

RESEARCH AND PRODUCT DEVELOPMENT

## Sour Crude Oil Products in the U.S. Gulf Coast

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CME GROUP ENERGY RESEARCH  
AND PRODUCT DEVELOPMENT

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As the world's largest and most diverse derivatives marketplace, CME Group is where the world comes to manage risk. CME Group exchanges offer the widest range of global benchmark products across all major asset classes, including futures and options based on interest rates, equity indexes, foreign exchange, energy, agricultural commodities, metals, weather and real estate. CME Group brings buyers and sellers together through its CME Globex electronic trading platform and its trading facilities in New York and Chicago. CME Group also operates CME Clearing, one of the largest central counterparty clearing services in the world, which provides clearing and settlement services for exchange-traded contracts, as well as for over-the-counter derivatives transactions through CME ClearPort. These products and services ensure that businesses everywhere can substantially mitigate counterparty credit risk in both listed and over-the-counter derivatives markets.

## ENERGY PRODUCTS

In 2008, NYMEX became part of CME Group. Together, we offer the most extensive and liquid energy complex in the world, including Light Sweet Crude Oil (WTI), Natural Gas (Henry Hub), petroleum and electricity products. Many of our contracts are benchmarks that set the price for these resources worldwide. From the world's largest industrial companies to financial institutions, our diverse universe of participants clear an average daily volume of 1.5 million energy contracts every day on CME Globex, through CME ClearPort or on our trading floor. And now that NYMEX is part of CME Group, the world's leading energy marketplace is growing even stronger.

CME Group is committed to providing a comprehensive choice to the industry to meet what may be an auspicious opportunity to forge an additional benchmark.

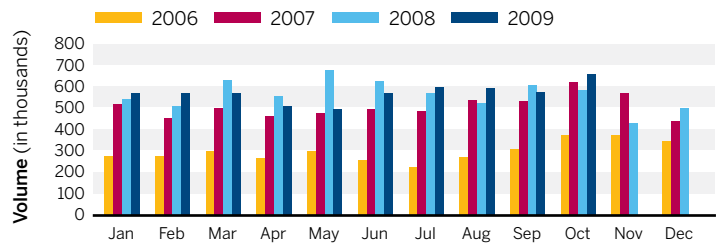
The Exchange is introducing several new products to satisfy the growing interest in a new sour crude oil benchmark in the U.S. Gulf Coast. Because the world oil industry has shown a capacity to embrace both physically delivered contracts as well as financially settled contracts, CME Group is committed to providing a comprehensive choice to the industry to meet what may be an auspicious opportunity to forge an additional benchmark. The new product slate features a physically delivered crude oil contract and four financially settled contracts. Our slate of U.S. Gulf Coast Sour Crude Oil contracts:

- Gulf Coast Sour Crude Oil Contract
- Argus Sour Crude Index (“ASCI”) Trade Month Swap Futures
- Argus Sour Crude Index (“ASCI”) vs. WTI Diff Spread Trade Month Swap Futures
- Argus Sour Crude Index (“ASCI”) Calendar Month Swap Futures
- Argus Sour Crude Index (“ASCI”) vs. WTI Diff Spread Calendar Month Swap Futures
- Argus WTI Formula Basis Calendar Month Swap Futures

## PHYSICALLY DELIVERED GULF COAST SOUR CRUDE OIL FUTURES

Starting on **December 7, 2009**, the Exchange will re-launch its Gulf Coast Sour Crude Oil futures, based on physical delivery of domestically produced Mars crude oil and two foreign sour crude oil streams at the Louisiana Offshore Oil Platform (LOOP) facility in Clovelly, Louisiana. In addition to Mars, the Exchange will allow delivery of two foreign crude oil streams, Basrah Light and Russian Urals. This new futures contract will be listed on CME Globex, and will feature inter-commodity spread trading with the Light Sweet Crude Oil (WTI) futures contract. Gulf Coast Sour Crude Oil futures will expire on the same day as the WTI futures contract, and will be linked to the powerful liquidity of the WTI futures contract.

## WTI FUTURES VOLUME



The U.S. Gulf Coast area of Texas and Louisiana is the key oil production and import hub for supplying most of the U.S. crude oil refining sector. The U.S. Gulf Coast crude oil market has a diverse group of commercial market participants, fluid interaction with other important regional markets, especially the U.S. Mid-continent market, and a strong existing base of market competition. The LOOP is the largest U.S. deepwater port and is the single largest point of entry for crude oil coming into the U.S. market. It receives and stores crude oil from supertankers, and domestic crude oil produced from the deepwater areas in the Gulf of Mexico. The LOOP terminal has upwards of 60 million barrels of storage capacity with pipeline connections to the refineries located in the U.S. Gulf Coast and Midwest areas.

## FINANCIALLY SETTLED ASCI SWAP FUTURES

The Exchange is introducing four new financially settled sour crude oil index products on **November 23, 2009**. These new contracts are based on the Argus Sour Crude Index (“ASCI”) which reflects the value of sour crude oil traded and delivered in the U.S. Gulf Coast market at a differential to the NYMEX settlement price for the nearest-to-delivery Light Sweet Crude Oil (WTI) futures contract<sup>1</sup>. Below, we describe what the ASCI Swap futures contract is, how it will be used, its relationship to WTI futures, and why this new contract, in concert with other new developments at CME Group, could be more successful than the previous efforts in introducing a U.S. Gulf Coast sour benchmark. Our ASCI Swap futures terminate through financial settlement based on the Argus’ ASCI. It is based on three different crude oil streams that are produced and traded in the U.S. Gulf: Mars, Poseidon and Southern Green Canyon. These streams are traded in the physical market at differentials to the NYMEX settlement price for the expiring month WTI futures contract, and that is how Argus collects the inputs for its ASCI. The ASCI is collected for each business day.

The ASCI reflects the value of sour crude oil traded in the U.S. Gulf Coast market.

Sour crude oil refers to the sulfur levels in the oil; if the content of sulfur is less than or equal to .5 percent, then the oil is considered sweet; if the content is greater than .5 percent, it is considered sour. In fact, the majority of the world’s oil reserves and production (about 70 percent of production) is sour crude oil and sulfur content is an important factor in determining the value of crude oil. Generally, but not always, the lower the sulfur content, all other things equal, the higher the value of the crude oil.

The four ASCI futures contracts that we’re introducing are structured as averages over the month; depending on the contract, the monthly averaging period differs. The most popular structure for crude oil transactions in the U.S. Gulf Coast crude oil market is the trade month index which is based on the North American crude oil pipeline scheduling cycle where the deadline for nominating pipeline space for the next calendar month is the 25th day of the month (or the first business day that precedes the 25th). Correspondingly, the trade month is from the 26th of the second preceding month through the 25th of the preceding month; i.e. the trade month for December is defined as October 26th through November 25th and the December trade month only includes December contract prices. The ASCI Trade Month Swap futures contract is calculated as the arithmetic daily average over the trade month. There is also an ASCI Differential Trade Month Swap futures contract being introduced; this contract is valued at the difference between the ASCI Trade Month Swap futures contract and the existing Argus Trade Month WTI Swap futures contract.

In addition to the Trade Month Swap futures contracts, we’re also listing two Calendar Month Swap futures contracts. The ASCI Calendar Month Swap futures contract is calculated as the arithmetic average of ASCI over the current calendar month – i.e. the November Calendar Month is from November 1st through November 30th but it includes December prices for the part of the month up to the expiration of the December Light Sweet Crude Oil (WTI) futures contract and January prices for the remainder of the month; in other words, it includes the nearest-to-delivery contract prices for each day of November. The ASCI Differential Calendar Month Swap futures are the difference between the ASCI Calendar Month Swap futures and the (also new) Argus WTI Formula Basis Swap futures contracts. The precise calculation of the ASCI is available from Argus at the following Web site: [www.argusmedia.com/methodology](http://www.argusmedia.com/methodology).

## HOW OUR ASCI SWAP FUTURES CONTRACTS CAN BE USED

In a White paper on the ASCI, Argus describes its process as:

**Index differential:** Argus collects and confirms all spot trades for Mars, Poseidon, and Southern Green Canyon during the entire trading day, and creates an average price weighted by the individual volume of each deal.

**WTI:** Argus uses the NYMEX WTI futures settlement price as the fixed price basis for the ASCI during the trade month prior to the expiration of the WTI futures contract, and uses the WTI cash (physical) Cushing market value for the days following the expiration, which is also linked to the WTI futures settlement price. This is known as the “WTI Formula Basis.”

**Index Price:** The weighted-average differential for the three crude streams is added to the WTI Formula Basis price to arrive at the final Index Price.

The ASCI is designed to capture the average differential each day between a composite for sour crude oil in the U.S. Gulf and WTI, which is a sweet crude oil stream, delivered in the U.S. Mid-continent. Recently, Saudi Aramco, a major seller of crude oil into the U.S. Gulf, announced that it had reached agreement with its term contract buyers in the U.S. Gulf to use the ASCI as a base for pricing its sales into the U.S. Gulf Coast market commencing with January 2010 deliveries. Prior to this, there were no public endorsements by physical market participants of any composite index for sales and purchases of sour crude oil in the U.S. Gulf; sales and purchases were typically as differentials to the WTI futures market price in some form. In the case of Aramco, they were not reported to be using the NYMEX settlement previously. By adopting the ASCI as their direct base, they will, presumably, be selling at a differential to the ASCI which, as indicated, is constructed as a differential to WTI futures settlement prices.

The ASCI Swap futures contracts will accommodate market participants who wish to either hedge or otherwise lock-in a transaction at a set value for the ASCI. Such participants include those who either already have or anticipate having floating-price risk with respect to the ASCI either as a seller or buyer. In addition to market positions with direct exposure to the ASCI index, ASCI Swap futures can be used to hedge transactions for individual crude streams such as its component streams, Mars, Poseidon and Southern Green Canyon. This introduces basis risk for these transactions but may, nonetheless, reduce the overall risk associated with these transactions. Since the inception of the ASCI earlier this year in May, the correlation between the ASCI and each of these crude stream prices has been:

<b>Mars</b>	<b>99.89%</b>
<b>Poseidon</b>	<b>99.83%</b>
<b>Southern Green Canyon</b>	<b>99.43%</b>

ASCI Swap futures can also be used for spread trading, in particular the sweet-sour spread which would involve a combination of buying WTI futures and selling ASCI futures or selling WTI futures and buying ASCI futures. Currently, the only available sweet-sour futures contract spreads to trade in the world involve spreads between contracts that are geographically remote from each other. This introduces a futures spread between crude streams from neighboring locations and markets that compete with each other. This spread would be very valuable for the world oil market.

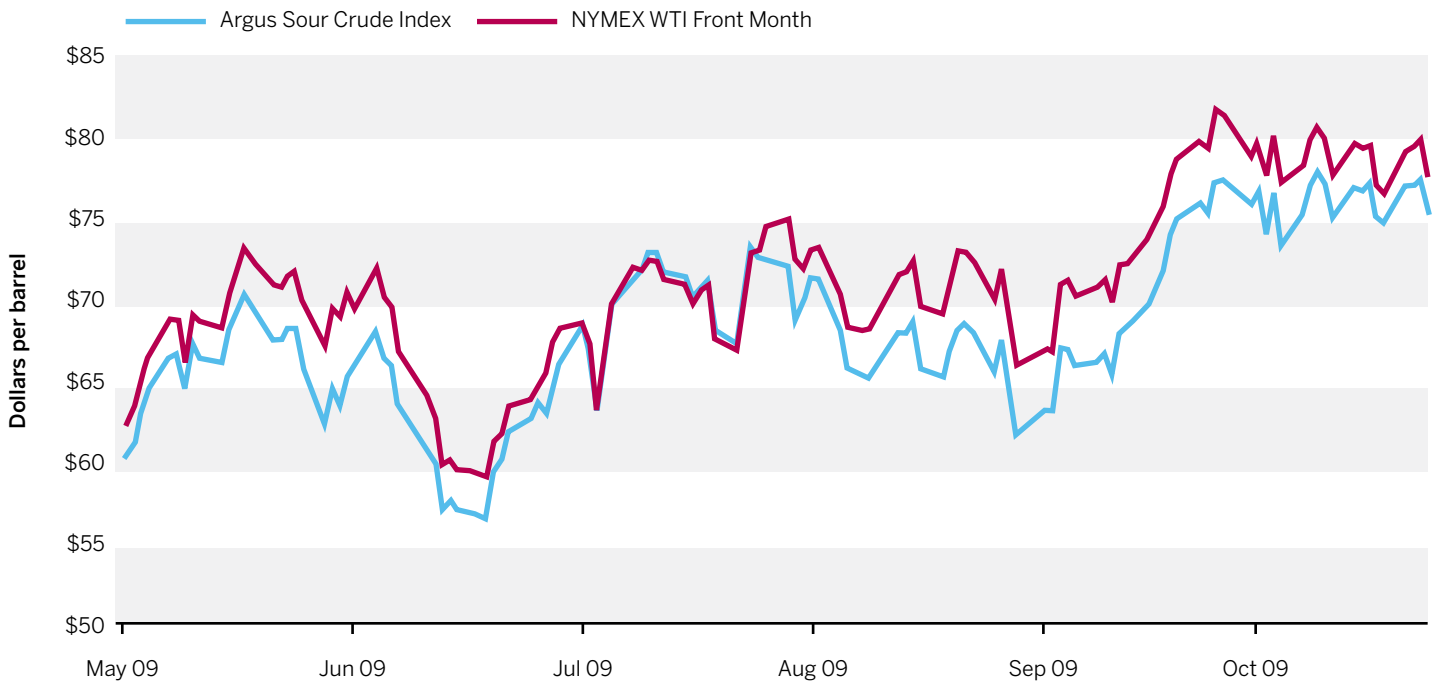
## THE RELATIONSHIP BETWEEN OUR ASCI SWAP FUTURES CONTRACTS AND OUR LIGHT SWEET CRUDE OIL (WTI) FUTURES CONTRACT

One of the questions that may arise with the introduction of ASCI Swap futures and use in physical-market transactions is what, if any, is the relationship between ASCI Swap futures and Light Sweet Crude Oil (WTI) futures; could ASCI Swap futures be a substitute for Light Sweet Crude Oil (WTI) futures? Overall, the relationship is synergistic. Initially, ASCI Swap futures will need to lean on WTI futures market liquidity to develop its own liquidity but, once ASCI liquidity does develop, spread-trading, cross-hedging and arbitrage between the two markets will grow hand-in-hand.

From a technical point of view, the mathematical base for the ASCI is the Light Sweet Crude Oil (WTI) futures settlement price for the nearest-to-delivery contract; the ASCI is, after all, constructed as a differential to NYMEX Light Sweet Crude Oil (WTI) futures settlement. But the inter-relationship is not simply technical. Virtually all of the crude oil delivered into North America is priced as a differential to WTI in some form, most as a differential to the WTI futures settlement price.

As the most liquid and transparent market for crude oil in the world, Light Sweet Crude Oil (WTI) futures also casts a strong, direct influence on all international pricing as well as an indirect influence through trading. The forward curve for world oil prices is essentially defined by NYMEX Light Sweet Crude Oil (WTI) futures prices as is the measure of market uncertainty (expected volatility) by the NYMEX Light Sweet Crude Oil (WTI) options market.

### ARGUS SOUR CRUDE INDEX VS. NYMEX WTI FUTURES



## PROSPECTS FOR U.S. GULF COAST SOUR BENCHMARK

It is an ambitious goal to introduce new benchmarks to the world's crude oil market. In terms of U.S. Gulf Coast sour crude oil, this has been attempted previously without sustained success. NYMEX, prior to becoming a part of CME Group, had introduced both physically delivered and financially settled U.S. Gulf Coast sour crude oil futures contracts starting back in 1991 and continuing into this decade. Each previous effort had its promise and industry support, but not enough of each to succeed.

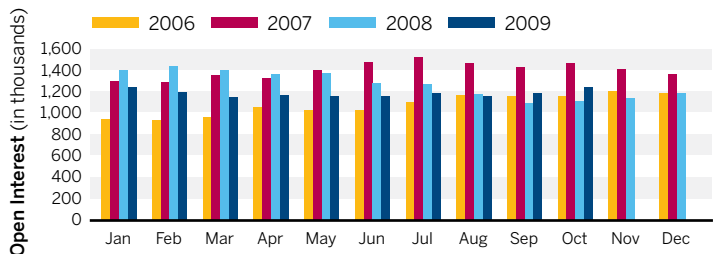
What is different about this effort is the public endorsement of a mechanism by a major producer and its buyers. Each of the previous efforts did not achieve this in spite of having active industry support in both the development of market mechanisms and the launch of related futures contracts. The support voiced so far, as significant as it is, is still seeking additional support from the industry. If and when that support is forthcoming, it could make the difference in providing the traction necessary to start the benchmark-liquidity process. In its White paper on *ASCI*, Argus directly recognized the essential role of Light Sweet Crude Oil (WTI) futures to support this process:

The *ASCI* is also undergirded by the breadth and depth of the WTI market. The trades which are averaged into the index are transacted as differentials to WTI and so embed the value of the WTI futures market, the most robust crude hedging vehicle available. The index is not looking to replace WTI as a fixed price benchmark, but instead works in conjunction with other markets to provide a tool for valuing sour crude at the U.S. Gulf coast.

Experience in energy commodity markets imparts that, whenever there is an attempt to launch a new contract, especially one with benchmark potential, it draws upon the force and liquidity associated with existing benchmarks to grow and become established. The existing benchmark is used at first as a firm, dependable foundation by which to support the initial trading activity and manage the risks associated with a less liquid fledgling instrument. As a new instrument becomes more active, the use of the existing benchmark slowly evolves from one of liquidity and risk-management supporter to, ultimately, one of partner in liquidity. When this occurs, the resulting market benefits include even greater increases in liquidity that support advances in risk management, including fine tuning in the management of basis risk.

The *ASCI* is also undergirded by the breadth and depth of the WTI market.

### WTI OPEN INTEREST



## GULF COAST SOUR CRUDE OIL FUTURES CONTRACT SPECIFICATIONS

FUTURES	
Product Symbol	MB
Venue	CME Globex, CME ClearPort, Open Outcry (New York)
Hours All times listed are New York time	<b>CME Globex/CME ClearPort:</b> Sunday – Friday 6:00 p.m. – 5:15 p.m. (5:00 p.m. – 4:15 p.m. Chicago Time/CT) with a 45-minute break each day beginning at 5:15 p.m. (4:15 p.m. CT) <b>Open Outcry:</b> Monday – Friday 9:00 a.m. to 2:30 p.m. (8:00 a.m. to 1:30 p.m. CT)
Contract Unit	1,000 barrels
Price Quotation	U.S. dollars and cents per barrel
Minimum Fluctuation	\$0.01 per barrel
Settlement Price	Physical delivery will be based on the Final Settlement Price on the last day of trading. The physical delivery obligation is based on MARS-type crude oil at the Louisiana Offshore Oil Port LLC (LOOP) facilities in Clovelly, Louisiana. Alternate delivery of Basrah Light and Russian Urals will be permitted at fixed differentials. The contract will be available for trading as an inter-commodity spread to WTI on CME Globex, using the MB:CL spread code.
Termination of Trading	Trading in the current delivery month shall cease on the third business day prior to the 25th calendar day of the month preceding the delivery month. If the 25th calendar day of the month is a non-business day, trading shall cease on the third business day prior to the last business day preceding the 25th calendar day. In the event that the official Exchange holiday schedule changes subsequent to the listing of a Crude Oil futures contract, the originally listed expiration date shall remain in effect.
Listed Contracts	36 consecutive months
Settlement Type	Physical with delivery at LOOP Facility in Clovelly, LA
Rulebook Chapter	506
Exchange Rule	These contracts are listed with, and subject to, the rules and regulations of NYMEX.

## ARGUS SOUR CRUDE INDEX (“ASCI”) TRADE MONTH SWAP FUTURES CONTRACT SPECIFICATIONS

SWAP FUTURES	
Product Symbol	29
Venue	CME ClearPort, Open Outcry (New York)
Hours All times listed are New York time	<b>CME ClearPort:</b> Sunday – Friday 6:00 p.m. – 5:15 p.m. (5:00 p.m. – 4:15 p.m. CT) with a 45-minute break each day beginning at 5:15 p.m. (4:15 p.m. CT) <b>Open Outcry:</b> Monday – Friday 9:00 a.m. to 2:30 p.m. (8:00 a.m. to 1:30 p.m. CT)
Contract Unit	1,000 barrels
Price Quotation	U.S. dollars and cents per barrel
Minimum Fluctuation	\$0.01 per barrel
Floating Price	The Floating Price for each contract month is equal to the arithmetic average of the outright index price from Argus Media for the Argus Sour Crude Index (“ASCI”) for the Trade month period beginning 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 holiday, the Trade month period shall end on the first business day prior to the 25th calendar day.
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 holiday, trading shall cease on the first business day prior to the 25th calendar day.
Listed Contracts	36 consecutive months
Settlement Type	Financial
Rulebook Chapter	221
Exchange Rule	These contracts are listed with, and subject to, the rules and regulations of NYMEX.

## ARGUS SOUR CRUDE INDEX (“ASCI”) VS. WTI DIFF SPREAD TRADE MONTH SWAP FUTURES CONTRACT SPECIFICATIONS

SWAP FUTURES	
Product Symbol	36
Venue	CME ClearPort, Open Outcry (New York)
Hours All times listed are New York time	<b>CME ClearPort:</b> Sunday – Friday 6:00 p.m. – 5:15 p.m. (5:00 p.m. – 4:15 p.m. CT) with a 45-minute break each day beginning at 5:15 p.m. (4:15 p.m. CT) <b>Open Outcry:</b> Monday – Friday 9:00 a.m. to 2:30 p.m. (8:00 a.m. to 1:30 p.m. CT)
Contract Unit	1,000 barrels
Price Quotation	U.S. dollars and cents per barrel
Minimum Fluctuation	\$0.01 per barrel
Floating Price	The Floating Price for each contract month is equal to the arithmetic average of the Argus Sour Crude Index (“ASCI”) differential (Diff) price for the front month from Argus Media, which is based on the ASCI price minus the WTI Formula Basis price, for the Trade month period beginning 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 holiday, the Trade month period shall end on the first business day prior to the 25th calendar day.
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 holiday, trading shall cease on the first business day prior to the 25th calendar day.
Listed Contracts	36 consecutive months
Settlement Type	Financial
Rulebook Chapter	222
Exchange Rule	These contracts are listed with, and subject to, the rules and regulations of NYMEX.

## ARGUS SOUR CRUDE INDEX (“ASCI”) CALENDAR MONTH SWAP FUTURES CONTRACT SPECIFICATIONS

SWAP FUTURES	
Product Symbol	37
Venue	CME ClearPort, Open Outcry (New York)
Hours All times listed are New York time	<b>CME ClearPort:</b> Sunday – Friday 6:00 p.m. – 5:15 p.m. (5:00 p.m. – 4:15 p.m. CT) with a 45-minute break each day beginning at 5:15 p.m. (4:15 p.m. CT) <b>Open Outcry:</b> Monday – Friday 9:00 a.m. to 2:30 p.m. (8:00 a.m. to 1:30 p.m. CT)
Contract Unit	1,000 barrels
Price Quotation	U.S. dollars and cents per barrel
Minimum Fluctuation	\$0.01 per barrel
Floating Price	The Floating Price for each contract month is equal to the arithmetic average of the Argus Sour Crude Index (“ASCI”) (1st month) outright price from Argus Media for each business day that it is determined during the contract month.
Termination of Trading	Trading shall cease at the close of trading on the last business day of the contract month.
Listed Contracts	36 consecutive months
Settlement Type	Financial
Rulebook Chapter	223
Exchange Rule	These contracts are listed with, and subject to, the rules and regulations of NYMEX.

## ARGUS SOUR CRUDE INDEX (“ASCI”) VS. WTI DIFF SPREAD CALENDAR MONTH SWAP FUTURES CONTRACT SPECIFICATIONS

SWAP FUTURES	
Product Symbol	38
Venue	CME ClearPort, Open Outcry (New York)
Hours All times listed are New York time	<b>CME ClearPort:</b> Sunday – Friday 6:00 p.m. – 5:15 p.m. (5:00 p.m. – 4:15 p.m. CT) with a 45-minute break each day beginning at 5:15 p.m. (4:15 p.m. CT) <b>Open Outcry:</b> Monday – Friday 9:00 a.m. to 2:30 p.m. (8:00 a.m. to 1:30 p.m. CT)
Contract Unit	1,000 barrels
Price Quotation	U.S. dollars and cents per barrel
Minimum Fluctuation	\$0.01 per barrel
Floating Price	The Floating Price for each contract month is equal to the arithmetic average of the Argus Sour Crude Index (“ASCI”) differential (Diff) price for the front month from Argus Media, which is based on the ASCI price minus the WTI Formula Basis price, for each business day that both are determined during the contract month.
Termination of Trading	Trading shall cease at the close of trading on the last business day of the contract month.
Listed Contracts	36 consecutive months
Settlement Type	Financial
Rulebook Chapter	224
Exchange Rule	These contracts are listed with, and subject to, the rules and regulations of NYMEX.

## ARGUS WTI FORMULA BASIS CALENDAR MONTH SWAP FUTURES CONTRACT SPECIFICATIONS

SWAP FUTURES	
Product Symbol	39
Venue	CME ClearPort, Open Outcry (New York)
Hours All times listed are New York time	<b>CME ClearPort:</b> Sunday – Friday 6:00 p.m. – 5:15 p.m. (5:00 p.m. – 4:15 p.m. CT) with a 45-minute break each day beginning at 5:15 p.m. (4:15 p.m. CT) <b>Open Outcry:</b> Monday – Friday 9:00 a.m. to 2:30 p.m. (8:00 a.m. to 1:30 p.m. CT)
Contract Unit	1,000 barrels
Price Quotation	U.S. dollars and cents per barrel
Minimum Fluctuation	\$0.01 per barrel
Floating Price	The Floating Price for each contract month is equal to the arithmetic average of the WTI (1st month) average price under the heading “WTI Formula Basis” from Argus Media for each business day that it is determined during the contract month.
Termination of Trading	Trading shall cease at the close of trading on the last business day of the contract month.
Listed Contracts	36 consecutive months
Settlement Type	Financial
Rulebook Chapter	225
Exchange Rule	These contracts are listed with, and subject to, the rules and regulations of NYMEX.

For more information on U.S. Gulf Coast Sour Crude products please visit [www.cmegroup.com/energy](http://www.cmegroup.com/energy) or contact one of our local offices.

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