METHODOLOGY AND SPECIFICATIONS GUIDE

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ARGUS CANADIAN CRUDE

Contents:

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The most up-to-date Argus Canadian Crude market methodology is available on www.argusmedia.com

Introduction

Argus has structured Canadian crude oil assessments to reflect the unique market characteristics of each Canadian grade and to reflect the broadest possible array of market activity.

In Canada, *Argus* provides the following types of index prices:
Daily weighted average price: This method captures the entire day of deals done as a volume weighted average, which Argus publishes as a differential. This differential average is then applied to the day's Nymex settlement in order to provide an outright daily mark. This allows companies to connect their physical program with the hedging program on a daily basis.
Trade month weighted average price: This method produces a differential price that captures all deals done from the first business day of the month through pipeline nominations day as a volume weighted average. This allows companies to price oil in a manner compatible with current Canadian practice.
Low/high price range: These prices reflect the full range of deals done each day. This range is essential to assessing value in illiquid markets and reflects the true movement of prices over the trading day.

Argus values liquidity and seeks to reflect the breadth of the spot market. This leads *Argus* to create price indices that include deals done on all broker and exchange platforms, deals done bilaterally, and deals done through the entire trading day. With this price discovery methodology, *Argus* can provide a comprehensive total market index for all crudes assessed.

Crudes assessed according to volume-weighted average method:

Grade	Density (kg/m3)	API Gravity	% Sulphur	Pricing basis	VWA Aggregate Volume Minimum	Low/High Minimum Volume
Syncrude (SYN)	860	31-33	0.1-0.2	Pembina AOSP at Edmonton	1,000 b/d; 159m3	500 b/d; 80m3
Western Canadian Select (WCS)	925	20-21	3.4-3.7	Husky at Hardisty	1,000 b/d; 159m3	500 b/d; 80m3

Basis (Location):

- *Syncrude (SYN)* – This assessment reflects synthetic crude produced by Syncrude Canada and delivered at the Edmonton terminus of Pembina's AOSPL (Alberta Oil Sands Pipe Line Ltd). Deals for SYN in the Edmonton pipeline/ tank facilities of Enbridge are also considered in the index.
- *Western Canadian Select (WCS)* – This reflects WCS blend at Husky's facilities in Hardisty and includes in-line deals on the Enbridge pipeline system (EIL).

Price index details:

Volume Weighted Averages

The daily weighted average price for these grades is set by the volume weighted average of all deals during the trading day. The volume weighted average is calculated by multiplying the price of each deal (reported as a differential) by the volume of the deal, then summing the results and dividing by the total volume traded on that grade throughout the day.

The daily weighted average is stated as a differential and as an outright price. The outright price is derived by applying the weighted average differential price to the daily Canadian CMA..

There is no minimum volume threshold for including any individual deal in the daily volume weighted average. However, if the aggregate daily volume of trade for any grade fails to reach a specified minimum volume (see table), the daily volume weighted price for that day will reflect the mean of the low/high price range assessed for that grade on that day.

Trade Month Weighted Averages

Argus publishes a trade month weighted average price for the following grades:

- Syncrude (SYN) at Edmonton
- Western Canadian Select (WCS) at Hardisty

The trade month weighted average price calculates a cumulative weighted average of every deal done on that grade from the first business day of the month through the end of the business day prior to pipeline nominations day (also referred to as the deadline for notice of shipment /initial NOS deadline), which typically falls around the 20th calendar day of the month. For example, the trade month weighted average price for April-delivered barrels would include all deals done from March 1 to March 17 – assuming that the initial NOS deadline is March 18. It would not include trades done between initial NOS deadline in mid February and the first business day of March. This average parallels traditional practice by other leading indices that have been used in recent years in the western Canadian market.

The trade month weighted average is stated only as a differential, reflecting prevailing market trading practice. No outright equivalent price will be reported.

Syncrude and WCS deals reported to Argus up to one trading day after being concluded will be eligible for inclusion in the calculation of the trade month cumulative weighted averages. However, any deals that are reported to Argus the day after they were concluded will not form part of any calculation for daily weighted averages, neither for the day in which the deals were transacted (previous session) nor the day in which they were reported (current session).

Low & High Prices:

For every grade of crude assessed, Argus publishes a low and high of deals done throughout the entire trading day. In order to qualify to set the low or high of the day, deals must meet the minimum volumes as specified in this methodology (see table at right). In illiquid markets, Argus pricing represents an intelligent assessment of the range within which a crude grade could have traded during the entire trading day. Such assessments are based on bids and offers through the entire day, price movements for similar grades, and extensive polling of market participants.

Trading day

Argus considers all bona fide deals done and reported during the period from 7am-3:30pm, prevailing time in Calgary (Mountain Time), in the calculation of its low, high, and daily weighted average prices. These deals should be reported to *Argus* by 4pm Mountain Time (5pm Central). *Argus* will review all data received after 4pm Mountain Time and will make best efforts to include all verifiable trades received after 4pm Mountain Time, but reserves the right to discard any deal for inclusion in the volume-weighted average if received after 4pm Mountain Time.

On days when the CME Nymex is closed but Canadian physical oil markets are open (eg US Thanksgiving, US Independence Day), *Argus* will not publish its Americas Crude Report (ACR), but it will gather Canadian deals and create volume-weighted indices and high/low market assessments for Canadian grades. These price assessments will be entered into the *Argus* price database as on any regular business day, and subscribers to *Argus* data will have access to the updated data as on any other business day. Only differential indices will be calculated on these days; outright prices will not be calculated because there will be no Nymex crude settlement to provide the fixed price component.

Timing & Roll Dates

Argus rolls its price basis forward on pipeline nominations day, also called initial NOS deadline, typically falling around the 20th calendar day of the month. So, for example, assuming the pipeline nominations deadline for March injected barrels is February 17, *Argus* daily prices reflect April as the prompt month beginning on February 17. *Argus* considers a new trade month to have begun on each pipeline scheduling day.

However, for purposes of the *Argus* trade month weighted average (Trade Month Wtd Avg), only trades for April-injected barrels traded from March 1 through March 17 would be considered.

Spot trade only

Argus indices are meant to be a reflection of spot trade done at a differential to WTI. Therefore, deals done as part of a strip or priced against another month or a grade other than WTI cannot be considered in the volume-weighted index. Deals priced against posted prices cannot be included in the index. Internal transfers between divisions of the same company cannot be considered as representative spot deals. Deals done conditional upon credit agreements or other pending arrangements will not be included in *Argus* price indices.

Canadian CMA

The Canadian CMA is calculated by extending the current day's Nymex prompt-month futures settlement for "Light Sweet Crude Oil (WTI)" until its expiry date, and extending the current day's second-month WTI settlement over the remaining days in the calendar month following prompt-month expiry. After the prompt month contract expires, the new prompt month is extended until the end of the calendar month. The Canadian CMA calculation does not include weekend days or US holidays when there are no Nymex futures settlements.

Other Canadian Crudes assessed

In addition to providing volume-weighted prices for the most actively traded petroleum liquids streams in western Canada, *Argus* provides assessments of prices for other less-actively traded streams shown below. On days in which trade occurs on these grades, *Argus* will set its price range based on the highest and lowest price achieved on trades during the day. In order to set the high or low for the range, a deal must reach a certain volume threshold, shown in the tables.

Grade	API Gravity	% Sulphur	Pricing Basis	Low/High Minimum Volume
Condensate	61-65	0.08-0.20	Enbridge CRW pool at Edmonton	500 b/d; 80m3
Mixed Sweet (MSW)	39-40	0.45	Enbridge at Edmonton	1,000 b/d; 159m3
Lloyd Blend (LLB)	20-21	3.47	Hardisty	500 b/d
Light Sour Blend (LSB)	38.0	0.88	Enbridge or Westspur at Cromer	500 b/d
Canadian CMA	39.0	0.40	Cushing, OK	

Grade	API Gravity	% Sulphur	Pricing Basis	Timing	Minimum Volume
Hibernia	35.0	0.45	fob Whiffen Head, Newf.	10-45 Days Forward	500,000 bl
Terra Nova	33.2	0.48	fob Whiffen Head, Newf.	10-45 Days Forward	500,000 bl

Basis (Location)
The Canadian waterborne assessments represent crude for loading out of the Newfoundland Transshipment Terminal at Whiffen Head, Newfoundland. Insurance and freight costs are not represented in these assessments.

Timing
Assessments for Hibernia and Terra Nova are a continuous series with no roll date. Prices represent physical cargoes that have loading dates 10-45 days forward, and their timing is referred to as Dated (abbreviated "Dtd" in the daily report).

Stream Quality
Argus assessments are meant to reflect stream quality for each grade. The table above reflects stream quality as ascertained by *Argus* at the time of methodology publication, but it is assumed that the market is aware of fluctuation of quality in the streams and reflects those quality variations in the prices agreed between trading parties.

Deals data gathering method and verification
Argus crude price assessments rely on a wide variety of sources for information. These include producers, refiners, marketers, importers, traders, brokers and data from electronic trading platforms. *Argus* will accept information over the phone, via instant messenger, via email, or by other means. *Argus* strives to verify all deal prices, counterparties, and volumes. *Argus* reserves the right to exclude deals from the range of trade in some circumstances. For example, if a deal should fall well outside of the channel of trade or raise other concerns, *Argus* will subject the deal to a detailed process of further scrutiny, and after senior editor review may choose to exclude the deal from the price formation process. This process is critical to ensuring that the *Argus* range of trade is not manipulated, and that the deal in question indicates activity that is representative and generally repeatable in the wider market that day. Deals reported to Argus in cubic meters are converted to barrels using a factor of 0.1589873.

Confidentiality
Argus asks for details of counterparties from contacts in order to confirm deals and to avoid double-counting in volume-weighted averages. But *Argus* does not publish counterparty names for transactions in the Americas, nor does it publish prices or volumes for discreet individual deals done in Canadian markets. Many companies in Canada have existing confidentiality agreements with counterparties and can only reveal deals to pricing services like *Argus* if confidentiality is maintained. *Argus* is committed to maintaining the confidentiality of deals information it receives, as this is critical to allowing us to gather more information and create more robust assessments of the range of trade throughout the day. In Canada, *Argus* is willing to sign confidentiality agreements where necessary in order to facilitate daily deals reporting.

Compliance and ethics
Argus operates according to the best practices in the publishing field, and maintains thorough compliance procedures throughout the firm. The company employs a full-time Compliance Officer in its London office, and conducts frequent and rigorous audits to ensure compliance with reporting practices and ethics. The company's procedures have passed further review by various North American government regulatory agencies including the US Bureau of Ocean Energy Management, Regulation and Enforcement (BOEM, formerly known as MMS), which has approved the use of *Argus* pricing for US royalty valuations. *Argus* has consulted in detail on price reporting procedures with the US Commodities Futures Trading Commission (CFTC), the US Securities and Exchange Commission (SEC), and the US Federal Energy Regulatory Commission (FERC).
Argus strives to be seen as a preferred provider by our subscribers, 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.

Relationship to industry
Our methodology is developed in consultation with industry, in order to provide a service that is useful to our clients. *Argus* seeks to report the market in the way that it is traded. We do not feel it is our role to change the way the industry seeks to trade or the way it hedges. Our goal is to develop price assessments that are reliable and consistent enough to be used as index prices in spot trade, term contracts, equalization formulas, and government royalty and taxation. *Argus* editors and managers are readily available to discuss our methodology, whether to enhance industry's understanding of it or to listen to feedback on how to enhance the methodology further.

Corrections
Argus will on occasion publish corrections to price assessments after the publication date. We will correct errors that arise from clerical mistakes, calculation error, 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. If transaction information is submitted in error, and the company submitting informs *Argus* of the error within 24 hours of the original submission, *Argus* will make its best effort to correct the price data. After 24 hours, *Argus* will review both the material effect that the correction will have on the price data and the amount of time that has elapsed from the date of the published price data before deciding whether to issue a correction. After 30 days, *Argus* is unlikely to make a correction based on information submitted in error, and data submitters are not expected to file corrections to submitted data.