

# Appendix E

Calculation of Royalty  
Trigger Factors, Meter  
Station Factors, and the  
Propane and Butane Floor  
Prices

## 1. Calculation of Royalty Trigger Factors and Meter Station Factors

The gas reference price is a representative market price for gas at a gas plant and uses in its calculation a deduction for Alberta transportation costs.

The gas reference price calculation was developed when the primary shipper of gas within Alberta, NOVA Gas Transmission Ltd. (NGTL), charged a postage stamp rate for transporting gas within Alberta. When NGTL changed its tolling methodology from postage stamp tolls to receipt point specific tolls, shippers paid different receipt transportation rates to deliver gas to various markets.

The department recognizes this toll change in the valuation of the Crown's share of gas by providing a different valuation price at each point (meter station) at which gas is received by the transmission pipeline system. The mechanism (factor model) for calculating the receipt point specific valuation price was developed by a joint industry and department working group.

With the introduction of ISC reference prices (See Appendix D) in October 2002, the factor model was retained. The factor model provides a representative market price (proxy versus actual) at a gas plant that adjusts for unique Alberta transportation costs, is simple to administer and understand, and is adaptable to changing business environments.

Under this model, a factor is calculated for each meter station to adjust the intra-Alberta transportation deduction in the ISC reference price calculations. If a factor is greater than one, indicating transportation rates greater than the Alberta average, a facility gas transportation adjustment is calculated that reduces the facility reference price for production at that meter station. The reverse is true where a meter station factor is less than one.

A factor is calculated for each meter station of each pipeline identified by the department as included in this program. Generally, pipelines are included if they have access to the ex-Alberta market and published tolls and tariffs. Production that is transported by a non-included Alberta pipeline has a factor of one.

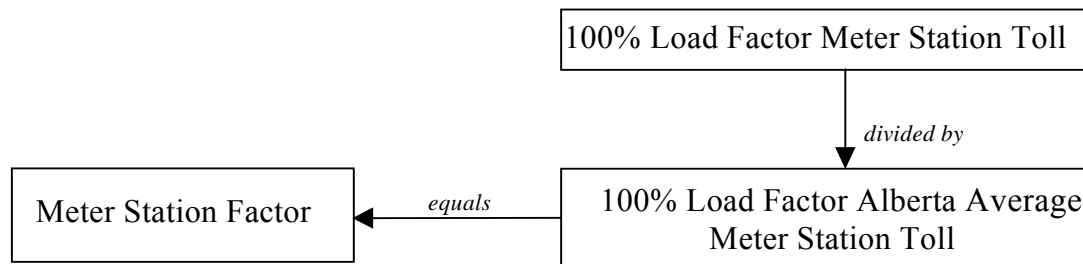
At this time, included pipelines are:

- NOVA Gas Transmission Ltd. (NGTL);
- Northwestern Utilities Limited (operating as ATCO Pipelines);
- ATCO Gas and Pipelines Ltd. (formerly Canadian Western Natural Gas Company Limited operating as ATCO Pipelines);
- Westcoast Transmission Company (Alberta) Ltd.;
- AltaGas Suffield Pipeline Inc.;
- Alliance Pipeline Limited Partnership.

## FACTOR MODEL

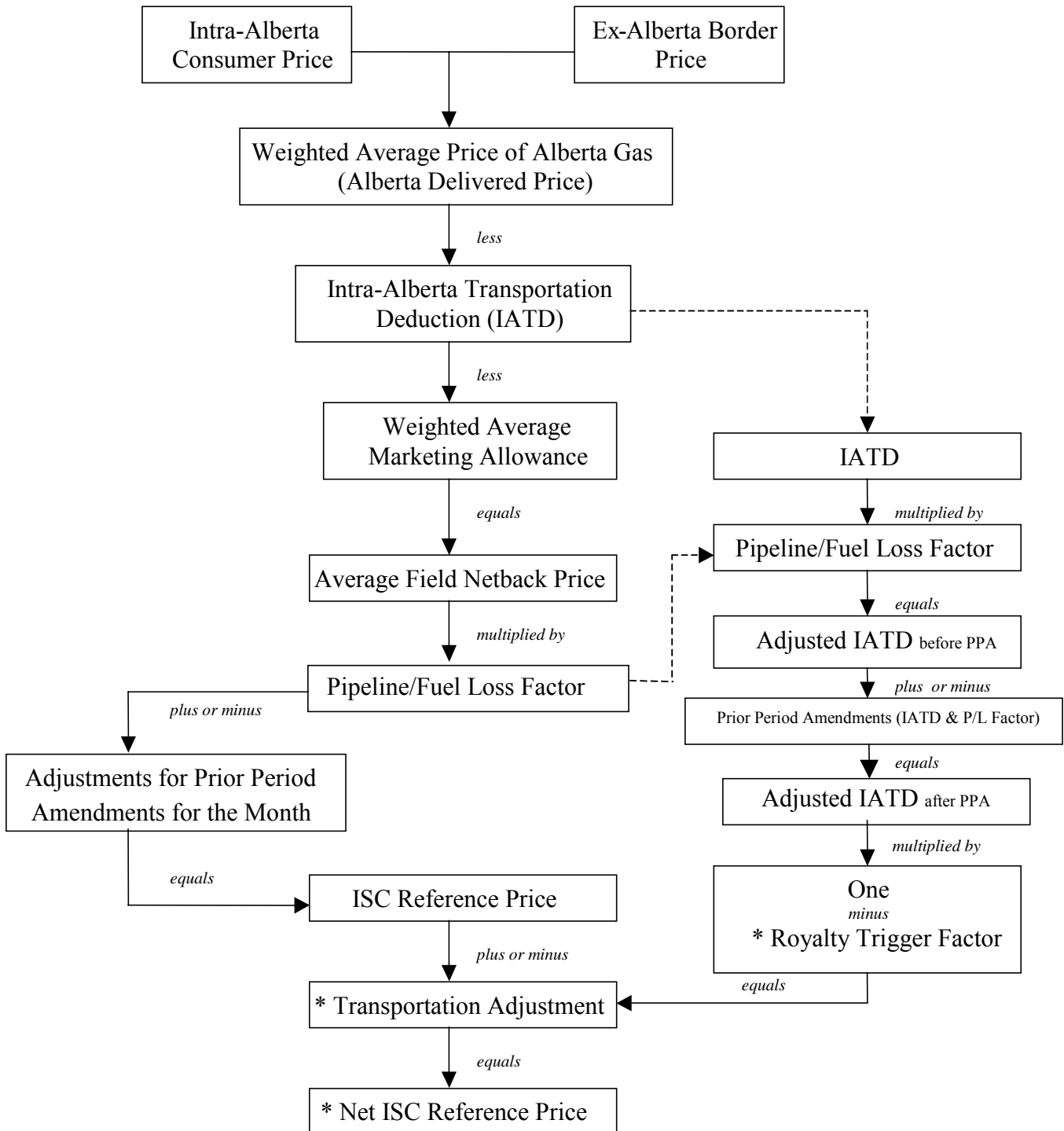
### 1.1 BASIC PRINCIPLES:

- The factor model requires the calculation of ISC reference prices, with major components being an overall Alberta Delivered Price (ADP) and an Intra-Alberta Transportation Deduction (IATD).
- The IATD for each ISC reference price is adjusted (Adjusted IATD) by the pipeline fuel/loss factor and prior period adjustments. An adjusted IATD and royalty trigger factor are calculated for each royalty trigger point by weight averaging ISC adjusted IATDs and meter station factors based on actual dispositions from the royalty trigger point. The transportation adjustment for the royalty trigger point is calculated by multiplying the facility adjusted IATD by the royalty trigger factor for that royalty trigger point.
- Meter stations with higher than average tolls receive a factor greater than one and therefore, a transportation adjustment that reduces the ISC reference prices. The opposite occurs with meter stations having lower than average tolls.
- The meter station factor is calculated as follows:



- Factors are calculated for all field receipt meter stations on all “included” Alberta pipelines. Normally, the department includes a pipeline if it has regulated tolls (not a proprietary pipeline) and physical access to the ex-Alberta market, either directly or by interconnection. Pipelines without regulated tolls (proprietary pipelines) could be included if deemed appropriate by the Crown.
- A royalty trigger point that connects to a meter station of a “not included” pipeline is assigned a factor of one for dispositions to that meter station. For example, a well supplying a small town without moving through an included pipeline receives a factor of one. A royalty trigger that connects to a facility other than a meter station will be assigned a factor of one. For injected raw gas, the royalty trigger will be the same factor as the reproducing facility.

**1.2 ADJUSTMENT TO THE ISC REFERENCE PRICE CALCULATIONS AT EACH ROYALTY TRIGGER POINT:**



\* Specific to each royalty trigger point.

### 1.3 INTRA-ALBERTA TRANSPORTATION DEDUCTION (IATD):

- The IATD continues to act as a proxy for the average intra-Alberta transportation rate in the Alberta gas reference price calculation. As well, the IATD continues to reflect the average load factor on pipelines within Alberta.
- Under the factor model, the gas IATD is calculated using costs and quantities of all included pipelines.
- $IATD = \Sigma \text{ billings} / \Sigma \text{ billable receipt quantities}$ . This information is obtained from NGTL plus incremental billings and incremental billable receipts of other included pipelines.
- The IATD in each ISC reference price calculation is calculated from the gas IATD. The gas IATD is multiplied by a factor using the ISC component makeup of field receipts for the included pipelines.
- The adjusted IATD for each ISC includes the full amount of any adjustments to prior period information.

### 1.4 PIPELINE FUEL/LOSS FACTOR:

- The pipeline fuel/loss factor includes quantities from all included pipelines.

### 1.5 ADJUSTMENTS FOR PRIOR PERIOD AMENDMENTS (IATD & P/L FACTOR):

- If a published IATD or pipeline fuel/loss factor is amended for a prior delivery month, the unit difference between the adjusted IATD calculation for the original business month and the calculation as amended is added to the current gas reference price month's adjusted IATD. There is no limit to the amount of prior period amendments that can be added to the current month's adjusted IATD.

### 1.6 100% LOAD FACTOR METER STATION TOLL:

- The 100% load factor meter station toll is calculated at each meter station on included pipelines as follows:

$$100\% \text{ Load Factor Meter Station Toll} = 100\% \text{ Load Factor Delivery Rate} + 100\% \text{ Load Factor Receipt Rate}$$

$$100\% \text{ Load Factor Delivery Rate} = \frac{\text{Export Delivery Billings} + \text{Intra-Alta Delivery Billings}}{\text{Total Receipt Contract Demand}}$$

#### 1) 100% Load Factor Delivery Rate is calculated:

- For all receipt meter stations by prorating forecasted export delivery billings on all included pipelines to receipt CD of all included pipelines. Also included in the billings are intra-Alta delivery billings on pipelines, where gas was transported through other included pipelines before being transported on their system for final consumption.
- a) Export Delivery Billings: are calculated by multiplying the 100% load factor export delivery toll on NGTL by the total export CD for all included pipelines. This process is necessary to

equalize the calculation for all included pipelines, for purposes of calculating a common factor.

- Intra-Alta delivery billings: are calculated by using forecasted CD or equivalent, multiplied by the 100% load factor delivery toll(s) for delivering gas on the included pipeline for final consumption. This gas had to have been received from another included pipeline.

## 2) 100% Load Factor Receipt Rate is calculated:

- At NGTL receipt points for non-Load Retention Service (LRS) by using NGTL's standard service base 100% load factor receipt tolls. This is currently the toll for 3-year firm service.
- For non-NGTL included pipelines, the difference between the 100% load factor total toll for the meter station and the NGTL export delivery toll determines the 100% load factor receipt toll for the meter station. This process, which also applies to NGTL's Load Retention Service (LRS), ensures that non-included pipelines - with different tolling methodologies - are properly equalized with NGTL for purposes of calculating a common factor.
- At NGTL receipt points for LRS service by calculating the difference between the LRS toll for the meter station and the NGTL export delivery toll.
- At NGTL receipt points for point-to-point service (intra-Alta points only - if and when this service is available) by using the 100% load factor total receipt/delivery toll.
- For ATCO Pipelines receipt points, by using the ATCO Pipelines 100% load factor receipt toll plus the market weighted ATCO Pipelines 100% load factor delivery tolls (exchange fee, large volume end users LRS delivery charge and system gas delivery charge). This calculation does not include any billings of ATCO Pipelines calculated and included under the 100% load factor delivery rate calculation.
- At Alliance receipt points by calculating the difference between the 100% load factor total toll (for Alberta) for the meter station and the NGTL export delivery toll. The 100% load factor total toll (for Alberta) is calculated by:
  - a) Prorating the Canadian toll by the percentage that the Alberta mainline mileage is to the total of Alberta and Saskatchewan mainline mileage, and
  - b) Then applying an adjustment for Alliance's Authorized Overrun percentage (AOP). The AOP is the rolling average of the preceding 3 years AOP except for the first year, which is determined by the department in consultation with Alliance. Alliance's CD is grossed up by the AOP.
  - c) The multiplier for the toll is 100%/AOP. The multiplier for Alliance CD is the AOP.
- At AltaGas Suffield receipt points by calculating the difference between the 100% load factor total toll for the meter station and the NGTL export delivery toll.
- For Westcoast (Alberta) and any other new pipelines by using similar methods and circumstances as the other included pipelines, where appropriate.
- If a standard receipt service base toll is unavailable, the department will determine a CD weighted average of the tolls in effect or some other proxy.

## 1.7 100% LOAD FACTOR ALBERTA AVERAGE METER STATION TOLL

- The 100% load factor Alberta average meter station toll is the weighted average (weighted by meter station CD) of the 100% load factor meter station tolls on pipelines qualified for inclusion in the calculation. At this point in the calculation, Alliance's tolls (applicable to Alberta) and CDs have already been adjusted by the AOP.

## 1.8 GENERAL

- The royalty trigger factor is calculated by weight averaging meter station factors based on actual dispositions from the royalty trigger point. A royalty trigger factor will change due to changes in ISC quantities. A meter station's factor does not normally change during a year.
- The factor for a meter station is determined annually and is in effect for October production based on rates and CDs in effect for the previous April delivery month. The six-month lag is designed to provide time to the Crown to validate the pipeline information used to calculate the annual meter station factors. Once the factors are established, they remain in effect for the year except for the addition of a new included pipeline. In this case all factors will be recalculated effective with the current production month following the validation of the new pipeline information. **Meter station factors and CDs are not recalculated once established except for the addition of a new included pipeline, and in any case not retroactively.**
- When a new meter station comes on stream during a year (excluding the global addition of meter stations for a new included pipeline), a factor and CD is established for that specific meter station effective with the first month of service. To calculate the factor for a new meter station, we use the existing 100% load factor Alberta average meter station toll for the denominator and the existing 100% load factor delivery rate in the calculation. The 100% load factor receipt rate is calculated as in Section 1.6 (2) above. In this limited case a meter station factor may be established retroactively but not before the start of the current factor year.
- The factor at a meter station or at a royalty trigger point is rounded to two decimals.

### 1.9 FACTOR MODEL EXAMPLE:

**FACTOR MODEL EXAMPLE**  
 -The purpose of this example to illustrate the workings of the factor model.  
 -all numbers are fictional

Pipeline Name	Pipeline Receipt Meter Station	Receipt Rate Calculation/Comments	(1) 100% LF Receipt Rate (\$/mcf)	(2) Receipt Contract Demand (CD)(mcf/d)	(3) (1*2) Value \$	(4) (see below) 100% LF Delivery Rate	(5) (1+4) 100% LF Meter Station Toll	(5/7) Meter Station Factor
NGTL	3040		0.100	1,000	100	0.125	0.225	0.87
NGTL	3041		0.120	10,000	1,200	0.125	0.245	0.94
NGTL	3042		0.170	10,000	1,700	0.125	0.295	1.14
NGTL	3043		0.180	15,000	2,700	0.125	0.305	1.17
NGTL	3044	Meter Stations could have 3 different firm rates but only use base year rate for all CDs	0.070	10,000	700	0.125	0.195	0.75
NGTL	3045		0.210	10,000	2,100	0.125	0.335	1.29
NGTL	3055		0.120	10,000	1,200	0.125	0.245	0.94
NGTL	3065		0.080	20,000	1,600	0.125	0.205	0.79
NGTL	3066	Import point on Alta/BC border	0.150	10,000	1,500	0.125	0.275	1.06
<b>Total</b>				<b>96,000</b>	<b>12,800</b>			
NGTL*	3099	Regular service shared with LRS1	0.080	2,000	160	0.125	0.205	0.58
NGTL*	LRS1 - 3099	Receipt Rate = LRS rate(.12)-Nova Ex(.15)	-0.030	2,000	-60	0.125	0.095	0.58
NGTL	LRS2	Receipt Rate = LRS rate(.25)-Nova Ex(.15)	0.100	2,000	200	0.125	0.225	0.87
<b>Total</b>				<b>6,000</b>	<b>300</b>			
Alliance	10000	Receipt Rate = Alliance Toll(.36)-Nova Ex(.15)	0.210	10,000	2,100	0.125	0.335	1.29
NUL	5000	Receipt Rate = NUL Receipt(.11)+NUL Delivery (.039)	0.149	1,000	149	0.125	0.274	1.05
AEC	213		0.020	1,000	20	0.125	0.145	0.56
		If pipeline has no base toll, use CD weighted average of the pipeline - Receipt Rate = AEC Toll (.17)-Nova Ex(.15)						
<b>Grand Total</b>			<b>0.135</b>	<b>114,000</b>	<b>15,369</b>	<b>0.125</b>	<b>0.260</b>	<b>1.00</b>

(7) 100% Load Factor Average Alberta Meter Station Toll  
 - CD weighted average of columns (2) and (5).

\* If a meter station has LRS and Non-LRS service, the meter station factor is a CD weighted average of the LRS and Non-LRS factors.

## 2. Overview of the Propane and the Butanes Floor Price

The propane floor price and butanes floor price are calculated by the department to protect the Crown against inappropriately depressed prices in the Edmonton market. Both the propane floor price and the butanes floor price are calculated based on the Edmonton netback value of posted prices at Conway, Kansas.

### 2.1 Calculate the Propane Floor Price

- Determine the Edmonton netback propane price in the units in which it is posted (U.S. cents per U.S. gallon):

Conway posted price for Specification Propane  
 ...*minus*...  
 transportation from Edmonton to Iowa City  
 ...*minus*...  
 transportation from Iowa City to Conway (including storage cost)

- Convert the Edmonton netback propane price to U.S. dollars per barrel:

U.S. cents per U.S. gallon  
 ...*multiplied by*...  
 42 (U.S. gallons per barrel)  
 ...*divided by*...  
 100 (cents per dollar)

- Convert the Edmonton netback propane price to Canadian dollars per cubic metre:

U.S. dollars per barrel ... <b>divided by</b> ... 0.15891 (m <sup>3</sup> per barrel) ... <b>multiplied by</b> ... Exchange Rate (Canadian dollars per U.S. dollar)
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- Convert the Edmonton netback propane price to the Propane Floor Price:

Canadian dollars per m <sup>3</sup> (at Edmonton) ... <b>multiplied by</b> ... 0.90 (conversion factor)
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## 2.2 Calculate the Butanes Floor Price

- Determine the Edmonton netback butanes price in the units in which it is posted (U.S. cents per U.S. gallon):

[Conway Posted Price for Normal Butanes ... <b>times</b> ... 0.65] ... <b>plus</b> ... [Conway Posted Price for Iso Butanes ... <b>times</b> ... 0.35] ... <b>minus</b> ... transportation from Edmonton to Iowa City ... <b>minus</b> ... transportation from Iowa City to Conway (including storage cost)
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- Convert the Edmonton netback butanes price to U.S. dollars per barrel:

U.S. cents per U.S. gallon ... <b>multiplied by</b> ... 42 (U.S. gallons per barrel) ... <b>divided by</b> ... 100 (cents per dollar)
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- Convert the Edmonton netback butanes price to Canadian dollars per cubic metre:

U.S. dollars per barrel ... <b>divided by</b> ... 0.15891 (m <sup>3</sup> per barrel) ... <b>multiplied by</b> ... exchange rate (Canadian dollars per U.S. dollar)
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- Convert the Edmonton netback butanes price to the butanes floor price:

Canadian dollars per m <sup>3</sup> (at Edmonton) ... <b>multiplied by</b> ... 0.90 (conversion factor)
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### 3. Canada/United States Exchange Rate

The exchange rate (Canadian dollars per U.S. dollar) employed by the department in calculating the propane floor price and the butanes floor price is the monthly average Bank of Canada rate. The department will obtain the exchange rate each month from the Alberta Treasury Branch.

### 4. Definition and Source of Posted Prices and Rates

- Conway posted price for propane is the average of daily *any barrel* posted prices for specification condition propane delivered at Conway, Kansas. *Any barrel* refers to the price for delivery at any time during the month of posting.

SOURCE: OIL PRICE INFORMATION SERVICE (OPIS)

- Conway posted price for butanes is based on a field butanes stream comprising 65% normal butane and 35% iso butane. Prices for both normal and iso butane are the average of daily prices for delivery at Conway, Kansas.

SOURCE: OIL PRICE INFORMATION SERVICE (OPIS)

- Transportation cost from Edmonton to Iowa City is the published monthly Cochin pipeline tariff, including incentive rates.

SOURCE: TARIFF BULLETINS SANCTIONED BY THE FERC (U.S.) AND NEB (CANADA)

- Transportation cost from Iowa City to Conway is the published monthly Mid-America Pipeline Company tariff, including incentive rates, for transportation between the two cities.

SOURCE: TARIFF BULLETINS SANCTIONED BY THE FERC (U.S.)

- Storage cost at Conway is an allowance for storage costs incurred in transporting and processing propane and butanes.

SOURCE: INCLUDED IN MID-AMERICA PIPELINE COMPANY TARIFF