



**BRITISH
COLUMBIA**

Ministry of Forests
and Range

**SPECIFICATIONS:
Calculation of the Interior
Average Market Price**



July 1, 2006



Revenue
Branch

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1. CALCULATING CONVENTIONS

Calculating conventions used throughout this document are as follows below.

Use only single operation calculations, except in compound additions and subtractions where all operands have the same number of decimal places.

Multiplication

Compute each product to a number of decimal places equal to the sum of the number of decimal places specified for the 2 operands, then round to the number of decimal places specified for the product. For example, the calculation to compute the product, to 2 decimal places, of 2 numbers (1 with no decimal places and the other with 3 decimal places) would be done as follows:

$$\begin{aligned} \text{i.e., } 262 * .234 &= 61.308 \\ &= 61.31 \text{ rounded to 2 decimal places} \end{aligned}$$

Division

Compute each quotient to a number of decimal places equal to the number of decimal places specified for the quotient plus 1, then round to the number of decimal places specified for the quotient. For example, the calculation to compute the quotient, to 2 decimal places, of 2 numbers (each with 0 decimal places), would be done as follows:

$$\begin{aligned} \text{i.e., } 234209 / 4671518 &= 62.616 \\ &= 62.62 \text{ rounded to 2 decimal places} \end{aligned}$$

Addition

Compute each sum to a number of decimal places equal to the larger of the number of decimal places specified for the 2 operands, then round to the number of decimal places specified for the sum. For example, the calculation to compute the sum, to 2 decimal places, of 2 numbers (each with 4 decimal places), would be done as follows:

$$\begin{aligned} \text{i.e., } 13.5837 + 11.6489 &= 25.2326 \\ &= 25.23 \text{ rounded to 2 decimal places} \end{aligned}$$

Subtraction

Compute each difference to a number of decimal places equal to the larger of the number of decimal places specified for the 2 operands, then round to the number of decimal places specified for the difference. For example, the calculation to compute the difference to 2 decimal places of 2 numbers (1 with 5 decimal places and the other with 3 decimal places), would be as follows:

$$\begin{aligned} \text{i.e., } 12.69999 - 9.375 &= 3.32499 \\ &= 3.32 \text{ rounded to 2 decimal places} \end{aligned}$$

Rounding

Determine the right most digit to be retained (i.e., 12.3449).

Determine the left most digit to be dropped (i.e., 12.3449).

If the left most digit to be dropped is less than 5, then the right most digit retained is unchanged (i.e., 12.3449 rounded to 2 decimal places is 12.34).

If the left most digit to be dropped is 5 or greater, then the right most digit retained is incremented by 1 (i.e., 12.3450 rounded to 2 decimal places is 12.35).

2. SOURCE DATA

Naming conventions for source data used throughout this document are as follows.

PAR	=	3 month average market values and other parameters published quarterly.
IAM	=	<i>Interior Appraisal Manual</i> .
Mark	=	refers to values on the corporate data base for each mark.
Mark/IAM	=	refers to site data for the mark and cost estimates from current <i>Interior Appraisal Manual</i> .
APP X	=	refers to an appendix of this document.
SX.X.X	=	refers to steps described in this document.

3. SELECTING MARKS TO BE INCLUDED IN THE AVERAGE MARKET PRICE CALCULATION

The selection of Interior marks is done from the snapshot of the SQLP1 DATABASE. Then, the species records for the mark are extracted to ensure only appraised species are used. Volumes billed for all coniferous species over the period (14 months prior to stumpage adjustment date to 2 months before the stumpage adjustment date) are then totalled into 2 groups: logs which receive the stand rate and low grade logs that are billed at the statutory minimum rate. In subsequent base rate calculations, any low grade logs will be made revenue neutral.

Select marks which meet the following criteria.

1. Mark is a stumpage mark.
2. Mark is appraised by the Interior method.
3. Mark is not part of BC Timber Sales.
4. Mark is from one of the following tenures:
 - Forest licence.
 - Tree farm licence.
 - Timber sale licence with allowable annual cut exceeding 10,000 cubic metres.
 - Timber licence.
5. Mark has complete appraisal data.
6. Mark has a total cruise volume of 100 cubic metres or more.
7. Mark has a confirmed worksheet with an appraisal effective data more recent than 48 months ago (from the stumpage adjustment date), that has not expired as of the stumpage adjustment date.
8. Mark has information for at least one of the following species: balsam, cedar, fir, hemlock larch, lodgepole pine, spruce, white pine or yellow pine.

Calculate the low grade and high grade volume billed for all coniferous saw log species.

Specifications: Calculation of the Interior Average Market Price

9. Include volume billed for the above species and the following species: white bark pine and cypress. Do not include the volumes of special forest products. Only volumes from normal and cruise based billings are included.

Low grade volumes and values are based on the species and grades shown in the species low grade saw log factors table for the applicable date.

High grade volumes are based on all volumes except Grade Z and low grade volumes.

Calculate the total volume billed for each mark by adding the individual species low grade and high grade volumes.

Exclude any mark where the total volume billed is less than 1,000 cubic metres.

Specifications: Calculation of the Interior Average Market Price

4. CALCULATING THE MARKET PRICE OF EACH MARK

		Units	Decimal Places	Maximum Value	Source/ Value	Rounding
2.1	selling price index	\$/m ³	2	999.99		yes
=	stand value				S 2.1.2	
/	CONVOL				S 2.1.1	
2.1.1	CONVOL	m ³	0	9999999		
=	sum of coniferous species cruise volumes	m ³		9999999	Mark	
2.1.2	stand value	\$	2	99999999.99		
=	sum of species values	\$			S 2.1.3	
2.1.3	species value	\$	2	99999999.99		
=	species selling price	\$/m ³			S 2.1.4	
*	species cruise volume	m ³	0	9999999	Mark	
2.1.4	species selling price	\$/m ³	2	999.99		
=	species appraisal LRF	fbm/m ³			S 2.1.5	
*	species lumber AMV	\$/fbm			S 2.1.6	
2.1.5	species appraisal LRF	fbm/m ³	0	999		
=	species cruise LRF	fbm/m ³	0	999	Mark	
+	species LRF add-on	Fbm/m ³	0	999	LRF	
2.1.6	species lumber AMV (fbm)	\$/fbm	3	9.999		
=	species lumber AMV (Mbm)	\$/Mbm	0	9999	PAR	
/	1000					
2.2	exchange rate	C\$/US\$	4	9.9999	PAR	yes
2.3	Douglas fir fraction	ratio	4	9.9999		yes
=	Douglas fir cruise volume	m ³	0	9999999	Mark	
/	CONVOL				S 2.1.6	
2.4	hembal fraction	ratio	4	9.9999		yes
=	hembal volume	m ³	0	9999999	S 2.4.1	
/	CONVOL				S 2.1.1	
2.4.1	hembal volume	m ³	0	9999999		
=	hemlock cruise volume	m ³	0	9999999	Mark	
+	balsam cruise volume	m ³	0	9999999	Mark	
2.5	cedar fraction	ratio	4	9.9999		yes
=	cedar cruise volume	m ³	0	9999999	Mark	
/	CONVOL				S 2.1.1	

Specifications: Calculation of the Interior Average Market Price

		Units	Decimal Places	Maximum Value	Source/ Value	Rounding
2.6	VPH	m ³ /ha	1	9999.9		yes
=	CONVOL	m ³			S 2.1.1	
/	total merchantable area	ha			Mark	
2.7	LOGVOL	N/A	4	99.9999	S 2.1.1	yes
=	natural logarithm (CONVOL/1000)					
2.8	VPT variable	N/A	4	99.9999		yes
=	1 / average volume per tree				S 2.8.2	
*	(1- hembal fraction)				S 2.4	
2.8.1	average volume per tree	m ³ /tree	4	99.9999	S 2.8.2	
=	sum of harvest method vpt prorates					
2.8.2	harvest method vpt prorate	m ³ /tree	4	99.9999		yes
=	harvest method vpt	m ³ /tree	2	99.99	Mark	
*	harvest method volume	m ³	0	9999999	Mark	
/	HARVOL				S 2.8.3	
note: in the above calculation, system vpt = 0.49 for helicopter and horse harvest methods						
2.8.3	HARVOL	m ³	0	9999999		yes
=	sum of all harvest method volumes, excluding specified operation volume.	M ³	0	9999999	Mark	
2.9	deciduous fraction	N/A	4	9.9999		
=	appraised deciduous volume	m ³	0	9999999	Mark	
/	TOTVOL	m ³			S 2.8.3	
2.9.1	TOTVOL	m ³	0	9999999		
=	CONVOL				S 2.1.1	
+	appraised deciduous volume	m ³	0	9999999	Mark	
2.10	decay fraction	N/A	4	9.9999		yes
=	sum of species decay percent prorates	%		99.9999	S 2.10.1	
/	100					
2.10.1	species decay percent prorate	N/A				
=	species decay percent	%	0	100	Mark	
*	species cruise volume		0	9999999	Mark	
/	CONVOL				S 2.1.1	

Specifications: Calculation of the Interior Average Market Price

		Units	Decimal Places	Maximum Value	Source/ Value	Rounding
2.11	average slope	%		999.99	S 2.11.1	2
=	sum of harvest method slope	%				
	Prorates					
2.11.1	harvest method slope prorate	%				
=	harvest method slope	%			Mark	
*	harvest method volume	m ³	0	999	Mark	
/	HARVOL		0	9999999	S 2.8.3	
note: in the above calculation, slope = 46.7% for helicopter and horse harvest methods						
2.12	partial cut fraction					
=	1		4	9.9999		yes
-	CAPCUT% (no 80% limit)		2	99.99	Mark/ IAM	
/	100					
2.13	cable yarding fraction	N/A	4	9.9999		yes
=	(hi lead and grapple volume	m ³	0	9999999	Mark	
+	skyline volume)	m ³	0	9999999	Mark	
/	HARVOL				S 2.8.3	
2.14	heli fraction	N/A	4	9.9999		yes
=	helicopter yarding volume	m ³	0	9999999	Mark	
/	HARVOL				S 2.8.3	
2.15	horse fraction	N/A	4	9.9999		yes
=	horse logging harvest method	m ³	0	9999999	Mark	
	Volume					
/	HARVOL				S 2.8.3	
2.16	fire damage fraction	N/A	4	9.9999		yes
=	sum of fire damage percent	%		99.9999	S 2.16.1	
	Prorates					
/	100					
2.16.1	species fire damage percent	%				
	prorate					
=	species fire damage percent	%	0	999	Mark	
*	species cruise volume	m ³	0	9999999	Mark	
/	CONVOL				S 2.1.1	
2.17	total cycle time	hours	1	99.9		
=	primary cycle time	hours	1	99.9	Mark	
+	secondary cycle time	hours	1	99.9	Mark	
2.18	tow distance	km	1	9999.9	Mark	

Specifications: Calculation of the Interior Average Market Price

		Units	Decimal Places	Maximum Value	Source/ Value	Rounding
2.19	salvage	N/A	0	1	Mark	
=	1 if yes, 0 otherwise					
2.20	Fort Nelson Peace	N/A	0	1	Mark	
=	1 if Zone 9					
	0 otherwise					
2.21	2005 Auctions	N/A	0	1	1	
=	1 for all marks					
2.22	DANB	N/A	1	99.9	APP 1	
=	DANB looked up by district					
2.23	CPIF	N/A	4	9.9999		yes
=	current CPI	N/A	1	999.9	PAR	
/	109.3	N/A			109.3	
3.1	selling price contribution	N/A	2	999.99		yes
=	selling price index	\$/m ³			S 2.1	
*	selling price coefficient				0.199	
/	CPIF	N/A			S 2.23	
3.2	exchange rate contribution	N/A	2	999.99		yes
=	exchange rate				S 2.2	
*	exchange rate coefficient				-9.91	
3.3	Douglas fir contribution	N/A	2	999.99		yes
=	Douglas fir fraction				S 2.3	
*	Douglas fir fraction coefficient				8.49	
3.4	hembal contribution	N/A	2	999.99		yes
=	hembal fraction				S 2.4	
*	hembal fraction coefficient				-12.37	
3.5	cedar contribution	N/A	2	999.99		yes
=	cedar fraction				S 2.5	
*	cedar fraction coefficient				36.40	
3.6	VPH contribution	N/A	2	999.99		yes
=	VPH 1000				S 2.6	
*	VPH coefficient				10.87	
/	1000					
3.7	LOGVOL contribution	N/A	2	999.99		yes
=	LOGVOL				S 2.7	
*	LOGVOL coefficient				3.36	
3.8	VPT variable contribution	N/A	2	999.99		yes
=	VPT variable				S 2.8	
*	VPT variable coefficient				-2.58	

Specifications: Calculation of the Interior Average Market Price

		Units	Decimal Places	Maximum Value	Source/ Value	Rounding
3.9	deciduous contribution	N/A	2	999.99		yes
=	deciduous fraction				S 2.9	
*	deciduous fraction coefficient				-14.13	
3.10	decay contribution	N/A	2	999.99		yes
=	decay fraction				S 2.10	
*	decay fraction coefficient				-33.81	
3.11	slope contribution	N/A	2	999.99		yes
=	slope				S 2.11	
*	slope coefficient				-0.0305	
3.12	partial cut contribution	N/A	2	999.99		yes
=	partial cut fraction				S 2.12	
*	partial cut coefficient				-2.17	
3.13	cable yarding contribution	N/A	2	999.99		yes
=	cable yarding fraction				S 2.13	
*	cable yarding fraction coefficient				-10.97	
3.14	heli contribution	N/A	2	999.99		yes
=	heli fraction				S 2.14	
*	heli fraction coefficient				-35.06	
3.15	horse contribution	N/A	2	999.99		yes
=	horse fraction				S 2.15	
*	horse fraction coefficient				-13.85	
3.16	fire damage contribution	N/A	2	999.99		yes
=	fire damage fraction				S 2.16	
*	fire damage fraction coefficient				-21.72	
3.17	cycle time contribution	N/A	2	999.99		yes
=	total cycle time				S 2.17	
*	cycle time coefficient				-2.46	
3.18	tow distance contribution	N/A	2	999.99		yes
=	tow distance				S 2.18	
*	tow distance coefficient				-0.0336	
3.19	salvage contribution	N/A	2	999.99		yes
=	salvage				S 2.19	
*	salvage coefficient				-3.40	
3.20	Fort Nelson Peace contribution	N/A	2	999.99		yes
=	Fort Nelson Peace				S 2.20	
*	Fort Nelson Peace coefficient				-3.76	

Specifications: Calculation of the Interior Average Market Price

		Units	Decimal Places	Maximum Value	Source/ Value	Rounding
3.21	2005 auctions contribution	N/A	2	999.99		yes
=	2005 auctions				S 2.21	
*	2005 auctions coefficient				0.395	
3.22	DANB contribution	N/A	2	999.99		yes
=	DANB				S 2.22	
*	DANB coefficient				0.601	
4.1	real estimated winning bid PLG	\$/m ³	2	999.99		yes
=	maximum of 0.25 or: constant				37.65	
+	selling price contribution				S 3.1	
+	exchange rate contribution				S3.2	
+	Douglas fir contribution				S 3.3	
+	hembal contribution				S 3.4	
+	cedar contribution				S 3.5	
+	VPH contribution				S 3.6	
+	LOGVOL contribution				S 3.7	
+	VPT variable contribution				S 3.8	
+	deciduous contribution				S 3.9	
+	decay contribution				S 3.10	
+	slope contribution				S 3.11	
+	partial cut contribution				S 3.12	
+	cable yarding contribution				S 3.13	
+	heli contribution				S 3.14	
+	horse contribution				S 3.15	
+	fire damage contribution				S 3.16	
+	cycle time contribution				S 3.17	
+	tow distance contribution				S 3.18	
+	salvage contribution				S 3.19	
+	Fort Nelson Peace contribution				S 3.20	
+	2005 auctions				S 3.21	
+	DANB contribution				S 3.22	
4.2	estimated winning bid PLG	\$/m ³	2	999.99		yes
=	maximum of 0.25 or: real estimated winning bid PLG	\$/m ³			S 4.1	
*	CPIF				S 2.23	
4.3	estimated winning bid	\$/m ³	2			yes
=	maximum of 0.25 or: estimated winning bid PLG	\$/m ³	2		S 4.2	
*	LGC				0.816	
+	0.046				0.046	

Specifications: Calculation of the Interior Average Market Price

		Units	Decimal Places	Maximum Value	Source/ Value	Rounding
5.1	tenure obligation adjustment	\$/m ³				
=	final TOA subtotal				S 5.1.1	
+	return to forest management				S 5.1.4	
+	final MLRC				S 5.1.5	
5.1.1	final TOA subtotal		2			yes
=	TOA subtotal				S 5.1.2	
/	high grade fraction				S 5.1.3	
5.1.2	TOA subtotal					yes
=	forest planning and administration	\$/m ³	2	999.99	Mark	
+	road development	\$/m ³	2	999.99	Mark	
+	road management	\$/m ³	2	999.99	Mark	
+	basic silviculture	\$/m ³	2	999.99	Mark	
5.1.3	high grade fraction	N/A	4	9.9999		yes
=	mark high grade AMP volume	\$/m ³	0	9999999	Mark	
/	mark AMP volume	\$/m ³	0	9999999	Mark	
5.1.4	return to forest management	\$/m ³	2	999.99		yes
=	TOA subtotal				S 5.1.2	
*	0.049				0.049	
5.1.5	final MLRC	\$/m ³	2	999.99		yes
=	MLRC	\$/m ³	2	999.99	1.60	
/	high grade fraction				S 5.1.3	
5.2	specified operations	\$/m ³	2	999.99		yes
=	rail haul	\$/m ³	2	999.99	Mark/IAM	
+	barge and ferry	\$/m ³	2	999.99	Mark/IAM	
+	dump boom dewater and reload	\$/m ³	2	999.99	Mark/IAM	
+	isolated	\$/m ³	2	999.99	Mark/IAM	
+	skyline	\$/m ³	2	999.99	Mark/IAM	
6.1	preliminary MPS market price	\$/m ³	2	999.99		yes
=	maximum of 0.25 or:					
	estimated winning bid				S 4.3	
-	tenure obligation adjustment				S 5.1	
-	specified operations				S 5.2	

Specifications: Calculation of the Interior Average Market Price

		Units	Decimal Places	Maximum Value	Source/ Value	Rounding
6.2	MPS market price	\$/m ³	2	999.99		yes
=	maximum of 0.25 or:					
	preliminary MPS market price				S 6.1	
-	dead saw log adjustment				S 6.2.1	
note: if appraisal effective date is greater than or equal to April 1, 2006, then dead saw log adjustment equals zero.						
6.2.1	dead saw log adjustment	\$/m ³	2	999.99		yes
=	dead saw log volume differential				S 6.2.2	
*	dead saw log value differential				10.00	
		Units	Decimal Places	Maximum Value	Source	Rounding
6.2.2	dead saw log volume differential	N/A	2	999.99		yes
=	historic dead saw log percent				S 6.2.3	
-	auction data set dead saw log percent				0.184	
6.2.3	historic dead saw log percent	N/A	2	999.99	Mark	
note: if mark data is insufficient (see Appendix 2), then look up dead saw log percent by point of appraisal in Appendix 2.						

5. CALCULATING THE AVERAGE MARKET PRICE

7.1	average market price	\$/m ³	2	999.99		yes
=	total AMP value				S 7.2.1	
/	total AMP volume				S 7.2.5	
7.2.1	total AMP value	\$	2	9999999999.99		yes
=	sum of mark AMP value				S 7.2.2	
7.2.2	mark AMP value	\$	2	9999999999.99		yes
=	mark high grade value				Mark	
*	mark low grade value				Mark	
7.2.3	mark high grade value	\$	2	9999999999.99		yes
=	mark high grade volume				Mark	
*	MPS market price				S 6.2	
7.2.4	mark low grade value	\$	2	9999999999.99		yes
=	mark low grade volume				Mark	
*	minimum stumpage rate				0.25	
7.2.5	total AMP volume	m ³	0	999999999		yes
=	sum of mark high grade volume				Mark	
+	sum of mark low grade volume				Mark	

APPENDIX 1

Appendix 1: District Average Number of Bidders (DANB)

Forest District	DANB
100 Mile House	5.1
Arrow Boundary	4.1
Cascades	4.9
Central Cariboo	3.7
Chilcotin	3.3
Columbia	3.5
Fort Nelson	2.2
Fort St. James	2.5
Headwaters	6.1
Kalum	3.1
Kamloops	6.2
Kootenay Lake	3.2
Mackenzie	2.3
Nadina	4.6
Okanagan Shuswap	4.8
Peace	3.7
Prince George	3.1
Quesnel	4.8
Rocky Mountain	4.0
Skeena Stikine	3.0
Vanderhoof	2.6

APPENDIX 2

Appendix 2: Dead Saw Log Percent by Point of Appraisal

Mark specific data for historic dead saw log percent is insufficient if: Volume billed prior to April 1, 2006 is less than 1000 cubic metres, or calculated dead saw log percent is less than 0 or greater than 1.

Point of Appraisal	Dead Saw Log Percent
100M	0.4410
ADLK	0.1105
ARMS	0.2321
BELK	0.2524
BOBA	0.1162
BSLK	0.3742
CAFL	0.0507
CANO	0.0818
CARN	0.0442
CAST	0.1168
CHET	0.0132
CHSM	0.3789
CLLK	0.5350
CRAI	0.0417
CRAN	0.0748
CRES	0.0758
ELKO	0.0731
ENGE	0.7078
FRLK	0.6781
FTJA	0.2590
FTJO	0.0112
FTNE	0.0326
GALL	0.0956
GRFO	0.0771
HAZE	0.0868
HOUS	0.1381
ISPI	0.5948
KAML	0.3374
KELO	0.1117
KITW	0.0153
LAVI	0.1053
LILL	0.0673
LSCK	0.2904
LUMB	0.0757

Specifications: Calculation of the Interior Average Market Price

Point of Appraisal	Dead Saw Log Percent
LYTT	0.1583
MBRI	0.0778
MERR	0.1566
MIDW	0.0655
MKEN	0.0576
OKFA	0.1189
PASI	0.0596
PRGE	0.4034
PRIN	0.0869
QUES	0.6213
RADI	0.0811
REVE	0.0403
SLOC	0.0582
SMIT	0.1908
STRA	0.4840
TAYL	0.0154
TERR	0.0087
THRU	0.1294
UPFR	0.1593
VALE	0.0711
VAND	0.5456
VAVE	0.1237
WEST	0.0615
WILK	0.3990
YMIR	0.0329