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Ministry of Forests
and Range

Minister's Office

MEMORANDUM

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Cliff: 122636

To: Madeline Maley, A/Regional Executive Director, Southern Interior Forest Region
Bill Warner, Regional Executive Director, Northern Interior Forest Region

From: The Honourable Pat Bell
Minister of Forests and Range and Minister Responsible for Integrated Land
Management Bureau

Re: Amendment No. 11 to the *Interior Appraisal Manual*

I hereby approve Amendment No. 11 to the *Interior Appraisal Manual* and attach a copy for your use. The following sections have been amended:

Section 1.1	Definition added for effective date.
Section 1.2.2	New section added for stumpage appraisal parameters.
Section 1.5.2	Text added for Interior Stumpage Rate Request Form.
Section 4.3.2.4 (2)	Some text moved to section 4.3.3(8).
Section 4.3.2.6	Text added for clarification.
Section 4.3.3(5)(f)	Text revised to clarify bridge costs.
Section 4.3.3(7)(c)	Redundant text removed.
Section 4.3.3(8)(d)	New subsection added to clarify bridge costs.
Table 4-5	Update for 2009 ECE Cost Year.
Section 4.4.3	Revised highlead and grapple equation.
Section 4.8.3	Revised low volume cost estimate for highlead and grapple.
Section 4.9	Section updated for clarity.
Section 4.11	Cost trend factors extended for October 1 to December 31, 2009 and January 1 to March 31, 2010.



Section 5.6.4	Revised text for levy on deciduous sawlogs and incidental conifer in deciduous leading stands where the Crown is responsible for silviculture.
Section 6.1.3 (2)	New paragraph for silviculture levy on incidental conifer in deciduous leading stands.
Section 6.1.3 (3)	Redetermination date changed from August 1 to June 1 for incidental conifer in deciduous leading stands.
Table 6.2.1 (1)	Revised text to clarify and change requirements for damaged timber for Forestry Licences to Cut for specific purposes.
Table 6-4	Section reference updated. Updated clearing rate for Fort Nelson District.
Section 7.2.1	Section reference updated.

This amendment will come into force on January 1, 2010. Further amendments or revisions to this manual require my approval.



Pat Bell
Minister

Attachment

pc: Murray Stech, Director, Revenue Branch



Ministry of
Forests
and Range



MANUAL REVISION TRANSMITTAL

<p>FOR FURTHER INFORMATION OR IF YOU HAVE A CHANGE OF ADDRESS, PLEASE CONTACT:</p> <p>Bob Bull Senior Timber Pricing Forester (Interior) Revenue Branch Ministry of Forests 1st Floor, 1520 Blanshard Street Victoria, BC V8W 3K1 Phone: 250-356-7709 Email: Bob.Bull@gov.bc.ca FAX: 250-387-5670</p>	MANUAL TITLE	
	Interior Appraisal Manual	
	AMENDMENT	ISSUE DATE
	Amendment No. 11	January 1, 2010
MANUAL CO-ORDINATOR		
Judy Laton Manuals Co-ordinator		
AUTHORIZATION (Name, Title)		
Murray Stech Director, Revenue Branch		

Please make the following changes to your copy of the above Ministry manual.

ACTION	(VOL.) CHAPTER-SECTION-SUBJECT		
(Remove/Insert)	TABLE OF CONTENTS	PAGE(S)	COMMENTS
Remove	Table of Contents	i – ii v - vi	After Table of Contents Tab
Insert		i – ii v - vi	
Remove	Chapter 1	3 - 10	After Chapter 1 Tab
Insert		3 - 12	
Remove	Chapter 4	17 - 60	After Chapter 4 Tab
Insert		17 - 62	
Remove	Chapter 5	7 - 8	After Chapter 5 Tab
Insert		7 - 8	
Remove	Chapter 6	3 – 6 17 - 18	After Chapter 6 Tab
Insert		3 – 6 17-18	
Remove	Chapter 7	3 - 4 13 - 14	After Chapter 7 Tab
Insert		3 – 4 13 - 14	
Remove	Index	1 - 4	After Index Tab
Insert		1 - 4	
INSERT	Letter from Minister and Transmittal Sheet		After Amendments Tab

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“Bonus Bid” means a bonus bid described in section 103(1)(d) of the *Act*,

“Bonus Offer” means a bonus offer described in section 103(2) of the *Act*,

“Chipped” means having been cut into small pieces by a chipper,

“Coniferous cruise volume” means that part of the total net cruise volume which is coniferous timber,

“Cutting Authority” means:

1. A cutting permit issued under:
 - a. a forest licence,
 - b. a timber sale licence that provides for the issuance of cutting permits,
 - c. a tree farm licence,
 - d. a community forest agreement,
 - e. a woodlot licence,
 - f. a timber licence,
 - g. a community salvage licence,
 - h. a master licence to cut, or
 - i. a forestry licence to cut.
2. A timber sale licence under which cutting permits have not or will not be issued.
3. All other licences to cut.
4. A road permit.

“Cutting Authority Area” means the area where timber may be harvested under a cutting authority, which has a unique timber mark,

“Deciduous timber” means timber that is not of a coniferous species,

“Decked timber” means timber that has been 100% decked at roadside,

“Director” means director of Revenue Branch Ministry of Forests and Range,

“District Manager” means:

- a. Except as provided in paragraph (b) of this definition, the district manager or district manager’s designate.

- b. Where the cutting authority area being appraised or reappraised is located in a controlled recreation area designated under the *Resort Timber Administration Act*, (RTAA) then district manager means an employee of the Ministry of Tourism, Culture and the Arts to whom the minister of that ministry has delegated the minister's powers and duties under section 2 of the RTAA.

“Fully Appraised” means stand data (site specific or borrowed) has been used by the general appraisal system to calculate an indicated stumpage rate or has been included in an appraisal for a BCTS cutting authority including appraisals where the upset rate was set at the variable cost to prepare the timber for sale,

“Effective Date” means, unless otherwise specified in the manual,

- i. the date the stumpage rate is determined when required for advertising for competitive award, or
- ii. the effective date of the cutting authority when the stumpage rate is determined for a cutting permit or a direct award licence.

“Hogged” means tree residues or by-products that have been shredded into smaller fragments by mechanical action.

“Licensee” means the holder of a cutting authority,

“Manual” means *Interior Appraisal Manual*,

“Minister” means Minister of Forests and Range,

“Ministry” means Ministry of Forests and Range,

“New Construction” means the following construction phases: subgrade construction, placement of additional stabilizing material and the construction and installation of drainage and other pertinent structures,

“Partially Harvested Timber” means timber that has been felled and/or bucked and not yet forwarded to roadside.

“Prescribed Minimum Stumpage Rate” means the minimum stumpage rate prescribed by the minimum stumpage rate regulation (BC Regulation 354/87).

“Reconstruction and Replacement” means replacement or structural repair of a major drainage structure (e.g., replacing stringers, cross ties, or cribbing), or major resurfacing, which means resurfacing sections of more than 0.3 km in length that were initially surfaced but have deteriorated due to long term wear and tear, where stabilizing material was not previously used, or major reconstruction, which means restoring at least 0.1 km of road (per occurrence) that requires complete rebuilding of the subgrade,

“Regional Manager” means regional executive director or regional executive director’s designate,

“Regulations” means regulations under the *Act*,

“Remedial Fences and Wing Fences” means fencing that is required to remedy, reduce or manage the impact of timber harvesting activities on range management,

“Revenue Branch” means the Revenue Branch of the Ministry,

“Road Permit” means road permit or road timber mark,

“Skidder Swing” means situations where two of the different harvest methods as listed in section 4.4.1 are required to move timber to an existing road or landing where it can be loaded onto a haul truck. Where skidder swing is included in an appraisal the harvest method that moves the felled timber first is the method that is indicated in the appraisal data submission,

“Salvage” except as provided in section 6.4, means a cutting authority area where greater than one-third of the net coniferous cruise volume is attacked by mountain pine beetle or other pests,

“Species Net Volume” is the species net volume reported in the appraisal summary report from the cruise compilation for the cutting authority area,

“Stud Log Percent” means the net volume of 5 m logs with top diameters under 20 cm expressed as a percentage of the total net cruise volume. The stud log percent is rounded to the nearest whole percentage point,

“Stumpage Appraisal Parameter” means:

- | | |
|-----------------------------------|--------------------------------------------------|
| a. Interior average market price, | e. US Dollar Exchange rate, |
| b. Interior base rate, | f. Lumber and Chip Average Market Values, |
| c. Interior mean value index, | g. Interior Basic Silviculture Costs by Species. |
| d. BC Consumer Price Index, | |

“Suitable Secondary Structure” means suitable secondary structure as defined in Section 1(4) of the *Forest Planning and Practices Regulation*.

“Timber Sales Manager” means the Timber Sales Manager or the Timber Sales Manager’s designate,

“Total Net Coniferous Volume” is the total of the species net volumes for all coniferous species on the cutting authority area,

“Total Net Cruise Volume” means the sum of the species net cruise volumes reported in the appraisal summary report from the cruise compilation for the cutting authority area,

“Total Net Deciduous Volume” is the total of the species net volumes for all deciduous species on the cutting authority area,

“Tributary Cutting Authority Area” means a cutting authority area from which timber must be transported over the road that is developed, or a cutting authority area to which bulk fuels, supplies, equipment and harvesting crews necessary to carry out the day-to-day harvesting activities on that area must be taken on a regular basis over the road that is developed,

1.2 Terms of Reference

1. Pursuant to section 105 of the *Forest Act* the provisions of this manual are policies and procedures to be used in the determination, redetermination and variance of stumpage rates in the Northern Interior Forest Region and in the Southern Interior Forest Region and Manning Park.

1.2.1 Responsibility for Stumpage Determination

1. The following employees of the ministry are authorized to determine, redetermine and vary rates of stumpage:
 - a. regional managers, regional timber pricing co-ordinators, and employees of the regional revenue sections, and
 - b. director and employees of Revenue Branch.

1.2.2 Stumpage Appraisal Parameters

1. The stumpage appraisal parameters are compiled, calculated, and/or adopted by Revenue Branch.
2. Once approved by the director they become an integral part of this manual.
3. The parameters are published by Revenue Branch.
4. Current and historical parameters may be found at the following web site:

<http://www.for.gov.bc.ca/hva/>

1.3 Numbering and Calculation Conventions

1. The following exemplifies the numbering system used in this manual:
 1. = Chapter.
 - 1.1 or 1.1.1. = Section.
 - 1.1.1 (2) = Section with subsection.
 - Table 4-2 = Table 2 within chapter 4.

2. The calculation of the Interior Average Market Price must be performed in accordance with the specifications contained in the documents titled: "*Specifications: Calculation of the Interior Average Market Price*" dated July 1, 2006, and "Interior Market Pricing System Update - 2007".

3. The calculation of the stand value index, mean value index and the base rate must be performed in accordance with the specifications in the document titled: "*Specifications: Calculation of Interior Stumpage Rates*" dated July 1, 2006.

4. Where a value is specified as a limit, for example a constraint or a requirement for an equation,
 - a. The value will be treated as an absolute value, and
 - b. An actual measurement or record will not be rounded before use unless otherwise specified in this manual.

1.4 Cutblocks within a Cutting Authority Area

1. Cutblocks within a cutting authority area must:
 - a. Constitute a logical unit,
 - b. Be within the same forest district,
 - c. Be tributary to a common point of appraisal,
 - d. Must not exceed a maximum distance of ten kilometres between the furthest boundaries of the furthest cutblocks, except when required for blanket salvage.

1.5 Appraisal Data Requirements

1. The cruise and all other pertinent information required for the appraisal must be submitted by the licensee or BC Timber Sales with the appraisal data submission to the district manager.
2. Unless otherwise specified by the Director, cruise data must be gathered and compiled according to the approved interior standard timber merchantability specifications in Table 1-1 below and in accordance with the following Ministry publications:
 - a. *Cruising Manual* web site:

<http://www.for.gov.bc.ca/hva/manuals/cruising.htm>
 - b. *Cruise Compilation Manual*.
3. When requested by the district manager, a copy of the original field data must be supplied by the licensee.

Table 1-1 Interior Standard Timber Merchantability Specifications

Description	
The following standard timber merchantability specifications must be used for all appraisals.	
Stumps (Measured on the side of the stump adjacent to the highest ground.) no higher than	30.0 cm
Diameter (outside bark) at stump height	
lodgepole pine: all timber that meets or exceeds	15.0 cm
all other species: all timber that meets or exceeds	20.0 cm
Top diameter (inside bark or slab thickness) for all species and ages, except cedar older than 141 years, all timber that meets or exceeds	10.0 cm
Top diameter (inside bark or slab thickness) for cedar older than 141 years, all timber that meets or exceeds	15.0 cm
Minimum length	
log or slab	3.0 m

1.5.1 Comparative Cruise Data

1. Comparative cruise data is cruise data from an existing cutting authority area with similar stand and terrain characteristics that is used in the appraisal of a new cutting authority area.

2. The district manager may require the selection of a comparable cutting authority to be in accordance with procedures set out in section 2.10 of the *Cruising Manual*.
3. Except for subsection (5), if there is time to perform a full cruise, then the timber will be cruised.
4. If there is insufficient time to perform a full cruise then comparative cruise data may be utilized:
 - a. For cutting authorities with volumes greater than 5 000 m³ if:
 - i. the area is in an approved Emergency Bark Beetle Management Area (EBBMA) as designated by the Minister of Forests and within an approved Emergency Management Unit (EMU) as designated by the beetle management coordinator,
 - ii. the licensee has previously harvested comparative cutting authorities in a timely manner, and
 - iii. the regional manager has determined that the requirement to perform a full operational cruise will delay expeditious harvesting and result in further damage.
 - b. When the stumpage rate is determined according to section 6.2(5).
5. Comparative cruise data may be utilized when the stumpage rate is determined according to section 6.2.1(1)(c)(ii).

1.5.2 Appraisal Data Submission

The form as required by the director may be found at:

<http://www.for.gov.bc.ca/hva/ECAS/index.htm>

For the Interior Stumpage Rate Request Form, contact the appropriate Regional office.

1.5.3 Appraisal Map

The appraisal map must be completed in accordance with the requirements of Appendix IV.

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Table 4-4 Culvert Appraisal Cost Estimates

INSTALLED CULVERT COST ESTIMATE (\$)														
Culvert	Equivalent Round Diameter (m)													
	0.3	0.4	0.45	0.5	0.6	0.7	0.8	0.9	.95	1.0	1.2	1.4	1.6	1.8 m
Length (m)	X-Section Area (m²)													
	0.07	0.13	0.16	0.20	0.28	0.38	0.50	0.64	0.71	0.79	1.13	1.54	2.01	2.54 m²
9	407	500	556	619	765	937	1136	1362	1484	1614	2197	2886	3681	4583
10	420	524	586	656	818	1010	1231	1481	1617	1761	2409	3175	4058	5060
11	434	547	616	693	871	1082	1325	1600	1750	1908	2621	3463	4436	5537
12	447	571	646	730	924	1154	1419	1720	1883	2055	2833	3752	4813	6014
13	460	594	676	767	977	1226	1513	1839	2016	2203	3045	4041	5190	6492
14	474	618	705	803	1030	1298	1608	1958	2149	2350	3257	4329	5567	6969
15	487	641	735	840	1083	1370	1702	2077	2282	2497	3469	4618	5944	7446
16	500	665	765	877	1136	1443	1796	2197	2415	2645	3681	4907	6321	7923
17	513	689	795	914	1189	1515	1890	2316	2548	2792	3893	5196	6698	8400
18	527	712	825	951	1242	1587	1985	2435	2681	2939	4106	5484	7075	8878
19	540	736	855	988	1295	1659	2079	2555	2814	3086	4318	5773	7452	9355
20	553	759	884	1024	1348	1731	2173	2674	2946	3234	4530	6062	7829	9832
21	566	783	914	1061	1401	1804	2267	2793	3079	3381	4742	6350	8206	10309
22	580	806	944	1098	1454	1876	2362	2913	3212	3528	4954	6639	8583	10786
23	593	830	974	1135	1507	1948	2456	3032	3345	3676	5166	6928	8960	11264
24	606	854	1004	1172	1560	2020	2550	3151	3478	3823	5378	7216	9337	11741
25	619	877	1034	1208	1614	2092	2645	3270	3611	3970	5590	7505	9714	12218
26	633	901	1063	1245	1667	2164	2739	3390	3744	4117	5802	7794	10091	12695
27	646	924	1093	1282	1720	2237	2833	3509	3877	4265	6014	8082	10468	13172
28	659	948	1123	1319	1773	2309	2927	3628	4010	4412	6227	8371	10845	13650
29	672	971	1153	1356	1826	2381	3022	3748	4143	4559	6439	8660	11222	14127
30	686	995	1183	1393	1879	2453	3116	3867	4276	4707	6651	8948	11599	14604

2. Bridges

Cost estimates for both log bridges and non-log bridges, where required and not included in subgrade cost estimates, are made as detailed engineering cost estimates (section 4.3.3).

4.3.2.5 Additional Stabilizing Material

Road stabilization is the placement of gravel or broken rock on the road subgrade to provide stable support and a running surface for logging equipment using the road during the harvesting of tributary timber (see section 4.3.3(5)(l) for cost estimates pertaining to the use of special materials). Where stabilizing material developed during the subgrade or ditch construction is insufficient, a cost estimate for additional stabilizing material to be trucked in from selected borrow pits may be included in the appraisal.

Unit Cost Estimate

The unit cost estimate (\$/km) for the additional stabilizing material includes:

- borrow pit preparation,
- rock drilling, explosives, loading of explosives and blasting,
- loosening and/or pushing materials in borrow pits when required (e.g., compacted or cemented gravel, oversize material, etc.),
- loading gravel trucks,
- truck hauling, and
- spreading and compacting the material.

The cost estimates assume borrow pits are located adjacent to the road side and are not part of the subgrade excavation. If a new road needs to be constructed to access the borrow pit, then an access road cost estimate is required in addition to the in-place unit cost estimates.

For each road, the additional stabilizing material cost estimate (\$/km) is determined from the equation for the appropriate road group.

Road Groups	Equation
1	Refer to section 4.3.3(5)(n)
2	8897
3	$7336 + (1334 * D) + (13331 * QROCK) + (3939 * LT)$
4	11913
5	9121
6	$10631 + (205 * D)$
7	$10631 + (205 * D)$
8	$3153 + (370 * D)$
9	$4375 + (3108 * D)$
10	16630
11	16630
12	16630

Where:

Road groups are defined in Table 4-3.

D = Distance in kilometres from source of ballast to the centre of the section that requires ballast (rounded to the nearest 0.1 km)

LT = 1 if a long term road, otherwise = 0

QROCK = 1 if road is stabilized with quarry rock that requires drilling and blasting. Otherwise QROCK = 0

No cost estimate for additional stabilizing material is allowed for any snow and ice roads.

4.3.2.6 Cattle Guards, Remedial Fences and Pipeline Crossings

1. Where the installation of cattle guards, remedial fences or wing fences are required to mitigate the impacts to range barriers resulting from harvesting on the cutting authority area, the following cost estimates apply:

- a. Cattle Guards \$5754 each
- b. Remedial Fences and Wing Fences \$987 per 100 m (post and wire construction only)

2. For pipeline crossings, the following cost estimates apply:

\$3400 per single pipe crossing

\$2046 per pipe in multiple pipe crossings
(where 2 or more pipes are crossed within
the same right-of-way)

3. The cost estimates for subsection (1) and (2) include materials, transportation and installation.

4.3.3 Detailed Engineering Cost Estimates

1. Where the tabular cost estimating procedures of this manual cannot be used due to their physical limitations, the cost of a project shall be estimated by preparing a detailed engineering cost estimate. The regional manager may approve standardized procedures to generate cost estimates for use in projects as listed below.
2. Where specific development projects involve detailed engineering cost estimates, the district manager shall be advised of project details no later than 60 days before the start of work on the project.
3. For appraisal purposes, the estimated development project costs are made on the basis of the site-specific data using the definitions found in section 4.3.2.2 for common subgrade construction variables, the culvert costs included in Table 4-4, and the equipment and labour rates specified in Appendix I. Due consideration is given to arm's length competitive bids for any specific project. The appraisal estimate is not constrained in any way by a licensee's actual costs.
4. If the ECE is re-estimated once after construction as provided in section 2.2(3) (using more accurate on site information) the new detailed engineering cost estimate replaces the original (used in the initial appraisal). Detailed engineering cost estimates originally estimated using ministry approved competitive bids may be re-estimated once after construction provided the original call to tender included a methodology for adjusting the bid price based on more accurate site information and re-estimation of those costs is performed in accordance with that methodology. ECE's are not re-estimated due to labour and/or equipment rates being updated periodically in Appendix I.
5. Where road sections estimated as a detailed engineered cost estimate are contiguous with tabular cost estimates, costs for mobilization and demobilization will only be allowed for special equipment not required for the construction of the tabular roads. The costs for replacement or addition of stabilizing material must be determined using section 4.3.2.5 unless the material is placed in conjunction with geo fabric, geo grids, corduroy or where the stabilizing material requires processing such as screening or crushing.

The following specific situations are considered for detailed engineering cost estimates:

- a. New construction of long term, primary access road sections, that will have 300 000 cubic metres of harvested crown timber hauled over them annually for at least ten years.
- b. Road construction on uphill side slopes greater than 50 percent.
- c. When rock percent as calculated in section 4.3.2.2(4) is greater than 50 percent, or terrain class 4 and 5.
- d. End haul construction (of roads and landings) requiring removal by truck of excavated material to a separate area to avoid side casting on steep and/or sensitive sites.
- e. Overland construction to provide a roadbed by trucking in material for extensive filling; see page 81 of *Forest Road Engineering Guidebook* for a more detailed description.
- f. Log bridges and non-log bridges (including ice bridges) that are not included in the subgrade cost estimates. Eligible costs are described in section 4.3.3(8).
- g. Structural maintenance of bridges, substructure and cribwork.
- h. Reconstruction of roads and pertinent structures. Cost estimates for reconstruction are not to exceed the tabular cost for new construction under similar conditions.
- i. Upgrade of roads and pertinent structures resulting in a change in the standard of the road and structure or where the licensee was not obligated to carry out road maintenance prior to the appraisal. Where road maintenance obligations exist, road upgrade is limited to widening the running surface, vertical and horizontal realignment, and additional culverts.
- j.
 - i. Replacement or addition of stabilizing material to the existing road running surface or where stabilizing material was not previously used, for uninterrupted road lengths of 0.3 km, or greater.
 - ii. Road lengths less than 0.3 km are included in the road management cost estimate.
- k. Culverts greater than 1.8 m in diameter, or culverts greater than 30 m in length regardless of diameter. The cost estimate includes all costs of transporting the culvert to the jobsite and all costs of installation of the culvert to the final subgrade stage.

- l. Placement of additional stabilizing material where geo fabric, corduroy, crushed and/or screened rock/gravel are used.
 - m. Retaining walls, railway crossings and other special structures (may include multiple culverts, baffled culverts, arched culverts and other structures determined by the timber pricing co-ordinator).
 - n. Subgrade and ballast cost estimate in road group 1, Kalum District. The subgrade and ballast cost estimate will be determined using the detailed engineering cost methodology specified by the Northern Interior Forest Region.
 - o. The costs of designing and constructing a forwarding road, where the timber pricing co-ordinator is satisfied that it will produce the least cost total development, harvesting and transportation estimate in the appraisal. A forwarding road is not a trail but a road built to a designed standard which includes stripping, grubbing, stumping and primary excavation to establish subgrade that is used for transporting crews and equipment and forwarding timber but not for hauling logs.
6. The data which may be required for excavation and fill estimates are:
- a. Plans, profiles, cross-sections showing the ground and design grade lines.
 - b. Volume summary sheets showing excavation quantities by various soil types, for subgrade and stabilization.
 - c. Type of construction equipment and quantity of material to be used, or ministry approved competitive bid costing.
 - d. Location of borrow and waste areas to calculate material haul distances.
7. The data required for bridges, culverts and for other unusual structures are:
- a. Where the bridge span is 15.4 m or less and the crib height is 5.4 m or less and a permanent structure is proposed, an economic life cycle comparison between a log structure and the permanent proposal is required.
 - b. Where the bridge span is greater than 15.4 m, and/or the crib height is 5.4 m or more and for pipe culverts greater than 1.8 m in diameter or 30 m in length: plans, specifications and design for the proposed structure; detailed estimate of costs of materials; equipment and labour or ministry approved competitive bid pricing; amount of timber accessed by the structure and the number of years of use for harvesting all timber are required.
8. Costs that may be included in the detailed engineered cost estimate are:
- a. Freight (for materials).

-
- b. Provincial sales tax (for materials).
 - c. Supervision of construction of complex structures by a professional engineer.
 - d. **Bridge Costs**
 - i. **In addition to other costs described in this section, bridge costs may include:**
 - Crib back fills to a maximum distance of 15 m on either end.
 - Site preparation.
 - Protection features such as rip rap.
 - Material and equipment supply and delivery (subject to paragraphs (ii) and (iii) in this subsection).
 - Bridge certification by a professional engineer either employed by the licensee or contracted. A maximum of three field visits are permitted unless otherwise approved by the regional timber pricing co-ordinator.
 - ii. Where bridge materials are re-used by the original purchaser at a different site, the bridge cost estimate may include the cost of dismantling the materials at the site where they were previously used, and transportation to and installation at the different site, but may not include the initial materials and delivery costs.
 - iii. Where used bridge materials are purchased by the licensee from a legally non-associated party, only the cost of purchasing and transporting those materials approved by the person determining the stumpage rate may be included in the bridge cost estimate in addition to the costs listed above.
 - e. Bridge certification by a professional engineer (maximum of three field trips) unless otherwise approved by the regional timber pricing co-ordinator (the costs for professional engineers are permitted whether they are on the licensee's staff or hired under contract).
 - f. Site plans, designs and layouts.
 - g. Where equipment is not, or will not be already on site for adjoining tabular road, bridge or culvert construction, then the costs of mob and demob may be included in the engineered cost estimate.
9. GST and supervision costs other than as stated above, are not to be included in the engineered estimate.

10. Where different timber volumes are used for separate cost estimates, the unit costs are rounded to the nearest cent before totalling.
11. In some cases, the detailed engineering cost estimates may be apportioned to two or more licensees' tributary cutting authorities, as described under section 4.3.1.1.4.

4.3.3.1 Trending of Detailed Engineering Costs

1. All detailed engineering costs must be adjusted to match the cost base of the manual in effect at the time of the appraisal or reappraisal (refer to Table 4-5). This includes development costs in apportionment agreements, ministry approved competitive bid tenders, and ECE's prepared using Appendix I.
2. ECE Cost Year means:
 - a. For ECEs (or portion(s) thereof) which are calculated using this manual, the ECE Cost Year is 2006.
 - b. For ECEs (or portions(s) thereof) which are calculated using tenders, materials costs, design and survey costs, etc. the year the costs are based on or incurred is the ECE Cost Year.
 - c. Where all components of an ECE have a common ECE Cost Year, the trend factor can be directly determined from Table 4-5.
 - d. For new or re-estimated (section 2.2(3)) ECEs where components of an ECE have different ECE Cost Years, it is necessary to trend all components to the Cost Base Year of the manual in effect at the time (based on the effective date of the cutting authority). The Cost Base Year then becomes the ECE Cost Year for future trending.

Table 4-5 Trend Factors for ECE Costs

ECE Cost Year	Multiply by this Trend Factor to Match the 2006 Cost Base
1995	0.925
1996	0.872
1997	0.811
1998	0.856
1999	0.899
2000	0.879
2001	0.894
2002	0.904
2003	0.978
2004	0.978
2005	1.0
2006	1.0
2007	1.0
2008	1.0
2009	1.0

4.4 Tree-to-Truck

Cost estimates included in the tree-to-truck phase of the logging operation include, but are not limited to, expenses incurred for:

- felling
- skidding
- yarding
- bucking
- sorting (bush, dryland, and water)
- landing construction, rehabilitation and reconstruction (excluding end haul)
- fuel and equipment moves
- pest control
- grass seeding
- all post logging treatments
- crew accommodation for accessible operations
- contractor overhead and profit, fringe benefits
- three metre knockdown
- lop and scatter
- landing burning (includes fireguards)
- roadside debris piling and disposal
- skid and back spar trail construction and rehabilitation/slashing
- slashing
- crew transport
- spur roads for ground skidding of less than or equal to 100 m length (see section 4.3.2.2(1))

4.4.1 Harvesting Methods

Each of the following harvesting methods is recognized only when it is identified on the map submitted with the appraisal data submission.

- Helicopter,
- Horse,
- Ground Skidding, and
- Overhead Cable Logging.

4.4.2 Tree-to-Truck Variables

1. a. The variables identified in subsections 2 to 15 of this section will be used in appraisals based on all compiled cruise plots segregated by logging method where applicable (see section 4.4.5).
 - b. Where:
 - i. The cutting authority area being appraised is authorized for harvest under an agreement other than a BCTS licence,
 - ii. The holder of the cutting authority is required to harvest in deciduous stands,
 - iii. The deciduous timber has not been reserved from harvest, and
 - iv. The calculation of a variable listed in this section requires the use of a volume,
the volume must include the total net deciduous volume and the total net coniferous volume.
 - c. Where the cutting authority area being appraised is authorized for harvest under an agreement other than a BCTS licence, and
 - i. the holder of the cutting authority is not required to harvest in deciduous stands, or the deciduous timber has been reserved from harvest, and
 - ii. The calculation of a variable listed in this section requires the use of a volume,
the volume shall only include the total net coniferous volume.
2. Biogeoclimatic Ecosystem Classification (BEC) Zones

A separate biogeoclimatic zone may be recognized for each harvest method (section 4.4.1) as part of the regional constant.

ICH	-	Interior Cedar Hemlock
CWH	-	Coastal Western Hemlock
SBS	-	Sub Boreal Spruce
ESSF	-	Engelmann Spruce – Subalpine Fir
IDF	-	Interior Douglas Fir

Where a harvest method area occupies more than one biogeoclimatic zone, the constant for the zone that occupies the greatest net merchantable area in the harvest method area shall be used in the calculation of the cost estimate.

3. Slope (SLOPE%)

The harvest method slope percent from the cruise appraisal summary report.

4. Volume per Hectare (VOLHA)

The harvest method net cruise volume per hectare (m³/ha), rounded to the nearest cubic metre. For partial cutting, it is based on the actual volume per hectare being harvested.

5. Percent Blowdown (BD%)

The percentage of the harvest method net cruise volume classified as blowdown.

6. Partial Cut Variables (PCUT, DPCUT)

The term partial cutting includes all forms of harvesting, other than clear cutting.

Clear cutting is defined as those areas with block opening sizes equal to or greater than 1 hectare and where the volume removal is equal to or greater than 90 percent based on the net volume measured to the Standard Timber Merchantability Specifications (section 1.5).

Partial cut areas that have less than 90 percent volume removal are not to be averaged with those areas that are equal to or greater than 90 percent. Clear cut areas are to be stratified out before calculating an overall weighted partial cut percent for the cutting authority.

a. PCUT

Where a partial cut is comprised of openings of less than 1 hectare in size, the PCUT percent is based on the cumulative volume of these openings divided by the volume of the block area surrounding them.

The percent partial cut is determined as:

$$PCUT = \frac{\text{Net cruise volume required to be removed using a partial cut system}}{\text{Total net cruise volume on the area where Partial Cutting is required}} * 100\%$$

(except if partial cut percent $\geq 90\%$ then PCUT = 0).

b. Partial cut dummy variable (DPCUT)

DPCUT = 1 if partial cut percent is greater than 0 and less than 90, otherwise
DPCUT = 0.

7. Distance to Support Centre (DS)

The one-way, road distance from the geographic centre of the cutting authority to the main post office (or other location designated by the regional timber pricing coordinator) in a community from the following list. The distance to support centre includes the distance covered by a daily barge or ferry service. Where there is more than one block in the cutting authority, the weighted average distance to support centre must be calculated using the individual distances and the individual block volumes. Where more than one alternative is possible, the least cost alternative is used. The distance is measured to the nearest kilometre. The following is a list of communities by forest region.

Northern Interior Forest Region

Burns Lake	Kitwanga	Smithers	Terrace
Houston	New Hazelton	Stewart	Prince George
Kitimat	Fort St. James	Fraser Lake	Fort St. John
Chetwynd	Fort Nelson	Mackenzie	Dawson Creek
Vanderhoof			

Southern Interior Forest Region

Boston Bar	Kamloops	Merritt	Salmon Arm
Clearwater	Kelowna	Pemberton	Vernon
Hope	Lillooet	Penticton	Nakusp
Canal Flats	Creston	Grand Forks	Nelson
Castlegar	Fernie	Greenwood	Revelstoke
Cranbrook	Golden	Invermere	100 Mile House
McBride	Valemount	Princeton	Quesnel
Williams Lake			

For cutting authorities serviced by a camp (see section 4.8.2), the distance to support centre is the one-way road distance from the geographic centre of the cutting authority to the isolated camp (including that covered by the non-road portions of the route). Where more than one alternative is possible, the least cost alternative is used. The distance is measured to the nearest kilometre.

The following distance variables are included:

- NEWDIST200 = 0 IF DS ≤ 100 km
 = (DS-100) if DS > 100 km and ≤ 200 km
 = 100 if DS > 200 km
- DIST200S150 = 0 if DS ≤ 150 km
 = (DS-150) if DS > 150 km and ≤ 200 km
 = 50 if DS > 200 km

8. Volume per Tree (VOLTREE)

The harvest method net cruise volume per tree (m³), rounded to two decimals. For partial cutting, it is based on the trees to be harvested.

9. Defect Percent

Harvest method stand defect from the cruise appraisal summary report. Defect percent is the estimate of decay, waste and breakage (DWB) of the gross merchantable volume from the cruise appraisal summary for the trees to be harvested. Defect percent is recorded to the nearest whole percentage point for appraisal calculation purposes.

- a. Gross volume per tree (m³) (GVOL)
 $GVOL = VOLTREE / (1 - \text{Defect \%} / 100)$.
- b. $GVOLSQR = (GVOL)^2$

10. Small Tree Volume (SMALL TREEVOL)

SMALLTREEVOL = harvest method net volume (m³) per tree if < 0.35 m³/tree. If ≥ 0.35 m³/tree SMALLTREEVOL = 0.

11. Small Tree Dummy Variable (SMALLTREED)

SMALLTREED = 1 if the harvest method net volume per tree < 0.35 m³/tree, otherwise = 0.

12. Heli Yarding Distance (HELIYARD)

The average loaded horizontal yarding distance (in kilometres) flown by helicopter measured to the nearest 0.1 km.

13. Skyline Yarding Distance (SKYYARD)

The average skyline slope distance measured to the nearest metre (m).

14. Species Percent

The species percent data used in the tree-to-truck and hauling equations is calculated as:

Harvest method species volume (m³) / (Total Net Coniferous Volume (m³) + Total Net Deciduous Volume (m³))

HE - Hemlock	SP - Spruce
FI - Fir	LO - Lodgepole Pine
LA - Larch	BA - Balsam
CE - Cedar	

15. Region Constants ¹

FNP	=	Fort Nelson & Peace Forest Districts
Prince George	=	Fort St. James, Mackenzie, Prince George, and Vanderhoof Forest Districts
Prince Rupert	=	Kalum, Nadina, and Skeena Stikine Forest Districts
Kamloops	=	Cascades, Kamloops, Headwaters and Okanagan Shushwap Forest Districts
Cariboo	=	Chilcotin, 100 Mile House, Central Cariboo and Quesnel Forest Districts
Nelson	=	Arrow Boundary, Columbia, Kootenay Lake and Rocky Mountain Forest Districts

4.4.3 Tree-to-truck Cost Estimates

Tree-to-truck costs estimates are determined for each harvesting method as follows:

1. Helicopter Logging

$$\$/\text{m}^3 = 46.15 + (18.96 * \text{SLOPE \%}/100) + (5.98 * \text{DS}/100) + (5.72 * \text{HELIYARD}) - (6.68 * \text{LO\%}/100)$$

2. Horse Logging

No variables are recognized for this method. The cost estimates is applied to the volume of timber to be clear cut or partial cut.

$$$/m^3 = 26.09$$

3. Ground Skidding

The ground skidding equipment options include, but are not limited to, rubber tired skidder, crawler tractor, soft track skidder, small cat skidding, hoe chucking, long line skidding, clambunk forwarders, low ground pressure skidders, harvester forwarders and cut-to-length processors. A system does not have to skid wood all the way from the stump to the landing to be included. Some wood may be moved part way by longlining or hoe chucking before being skidded by some other system to the landing. Two variations are recognized:

a. Clear Cut,

b. Partial Cut

The tree-to-truck cost estimate for both variations is determined from the equation as follows:

$$$/m^3 = \text{CONSTANT} + (6.13 * \text{SLOPE\%/100}) - (3.06 * \text{VOLHA/1000}) + (1.65 * \text{BD\%/100}) + (9.78 * \text{Defect\%/100}) + (1.64 * \text{DPCUT}) + (7.45 * \text{SMALLTREED}) - (21.52 * \text{SMALLTREEVOL}) + (2.05 * \text{NEWDIST200/100})$$

Where CONSTANT =

REGION	BEC ZONE				
	BWBS	ICH	IDF	ESSF	Other
Cariboo	15.89	16.56	16.07	16.07	14.79
FNP	15.70	16.37	15.88	15.88	14.60
Kamloops	15.78	16.45	15.96	15.96	14.68
Prince George*	15.35	16.02	15.53	15.53	14.25
Prince Rupert	16.65	17.32	16.83	16.83	15.55
Other	19.73	20.40	19.91	19.91	18.63

* Excluding FNP

4. Overhead Cable Logging

The method includes both highlead (spar) mobile (grapple) yarders and skyline yarders, but variations in machine size, spar/boom height, winch line capacity and yarding technique are not recognized.

Variations recognized within the method are:

a. Highlead and Grapple

The tree-to-truck cost estimate for clear cut and partial cut is determined from the equation as follows:

$$\begin{aligned}
 \$/m^3 = & \text{CONSTANT} + (4.20 * \text{SLOPE\%/100}) + (4.19 * \text{NEWDIST200/100}) \\
 & - 2.33 * \text{VOLTREE}
 \end{aligned}$$

Where CONSTANT =

REGION	CWH	Other
Cariboo	38.28	28.24
Kamloops	42.66	32.62
Prince George ¹	37.27	27.23
Nelson	43.09	33.05
Other	35.57	25.53

¹ Excluding FNP

b. Skyline and Intermediate Support Skyline

Skyline yarding estimates will be recognized for each block where the average yarding distance is greater than 300 m, or intermediate supports are required.

The average yarding distance is determined by:

1. Drawing a series of transects (minimum four) with their origin at the landing, being equi-angle apart and measured to the back-line. This is done for each block; blocks will not be amalgamated for the purpose of average yarding distance calculation. The volume for the system is the sum of the volumes of qualifying blocks.
2. Yarding distance will be measured as slope distance from the centre of the landing to the falling boundary.
3. The sum of transect lengths divided by the number of transects equals the average yarding distance.
4. The exception to the above; where the ministry and the licensee agree that Forest and Land Management is better served by the use of a skyline system in a particular logging chance, then the average yarding distance greater than 300 meters requirement is waived.

The tree-to-truck cost estimate is determined from the equation as follows:

$$\$/m^3 = 42.12 - (6.47 * \text{GVOL}) + (1.27 * \text{GVOLSQ})$$

4.4.4 Tree-to-Truck Additive for Damaged Timber

The following cost estimate additives are recognized for heavy fire damage (HFD), and dead/live useless snags (DUS). The data is collected as specified by the *Cruising Manual*. The additional costs incurred to harvest blowdown timber are recognized in the tree-to-truck ground skidding and overhead cable logging equations (sections 4.4.3(3), 4.4.3(4)).

The following additive is determined for all cable and ground skidding harvesting methods and is added to the tree-to-truck cost estimate.

$$$/m^3 = 0.04 * (DT - 15)$$

Where: DT is the Damaged Timber percent

$$DT = HFD + DUS$$

If: DT is less than 15 percent, DT = 15

If: DT is more than 100 percent, DT = 100

$$\text{Heavy Fire Damage \%} = \frac{\text{Conifer HFD Volume (m}^3\text{)} * 100}{\text{Total Net Conifer Volume (m}^3\text{)}}$$

4.4.5 Prorating Tree-to-Truck Cost Estimates

Where more than one harvesting method is required, a proration of costs is necessary.

The variables for each required harvesting method must be based on a cruise compilation of only those plots located within the area to be harvested by the method and include the deciduous volume if the licence requires harvesting in deciduous stands.

The additive for damaged timber is also determined for each applicable method.

The final prorated tree-to-truck cost estimate is determined according to the following equation where each component is rounded to the nearest cent before totalling:

$$\begin{aligned}
 \$/\text{m}^3 = & \frac{(\text{Cost}_{\text{Heli (C)}})(V_{\text{Heli (C)}})}{(\text{TNCV})} + \frac{(\text{Cost}_{\text{Heli (P)}})(V_{\text{Heli (P)}})}{(\text{TNCV})} + \frac{(\text{Cost}_{\text{Horse}})(V_{\text{Horse}})}{(\text{TNCV})} \\
 & + \frac{(\text{Cost}_{\text{OC(C)}})(V_{\text{OC(C)}})}{(\text{TNCV})} + \frac{(\text{Cost}_{\text{OC(P)}})(V_{\text{OC(P)}})}{(\text{TNCV})} + \frac{(\text{Cost}_{\text{GS(C)}})(V_{\text{GS(C)}})}{(\text{TNCV})} \\
 & + \frac{(\text{Cost}_{\text{GS(P)}})(V_{\text{GS(P)}})}{(\text{TNCV})} + \frac{(\text{Cost}_{\text{SK}})(V_{\text{SK}})}{(\text{TNCV})}
 \end{aligned}$$

Where:

Cost	=	cost estimate (\$/m ³) including any damaged timber additive
V	=	volume (m ³) required to be logged by each system
Heli (C)	=	helicopter logging (clear cut)
Heli (P)	=	helicopter logging (partial cut)
Horse	=	horse logging
GS (C)	=	ground skidding (clear cut)
GS (P)	=	ground skidding (partial cut)
OC(C)	=	overhead cable logging (clear cut)
OC(P)	=	overhead cable logging (partial cut)
SK	=	skyline logging
TNCV	=	total net cruise volume (m ³)

4.5 Log Transportation

The log transportation phase covers all aspects of log movement from the place of initial loading to the point of appraisal, including truck haul, rail, water and other specialized transportation. The use of section 4.5.1(1)(c) does not affect any other provision that requires the use of the least cost point of appraisal.

4.5.1 Truck Haul Variables

1. Cycle Time (CT):

For appraisal purposes, weighted average Cycle Time is the estimated time in hours (rounded to the nearest 0.1 hour) for transporting logs from the centre of a cutting authority area to:

- a. the least cost point of appraisal,
- b. the appraisal place of unloading in the case of water or rail transport, or
- c. where the regional manager is satisfied that a transfer of current cutting rights to address a bark beetle infestation will result in:
 - i. equal or higher sawlog stumpage rates for the timber to which the current cutting rights are transferred to, when compared to the sawlog stumpage rates for the timber where the current cutting rights are transferred from, and
 - ii. an increase in milling consumption of beetle infested timber by the licensee whose current cutting rights are transferred, then

the place that would have been the point of appraisal if the timber had been harvested in the area from which the current cutting rights are transferred from.

2. To determine weighted average cycle time:

- a. establish the geographical centre point of each cutblock and project this point to the nearest road for measurement purposes,
- b. from this centre point, determine the cycle time to the nearest junction serving all cutblocks,
- c. weight the cycle time for each cutblock by the volume on the cutblock and determine the average weighted cycle time to the junction. If the cutblock volume is not available, the cutblock area is used, and
- d. determine the cycle time from the junction to:
 - i. the least cost point of appraisal,
 - ii. the appraisal place of unloading,

- iii. if the conditions under 4.5.1 (1)(c) are met, then
- the place that would have been the point of appraisal if the timber had been harvested in the area from which the current cutting rights are transferred from.
- e. add this to the average weighted cycle time from paragraph 'c' above.

The cycle consists of loading, hauling, weighing, unloading, return time, and unavoidable delays. The cycle time will normally be determined by taking into consideration all the factors that may affect it: distance, expected rate of speed, necessary delays, expected standard of roads and their maintenance, traffic density, and seasonal weather conditions.

In many cases standard cycle time schedules from specific road junctions to the point of appraisal have been developed and should be used (Sector times).

Unavoidable delays are periods when the truck is on the job but not operating due to unpredictable delays such as; tightening binder chains, minor repairs made by driver, checking and adjusting brakes, minor delays prior to loading and unloading, refuelling, etc. Unavoidable delay time does not include any breakdown which requires shop repair, the services of a skilled mechanic, or a spilled load of logs. The time for load, unload and unavoidable delay is set at 75 minutes for cable yarding systems (see section 4.4.3 (4)) and 60 minutes for all other systems (see section 4.4.3 (1), (2), & (3))

3. Haul Method

Cost estimates do not recognize different types of logging trucks. The estimate is based upon the possible haul method, either highway or off-highway and not specifically on the licensee's particular method.

Highway hauling is assumed when loaded logging trucks must travel in part over roads administered under the *Highway Act*, without truck-to-truck transfer, to the point of appraisal, or on roads administered under the *Industrial Road Act* and Forest Service Roads as defined in *Forest Act* where prolonged known road restrictions prevent the use of oversize loads, or in all instances where the volume per tree is less than 0.20 m³.

Off-highway hauling is assumed when loaded logging trucks can travel over roads administered under the *Industrial Road Act* and Forest Service Roads as defined in *Forest Act* to the point of appraisal, or to a recognized reload. Where prolonged known restrictions (e.g., bridge load limit, narrow road, through rock cut, WCB Regulations, etc.) prevent the use of oversize loads, highway haul is assumed.

Region constants:

FPN	=	Fort Nelson & Peace Forest Districts
Prince George	=	Fort St. James, Mackenzie, Prince George, and Vanderhoof Forest Districts
Prince Rupert	=	Kalum, Nadina and Skeena Stikine Forest Districts
Kamloops	=	Cascades, Kamloops, Headwaters and Okanagan Shushwap Forest Districts
Cariboo	=	Chilcotin, 100 Mile House, Central Cariboo and Quesnel Forest Districts
Nelson	=	Arrow Boundary, Columbia, Kootenay Lake and Rocky Mountain Forest Districts

4.5.2.2 Secondary Haul

The secondary haul cost estimate is made when logs must be truck hauled between the dewater and reload site to the appraisal point.

$$$/m^3 = 2.002 * CT$$

4.5.3 Water Transportation Cost Estimate

A water transportation cost estimate is made when logs must be transported by water between the cutting authority and the point of appraisal or reload. The estimate includes the costs of strapping logs on the truck, dumping, booming, developing and operating dumping and booming grounds, and towing. The cost estimate for reservoir lakes applies to all marine appraisals and to Arrow, Kinbasket, Ootsa, Revelstoke and Williston Lakes. All other lakes receive the natural lake cost estimate.

1. Dump and Boom:

Reservoir Lakes and Marine: $$/m^3 = 4.07$

Natural Lakes: $$/m^3 = 1.81$

2. Tow:

All $$/m^3 = 1.8125 + 0.00218 * d$

Where d = one way tow distance in kilometres.

3. Dewater and Reload:

All $$/m^3 = 1.96$

Only considered if the mill infeed is not located on the same lake, or a dam transfer is required. Otherwise dewatering is part of the manufacturing cost estimate.

4.5.4 Special Transportation Systems

A special transportation system is recognized in the appraisal where geographic conditions dictate its use.

The cost estimates include all costs associated with servicing the appropriate cutting authorities, (excluding all on-site costs of owning and operating a camp facility) and operation of bubble systems where applicable.

The recognized special transportation systems are as follows:

1. Railway

a. Truck-to-Rail Transfer

When logs are appraised by railway for part of the way between the cutting authority and the point of appraisal, the cost estimate for the truck-to-rail transfer part of the phase is:

All $\$/\text{m}^3 = 4.82$

b. Railway Transportation

The railway transportation cost estimate is based on the following table for the points of origin shown. Otherwise, the best information on hand is used.

Table 4-6 Rail Log Transportation

Origin	Cost Estimate (\$/m ³)	Point of Appraisal
Leo Creek	\$12.73	Fort St. James
Lovell	\$16.73	Fort St. James
Bear Lake	\$23.64	Fort St. James
Minaret Creek	\$25.75	Fort St. James
Niteal	\$22.45	Fort St. John

2. Barge/Ferry Used for Truck Haul (Private)

When a truck haul road is interrupted by a body of water and the operation of a barge system is feasible to provide the road link for logging trucks, the cost estimate for this phase, regardless of ownership is:

Reservoir Lakes $\$/m^3 = 6.66$

Natural Lakes $\$/m^3 = 5.01$

3. Barge/Ferry Not Used for Truck Haul (Private)

When a cutting authority can be served only by water, and daily (operating days only) ferry/barge services are feasible for crew transportation, the cost estimate for this phase, regardless of ownership is:

All lakes $\$/m^3 = 1.25$

4.6 Road Management

Where the licensee is obliged to carry out road management, it includes but is not limited to, the following:

- grading
- snowplowing and refreezing
- sanding
- spot gravelling (< 0.3 km distance)
- culvert repairs and thawing
- culvert removal (< 950 mm)
- culvert replacement (< 950 mm)
- non-structural maintenance of bridges
- bridge re-decking/wearing surface replacement
- ditching
- cattle guard cleanout
- road use charges paid to other licensees
- all access management
- seasonal erosion control
- roadside treatments
- sign maintenance
- dust control
- brushing
- minor flood and storm damage repair
- slough removal
- water bar construction (seasonal)
- road ripping
- cross ditch construction
- grass seeding
- all deactivation

The cost estimate for all road management carried out on logging operations depends on the geographic location of the cutting authority area (refer to Table 4-7).

Cutting authorities issued under forms of tenure not located administratively within a tree farm licence area or timber supply area will be assigned the road management cost estimate for the TFL or TSA/supply block in which the cutting authority is geographically located.

The geographic location is recognized by forest region, timber supply area and supply block, and tree farm licence as follows.

Table 4-7 Road Management Cost Estimates

Region	TFL #	TSA	TSA #	Supply Block	\$/m3	
Northern Interior		Bulkley	3	All	2.97	
		Cassiar	4	All	2.97	
		Cranberry	42	All	2.97	
		Dawson Creek	41	All	2.76	
		Fort Nelson	8	All	3.76	
		Fort St. John	40	All	2.76	
		Kalum	10	All	2.97	
		Kispiox	12	All	2.97	
		Lakes	14	All	1.92	
		Mackenzie	16	All	1.30	
		Morice	20	All	1.92	
		Nass	43	All	2.97	
		Prince George	24	A, B, C	1.30	
		Prince George	24	D	1.78	
		Prince George	24	E, F, I	1.02	
		Prince George	24	G, H	1.28	
		1				2.97
		30				1.28
		41				2.97
		42				1.30
	48				2.76	
	53				1.28	
Southern Interior		100 Mile House	23	A, B, C, D	.80	
		100 Mile House	23	E, F, G, H	.71	
		Arrow	1	All	3.11	
		Boundary	2	C, D, G	3.11	
		Boundary	2	E, F	2.10	
		Cranbrook	5	All	2.11	
		Golden	7	All	3.76	
		Invermere	9	All	2.11	
		Kamloops	11	1	1.75	
		Kamloops	11	2, 3, 4	1.27	
		Kootenay Lake	13	All	2.29	

Region	TFL #	TSA	TSA #	Supply Block	\$/m3	
Southern Interior		Lillooet	15	All	2.97	
		Merritt	18	All	1.11	
		Okanagan	22	1, 2, 3	2.10	
		Okanagan	22	4, 5, 6, 7	1.77	
		Okanagan	22	8, 9	3.76	
		Quesnel	26	A, B, C, D	1.00	
		Quesnel	26	E, F, G, H, I	1.28	
		Revelstoke	27	All	3.76	
		Robson Valley	17	All	1.75	
		Williams Lake	29	A, B, C, D, E, I	.74	
		Williams Lake	29	F, G, H, J	.80	
		Williams Lake	29	K, L	.71	
		Williams Lake	29	M, N	1.59	
		3				3.11
		5				1.02
		8				2.10
		14				2.11
		15				2.10
		18				1.75
		23				3.11
	33				3.76	
	35				1.27	
	49				1.77	
	52				1.28	
	55				3.76	
	56				3.76	

4.7 Road and Land Use Charges

Prior to a road or land use charge being included in an appraisal, the licensee must:

- a. submit a "Request for Approval of a Road Use Charge" form with the appraisal data submission; and
- b. receive written approval of the road or land use charge from the regional manager.

1. Charges as a Share of Road Management

- a. No recognition is made of such charges. The road management cost estimate in section 4.6 includes all relevant costs whether incurred directly by the licensee or by payment to another party for services performed.

2. Charges Other Than for Road Management

There are three main categories of road status:

a. Forest Service Roads

A road that is declared, determined, built, maintained or modified by the ministry, as defined in forest legislation. No road use charges will be considered in appraisals,

b. Permitted Roads

Roads built on Crown land, authorized by road permit or other cutting authority documents. This category also includes foreshore leases, camp areas and dryland sorts. No road use charges will be considered in appraisals,

c. Other Roads

Road use charges for roads on Indian Reserves or on private land owned by an arm's length third party and not subject to a lease held by the licensee, their affiliate or an agent of either, may be considered in appraisals provided there is no lower cost route capable of development through Crown land.

The charges recognized must be reasonable, must not exceed compensation that might be determined under forest legislation and must be proven through the presentation of auditable documents.

3. Other Land Use Charges

Only non-governmental land use charges will be considered in appraisals.

4.8 Administration and Other Costs

4.8.1 Forest Management Administration

Forest management administration costs are those costs directly related to supervision and administration of the activities listed below:

- Office Operations,
- Scaling,
- Cruising,
- Environmental Protection,
- Consultants fees (section 4.3.3),
- Archaeological surveys,
- Waste and Residue surveys,
- Right-of-way easements,
- Foreshore and other land leases,
- Tree marking Beetle probing & Pheromone baiting,
- Engineering (road layout, survey including geotechnical surveys, and design, other than those applicable as engineered cost estimate).

The forest management administration cost estimate in an appraisal is determined as follows:

$$$/m^3 = 2.01345 + (0.19721 * CPSlope\%)$$

Where:

\$2.15/m³ is set as the minimum. If equation yields less than \$2.15/m³ then use \$2.15/m³.

\$17.06/m³ is set as the maximum. If equation yields more than \$17.06/m³ then use \$17.06/m³.

CP Slope % - is the cutting permit average slope from the cruise appraisal summary report.

4.8.2 Camp Costs

1. A camp cost estimate may be included in an appraisal if the workers who work on cutting authority area, reside in the camp, and travel on each day of work during timber harvesting operations from the camp to the cutting authority area.
2. A camp must:
 - a. be a permanent structure,
 - b. have a cookhouse and a bunkhouse,
 - c. have been established through the expenditure of capital costs,
 - d. have full time camp staff, and

- e. be outside of a support centre listed in section 4.4.2(7).
3. Where a cutting authority area, serviced by a camp, may be accessed only by rail, the camp cost estimate for that cutting authority area is \$5.00/m³, otherwise the cost estimate is \$2.51/m³.

4.8.3 Low Volume Cost Estimate

All fully appraised cutting authorities are eligible for a specific low volume cost estimate in addition to all other phase cost estimates.

1. Where the licence to which the cutting authority belongs has an allowable annual cut of Crown timber greater than 0 m³ and less than 3 000 m³:

$$$/m^3 = 8.35$$

2. Where the licence to which cutting authority belongs has an AAC of 3 000 m³ or greater and the net cruise volume for the cutting authority is less than 3 000 m³;

The cost estimate is: (prorated by volume)	Ground Skidding	\$0.63/m ³
	Highlead & Grapple	\$0.70/m ³
	All Other	\$0.00/m ³

4.9 Basic Silviculture Cost Estimate

1. The basic silviculture cost estimates includes the cost of **all activities** that **are** required to achieve a licensee's free-growing stand obligations (**except root disease control and suitable secondary stand structure specified operations**).
 - a. A basic silviculture cost estimate may not be included in **an** appraisal unless:
 - i. the licensee is obligated **to establish a free growing stand, and,**
 - ii. the **activity** is not funded by **another agency**.
2. The area of land where **an activity** is to be applied that may be considered in the basic silviculture cost estimate is the net area to be reforested (NAR) for which the licensee has an obligation to establish a free-growing stand. The NAR includes the net merchantable area (NMA) from the cruise.
3. Table 4-9 lists the associated cost estimates (\$/ha) for Biogeoclimatic Ecosystem Classification (BEC) zone, subzone, and variant combinations across the interior. Where the subzone/variant combination is not listed in the table, the BEC undifferentiated subzone "un" cost estimate is used.
4. Where a cutting authority area includes more than one BEC/zone/subzone/variant combination, a prorated BEC zone/subzone/variant cost estimate will be determined by prorating the cost estimates from Table 4-9 for the primary and secondary BEC combination identified in the appraisal data submission based on their respective percent by net merchantable area identified in the appraisal data submission. -
5. The cutting authority basic silviculture cost estimate is calculated as follows:

$$\$/m^3 = \frac{[NMA * Cost * (CAPCUT\% / 100) * 1.25] + [(NAR - NMA) * Cost]}{NMV}$$

Where:

NMA	=	Net Merchantable area (ha) from the cruise appraisal summary report. This area must be the same area directly attributed to the appraised net merchantable volume for the cutting authority. Where the licence requires harvesting in deciduous stands the NMA includes the area for the deciduous volume.
Cost	=	Prorated BECzone/subzone/variant cost (\$/ha) using Table 4-9.
NAR	=	Net area to reforest (ha) within the cutting authority area for which the licensee has free-growing obligations (ha) and has not yet received a basic silviculture cost estimate in any appraisal. For the purpose of this section the NAR can not be less than the NMA.
NMV	=	Net merchantable volume (m ³) for the cutting authority area from the cruise appraisal summary report.
CAPCUT	=	Cutting Authority (CA) partial cut % calculated under section 4.4.2(6). If CAPCUT% > 80% CAPCUT% = 80, otherwise: CAPCUT% = (CANMV/CA Gross NMV) * 100

$$\text{CA Gross NMV(m}^3\text{)} = {}^v\text{GS(C)} + ({}^v\text{GS(P)} / \text{GS(PCUT/100)}) + {}^v\text{OC(C)} + ({}^v\text{OC(P)} / \text{OC(PCUT/100)}) + {}^v\text{SK(C)} + {}^v\text{Horse(C)} + {}^v\text{Heli(C)} + ({}^v\text{Heli(P)} / \text{Heli(PCUT/100)})$$

Where:

PCUT	=	Logging method PCUT (%) from section 4.4.2,(6)
CAPCUT	=	Cutting Authority (CA) partial cut percent
^v	=	Net merchantable volume (m ³) required to be logged by each system
Heli (C)	=	helicopter logging (clear cut)
Heli (P)	=	helicopter logging (partial cut)
Horse(C)	=	horse logging (clear cut)
GS (C)	=	ground skidding (clear cut)
GS (P)	=	ground skidding (partial cut)
OC(C)	=	overhead cable logging (clear cut)
OC(P)	=	overhead cable logging (partial cut)
SK(C)	=	skyline logging (clear cut)

Table 4-9 BEC Silviculture Cost Estimates*

BEC Zone	Subzone	Variant	\$/ha	BEC Zone	Subzone	Variant	\$/ha
BWBS	dk	1	1736	ESSF	mm	2	1355
BWBS	dk	2	1736	ESSF	mmp	1	1355
BWBS	mw	1	1719	ESSF	mmp	2	1355
BWBS	mw	2	1875	ESSF	mv	1	1355
BWBS	un		1736	ESSF	mv	2	1432
BWBS	vk		1736	ESSF	mv	3	801
BWBS	wk	1	1179	ESSF	mv	4	1453
BWBS	wk	2	1736	ESSF	mvp	1	1355
BWBS	wk	3	1736	ESSF	mvp	2	1355
CWH	un		1690	ESSF	mvp	3	1355
CWH	vh	1	1690	ESSF	mvp	4	1355
CWH	vh	2	1690	ESSF	mw		1487
CWH	vm		1690	ESSF	mwp		1355
CWH	vm	1	1690	ESSF	un		1355
CWH	vm	2	1690	ESSF	vc		2765
CWH	vm	3	1690	ESSF	vcp		1355
CWH	wh	1	1690	ESSF	vv		2116
CWH	wh	2	1690	ESSF	vvp		1355
CWH	wm		1690	ESSF	wc	1	1789
CWH	ws	1	1690	ESSF	wc	2	1840
CWH	ws	2	1690	ESSF	wc	3	1025
CWH	xm	1	1690	ESSF	wc	4	1642
CWH	xm	2	1690	ESSF	wcp	2	1355
ESSF	dc	1	1355	ESSF	wcp	3	1355
ESSF	dc	2	1189	ESSF	wcp	4	1355
ESSF	dcp	1	1355	ESSF	wk	1	1639
ESSF	dcp	2	1355	ESSF	wk	2	1626
ESSF	dk		1355	ESSF	wm		1906
ESSF	dkp		1355	ESSF	wmp		1355
ESSF	dku		1355	ESSF	wv		1746
ESSF	dv		1355	ESSF	wvp		1355
ESSF	dvp		1355	ESSF	xc		912
ESSF	mc		1350	ESSF	xcp		1355
ESSF	mcp		1355	ESSF	xv	1	1355
ESSF	mk		1355	ESSF	xv	2	1355
ESSF	mkp		1355	ESSF	xvp	2	1355
ESSF	mm	1	1355	ICH	dk		1674

BEC Zone	Subzone	Variant	\$/ha
ICH	dm		1674
ICH	dw		1329
ICH	mc	1	1231
ICH	mc	2	1095
ICH	mk	1	1226
ICH	mk	2	1383
ICH	mk	3	581
ICH	mm		1674
ICH	mw	1	1962
ICH	mw	2	1719
ICH	mw	3	1534
ICH	un		1674
ICH	vc		1674
ICH	vk	1	2491
ICH	vk	2	1674
ICH	wc		1674
ICH	wk	1	2037
ICH	wk	2	1674
ICH	wk	3	1674
ICH	wk	4	1674
ICH	xw		1674
IDF	dk	1	908
IDF	dk	2	1118
IDF	dk	3	564
IDF	dk	4	830
IDF	dm	1	830
IDF	dm	2	693
IDF	dw		830
IDF	mw	1	830
IDF	mw	2	1590
IDF	un		830
IDF	ww		830
IDF	xh	1	830
IDF	xh	2	1521
IDF	xm		830
IDF	xw		830
MH	un		1690

BEC	Subzone	Variant	\$/ha
MS	dc	1	914
MS	dc	2	914
MS	dk		868
MS	dm	1	914
MS	dm	2	1113
MS	dv		914
MS	un		914
MS	xk		764
MS	xv		740
PP	dh	1	28
PP	dh	2	28
PP	un		28
PP	xh	1	28
PP	xh	2	28
SBPS	dc		793
SBPS	mc		771
SBPS	mk		769
SBPS	un		771
SBPS	xc		771
SBS	dh		1102
SBS	dh	1	1102
SBS	dh	2	1102
SBS	dk		1081
SBS	dw	1	934
SBS	dw	2	824
SBS	dw	3	892
SBS	mc	1	742
SBS	mc	2	1195
SBS	mc	3	1102
SBS	mh		1102
SBS	mk	1	1137
SBS	mk	2	992
SBS	mm		1339
SBS	mw		1207
SBS	un		1102
SBS	vk		1610
SBS	wk	1	1241

BEC	Subzone	Variant	\$/ha
SBS	wk	2	1315
SBS	wk	3	1082
SWB	dk		1295
SWB	dks		1295
SWB	mk		1295
SWB	mks		1295
SWB	un		1295
SWB	vk		1295
SWB	vks		1295

* The dollar per hectare (\$/ha) cost estimates are net of overhead.

4.9.1 Suitable Secondary Structure Survey Specified Operation (SSSSO)

1. If the licensee other than a BCTS licence has incurred the cost to complete a survey to determine if an adequate stocking density of suitable secondary structure exists on an area where the *Forest Planning and Practices Regulation* restricts harvesting in targeted pine leading stands, an SSSSO cost estimate may be included in an appraisal.
2. Except as otherwise provided in this section, the SSSSO cost estimate is determined as follows:

$$$/m^3 = \frac{\$20.00 \times \text{the number of 3.99 m radius plots}}{\text{Total Net Cruise Volume (m}^3\text{)}}$$

3. No SSSSO cost estimate may be included in an appraisal or reappraisal unless:
 - a. the licensee submits the plot card records for each plot to the district manager with the appraisal data submission,
 - b. a sample intensity of greater than one plot per hectare for a survey used to assess secondary stand structure has been approved by the district manager.
4. A plot submitted with an appraisal data submission cannot be submitted with another appraisal data submission and it cannot be considered in another appraisal or reappraisal.
5. This section only comes into effect on July 25, 2008.

4.10 Manufacturing Cost Estimates

1. In the interior, appraisal calculations include estimates of the cost of manufacturing lumber and chips. Manufacturing cost estimates are developed from a survey of sawmills and encompass all phases of manufacturing beginning with the unloading of logging trucks at the mill log yard, (land or water or satellite log yards) or the dewatering of logs in cases when the mill infeed is on the same lake as used for towing the logs, and ending when the lumber and chips have been loaded on rail cars or trucks for transport to market.
2. The survey collects actual costs to the licensee, including wages, benefits, overtime, depreciation, fuel, supplies, repair, maintenance, applicable licences, insurance, etc. from a representative sample of interior operations.
3. The cost estimates reflect average conditions, operating practices, and phase accounting allocations experienced in the survey data. Because of this averaging, no additions to or subtractions from these estimates are permitted to reflect operation-specific conditions.
4. The estimates have an effective cost base date of July 1, 2006, and will be used for all appraisals, reappraisals and adjustments of stumpage rates.
5. Once the least cost point of appraisal has been determined under section 4.1, the cost estimate of manufacturing for that point, as specified in this section, is determined.

Table 4-10 Untrended Manufacturing Cost Estimates

Untrended Manufacturing Cost Estimates (\$/m³) 2006 Cost Survey Base		
	Species	Manufacturing cost (\$/m³) 0% Decay
Northern Interior (Zone 5)	LO	35.81
	SP	32.83
	BA	37.41
	FI, LA, WH, YE	51.60
	CE	48.52
	HE	45.41
Skeena (Zone 6)	LO	28.15
	SP	26.66
	BA	29.47
	CE	37.59
	HE	34.41
Southern Interior (Zone 7)	LO	36.00
	SP	31.82
	BA	37.21
	FI, LA, WH, YE	51.98
	CE	48.85
	HE	47.98

Untrended Manufacturing Cost Estimates (\$/m³) 2006 Cost Survey Base		
	Species	Manufacturing cost (\$/m³) 0% Decay
Southern Cariboo (Zone 8)	LO	32.59
	SP	29.32
	BA	34.21
	FI, LA, WH, YE	47.85
	CE	41.34
	HE	41.25

Fort Nelson/Peace (Zone 9)	LO	35.53
	SP	32.33
	BA	36.57

To derive the manufacturing cost estimate for decay % from 1 to 50, use the above table values in the following equation:

The cost estimate is calculated to four decimal places, then rounded to the nearest cent. Where decay exceeds 50 percent, the manufacturing cost estimate for 50 percent decay is used.

Manufacturing cost (\$/m³) = decay % * 0.1755 + base value from table.

For a list of points of appraisal by zone, refer to section 4.1.1

4.10.1 Manufacturing Cost Estimate Adjustment

For each species of timber except lodgepole pine:

$$\text{Adjusted Species MC} = \text{Species MC} - \text{MCAF}$$

Where:

Species MC is the species manufacturing cost calculated according to section 4.10.

MCAF is the manufacturing cost estimate adjustment factor from Table 4-11 for the point of appraisal of the cutting authority area being appraised or reappraised.

Adjusted Species MC is the adjusted species manufacturing cost estimate for that species of timber.

Table 4-11 Manufacturing Cost Estimate Adjustment Factors

Point of Appraisal	BA	CE	FI	HE	LA	Lo	SP	WH	YE
100 Mile	-2.32	-0.02	-0.53	-1.59	0.00	-4.90	-1.25	-9.85	0.00
Adams Lake	-0.83	-0.05	-0.45	-0.06	-0.05	-2.46	-0.56	-0.64	-1.12
Armstrong	-1.06	-0.05	-0.37	-0.09	-0.16	-2.89	-0.17	-0.51	-0.76
Bear Lake	-0.40	-7.05	-0.17	0.00	0.00	-3.61	-0.59	0.00	0.00
Boston Bar	-0.82	0.00	-0.23	-3.55	-0.04	-3.44	-0.37	-6.61	-3.32
Burns Lake	-1.66	0.00	0.00	0.00	0.00	-2.82	-0.66	0.00	0.00
Canal Flats	-0.40	-0.06	-0.11	-0.38	-0.03	-0.70	-0.12	-0.38	-0.06
Canoe	-0.55	-0.06	-0.37	-0.04	-0.12	-2.10	-0.41	-1.77	-0.58
Carnaby	-0.33	-0.11	0.00	-0.01	0.00	-0.82	-0.27	0.00	0.00
Castlegar	-1.17	-1.21	-0.50	-0.10	-0.58	-2.60	-0.52	-2.12	-0.41
Chasm	-0.88	-7.16	-0.64	-2.33	-0.24	-3.50	-0.56	-1.54	-6.76
Chetwynd	-0.11	0.00	0.00	0.00	0.00	-0.11	-0.16	0.00	0.00
Clear Lake	-1.05	0.00	-0.18	0.00	0.00	-7.56	-0.45	0.00	0.00
Craigellachie	-1.02	-0.07	-0.17	-0.07	-0.09	-1.58	-0.18	-0.33	-7.65
Cranbrook	-0.21	0.00	-0.09	-0.27	-0.01	-0.90	-0.10	-3.33	-0.02
Creston	-0.95	-0.41	-0.19	-0.15	-0.10	-0.89	-0.15	-1.31	-0.41
Elko	-0.21	0.00	-0.09	-0.27	-0.01	-0.90	-0.10	-3.33	-0.02
Engen	-0.38	0.00	0.00	0.00	0.00	-7.52	-0.95	0.00	0.00
Fort Nelson	-0.61	0.00	0.00	0.00	0.00	-0.44	-0.21	0.00	0.00
Fort St. James	-0.54	0.00	-0.18	0.00	0.00	-2.87	-1.12	0.00	0.00
Fort St. John	-0.49	0.00	0.00	0.00	-2.02	-0.14	-0.14	0.00	0.00
Fraser Lake	-1.69	0.00	0.00	0.00	0.00	-7.61	-0.79	0.00	0.00
Galloway	-1.44	-0.03	-0.23	-0.29	-0.12	-1.01	-0.55	-3.61	-0.10
Grand Forks	-0.93	-0.09	-0.65	-0.09	-0.44	-1.40	-0.26	-1.55	-0.34
Hazelton	-0.33	-0.11	0.00	-0.01	0.00	-0.82	-0.27	0.00	0.00
Houston	-0.70	0.00	0.00	-2.88	0.00	-1.72	-0.55	0.00	0.00
Isle Pierre	-0.61	-6.89	-0.21	-0.77	0.00	-7.53	-0.49	0.00	0.00
Kamloops	-0.93	-0.09	-0.62	-0.61	-0.04	-3.62	-0.30	-1.05	-0.72
Kelowna	-0.98	-0.05	-0.21	-0.13	-0.15	-1.44	-0.26	-3.18	-0.61
Kitwanga	-0.33	-0.11	0.00	-0.01	0.00	-0.82	-0.27	0.00	0.00
Lavington	-1.53	-0.66	-0.35	0.00	-0.16	-1.45	-0.31	-0.13	-0.31
Lillooet	-2.18	-0.02	-0.48	-3.18	0.00	-4.31	-1.08	-8.29	-0.68
Louis Creek	-3.10	-0.53	-2.31	-0.45	-0.05	-3.80	-1.85	-4.53	-3.71
Lumby	-0.88	-0.15	-0.24	-0.13	-0.33	-2.34	-0.24	-2.38	-0.76
Lytton	-2.18	-0.02	-0.48	-3.18	0.00	-4.31	-1.08	-8.29	-0.68
Mackenzie	-0.70	0.00	0.00	0.00	0.00	-0.59	-0.34	0.00	0.00
McBride	-0.55	-0.31	-0.33	0.00	0.00	-1.29	-0.23	-0.38	0.00
Merritt	-0.63	-0.02	-0.14	-0.03	-0.07	-1.71	-0.16	-0.46	-0.75
Midway	-0.86	-0.07	-0.76	-0.02	-0.43	-0.91	-0.21	-0.73	-0.16
O.K. Falls	-0.88	-0.02	-0.33	-0.15	-0.10	-1.63	-0.34	-8.69	-0.41
Park Siding	-1.14	-0.07	-0.52	-0.11	-0.23	-1.49	-0.18	-1.20	-0.20
Prince George	-0.31	-7.03	-0.13	-3.38	0.00	-5.39	-0.39	0.00	0.00
Princeton	-0.57	-0.01	-0.14	0.00	-0.03	-1.09	-0.10	-0.07	-0.60
Quesnel	-1.17	0.00	-0.45	0.00	0.00	-7.06	-0.73	0.00	0.00
Radium	-0.63	-0.13	-0.12	-0.10	-0.03	-1.45	-0.16	-0.36	0.00
Revelstoke	-1.14	-0.35	-0.27	-0.13	-0.27	-2.97	-0.60	-1.20	-4.70

Point of Appraisal	BA	CE	FI	HE	LA	Lo	SP	WH	YE
Slocan	-0.71	-0.17	-0.30	-0.11	-0.32	-2.89	-0.21	-1.66	-0.13
Smithers	-1.53	0.00	0.00	-0.54	0.00	-3.31	-1.36	0.00	0.00
Squamish	-2.18	-0.02	-0.48	-3.18	0.00	-4.31	-1.08	-8.29	-0.68
Strathnaver	-0.60	0.00	-0.32	0.00	0.00	-7.20	-0.52	0.00	0.00
Taylor	-0.25	0.00	0.00	0.00	0.00	-0.11	-0.19	0.00	0.00
Terrace	-0.10	-0.17	0.00	-0.06	0.00	0.00	-0.22	0.00	0.00
Thrums	-1.00	-0.07	-0.29	-0.09	-0.15	-2.39	-0.22	-1.82	-0.11
Upper Fraser	-0.62	-0.62	-0.34	-0.24	0.00	-6.93	-0.48	-9.92	0.00
Valemount	-0.53	-0.12	-0.09	-0.05	-0.03	-1.51	-0.21	-0.64	0.00
Vanderhoof	-0.54	0.00	0.00	0.00	0.00	-5.24	-0.42	0.00	0.00
Vavenby	-1.43	-0.07	-0.29	-0.17	0.00	-2.34	-0.88	-2.66	0.00
Westbank	-0.94	0.00	-0.25	-0.13	-0.28	-0.67	-0.16	-0.34	0.00
Williams Lake	-2.33	-0.03	-0.27	-0.01	0.00	-4.68	-1.21	0.00	0.00
Ymir	-0.80	-0.05	-0.31	-0.08	-0.06	-2.19	-0.22	-0.89	0.00

4.11 Cost Trend

Cost trend factors are separately applied to the total logging, silviculture and manufacturing cost estimates. The factors cover the period from the effective date of the cost base to the effective date of the rate calculation. Cost trend factors are applied at the appraisal effective date and at the date of each stumpage adjustment.

For trend factors applicable prior to July 1, 2008, refer to earlier *Interior Appraisal Manuals*.

Appraisal Effective Dates From September 1, 1998 to September 30, 1999

<u>Appraisal Effective Date or Stumpage Adjustment Date</u>	<u>Trend Factor</u>	
	<u>Logging and Silviculture</u>	<u>Manufacturing</u>
July 1 to September 30, 2008	0.856	1.0
October 1 to December 31, 2008	0.856	1.0
January 1 to March 31, 2009	0.856	1.0
April 1 to June 30, 2009	0.856	1.0
July 1 to September 30, 2009	0.856	1.0
October 1 to December 31, 2009	0.856	1.0
January 1 to March 31, 2010	0.856	1.0

Appraisal Effective Dates From October 1, 1999 to August 31, 2000

<u>Appraisal Effective Date or Stumpage Adjustment Date</u>	<u>Trend Factor</u>	
	<u>Logging and Silviculture</u>	<u>Manufacturing</u>
July 1 to September 30, 2008	0.899	1.0
October 1 to December 31, 2008	0.899	1.0
January 1 to March 31, 2009	0.899	1.0
April 1 to June 30, 2009	0.899	1.0
July 1 to September 30, 2009	0.899	1.0
October 1 to December 31, 2009	0.899	1.0
January 1 to March 31, 2010	0.899	1.0

Appraisal Effective Dates From September 1, 2000 to June 30, 2001

<u>Appraisal Effective Date or Stumpage Adjustment Date</u>	<u>Trend Factor</u>	
	<u>Logging and Silviculture</u>	<u>Manufacturing</u>
July 1 to September 30, 2008	0.884	1.0
October 1 to December 31, 2008	0.884	1.0
January 1 to March 31, 2009	0.884	1.0
April 1 to June 30, 2009	0.884	1.0
July 1 to September 30, 2009	0.884	1.0
October 1 to December 31, 2009	0.884	1.0
January 1 to March 31, 2010	0.884	1.0

Appraisal Effective Dates From July 1, 2001 to October 31, 2002

<u>Appraisal Effective Date or Stumpage Adjustment Date</u>	<u>Trend Factor</u>	
	<u>Logging and Silviculture</u>	<u>Manufacturing</u>
July 1 to September 30, 2008	0.884	1.0
October 1 to December 31, 2008	0.884	1.0
January 1 to March 31, 2009	0.884	1.0
April 1 to June 30, 2009	0.884	1.0
July 1 to September 30, 2009	0.884	1.0
October 1 to December 31, 2009	0.884	1.0
January 1 to March 31, 2010	0.884	1.0

Appraisal Effective Dates From November 1, 2002 to October 31, 2004

<u>Appraisal Effective Date or Stumpage Adjustment Date</u>	<u>Trend Factor</u>	
	<u>Logging and Silviculture</u>	<u>Manufacturing</u>
July 1 to September 30, 2008	0.921	1.0
October 1 to December 31, 2008	0.921	1.0
January 1 to March 31, 2009	0.921	1.0
April 1 to June 30, 2009	0.921	1.0
July 1 to September 30, 2009	0.921	1.0
October 1 to December 31, 2009	0.921	1.0
January 1 to March 31, 2010	0.921	1.0

Appraisal Effective Dates From November 1, 2004 to June 30, 2007

<u>Appraisal Effective Date or Stumpage Adjustment Date</u>	<u>Trend Factor</u>	
	<u>Logging and Silviculture</u>	<u>Manufacturing</u>
July 1 to September 30, 2008	0.915	1.0
October 1 to December 31, 2008	0.915	1.0
January 1 to March 31, 2009	0.915	1.0
April 1 to June 30, 2009	0.915	1.0
July 1 to September 30, 2009	0.915	1.0
October 1 to December 31, 2009	0.915	1.0
January 1 to March 31, 2010	0.915	1.0

Appraisal Effective From July 1, 2007 to June 30, 2008

<u>Appraisal Effective Date or Stumpage Adjustment Date</u>	<u>Trend Factor</u>	
	<u>Logging and Silviculture</u>	<u>Manufacturing</u>
July 1 to September 30, 2008	1.022	1.0
October 1 to December 31, 2008	1.022	1.0
January 1 to March 31, 2009	1.022	1.0
April 1 to June 30, 2009	1.022	1.0
July 1 to September 30, 2009	1.022	1.0
October 1 to December 31, 2009	1.022	1.0
January 1 to March 31, 2010	1.022	1.0

Appraisal Effective On or After July 1, 2008

<u>Appraisal Effective Date or Stumpage Adjustment Date</u>	<u>Trend Factor</u>	
	<u>Logging and Silviculture</u>	<u>Manufacturing</u>
July 1 to September 30, 2008	1.0	1.0
October 1 to December 31, 2008	1.0	1.0
January 1 to March 31, 2009	1.0	1.0
April 1 to June 30, 2009	1.0	1.0
July 1 to September 30, 2009	1.0	1.0
October 1 to December 31, 2009	1.0	1.0
January 1 to March 31, 2010	1.0	1.0

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5.6 Calculation of Stumpage Rate

5.6.1 Calculation of Indicated Stumpage Rate

The indicated stumpage rate for a cutting authority is defined as:

$$\text{ISR} = \text{IBR} + (\text{VI} - \text{IMVI})$$

Where:

ISR = Indicated Stumpage Rate

IBR = Interior Base Rate as defined in Section 5.5

VI = Value Index for the cutting authority as defined in Section 5.2

IMVI = Interior Mean Value Index, as defined in Section 5.3

5.6.2 Prescribed Minimum Stumpage Rate

The minimum stumpage rate is prescribed by the *Minimum Stumpage Rate Regulation* (B.C. Reg. 354/87). The current minimum stumpage rate is \$0.25 per cubic metre.

5.6.3 Reserve Stumpage Rate

For each cutting authority area, except those containing timber licence volume, the reserve stumpage rate is determined by selecting the greater of:

- the indicated stumpage rate, or
- the prescribed minimum stumpage rate.

5.6.4 Levies

1. A silviculture levy may be added to:
 - a. the reserve stumpage rate determined under section 5.6.3,
 - b. the stumpage rate determined under subsections 6.1.3, 6.2(1), 6.2(2) or section 6.5,
 - c. the reserve rate indicated in Table 6-4 for all species grades 4 and 6 **and deciduous sawlogs**.

2. The levy is equal to the district manager's cost estimate of silviculture costs to be incurred by the Crown.
3. Development/Administration Levy:
 - a. A development levy may be added to the reserve stumpage rate. The development levy is equal to the appraisal cost estimate of road construction provided by the Crown as approved by the regional manager.
 - b. An administration levy may be added to the reserve stumpage rate. The administration levy is equal to the district manager's cost estimate of administration provided by the Crown for preparing a Forestry Licence to Cut for salvage timber. An administration cost estimate is made for every cutting authority where the district office has to prepare all details of a Forestry Licence to Cut for salvage. No levy is applicable to professional applications.
4. The amount of any levy may be re-determined at reappraisal only.

5.6.5 Upset Stumpage Rate

The upset stumpage rate is the total of the reserve stumpage rate plus any development, silviculture and administration levies which may be charged as defined in section 5.6.4.

5.6.6 Total Stumpage Rate

1. Except as provided in subsection (2) of this section the total stumpage rate is the upset stumpage rate plus any bonus bid.
2. If the upset stumpage rate is determined under section 7.5.1(7), the total stumpage rate is equal to the MPS upset stumpage rate determined under that section.

6.1.1 Community Forest Agreements

1. The sawlog stumpage rate for each species of coniferous timber harvested under any cutting authority issued under a Community Forest Agreement is the rate prescribed in Table 6-1a for the forest zone in which the cutting authority area is located.
2. Sections 1.4(d), sections 6.1.2 through 6.5 and section 6.7 of this chapter do not apply to Community Forest Agreement cutting authorities.
3. The stumpage rate determined under this section is redetermined on August 1 of each year in accordance with this section.
4. Notwithstanding any other subsection of this section the stumpage rate determined under this section must not be less than the prescribed minimum stumpage rate.

6.1.2 Woodlot Licences

1. Except as provided in subsection (2) of this section, the sawlog stumpage rate for each species of coniferous timber harvested under a cutting permit issued for a woodlot licence with an effective date after November 30, 2008 is the rate prescribed in Table 6-1a for the forest zone in which the cutting authority area is located.
2. Where a woodlot licence cutting permit has been issued with an effective date after November 30, 2008 for the purpose of using amounts from an eligible extended road amortization agreement in an appraisal, then the stumpage rate will be determined using the procedures in this manual excluding this section.
3. Except as provided in subsection (4) of this section, the sawlog stumpage rate for coniferous timber harvested under a road permit issued for a woodlot licence with an effective date after November 30, 2008 is the rate prescribed in Table 6-1a for the forest zone in which the timber mark applies.
4. Where a woodlot has an eligible extended road amortization agreement before December 1, 2008 the sawlog stumpage rate for a road permit with an effective date on or after December 1, 2008 is calculated using the procedures in section 6.3.
5. The sawlog stumpage rate for each species of coniferous timber harvested under a blanket salvage permit issued for a woodlot licence is the rate prescribed in Table 6-1a for the forest zone in which the blanket salvage permit applies.
6. The stumpage rate determined under subsections (1), (3) and (5) of this section is redetermined on August 1, each year in accordance with this section.

7. Except as provided in subsections (2) and (4) of this section, sections 1.4(d), 6.1.1, 6.1.3 through 6.5 and 6.7 do not apply to woodlot licences.
8. Notwithstanding any other subsections of this section the stumpage rate determined under this section must not be less than the prescribed minimum stumpage rate.

**Table 6-1a Community Forest Agreements and Woodlot Licences:
Coniferous Average Sawlog Stumpage Rates in \$/m³**

FOREST ZONE	BALSAM	CEDAR	FIR	HEMLOCK	LARCH	L. PINE	SPRUCE	Y. PINE	OTHER'
North Central	1.42	-	1.51	-	-	1.19	1.61	-	1.36
North East	0.42	-	-	-	-	0.84	1.05	-	0.90
North West	0.29	0.38	-	0.25	-	1.55	1.49	-	0.56
South East	2.18	2.70	1.99	2.21	1.75	1.98	2.12	0.62	2.06
South West	1.93	1.83	1.51	1.85	2.39	1.55	1.87	-	1.64

' Average for the Forest Zone

6.1.3 Incidental Conifer in Deciduous Leading Stands

1. Except as provided in section 7.5.1(5), this section applies to coniferous timber in a cutting authority area where the total volume of all deciduous species to be harvested is greater than 70 percent of the total net cruise volume to be harvested.
2.
 - a. The stumpage rate for each species of coniferous timber must be determined by using the stumpage rate prescribed in Table 6-1 for the forest zone in which the cutting authority area is located.
 - b. Where the Crown is responsible for basic silviculture on the cutting authority area, the stumpage rate for each species of coniferous timber shall be the sum of the rate determined under paragraph (a) of this subsection and the silviculture levy determined under section 5.6.4.
3. A stumpage rate determined under subsection 2 shall be redetermined on **June 1**, of each year in accordance with this section.

6.2 Cutting Authorities With 5 000 m³ or Less Volume

1. Where the total coniferous volume to be harvested in a cutting authority area is 2 000 m³ or less, and where the agreement under which the cutting authority authorizing harvesting on the cutting authority area has been issued has a coniferous allowable annual cut of not more than 3 000 cubic metres, or no coniferous annual allowable cut:
 - a. The stumpage rate for each species of coniferous timber in the cutting authority area must be determined using the stumpage rate in Table 6-1 for the forest zone in which the cutting authority area is located, except that,
 - b. Where the agreement holder is not required to establish a free growing crop of trees on the cutting authority area, the stumpage rate for each species of timber shall be
 - i. the sum of the rate determined under paragraph (a) of this subsection and the basic silviculture cost for the species in the forest region, or
 - ii. where the Crown has the responsibility for silviculture, the silviculture levy determined under section 5.6.4.
2. Except as provided in subsection 3 of this section, where the total coniferous volume to be harvested on a cutting authority area is 5 000 m³ or less, and the cutting authority authorizing harvesting on the cutting authority area is a competitively awarded forestry licence to cut, other than a BCTS licence:
 - a. Subject to section 5.6.2 and paragraph (d) of this subsection, the upset stumpage rate for each species of coniferous timber in the cutting authority area will be 70 % of the stumpage rate for that species in Table 6-1 for the forest zone in which the cutting authority area is located, except that,
 - b. Where applications for a forestry licence to cut have been invited with upset stumpage rates determined under this subsection and no applications have been received, the upset stumpage rate for each species of coniferous timber shall be the rate requested by the district manager and approved by the regional manager.
 - c. Where the regional manager does not anticipate that applications for a forestry licence to cut will be received due to market conditions or timber profile, the upset stumpage rate for each species of coniferous timber shall be the rate requested by the district manager and approved by the regional manager.
 - d. Where the Crown is responsible for basic silviculture on the cutting authority area, the upset stumpage rate for each species of coniferous timber in the cutting authority area will be the sum of the stumpage rate determined under paragraphs (a), (b) or (c) of this subsection and the basic silviculture levy determined under section 5.6.4.

3. Each upset stumpage rate determined under subsection (2) of this section shall not be less than the district's variable cost per cubic meter to prepare the timber for sale calculated by the district manager.
4. Except as provided in section 2.2.2, where the upset stumpage rate is determined under subsections 1 and 2 of this section, the total stumpage rate is fixed for the term of the cutting authority and all extensions.
5. a. Notwithstanding subsections (1) or (2) of this section, where the total coniferous volume to be harvested on a cutting authority area is 5 000 m³ or less, the stumpage rate may be determined:
 - i. for a cutting authority other than a BCTS licence by an appraisal in accordance with chapters 2, 3, 4, 5, and
 - ii. for a BCTS licence by an appraisal in accordance with chapter 7.
- b. Where the stumpage rate is determined in accordance with this subsection:
 - i. the cruise data that is used in the appraisal may be from the cruise of a comparable cutting authority as per section 1.5.1, and
 - iii. except as provided in sections 2.3(4) and 7.2.1(2) the total stumpage rate is adjustable for the term of the cutting authority and all extensions.

6.2.1 Forestry Licences to Cut for Specific Purposes (No Volume Limit)

1. a. Where the cutting authority is a forestry licence to cut awarded to the highest bidder, other than a BCTS licence and it has been issued:
 - i. For the purpose of protecting a community from wildfire as prescribed under section 1 of the *Forestry Licence to Cut Regulation*, or
 - ii. For the purpose of removing damaged timber from natural stands or plantations where:
 - aa. **at least** seventy percent of **all of the merchantable timber volume** on the cutting authority area is Pine that has been damaged by mountain pine beetle, and either
 - bb. at the time of death, the age of the damaged timber was not more than **60** years, or
 - cc. a field survey indicates that the average stems per hectare on the cutting authority area is greater than 2 000 with a minimum diameter at breast height of 5 centimeters.
 - iii. For the purpose of utilizing post harvest material in piles on landings or at roadside after a waste assessment has been made.

Then, the upset stumpage rate shall be the rate approved by the Regional Manager.

6.6 Miscellaneous Stumpage Rates

1. Unless otherwise specified in this manual, the stumpage rates, at the time of scale for timber harvested for the purposes described, in the districts listed, in the forest district specific section of Table 6-4 are as prescribed in that table.

Table 6-4 Miscellaneous Stumpage Rates

All Interior Forest Regions

Species	Code ¹	Product	Reserve Stumpage Rate
All Species	SB	Shake & Shingle Bolts, Blocks and Blanks.	\$5.30/m ³
All Species	SK	Shakes	\$6.00/m ³
Cedar	PR	Posts & Rails (Split and Round)	\$3.00/m ³
All other Species	PR	Posts & Rails (Split and Round)	\$1.20/m ³
All Species	MT	Mining Timbers	\$3.00/m ³
All Species	FW	Firewood	\$0.50/m ³
Yew		All	\$0.25/m ³
All Species	CH	Wood chips from post-harvest material where a waste assessment has been made and the material will be chipped at the roadside or the landing	\$0.25/m ³
All Species	HF	Hogged tree material from post-harvest material where a waste assessment has been made and the material will be hogged at the roadside or the landing.	\$0.25/m ³
All Species		Grades 4 and 6, except where the upset stumpage rate is determined under section 6.2.1(1)(a) and (b) and 7.5.1(7)	\$0.25/m ³
Deciduous Species		All, except grades 4 and 6 and except where the upset stumpage rate is calculated under section 6.2.1(1)(a) and (b) and 7.5.1(5) and (7)	\$0.50/m ³
All Species	SS	Stakes & Sticks.	\$1.20/m ³
All Species	XM	Christmas Tree: under 3m 3-5 m over 5 m	\$0.20/each \$1.00/each \$1.50/each
All Species		Logs salvaged below the high water levels of Reservoir Lakes and the Slocan, Kootenay, Mineral, Babine and Ootsa Lakes	\$0.25/m ³
All Species		Marine Beachcomb	\$0.70/m ³
All Species		Trees classified as "Dead Potential" on Cruise-based cutting authorities, except where the upset stumpage rate is calculated under section 6.2.1 and 7.5.1(7)	\$0.25/m ³
All Coniferous		For logs harvested from the following Research Forests: Alex Fraser (UBC), Aleza Lake (UBC and UNBC), College of New Caledonia (CNC), and Fort St. James (UNBC)	\$0.25/m ³
All Species		Firmwood Reject	NIL

¹ Special Forest Product as identified in section 94(3) of the *Act* and described in the *Scaling Manual*.

Forest District Specific

Description of Activity	Forest District	Reserve Stumpage Rate
New Crown land area disturbed for mining exploration trails, seismic lines ¹ , gas or oil well sites and right-of-way to well sites. ²	Rocky Mountain	\$2,015/ha
	Peace	\$1,030/ha
	Ft. Nelson	\$729/ha
	Mackenzie	\$1,244/ha

¹ The corresponding district reserve stumpage rate from the above table is adjusted according to the category of line clearing as follows:

Category 1 - no adjustment

Category 2 - 1/2 of the reserve stumpage rate

Category 3 - 1/3 of the reserve stumpage rate

The gross area for each category reported as new line on either; the Oil and Gas Commission's Geophysical Final Plan cover sheet or an As Cleared Plan is multiplied by the reserve stumpage rate as adjusted above (refer to Appendix V for category definitions).

² For pipe line rights-of-way a stumpage rate must be determined by using the above rates for cutting authorities containing 2 000 m³ or less, of merchantable coniferous volume. For pipe line rights-of-way cutting authorities greater than 2 000 m³ see section 6.7.

6.6.1 Miscellaneous Stumpage Rates for Timber Licences

Timber licence cutting authority areas that have not been appraised and have a cutting authority term that began before May 1, 1995, must be appraised effective April 1, 2003.

7.2 MPS Principles and Procedures

7.2.1 MPS Appraisals

1. The MPS upset stumpage rate must be calculated using the *Interior Appraisal Manual* in effect on the date that the rate is determined (appraisal effective date).
2. Except as provided in Appendix VI, all MPS upset stumpage rates on Section 20 timber sale licences advertised on or after November 1, 2003 and Forestry Licences to Cut entered into under section 47.6(3) of the *Forest Act* are fixed for the term of the timber sale and all extensions except where:
 - a. a reappraisal is done under section 2.2.1(1)(e) due to sudden and severe damage, or
 - b. a Minister's directed reappraisal is done under section 2.2.2.

7.2.2 MPS Stumpage Adjustments

1. Cutting authorities issued under Timber Sale licences that were advertised for sale prior to November 1, 2003, that elected to have, or have adjustable stumpage rates, the stumpage rates are adjusted quarterly on January 1, April 1, July 1, and October 1, of each year.
2. At the time of the quarterly adjustment, the MPS upset stumpage rate will be re-calculated based on the equations applicable for the appraisal effective date and the cutting authority data. The monthly parameters effective for the month of the adjustment will be used in the calculation instead of the original values. Except as provided in Appendix VI, all other data remain unchanged.
3. This process is repeated quarterly until the cutting authority is reappraised.

7.2.3 Reappraisals for MPS Appraisals

Revised data and revised monthly parameters will be used with the equations in effect on the reappraisal date. Any reappraisal will follow the procedures in chapter 2 of this manual. The original bonus bid or bonus offer remains in effect.

7.2.4 Methodology

1. Except as provided in Appendix VI, the following methodology must be used for the calculation of the MPS upset stumpage rate:
 - a. Calculate a selling price (SP) of the products that can be recovered from the stand using sections 7.3.1 and 7.3.2 with the variables as defined.
 - b. Calculate the market price using the equation in section 7.4.2, the variables for the stand, and the SP calculated in section 7.3.
 - c. Calculate the MPS upset stumpage rate according to section 7.5.
2. Except as provided in section 7.5.3(3) or (4) one stumpage rate is determined for all appraised coniferous sawlogs in each cutting authority area.
3. Where the MPS upset stumpage rate has been calculated under section 7.5.1(5) one stumpage rate is determined for all appraised coniferous and deciduous sawlogs in each cutting authority area.
4. All other products are priced using miscellaneous stumpage rates as prescribed under section 6.6.

6. The MPS upset stumpage rate determined under subsections, (2), (3), (4)(b), (5)(a)(b) and (7) of this section shall not be less than the variable cost to prepare the timber for sale calculated by the Timber Sales Manager.
7. Where the invitation to tender for timber authorized for harvest under a timber sale licence requires a bonus offer and the amount of stumpage payable will be based on a cruise of the timber as authorized under section 106 of the *Act*, the MPS upset stumpage value shall be the value approved by the Director of Operations, BC Timber Sales.
8. Notwithstanding any other paragraph in this section the MPS upset stumpage rate must not be lower than the prescribed minimum stumpage rate.

7.5.2 Upset Stumpage Rate Calculation

The upset stumpage rate (USR) is calculated as follows:

$$\text{USR} = (\text{MP} - \text{SO}) \times (1 - \text{DF})$$

Where:

USR	=	Upset stumpage rate
MP	=	Market Price as defined in section 7.4.2
SO	=	Specified operations as defined in section 7.4.3.
DF	=	0.00 if the cutting authority being appraised was entered into under section 47.6(3) of the <i>Forest Act</i> , otherwise DF = 0.30

7.5.3 Total MPS Stumpage Rate

1. Except as provided in subsections (2), (3) and (4) of this section, the total MPS stumpage rate is the sum of the MPS upset stumpage rate and the bonus bid.
2. Where the MPS upset stumpage rate is determined under subsections (2), (3), and (4) of section 7.5.1, or section 7.5.2, the total MPS stumpage rate applies to Grade Code 1 and 2 coniferous sawlogs.
3. Where the MPS upset stumpage rate is determined under section 7.5.1(5), the total MPS stumpage rate applies to Grade Code 1 and 2 coniferous and deciduous sawlogs.
4. Where the MPS upset stumpage rate is determined under section 7.5.1(7), the total MPS stumpage rate applies to the timber species and volumes specified by the Director of Operations, BC Timber Sales.

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