Government of Alberta

Petroleum Plaza – North Tower 9945 – 108 Street Edmonton, Alberta T5K 2G6 Canada www.alberta.ca

GAS ROYALTY OPERATIONS INFORMATION BULLETIN September 2010

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A. PRICING RATES AND TRANSPORTATION INFORMATION

For Pricing, Royalty Rates and Transportation Information for July 2010, refer to <u>Attachments 1, 1A, 2, 2A</u> and <u>3</u>. These attachments are also available in <u>Excel Format</u>.

B. <u>NOTICES</u>

Statutory Requirement and Recalculation of 2006 Royalty

A production year becomes statute barred on December 31st, four years after the end of a production year. Once a year has become statute barred, calculation or recalculation of royalty does not occur on a monthly basis. Section 38 of the *Mines and Minerals Act* provides for recalculation of royalty that can be initiated in two ways:

- 1. On the department's initiative in conjunction with an audit or examination; or
- 2. At the request of a royalty payer.

Audits in Progress

Non-operator partners are advised that certain 2006 allowable costs, custom processing fees, capital costs and custom processing adjustment factor, and reporting discrepancy audits are currently in progress. It is anticipated that these audits may be completed before December 31, 2010. However, should circumstances require that these audits be completed in 2011, a list of the affected Energy Resources Conservation Board facilities will be included in the December 2010 Information Bulletin. Royalty clients are also reminded that amendments received by the Department in the fourth year following the production year may be subject to audit. If the amendments are received late in the fourth year and insufficient time is available for the Department to commence a review of the amendments prior to the end of the year, the Department reserves the right to commence the audit at the beginning of the fifth year.

If you have any questions, please contact Kris Pretty of the Compliance & Assurance group at (403) 297-8785.

Industry Recalculation of 2006 Royalty

Industry initiated royalty recalculation requests for the 2006 production year must be submitted in writing to the attention of Wayne Taljit, Manager of Gas Royalty Client Services. This request must be received by the Department on, or before, December 31, 2010, and it must include the following:

- Identification of the recalculation facility or facilities;
- The reason for the recalculation:

- An order of magnitude estimate, i.e. the approximate amount of the royalty impact;
- Identification of the royalty clients that may be impacted by the request;
- The time lines for recalculation preparation and submission to the Crown including a reasonable time for the Crown to review the submission; and
- Confirmation that the affected partner(s) have been notified.

If you have any questions regarding this process, please contact your Gas Royalty Client Services portfolio representative as identified in <u>Section F</u> of this bulletin.

C. MONTHLY INFORMATION

July 2010 Royalty Due October 31

- Royalty clients are to remit the total amount payable shown on the October 2010 Statement of Account by October 31, 2010. If the amount payable includes accrued current period interest, the interest has only been accrued to the statement issue date. Clients must also include the additional interest that has accrued from the statement issue date to the date of payment, using the per diem amount provided.
- The October 2010 Statement of Account shows your amount payable as of the Statement issue date. It includes any outstanding balances from your previous statement, your July 2010 invoice amount and any applicable current period interest charges. It also identifies refunds resulting from overpayments.
- Current period interest will not be charged on current invoice charges for the production month of July 2010 if it is paid in full by October 30, 2010.
- Current period interest will accrue on any overdue charges commencing the first day after the due-date until it is paid in full.

Note: If the due date falls on a non-business day, the next business day will apply as the due date.

• Cheques are payable to the Minister of Finance, Province of Alberta.

August 2010 VA4 Due October 15

The VA4 forms for the production month of August 2010 are due in the department offices by October 15, 2010.

Note: If the due date falls on a non-business day, the next business day will apply as the due date for VA4 forms.

Registry Deadline Submissions

The Registry deadline submissions for SAF, OAF, and Volumetrics are posted in the Petroleum Registry of Alberta website "Reporting Calendars" under Calendars. Changes to this calendar will be posted on the Registry website home page in "Broadcast Messages."

Interest Rate September 2010

Alberta Energy's interest rate for September is 3.75%.

June Provisional Assessment Charge

The summary of Provisional Assessment Charges for all production periods in the June 2010 billing period was:

First Time Provisional	Reversals of Provisional	Net Provisional
Assessment	Assessments	Assessment
44.000 = 50.54	(0.440.00.00.00.00.00.00.00.00.00.00.00.0	(0.1 =0.0 0.5= .1.1)
\$1,829,758.54	(\$3,410,025.95)	(\$1,580,267.41)

June Penalty Charges

The penalty table below shows at the form level, the total penalty charges and reversals, for the June 2010 billing period:

FORM	Penalty Charges	Penalty Reversals	Net Penalty Charges for 2010/06
AC2	\$51,800	(\$21,500)	\$30,300
AC4	\$0	\$0	\$0
AC5	\$1,400	\$0	\$1,400
NGL1	\$0	\$0	\$0
VA2	\$0	\$0	\$0
VA3	\$0	\$0	\$0
VA4	\$800	\$0	\$800
Total	\$54,000	(\$21,500)	\$32,500

Gas Royalty Operations Support

Upon request, Gas Royalty Operations staff will be available to meet with clients who need assistance with royalty reporting. Royalty clients requiring assistance are encouraged to contact your respective Gas Royalty Client Services portfolio representative, as identified in <u>Section F</u> of this bulletin, to arrange a meeting.

Well Event Measured Depth Determination Letter

The department has issued a "Well Event Measured Depth Determination Letter" under the Report Package DOE – Gas to facility operators via the PRA on September 1 and 15, 2010. This letter shows the confirmed Measured Depth (MD) of each active well event that will be used to calculate the Depth Factor (DF) of the quantity component rate under the new royalty formula. A well event that is not listed on the letter and does not have a confirmed MD will receive a DF of 1. When the changes to the MD are confirmed by the department, a letter is issued to a Facility Operator who reports changes through the PRA to well event attributes affecting MD. All changes to the MD are applied on a go forward basis only. Facility Operators are advised to submit well event attribute changes by the last day of the calendar month in order for timely determination of MD.

D. INFRASTRUCTURE DATA CHANGES

Client ID Listing

The BA Identifiers Report is a directory of Business Associate (BA) names, codes, status (e.g. struck, active, amalgamated, etc.), status effective dates, and effective August 2004, includes Working Interest Owner (WIO) role start/end dates.

This report is also published daily on the Petroleum Registry website at:

http://www.petroleumregistry.gov.ab.ca

The department reminds Business Associates to review their WIO role to ensure that the start and end dates are reflected correctly. If the BA does not have an active WIO role, the operators cannot allocate volumes to the BA for the relevant production periods through the SAF/OAF allocations.

- If a BA has a WIO role, then that BA can receive SAF/OAF allocations from the WIO role start date forward.
- If a BA has a WIO role with an end date, then they can only receive SAF/OAF allocations from the WIO role start date until the end date. Any SAF/OAF allocations after the end date will be rejected.
- If a BA does not have a WIO role start date, then that BA cannot receive SAF/OAF allocations.

Please contact Client Registry at 780-422-1395 if you have any questions regarding the information supplied on this listing.

Client Status Changes

Clients must ensure that all royalty documents are completed using only valid client names and IDs. It is critical that royalty clients use current legal client names and their appropriate IDs on all documents to ensure accurate royalty calculation and to prevent provisional assessment and penalties. Rejects will occur when invalid IDs are used.

If you require information regarding client names or IDs, please contact Client Registry at 780-422-1395.

Nova Tolls - Multiple Gas Reference Prices

Royalty information related to the implementation of the Factor Model negotiated with industry for determining Multiple Gas Valuation Prices is provided on the Natural Gas website's Royalty Related Information page under <u>Facility Royalty Trigger Factors and Meter Station Ties</u>.

E. <u>REMINDERS</u>

AB WG 99999 - June 2010

Definition: AB WG 99999 is a stream ID introduced, by the department, to facilitate reporting by industry clients on specific pre-authorized applications where royalty paid gas volumes are used for fuel and other applications.

Consequently, any gas brought in from outside the Alberta Royalty Network and/or purchased from within the network (PURREC – Purchased Receipt) and used for fuel entitles the operator to report the remainder of the gas volumes, on which royalty have been paid, under stream ID AB WG 99999. As Crown Interest is zero per cent, this will ensure that royalty is not charged twice on the same volume.

Applications: Some instances where the use of royalty paid volumes may apply include the need for gas used for:

- 1. Fuel
- 2. Gas Lift
- 3. Pipeline Specifications
- 4. Injection
- 5. Other

Authorization For Use: Clients who need the use of stream ID AB WG 99999 for the first time are required to contact their respective Client Services Representative, in writing, requesting authorization to report the balance of the royalty paid gas volumes under stream id AB WG 99999. The client written request must include a detailed descriptive flow of the planned volumes applicable to AB WG 99999 and a corresponding schedule for its use. Following receipt and review of the application by Client Services/the department, the royalty client will be notified of the status of the application within 14 days of its receipt.

Additional Information:

Written application should be addressed to:

Client Services, Gas Royalty Operations 8th Floor, North Petroleum Plaza 9945 –108 Street Edmonton, Alberta Canada T5K 2G6

Telephone inquiries may be directed to:

If Client Id = # Co, Name Begins A, B & L – Telephone 780 644 1201

If Client Id = Name Begins With C to G – Telephone 780 644 1202

If Client Id = Name Begins With H to P excluding L – Telephone 780 644 1203

If Client Id = Name Begins With Q to Z – Telephone 780 644 1204

Soldier Settlement Board

We remind clients that when making royalty or rental payments in regards to Soldier Settlement Leases to comply with Information Bulletin 2010-01 (see attached link). http://www.energy.alberta.ca/OurBusiness/1833.asp

F. POINTS OF CONTACT

Petroleum Registry of Alberta

The Petroleum Registry of Alberta Service Desk is the focal point for communications with the Registry regarding preparations for, access to, or utilization of the Registry. To contact the Petroleum Registry of Alberta Service Desk:

Phone: 403-297-6111 or 1-800-992-1144

Fax: 403-297-3665

Email: petroleumregistry.energy@gov.ab.ca

Alberta Energy Internet

Prices, Royalty Rates and Transportation Information are available on the Alberta Energy Internet address: www.energy.alberta.ca, from "Our Business", navigate to "Natural Gas", "About Natural Gas", "Prices", "Alberta Natural Gas Reference Price (ARP)".

In addition, both the Gas Royalty Information Bulletins and Information Letters are also available under "Our Business", navigate to "Natural Gas", "Legislation, Guidelines & Policies".

Gas Royalty Client Services

Gas Royalty Client Services is structured as a Business Associate client portfolio system, which assigns a given Business Associate to one of four Client Services teams. Listed below is the portfolio breakdown along with Client Services Team Leads and phone numbers. The portfolios are divided by company name and not by BA ID.

Example: If your company name is the "Gas Company" you would call C – G team

at 780-644-1202.

Business Associate	Phone Number and E-mail Address	Team Lead		
Numbered companies, A, B & L	780-644-1201	Todd Atwood		
	GRCST1@gov.ab.ca			
C – G	780-644-1202	Lily Hiew		
	GRCST2@gov.ab.ca			
H – P (excluding L)	780-644-1203	Chris Nixon		
Tier (excluding E)	GRCST3@gov.ab.ca	Chiris TVIXOII		
O – Z	780-644-1204	Jyoti Bhambhani		
Q-L	GRCST4@gov.ab.ca			

Gas Royalty Reception: 780-422-8727

Fax: 780-427-3334 or 780-422-8732

Alberta Toll Free: 780-310-0000

Hours of operation are 8:15 a.m. to 4:30 p.m. Voice messages left after 4:30 p.m. will be answered the next business day.

In situations where a company has just amalgamated or purchased another company, the general rule is to call the team that is responsible for the "Supra" business associate, or Royalty payer. Below are some guidelines for clients who are unsure which Client Services Team to call regarding their questions.

- 1. **Amalgamation/consolidation** Call the team responsible for the "Supra" business associate (Royalty Payer).
 - i.e. ABC Oil and Gas amalgamates with Zed Exploration and Zed is the amalgamator (royalty payer). When calling Client Services regarding business for ABC Oil and Gas, you would call Team 4 (Q-Z) (780-644-1204) because Zed Exploration is now the Supra business associate and royalty payer. This rule would apply even if you were calling regarding business that is prior to the acquisition or amalgamation.
- 2. **Asset Purchase** Call the team responsible for your company.
 - i.e. 123 Gas purchases the assets of TSP Exploration, but not the company. When calling Client Services regarding business for 123 Gas, you would call Team 1 (# Co., A, B, & L) (780-644-1201) because you have only purchased assets.
- Consultants/service providers If you have a contract to provide production accounting services to a company, call the team responsible for your client's company.
 - i.e. Paul Snow Consulting Services enters into a contract with Duckback Oil and Gas and Olive Oil and Gas. Paul Snow would contact Team 2 (C-G) (780-644-1202) to discuss Duckback Oil business and Team 3 (H-P excluding L) (780-644-1203) to discuss Olive Oil and Gas business. At the time the contract is signed, Paul Snow would have had each company notify the appropriate team that he was authorized to access information for their company.

Reference Prices and Valuation Allowances Calculation Information

Gas Royalty Valuation and Markets 300, 801 – 6 Avenue SW Calgary, Alberta T2P 3W2 Telephone: 403-297-5514

Fax: 403-297-5400

Deen Khan

Director, Gas Royalty Operations

Royalty Operations

Attachments

INFORMATION BULLETIN - SEPTEMBER 2010 ATTACHMENT 1

2010 GAS AND ISC PRICES

MONTH	Gas Reference Price (\$/GJ)	Methane ISC Reference Price (\$/GJ)	Methane ISC Par Price (\$/GJ)	Ethane ISC Reference Price (\$/GJ)	Propane ISC Reference Price (\$/GJ)	Butane ISC Reference Price (\$/GJ)	Pentanes plus ISC Reference Price (\$/GJ)
MONTH	(, ,	· ,	· , ,	\. ,	· ,	(, ,	,, ,
JAN	4.88	4.85	4.85	5.19	5.32	5.35	5.37
FEB	4.68	4.61	4.61	5.04	5.18	5.22	5.25
MAR	4.05	4.02	4.02	4.28	4.37	4.40	4.43
APR	3.26	3.22	3.22	3.60	3.71	3.73	3.75
MAY	3.37	3.29	3.29	3.73	3.85	3.88	3.90
JUN	3.49	3.46	3.46	3.78	3.88	3.92	3.96
JUL	3.42	3.40	3.40	3.77	3.82	3.85	3.88
AUG							
SEPT							
OCT							
NOV							
DEC		·					

DETAIL OF THE JULY 2010 GAS AND ISC REFERENCE PRICES									
	Gas	Methane	C2-IC	C3-IC	C4-IC	C5-IC			
Weighted Average Price of Alberta	3.826	3.824	3.924	3.923	3.921	3.925			
Deductions: Intra – Alberta Transportation	0.300	0.319	0.182	0.128	0.099	0.075			
Marketing Allowance	.0.019	0.019	0.019	0.019	0.019	0.019			
Price Before Pipeline Factor	3.507	3.486	3.723	3.776	3.803	3.831			
Pipeline Fuel/Loss Factor	0.993	0.993	0.993	0.993	0.993	0.993			
Price before Special Adjustment	3.483	3.462	3.697	3.750	3.777	3.804			
Special Adjustment	0.000	0.000	0.000	0.000	0.000	0.000			
Price before 2% amendment limitation or rounding	3.483	3.462	3.697	3.750	3.777	3.804			
Amendments: Carry forward (from previous RP month	0.004	-0.002	0.589	1.053	1.018	1.018			
Prior Period Amendment Adjustment (current RP mon	-0.074	-0.060	-0.045	-0.083	-0.094	-0.108			
Calculated RP after Amendments	3.413	3.400	4.241	4.720	4.701	4.714			
JULY 2010 Reference Price	3.42	3.40	3.77	3.82	3.85	3.88			
Difference = value carried forward to next RP month	-0.007	0.000	0.471	0.900	0.851	0.834			
Adjusted IATD (before Prior Period Amendments)		0.317	0.181	0.127	0.098	0.075			
Prior period Amendments (IATD and Pipeline Fuel Los	ss)	0.000	0.000	0.000	0.000	0.000			
Adjusted IATD (after Prior Period Amendments)		0.317	0.181	0.127	0.098	0.075			

INFORMATION BULLETIN - SEPTEMBER 2010 ATTACHMENT 1A

2010 NATURAL GAS LIQUIDS PRICES

MONTH	Ethane Reference Price (\$/GJ)	Ethane Par Price (\$/GJ)	Propane Reference Price (\$/m3)	Propane Floor Price (\$/m3)	Butane Reference Price (\$/m3)	Butane Floor Price (\$/m3)	Pentanes plus Reference Price (\$/m3)	Pentanes plus Par Price (\$/m3)	Sulphur Default Price (\$ per tonne)
JAN	5.19	5.19	365.10	304.14	462.20	362.63	535.03	512.98	15.84
FEB	5.04	5.04	350.66	310.59	440.83	328.69	552.62	541.33	38.58
MAR	4.28	4.28	271.19	243.48	437.36	299.13	568.06	554.48	49.30
APR	3.60	3.60	269.23	242.05	428.49	308.22	583.58	574.41	69.93
MAY	3.73	3.73	256.46	237.89	387.98	293.51	524.21	506.81	52.32
JUN	3.78	3.78	238.47	218.81	400.01	293.50	492.95	476.28	65.38
JUL	3.77	3.77	228.03	208.49	395.18	285.56	491.27	475.35	11.73
AUG									
SEPT									
OCT									
NOV									
DEC									

ANNUAL SULPHUR DEFAULT PRICE

2005	2006	2007	2008	2009
\$33.97	\$18.89	\$32.88	\$297.39	\$6.35

INFORMATION BULLETIN - SEPTEMBER 2010 ATTACHMENT 2

2010
NGL TRANSPORTATION ALLOWANCE AND DEDUCTIONS

	PENTANES PLUS (a)				PROPANE AND BUTANE (b)				PENTANES PLUS, PROPANE & BUTANE (c)				
MONTH		REG	SION			REC	SION			REC	GION		ALLOW.
	1	2	3	4	1	2	3	4	1	2	3	4	(per m3)
JAN	19.35	26.76	10.13	25.18	57.07	19.16	3.92	-10.19	57.95	52.54	63.03	51.40	17.25
FEB	8.52	17.16	-6.32	17.46	51.39	24.76	61.89	-8.43	51.58	51.62	55.86	45.56	17.25
MAR	10.32	18.62	1.65	17.28	51.24	32.88	15.96	5.15	59.67	47.42	53.64	47.86	17.25
APR	8.28	9.64	7.49	14.86	28.22	18.05	23.93	23.68	31.98	31.69	42.44	29.77	17.25
MAY	15.74	24.44	5.69	13.53	24.26	14.77	16.30	24.94	28.14	28.83	32.16	29.88	17.25
JUN	10.87	25.23	-9.35	25.61	32.46	21.34	27.66	27.22	39.71	41.09	41.95	39.68	17.25
JUL	11.97	22.28	13.61	14.89	34.82	29.00	32.30	32.30	38.38	49.95	39.07	37.72	17.25
AUG													
SEPT													
OCT				· ·						· ·			
NOV													
DEC													

⁽a) Pentanes Plus obtained as a specification gas product,

Note: For details on "Prior Period Amendment Effects", see Attachment 2A.

⁽b) Propane and Butane obtained as specification products, and

⁽c) Pentanes Plus, Propane and Butane contained in a natural gas liquids mix.

INFORMATION BULLETIN - SEPTEMBER 2010 ATTACHMENT 2A

PRIOR PERIOD AMENDMENT EFFECTS												
NGL REFERENCE PRICES						JULY	2010					
	Propa	ne	But	anes	Pente	anes						
Price before amendments	228.033	064	395.1	83290	491.2	73522						
Opening Rollover (from prior business mth)	0.0007	19	-0.00	02152	-0.00	4354						
Prior Period Amendment Adj. (NGL-100)	0.0000	00	0.00	00000	0.00	0000						
Published Reference Price	228.0	3	39	5.18	491	.27						
TRANSPORTATION ALLOWANCES					JULY 2010							
		Pentane	s Plus		Propane and Butane				Pentanes Plus, Propane & Butane			
AMENDMENTS	Region 1	Region 2	Region 3	Region 4	Region 1	Region 2	Region 3	Region 4	Region 1	Region 2	Region 3	Region 4
Opening Rollover (from prior business mth)	0.002624	0.002215	-0.000129	0.000299	0.004269	-0.001330	-0.000134	-0.003448	-0.002923	-0.002872	-0.004984	-0.004699
Prior Period Amendment Adj. (NGL-100)	-0.001161	0.000000	0.000000	-7.116912	0.000000	-0.000773	-0.000334	-0.000334	-0.000306	5.670291	0.000000	0.000000
Total Amendment Effect	0.001463	0.002215	-0.000129	-7.116613	0.004269	-0.002103	-0.000468	-0.003782	-0.003229	5.667419	-0.004984	-0.004699
Calculated Transp. Differential	11.966981	22.277687	13.614754	22.002519	34.811225	29.004609	32.304781	32.304781	38.382133	44.283118	39.077880	37.725904
Calculated Transp. Differential after Total Amendments	11.968444	22.279902	13.614625	14.885906	34.815494	29.002506	32.304313	32.300999	38.378904	49.950537	39.072896	37.721205
Published Transportation Allowance	11.97	22.28	13.61	14.89	34.82	29.00	32.30	32.30	38.38	49.95	39.07	37.72

Effective the January 2009 production period, the royalty rates for **methane** and **ethane** will be calculated based on a new royalty formula. The new royalty formula consists of the sum of a price component and a quantity component. The new royalty rates will range from 5% to 50%. **Propane** and **butanes** will have fixed royalty rates of 30%, whereas **pentanes plus** will have a fixed royalty rate of 40%.

The price component of the new royalty formula royalty rate for methane and ethane is determined by the monthly methane or ethane par price (PP)

Price (\$/GJ)	\mathbf{r}_{p}
PP ≤ 7.00	(PP - 4.50) * 0.0450
$7.00 < PP \le 11.00$	(PP - 7.00) * 0.0300 + 0.1125
PP > 11.00	(PP - 11.00) * 0.0100 + 0.2325
Maximum	30%
Minimum	Can be negative (-20.25% if PP=0)

The par price is a provincial weighted price determined by the department and published in the Information Letter for each production month. Determination of the par price has not changed under the Alberta Royalty Framework.

The quantity component of the new royalty formula royalty rate for methane and ethane is based on the average daily production (ADP) of the well event. The quantity component is adjusted for either the depth of the well event and/or the acid gas content of the well event.

Quantity (10 ³ m ³ /d)	${f r_q}$
$ADP \leq (6 * DF)$	[ADP - (4 * DF)] * (0.0500/DF)
$(6 * DF) < ADP \le (11* DF)$	[ADP - (6 * DF)] * (0.0300/DF) + 0.1000
ADP > (11*DF)	[ADP - (11 * DF)] * (0.0100/DF) + 0.2500
Maximum	30%
Minimum	Can be negative

The ADP for a well event is the total raw gas production in thousand cubic metres (10³m³) for the month divided by the total hours of production in that month multiplied by 24. The ADP formula is as follows:

$$ADP = \frac{\text{Total raw gas production}}{\text{Total hours of production}} \times 2^{2}$$

Acid Gas Factor (AGF) is a factor that adjusts the ADP of a well event if that well event is producing high amounts of acid gas, that is, if the combined concentration of hydrogen sulphide (H2S) and carbon dioxide (CO₂) is greater than 3% and less than or equal to 25%. If a well event has an acid gas content of less than or equal to 3%, then the AGF of the well event will default to 1.00. If a well event has acid gas content greater than 25% then the AGF has a minimum value of 0.78.

The AGF is determined based on the following formula:

$$AGF = [1.03 - (H_2S\% + CO_2\%)]$$

The ADP is adjusted by multiplying the ADP by the AGF, that is:

$$Adjusted ADP = ADP * AGF$$

The acid gas content of a well event, used by the department for the determination of the AGF, will be according to the records of the ERCB.

A depth factor (DF) is required for all well events, and is calculated based on the measured depth (MD) according to the records of the ERCB for that well event. Information on the MD, of a well event, can be found on the Petroleum Registry of Alberta (PRA) in the 'Infrastructure' section.

The DF is used in the determination of the quantity component (r_q) of the royalty rate; it adjusts the quantity component royalty formula for measured depths that exceed 2000 metres. The DF for a well event is determined based on the following formula:

$$DF = \left(\frac{MD}{2000}\right)^2$$

A well event with a MD greater than 2,000 metres will receive a royalty adjustment based on production from the well event. A well event without a reported MD or with MD less than or equal to 2,000 metres will have a DF of 1.00. The DF is capped at 4.00 for well events with MD greater than or equal to 4,000 metres.

If the MD is
$$\begin{cases} \leq 2,000 \text{ metres, then the DF} = 1.00 \\ > 2,000 \text{ metres and } <4,000 \text{ metres, then DF} = \\ \hline \geq 4,000 \text{ metres, then the DF} = 4.00 \end{cases}$$