

# WTI: what's in a name?

Not all WTI crude oil is created equal: in reality, the term can refer to assorted crude grades of varying value. John-Laurent Tronche unravels the differences and explains why they matter

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Suppose you are a refiner somewhere in Asia, interested in diversifying your crude slate, and you have heard talk about booming West Texas oil production and exports out of the US Gulf Coast to the tune of a VLCC or more per day.

So you decide to buy some WTI, but which?

There is WTI at Midland, at Cushing, Cactus, Corpus Christi, Magellan East Houston or MEH, Bridgetex and Longhorn. There are related terms like Midland Sweet and Domestic Sweet. There are price differences between many of these things, too.

That is a problem with no obvious near-term solution. So let's try to demystify what is meant by these terms.

West Texas Intermediate is the flagship US grade of oil produced in the Permian Basins of West Texas and transported by pipe, rail and truck to refiners

near and far (like India far). Near the wellhead, it is called WTI Midland or Midland Sweet. The value of WTI at Cushing, Oklahoma, is the most commonly accepted benchmark for sales in the Americas of varying types of crude oil produced onshore and offshore in the US. It is called "Cash WTI."

WTI at Cushing also forms the backbone of the de facto North American crude oil futures contract, CME Group's NYMEX WTI Light Sweet Crude Oil, which for simplicity's sake we'll call NYMEX Crude from now on. Launched in March 1983, historically, it was often colloquially referred to in the market as "NYMEX WTI," even though WTI was one of many grades that could be delivered at Cushing against the contract, which caused uncertainty.

"Confusion over what is sold has led to problems, Merc officials say," an Associated Press article from August 1990 reads. "Some buyers who thought



they were getting WTI have discovered they were getting a different grade.” That led the NYMEX at the time to tell the market it should refer to the contract as light sweet crude instead of WTI, though the three-letter acronym persists to this day.

CME says NYMEX Crude represents light sweet crude oil meeting a series of specifications including 37–42 API, less than 0.42% sulfur and other parameters. This includes WTI-type light sweet crude streams, as well as other blends referred to as Domestic Sweet, or DSW, that meet those specs. To simplify: NYMEX Crude is WTI that meets NYMEX parameters, as well as other crudes, which may be blends, that meet NYMEX parameters. Blended crudes are not bad, but the possibility that a buyer may get one is an uncertainty, and uncertainty leads to lower bids for the unknown and higher bids for the known.

The difference between physical, NYMEX-spec WTI and the NYMEX contract is what is called the exchange-for-physical, or EFP, which typically ranges from flat, or 0 cents/b, to roughly 5 cents/b. In other words, physical WTI that meets NYMEX specs is often worth a few cents more than plain-old NYMEX-suitable crude.

Finally, there is a market for pure WTI at Cushing. Recently, a source indicated the going rate for pure, unblended WTI direct from the Permian to Cushing was 90 cents/b more than NYMEX-suitable WTI. An absolute guarantee of quality is nearly a full dollar over what, in theory, should be the same grade, if you figure that all WTI is Midland WTI.

Why? Refiner concerns about the significant amount of blending that goes on at Cushing — where crudes from all around North America comingle —

What's that mean?	It's WTI...
Midland	...near the wellhead at the Permian pricing point of Midland, Texas.
Cushing	...at the NYMEX WTI Light Sweet Crude Oil futures contract pricing point of Cushing, Oklahoma.
MEH	...at Magellan's East Houston terminal, the pricing point for WTI MEH and ICE's Permian WTI Futures contract.
Corpus Christi	...at Corpus Christi, Texas, about 215 miles southwest of Houston.
Cactus	...shipped to the US Gulf Coast, specifically Corpus Christi, on the Plains All American Pipeline-operated Cactus pipeline.
Longhorn	...shipped to the US Gulf Coast, specifically Houston, on the Magellan-operated Longhorn pipeline.
Bridgetex	...shipped to the US Gulf Coast, specifically Houston, on the Plains- and Magellan-operated Longhorn pipeline.

has led to a significant price difference between DSW (NYMEX crude that is not WTI), NYMEX-suitable WTI, and virgin WTI from Midland.

To ease this confusion, CME Group in mid-December said it would amend Chapter 200 — essentially, the rulebook for NYMEX Crude — by adding additional quality requirements for physical crude deliveries against the January 2019 contract month and beyond. Its move followed an identical move announced one day earlier by Enterprise Products Partners, one of two midstream outfits to which pipeline access is a must for barrels to be included in NYMEX Crude delivery. The second, Enbridge, has not publicly expanded its definition of WTI, although S&P Global Platts understands the company has told customers it is following suit. Enbridge did not respond to requests for comment.

“CME Group is amending the contract specifications to include five additional quality test parameters which will provide assurance that the quality and integrity of West Texas Intermediate (WTI) is maintained,” the exchange said at the time.

The changes have been applauded by refiners — largely through their work via the Crude Oil Quality Association, which recommended the Enterprise- and CME-adopted changes — but it remains to be seen whether this results in a narrower spread between “pure” WTI Midland at Cushing and WTI at Cushing that's suitable for NYMEX delivery. In other words, as a result of the changes, does the perception of WTI at Cushing — or Domestic Sweet — improve?

### The problem with DSW

Domestic Sweet has well-publicized quality issues. A June 2015 presentation from BP to the COQA said asphaltene content had risen in DSW tests done at Cushing, and at its Whiting, Indiana, refinery. Asphaltenes are known to cause clogging in many parts of the up-, mid-, and downstream oil processes. From 2000–2011, total asphaltenes were 0.2%–0.5%. Since 2013, they have been in the range of 0.7%–1%. A high range is 0.2%–0.4%.

The BP presentation said “some of the asphaltene precipitation could be caused by blending small amounts of sour crudes (i.e. West Texas Sour or Canadian) in to domestic sweet.”

It has been suggested for years that blenders are mixing WTI look-alikes by blending heavy sour and ultra-light grades, such as condensate, into so-called dumbbell crude. For the blender or trader, the mix is profitable. But a dumbbell crude produces very little middle distillates and excessive light and heavy end products — heavy on both ends, hence the term “dumbbell.” Dumbbell crudes can also cause operating issues for refiners.

“The market seems to have a perception that a barrel that comes out of Cushing is called DSW and is unpredictable in quality,” a US crude trader told S&P Global Platts. “Something that comes out of Cushing has probably been blended to spec using Canadian crudes and some condensate.”

In reality, it is almost impossible to know the source of the barrel delivered into Cushing. "It would take an army of forensic auditors with petroleum engineering backgrounds to track all these disparate crudes back to their source counties via the various pipelines, producers, refiners, et cetera," said Bob Williams, director of content at S&P Global Platts RigData. "And they would be slammed by NDAs."

NYMEX Chapter 200 forbids blending of crudes to meet NYMEX specifications. "No blends of foreign crude oil streams or foreign and domestic crude oil streams shall be deliverable," the rulebook says. Economics and infrastructure mean the five foreign crudes allowed under NYMEX crude specifications are highly unlikely to find their way to Cushing. Rather, the more likely newcomer is a Canadian heavy sour such as Western Canadian Select, which is typically 20.9 API and 3.7% sulfur, according to crudemonitor.ca. Roughly 800,000 b/d to 1 million b/d of Canadian crude is estimated to arrive at Cushing via the Keystone, Spearhead, Flanagan South and Pony Express lines. It is often heavily discounted to WTI, so there can be a strong incentive to splash a little with condensate and make a few dollars.

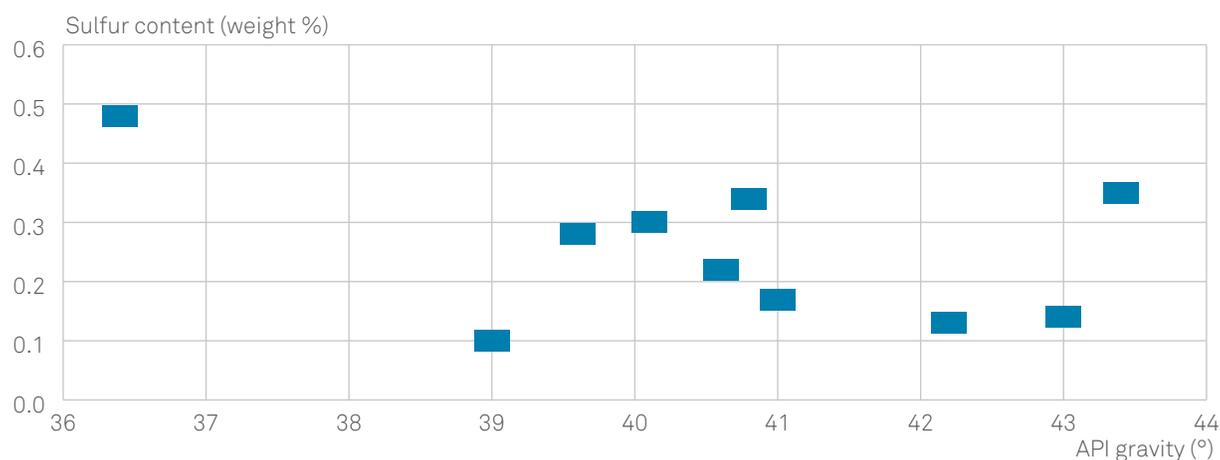
## COQA's sampling program

The COQA has for years studied the issue and launched several years ago a website to publicize quality data. As of publication, the crudemonitor.us website included 111 quality samples of WTI and 212 samples of DSW at Cushing dating as far back as 2012. An analysis of these more than 350 samples shows the two crudes are similar and largely in compliance with existing and forthcoming NYMEX specifications, with two exceptions.

WTI and DSW are off-spec for sulfur roughly equal amounts, about 3% of the time. There are occasional off-spec issues for API and micro-carbon residue. One glaring issue is the presence of vanadium. WTI was off-spec for the metal in one-third of samples, compared with 26% for DSW.

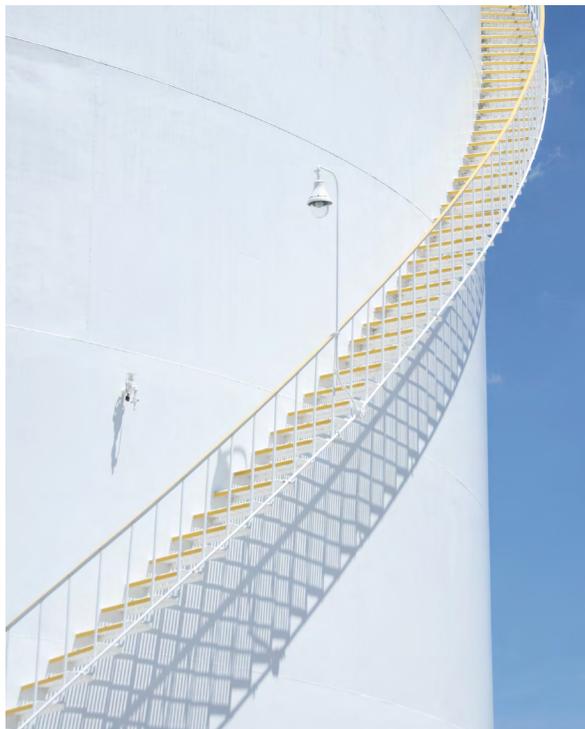
Another issue is high-temperature simulated distillation, used to measure the amount of light ends and bottom-of-the-barrel products, which may suggest blending. For DSW, 22% of samples that had HTSD data showed up as off-spec for one of the three parameters, compared with 33% of the 51 WTI samples that had HTSD data.

## API, sulfur variance in WTI at points other than Cushing



Source: Assays provided to S&P Global Platts

**39%**  
of WTI samples  
were off-spec  
compared to  
**34%**  
for DSW



Overall, however, 43 of 111 WTI samples (39%) were off-spec for at least one category. This compares with 73 of 212 for DSW (34%).

This suggests a combination of several situations: WTI is just as likely to be off-spec at Cushing as other NYMEX-deliverable crudes or crude blends, off-spec barrels at Cushing are not as widespread as some would suggest, or selective reporting to the COQA has resulted in a situation where off-spec DSW samples are withheld, resulting in a similar look for DSW compared with WTI.

### Where to from here?

Not everyone takes issue with DSW. ExxonMobil is said to regularly export DSW to its European refineries. Venezuela's PDVSA has issued tenders seeking it for the company's Isla refinery located on the island of

Curacao. Petroperu, Japan's Cosmo Energy and Swiss trading company Gunvor have also taken DSW in the past, while Uruguay's ANCAP has at least received offers for it. And some US Gulf Coast refineries, such as Motiva's massive Port Arthur facility, are specifically geared to take even the ugliest crudes.

"The crude itself is not too bad," a Canadian crude trader told S&P Global Platts. "The problem becomes the consistency of the quality, due to the various blending programs; refiners don't necessarily know what they are getting, which is a negative."

For now though, the overwhelming consensus about US crude quality has been that it varies dramatically, and that blends are bad. By and large, exporters can forget about selling DSW abroad for the moment.

If we've learned anything in the more than two years since US crude export restrictions were lifted, it's that globally, refiners are well aware of the sophisticated blending operations in the US and are wary of anything that hints of a blend. That's why buyers are asking for "WTI Midland" instead of just "WTI" — to be sure they're not getting WTI via Cushing.

But judging by the continuing price spreads between DSW, NYMEX WTI and unblended WTI Midland, all at Cushing, it appears US refiners are just as picky as those outside of the US.

Perhaps there is a need to ditch the acronym WTI, which has existed since at least the 1950s — S&P Global Platts first used it in 1952 — for something more descriptive? There is already talk of doing so, further categorizing WTI as WTI Midland, WTI Midland Light, and WTI Midland Super Light, with clear definitions between them.

That would go a long way towards improving the perception of US crudes outside the US. Greater confidence in the quality of the product being offered would likely also lead to higher bids as well. Improved perception, more confidence, higher bids, and happier counterparties... what's not to like? ■