

SUBMISSION COVER SHEET

IMPORTANT: Check box if Confidential Treatment is requested

Registered Entity Identifier Code (optional): 23-064 (2 of 3)

Organization: New York Mercantile Exchange, Inc. ("NYMEX")

Filing as a: DCM SEF DCO SDR

Please note - only ONE choice allowed.

Filing Date (mm/dd/yy): 03/01/23 Filing Description: Initial Listing of Three (3) Crude Oil Futures Contracts

SPECIFY FILING TYPE

Please note only ONE choice allowed per Submission.

Organization Rules and Rule Amendments

- Certification § 40.6(a)
- Approval § 40.5(a)
- Notification § 40.6(d)
- Advance Notice of SIDCO Rule Change § 40.10(a)
- SIDCO Emergency Rule Change § 40.10(h)

Rule Numbers:

New Product

Please note only ONE product per Submission.

- Certification § 40.2(a)
- Certification Security Futures § 41.23(a)
- Certification Swap Class § 40.2(d)
- Approval § 40.3(a)
- Approval Security Futures § 41.23(b)
- Novel Derivative Product Notification § 40.12(a)
- Swap Submission § 39.5

Product Terms and Conditions (product related Rules and Rule Amendments)

- Certification § 40.6(a)
- Certification Made Available to Trade Determination § 40.6(a)
- Certification Security Futures § 41.24(a)
- Delisting (No Open Interest) § 40.6(a)
- Approval § 40.5(a)
- Approval Made Available to Trade Determination § 40.5(a)
- Approval Security Futures § 41.24(c)
- Approval Amendments to enumerated agricultural products § 40.4(a), § 40.5(a)
- "Non-Material Agricultural Rule Change" § 40.4(b)(5)
- Notification § 40.6(d)

Official Name(s) of Product(s) Affected:

Rule Numbers:



Christopher Bowen
 Managing Director and Chief Regulatory Counsel
 Legal Department

March 1, 2023

VIA ELECTRONIC PORTAL

Mr. Christopher J. Kirkpatrick
 Office of the Secretariat
 Commodity Futures Trading Commission
 Three Lafayette Centre
 1155 21st Street, N.W.
 Washington, DC 20581

**Re: CFTC Regulation 40.2(a) Certification. Initial Listing of Three (3) Crude Oil Futures Contracts.
 NYMEX Submission No. 23-064 (2 of 3)**

Dear Mr. Kirkpatrick:

New York Mercantile Exchange, Inc. (“NYMEX” or “Exchange”) is certifying to the Commodity Futures Trading Commission (“CFTC” or “Commission”) the initial listing of three (3) crude oil futures contracts as noted in the table below (the “Contracts”) for trading on the CME Globex electronic trading platform (“CME Globex”) and for submission for clearing via CME ClearPort, effective Sunday, March 19, 2023, for trade date Monday, March 20, 2023 as described in the table below.

Contract Title	WTI-Brent Trade Month Financial Futures	WTI Houston (Argus) vs. Brent Cross-Month Futures	WTI Midland (Argus) vs. Brent Cross-Month Futures
Commodity Code	TBK	HBX	WBX
Rulebook Chapter	1231	1232	1233
Settlement Type	Financial		
Contract Size	1,000 barrels		
Minimum Price Fluctuation	\$.01 per barrel		
Value per tick	\$10.00		
Listing Schedule	Monthly contracts listed for the current year and the next 3 calendar years. List monthly contracts for a new calendar following the termination of trading in the December contract of the current year.		
First Listed Month	April 2023		
Block Trade Minimum Threshold	5 contracts – subject to a minimum 15-minute reporting window		
Termination of Trading	Trading terminates on the 25th calendar day of the month prior to the contract month. If the 25th calendar day is not a Business Day, trading terminates on the business day prior to the 25th calendar day.		
CME Globex Matching Algorithm	First-In, First-Out (FIFO)		
Trading and Clearing Hours	CME Globex Pre-Open: Sunday 4:00 p.m. - 5:00 p.m. Central Time/CT Monday - Thursday 4:45 p.m. - 5:00 p.m. CT		

	<p>CME Globex: Sunday - Friday 5:00 p.m. CT with a daily maintenance period from 4:00 p.m. - 5:00 p.m. CT</p> <p>CME ClearPort: Sunday - Friday 5:00 p.m. - 4:00 p.m. CT with no reporting Monday - Thursday from 4:00 p.m. - 5:00 p.m. CT</p>
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The Exchange reviewed the designated contracts market core principles (“Core Principles”) as set forth in the Commodity Exchange Act (“CEA” or “Act”) and identified that the Contracts may have some bearing on the following Core Principles:

- **Compliance with Rules:** Trading in the Contracts will be subject to the rules in Rulebook Chapter 4 which includes prohibitions against fraudulent, noncompetitive, unfair and abusive practices. Additionally, trading in the Contracts will also be subject to the full panoply of trade practice rules, the majority of which are contained in Chapter 5 and Chapter 8 of the Rulebook. As with all products listed for trading on one of CME Group’s designated contract markets, activity in the new product will be subject to extensive monitoring and surveillance by CME Group’s Market Regulation Department. The Market Regulation Department has the authority to exercise its investigatory and enforcement power where potential rule violations are identified.
- **Contract Not Readily Subject to Manipulation:** The Contracts are not readily susceptible to manipulation and are based on the liquidity and robustness of the underlying cash market.
- **Prevention of Market Disruption:** Trading in the Contracts will be subject to the Rules of NYMEX which include prohibitions on manipulation, price distortion and disruptions of the delivery or cash-settlement process. As with all products listed for trading on one of CME Group’s designated contract markets, activity in the new products will be subject to extensive monitoring and surveillance by CME Group’s Market Regulation Department.
- **Position Limitations or Accountability:** The speculative position limits for the Contracts as demonstrated in this submission are consistent with the Commission’s guidance.
- **Availability of General Information:** The Exchange will publish on its website information regarding contract specifications, terms and conditions, as well as daily trading volume, open interest and price information for the Contracts.
- **Daily Publication of Trading Information:** The Exchange will publish information contract trading volumes, open interest levels, and price information daily on its website and through quote vendors for the Contracts.
- **Execution of Transactions:** The Contracts will be listed for trading on the CME Globex electronic trading and for clearing through CME ClearPort. The CME Globex trading venue provides for competitive and open execution of transactions. CME Globex affords the benefits of reliability and global connectivity.
- **Trade Information:** All required trade information for the Contracts will be included in the audit trail and is sufficient for the Market Regulation Department to monitor for market abuse.
- **Financial Integrity of Contract:** The Contracts will be cleared by the CME Clearing House which is a registered derivatives clearing organization with the Commission and is subject to all Commission regulations related thereto.
- **Protection of Market Participants:** NYMEX Rulebook Chapters 4 and 5 contain multiple prohibitions precluding intermediaries from disadvantaging their customers. These rules apply to trading on all of the Exchange’s competitive trading venues and will be applicable to transactions in these Contracts.

- **Disciplinary Procedures:** Chapter 4 of the Rulebook contains provisions that allow the Exchange to discipline, suspend or expel members or market participants that violate the rules. Trading in these Contracts will be subject to Chapter 4, and the Market Regulation Department has the authority to exercise its enforcement power in the event rule violations in these Contracts are identified.
- **Dispute Resolution:** Disputes with respect to trading in the Contracts will be subject to the arbitration provisions set forth in Chapter 6 of the Rulebook. The rules in Chapter 6 allow all nonmembers to submit a claim for financial losses resulting from transactions on the Exchange to arbitration. A member named as a respondent in a claim submitted by a nonmember is required to participate in the arbitration pursuant to the rules in Chapter 6. Additionally, the Exchange requires that members resolve all disputes concerning transactions on the Exchange via arbitration.

Pursuant to Section 5c(c) of the Act and CFTC Regulation 40.2(a), the Exchange hereby certifies that the Contracts comply with the Act, including regulations under the Act. There were no substantive opposing views to the proposal.

The Exchange certifies that this submission has been concurrently posted on the CME Group website at <http://www.cmegroup.com/market-regulation/rule-filings.html>.

Should you have any questions concerning the above, please contact the undersigned at (212) 299-2200 or via e-mail at CMEGSubmissionInquiry@cmegroup.com.

Sincerely,

/s/ Christopher Bowen
 Managing Director and Chief Regulatory Counsel

Attachments: Exhibit A: NYMEX Rulebook Chapters
 Exhibit B: Position Limits, Position Accountability and Reportable Level Table in Chapter 5 of the NYMEX Rulebook (attached under separate cover)
 Exhibit C: Exchange Fees
 Exhibit D: NYMEX Rule 588.H. – (“Globex Non-Reviewable Trading Ranges”) Table
 Exhibit E: Cash Market Overview and Analysis of Deliverable Supply

Exhibit A
NYMEX Rulebook

Chapter 1231
WTI-Brent Trade Month Financial Futures

1231100. SCOPE OF CHAPTER

The provisions of these rules shall apply to all futures contracts bought or sold on the Exchange for cash settlement based on the Floating Price. The procedures for trading, clearing and cash settlement of this contract, and any other matters not specifically covered herein shall be governed by the general rules of the Exchange.

1231101. CONTRACT SPECIFICATIONS

The Floating Price for each contract month is equal to the arithmetic average of the NYMEX Light Sweet Crude Oil (CL) first nearby contract settlement price minus the arithmetic average of the ICE Brent Futures settlement price for the contract month that is one month following the first nearby Light Sweet Crude Oil (CL) contract month, over the trade month period. The Trade month period begins with the first business day after the 25th calendar day two months prior to the contract month through the last business day that falls on or before the 25th calendar day of the month prior to the contract month. If the 25th calendar day is a weekend or U.S. holiday, the Trade month period shall end on the first business day prior to the 25th calendar day.

1231102. TRADING SPECIFICATIONS

The number of months open for trading at a given time shall be determined by the Exchange.

1231102.A. Trading Schedule

The hours of trading for this contract shall be determined by the Exchange.

1231102.B. Trading Units

The contract quantity shall be 1,000 U.S. barrels. Each contract shall be valued as the contract quantity (1,000) multiplied by the settlement price.

1231102.C. Price Increments

Prices shall be quoted in U.S. dollars and cents per barrel. The minimum price fluctuation shall be \$0.01 per barrel.

1231102.D. Position Limits, Exemptions, Position Accountability and Reportable Levels

The applicable position limits and/or accountability levels, in addition to the reportable levels, are set forth in the Position Limit, Position Accountability and Reportable Level Table in the Interpretations & Special Notices Section of Chapter 5.

A Person seeking an exemption from position limits for bona fide commercial purposes shall apply to the Market Regulation Department on forms provided by the Exchange, and the Market Regulation Department may grant qualified exemptions in its sole discretion. Refer to Rule 559 for requirements concerning the aggregation of positions and allowable exemptions from the specified position limits.

1231102.E. Termination of Trading

Trading shall cease at the close of trading on the last business day that falls on or before the 25th calendar day of the month prior to the contract month. If the 25th calendar day is a weekend or U.S. holiday, trading shall cease on the first business day prior to the 25th calendar day.

1231103. FINAL SETTLEMENT

Final settlement under the contract shall be by cash settlement. Final settlement, following termination of trading for a contract month, will be based on the Floating Price. The final settlement price will be the Floating Price calculated for each contract month.

Chapter 1232 WTI Houston (Argus) vs. Brent Cross-Month Futures

1232100. SCOPE OF CHAPTER

The provisions of these rules shall apply to all futures contracts bought or sold on the Exchange for cash settlement based on the Floating Price. The procedures for trading, clearing and cash settlement of this contract, and any other matters not specifically covered herein shall be governed by the general rules of the Exchange.

1232101. CONTRACT SPECIFICATIONS

The Floating Price for each contract month is equal to the arithmetic average of the WTI Houston (1st month) weighted average index price from Argus Media, minus the arithmetic average of the ICE Brent Futures price for the Brent contract month that is two months following the contract month, over the trade month period. The trade month period begins with the first business day after the 25th calendar day two months prior to the contract month through the last business day that falls on or before the 25th calendar day of the month prior to the contract month. If the 25th calendar day is a weekend or U.S. holiday, the trade month period shall end on the first business day prior to the 25th calendar day.

1232102. TRADING SPECIFICATIONS

The number of months open for trading at a given time shall be determined by the Exchange.

1232102.A. Trading Schedule

The hours of trading for this contract shall be determined by the Exchange.

1232102.B. Trading Units

The contract quantity shall be 1,000 U.S. barrels. Each contract shall be valued as the contract quantity (1,000) multiplied by the settlement price.

1232102.C. Price Increments

Prices shall be quoted in U.S. dollars and cents per barrel. The minimum price fluctuation shall be \$0.01 per barrel.

1232102.D. Position Limits, Exemptions, Position Accountability and Reportable Levels

The applicable position limits and/or accountability levels, in addition to the reportable levels, are set forth in the Position Limit, Position Accountability and Reportable Level Table in the Interpretations & Special Notices Section of Chapter 5.

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Refer to Rule 559 for requirements concerning the aggregation of positions and allowable exemptions from the specified position limits.

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Trading shall cease at the close of trading on the last business day that falls on or before the 25th calendar day of the month prior to the contract month. If the 25th calendar day is a weekend or U.S. holiday, trading shall cease on the first business day prior to the 25th calendar day.

1232103. FINAL SETTLEMENT

Final settlement under the contract shall be by cash settlement. Final settlement, following termination of trading for a contract month, will be based on the Floating Price. The final settlement price will be the Floating Price calculated for each contract month.

1232104. DISCLAIMER

See [NYMEX/COMEX Chapter iv. \("DISCLAIMERS"\)](#) incorporated herein by reference.

Chapter 1233
WTI Midland (Argus) vs. Brent Cross-Month Futures
Average Price Option

1233100. SCOPE OF CHAPTER

The provisions of these rules shall apply to all futures contracts bought or sold on the Exchange for cash settlement based on the Floating Price. The procedures for trading, clearing and cash settlement of this contract, and any other matters not specifically covered herein shall be governed by the general rules of the Exchange.

1233101. CONTRACT SPECIFICATIONS

The Floating Price for each contract month is equal to the arithmetic average of the WTI Midland (1st month) weighted average index price from Argus Media, minus the arithmetic average of the ICE Brent Futures price for the Brent contract month two months following the contract month, over the trade month period. The trade month period begins with the first business day after the 25th calendar day two months prior to the contract month through the last business day that falls on or before the 25th calendar day of the month prior to the contract month. If the 25th calendar day is a weekend or U.S. holiday, the trade month period shall end on the first business day prior to the 25th calendar day.

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The hours of trading for this contract shall be determined by the Exchange.

1233102.B. Trading Units

The contract quantity shall be 1,000 U.S. barrels. Each contract shall be valued as the contract quantity (1,000) multiplied by the settlement price.

1233102.C. Price Increments

Prices shall be quoted in U.S. dollars and cents per barrel. The minimum price fluctuation shall be \$0.01 per barrel.

1233102.D. Position Limits, Exemptions, Position Accountability and Reportable Levels

The applicable position limits and/or accountability levels, in addition to the reportable levels, are set forth in the Position Limit, Position Accountability and Reportable Level Table in the Interpretations & Special Notices Section of Chapter 5.

A Person seeking an exemption from position limits for bona fide commercial purposes shall apply to the Market Regulation Department on forms provided by the Exchange, and the Market Regulation Department may grant qualified exemptions in its sole discretion.

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1233103. FINAL SETTLEMENT

Final settlement under the contract shall be by cash settlement. Final settlement, following termination of trading for a contract month, will be based on the Floating Price. The final settlement price will be the Floating Price calculated for each contract month.

1233104. DISCLAIMER

See [NYMEX/COMEX Chapter iv. \("DISCLAIMERS"\)](#) incorporated herein by reference.

Exhibit B
NYMEX Rulebook
Chapter 5
(“Trading Qualifications and Practices”)
Position Limits, Position Accountability and Reportable Level Table
(attached under separate cover)

Exhibit C
Exchange Fees

	Member	Non-Member	International Incentive Programs (IIP/IVIP)
CME Globex	\$0.85	\$1.35	\$1.35
EFP	\$0.85	\$1.35	
Block	\$0.85	\$1.35	
EFR/EOO	\$0.85	\$1.35	

Processing Fees	Member	Non-Member
Cash Settlement	\$0.50	\$0.50
Facilitation Fee	\$0.60	
Give-Up Surcharge	\$0.05	
Position Adjustment/Position Transfer	\$0.10	

Exhibit D
NYMEX Rulebook
Chapter 5
(“Trading Qualifications and Practices”)
Rule 588.H. (“Globex Non-Reviewable Trading Ranges”) Table

Instrument	Globex Symbol	Outrights			Spreads	
		Globex Non-Reviewable Ranges (NRR)	NRR: Globex Format	NRR: Minimum Ticks	NRR: Globex Format	NRR: Minimum Ticks
<u>WTI-Brent Trade Month Financial Futures</u>	<u>TBK</u>	<u>\$1.00 per barrel</u>	<u>100</u>	<u>100</u>	<u>N/A</u>	
<u>WTI Houston (Argus) vs. Brent Cross-Month Futures</u>	<u>HBX</u>	<u>\$1.00 per barrel</u>	<u>100</u>	<u>100</u>	<u>N/A</u>	
<u>WTI Midland (Argus) vs. Brent Cross-Month Futures</u>	<u>WBX</u>	<u>\$1.00 per barrel</u>	<u>100</u>	<u>100</u>	<u>N/A</u>	

Exhibit E

Cash Market Overview and Analysis of Deliverable Supply

New York Mercantile Exchange, Inc. (“NYMEX” or “Exchange”) is proposing to list three new financially-settled crude oil contracts: WTI-Brent Trade Month Financial Futures (Exchange Code: TBK), WTI Houston (Argus) vs. Brent Cross-Month Futures (Exchange Code: HBX), and WTI Midland (Argus) vs. Brent Cross-Month Futures (Exchange Code: WBX) (the “Contracts”) for trading on the CME Globex electronic trading platform (“CME Globex”) and for submission for clearing via CME ClearPort.

The Exchange conducted a review of the underlying cash markets and deliverable supply in the WTI Cushing, Brent, WTI Midland and WTI Houston areas.

WTI Houston Cash Market Overview

There is an active physical crude oil trading center based in Houston, Texas, which is a major hub for storage facilities and pipelines with direct connectivity to the Cushing, Midland, and the larger U.S. Gulf Coast markets.

The WTI Houston price, published daily in the Argus Americas Crude report, is for WTI-quality oil traded at the Magellan East Houston (“MEH”) terminal. The quality of WTI crude oil at MEH is set by Magellan¹ with

¹ <https://www.magellanlp.com/WhatWeDo/meh-wtioprogram.aspx/> <https://www.magellanlp.com/WhatWeDo/HistoricalQuality.aspx>

a range of 41-43.5°API, and reported in monthly aggregate. Argus publishes the WTI Midland price assessment as a differential to the WTI Cushing price. The Argus methodology for the assessment of the WTI Houston crude oil price is the volume weighted-average price of transactions done during the entire trading day and is available at the following link: <https://www.argusmedia.com/-/media/Files/methodology/argus-americas-crude.ashx>

The Magellan East Houston terminal² is directly connected to the Permian Basin via the Longhorn and BridgeTex pipelines, and indirectly via Magellan's Houston distribution system which provides connectivity to other third party pipelines from the Permian Basin and South Texas to the Houston area. The terminal has 9 million barrels of crude oil storage capacity, and is a key physical trading location for producers, refiners, and other commercial participants.

Crude Oil production from the Permian and Eagle Ford Basins

The Exchange considered the production of crude oil in the local onshore basins of Permian and Eagle Ford. The EIA reports production by basin in the Drilling Productivity Report ("DPR"). After declining during 2020 and 2021, production has begun increasing again. Over the three-year period between November 2019 and October 2022, the DPR reports average regional production of 5,865,783 barrels per day. The volume of crude oil produced in these basins that meet the 41-43.5°API is not reported. Using information from industry sources, the Exchange conservatively estimate that 70% of crude oil produced in these basins, or 4,106,048 is of a quality similar to WTI Midland.

² <https://www.sec.gov/ix?doc=/Archives/edgar/data/1126975/000112697522000070/mmp-20211231.htm>

Table 1. Crude Oil Production by Region - EIA Drilling Productivity Report³ (barrels/day)

	Permian	Eagle Ford	Total
3 Yr Avg	4,729,948	1,135,835	5,865,783
Oct-22	5,413,754	1,207,253	6,621,007
Sep-22	5,351,572	1,184,082	6,535,654
Aug-22	5,277,294	1,161,836	6,439,129
Jul-22	5,189,919	1,138,429	6,328,348
Jun-22	5,104,026	1,114,885	6,218,911
May-22	5,085,171	1,091,986	6,177,156
Apr-22	5,129,596	1,070,321	6,199,917
Mar-22	5,044,265	1,065,128	6,109,394
Feb-22	4,822,223	1,042,229	5,864,453
Jan-22	4,796,132	1,056,991	5,853,123
Dec-21	4,956,372	1,072,958	6,029,330
Nov-21	4,964,667	1,080,700	6,045,367
Oct-21	4,940,329	1,073,433	6,013,762
Sep-21	4,904,169	1,119,485	6,023,654
Aug-21	4,841,043	1,108,293	5,949,336
Jul-21	4,728,314	1,101,349	5,829,664
Jun-21	4,672,098	1,081,950	5,754,048
May-21	4,650,677	1,087,035	5,737,712
Apr-21	4,585,644	1,106,212	5,691,857
Mar-21	4,584,953	1,100,448	5,685,400
Feb-21	3,662,166	891,030	4,553,196
Jan-21	4,430,282	1,054,254	5,484,535
Dec-20	4,368,775	1,076,215	5,444,989
Nov-20	4,390,525	1,112,371	5,502,896
Oct-20	4,359,854	1,120,098	5,479,952
Sep-20	4,306,494	1,112,383	5,418,877
Aug-20	4,317,666	1,127,791	5,445,457
Jul-20	4,377,493	1,102,355	5,479,848
Jun-20	4,311,198	1,005,057	5,316,255
May-20	3,958,709	928,014	4,886,724
Apr-20	4,618,557	1,289,363	5,907,920
Mar-20	4,914,254	1,391,675	6,305,929
Feb-20	4,819,026	1,397,153	6,216,179
Jan-20	4,837,882	1,403,113	6,240,994
Dec-19	4,791,567	1,415,672	6,207,240
Nov-19	4,771,471	1,398,499	6,169,970

Crude Oil Pipeline Capacity to Houston

There is significant pipeline capacity delivering crude oil from production and storage hubs to the Houston area. Table 2 below reflects known pipelines capable of delivering WTI-quality crude oil to Houston from the Permian and Eagle Ford basins, with a total capacity of 3.77 million barrels per day.

³ <https://www.eia.gov/petroleum/drilling/archive/2022/11/xls/dpr-data.xlsx>

Table 2. Crude Oil Pipelines to Houston (Barrels/Day)

<u>Pipeline</u>	<u>Capacity</u>	<u>Source</u>	<u>Owner</u>
BridgeTex	400,000	Permian	Magellan
Longhorn	275,000	Permian	Magellan
Midland to Echo 1	620,000	Permian	Enterprise Products LLC
Midland to Echo 2	225,000	Permian	Enterprise Products LLC
Midland to Echo 3	450,000	Permian	Enterprise Products LLC
Wink to Webster	1,000,000	Permian	Exxon, Plains, Marathon, etc
Kinder Morgan Crude & Condensate	350,000	Eagle Ford/Permian	Kinder Morgan
South Texas Crude Oil Pipeline System	450,000	Eagle Ford/Permian	Enterprise
Total	3,770,000		

Crude Oil Storage

There is significant crude oil storage in the Greater Houston area. Table 3 below provides the monthly Padd 3 storage levels for the three-year time period of December 2019 through November 2022. Inventories averaged 250,065 thousand barrels and ranged from 219,791 to 300,547 thousand barrels over that time period. However, the EIA does not provide a breakdown by type of crude oil stored in the Houston area, and consequently, the Exchange will not utilize inventory levels in the deliverable supply estimate.

Table 3. PADD 3 Non-SPR Crude Oil Stocks⁴ (Thousand Barrels)

<u>3 Yr Avg</u>	<u>250,065</u>
Nov-22	228,621
Oct-22	244,225
Sep-22	240,170
Aug-22	234,849
Jul-22	233,903
Jun-22	234,664
May-22	231,494
Apr-22	234,392
Mar-22	227,905
Feb-22	224,951
Jan-22	221,524
Dec-21	225,194
Nov-21	238,016
Oct-21	247,876
Sep-21	228,340
Aug-21	226,373
Jul-21	242,322
Jun-21	243,762
May-21	260,902
Apr-21	273,171
Mar-21	294,692
Feb-21	277,613
Jan-21	258,001
Dec-20	258,874
Nov-20	271,206
Oct-20	261,645
Sep-20	270,669
Aug-20	272,814
Jul-20	288,668
Jun-20	300,547
May-20	285,822
Apr-20	278,219
Mar-20	251,419
Feb-20	241,789
Jan-20	227,913
Dec-19	219,791

Analysis of Deliverable Supply of WTI Houston

In its estimate of deliverable supply for the WTI Houston cash market, the Exchange has determined to focus on the pipeline capacity from the Permian Basin and Eagle Ford production areas in West and South Texas to Houston. The pipeline capacity from the Permian Basin and Eagle Ford production areas to Houston (as outlined in Table 2) is 3.77 million b/d, which is less than the total production in the Permian Basin and Eagle Ford regions and less than the portion of the production estimated to be of 41-43.5 API. Further, the Exchange will not utilize inventory levels in the deliverable supply estimate, as the EIA data does not provide a breakdown by type of crude oil to the Houston area. Thus, the pipeline capacity will be utilized to determine the deliverable supply.

⁴ As of 2/1/23: https://www.eia.gov/dnav/pet/pet_stoc_typ_c_r30_EPC0_mbb1_m.htm

The total pipeline capacity from the Permian Basin and Eagle Ford production areas to Houston (as outlined in Table 2) is 3.77 million b/d. The Exchange has determined to reduce this level for its estimation of deliverable supply to conservatively account for the pipeline utilization rates. To be conservative, the Exchange has assumed that the total pipeline capacity is not fully utilized, and consequently, the Exchange has applied a reduction of 30% to total in-bound pipeline capacity in its calculations. This utilization rate is consistent with estimates provided publicly by Magellan during various investor presentations⁵ and estimated by industry experts⁶. Therefore, the Exchange has determined the deliverable supply for WTI-type crude oil to Houston to be 2.639 million b/d (calculated as 3.77 million b/d for pipeline capacity * 70% utilization). This is equivalent to 79.2 million barrels per month, which is equivalent to 79,200 contracts per month.

The Exchange is not applying a reduction for long term contracts, given the liquid spot market, and the lack of restrictions applied to the resale of crude oil. Almost all first-sales of production are sold typically to middleman-firms or marketers who then resell the crude oil to other middleman-firms (or participants performing that function) or to end-users. The Houston market is downstream of term sales from producers. Thus, even if barrels were sold term by the producer, in the Houston markets those barrels are re-sold and re-delivered by either the purchaser from the producer or a subsequent purchaser/middleman from that original purchaser.

⁵ <https://www.magellanlp.com/Investors/-/media/B50A06DB805C4158B7A0DC44A413A035.ashx> (slide 48)

⁶ <https://www.reuters.com/business/energy/us-oil-pipeline-operators-gear-up-higher-shale-output-2022-05-11/#:~:text=Utilization%20of%20pipelines%20from%20the,was%20around%2070%25%20in%20April.>

WTI Midland Cash Market Overview

There is an active physical crude oil trading center based in Midland, Texas, which is the chief gathering hub for Permian Basin crude oil, for storage and/or pipeline distribution with direct connectivity to the Cushing and the U.S. Gulf Coast markets. Major crude oil pipelines originating in the Permian Basin have approximately 7.6 million barrels per day of takeaway capacity, as shown in Table 1. There is active trading in WTI type crude oil at Midland.

The WTI Midland price, published daily in the Argus Crude report, is for WTI-quality Permian Basin crude oil traded at terminals in Midland, Texas. According to regional pipeline specifications such as Energy Transfer's Permian Express Tariff⁷ the gravity of WTI Midland can be in a range of 38 to 45°API. In practice, the gravity of WTI Midland is estimated by Argus to be on average 42°API, and in the range of 40 to 44°API. Argus publishes the WTI Midland price assessment as a differential to the WTI Cushing price. The Argus methodology for the assessment of the WTI Midland crude oil index is the volume weighted-average price of transactions done during the entire trading day and is available at the following link:

<https://www.argusmedia.com/-/media/Files/methodology/argus-americas-crude.ashx>

**Table 1
Crude Oil Pipelines Originating in the Permian Basin
(Barrels/Day)**

<u>Pipeline</u>	<u>Capacity</u>	<u>Destination</u>	<u>Owner</u>
BridgeTex	400,000	Houston	Magellan
Longhorn	275,000	Houston	Magellan
Midland to Echo 1	620,000	Houston	Enterprise Products LLC
Midland to Echo 2	225,000	Houston	Enterprise Products LLC
Midland to Echo 3	450,000	Houston	Enterprise Products LLC
Wink to Webster	1,000,000	Houston	Exxon, Plains, Marathon, etc
Gray Oak	900,000	Corpus Christi	Phillips66, Enbridge, Marathon, etc
EPIC Pipeline	400,000	Corpus Christi	EPIC
Cactus I	390,000	Corpus Christi	Plains
Cactus II	670,000	Corpus Christi	Plains
Permian Express 1-4	690,000	Port Arthur Area	Energy Transfer
West Texas Gulf	340,000	Port Arthur Area	Energy Transfer
Centurion	170,000	Cushing	Lotus Midstream
Basin	550,000	Cushing	Plains
Sunrise	500,000	Wichita Falls	Plains
Outbound Total	7,580,000		

WTI Midland: Key Component of Deliverable Supply

In its analysis of deliverable supply for WTI at Midland, the Exchange has focused on crude oil production in West Texas. The Texas Railroad Commission (TRC) provides detailed data on crude oil production in West Texas. However, the TRC does not provide a breakdown of the crude oil production by type of crude oil, i.e., for light sweet or sour crude oil.

Table 2 below provides TRC production data for the three-year period of November 2019 through October 2022 for crude oil produced in the Permian Basin region. For this three-year period, Permian Basin crude oil production averaged 3,045 thousand barrels per day, or 91.350 million barrels per month.

⁷https://commoncarrier.energytransfer.com/InfoPost/CommonCarriers/resources/PEP/Tariffs/PEP_FERC_2.9.0.pdf?undefined=10

Analysis of WTI Midland Deliverable Supply

In its estimate of deliverable supply for the WTI Midland cash market, the Exchange has determined to focus on TRC production data for crude oil in West Texas, based on data in Table 2 above, and within the 40 to 44 API gravity range.

Given that the EIA does not provide a specific breakdown for West Texas crude oil produced in the range of 40 to 44 degrees API gravity, the Exchange has applied a reduction of 30% to the production data. Based on conversations with market analysts and data quoted by Drillinginfo,⁸ it was estimated that approximately 70 to 75% of production in the Permian Basin is WTI Midland type crude oil in the range of 40 to 44 API gravity. Therefore, the Exchange has determined the deliverable supply for WTI type crude oil in Midland to be approximately 2,132 thousand b/d (70% of 3,045 thousand b/d). This is equivalent to 63.930 million barrels per month, which is equivalent to 63,930 contracts per month.

The Exchange is not applying a reduction for long term contracts, given the liquid spot market and the lack of restrictions applied to the resale of crude oil. Almost all first-sales of production are sold typically to middleman-firms or marketers. These middleman-firms typically resell the crude oil to other middleman-firms (or participants performing that function) or to end-users. Typically, the first-sales contracts are “evergreen” contracts that can be discontinued by either party with notice, so there are no restrictions applied to the resale of crude oil bought first-sale on a term basis from producers. The Midland market is downstream of first-sales; in other words, the hub is downstream of any term sales from producers. Thus, even if barrels were sold term by the producer, in the Midland market those barrels are re-sold and re-delivered by either the purchaser from the producer or a subsequent purchaser/middleman from that original purchaser. The Midland cash market consists of active trading and physical delivery of WTI type crude oil and provides commercial secondary (or *spot*) markets which are liquid, with broad participation, and results in a substantial quantity of physical delivery of crude oil.

Table 2: Texas Railroad Commission Data1 Texas Production of Crude Oil in West Texas (by District)
⁹(For Districts 7C, 8, 8A, 9, and 10 located near Midland, Texas)
(Thousands of Barrels per Day)

	Total	7c	8	8A	9	10
3-yr Avg	3,045	391	2,372	236	23	23
Oct-22	3,039	407	2,365	226	22	19
Sep-22	3,133	433	2,426	229	23	21
Aug-22	3,138	425	2,443	226	22	21
Jul-22	3,130	403	2,454	229	23	21
Jun-22	3,123	399	2,453	226	23	22
May-22	3,147	403	2,471	227	23	23
Apr-22	3,191	416	2,497	231	23	24
Mar-22	3,190	435	2,478	230	23	24
Feb-22	3,081	401	2,406	231	22	21
Jan-22	3,122	394	2,453	231	23	22
Dec-21	3,182	393	2,508	235	23	23
<u>Nov-21</u>	<u>3,192</u>	<u>410</u>	<u>2,500</u>	<u>237</u>	<u>23</u>	<u>22</u>
Oct-21	3,193	414	2,501	233	23	23
Sep-21	3,155	422	2,459	230	22	22
Aug-21	3,088	392	2,425	228	22	21
Jul-21	3,035	382	2,382	228	22	22
Jun-21	2,997	388	2,333	233	22	22
May-21	3,010	377	2,360	228	22	23
Apr-21	2,994	377	2,338	234	23	23
Mar-21	3,003	371	2,352	235	23	22
Feb-21	2,305	264	1,785	218	19	18
Jan-21	2,862	342	2,240	236	22	22
Dec-20	2,873	351	2,237	240	22	22
<u>Nov-20</u>	<u>2,873</u>	<u>363</u>	<u>2,227</u>	<u>238</u>	<u>23</u>	<u>22</u>
Oct-20	2,858	357	2,218	237	22	23
Sep-20	2,848	361	2,202	238	22	24
Aug-20	2,858	373	2,201	239	22	24
Jul-20	2,933	385	2,263	240	22	24
Jun-20	2,925	393	2,252	237	20	23
May-20	2,676	378	2,057	203	17	21
Apr-20	3,105	427	2,387	243	22	25
Mar-20	3,272	413	2,539	268	24	28
Feb-20	3,236	412	2,500	270	25	28
Jan-20	3,304	407	2,572	271	26	28
Dec-19	3,285	410	2,546	274	26	29
<u>Nov-19</u>	<u>3,268</u>	<u>408</u>	<u>2,552</u>	<u>253</u>	<u>26</u>	<u>29</u>

⁹ <http://webapps.rrc.texas.gov/PDQ/generalReportAction.do>

WTI at Cushing, Oklahoma

I. Key Components of Deliverable Supply

The WTI Financial Futures Contract (Exchange Code: CS) and the Argus WTI Trade Month Futures contract (Exchange Code: V7) are cash-settled look-alike contracts of the NYMEX Light Sweet Crude Oil Futures Contract. In estimating deliverable supply for these financially-settled contracts (also referred to as “WTI”), there are three main components that NYMEX considered in updating the deliverable supply estimates of the Domestic Light Sweet Common Stream Crude Oil for the Cushing, Oklahoma delivery location:

- (1) Crude Oil Production;
- (2) Crude Oil Flows to the delivery area; and
- (3) Crude Oil Storage in the delivery area.

A. Crude Oil Production

While crude oil production information is, in part, available from other sources, particularly at the state level from energy or tax revenue authorities, the Exchange determined to use production information collected by the U.S. Department of Energy (“DOE”) Energy Information Administration (“EIA”). Specifically, the Exchange has chosen to rely on the EIA production data because it constitutes a single source, employing common standards, across all states. The EIA data are highly regarded but they do not provide sufficient breakdown on the quality characteristics of the oil production to determine the subset of total production that would qualify as Domestic Light Sweet under the terms of the futures contract.

B. Crude Oil Flows to the Cushing Delivery Area

To determine the flows of Domestic Light Sweet crude oil into the delivery area, NYMEX consulted with industry executives and professionals from pipeline and storage terminal operators in Cushing as well as other major industry participants. It is noteworthy that the estimates provided here are materially less than the production that can readily access the delivery mechanism and which *could* be delivered due to the fact that the sources the Exchange used were specifically knowledgeable about *actual* Cushing deliveries. Thus, the information provided is not what *could be* delivered — the standard which is in accordance with Commission’s policy and precedent — but what actually *is* delivered. The Exchange believes that the Cushing delivery mechanism for light sweet crude oil and corresponding commercial secondary market constitutes such a sophisticated and highly-developed commercial market mechanism that, at any time, the actual flows to and stocks in the delivery area represent precisely the deliverable supply sufficient to support the mechanism. In other words, even though at any time there is additional production that *could* be delivered to the delivery mechanism, the Exchange are only including what *actually* flows in our estimate of deliverable supply.

C. Crude Oil Storage in the Cushing Delivery Area

Storage data are provided on a weekly basis by EIA. Details are provided for the U.S. Petroleum Administration for Defense Districts (“PADDs”) and Cushing. There are five PADDs and, in some cases, they correspond to broad regions. PADD 2 broadly includes the Midwest; PADD 3 broadly includes U.S. Gulf Coast states and New Mexico; PADD 4 contains the Rocky Mountain States excluding New Mexico. Cushing is the only single location where crude oil official inventory numbers are collected and publicly disseminated on a regular basis anywhere in the world. The actual geographic market that is consistently most applicable to the NYMEX crude oil futures contract would, therefore, include much of PADD 2, not just Cushing.

Nonetheless, NYMEX includes only inventories reported at Cushing, so these underestimate relevant storage. As with production, EIA does not provide details on the quality characteristics of stored crude oil, but the industry experts with whom NYMEX consulted consistently estimated that 60% to 70% of the crude

oil stored at Cushing qualified as Domestic Light Sweet Common Stream (to be conservative, the Exchange will discount 40% of inventory in its calculation of deliverable supply estimates).

II. The Cushing Physical Delivery Mechanism: Scope of Deliverable Crude Oil

The Cushing physical delivery mechanism is comprised of a network of nearly two dozen pipelines and 12 storage terminals, with extensive inter-connectivity. Three of the storage facilities — Enterprise, Enbridge, and Plains — and their pipeline manifolds are the core of the Cushing physical delivery mechanism.¹⁰ Physical volumes delivered against the Light Sweet Crude Oil Futures contract within the Enterprise, Enbridge, and Plains systems are at par value. Any deliveries made on futures contracts elsewhere in Cushing require the seller to compensate the buyer for the lower of the transportation netbacks from these facilities to where the delivery occurs. Detailed information about the inflowing and outflowing pipelines is contained below in Table 2.

Terminating obligations in the Light Sweet Crude Oil Futures contract are fulfilled by delivering WTI type light sweet crude oil designated as “Domestic Common Stream” by Enterprise Products LLC. Market participants commonly refer to the light sweet deliverable streams as “WTI.” In addition, the Domestic Common Stream includes a fungible blend of light sweet streams produced in the U.S. shale oil areas, including the Bakken, Niobrara, and Permian producing areas. Furthermore, each of these light sweet crude oil streams is fungibly blended and included as part of the “Domestic Common Stream” within the complex that comprises the Cushing delivery mechanism, as well as in the WTI physical market which calls for delivery in the Cushing delivery mechanism.

III. Physical Market Trading Structure and Term Contracts

A. Physical Market Trading Structure

Typically, there is a chronology of sales and purchases of crude oil in the onshore U.S. market that starts with a sale from producer and finishes with a purchase by an end-user to consume the crude oil. First-sales are from producers to aggregators or other middleman-type firms with delivery at the property where it is produced. The first-sale buyer transports oil downstream from the point of sale. Usually the first-sale buyer resells the oil to someone other than the end-user but sometimes sells directly to the end-user.

Final sales are sales to end-users who when they consume the oil remove it from the supply chain. End-users, however, also resell oil. Such end-user re-sales sometimes occur during the same commercial cycle in which they purchased it; other times, they occur during a later commercial cycle after the oil has been stored for a period of time. Like end-users, other buyers of oil also can either resell it immediately or store it first for some period of time and then resell it later. Thus, it is a common commercial practice that the first-sale and multiple subsequent re-sales occur in the same delivery cycle.

As discussed above, the Cushing delivery market is essentially a major reseller market where buyers either: resell the oil to someone else; store the oil and resell it later; store the oil and then consume it later; or transport it to consume it. The Cushing market is essentially downstream of first-sales. Most of the sales in the Cushing market are for resale and not for either storage or final-sale; in fact, the physical market in “WTI,” in which the standard form of delivery is within the pipeline system at Cushing, is estimated to be 10-20 times the multiple of “WTI” oil that flows to Cushing. As such, it is clear that most sales are for resale because they constitute the selling, over-and-over (thus, *re-selling*), of the base physical oil that flows to

¹⁰ Three of the major sources for the cash-market information provided herein are Plains All America, Enterprise and Enbridge. Enterprise oversees the vast majority of deliveries in the Cushing Delivery Market and, as indicated, Enterprise and Enbridge are the core delivery mechanism operators, with Plains added as a delivery option in February 2022. Plains and Enbridge account for about 60% of the storage available at Cushing.

Cushing. *Argus Media* documents about 5-8 times the flow in “WTI” sales but does not capture all of the sales.¹¹

B. Term Contracts

The Exchange has spoken with and interviewed a number of market participants regarding common commercial practices with respect to the use of term contracts in the U.S. onshore crude oil market.¹² The responses received were consistent and they can be summarized as follows:

- Almost all first-sales of production are sold term; as discussed in the previous section, typically for delivery on the property where it is produced (or nearest gathering pipeline or holding tank), and typically to middleman-firms or aggregators. These middleman-firms typically resell the crude oil to other middleman-firms (or participants performing that function) or to end-users. Typically, the first-sales contracts are “evergreen” contracts that can be discontinued by either party with notice. NYMEX is including evergreen contracts in the “term contracts” category.
- There are no restrictions applied to the resale of crude oil bought first-sale on a term basis from producers. In fact, that would clearly not be applicable because sales are typically to aggregators or others acting in a middleman-firm role with the expressed responsibility of reselling the oil.
- The Cushing market is downstream of first-sales; in other words, Cushing is downstream of any term sales from producers. Thus, even if barrels were sold term by the producer, in the Cushing market those barrels are re-sold and re-delivered by either the purchaser from the producer or a subsequent purchaser from that original purchaser. The Cushing market mechanism, which consists of trading and physical delivery of light sweet crude oil, is a commercial secondary (or *spot*) market which is extremely liquid, comprised of broad participation and results in a substantial quantity of physical delivery of crude oil.
- Some end-user refiners in the Cushing market purchase specific light sweet crude oil streams, such as Bakken or Niobrara Light Sweet crude oil, on a term basis, and these refiners tend to segregate a portion of the specific light sweet crude streams for processing at their refineries. Based on conversations with refiners in the Cushing market, the Exchange estimates that approximately 10% of the deliverable supply for Cushing is segregated and designated for use by end-user refiners, and therefore is not available for re-sale in the Cushing market. Consequently, the Exchange will reduce its estimate of deliverable supply in Cushing by 10% to account for the specific light sweet streams that are designated for processing and segregated by the end-user refiners.
- Our sources expressly advised us that any production sold long-term was available for potential re-sale, such as during periods of refinery maintenance, and this is especially the case in the Cushing market.

C. Crude Oil Production

The production area that supplies crude oil to Cushing via pipeline and rail is comprised of the following eight (8) states: North Dakota, Montana, Wyoming, Colorado, New Mexico, Onshore Texas, Oklahoma, and Kansas.

In the three-year period of November 2019 through October 2022, the average production of crude oil available in the eight states was approximately 8.5 million barrels per day. Based on discussions with

¹¹ The commercial market for physical delivery of light sweet crude oil in Cushing is a *secondary* (or *spot*) market mechanism. The number of physical deliveries in this market each month is 240 million barrels or higher (240,000 futures contracts equivalent or higher).

¹² These include: Plains All America, a major Midcontinent aggregator and marketer and operator of pipeline and storage terminals including in Cushing; and an Energy Market Participant Group of several dozen market participants organized through Hunton & Williams LLP to discuss and comment on Regulatory issues.

industry participants, our estimate of the portion of that average production which would qualify as Domestic Light Sweet Common Stream is 50% or higher— i.e., approximately 4.25 million barrels per day. The 4.25 million barrels per day of crude oil production is equivalent to approximately 127.5 million barrels per month, or 127,500 futures contracts equivalents (contract size: 1,000 barrels).

Table 1 below provides annual production data available for production in the eight states that supply the Cushing crude oil market for the period of November 2019 through October 2022. The data shows that production in 2020, and has been rising in 2022. As indicated above, the Exchange has determined to not utilize production data in its deliverable supply estimate, but the data demonstrates that production levels are more than sufficient to support the actual flows of deliverable product to the delivery location.

D. Crude Oil Flows to the Cushing Delivery Area

Currently, there is approximately 4.1 million b/d of inflow pipeline capacity to Cushing and 3.2 million barrels per day of outflow capacity. In addition, according to the EIA, there are 94.2 million barrels of storage capacity in the Cushing area.

The Exchange collects inbound Cushing crude oil flows periodically but not on an on-going or scheduled basis as such information is proprietary and non-public. Based on information provided by industry sources in Table 2 below, as of December 2020, actual flows of crude oil to Cushing have ranged from 2.3 million to 2.6 million barrels per day, with Domestic Light Sweet Common Stream Crude Oil averaging between 1.3 to 1.5 million barrels per day.¹³ On a 30-day monthly basis, actual flows of Domestic Light Sweet Common Stream Crude Oil ranged from 39 to 46.5 million barrels per month, or 39,000 to 46,500 Light Sweet Crude Oil futures contract equivalents.

As of July 2018, actual flows of crude oil in-bound to Cushing have ranged from 2.2 million to 2.5 million barrels per day as shown in Table 3 below, with Domestic Light Sweet Common Stream Crude Oil averaging between 1.270 to 1.450 million barrels per day.¹⁴ On a 30-day monthly basis, actual flows of Domestic Light Sweet Common Stream Crude Oil ranged from 38.0 to 43.5 million barrels per month, or 38,000 to 43,500 Light Sweet Crude Oil futures contract equivalents.

As of March 2015, estimated in-bound flows of Domestic Light Sweet Common Stream Crude Oil into Cushing averaged between 920,000 and 1,000,000 barrels per day as illustrated in Table 4 below. On a 30-day monthly basis, actual flows of Domestic Light Sweet Common Stream Crude Oil were 27.6 million to 30.0 million barrels per month or 27,600 to 30,000 Light Sweet Crude Oil futures contract equivalents.

Given that the Exchange only collects pipeline flow data on a periodic basis, the Exchange is unable to provide a three-year average of Domestic Light Sweet Common Stream Crude Oil flows into Cushing. As such, the Exchange determined to average the 2015, 2018 and 2020 estimated flows data collected. The average of the ranges for 2015, 2018 and 2020 for Domestic Light Sweet Common Stream Crude Oil flows into Cushing are 35,000 to 40,000 contract equivalents. The midpoint of the average of the ranges is approximately 37,500 contract equivalents.

E. Crude Oil Storage in the Cushing Delivery Area

As of March 2022, EIA reported that shell storage capacity at Cushing was 94.235 million barrels and working storage capacity was 78.45 million barrels.¹⁵ Currently, there is substantial excess working capacity at Cushing (approximately 45 million barrels). Finally, it should be noted that, at least on a

¹³ The sources were various pipeline operators and other industry sources.

¹⁴ The sources were: Plains All America, an aggregator and marketer of crude oil production and pipeline and storage terminal operator at Cushing; and other industry sources.

¹⁵ <https://www.eia.gov/petroleum/storagecapacity/storagecapacity.xlsx> - Table 2. Shell capacity is defined by EIA as the design capacity of a petroleum storage tank which is always greater than or equal to working storage capacity.

temporary basis, storage can exceed working capacity and it is common for an individual tank to reach 85-90% of shell capacity (which exceeds the 84.9% average underlying the EIA estimates).

Table 5 below provides monthly averages of weekly Cushing stocks for the period beginning February 2020 through January 2023 as published by the EIA. For the three-year average over this period inventories averaged 38.787 million barrels and on a weekly basis ranged from about 21 million to 65 million barrels. NYMEX asked operators of storage in Cushing if they would share specific data on quantities of Domestic Light Sweet Common Stream Crude Oil stored at their facilities and they responded that such data were confidential. As discussed above, the Exchange estimated that approximately 60% of the total oil stored at Cushing qualified as Domestic Light Sweet Common Stream Crude Oil. Based on the foregoing, for the February 2020 through January 2023 period, the monthly average Domestic Light Sweet Common Stream Crude Oil stored at Cushing was approximately 23.27 million barrels or 23,270 futures contract equivalents.

The Exchange has further evaluated both operational practices at storage facilities as well as commercial practices by customers of storage facilities to determine if some components of inventoried product could rightfully be considered *not* to be readily deliverable.

With respect to operational practices, based on discussions with some industry experts, the Exchange conservatively estimates that 6.75% of stored product, on average, is required for operational minimums.¹⁶ This converts into discounting an estimated 1.57 million barrels of Domestic Light Sweet crude oil based on the three-year average storage level (or 1,570 contract equivalents). In applying a discount of 6.75% to account for operational minimums, average monthly Domestic Light Sweet Common Stream Crude Oil for the February 2020 through January 2023 period is further reduced to approximately 21,699 contract equivalents.

With respect to commercial practices, the Exchange specifically sought whether storage customers were expressly allotting any stored barrels at Cushing for refining that were, therefore, unavailable for secondary market delivery. The Exchange consistently heard from market participants that was not the case; that barrels stored at Cushing are not specifically targeted for scheduled refining. Rather, refiners typically store barrels targeted for scheduled refining in tanks on the premises at their respective refineries or at other storage facilities. However, the Exchange did learn from one refiner that they keep barrels stored at Cushing for the contingency that there could be some unexpected interruption in their refinery supply; and, rather than refine the barrels stored at Cushing, they use them to trade for other barrels they would refine. Thus, the Exchange determined to further reduce the average monthly Domestic Light Sweet Common Stream crude oil stored at Cushing to account for this *contingency storage* in our estimate of deliverable supply. The Exchange estimates this quantity to be 2 million barrels (or 2,000 contract equivalents) of Domestic Light Sweet crude oil. Therefore, for the February 2020 through January 2023 period, the Exchange estimates stored product at Cushing (adjusted for quality specifications, operational minimums and contingency storage) and which is readily available for delivery against the Light Sweet Crude Oil Futures contract to be approximately 19,699 contract equivalents.

Analysis of WTI Cushing Deliverable Supply

Based on the above analysis, the Exchange determined at this time to base its estimates of deliverable supply on the sum of:

- Storage: 19,699 contract equivalents (which represents the average monthly inventory for the February 2020 - January 2023 period adjusted to account for quality specifications, operational minimums and contingency storage); and
- Inflow: 37,500 contract equivalents (which represents the midpoint of the average of the ranges of the 2015, 2018 and 2020 Domestic Light Sweet Common Stream Crude Oil flows into Cushing).

¹⁶ The Exchange has been advised that, for older tanks, the operational minimum is 9% and, for newer tanks, it is 4.5%. Our assessment is that the majority of tanks at Cushing would qualify as newer. Nonetheless, to be conservative, the Exchange has applied the mid-point percentage—6.75%— for all of Cushing.

The total estimated deliverable supply, consisting of storage and pipeline inflows, 57,199 contract equivalents. Additionally, and as noted in the above analysis, the Exchange shall apply a 10% haircut to the sum of inventory storage and inflows into Cushing in order to discount segregated barrels that may be designated for processing by end-user refiners and typically not available for re-sale in the Cushing market. Therefore, after applying the 10% haircut, the Exchange has determined the estimated deliverable supply available for delivery against the Light Sweet Crude Oil Futures contract at approximately 51,479 futures contract equivalents per month.

Table 1
U.S. Crude Oil Production¹⁷
For Eight States that Supply Cushing, Oklahoma
(in Thousands of Barrels per Day)

Annual Averages based on Monthly EIA Data		Crude Oil Production
<i>From</i>	<i>To</i>	<i>Thousand Barrels/Day</i>
Nov-19	Oct-20	8615
Nov-20	Oct-21	8190
Nov-21	Oct-22	8820
Three-Year Average		8542

Table 2
Crude Oil Flows to Cushing (as of December 2020)
(Barrels/Day)¹⁸

Incoming Pipelines	Capacity	Owner	Estimated Flows (in Barrels/Day)
Keystone XL (from Steele City, NE)	760,000	Transcanada	400,000 – 450,000 BD (100% Heavy Sour)
Basin Pipeline (Permian)	550,000	Plains All American	250,000 – 325,000 (90% WTI, 10% Sour)
Centurion North Pipeline (Permian)	170,000	Occidental	40,000 – 50,000 (100% WTI)
Spearhead Pipeline (Canada)	195,000	Enbridge	180,000 – 195,000 (100% Heavy Sour)
Flanagan South (Canada/Bakken)	600,000	Enbridge	450,000 – 500,000 (10% WTI, 90% Heavy Sour)
White Cliffs Pipeline (Niobrara)	90,000	Rose Rock	85,000 – 90,000 (100% WTI)
Cashion, OK Pipeline	250,000	Plains All American	120,000 – 130,000 (100% WTI)
Mississippian Lime Pipeline	150,000	Plains All American	70,000 – 80,000 (100% WTI)
Pony Express Pipeline (Niobrara)	400,000	Tallgrass	350,000 – 375,000 (100% WTI)
Saddlehorn/Grand Mesa	450,000	Magellan/Plains	225,000 – 300,000 (100% WTI)
Glass Mountain	210,000	Navigator	50,000 – 60,000 (100% WTI)
Hawthorn (Stroud to Cushing)	90,000	Hawthorn	25,000 – 30,000 (100% WTI)
SCOOP Pipeline	70,000	Magellan	45,000 – 50,000 (100% WTI)
Great Salt Plains	35,000	Parnon	25,000 – 30,000 (100% WTI)
Eagle North	25,000	Blueknight	4,000 – 7,000 (100% WTI)
Red River	35,000	Plains All American	1,000 – 5,000 (100% WTI)

TOTAL In-Bound Capacity 4.1 Million Capacity WTI Flow: 1,310,000 – 1,550,000 B/D

Outgoing Pipelines	Capacity (B/D)	Owner
Seaway Pipeline	950,000	Enterprise
Keystone MarketLink	750,000	Transcanada
BP#1 (to Chicago)	180,000	BP
Ozark (to Wood River, IL)	360,000	Enbridge
Osage (to Eldorado, KS)	165,000	Magellan/NCRA
Coffeyville CVR pipeline	110,000	CVR Energy
Phillips (to Ponca City, OK)	122,000	ConocoPhillips
Phillips (to Borger, TX)	59,000	NuStar
Plains Red River (to Longview)	235,000	Plains All American
Diamond Pipeline (to Memphis)	200,000	Plains All American
Sunoco (twin lines to Tulsa)	70,000	Sunoco
Magellan Tulsa	30,000	Magellan

¹⁷ As of 2/1/23: The production listed here includes North Dakota, Montana, Wyoming, Colorado, New Mexico, Onshore Texas, Oklahoma, and Kansas. The web link is: http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbldpd_a.htm

¹⁸ Sources: pipeline operators and other industry sources.

TOTAL Out-bound Capacity 3.2 Million B/D

**Table 3
Crude Oil Flows to Cushing (as of July 2018)
(Barrels/Day)¹⁹**

Incoming Pipelines	Capacity	Owner	Estimated Flows (in Barrels/Day)
Keystone XL (from Steele City, NE)	590,000	Transcanada	350,000 - 400,000 BD (100% Heavy Sour)
Basin Pipeline (Permian)	450,000	Plains	350,000 - 400,000 (80% WTI, 20% Sour)
Centurion North Pipeline (Permian)	170,000	Occidental	120,000 - 140,000 (100% WTI)
Spearhead Pipeline (Canada)	195,000	Enbridge	150,000 - 175,000 (100% Heavy Sour)
Flanagan South (Canada/Bakken)	600,000	Enbridge	400,000 - 450,000 (10% WTI, 90% Heavy Sour)
White Cliffs Pipeline (Niobrara)	215,000	Rose Rock	100,000 - 120,000 (100% WTI)
Plains Cashion, OK Pipeline	250,000	Plains	120,000 - 145,000 (100% WTI)
Mississippian Lime Pipeline	150,000	Plains	95,000 - 100,000 (100% WTI)
Pony Express Pipeline (Niobrara)	325,000	Tallgrass	300,000 - 325,000 (100% WTI)
Saddlehorn-Grand Mesa	340,000	Magellan/Plains	140,000 - 150,000 (100% WTI)
Glass Mountain	210,000	Sem Group	30,000 - 40,000 (100% WTI)
Hawthorn (Stroud to Cushing)	90,000	Hawthorn	10,000 - 20,000 (100% WTI)
Great Salt Plains	35,000	Parnon	30,000 - 35,000 (100% WTI)
Eagle North	20,000	Blueknight	5,000 - 10,000 (100% WTI)

TOTAL In-Bound Capacity 3.6 Million Capacity WTI Flow: 1,270,000 - 1,450,000 B/D

Outgoing Pipelines	Capacity (B/D)	Owner
Seaway Pipeline	850,000	Enterprise
Keystone MarketLink	700,000	Transcanada
BP#1 (to Chicago)	180,000	BP
Ozark (to Wood River, IL)	345,000	Enbridge
Osage (to Eldorado, KS)	165,000	Magellan/NCRA
Coffeyville CVR pipeline	110,000	CVR Energy
Phillips (to Ponca City, OK)	122,000	ConocoPhillips
Phillips (to Borger, TX)	59,000	NuStar
Plains Red River Pipeline (to Longview)	125,000	Plains All American
Plains Red River Pipeline	25,000	Plains All American
Sunoco (twin lines to Tulsa)	70,000	Sunoco
Plains Cherokee	20,000	Plains All American
Magellan Tulsa	30,000	Magellan
Diamond Pipeline (to Memphis)	200,000	Plains

TOTAL Out-bound Capacity 3.0 Million B/D

**Table 4
Crude Oil Flows to Cushing (as of March 2015)
(Barrels/Day)²⁰**

Incoming Pipelines	Capacity	Owner	Estimated Flows (in Barrels/Day)
Keystone XL (from Steele City, NE)	575,000	Transcanada	200,000 - 250,000 BD (Heavy sour)
Basin Pipeline (Permian)	450,000	Plains	250,000 (80% WTI)
Centurion North Pipeline (Permian)	120,000	Occidental	95,000 - 100,000 (100% WTI)
Spearhead Pipeline (Canada)	210,000	Enbridge	150,000 - 175,000 (Canadian sour)
Flanagan South (Canada/Bakken)	585,000	Enbridge	400,000 - 450,000 (10% WTI, 90% Sour)
White Cliffs Pipeline (Niobrara)	150,000	Rose Rock	100,000 - 120,000 (100% WTI)
Plains Cashion, OK Pipeline	100,000	Plains	80,000 (100% WTI)
Mississippi Lime Pipeline	175,000	Plains	110,000 (100% WTI)
Pony Express Pipeline (Niobrara)	320,000	Tallgrass	180,000 - 200,000 (100% WTI)
Hawthorn (Stroud to Cushing)	90,000	Hawthorn	20,000 - 25,000 (100% WTI)
Great Salt Plains	30,000	JP Energy	15,000 - 20,000 (100% WTI)
Northern Cimarron	30,000	Rose Rock	15,000 - 20,000 (100% WTI)
Midcontinent Pipeline	30,000	Sunoco Logistics	25,000 - 30,000 (100% WTI)

¹⁹ Sources: Plains All American Pipeline Company, and other industry sources.

²⁰ Sources: Plains All American Pipeline Company, JSK consulting, and other industry sources.

Glass Mountain Pipeline
TOTAL In-Bound Capacity

140,000 Rose Rock
3.0 Million Capacity

40,000 – 50,000 (100% WTI)
WTI Flow: 920,000 – 1,000,000 B/D

Table 5
Cushing Storage²¹
Monthly Average of Weekly EIA Stocks Data
(in Thousand Barrels)

Month	Stock
Jan-23	33,228
Dec-22	24,765
Nov-22	25,476
Oct-22	26,735
Sep-22	25,212
Aug-22	25,415
Jul-22	22,754
Jun-22	22,340
May-22	25,973
Apr-22	26,931
Mar-22	23,926
Feb-22	25,035
Jan-22	32,648
Dec-21	33,767
Nov-21	27,227
Oct-21	30,810
Sep-21	34,887
Aug-21	34,084
Jul-21	36,952
Jun-21	42,810
May-21	45,491
Apr-21	46,148
Mar-21	47,594
Feb-21	47,298
Jan-21	53,570
Dec-20	58,353
Nov-20	60,373
Oct-20	59,464
Sep-20	54,744
Aug-20	52,722
Jul-20	50,002
Jun-20	46,927
May-20	57,986
Apr-20	56,831
Mar-20	39,614
Feb-20	38,237
3-yr Average	38,787

²¹ http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPC0_SAX_YCUOK_MBBL&f=W as of 2/1/2023

Cash Market Analysis of Brent crude oil

Market overview

The North Sea market is comprised of a series of smaller oil fields in the UK and Norwegian North oil sectors. Each of the “satellite fields” connect into the large production systems such as Brent, Forties, Oseberg or Ekofisk. Norwegian crude oil Troll was added to the basket of Brent deliverable streams from January 2018²².

The most important streams in the North Sea are Brent, Forties, Oseberg and Ekofisk and Troll. Each stream has a principle operator that is responsible for the day to the day control of the operations including the scheduling of the cargoes based on the production from each of the smaller producing fields. The Brent, Forties, Oseberg, Ekofisk and Troll fields collectively known as BFOET underpins the Brent complex. These crude grades are the key grades of oil that make up the trading of Dated Brent – the international crude oil physical benchmark price. Brent and Forties lie in the UK sector of the North Sea with Ekofisk, Oseberg and Troll in the Norwegian sector.

Dated Brent is a critical component of the Brent complex which also includes physically deliverable crude oil in the future, in the form of cash Brent or cash BFOET and a liquid EFP market. There is also a large set of financial derivatives contracts such as the Contract for Differences (CFDs), Dated to Frontline (DFLs).

The Brent forward market consists of the trading of cargoes of any of the BFOET streams for delivery beyond month ahead, with no specific dates assigned for loading. The cargoes are 600,000 barrels and, in the forward market, precise loading dates are not provided with cargoes labelled as June BFOET for example. However, the commercial contracts, which are standardized, underlying the forward market to specify the minimum notification a seller must provide to a buyer is 10 days but the standard range is between 10 days and month ahead. After a holder of a BFOET forward notifies the buyer as to the loading date and which stream is being loaded, the contract is now considered to have moved from the forward market to the Dated Brent market, historically this moment is referred to as the cargo going “wet” i.e. it has loading dates attached to it and can therefore be sold as a Dated Brent cargo.

The Brent cash market is essentially a reseller market where buyers either: resell the oil to someone else; transport the cargo and resell it later; or transport the cargo to consume it. Most of the sales in the Brent market are conducted as spot-market transactions; in fact, Brent cargoes in the physical market are estimated to trade 10 or more times. Typically, there is a chronology of sales and purchases of crude oil in the Brent cash market that starts with a sale from the equity producer in a spot market transaction, and finishes with a purchase by an end-user to consume the crude oil. Equity producers typically utilize the robust spot market to sell their BFOET production at the cargo loading terminal, as a “Free on Board” (FOB) delivery. Traders play an active role in the Brent market as middlemen with the expressed responsibility of reselling the oil. Further, the refiners typically rely on the spot market to purchase Brent crude oil, because there is vibrant liquidity in the spot market, and hence, the refiners have developed a preference for short-term spot market purchases, rather than long-term contracts. This applies to refiners affiliated with equity producers as well as those not affiliated; this is the standard practice, established and institutionalized over the past 34 years.

Production of BFOE has been declining over the past few years due to the cost of drilling and the returns on investment compared to other regions in the world. This was one of the main reasons why the Troll crude stream was added to the Brent basket. All the Brent grades are segregated blends delivered at different locations in the North Sea, and each can be substituted by the seller in the BFOET cash market (“the forward market”).

Quality adjustments ensure that all four grades can be delivered to a buyer under the standardized forward contract. In March 2015, the nomination period in the forward market was changed to reflect 10 days to

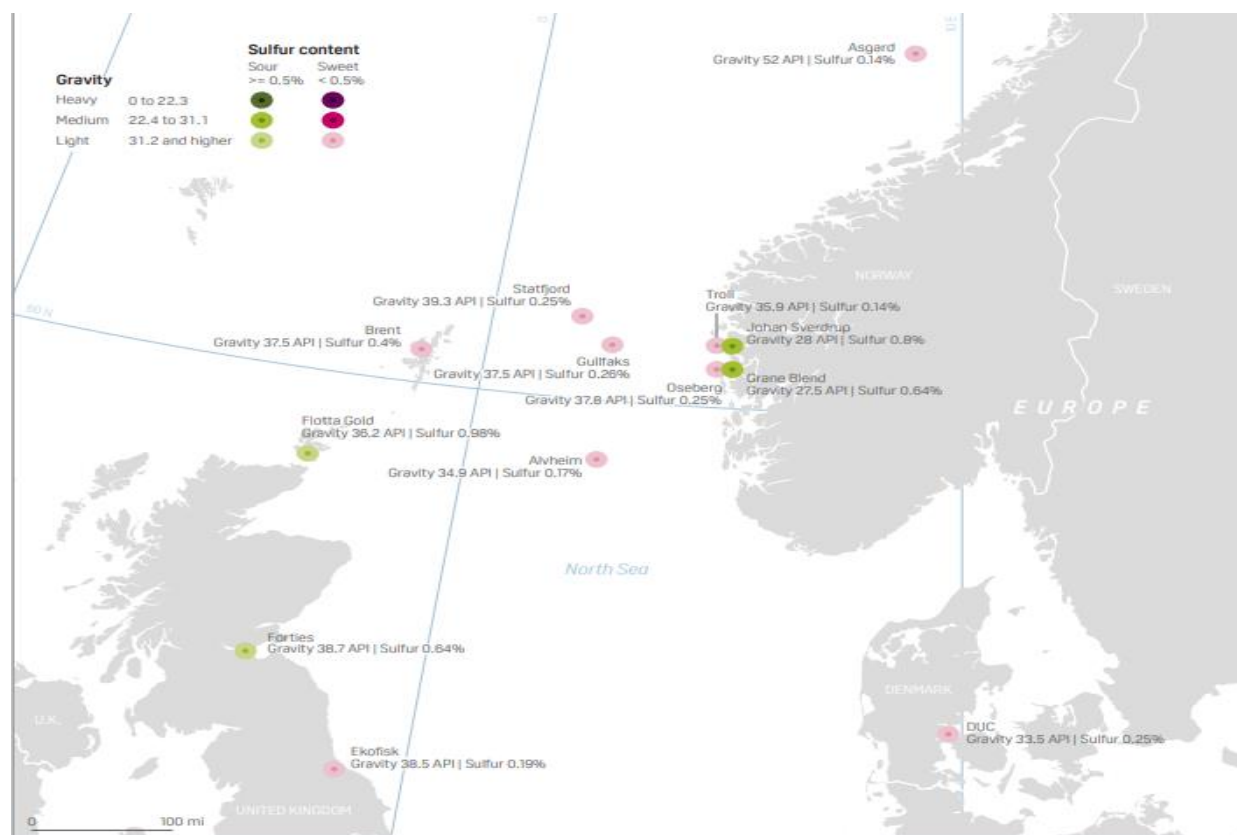
²² Platts press release – Troll into Brent basket <https://www.platts.com/pressreleases/2017/022017>

month ahead. The change took effect with from January 2016 which reflected the March 2016 cash Brent month. The process of moving from a forward to the physical market where a forward Brent cargo becomes a physical North Sea Dated Brent cargo happens as follows:

1. Refiners, producers and traders enter into a forward agreement for a specific month.
2. The Operator of each field being Shell for Brent; BP for Forties; ConocoPhillips for Oseberg and Statoil for Ekofisk and Troll will announce the loading programs for each contract month a few days prior to the beginning of the month (one month prior) to each loading month (i.e., cargoes in the delivery month start to load). For example, for a June 2018 contract month, the field operators will announce the loading schedules a few days prior to the beginning of April 2018. The equity producers will begin the chain of nominating cargoes to buyers (or they can decide to keep the cargo). A buyer benefiting from a nomination can keep the cargo or pass it to another player with whom it has another forward contract.
3. Buyers trade the cash BFOET on the basis that they will accept any cargo as nominated, provided it is done so within the agreed notice period (10 days to month ahead) by 4pm London time. Any cargo not nominated by this time will remain with the participant last notified. After 4pm London time, the cargo becomes wet physical with precise loading dates attached.
4. Cargoes that are wet physical will be sold as a Dated Brent cargo with cargo loading dates between 10 days and month ahead (forward).
- 5.

Chart 1 shows the main North Sea fields. The main BFOET crude grades are also shown.

Chart 1: The North Sea crude market supply²³



The quality of the Forties crude oil stream changed in 2007 when a sour crude Buzzard began flowing into the blend that was delivered to the terminal. Buzzard remains the largest field within the forties pipeline system (FPS). Buzzard crude oil is a medium gravity, sour crude oil with an API of 32.6° and a sulphur content of 1.44% therefore the yield is very similar to that of Urals crude. INEOS FPS produces a monthly blend quality on a forward basis as laid out in the table below. They also provide indications to the market about the volume of forties crude oil that is expected to be made available on receipt of the data from all of the individual field operators within the FPS (see table below).

Table 1: The volume of Buzzard crude in the Forties Blend Estimates²⁴ (updated April 2018)

Date	Buzzard percentage in Forties	Forties Blend unstabilised crude oil (kbd)
March 2022	26.0%	294.7
April 2022	26.2%	289.0
May 2022	26.4%	288.8
June 2022	28.3%	284.8

²³ <https://www.spglobal.com/commodity-insights/plattscontent/assets/files/en/our-methodology/methodology-specifications/emea-crude-methodology.pdf>

²⁴ Ineos Forties Pipeline System – Forties Blend Assay <https://www.ineos.com/businesses/ineos-fps/business/forties-blend-quality/>

Bloomberg LP (“Bloomberg”) provides details of the BFOET loading programs for the grades that comprise the Brent market. Based on the most recent 3-year average of the Bloomberg data on BFOET loadings (from June 2019 to May 2022).

Based on the data, total loadings of Brent (BFOET) crude oil were approximately 819,124 barrels per day, which is equivalent to approximately 24.57 million barrels per month. The Bloomberg data, in **Appendix 2**, shows the loaded volume of crude oil for Brent, Forties, Oseberg, Ekofisk and Troll (collectively known as BFOET).

The Brent market is priced in USD and cents per barrel. There are two significant Futures contracts based on trading activity in the forward BFOE market; NYMEX and ICE Futures Europe offer trading of Brent Futures on their respective Exchanges. The cash market is traded in partials of 100,000 barrels or larger full-size cargo transactions of 600,000 barrels. Physical convergence can occur through the partials market mechanism upon the trading of six parcels with the same counterparty in a single delivery month. If physical convergence does not occur then trades are booked out at the prevailing cash value on the last day of trading day of the cash market for the specific delivery month (i.e. this is currently month ahead prior to the 1st loading date of the delivery month). Full sized physical cargo BFOE trades will be used by ICE in the establishment of the Brent Index which is the mechanism by which the futures open on expiry are cash settled.²⁵

The Dated Brent or Dated BFOET, as it is sometimes referred, reflects the value of the cheapest of Brent, Forties, Oseberg, Ekofisk and Troll, of 600,000 barrels, loading 10 days to Month Ahead. Dated Brent is estimated to price around 50% of the global crude oil supply²⁶. Within the North Sea and beyond, grades are traded as a differential to Dated Brent or as a differential to cash Brent (BFOE). Each of the crude oil grades within BFOE are not the same quality, several adjustments have been made. In 2007 Platts included a sulphur de-escalator for Forties crude oil within its Dated Brent and Brent related instruments. The change was made in response to inclusion of sour crude Buzzard into the Forties pipeline system (see chart 1). The de-escalator of price is applied to deliveries above a minimum sulphur level of 0.6%. Every month, Platts establishes a USD and cents value de-escalator for every 0.1% of sulphur above the maximum level 0.6% (for Forties crude oil). The value of de-escalator is established by reviewing evidence of significant and sustained changes in the crude market, as affected by refined products (crack spread values of both heavy fuel oils and light ends) and other relevant factors that affect the economics of Forties crude.

In February 2022,²⁷ Platts has launched a consultation to the Brent basket of crudes to accommodate a growing supply of Midland US crude being traded into Rotterdam on a delivered basis. Effective for cargoes loading from June 2023, Platts has proposed to include Midland crude oil as one of the deliverable crude oil streams into the Brent or BFOET forward market. Importantly, Platts would also change the traded cargo size volume from 600,000 to 700,000 barrels as US crude is traded on larger vessel sizes.

²⁵ https://www.theice.com/publicdocs/futures/ICE_Futures_Europe_Brent_Index.pdf

²⁶ <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2012/03/Brent-Prices-Impact-of-PRA-methodology-on-price-formation.pdf>

²⁷ <https://www.spglobal.com/commodity-insights/en/market-insights/latest-news/oil/021422-s-p-global-platts-proposes-including-us-wti-midland-crude-in-dated-brent-keeps-benchmark-on-fob-basis>

Analysis of Deliverable Supply

In estimating deliverable supply for the futures contract, the Exchange relied on long-standing precedent, which provides that the key component in estimating deliverable supply is the portion of typical production and supply stocks that could reasonably be considered to be readily available for delivery. In its guidance on estimating deliverable supply, the Commodity Futures Trading Commission (“CFTC” or “Commission”) states:

In general, the term “deliverable supply” means the quantity of the commodity meeting a derivative contract’s delivery specifications that can reasonably be expected to be readily available to short traders and saleable by long traders at its market value in normal cash marketing channels at the derivative contract’s delivery points during the specified delivery period, barring abnormal movement in interstate commerce. Typically, deliverable supply reflects the quantity of the commodity that potentially could be made available for sale on a spot basis at current prices at the contract’s delivery points. For a non-financial physical-delivery commodity contract, this estimate might represent product which is in storage at the delivery point(s) specified in the futures contract or can be moved economically into or through such points consistent with the delivery procedures set forth in the contract and which is available for sale on a spot basis within the marketing channels that normally are tributary to the delivery point(s).²⁸

The basis of the analysis in the Brent market is BFOET loadings in the North Sea. The Exchange determined that the volume of loaded barrels of BFOE crude oil from Brent, Forties, Oseberg and Ekofisk and Troll best meets the definition of supply readily available for delivery. In addition, the Exchange has reduced the deliverable supply of Forties to account for the long-term commitment for crude oil purchases by the Grangemouth refinery. The Grangemouth oil refinery is located close to the delivery point of the Forties pipeline and volumes from the outer fields are connected directly via a series of pipelines to the refinery²⁹. Based on the most recent 3-year average of the Bloomberg data on BFOE loadings (June 2019 to May 2022), total loadings of Brent (BFOET) crude oil was approximately 819,924 barrels per day, which is equivalent to approximately 24.597 million barrels per month, or 24,597 contract equivalents (contract size: 1,000 barrels). Further, to account for the crude oil purchases by the Grangemouth refinery, the deliverable supply (using the three-year average BFOET figures) would be reduced by 3 million barrels³⁰ per month³¹. Therefore, the total deliverable supply of BFOE is approximately **21.597 million barrels per month** which is equivalent to 21,597 contracts.

A breakdown of the data is shown in Exhibit A.

²⁸ http://www.ecfr.gov/cgi-bin/text-idx?SID=74959c3dbae469e2efe0a42b45b8dfae&mc=true&node=ap17.1.38_11201.c&rqn=div9

²⁹ http://www.bp.com/en/global/forties-pipeline/about_fps/Technical/technical_information.html - BP Forties Pipeline system

³⁰ UKPia – Petroineos Grangemouth Refinery capacity http://www.ukpia.com/industry_information/refining-and-uk-refineries/Petroineos-grangemouth-refinery.aspx

³¹ Market suggests 50% of the processing capacity for Grangemouth is Forties therefore the Exchange reduced the deliverable supply of Forties by 3-million barrels per month (the full capacity of the refinery is 6 million barrels per month).

Exhibit A.

North Sea crude oil loadings – Brent, Forties, Oseberg, Ekofisk and Troll

Source: Bloomberg data - LOSDFOET Index

This data shows the total volume of BFOET crudes loaded by delivery month. The data set is based on data gathered by Bloomberg. Each field operator for Brent, Forties, Oseberg, Ekofisk and Troll releases the amount of crude oil that is scheduled for loading per month. The data has been split by field to show the underlying volume for each constitute grade going into the total BFOET volume by month.

	Brent	Forties	Oseberg	Ekofisk	Troll	Total BFOET
Jun-19	80,000	340,000	100,000	40000	160,000	720,000
Jul-19	116,129	309,677	116,129	290323	154,839	987,097
Aug-19	96,774	290,323	96,774	251613	154,839	890,323
Sep-19	80,000	240,000	100,000	260000	180,000	860,000
Oct-19	116,129	309,677	77,419	251613	209,677	964,515
Nov-19	80,000	260,000	100,000	280000	171,000	891,000
Dec-19	77,419	367,742	135,484	232258	145,161	958,064
Jan-20	58,065	367,742	96,774	270968	185,484	979,033
Feb-20	62,069	372,414	103,448	268966	144,828	951,725
Mar-20	96,774	348,387	96,774	232258	193,548	967,741
Apr-20	20,000	320,000	100,000	260000	100,000	800,000
May-20	58,065	309,677	96,774	270968	174,194	909,678
Jun-20	60,000	300,000	120,000	280000	120,000	880,000
Jul-20	96,774	329,032	96,774	212903	135,484	870,967
Aug-20	58,065	251,613	116,129	270968	135,484	832,259
Sep-20	60,000	220,000	100,000	260000	80,000	720,000
Oct-20	77,419	290,323	96,774	232258	135,484	832,258
Nov-20	60,000	280,000	80,000	220000	140,000	780,000
Dec-20	77,419	270,968	116,129	290323	135,484	890,323
Jan-21	77,419	270,968	96,774	270968	135,484	851,613
Feb-21	64,286	278,571	85,714	257143	150,000	835,714
Mar-21	58,065	251,613	96,774	251613	154,839	812,904
Apr-21	60,000	220,000	80,000	260000	80,000	700,000
May-21	38,710	174,194	96,774	270967.75	96,774	677,419
Jun-21	80,000	20,000	100,000	200000	160,000	560,000
Jul-21	38,710	251,613	96,774	251613	135,484	774,194
Aug-21	58,065	212,903	77,419	251613	135,484	735,484
Sep-21	60,000	200,000	80,000	240000	160,000	740,000
Oct-21	38,710	290,323	96,774	251613	154,839	832,259
Nov-21	40,000	260,000	80,000	260000	160,000	800,000
Dec-21	38,710	251,613	96,774	270968	96,774	754,839
Jan-22	58,065	270,968	96,774	232258	154,839	812,904
Feb-22	42,857	235,714	64,286	214286	150,000	707,143
Mar-22	58,065	251,613	96,744	232258	135,484	774,164
Apr-22	40,000	260,000	80,000	200000	100,000	680,000

May-22	58,065	232,258	96,774	212903	154,839	754,839
3-year average	65,023	269,720	96,215	244,545	143,621	819,124

Analysis of Spot-Month Position Limits

For the purposes of calculating compliance with position limits, the new contracts aggregate into two underlying legs, as outlined below:

WTI-Brent Trade Month Financial Futures contract aggregates into: the WTI Trade Month Futures contract (Commodity Code: TCS) and the Brent Crude Oil Futures contract (Commodity Code: BB). The spot month position limit for the underlying cash-settled WTI Trade Month Futures contract (Commodity Code: TCS) is 3,000 contracts for the final three days of trading for the expiring contract month. Based on the prior analysis for deliverable supply for WTI Cushing, the current spot month position limit of 3,000 contracts represents 5.8% of the total estimated monthly deliverable supply. The spot month position limit for the underlying cash-settled Brent Crude Oil Futures contract (Commodity Code: BB) is 5,000 contracts for the final three days of trading for the expiring contract month. Based on the foregoing analysis of deliverable supply for Brent Crude Oil, the current spot month position limit of 5,000 contracts represents 23.15% of the total estimated monthly deliverable supply.

WTI Houston (Argus) vs. Brent Cross Month Futures contract aggregates into: the WTI Houston (Argus) Trade Month Futures contract (Commodity Code: HTA) and the Brent Crude Oil Futures contract (Commodity Code: BB). The spot month position limit for the underlying cash-settled WTI Houston (Argus) Trade Month Futures contract (Commodity Code: HTA) is 3,000 contracts for the final three days of trading for the expiring contract month. Based on the prior analysis for deliverable supply for WTI Houston, the current spot month position limit of 3,000 contracts represents 3.79% of the total estimated monthly deliverable supply of 79.2 million barrels. The spot month position limit for the underlying cash-settled Brent Crude Oil Futures contract (Commodity Code: BB) is 5,000 contracts for the final three days of trading for the expiring contract month. The financially settled WTI Houston (Argus) vs. Brent Cross Month Futures contract expires prior to the spot period of its underlying core referenced futures contract Brent Crude Oil Futures contract. As such, Brent spot month position limits are not applicable.

WTI Midland (Argus) vs. Brent Cross Month Futures contract aggregates into: the WTI Midland (Argus) Trade Month Futures contract (Commodity Code: WTI) and the Brent Crude Oil Futures contract (Commodity Code: BB). The spot month position limit for the underlying cash-settled WTI Midland (Argus) Trade Month Futures contract (Commodity Code: HTA) is 3,000 contracts for the final three days of trading for the expiring contract month. Based on the prior analysis for deliverable supply for WTI Houston, the current spot month position limit of 3,000 contracts represents 4.7% of the total estimated monthly deliverable supply of 63.93 million barrels. The spot month position limit for the underlying cash-settled Brent Crude Oil Futures contract (Commodity Code: BB) is 5,000 contracts for the final three days of trading for the expiring contract month. The financially settled WTI Midland (Argus) vs. Brent Cross Month Futures contract expires prior to the spot period of its underlying core referenced futures contract Brent Crude Oil Futures contract. As such, Brent spot month position limits are not applicable.