, according to Genscape pricing data. In the week ending September 18, it was WTI minus \$3/bbl, compared with WTI minus \$8.25/bbl during the week ending January 2. In September 2014, the differential was near WTI minus \$9/bbl. The differential was the widest in October 2013, when it hit WTI minus \$13/bbl, according to Genscape. Genscape began assessing the Bakken Railhead spot market in September 2013.

Coinciding with the North Dakota Bakken Shale boom, crude-by-rail emerged in late 2008 as a way to transport the light sweet crude ahead of available pipeline capacity. In the industry’s early days, refiners, midstream companies, and private investors rushed to construct loading terminals in North Dakota and unloading terminals first along the U.S. Gulf Coast and then along the East Coast.

Basin. By the end of this year, there is expected to be 707,000 bpd of outbound pipeline capacity. That number is expected to reach 731,000 bpd in 2016, according to the North Dakota Pipeline Authority.

"Time flies, at one point there was 10,000 rail-cars on order and there was a huge backlog of growth," Cowen and Company Senior Analyst Sam Margolin said. Now, that back log doesn't exist, he said. He noted one refiner who ordered thousands of rail-cars is converting many of them into refined products service.

Perhaps the best illustration of the crude-by-rail story is within the short-term six- to- 12-months tank-car leasing rate prices, which have slid since December 2014. At that time, leases for newer model GP-31.8 CPC-1232 tank-cars were \$2,215/month, while DOT-111 GP-30 units were \$1,550/month and 29,000 barrel Coiled and Insulated cars were \$1,750/month. In the week ended Sept. 29, short term leases for 31.8 CPC-1232 tank-cars were \$625/month, DOT-111 GP-30 units were \$550/month and Coiled and Insulated cars were \$625/month.

WEEKLY PETRORAIL REPORT

Analysis and market implications of crude-by-rail movements in North America

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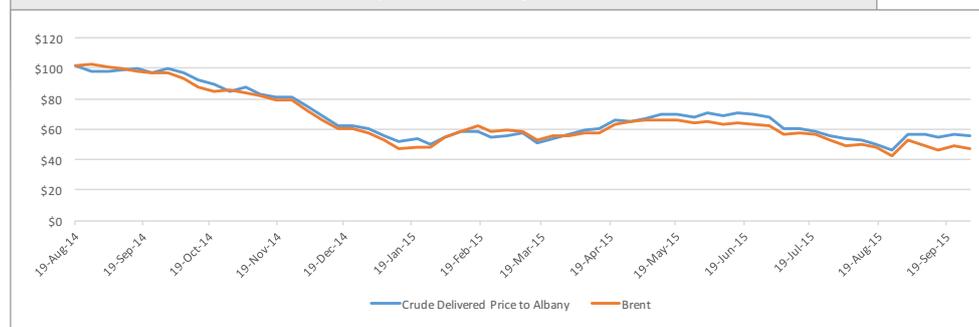
While Gulf Coast refiners, which have a relatively heavy crude slate, blended Bakken crude to cut refinery margins, many East Coast refineries, who were close to closing on poor profits, were revitalized by replacing more expensive comparable oil.

Since then, new relatively cheaper outbound pipeline capacity from the Bakken region and more competitive crude imports have dampened some loading volumes.

Recently, the spread between Brent crude and North Dakota Bakken crude at rail terminals has also narrowed, making spot rail shipments to the East Coast from North Dakota relatively uneconomic.

NO 'NEW' CRUDE-BY-RAIL SPOT PLAYERS

Brent versus Bakken rail-delivered price to Albany, NY (\$/bbl)



"With North Dakota to Brent spreads of under \$7/bbl you won't see anyone 'new' trying to do a [spot] deal," one East Coast crude shipper said. But, without pipelines to carry crude into the region, refiners there must chose to rail in or import crude.

Though they have recently resumed sourcing foreign oil in greater shipments, East Coast refiners continue to run Bakken crude by erasing some portion of poor shipping margins with profitable refined products crack spreads, which measure a refineries profitability, and investing in midstream assets. During the past year, unloadings on the East Coast have declined, but remain healthy at some locations.

At Global's Albany terminal, volumes were 63,771 bpd in the week ending September 18, nearly flat to the beginning of the year, when volumes were 61,650 bpd in the week ending January 2. In the week ending September 19, 2014, volumes were 97,857 bpd. When monitoring began during the week ending August 9, 2013, volumes were 46,580 bpd.

Volumes at the PBF Delaware City, DE, unloading terminal were 41,143 bpd for the week ending September 18, up from 19,571 bpd during the week ending January 2. In the week ending September 19, 2014, volumes were 78,286 bpd. When monitoring began during the week ending May 23, 2014, volumes were 64,219 bpd.

At Plains' Yorktown, VA, refinery unloading volumes were 24,960 bpd during the week ending September 18, up from zero bpd for the week ending January 2. Unloading volumes for the week ending September 19, 2014 were 61,650 bpd. During the first week of monitoring on December 27, 2013, volumes were on average 71,925 bpd.

At Philadelphia Energy Solutions' Philadelphia, PA, terminal unloading volumes were 37,440 bpd during the week ending September 4, 2015. There were monitoring outages during the following two weeks. For the week ending January 2, volumes there were 152,657 bpd, and volumes were 101,771 bpd during the week ending October 31, 2014, the first week of monitoring.

Also near Philadelphia, at the Canopy/Enbridge Energy Partners' Eddystone terminal, volumes were 120,000 bpd in the week ending September 18, not counting four days of monitoring because of an outage. During the week ending January 2, 2014, volumes were 88,071 bpd, while volumes were 68,500 bpd during the first day of monitoring during the week of August 29, 2014.



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MAKING IT UP WITH CRACKS

U.S. spot crude-by-rail movements don't work "unless you are a refinery, and you are making it up on the crack," one rail market source said, adding: "Obviously, with hedges and certain contracts signed in the past, people will continue to ship."

The Brent crude 3:2:1 crack spread, which is a measure of profitability that takes into account the differential between the price of crude and its refined products, was \$9.49/bbl on January 2, 2014, but dipped down to \$3.59/bbl on January 2 of this year, according to RBN Energy data. The crack spread increased greatly the next month to \$21.28/bbl on February 9. At that start of the summer, the spread was \$22.94/bbl on June 9. On October 1, the crack spread was \$9.80/bbl with lower gasoline and heating oil prices. In addition, refinery utilization on the East Coast has been at 100 percent during most of the past year. At the end of September, utilization was 70 percent, with a major refinery unit in turnaround, according to Genscape.

"They do have healthy margins, but in the end, crude-by-rail works only if it can get crude to a refinery at a lower laid-in cost than the refiners alternate options," Turner Mason & Company Vice President John Auers said.

Foreign crude imports into the East Coast have increased over the past year as the price of Brent crude fell considerably to \$46.99/bbl on October 1 from \$114.10/bbl on June 20, 2014. In the week ending September 25, imports to the East Coast were 3.405mn bbls, or 486,429 bpd, according to Genscape shipping data. In the previous week, imports were 1.728mn bpd, or 246,923 bpd. In the week ending September 26, 2014, only 250,000 bbls, or 35,714 bpd, were imported. The week before that 674,912 bbls were imported, or 96,416 bpd.

BUYING-IN FOR BAKKEN

Some East Coast refiners have purchased rail-cars and invested in crude-by-rail loading facilities in part to cut costs associated with using a third-party terminal.

Refiner Phillips 66, which owns the Bayway, NJ, refinery, will operate and own a part interest in a proposed crude-by-rail terminal near Palermo, ND, under construction by Paradigm Energy Partners.

"The terminal will have an initial capacity of 100,000 barrels per day, with the flexibility to be expanded to 200,000 barrels per day," according to the Paradigm Midstream website.

Phillips 66 spokesman Dennis Nuss said in an email said that the project is moving forward, but he did not give a start date. The rail terminal is expected to begin service in Q1 2016, according to a company statement released in late 2014. Recently, Phillips 66 put back into service some rail-cars that were parked earlier this year when imports were sourced instead of railed Bakken crude because of cost incentives, according to Reuters.

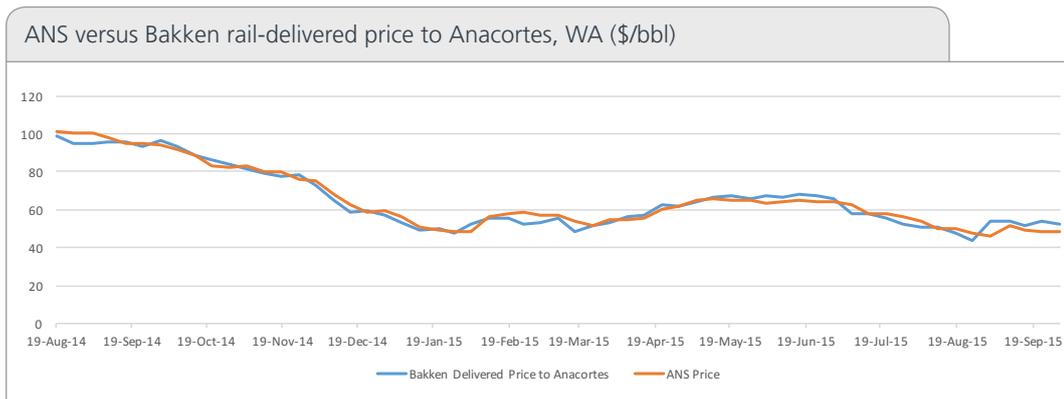
President Tim Taylor told Reuters that some rail-cars were pulled from storage to send Bakken crude to its Ferndale, WA, and Bayway refineries. Nuss declined to comment on Taylor's statement. During a second-quarter earnings call, Taylor said that rail utilization is increasing to take Canadian Crude to the East Coast.

Phillips 66 owns one of the largest fleets of rail-cars, and by "having their own loading facilities, cars and refinery, they can use the assets better than a trading house or a firm without any space at the either end of the supply chain," a source said. In addition, market participants must pay to park rail-cars.

Like PBF, PES is also placing stakes in the Bakken. The company announced recently that it plans to own part of the 210,000 bpd Bakken Oil Express crude-by-rail terminal near Dickinson, ND, by forming a joint-venture with Globe Resources, according to a U.S. Securities Exchange Commission filing. On June 9, PES entered into a "term sheet" with Globe Resources relating to the joint venture combining the business PES' logistics segment, North Yard Logistics, with BOE Midstream, a subsidiary of Globe Resources.

The subsidiary of PES Holdings will own an 85.25 percent interest in and control the BOEM joint venture, PES said in the filing, which was made ahead of an IPO offering. The BOEM JV was expected to be completed in the third quarter of 2015.

PRICE SPREADS CHALLENGE WEST COAST CBR BUILDOUT



Crude-by-rail volumes are also moving to the West Coast. In the case of Tesoro's Anacortes facility, those volumes appear to have remained fairly steady in the past 12 months. In the week ending September 25, unloading volumes at Tesoro's Anacortes, WA, facility were on average 69,000 bpd, up 25,286 bpd compared with the previous week. In the corresponding week last year, volumes were 56,268 bpd, close to the average unloading volumes during the week ending August 28 of 51,429 bpd.

The West Coast has been called the last frontier for Bakken because the region was expected to be flush with infrastructure following the construction of unloading facilities in the East and Gulf coasts. But, the infrastructure buildout has been slower than expected because of permitting issues, while local lawmakers weigh the potential dangers of crude by rail.

Recently, relatively uneconomic shipping margins and lower crude prices have provided another challenge for the development of unloading facilities in the region.

Sending crude to the West Coast "isn't a straight-forward economic argument anymore," Fielden said, noting that issues in the region "are really more about politics than economics."

But, Alon USA recently slowed development of its Bakersfield Crude Flexibility Project in California, which includes crude-by-rail capacity, because of the "current market and crude differentials," CEO Paul Eisman said during a second quarter earnings call. The company is working with a firm for the rail loop design and unloading facilities so that construction could begin quickly if there is "an opportunity to move forward," he said, noting that the "crude differentials right now may make rail transportation difficult."

In September 2014, Alon said in a statement that it received the necessary approval in Kern County to construct a new rail facility at its Bakersfield refinery and to make modifications on the refinery to process more light sweet crude. The permit is for a double rail loop that can handle two unit trains per day, according to the statement. At that time, the facility was expected to be completed by the end of 2015.

In addition, Questar Pipeline and Spectra Energy have not obtained a "suitable site" for a proposed crude-by-rail terminal in Southern California that would be part of project to convert the western segment of the Southern Trails Pipeline to crude service, according to a second-quarter earnings statement. The development of the pipeline conversion has been delayed to 2017. "Questar and Spectra are now evaluating additional alternatives for the conversion of some or all of the Southern Trails Pipeline to transport crude oil," the statement said. "These alternatives include evaluation of other rail terminal locations or conversion of the entire pipeline to oil service from the San Juan Basin." The company is also considering selling the Southern Trails Pipeline, it said.

Without the Questar and Alon projects, proposed crude-by-rail unloading capacity in California declined to about 220,000 bpd, while proposed capacity in Washington state is higher, at about 512,000 bpd.

In Washington, Tesoro Corp. remains "committed" to its proposed 360,000 bpd crude-by-rail terminal in Vancouver, WA, and believes that crude-by rail will play an important part in bringing so-called advantaged crude to the U.S. West Coast, CEO Greg Goff said during a second-quarter earnings call. "We continued to upgrade our crude oil rail fleet by adding 210 enhanced tank cars that exceed the new safety transport standards issued by the U.S. Department of Transportation on May 1 of this year," he said.

New Tank-Car Standards Rolled Out

The U.S. Department of Transportation announced in May its Final Rule to strengthen safe transportation of flammable liquids by rail. The rule enhanced standards for new and existing tank-cars used in so-called high-hazard flammable trains, a continuous block of 20 or more tank-cars loaded with a flammable liquid dispersed through a train. New tank-cars constructed after Oct. 1, are required to meet new DOT-117 design performance criteria, including a 9/16 inch tank shell, 11 gauge jacket, 1/2 inch full-height head shield, thermal protection and improved pressure relief.

The rule requires that the entire fleet of older model DOT-111 tank-cars to be replaced in three years and all non-jacketed CPC-1232s to be replaced in about five years. The rule also requires HHFTs to have a functioning two-way end-of-train device or a distributed power braking system and it reduced HHFT speeds to 50 or 40 mph in all areas.

The rule was made in response to a number of high-profile accidents including crude-by-rail shipments, most notably at Lac-Mégantic in Quebec, Canada, in July 2013 which resulted in 47 fatalities. Since, regulatory attention has shifted toward improving the specifications of tank-cars used to transport Bakken crude.

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INLAND BARGE VERSUS CRUDE-BY-RAIL

Like Tesoro's project, many of the proposed Washington facilities are designed to load railed crude onto barges for delivery to California refineries. This is already an option for rail shippers into Global's Clatskanie, OR, transloading facility. The unloading terminal is linked to Global's Basin Transload crude-by-rail loading facility in Beulah, ND, the company said in a 2013 statement.

"Inland barge will always be a unique market," a shipping source said. "Barges tend to have more flexibility than rail and can move in and out of various products and ports with ease." But, like rail, "crude by barge is not working."

Shipping on inland barge is cheaper per barrel per day than sending barrels on rail, an analysis of Genscape data showed. The all-in cost of moving crude by inland barge is generally agreed to be around \$7,500 per day per 30,000-bbl barge. On a per-barrel basis, the cost is about \$0.25/bbl. This does not include dock fees. In the current pricing environment, it costs about \$1.20/bbl per day to move crude from North Dakota to Anacortes on a unit train. This cost takes into account the per-day costs for a six-day journey for rail freight, fuel surcharge and the rail-car leasing rate.

DOMESTIC BARRELS ARE WESTBOUND

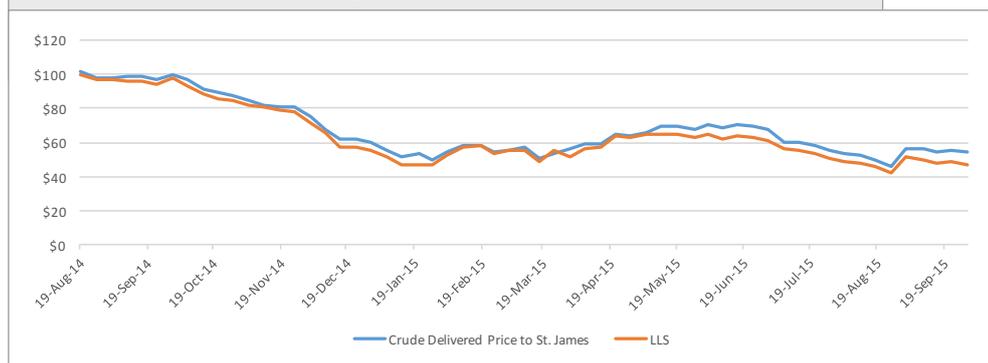
Adam Bedard, CEO of Arb Midstream, which is developing the NiCon Connector Energy Hub, might look to send barrels westward. The hub includes a crude-by-rail loading facility in Evans, CO, and crude from the Denver-Julesburg Basin is expected to move from the terminal.

"Currently our outlook has shifted somewhat," he said. "We still feel there is a lot of opportunity for segregation and blending of light barrels, but with the overbuild in pipeline capacity, the pipes are sucking all molecules out of the market. There is very little distress on the light barrels. Needless to say, there are still no pipelines to the West Coast, and we see that market opening up eventually."

Bedard said that crude-by-rail economics "are out of the money on spot," but longer term his company expects crude price arbitrage spreads to open up again.

CONTRACT CRUDE-BY-RAIL MOVES TO GULF COAST

LLS versus Bakken rail-delivered price to St. James, LA (\$/bbl)



Spot crude-by-rail spot movements to the Gulf Coast from North Dakota have declined significantly in recent years on increased pipeline flows into the region from Cushing, OK, and increased light sweet crude production from the South Texas Eagle Ford Shale and West Texas Permian Basin. But, contract light sweet barrels continue to move.

In St. James LA, combined unloading volumes at terminals owned by Plains and NuStar averaged 105,737 bpd for the week ending September 18, down from 149,525 bpd for the week ending January 2. For the corresponding week in September 2014, volumes were 153,929 bpd.

U.S. East Coast Refiners Placed Bets on Bakken

In recent years, East Coast refiners, which traditionally processed light sweet crude from Atlantic Basin producers, sought rail access to low-cost inland crudes to revitalize their faltering facilities.

PBF Energy who reopened its Delaware City, DE, refinery in October 2011 after its purchase in an idled state in June 2010. The company's Paulsboro Refinery was purchased in December 2010.

In February 2013, PBF announced the arrival of the first unit train at the Delaware City refinery's crude-by-rail unloading facility. At that time the facility was able to discharge 110,000 bpd of crude directly at the refinery – 40,000 bpd of heavy crude and 70,000 bpd of light crude. PBF also said it also entered into agreements for an additional 2,000 coiled and insulated tank-cars to bring the company's number of heated cars to 3,600.

In July 2012, the Caryl Group and Sunoco agreed to form Philadelphia Energy Solutions to save the oldest continuously operating refinery on the East Coast. The 330,000 bpd refinery was set to shut in Aug. 2012. A project announced at that time was a high-speed train unloading facility at the refinery to provide access to greater quantities of crude from North America versus imported crude, particularly from the North Dakota Bakken region. In Oct. 2013, the Philadelphia Energy Solutions refinery began processing a fifth of all Bakken production, or about 190,000 bpd.

In July 2014, Monroe Energy, a subsidiary of Delta Air Lines, entered into a five-year agreement with Bridger LLC, to supply 65,000 bpd of domestic crude to its refinery in Trainer, PA. A third of the crude refined at the refinery was expected to come from the Bakken Shale, the company said in a statement.

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BAKKEN PRODUCTION FALLS ON LOWER CRUDE PRICES

Lower North Dakota production has in part caused crude-by-rail loading volumes to decline. Production in North Dakota, which ramped up quickly to unprecedented levels, decreased this year after four years of increased output.

In October, North Dakota production is expected to be 1.129mn bpd, according to Genscape's SpringRock production forecast. North Dakota production increased to a high of 1.22mn bbls in December 2014. Production is expected to end this year at 1.096mn bbls, before retreating to 956,000 bbls in December 2016.

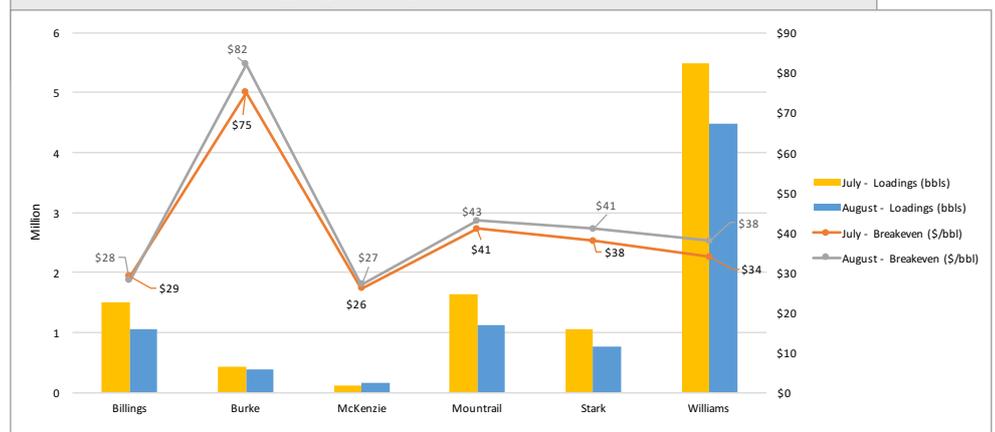
In December 2014, when production hit a high, the WTI price was near \$53.66/bbl. At the end of September, WTI was near \$44.48/bbl. At the end of July 2014, the price was much higher at \$101.57/bbl.

While the WTI price declined, the price of Bakken Railhead crude fell in tandem. For the week ending September 29, the Bakken Railhead price was \$41.63/bbl. In December 2014, when North Dakota production hit a high, the Bakken Railhead price was near \$47.71/bbl. At the end of July 2014, the Bakken Railhead price was \$92.57/bbl.

North Dakota production has declined as producers faced prices dangerously close to breakeven levels. "There's pressure on the producers on breakeven costs to keep producing, but as long as they are alive and kicking they have to sell the stuff," Fielden said.

BAKKEN BREAKEVEN WELL COSTS CORRELATE TO LOADING VOLUMES

North Dakota Rail Loadings by County vs. Well Breakeven Costs (\$/bbl)



An analysis of recent breakeven costs for North Dakota production by county versus regional loading volumes showed a correlation between the breakeven prices and loading volumes located in those counties, according to Genscape and North Dakota Department of Minerals Resources. In addition, while prices dropped along with volumes at many loading terminals, some facilities have bucked the trend with increasing or steady volumes.

Billings County

During July, the breakeven cost was \$29/bbl and loading volumes were 1.5mn bbls, while during August breakeven costs were \$28/bbl and volumes were 1.05mn bbls. In Billings County, Genscape monitors the 65,000 bpd Bakkenlink terminal in Fryburg, where volumes have remained fairly steady since Genscape began monitoring the terminal. Average loading volumes there averaged 65,829 bpd in the week ending September 25, up from 29,749 bpd in late December 2013. Volumes there peaked at 80,373 bpd in the week ending June 13, 2014, but reached an average of nearly 75,000 bpd in the week ending August 28.

“The lower-cost domestic crude from the Bakken oil fields in North Dakota replaces more expensive crude that historically has been shipped to the refinery from overseas,” the statement said.

Some East Coast refineries succumbed to poor margins due to relatively expensive imported crude. Sunoco shut a 175,000 bpd refinery in Marcus Hook, Pennsylvania in December 2011, about two years after it shut its 145,000 bpd Eagle Point New Jersey plant. Then, Hess closed its 70,000 bpd refinery in Port Reading, NJ.

Burke County

During July, the breakeven cost was \$75/bbl and loadings volumes were 438,400 bbls, while during August, breakeven costs were \$82/bbl and loading volumes were 387,800 bbls. In Burke County, Genscape monitors Global’s 80,000 bpd Stampede terminal, where volumes have shifted lower since December 2013. At that time, volumes were near 35,000 bpd on average, compared with 4,114 bpd for the week ending September 25. Volumes peaked at 58,714 bpd in the week ending May 23, 2014, and August 15, 2014. They reached a high this year of 39,143 bpd on April 3.

McKenzie County

During July, the breakeven cost was \$26/bbl and loadings were 115,080 bbls, while during August, breakeven costs were \$27/bbl and loadings were 158,700 bbls. In McKenzie County, Genscape monitors Musket’s 70,000 bpd Dore terminal, where average weekly volumes have fallen since late December 2013, when they were more than 50,000 bpd. Volumes breached that mark again in the week ending July 18, 2014, before falling considerably. In the week ending September 25, volumes were 6,171 bpd.

Mountrail County

During July, the breakeven cost was \$41/bbl and loadings were about 1.64mn bbls, while during August, breakeven costs were \$43/bbl and volumes were 1.13mn bbls. In Mountrail County, Genscape monitors Plains All American’s 65,000 bpd Van Hook facility, Dakota Plains’ 80,000 bpd New Town terminal and EOG Resources’ 75,000 bpd Stanley terminal.

In contrast to many other terminals in North Dakota, volumes at the Van Hook facility have rebounded this year, after falling on average in 2014. In December 2013, volumes were on average 17,027 bpd, roughly flat to where they were for the week ending September 25 at 16,663 bpd. Volumes jumped to over 25,000 bpd in the week ending July 31 after falling to near 5,000 bpd earlier in the year. In 2014, weekly average volumes at Van Hook peaked at 26,421 bpd during the week ending July 31.

At Stanley, volumes have declined greatly since Genscape began monitoring the facility. Since the week ending July 10, volumes have been at zero bpd for the terminal, compared with nearly 80,000 bpd on average in late December 2013. Volumes peaked at 91,594 bpd in the week ending August 22, 2014, before beginning a decline. Volumes at EOG’s Stroud, OK, terminal, where the crude from Stanley is delivered, also dropped to zero bpd.

At the New Town terminal, volumes have remained steady, but dropped from a peak earlier this year. Loading volumes there averaged 28,800 bpd in the week ending Sept. 25, up from nearly 20,000 bpd in late December 2013. Weekly volumes peaked at more than 70,000 bpd in the week ending February 13, and hit that level again in the week ending May 15.

Stark County

During July, the breakeven cost was \$38/bbl and loadings were about 1.068mn bbls, while during August, breakeven costs were \$41/bbl and volumes were 769,180 bbls. In Stark County, Genscape monitors BOE Midstream’s 200,000 bpd Bakken Oil Express facility. Volumes there dipped earlier this year, but have recovered to as high as a weekly average of 64,183 bpd in the week ending August 28. Volumes for the week ending September 25 were 44,434 bpd, after averaging zero bpd during several weeks in 2015. In late December 2013, weekly average volumes were nearly 70,000 bpd, and weekly average volumes peaked in the week ending March 7, 2014, at 83,113 bpd.

Williams County

During July, the breakeven cost was \$34/bbl and loadings were 5.48mn bbls, while during August, breakeven costs were \$38/bbl and loading volumes were 4.485mn bbls. In Williams County, Genscape monitors Savage’s 175,000 bpd Trenton terminal, Hess’ 140,000 bpd Tioga

terminal and Crestwood's 160,000 bpd COLT Terminal in Epping. Volumes at Savage Terminal have remained fairly steady since late December 2013, when they were about 112,000 bpd. In the week ending Sept. 18, volumes were 89,856 bpd. Volumes peaked in the week ending April 4, 2014, at 122,126 bpd and hit a weekly average low of 35,620 bpd in the week ending April 11, 2014. Since, volumes have gradually moved higher.

At the COLT terminal, average loading volumes have remained healthy, and 117,669 bpd loaded on average for the week ending September 25. In late December 2013, volumes were on average near 100,000 bpd. In the week ending, January 2, average loading volumes were 122,126 bpd.

At Hess' Tioga terminal, average loading volumes were 49,680 bpd for the week ending September 25, close to where they were in late December 2013 at 42,881 bpd. Average volumes were 65,760 bpd in the week ending May 1.

North Dakota Loading Facilities Volume Changes (BPD)				
Loading Facility		Q1	Q2	Q3
BakkenLink - Fryburg	2014	44,677	50,989	55,837
	2015	49,499	50,015	50,706
Crestwood - Epping COLT	2014	99,274	114,447	121,899
	2015	120,905	124,701	108,076
DTS - New Town	2014	23,449	22,964	28,899
	2015	46,277	37,907	32,807
EOG - Stanley	2014	76,063	70,499	71,878
	2015	43,608	18,078	766
GLP - Stampede	2014	35,865	32,174	31,848
	2015	24,988	23,432	18,380
Lario - Dickinson	2014	41,582	34,226	43,305
	2015	20,664	19,113	37,856
Savage - Trenton	2014	83,824	87,051	77,521
	2015	79,310	85,449	85,307

CONCLUSION

Narrowing price spreads in a low-cost crude environment, regulatory issues and lower North Dakota Bakken Shale production have slowed crude-by-rail movements from the state, but barrels will continue to move on a contract basis to the East, Gulf, and West coasts.

Though crude imports have increased to the East Coast, refiners there will continue to source unit trains from North Dakota in times of price incentives. On the West Coast, many unloading facility developers remain committed to constructing capacity despite continued regulatory and permitting issues and now some challenges with price spreads.

North Dakota well breakeven prices appear to be correlated to loading volumes, with the lower the breakeven cost, the more crude being railed, and some North Dakota loading terminals appear to be thriving even in the current pricing environment.

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