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ARGUS PETROLEUM TRANSPORTATION NORTH AMERICA

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The most up-to-date Argus Petroleum Transportation North America methodology is available on www.argusmedia.com

Methodology overview

Methodology rationale

Argus strives to construct methodologies that reflect the way the market trades. Argus aims to produce price assessments which are reliable and representative indicators of commodity market values and are free from distortion. As a result, the specific currencies, volume units, locations and other particulars of an assessment are determined by industry conventions.

In the North American petroleum transportation markets, Argus publishes physical market prices in the open market as laid out in the specifications and methodology guide. Argus uses the trading period deemed by Argus to be most appropriate, in consultation with industry, to capture market liquidity.

In order to be included in the assessment process, deals must meet the minimum volume, delivery, timing and specification requirements in our methodology. In illiquid markets, and in other cases where deemed appropriate, Argus assesses the range within which product could have traded by applying a strict process outlined later in this methodology.

Survey process

Argus price assessments are informed by information received from a wide cross section of market participants, including producers, consumers and intermediaries. Argus reporters engage with the industry by proactively polling participants for market data. Argus will contact and accept market data from all credible market sources including front and back office of market participants and brokers. Argus will also receive market data from electronic trading platforms and directly from the back offices of market participants. Argus will accept market data by telephone, instant messenger, email or other means.

Argus encourages all sources of market data to submit all market data to which they are a party that falls within the Argus stated methodological criteria for the relevant assessment. Argus encourages all sources of market data to submit transaction data from back office functions.

Throughout all markets, Argus is constantly seeking to increase the number of companies willing to provide market data. Reporters are mentored and held accountable for expanding their pool of contacts. The number of entities providing market data can vary significantly from day to day based on market conditions.

For certain price assessments identified by local management, if more than 50pc of the market data involved in arriving at a price assessment is sourced from a single party the supervising editor will engage in an analysis of the market data with the primary reporter to ensure that the quality and integrity of the assessment has not been affected.

Market data usage

In each market, Argus uses the methodological approach deemed to be the most reliable and representative for that market. Argus will utilise various types of market data in its methodologies, to include:

- Transactions
- Bids and offers
- Other market information, to include spread values between grades, locations, timings, and many other data.

In many markets, the relevant methodology will assign a relatively higher importance to transactions over bids and offers, and a relatively higher importance to bids and offers over other market information. Certain markets however will exist for which such a hierarchy would produce unreliable and non-representative price assessments, and so the methodology must assign a different relative importance in order to ensure the quality and integrity of the price assessment. And even in markets for which the hierarchy normally applies, certain market situations will at times emerge for which the strict hierarchy would produce non-representative prices, requiring Argus to adapt in order to publish representative prices.

Verification of transaction data

Reporters carefully analyse all data submitted to the price assessment process. These data include transactions, bids, offers, volumes, counterparties, specifications and any other information that contributes materially to the determination of price. This high level of care described applies regardless of the methodology employed. Specific to transactions, bids, and offers, reporters seek to verify the price, the volume, the specifications, location basis, and counterparty. In some transactional average methodologies, reporters also examine the full array of transactions to match counterparties and arrive at a list of unique transactions. In some transactional average methodologies, full details of the transactions verified are published electronically and are accessible by subscribers.

Several tests are applied by reporters in all markets to transactional data to determine if it should be subjected to further scrutiny. If a transaction has been identified as failing such a test, it will receive further scrutiny. For assessments used to settle derivatives and for many other assessments, Argus has established internal procedures that involve escalation of inquiry within the source's company and escalating review within Argus management. Should this process determine that a transaction should be excluded from the price assessment process, the supervising editor will initiate approval and, if necessary, documentation procedures.

Primary tests applied by reporters

- Transactions not transacted at arm's length, including deals between related parties or affiliates.
- Transaction prices that deviate significantly from the mean of all transactions submitted for that day.
- Transaction prices that fall outside of the generally observed lows and highs that operated throughout the trading day.
- Transactions that are suspected to be a leg of another transaction or in some way contingent on an unknown transaction.
- Single deal volumes that significantly exceed the typical transaction volume for that market.
- Transaction details that are identified by other market participants as being for any reason potentially anomalous and perceived by Argus to be as such.

- Transaction details that are reported by one counterparty differently than the other counterparty.
- Any transaction details that appear to the reporter to be illogical or to stray from the norms of trading behaviour. This could include but is not limited to divergent specifications, unusual delivery location and counterparties not typically seen.
- Transactions that involve the same counterparties, the same price and delivery dates are checked to see that they are separate deals and not one deal duplicated in Argus records.

Secondary tests applied by editors for transactions identified for further scrutiny

Transaction tests

- The impact of linkage of the deal to possible other transactions such as contingent legs, exchanges, options, swaps, or other derivative instruments. This will include a review of transactions in markets that the reporter may not be covering.
- The nature of disagreement between counterparties on transactional details.
- The possibility that a deal is directly linked to an offsetting transaction that is not publicly known, for example a “wash trade” which has the purpose of influencing the published price.
- The impact of non-market factors on price or volume, including distressed delivery, credit issues, scheduling issues, demurrage, or containment.

Source tests

- The credibility of the explanation provided for the outlying nature of the transaction.
- The track record of the source. Sources will be deemed more credible if they
 - Regularly provide transaction data with few errors.
 - Provide data by Argus’ established deadline.
 - Quickly respond to queries from Argus reporters.
 - Have staff designated to respond to such queries.
- How close the information receipt is to the deadline for information, and the impact of that proximity on the validation process.

Assessment guidelines

When insufficient, inadequate, or no transaction information exists, or when Argus concludes that a transaction based methodology will not produce representative prices, Argus reporters will make an assessment of market value by applying intelligent judgment based on a broad array of factual market information. Reporters must use a high degree of care in gathering and validating all market data used in determining price assessments, a degree of care equal to that applying to gathering and validating transactions. The information used to form an assessment could include deals done, bids, offers, tenders, spread trades, exchange trades, fundamental supply and demand information and other inputs.

The assessment process employing judgment is rigorous, replicable, and uses widely accepted valuation metrics. These valuation metrics mirror the process used by physical commodity traders

to internally assess value prior to entering the market with a bid or offer. Applying these valuation metrics along with sound judgment significantly narrows the band within which a commodity can be assessed, and greatly increases the accuracy and consistency of the price series. The application of judgment is conducted jointly with the supervising editor, in order to be sure that guidelines below are being followed. Valuation metrics include the following:

Relative value transactions

Frequently transactions occur which instead of being an outright purchase or sale of a single commodity, are instead exchanges of commodities. Such transactions allow reporters to value less liquid markets against more liquid ones and establish a strong basis for the exercise of judgment.

- Exchange one commodity for a different commodity in the same market at a negotiated value.
- Exchange delivery dates for the same commodity at a negotiated value.
- Exchange a commodity in one location for the same commodity at another location at a negotiated value.

Bids and offers

If a sufficient number of bids and offers populate the market, then in most cases the highest bid and the lowest offer can be assumed to define the boundaries between which a deal could be transacted.

Comparative metrics

The relative values between compared commodities are readily discussed in the market and can be discovered through dialogue with market participants. These discussions are the precursor to negotiation and conclusion of transactions.

- Comparison to the same commodity in another market centre.
- Comparison to a more actively traded but slightly different specification commodity in the same market centre.
- Comparison to the same commodity traded for a different delivery timing.
- Comparison to the commodity’s primary feedstock or primary derived product(s).
- Comparison to trade in the same commodity but in a different modality (as in barge versus oceangoing vessel) or in a different total volume (as in full cargo load versus partial cargo load).

Volume minimums and transaction data thresholds

Argus typically does not establish thresholds strictly on the basis of a count of transactions, as this could lead to unreliable and non-representative assessments and because of the varying transportation infrastructure found in all commodity markets. Instead, minimum volumes are typically established which may apply to each transaction accepted, to the aggregate of transactions, to transactions which set a low or high assessment or to other volumetrically relevant parameters.

For price assessments used to settle derivatives, Argus will seek to establish minimum transaction data thresholds and when no such

threshold can be established Argus will explain the reasons. These thresholds will often reflect the minimum volumes necessary to produce a transaction-based methodology, but may also establish minimum deal parameters for use by a methodology that is based primarily on judgment.

Should no transaction threshold exist, or should submitted data fall below this methodology's stated transaction data threshold for any reason, Argus will follow the procedures outlined elsewhere in this document regarding the exercise of judgment in the price assessment process.

Transparency

Argus values transparency in energy markets. As a result, where available, we publish lists of deals in our reports that include price, basis, counterparty and volume information. The deal tables allow subscribers to cross check and verify the deals against the prices. Argus feels transparency and openness is vital to developing confidence in the price assessment process.

Swaps and forwards markets

Argus publishes forward assessments for numerous markets. These include forward market contracts that can allow physical delivery and swaps contracts that swap a fixed price for the average of a floating published price. Argus looks at forward swaps to inform physical assessments but places primary emphasis on the physical markets.

Publications and price data

Argus North American petroleum transportation prices are published in the Argus Petroleum Transportation North America report. Subsets of these prices appear in other Argus market reports and newsletters in various forms. The price data are available independent of the text-based report in electronic files that can feed into various databases. These price data are also supplied through various third-party data integrators. The Argus website also provides access to prices, reports and news with various web-based tools. All Argus prices are kept in a historical database and available for purchase. Contact your local Argus office for information.

A publication schedule is available at www.argusmedia.com

Corrections to assessments

Argus will on occasion publish corrections to price assessments after the publication date. We will correct errors that arise from clerical mistakes, calculation errors, or a misapplication of our stated methodology. Argus will not retroactively assess markets based on new information learned after the assessments are published. We make our best effort to assess markets based on the information we gather during the trading day assessed.

Ethics and compliance

Argus operates according to the best practices in the publishing field, and maintains thorough compliance procedures throughout the firm. We want to be seen as a preferred provider by our sub-scribers, who are held to equally high standards, while at the same time maintaining our editorial integrity and independence. Argus has a strict

ethics policy that applies to all staff. The policy can be found on our website at www.argusmedia.com. Included in this policy are restrictions against staff trading in any energy commodity or energy related stocks, and guidelines for accepting gifts. Argus also has strict policies regarding central archiving of email and instant messenger communication, maintenance and archiving of notes, and archiving of spreadsheets and deal lists used in the price assessment process. Argus publishes prices that report and reflect prevailing levels for open-market arms length transactions (please see the [Argus Global Compliance Policy](#) for a detailed definition of arms length).

Consistency in the assessment process

Argus recognises the need to have judgment consistently applied by reporters covering separate markets, and by reporters replacing existing reporters in the assessment process. In order to ensure this consistency, Argus has developed a programme of training and oversight of reporters. This programme includes:

- A global price reporting manual describing among other things the guidelines for the exercise of judgment
- Cross-training of staff between markets to ensure proper holiday and sick leave backup. Editors that float between markets to monitor staff application of best practices
- Experienced editors overseeing reporting teams are involved in daily mentoring and assisting in the application of judgment for illiquid markets
- Editors are required to sign-off on all price assessments each day, thus ensuring the consistent application of judgment.

Review of methodology

The overriding objective of any methodology is to produce price assessments which are reliable and representative indicators of commodity market values and are free from distortion. As a result, Argus editors and reporters are regularly examining our methodologies and are in regular dialogue with the industry in order to ensure that the methodologies are representative of the market being assessed. This process is integral with reporting on a given market. In addition to this ongoing review of methodology, Argus conducts reviews of all of its methodologies and methodology documents on at least an annual basis.

Argus market report editors and management will periodically and as merited initiate reviews of market coverage based on a qualitative analysis that includes measurements of liquidity, visibility of market data, consistency of market data, quality of market data and industry usage of the assessments. Report editors will review:

- Appropriateness of the methodology of existing assessments
- Termination of existing assessments
- Initiation of new assessments.

The report editor will initiate an informal process to examine viability. This process includes:

- Informal discussions with market participants
- Informal discussions with other stakeholders
- Internal review of market data

Should changes, terminations, or initiations be merited, the report editor will submit an internal proposal to management for review and approval. Should changes or terminations of existing assessments be approved, then formal procedures for external consultation are begun.

Changes to methodology

Formal proposals to change methodologies typically emerge out of the ongoing process of internal and external review of the methodologies. Formal procedures for external consultation regarding material changes to existing methodologies will be initiated with an announcement of the proposed change published in the relevant Argus report. This announcement will include:

- Details on the proposed change and the rationale
- Method for submitting comments with a deadline for submissions
- For prices used in derivatives, notice that all formal comments will be published after the given consultation period unless submitter requests confidentiality.

Argus will provide sufficient opportunity for stakeholders to analyse and comment on changes, but will not allow the time needed to follow these procedures to create a situation wherein unrepresentative or false prices are published, markets are disrupted, or market participants are put at unnecessary risk. Argus will engage with industry throughout this process in order to gain acceptance of proposed changes to methodology. Argus cannot however guarantee universal acceptance and will act for the good order of the market and ensure the continued integrity of its price assessments as an overriding objective.

Following the consultation period, Argus management will commence an internal review and decide on the methodology change. This will be followed by an announcement of the decision, which will be published in the relevant Argus report and include a date for implementation. For prices used in derivatives, publication of stakeholders' formal comments that are not subject to confidentiality and Argus' response to those comments will also take place.

Introduction

Argus Media publishes market reports and business intelligence on a wide range of energy markets and related markets, including rates for seaborne freight, rail service and surcharges, barge transportation, and lease rates for tank cars and other freight infrastructure.

Rail transportation rates

Argus publishes prices that reflect prevailing levels for transportation of petroleum commodities in specified rail lanes, assessing rates separately for manifest and unit trains (see table).

Manifest train:	Crude: 99 cars maximum Ethanol/refined products: 74 cars maximum
Unit train:	Crude: 100 cars minimum Ethanol/refined products: 75 cars minimum
Tank car carrying capacity:	Light crude or dilbit: 660 bl Heavy crude: 540 bl Ethanol/refined products: 28,000 USG (666.67 bl) Natural gas liquids: 25,000 USG (595.24 bl)

At the beginning of each calendar month, Argus will assess rail rates that will apply for shipments made in the next calendar month. A shipment begins when the volume is delivered to the railroad for transport. These rates will be updated each month in the first weekly issue of *Argus Petroleum Transportation North America*. For example, in early August, Argus will publish rates for petroleum shipments moving in September.

Crude transportation rates reflect transportation in railcars that meet at least one of two design standards — CPC-1232 or DOT-117.

Ethanol and refined products rail transportation rates reflect transportation in railcars that meet DOT-111. LPG rail transportation rates reflect transportation in pressurized tank cars that meet DOT-112.

Base rail rate

The rail rate is comprised of two components, the base rail rate and the fuel surcharge. Argus surveys the market to arrive at the month-ahead base rail rate and then applies the relevant fuel surcharge for the month ahead. The fuel surcharge is available at the beginning of each calendar month. Argus uses spot rates in compiling assessments and does not include long term contracts. For Canadian crude-by-rail rates, prices for routes originating in Alberta and destined for the US Gulf are assessed according to group-areas, which combine multiple origin points into a group origin (Alberta) and multiple destination points into a group destination (US Gulf coast).

Rail tariffs are not the only component in the price formation process. When the route indicated in tariff pricing falls outside the specific origin-destination lanes assessed by Argus, mileage differences are

taken into account in normalizing the rates to the specified lane. In addition to tariff information, Argus collects information from a broad array of market participants in determining rates. Tariff information alone may represent only the ask side of the market as published tariffs are the railroads' starting point in a rate negotiation. If certain routes are illiquid during the assessment period, Argus will use the industry survey for similar moves along other routes in determining how those rail rate assessments should change.

Rail rates assessed, US and Canada

Origin	Destination
Crude	
North Dakota	Chicago
North Dakota	St James
North Dakota	Houston
North Dakota	Bakersfield, CA
North Dakota	Seattle
North Dakota	Philadelphia
North Dakota	New York Harbor
Alberta	Stockton, CA
Alberta	Seattle
Alberta	US Gulf coast
Cheyenne	Stockton, CA
Ethanol	
Omaha	Chicago
Omaha	Houston
Omaha	Phoenix
Omaha	Bakersfield, CA
Omaha	Stockton, CA
Omaha	Seattle
Chicago	Houston
Chicago	New York
Refined products	
Houston	San Luis Potosi
Houston	Monterrey
Corpus Christi	San Luis Potosi
Natural gas liquids (Y-Grade)	
Edmonton	Conway
West Texas	Mont Belvieu
North Dakota	Conway
Natural gas liquids (LPG)	
Western Pennsylvania	Chicago
Western Pennsylvania	New York
Houston	New York
Houston	San Luis Potosi
Western Pennsylvania	San Luis Potosi
Edmonton	San Luis Potosi

Argus rail rate assessments do not incorporate costs for the purchase or lease of railcars, or the fees associated with equipment handling. Rates are not reflective of equipment ownership and are solely the cost of transport for the routes in question. Argus separately assesses the cost of leasing tank cars.

Fuel surcharges

Diesel fuel surcharges are levied on shippers by railroads and Argus rail rates include these surcharges. The Class I railroads assess fuel surcharges using a mileage-based system, although some contracts base fuel surcharges on the underlying base rail rate. The mileage-based rate is calculated by multiplying the applicable fuel surcharge by the number of miles per carload. Each carrier has a different price at which surcharges begin to accrue, indicating when the surcharge goes into effect, and surcharge levels change in correlation to the price of diesel.

The fuel surcharge is based on a monthly average of EIA on-highway diesel prices. Each railroad uses that price to arrive at their fuel surcharges and publishes the surcharge on their websites. Argus converts the rates into dollars per barrel.

Switching and accessorial charges

Argus rates for petroleum transportation do not include switching and terminal fees assessed by switching carriers that serve shipper origin or destination facilities. These most often occur in the metropolitan terminal areas of Houston, New Orleans and Chicago. Rates to these destinations are for delivery to a terminal or industry served by a Class I railroad.

Argus assessments make no allocation in the rate shown for demurrage charges shippers may incur. The sporadic and irregular pattern of these charges makes it difficult to assess a blanket cost per railcar, even though some shippers may find their shipments subject to demurrage fees.

Rail tank car leasing rates

Argus publishes lease rates for six types of railcar:

- CPC-1232 (non-pressurized)
- DOT-111 (non-pressurized)
- DOT-117 (non-pressurized)
- Pressurized
- Coiled and insulated (non-asphalt)
- Coiled and insulated (asphalt)

Lease rate assessments are of the price in US dollars of leasing a single car for a month over a named term. Assessments do not include fuel surcharges. Argus assesses full-serve lease rates, which include all maintenance and repair costs.

At the beginning of each calendar month, Argus will assess lease rates that will apply for shipments made in the next calendar month. These rates will be updated each month in the first weekly issue of *Argus Petroleum Transportation North America*. For example, in early August, Argus will publish rates for leases available in September.

Barge rates

Argus assesses barge rates on US inland waterways through a survey of barge operators, shippers and other industry participants. Crude is transported on inland and intra-coastal waterways in towboat-pushed tanker barges. Rates are inclusive of all costs such as the day rate charged for the boat, diesel fuel and lube costs. Assessments apply to movements during the current month, and will be updated each month in the first weekly issue of *Argus Petroleum Transportation North America*.

Timing: Current month
Volume: Gulf Intra-Coastal Waterway and lower Mississippi river: 46,200 bl loaded (two-barge tow) with 9.6ft maximum draft
 Houston cross-channel: 54,000 bl loaded at maximum 11ft draft.
Load time: 16-18 hours

Barge transportation rate assessments

Origin	Destination	Commodity
Corpus Christi	Texas City	Crude
Corpus Christi	Houston	Crude
Corpus Christi	Beaumont/Port Arthur	Crude
Corpus Christi	Houma	Crude
Corpus Christi	Baton Rouge	Crude
Brownsville	Houston	Crude
Houston	Beaumont/Port Arthur	Crude
Wood River	St. James	Crude
Corpus Christi	Houston	Products
Houston	Corpus Christi	Products
Houston	Cross-channel	Products
Beaumont/Port Arthur	Houston	Products
Beaumont/Port Arthur	Corpus Christi	Products

Waterborne freight

Argus Petroleum Transportation North American includes international and domestic US freight rate assessments republished from Argus Tanker Freight and Argus Gas Freight.

Jones Act freight rates

Assessments are published in \$/bl for Jones Act-compliant freight between US ports. Jones Act-compliant vessels are US-flagged, built and crewed.

Dirty

- Corpus Christi-Delaware Bay 260,000-330,000 bl

Clean

- Houston-Port Everglades 310,000-330,000 bl

See the [Argus Tanker Freight methodology](#).

International freight

International waterborne freight rates are published weekly, on Friday, in \$/t and converted to \$/bl using the densities listed below. See the [Argus Tanker Freight](#) and [Argus Gas Freight](#) methodologies.

International freight rates		
	000' metric tonnes	bl/t conversion
Dirty tanker rates		
NW Europe-US Atlantic coast	80	7.8323
Mideast Gulf-US Gulf	280	7.2588
Mediterranean-US Gulf	135	7.4772
Caribbean-US Gulf	70	6.9343
US Gulf-East coast Canada	70	7.5078
USGC-China	130	7.3300
Clean tanker rates		
USGC-Chile	38	7.1788
USGC-Argentina/Brazil	38	7.1788
USGC-East coast Mexico	38	8.6013
USWC-Rosarito	38	8.6013
East coast Canada-USAC	38	8.6013
USGC-East coast Canada	38	8.6013
Mediterranean-US Atlantic coast	37	8.6013
USGC-Pozos	38	7.1788
Propane tanker rates		
VLGC Houston-Chiba	NA	12.429
VLGC Houston-Flushing	NA	12.429

Comparative costs per mile

Argus publishes several graphical comparisons displaying the cost to move commodities on a per mile basis. In each, the mileage used is straight line distance — not rail track or waterway distance — to compare on a like for like basis.

- Ethanol rail cost per mile from Omaha to eight US cities.
- Bakken crude rail cost per mile from North Dakota (Minot) to nine US cities.
- Crude cost per mile, comparing costs of rail, barge, pipeline, and waterborne cargo.
- Unfractionated NGLs cost per mile.

Definitions

Locations

North Dakota	Minot
Saskatchewan	Estevan
Oklahoma	Tulsa
South Texas	Gardendale
Atlanta	Doraville, GA
Wyoming	Guernsey
West Texas	Midland
Western Pennsylvania	Pittsburgh

Pipelines

Pipeline tariffs change infrequently but are included as important comparisons to other transport modalities. Argus constantly monitors the pipeline websites for the release of FERC-approved tariff change bulletins and will update tariffs as released.

Pipeline tariffs		
Pipeline	Origin	Destination
Crude pipeline tariffs		
Enbridge	Hardisty	Cushing
Enbridge	Hardisty	Sarnia
Enbridge	Hardisty	Houston
Enbridge	North Dakota	Clearbrook, Minnesota
Energy Transfer	North Dakota	Patoka
Energy Transfer	North Dakota	Nederland
Longhorn	West Texas	Houston
Cactus II	West Texas	Corpus Christi
Seaway	Cushing	Houston/Nederland
Spearhead	Chicago	Cushing
Pony Express	Wyoming	Cushing
Refined products pipeline tariffs		
Colonial	Houston	Atlanta
Colonial	Houston	Northern Virginia
Colonial	Houston	Linden, New Jersey
Explorer	Houston	Tulsa, Oklahoma
Explorer	Houston	Wood River, Illinois
Explorer	Houston	Chicago
Magellan	Tulsa, Oklahoma	Lincoln, Nebraska
Magellan	Tulsa, Oklahoma	Albany, Illinois
NGL pipeline tariffs		
Atex	Pennsylvania	Mont Belvieu, Texas
Dixie	West Texas	Mont Belvieu, Texas
Sand Hills	Mont Belvieu, Texas	Hattiesburg, Mississippi
Southern Hills	Conway, Kansas	Mont Belvieu, Texas

Commodity prices

Argus Petroleum Transportation North America includes commodity prices drawn from other Argus publications.

Crude

- Bakken
- LLS weighted average
- WCS daily weighted average
- WTI Houston

see the [Argus America Crude methodology](#)

Ethanol

- Ethanol Chicago Argo in-tank transfer

see the [Argus Americas Biofuels methodology](#)

Refined products

- Gasoline 87 conv USGC waterborne fob lowest RVP not 7.8 or 7.0
- ULSD fob USGC waterborne

see the [Argus US Products methodology](#)

NGLs

- USGC propane fob

see the [Argus NGL Americas methodology](#)