File: 195-30/CAPP

MAR 23 1995

All Regional Managers and
All Holders of the Coast Appraisal Manual

Re: Coast Appraisal Manual Amendment No. 1

I hereby approve amendment 1 to the *Coast Appraisal Manual*, effective April 1, 1995. The following sections are amended:

Section	Nature of Amendment
Generic	All references to "Valuation Branch" have been revised to "Revenue Branch" to reflect the name change which becomes effective April 1, 1995.
1.1	Sentence 1, the words 'British Columbia' have been deleted and royalty has been added. Sentence 3, the words 'as required by the Forest Act' have been deleted. Sentence 4, the words "and silviculture" were added.
1.4	Gender neutrality correction and Revenue Branch change.
1.5	d. added "and adding the Coast Base Rate."
2.2	a. replace "to him" with "at that time." b. delete "his" before designate f. replace "valuation" with "appraisal" h. change "letter and facsimile" to "letter or facsimile" i. insert last sentence to match Interior Manual. j. revenue staff and change and for or as in h.
2.4	b. replace "he" with "the licensee" d. replace "for special forest products" with "(see Section 6.6)"
3.2	require replaceable Timber Sale Licence Majors to use Cruise Grades.

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Forests

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3.2.3	revise the log grade hierarchy to clarify it and include timber licences.
4.1	change font on "Section 88".
4.1.1	remove line space after Balloon Logging
4.3.1.1	the whole section has been revised to reflect the changes to timber licence administration.
4.3.2.1	Part 3 a. - correct "(2)" to "3b" Part 3 e. - correct "3 and 4" to "c and d".
5.3	Revenue Branch and add statement that timber licence volumes are not part of MVI calculation.
Appendix III	Amended the flow chart to match Section 4.3.1.1.
Appendix V	New appendix to flow chart the log grade hierarchy of Section 3.2.3.

Yours truly,

Andrew Petter
Minister

Attachment: (1)

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Introduction 1

1.1 Terms of Reference

The *Forest Act,* Sections 81 to 86, and regulations set out the conditions that apply to the determination and payment of stumpage and royalty for the purchase of Crown timber.

The *Forest Act,* Section 84, requires adherence to the policies and procedures approved for the forest region by the Minister of Forests. This *Coast Appraisal Manual,* approved by the Minister, contains the policies and procedures for determining stumpage rates charged for Crown timber harvested in the area described in Section 1.2.

Data used in the manual are based on a broad sampling of timber harvesting and silviculture costs experienced by licensees on the coast. Log selling prices are derived from sales data compiled by the Ministry of Forests.

1.4 Responsibility for Stumpage Determination

The *Forest Act,* Section 84(1), states in part that the rates of stumpage shall be determined, redetermined and varied by the regional manager or a forest officer duly authorized in accordance with the policies and procedures approved for the forest region by the Minister of Forests.

The Regional Appraisal Coordinator is the forest officer authorized by the regional manager to be directly responsible for determining stumpage rates, for both appraisals and reappraisals and providing interpretation of this manual in a manner that is consistent with the policies and procedures approved by the Minister.

Revenue Branch employees are forest officers for the purpose of carrying out stumpage rate adjustments under Section 1.6.

1.5 Comparative Value Timber Pricing

Comparative Value Pricing, (CVP) subject to a minimum stumpage rate, is the basis for determining stumpage rates with the exceptions noted in subsection 2.1 (b, c and d).

An average stumpage rate for the Coast has been set by the provincial government. The stumpage rate for a given stand of timber is more or less than the pre-set average rate depending upon whether the stand is more or less valuable than the average stand. To make that assessment and hence to determine a stumpage rate, the Forest Officer will typically:

a. estimate the selling price of the products that can be recovered from the timber stand (see Chapter 3);

b. estimate the costs necessary to harvest the timber and realize the estimated selling price (see Chapter 4);

c. determine the Value Index (see Chapter 5) of the timber stand by subtracting the estimated operating cost from the estimated selling price;

d. determine the indicated stumpage rate by comparing the Value Index for the timber stand with the Coast Mean Value Index and adding the Coast Base Rate (see Chapter 5);

e. determine the reserve stumpage rate (see Chapter 5) by selecting the greater of the indicated stumpage rate or the prescribed minimum stumpage rate (as defined in the Minimum Stumpage Rate Regulation, B.C. Reg. 354/87). The current minimum stumpage rate is $\$0.25/m^3$;

f. determine the upset stumpage rate by adding any development or silviculture levies (see Section 6.5) to the reserve stumpage rate;

g. determine the total stumpage rate by adding any bonus bid to the upset stumpage rate;

One stumpage rate is determined for all appraised timber in each cutting authority with the exception of miscellaneous stumpage rates for special forest products and for timber in specified areas listed under Section 6.6.

The average stumpage rate itself is indexed to lumber market values as explained in Chapter 5.

Appraisal Principles & Procedures 2

2.1 Types of Determination

Stumpage rates are determined by one of the following methods:

a. a full appraisal as described under Chapters 3 and 4 of this manual;

b. an Order-in-Council directive setting stumpage rates under the *Forest Act,* Section 84;

c. pricing under Chapter 6 of this manual;

d. the use of stumpage rates developed by regional revenue staff, and approved by the regional manager.

2.2 Time Schedule - New Appraisals and Reappraisals

Timeliness is an important factor in the stumpage appraisal process. The following schedule applies:

a. For each cutting authority, the licensee must submit to the district manager an appraisal data submission (Coast Appraisal Data Sheet) at least 90 calendar days prior to the appraisal effective date for new appraisals or at least 60 calendar days prior to the anniversary date for reappraisals.

   If the licensee fails to provide an appraisal data submission as stated above, then the district manager must use the best appraisal information available at that time;

b. The district manager or designate reviews the submitted data and all other available information, signs the appraisal data sheet and notifies the licensee or;

c. The district manager or the licensee may request a meeting to discuss the appraisal data submission;

d. At the meeting, the licensee may clarify data previously submitted. The district manager may revise the appraisal data sheet as a result of the meeting;

e. The licensee is notified by the district manager of changes, if any, made to the appraisal data after the meeting;

f. The appraisal data sheet is then sent to the regional office by the district manager as part of the appraisal package;

g. The licensee and district manager are notified by the regional appraisal staff of any further changes made to the appraisal data sheet;

h. The licensee is notified, by letter or facsimile transmission, of the stumpage rate and a summary of the appraisal information used in determining the stumpage rate;

i. The licensee must advise the issuing regional office in writing of any disagreement with the information contained in the stumpage advisory notice and provide adequate factual data to permit a review. At this point, the disagreement is not considered as an appeal under Section 154 of the *Forest Act.*

j. After such a review, the regional revenue staff sends a letter notifying the licensee, by mail or facsimile transmission, of the results of the review and summary appraisal information.

2.3 Reappraisal

A reappraisal is a re-estimation of Operating Cost, Log Grade Percentages, and Selling Price according to the Appraisal Manual in effect on the effective date of the re-estimation. Except in the case of "sudden and severe damage" as explained below, a reappraisal is based upon a complete reassessment of a cutting authority carried out by "standing up the trees, unbuilding the roads and drainage structures and returning the stand to its original condition" before making a re-estimate of the operating costs. The operating cost data may be revised or left unchanged at the time of reappraisal. At the time of a reappraisal, initial detailed engineering cost estimates may be re-estimated once after construction to reflect more accurate on-site information.

A reappraisal is made only if one of five situations arises:

1. Sudden and Severe Damage

If the regional manager is satisfied that sudden and severe damage has occurred to the appraised timber, the cutting authority is reappraised upon the licensee's request. *The effective date of the redetermined rate is the first of the month following the occurrence of the damage*, unless otherwise specified by the regional manager. A reappraisal is not made in the case of fire damage caused by the licensee if he has failed to comply with the *Forest Act,* Part 10, and relevant regulations.

In the case of "sudden and severe damage" the redetermined stumpage rate is based upon the remaining timber only. The regional manager may approve the use of appraisal data obtained from comparable cutting authorities. The reappraisal cost estimate for development takes into account volume already removed.

This policy on "sudden and severe damage" applies to fixed rate cutting authorities as well as to adjustable rate cutting authorities. Any existing bonus bid is payable in addition to the redetermined upset stumpage rate.

2. Amendments

If accumulated amendments (either addition or deletion of area containing merchantable timber) made to the cutting authority exceed 25 hectares or 25% of the merchantable area, whichever is less, then the entire cruise must be recompiled and the stumpage rate redetermined.

The redetermined stumpage rate becomes effective on the first of the month following the notice to the licensee which approves the amendment.

2.4 Extension of Term

a. When a licensee has elected the fixed stumpage rate option for a timber sale licence in the Small Business Forest Enterprise Program, that stumpage rate remains fixed for the term and all extensions.

b. When a woodlot licensee has a cutting authority where the term is for two years or less, the licensee may elect the fixed stumpage rate option. That fixed stumpage rate shall remain in effect for the term and all extensions.

c. When the stumpage rate was fixed other than by the election of the fixed rate option and the term is extended, the regional manager may either extend that stumpage rate or reappraise the cutting authority.

d. Miscellaneous stumpage rates (see Section 6.6) will be based on the appraisal manual rate table in effect on the date of scale, except for those cutting authorities that contain miscellaneous stumpage rates specified in their cutting authority document.

2.5 Point of Appraisal

Cutting authorities are appraised to the point of appraisal that results in the least total operating cost estimate.

The recognized Points of Appraisal are:

Location	Code	Details
Alberni	ALBE	The head of Alberni Inlet
Chemainus	CHEM	Tie-up grounds in the vicinity of Chemainus representing the facilities from Nanaimo Harbour to Cowichan Bay
Gambier Island	GAMB	Representing all facilities in the Howe Sound area
Pitt River Bridge	PIRV	Representing the facilities near the confluence of the Fraser and Pitt Rivers.

2.6 Calculation Conventions

All operating cost calculations are performed to the full capacity of the calculating machine with the results truncated at four places of decimals and rounded to two places.

Results from 5 to 9 are rounded upward and from 1 to 4 rounded downward.

After each phase cost estimate ($/m^3) has been rounded to the nearest cent, it is summed with other estimates to obtain the total cost estimate.

Where values are specified as limits (constraints or requirements for equations), they are treated as absolute values and actual measurements or records are not rounded before use unless otherwise specified.

Stumpage rate calculations are performed according to the methods specified in the document entitled **SPECIFICATIONS: CALCULATING STUMPAGE RATES FOR COAST APPRAISALS** approved by the Director, Revenue Branch.

2.7 Immature Coniferous Timber

Immature coniferous timber is defined as being less than 121 years old (Timber Utilization Policy).

The volume of mature and immature timber will be compiled on a tree by tree basis and the percentage of the total coniferous Cutting Authority volume represented by the immature timber will be calculated.

Using this calculated percentage, any Cutting Authority that contains 80 percent or greater immature coniferous timber volume will be appraised as immature timber using an Immature Average Market Value schedule.

Selling Price Estimation 3

Selling price estimates are based upon a schedule of log market values collected and published by Revenue Branch. These values when compiled and distributed become an integral part of this manual.

3.1 Average Market Value (AMV) Determination

Invoiced (f.o.b.) market values are collected and compiled from prime, domestic, arms-length sales reported to occur in areas adjacent to the Strait of Georgia; the Strait of Juan de Fuca and the Alberni Inlet east of a line drawn south from Amphitrite Point; Johnstone Strait; the Queen Charlotte Strait south of a line drawn west from Cape Caution; and the Fraser River west of the bridge at the confluence of the Pitt River. The cut-off date for log market value input is approximately forty-five (45) days prior to the stumpage rate adjustment date.

A set of average market values by species and log grade is developed using sales data for each one-month reporting period. The data is accumulated into a six-month schedule of average market values by species and log grade for mature timber stumpage rate determinations. The same six-month schedule is adjusted on a species grade level to create a schedule for immature average market values to be used for immature stumpage rate determinations.

3.2 Log Grade Percentages

Log grade percentages are obtained for each species in each cutting authority as described under Sections 3.2.1, 3.2.2 and 3.2.3. Log grade percentages are determined from the billing history record (Section 3.2.2), except for appraisals of woodlots, replaceable Timber Sale Licence (TSL) majors and appraisals of cutting authorities which meet the immature timber criteria in Section 2.7.

For a Woodlot Licence, TSL majors and for any cutting authority consisting of immature timber, unless the volume in Level 1 of Section 3.2.3 is 2 000 m^3 for a given species, the log grade percentages predicted by the cruise compilation algorithm are used for that species.

Separation of cruise summary log grade data may be required for Cedar grades D and K, F and L, and I and M. These grades are separated by using the proportional grade percentages from the first qualifying level in the table in Section 3.2.3.

3.2.1 Selection of Log Grade Percentages

When selecting log grade percentages for a cutting authority, the following criteria apply:

- the source of log grade percentages may vary by species;
- the minimum acceptable billed volume for the source of log grade percentages for a species shall be 2,000 m^3; the only exception is that upon reaching the highest level of the table in Section 3.2.3 the species log grade percentage is used regardless of the billed volume (see also Appendix V).

3.2.2 Billing Period

"Billing history record" means the Ministry of Forests' record of log volume and grades for which invoices were issued during the period specified.

Log grade percentages are obtained from the two-year billing history record as follows:

Effective Date of Appraisal/Reappraisal	Two-Year Billing Period Ending on the preceding:
January 1 to March 31	November 30
April 1 to June 30	February 28/29
July 1 to September 30	May 31
October 1 to December 31	August 31

The data used are the volumes billed by species and grade during the two year period, not volumes scaled during that period.

All cutting authorities with appraisal/reappraisal dates occurring within a given quarter shall use the same billing history period.

3.2.3 Sources of Log Grade Percentages for Each Cutting Authority

The log grade percentage for each species in each cutting authority is determined from the billing history record at the level in the following table (see also Appendix V) which first meets the criteria listed in Section 3.2.1.

Level	All Cutting Authorities Within the Geographic Boundaries of a TFL	All Cutting Authorities within the Geographic Boundaries of a TSA
1	Cutting Authority	Cutting Authority
2	Timber Licence(2)	Timber Licence (1)
3	District Portion of TFL	Supply Block(1)
4	TFL	TSA(1)
5	N/A	Total TSB
6	N/A	Total TSA

Where: TFL = Tree Farm Licence and Watershed Licence
TSA = Timber Supply Area.
TSB = Timber Supply Block

(1) At this level, the billing history is for the licence to which the cutting authority area belongs.

(2) The Timber Licence (TL) average will be used where the cutting authority is completely within the timber licence

Note: For these purposes, the Small Business Forest Enterprise Program as defined in Section 6.4, is considered to be one "licence".

3.2.4 Damaged Timber

If the regional manager is satisfied that the timber in a cutting authority is significantly damaged, then log grade percentages are estimated on the basis of the site-specific information at hand. Section 3.2 does not apply.

Operating Cost Estimation 4

The Operating Cost is the sum of the trended Total Logging Cost Estimate and the trended Basic Silviculture Cost Estimate as detailed in this chapter.

4.1 Cost Estimates

Cost estimates have been determined from a comprehensive survey of operations associated with logging on the Coast. The survey includes both employee and contractor operations.

The survey collects experienced costs to the licensee from both company and contract operations: including wages, benefits, overtime, depreciation, fuel, supplies, repair and maintenance, moving assistance, freight, applicable licences, insurance, etc. from a representative sample of coast operations. Contract costs, including contractor profit and risk margins, overhead, crew transportation, etc., are included.

The phase cost estimating formulas and tables in this manual have been derived from this cost survey.

Phase cost estimates are complete and reflect average conditions, operating practices, and phase accounting allocations experienced in the survey data. Because of this averaging, no additions to or subtraction's from these estimates to reflect site-specific conditions are permitted. The estimates have an effective cost base date of July 1, 1993.

Where feasible alternative methods exist for harvesting and transporting timber from the cutting authority to the point of appraisal, the alternative with the least total operating cost estimate is selected.

An appraisal assumes physically compatible individual operating phases.

Appraisal cost estimates exclude the cost of performing work that is carried out under the *Forest Act,* Section 88, or work for which funding is provided by any Crown agency, except as noted in Section 6.5. The cost estimates in this chapter are applicable to all cutting authorities unless superseded by the procedures outlined in Section 2.1.

Phase cost estimates for specified operations, helicopter logging operations and conventional logging are weighted according to the applicable net cruise volume for each system.

4.1.1 Specified Operations

In addition to the logging phases and systems that are covered by this manual, there are specified operations which require special cost estimates.

The following is a complete list of specified operations for which certain cost phase estimates are based on the information on hand rather than on the tables and formulas in this manual. Other manual phase cost estimates are combined with the specified operation cost estimate to determine the total operating cost.

SPECIFIED OPERATIONS	*AFFECTED PHASE*
A-frame Logging	Tree-to-Truck (S.4.4)
Skyline Logging	Tree-to Truck (S.4.4)
Blowdown Timber	Tree-to-Truck (S.4.4)
Selection Logging	Tree-to-Truck (S.4.4)
Commercial Thinning	Tree-to-Truck (S.4.4)
Balloon Logging	Tree-to-Truck (S.4.4)
Skidder Swinging	Log Transportation (S.4.5)
Railway Transportation	Log Transportation (S.4.5)
Lake Transportation	Log Transportation (S.4.5)
Towing to Tie-up Grounds over 10 km Distance	Log Transportation (S.4.5)
Camp Moves of greater than 10 km	Administration and Other Costs (S.4.6) except Helicopter Logging
Destumping for root disease control	Administration and Other Costs (S.4.6)

The specified operations phase costs are monitored and updated by the regional manager and are not part of the annual cost collection and analysis process.

4.2 Appraisal Data Requirements

The cruise and all other pertinent information required for the appraisal must be submitted with the appropriate **COAST APPRAISAL DATA SHEET**.

Unless otherwise specified by the Director, Revenue Branch, cruise data must be gathered and compiled according to the approved utilization specifications and in accordance with the following Ministry of Forests Publications:

- ***Forest Service Cruising Procedures & Cruise Compilation*** (Cruising Manual)
- ***Cruise Compilation Program - Documentation Manual***
- ***Cruise Compilation System - Change Specification Detailed Requirements & Design***
- ***Cruise Compilation Loss Factor Table Manual***
- ***Regional publications*** (e.g., Operational Cruising Requirements in the Vancouver and Prince Rupert Forest Regions)

In order to verify the accuracy of the cruise compilation program, the licensee must provide on request, photocopies of the tallysheets and a magnetic copy of the compilation in a format prescribed by the regional manager.

The appraisal uses the net cruise close utilization volume of timber per hectare. The net cruise volume (m^3) is the gross volume (m^3) less decay, waste and breakage for all of the species listed in section 3.3. The cutting authority total net cruise volume is determined by multiplying the net cruise volume per hectare (m^3/ha) by the total merchantable timbered area (ha) to be harvested in the cutting authority. The total merchantable timbered area is determined from the cruise summary if available.

If the application for a cutting authority is subsequently modified, the cruise submission must be recompiled by the applicant when more than five percent of the total number of compiled plots used in the cruise submission lie outside the boundaries established for the initial appraisal of the cutting authority.

Each reappraisal uses the net cruise volume by species determined by adjusting the original cruise volume on the basis of approved amendments since the last appraisal.

The cost estimate may be allocated, by the licensee, to any individual tributary cutting authority that is in the licensees' approved five-year development plan. However, the licensee must identify this cutting authority as part of the detailed engineering cost estimate.

Reconstruction and replacement cost estimates will be determined on an individual project basis as detailed engineering cost estimates (Section 4.3.3) and must be approved by the district manager.

These projects may include:

- Bridge structural maintenance including redecking (ties and decking) or replacement of a major drainage structure;
- Reconstruction of a road;
- Resurfacing of a road, with a minimum loose depth of 0.1 m. over a continuous length of 0.5 km or greater;
- Replacing pipe culverts larger than 900 mm in diameter.

Where bridge materials are re-used, at the second and subsequent locations, the cost estimate will include dismantling, transport and installation at the new site, but will exclude initial materials purchased and initial delivery costs of same.

To determine the unit cost ($/m³) for reconstruction and replacement, the total approved costs are divided by the total net cruise volume at initial appraisal or the remaining volume at reappraisal.

3. Deactivation

Deactivation sites include roads, bridges, logging campsites, dryland sorts and log dumps. Deactivation is defined in the Forest Road and Logging Trail Engineering Practices (Interim) and segregated into three levels as follows (see Part C of Engineering Practices):

1. temporary (seasonal)
2. semi-permanent (rotation maintenance)
3. permanent

For appraisal purposes, temporary deactivation is recognized in the routine maintenance phase. The semi-permanent and permanent deactivation cost estimates will be calculated as detailed engineering cost estimates (Section 4.3.3).

Only specific projects required in a cutting authority document will be considered in appraisals. These projects do not include those designed exclusively for silvicultural purposes. The cost estimate may be allocated by the licensee, to any individual tributary cutting authority that is in the licensee's approved five-year development plan. However, the licensee must identify this cutting authority as part of the detailed engineering cost estimate.

To determine the unit cost ($/m³) for deactivation, the total approved costs are divided by the total net cruise volume of the cutting authority at initial appraisal or the remaining volume when new projects and costs are added at reappraisal.

4.3.1.1 Development Cost Allocation

Where proration is required for Section 4.3.1.1.1, 4.3.1.1.2 and 4.3.1.1.3:

$$\text{Crown share} = \text{Total Estimated Cost} * \frac{\text{Appraised Timber Volume}}{\text{Total Timber Volume}}$$

Where:

Crown share ($)	=	dollar amount to be allocated to stumpage-bearing timber in the cutting authority being appraised.
Total Cost Estimate ($)	=	dollar amount of the total development cost estimate.
Appraised Timber Volume (m³)	=	volume of appraised timber tributary to the project and under the control of the licensee or a company legally associated with the licensee, including volume in all areas contributing to the allowable annual cut determination.
Total Timber Volume (m^3)	=	total volume tributary to the project and under the control of the licensee or a company associated with the licensee.

In all cases, volumes are estimated from the latest approved operational or inventory cruise data and maps of the area within the drainage to the height of land.

The Crown share is a dollar amount which is included in the appraisal of a tributary cutting authority, subject to Section 4.3.1.1.5.

Development cost estimate is allocated according to the outline below (See Also Appendix III):

4.3.1.1.1 Development Cost Estimates in Appraised Timber on Crown Lands

a. Development providing access to appraised timber only.

   Total estimated costs by tabular or detailed engineering methods are included in the appraisal.

b. Development providing access to non-appraised timber only.

   Cost estimates are not included in the appraisal.

c. Development in appraised timber areas providing access to both appraised and non-appraised timber held by the licensee or a company legally associated with the licensee.

   All costs are prorated between appraised and non-appraised timber, and then included in the appraisal.

4.3.1.1.2 Development Cost Estimates for Full Appraisal on Timber Licence (TL) Cutting Authorities

a. New development will be allocated as in Section 4.3.1.1.1.

b. Unamortized development on the TL that is required for access to the cutting authority will be included in the appraisal of that cutting authority. Unamortized development is defined as:

   i. the development started after January 1, 1988;

   ii. development cost estimates were not included in any prior appraisal calculation for Crown timber (or were considered as zero), and

   iii. having had no non-appraised timber transported over the development (excluding Right of Way timber).

Costs for this type of existing development are exempt from Section 4.3.1.1.4.

Cost estimates for these existing roads will be derived from the nearest appraised cutting authority by:

i. establishing the average road cost per kilometre from that appraisal estimate, excluding bridges and pertinent structures, and

ii. multiply that $/km by the kilometres of tributary road in the TL cutting authority.

Cost estimates for bridges or pertinent structures will be derived from Table 4-3, Bridge cost estimate or from the detailed engineering estimates as defined in Section 4.3. At reappraisal, these initial cost estimates for existing development will be trended as provided for in Section 4.9, but will not otherwise be revisited.

4.3.1.1.3 Development Costs on Private Land

A part of a new or reconstructed road may lie on private land and may have a reasonable probability of being required on a major or long term basis for either timber extraction, future management of Crown forest land and/or present or future public use. In order to be considered in stumpage appraisal cost estimates, the right-of-way ownership must first be transferred to the Crown, except as stated below.

When a road on private land is required for only short term timber extraction, the estimated cost of the road is included in the appraisal according to the procedures of Sections 4.3.1.1 and 4.5.4.

4.3.1.1.4 Existing Roads and Structures

The costs of previously constructed roads that have been considered in appraisals of Crown timber, roads constructed to develop non-appraised timber and roads constructed all or in part for purposes unrelated to logging the cutting authority being appraised, are defined to be "existing roads" and are not eligible for inclusion in development cost estimates. If the "existing road" requires reconstruction or permanent deactivation, the cost estimate is made as described in Section 4.3.1. If the "existing road" is on private land, road and land use charges may be recognized as described in Section 4.5.4.

4.3.1.1.5 Extended Road Amortization

Where the New Construction cost estimate exceeds $\$7.00/m^3$, a written agreement may be made which apportions the main access road cost estimate to two or more tributary cutting authorities. The main access road ends at the far boundary of the first cutting authority being appraised.

The agreement is subject to the following conditions:

a. only main access roads serving the tributary cutting authorities (as defined in Section 4.3) may be considered. The roads must be on Crown land;

b. each cutting authority must be in the licensee's approved five year development plan;

c. the agreement must be signed by the licensee and the licensor;

d. the amount apportioned will be a fixed lump sum which will be trended as provided for in Section 4.9 but not otherwise revisited;

e. the term of the agreement must not exceed the terms of the cutting authorities;

f. the agreement will only be valid under CVP and confers no obligation on the Crown to compensate licensees for any unamortized costs.

4.3.2 Tabular Cost Estimates

Tabular road cost estimates are based on average logging road construction practices, generally single lane width roads with turnouts and landings. These roads may or may not require placement of additional stabilizing materials.

Weighted averages for each variable (uphill side slope, rock, etc.) are applied to each road section. Averages are obtained by weighting the cross-section measurements taken at representative points along the road by the applicable road section length. The length of bridges occurring in the section is excluded.

4.3.2.1 Subgrade Construction

The estimated cost per kilometre for subgrade construction is provided for each combination of Construction Category and uphill side-slope for two Rock Mass Classification categories, "RMC 5 Only" and "Other RMC's".

1. *Construction Category* (CC) is determined on the basis of the percent rock in relation to the total volume of all materials.

   The percent rock is determined as follows:

$$\% \text{ rock} = \frac{h^2}{H^2} * 100\%$$

   Where:

   h = the vertical cut height of all rock measured from the bottom of the ditch

   H = the total vertical cut height of all materials including organic layers, glacial till and hardpan measured from the bottom of the ditch

Construction Category may show a range of variation (± one CC) within any section length, and is recorded to the nearest integer. Hardpan is CC1, whether drilled and blasted or not. Rippable rock and boulders may occur in CC2 to CC6

The following table defines the Construction Categories.

Table 4-1: Construction Categories

Construction Category	1	2	3	4	5	6
% rock	0	1-12	13-37	38-62	63-87	88+

2. *Rock Mass Classification* (RMC) is based on the physical characteristics of rock encountered in forest road development and is the subject of a report commissioned by the Forest Engineering Research Institute of Canada in 1978 and prepared by Piteau & Associates/Geotechnical Consultants.

   Rock can be classified into five types referred to as Rock Mass Classification (RMC) values and identified as RMC 1, 2, 3, 4, 5.

   The steps taken to determine RMC values and apply these to road development cost estimates are:

   a. examine and record surface hardness, weathering, and block diameter in the field;

   b. determine subsurface hardness from the table in Appendix IV with this title;

   c. determine RMC value from the table Appendix IV with this title; and,

   d. apply selected RMC values to applicable tables and formulas for road cost estimates.

   The text and tables in Appendix IV have been derived from the report prepared by Piteau & Associates. These tables are used to determine the RMC-based factors required for road cost estimates.

   In all circumstances where a complete interpretation of the Rock Mass Classification system is required, the Piteau & Associates report is to be consulted directly.

3. *Subgrade cost estimates* are determined as follows:

   a. all section lengths must be 0.3 km or longer, with the exception of short spurs and those sections which do not qualify under '3.b.' Lengths are recorded to the nearest 0.01 km;

   b. In general *each section* should consist of a length of road wherein:

      i. variations in slope percentage measurement are within ± 15 percent of the average slope measured in the section. The uphill slope percent is measured at right angles to the road centreline, parallel to the ground of the uphill slope and recorded to the nearest percent. Where the road is located on a bench, the slope of the bench is used;

      ii. construction categories vary by no more than ± 1 construction category about the average construction category in the section;

      iii. one rock mass class predominates;

      iv. all stabilizing material is trucked or no stabilizing material is trucked;

      v. stabilizing material is either all gravel or all rock.

   c. All sections with 60 percent or more (by length) of RMC 5 are designated as "hard".

   d. If the total length of all "hard" sections is greater than 90 percent of the total length of sections containing rock (i.e. CC 2-6), then the cost table for RMC 5 Only is applied to all roads in the appraisal.

   e. If the roads do not qualify under 'c.' and 'd.' above, then the subgrade construction cost estimate table for Other RMC's is applied to all roads in the appraisal.

The subgrade construction cost estimate includes clearing and grubbing, stripping, stump removal, incidental log decking, ditch construction, landing and turnout construction, material costs and installation of pipe culverts (with diameters up to and including 900 mm) and single log abutment culverts with spans less than 3.5 m. Right-of-way felling and loading is excluded from the road construction phase but included in the tree-to-truck phase.

Table 4-6: Barging Cost Estimates

Code	Point of Origin	P/A	$/m3	Code	Point of Origin	P/A	$/m3
BACK	BARR CREEK	A	4.45	BOIN	BOSWELL INLET /SECURITY BAY	G	5.72
BLBY	BLOWHOLE BAY	A	4.18	CAIS	CAMPBELL ISLAND	G	6.46
CLCK	CLEAGH CREEK	A	5.20	DIBY	DINAN BAY	G	10.16
COHA	COAL HARBOUR	A	5.39	ELHA	ELCHO HARBOUR	G	6.59
CYRV	CYPRE RIVER	A	3.61	FEBY	FERGUSON BAY	G	10.04
EAIN	EASY INLET	A	4.68	RIIH	HEAD OF RIVERS INLET	G	5.99
ESIN	ESPINOSA INLET	A	4.48	SBEH	HEAD OF SOUTH BENTINCK ARM	G	7.04
GORV	GOLD RIVER	A	4.23	HNRV	HONNA RIVER	G	9.20
HEBY	HEAD BAY	A	4.16	KMBY	KEMANO BAY	G	8.36
BESH	HEAD OF BEDWELL SOUND	A	3.70	KHIN	KHUTZEYMATEEN INLET	G	9.41
HENO	HECATE CHANNEL - NOOTKA	A	4.19				
HOLB	HOLBERG	A	5.61	KIMS	KIMSQUIT	G	7.13
HORV	HOUSTON RIVER	A	4.11	KLEM	KLEMTU	G	6.84
HUCK	HUSHAMU	A	5.48	KUIN	KUMEALON INLET	G	8.44
INGE	INGERSOLL	A	5.23	KWBY	KWATNA BAY/MINERVA	G	6.49
JELA	JEUNE LANDING	A	5.36	KWRV	KWINAMASS RIVER	G	9.36
KEIN	KENDRICK INLET	A	4.07	MCBY	McCLINTON BAY	G	10.20
KOHA	KOPRINO HARBOUR	A	5.11	MOIN	MOSES INLET/INRIG BAY	G	6.02
KUCV	KULTUS COVE	A	5.27	NAHA	NADEN HARBOUR	G	9.91
MCCK	McCURDY CREEK	A	4.20	NABY	NASS BAY	G	9.59
MORV	MOOYAH RIVER	A	4.07	NORV	NOOTSUM RIVER	G	6.15
OUIN	OUOUKINSH INLET	A	4.75	OCFA	OCEAN FALLS	G	6.49
PLHA	PLUMPER HARBOUR	A	4.02	POIS	PORCHER ISLAND	G	8.68
PTEL	PORT ELIZA	A	4.34	PRRU	PRINCE RUPERT	G	8.79
RACV	RANKIN COVE	A	3.82	RESO	RENNELL SOUND	G	9.25
STCV	STEAMER COVE	A	3.73	REPA	RENNERS PASSAGE	G	9.22
TLRV	TLUPANA RIVER	A	4.14	SCRV	SCOTIA RIVER *	G	9.38
TSRV	TSOWWIN	A	4.11	SWIN	SEWELL INLET	G	8.77
WIHA	WINTER HARBOUR	A	5.11	SKIN	SKIDEGATE INLET	G	9.18
ZEBA	ZEBALLOS	A	4.54	SOBY	SOUTH BAY	G	9.25
ALAR	ALICE ARM	G	10.02	STEW	STEWART	G	10.32
ALBY	ALLIFORD BAY	G	9.18	TASU	TASU SOUND	G	8.74
BEAN	BEATTIE ANCHORAGE	G	8.72	TUIN	TUCK INLET	G	8.88
BECO	BELLA COOLA	G	6.84	WECK	WEEWANIE CREEK	G	8.02
BIBY	BISHOP BAY	G	7.70	WOCH	WORK CHANNEL	G	9.41

Note: P/A = Point of Appraisal as defined on the previous page.

* Includes river towing.

4.5.3 Routine Maintenance

Routine maintenance includes grading, brush control, minor surfacing repairs, sanding, snowplowing, ditch maintenance and repair, replacement of culverts, slough removal and waterbar construction, for seasonal erosion control.

Routine maintenance also includes minor repairs to roads due to slides, erosion and flood damage. All road use charges except those recognized in Section 4.5.4 are also included.

The cost estimate for all routine maintenance carried out on logging operations, including roads required for basic silviculture and protection, depends on the geographic location of the cutting authority. Cost estimates do not apply where there are no roads to be maintained.

The cost estimates (by Forest District) are:

Zone 1 (North)

- Queen Charlotte
- Mid Coast
- North Coast
- Port McNeill

Cost Estimate = $1.39/m^3$

Zone 2 (South)

- Sunshine Coast
- Campbell River
- Duncan
- Squamish
- Chilliwack
- Port Alberni

Cost Estimate = $2.59/m^3$

4.5.4 Road and Land Use Charges

Where applicable in the following options and prior to a stumpage appraisal cost estimate being used in any appraisal, the licensee must:

i. submit a "Request for Approval of a Road Use Charge" form with the Appraisal Data Sheet; and

ii. receive written approval of the road or land use charge from the Director, Revenue Branch.

5.2 Value Index

The stumpage rate charged on each cutting authority is keyed to the estimated Value Index of the stand to be harvested. The Value Index is defined as the Selling Price less the Operating Cost, both of which are estimates expected for an average operator in that stand. The formula to be used is:

$$VI = SP - OC$$

Where:

VI = Value Index for the cutting authority.

SP = estimated stand Selling Price determined in accordance with Chapter 3.

OC = estimated Operating Cost applicable to the timber being appraised, and determined in accordance with Chapter 4.

5.3 Mean Value Index

The Coast Mean Value Index (MVI) is the benchmark against which individual stands of timber are compared. The Mean Value Index is recalculated and published by Revenue Branch at the time of each quarterly stumpage adjustment. When distributed it becomes an integral part of this manual.

The MVI does not include appraisals from timber licences.

5.4 Market Value Indexing

At the times specified in Section 1.6, stumpage rates are adjusted upwards or downwards to reflect changes in the value of softwood lumber as indicated by the new Statistics Canada British Columbia Softwood Lumber Index (INDEX) for the Coast, number D693601.

New Coast Target Rate Calculation:

i. If the INDEX is less than or equal to 160 then,

$$TR = \frac{INDEX}{138.5} * 10.59$$

ii. If the INDEX is greater than 160, but less than or equal to 185 then,

$$TR = 12.23 + \left[\frac{(INDEX - 160)}{25} * 9.73\right]$$

iii. If the INDEX is greater than 185 then,

$$TR = 21.96 + \left[\frac{(INDEX - 185)}{49} * 7.45\right]$$

Where: TR = New Target Rate ($/m³)

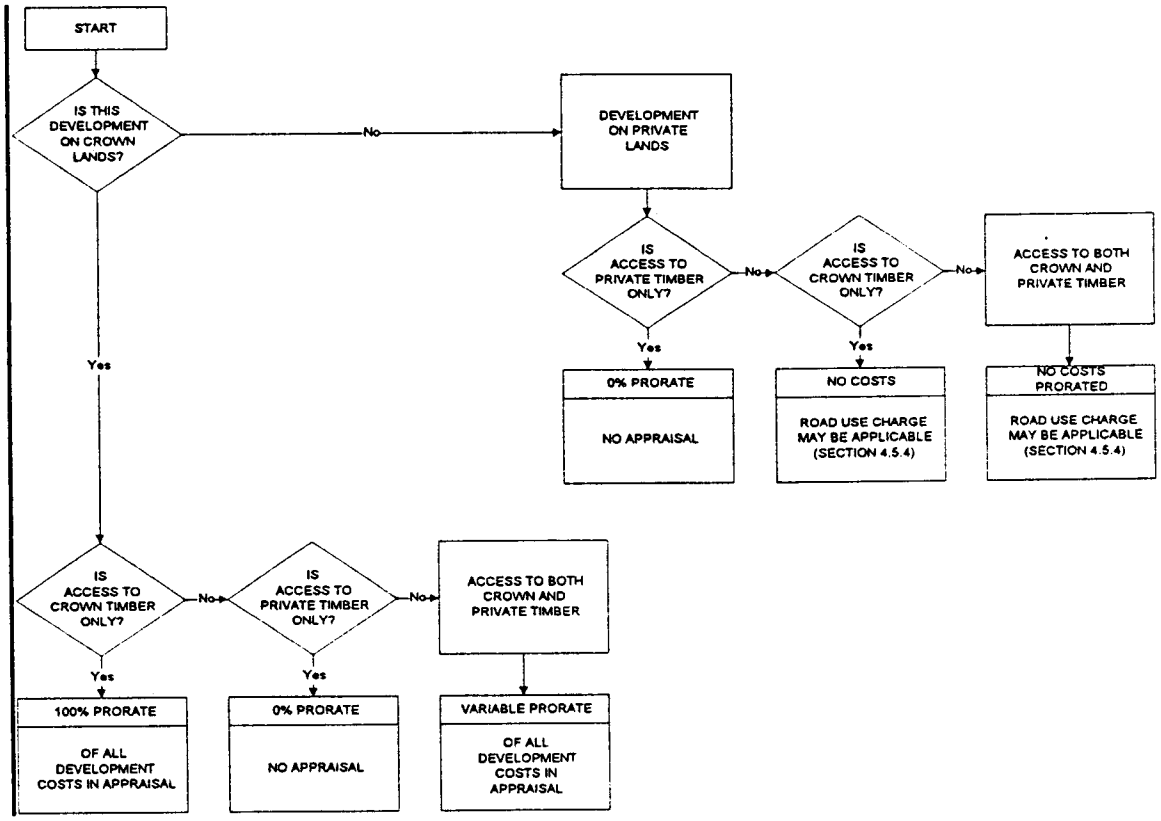
Quarterly Stumpage Rate Adjustment Date	**New Statistics Canada Index based on index values for the months of:**
January 1	Preceding August, September, October
April 1	Preceding November, December, January
July 1	Preceding February, March, April
October 1	Preceding May, June, July

The applicable Statistics Canada Index is published by Revenue Branch at the time of each quarterly stumpage adjustment. When distributed it becomes an integral part of this manual.

5.5 Base Rate

The Coast Base Rate is redetermined and published by Revenue Branch at the time of each quarterly stumpage rate adjustment. When distributed it becomes an integral part of this manual.

Appendix III Development Cost Allocation



Crown Timber = Appraised timber including appraised Timber Licences

Private Timber = Non-appraised timber

Variable Prorate = A tributary-volume type prorate between appraised and non-appraised timber

Appendix IV Rock Mass Classification

SUBSURFACE HARDNESS

SURFACE HARDNESS	WEATHERING ON SURFACE W1	W2	W3	W4	W5
H2	R2	R2	R2,R3	R3,R4	R4,R5
H3	R3	R3	R3,R4	R4,45	
H4	R4	R4	R4,R5		
H5	R5	R5			

Hardness Factors

H2 Can be scraped and peeled by a pocket knife with difficulty. Shallow indentations (i.e. 1/16 inch to 1/8 inch) made by firm blow of geological pick.

H3 Cannot be scraped or peeled with a pocket knife. Hand-held specimen can be fractured with single firm blow of hammer end of geological pick.

H4 Hand-held specimen requires more than one blow with hammer end of geological pick to fracture it.

H5 Hand-held specimen is very hard and requires many blows of hammer end of geological pick to fracture it.

Weathering Factors

W1 The rock shows no loss of strength or any other effect of weathering other than slight staining on a few discontinuities*.

W2 The intact rock is slightly discoloured but not noticeably lower in strength than the fresh rock. The discontinuities are discoloured and some discoloration extends into the rock.

W3 The intact rock is discoloured and noticeably weakened. Discontinuities are stained and/or contain filling comprising altered material.

W4 Discolouration and weakening extends throughout rock mass and rock mass tends to crumble somewhat. Rock can be excavated with geological pick.

W5 The rock is totally discoloured and decomposed and is entirely changed to a soil but the original structure of the rock is mostly preserved.

* The term discontinuities refers to natural breaks, shears or faults in the bedrock.

RMC VALUE

SURFACE HARDNESS	AVERAGE BLOCK DIAMETER				
	0 to 3"	3" to 6"	6" to 1'	1' to 4'	4'+
R2	RMC1	RMC2	RMC2	RMC2	RMC2
R3	RMC2	RMC2	RMC3	RMC3	RMC3
R4	RMC2	RMC3	RMC4	RMC4	RMC4
R5	RMC3	RMC4	RMC5	RMC5	RMC5

Description of RMC Values

RMC1 Rock crumbles under firm blows with the point of a geological pick and can be peeled by a pocket knife (R1). The average block diameter is not important. The rock may be harder (R2) but must have an average block diameter of less than 3 inches. This rock can be excavated by free digging or ripping.

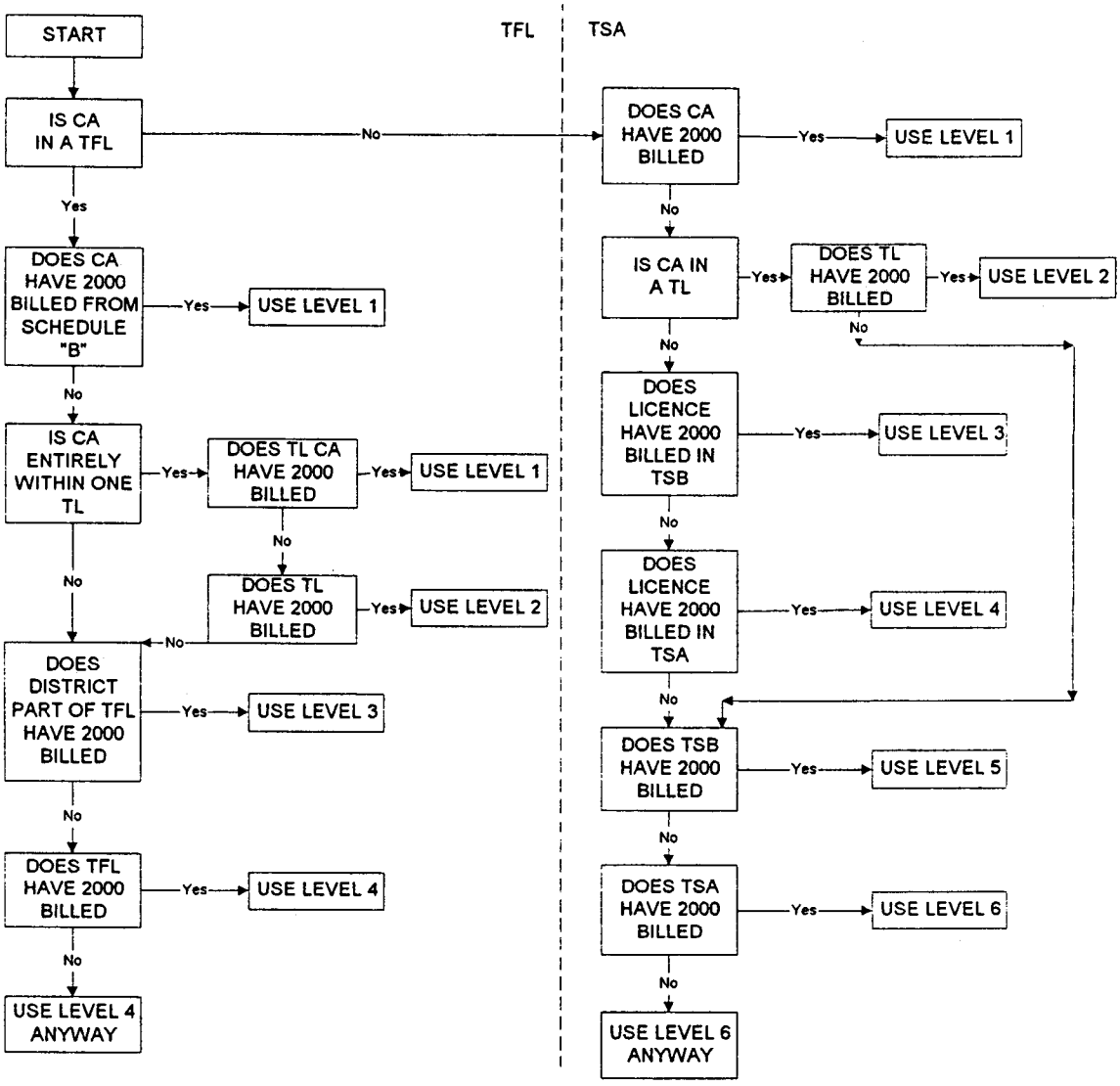
RMC2 Rock can be scraped and peeled by a pocket knife with difficulty and shallow indentations (i.e. 1/16 inch to 1/8 inch) can be made by a firm blow of a geological pick (R2) and has an average block diameter greater than 3 inches. The rock may be somewhat harder (R3) but must have an average block diameter less than 6 inches or hard (R4) and have an average block diameter less than 3 inches. The rock is usually rippable.

RMC3 Rock cannot be scraped or peeled with a pocket knife. Hand-held specimen can be fractured with a single firm blow of the hammer end of a geological pick (R3) and has an average block diameter greater than 6 inches. Rock may be harder (R4) but must have an average block diameter of 3 to 6 inches or very hard (R5) and have an average block diameter of less than 3 inches. The rock is usually not rippable.

RMC4 Hand-held specimen requires more than one blow with hammer end of geological pick to fracture it (R4) and has an average block diameter greater than 6 inches. Rock may be very hard (R5) but must have an average block diameter of 3 to 6 inches. The rock must be blasted.

RMC5 Hand-held specimen is very hard and requires many blows of the hammer end of a geological pick to fracture it (R5) and has an average block diameter greater than 6 inches. The rock must be blasted.

Appendix V Log Grade Hierarchy



CA = Cutting Authority TL = Timber Licence 2000 = 2000 m3 billed