



**Spray Lake Sawmills Ltd. (1980) and FMU
C05 Timber Harvest Planning and
Operating Ground Rules**

2016

SPRAY LAKE SAWMILLS

(1980) LTD. FMA and FMU C05

TIMBER HARVEST PLANNING AND OPERATING GROUND
RULES

SPRAY LAKE SAWMILLS
(1980) LTD.

ALBERTA
AGRICULTURE and
FORESTRY

ENDORSEMENTS

The Spray Lake Sawmills (1980) Timber Harvest Planning and Operating Ground Rules, having been prepared in accordance with Section 16 (3) of FMA 0100038, and hereby endorsed this 1 day of June, 2016. The Executive Director of Forest Management Branch has also determined these ground rules will apply to FMU C05, C04 (Green Area), C02 (White Area), C01 (White Area), B01, B02 (White Area) and B09 (Green Area).

HER MAJESTY THE QUEEN in right of Alberta
as represented by the Minister of Agriculture and
Forestry

Per:

Original Signed

Darren Tapp

(print name)

Executive Director

(title)

SLS FMA and C05 FMU Operating Ground Rules
Revisions from 2012 to 2016
(Effective Date: May 1, 2016)
2016 Revisions

Ground Rule Number	2012 Version of the Ground Rule	2016 Version of the Ground Rule
General	Some edits were made outside of the joint review that included deletion of word(s), correction of spelling & grammar, changes to bolded text, etc. that did not change the intent, meaning or requirements of the OGRs, but rather to provide clarification. These changes are not documented in this table.	
3.2 Compartment Assessment (Discussion)	CAs are necessary when major new issues or information that have been identified since FMP approval make the SHS inappropriate.	CAs may be necessary when major new issues or information have been identified since FMP approval and make the SHS inconsistent with the objectives and strategies of the FMP.
3.2 Compartment Assessment (Discussion)	In completing the CA, forest disposition holder must consult in a meaningful way with stakeholders and strive to reach general agreement on issues. The CA provides an opportunity to reconsider management strategies at the time of operational planning if warranted.	In completing the CA, forest disposition holder must consult with stakeholders. The CA provides an opportunity to recommend alternative management strategies at the time of operational planning if warranted.
3.3.1	The GDP submission date is the first work day on or after April 1 of each year unless otherwise approved by Alberta. Alberta shall respond with approval or conditions to approval within 30 calendar days. The GDP shall be approved subject to an appraisal by Alberta. Two hard copies and one digital copy each for C05 and FMA operations shall be submitted to Alberta.	The GDP submission date is the first work day on or after April 1 of each year with the First Nations record of consultation submitted by September 1 unless otherwise approved by Alberta. Alberta shall respond with approval or conditions to approval by October 1 of the year of submission. The GDP shall be approved subject to an appraisal by Alberta and once approved it replaces the previously approved GDP. The AOP for the upcoming year/period is covered by the GDP submitted the previous year. Two hard copies and one digital copy each for C05 and FMA operations shall be submitted to Alberta.
3.6	d) summary table of block and road specific ground rule deviations and justification;	d) summary table of block and road specific ground rule amendment requests and justification;
3.4.9.1	e) The inter block road within the block boundary may be moved as required, provided the total disturbed area does not exceed 5% of the block area and no additional watercourse crossings are required;	e) The inter block road within the block boundary may be moved as required, provided the total disturbed area does not exceed the amount allowed in Section 9.3 and no additional watercourse crossings are required;

3.5.1	The AOP submission date is April 1 of each year unless otherwise approved by Alberta. Alberta shall respond with approval or conditions to approval within 30 calendar days. The AOP shall be appraised by Alberta in accordance to the AOP checklist (see appendix 5) with approval subject to the outcome of the appraisal. The AOP shall only be approved if there is an approved GDP covering the operating period or area for which the AOP approval is requested.	The AOP submission date is April 1 of each year unless otherwise approved by Alberta. Alberta shall respond with approval or conditions to approval within 30 calendar days. The AOP shall be appraised by Alberta in accordance to the AOP checklist (see appendix 5) with approval subject to the outcome of the appraisal.
4.1	Spatial Harvest Sequence (SHS) definitions updated	See Section 4.1 for details
4.1.1	Companies shall submit a map to show the comparison of the SHS to the laid out FHP highlighting all deletions, deferrals, and additions >1 ha.	Companies shall submit a map to show the comparison of the SHS to the laid out FHP highlighting all substantial deletions, deferrals, and additions.
4.1.2	Variance shall be reported by stratum for each FHP. The table shall include the minimum information as per Variance Table 1.	Variance shall be reported by stratum/compartment for each FHP/GDP. The table shall include the minimum information as per Table 1.
4.1.3	Variance calculation updated	See Section 4.1.3 for details
4.1.4	Added	Area of Substantial Additions shall not exceed the sum of Area in Substantial Deletion and Substantial Deferrals.
Table 1	Updated	See Section 4.1 for details
4.2.7	Added	Company processing practices cannot make an unmerchantable piece from a merchantable tree or merchantable piece.
5.2 (Discussion)	Potential exists for increased public awareness and for increased recreational opportunities through co-ordination with forest management practices.	Potential exists for increased public awareness and for increased recreational opportunities through co-ordination with forest management practices. Alberta and the company may explore opportunities to upgrade or relocate existing trails through normal timber operations.
5.2.1	Operational tactics to mitigate impacts on recreation and tourism shall be described in the GDP and FHP. This includes reclamation of recreational trails used during timber operations.	Operational tactics to mitigate impacts on recreation and tourism shall be described in the GDP and FHP. This may include reclamation/restoration of non-designated trails.
5.2.3	Operators shall restore designated recreational trails and their associated watercourse crossings that are affected by their operations. Alberta and the company shall explore opportunities to upgrading existing trails through normal timber operations.	Operators shall restore designated recreational trails and their associated watercourse crossings that are affected by their operations.

6.0.6	Unless otherwise approved in a FMP, variances from the standards in Table 2, must demonstrate that aquatic and terrestrial objectives are met. Any such proposals shall undergo a full review by Alberta as a component of the FHP review.	Unless otherwise approved in a FMP, proposed amendments to the standards in Table 3 must provide rationale that aquatic and terrestrial objectives are met. Any such proposals shall undergo a full review by Alberta as a component of the FHP review.
Table 3 Class 'A' Waterbodies	Not permitted within 100 m of high water mark. Any existing roads may be maintained at present classification standards. Any proposed watercourse crossings within 2 km upstream must be approved in the AOP.	Not permitted within 100 m of high water mark of mapped Class "A" watercourse unless approved by Alberta. Any existing roads may be maintained at present classification standards. Any proposed watercourse crossings within 2 km upstream of mapped Class "A" watercourse must be identified in the FHP and approved in the AOP.
Table 3 Class 'B' Waterbodies	Not permitted within 60 m of high water mark. Any existing roads may be maintained at present classification standards. Any watercourse crossings within 500 m upstream must be approved in the AOP.	Not permitted within 60 m of high water mark of mapped Class "B" watercourse unless approved by Alberta. Any existing roads may be maintained at present classification standards. Any watercourse crossings within 500 m upstream of mapped Class "B" watercourse must be identified in the FHP and approved in the AOP.
Table 3 Footnote (Class 'A' and 'B' definitions)	See Water Act for definitions of class A and B waterbodies.	Recommended buffers on Class "A" and "B" waterbodies are not a requirement of the Code of Practice for Watercourse Crossings. "Mapped" Class "A" and "B" watercourses refer to maps in Schedule 6 of the Code of Practice for Watercourse Crossings. Definitions of Class "A" and Class "B" as per the Code of Practice are not applicable where the appropriate Water Act exemption applies.
7.2.3	Irregular or natural boundaries shall be employed in the FHP harvest area design. New harvest designs in areas previously harvested shall create natural boundaries.	Irregular or natural boundaries shall be employed in the FHP harvest area design to minimize line of sight for wildlife or aesthetic purposes. New harvest designs in areas previously harvested shall create natural boundaries.
7.2.8	Meadows are defined on Alberta vegetation inventory (AVI) as HF, HG, SC or SO.	Meadows are defined on Alberta Vegetation Inventory (AVI) as HF (herbaceous - forbs), HG (herbaceous - grassland), SC (shrub closed) or SO (shrub open).
7.4.9	Structural retention shall be reported annually in a manner acceptable to Alberta for: a) the volume retained; and b) the area retained.	As per the targets in 7.4.6, structural retention shall be tracked annually in a manner acceptable to Alberta including: a) the total volume retained on blocks <100 ha; and b) the total area retained on blocks >100 ha. Cumulative totals shall be consistent with the values reported in the Stewardship Report and can be calculated as per methodology in the Detailed Forest Management Plan.

7.7.2	<p>Agreed upon critical winter ungulate habitat in the SLS FMA (see 3.3.3.1) shall have:</p> <p>a) shrub areas (AVI veg classes HG, HF, SC and SO) require adjacent hiding/thermal cover to keep the effectiveness of these willow areas. These areas will be agreed to at the FHP;</p>	<p>Agreed upon critical winter ungulate habitat in the SLS FMA (see 3.3.3.1) shall have:</p> <p>a) Non-forested areas (AVI veg classes HG, HF, SC and SO) require adjacent hiding/thermal cover to maintain their effectiveness. These areas will be agreed to at the FHP;</p>
7.7.3.8 – 7.7.3.10	Added	<p>Locations of existing Bull Trout and pure strain Westslope Cutthroat Trout can be identified using the Fisheries and Wildlife Management Information System (FWMIS), the associated Fish and Wildlife Internet Mapping Tool (FWMIT) and consultation with Alberta. Within these identified areas:</p> <p>7.7.3.9 Operational planning by the company should incorporate the use of Alberta’s Wet Areas Mapping tool to identify areas that are sensitive to disturbance. Field confirmation of these sites including depth to water, potential disruption of groundwater flows, and areas at high risk of erosion in wet or riparian areas can be a useful tool in determining road and crossing location.</p> <p>7.7.3.10 Detailed Harvest Area Plans (DHAP) for operations shall be submitted.</p> <p>7.7.3.11 Watercourse(s) shall be treated as Class “A” as per Table 3.</p>
9.3	<p>The total area covered by temporary roads, rutting, bared landing areas, displaced soil, and debris piles created by timber harvesting operations shall not exceed five percent of each harvest area without prior approval of Alberta.</p>	<p>The total area covered by temporary roads, bared processing areas, and soil displaced during timber harvesting operations shall not exceed 5% of each harvest area without Alberta’s approval. Blocks less than 7 ha or narrow blocks (averaging less than 100 metres from boundary to boundary) may exceed 5% with these blocks reported on the as-built.</p>
11.1.2	<p>All roads, regardless of class, with a lifespan of greater than five years shall be built under the authority of a LOC.</p>	<p>All roads, regardless of class, with a lifespan of greater than three years shall be built under the authority of a DLO.</p>
11.2.3	<p>Temporary Roads: Class III and Class IV (with a lifespan up to five years from start of construction).</p>	<p>Temporary Roads: Class III and Class IV (with a lifespan up to three years from start of construction).</p>
11.3.1.3	Added	<p>Temporary road construction activities that are required outside an approved ROW can be considered incidental to construction and will be approved as part of the AOP provided the following is met:</p> <p>a) Be immediately adjacent to AOP approved disposition (temporary road and associated</p>

		<p>ROW only);</p> <p>b) Be reclaimed or reforested in the same fashion as the adjacent AOP approved disposition (if applicable);</p> <p>c) Be without conflict of existing dispositions and/or adjacent land uses; AND</p> <p>d) Be an activity type and within the parameters as described below:</p> <p>Log Decks or Decking Areas:</p> <ul style="list-style-type: none"> • ≤ 0.18 hectares in size; • Located on average ≥400 metres apart <p>Bank Stabilization:</p> <ul style="list-style-type: none"> • Related to hill cuts impacted during construction; <p>Push Outs:</p> <ul style="list-style-type: none"> • ≤0.04 hectares in size; • Located on average ≥800 metres apart. Where this distance is not feasible due to operational constraints, line of sight between push outs should be minimized.
11.3.1.4	<p>Roads and landings shall be constructed to avoid:</p> <p>a) unstable soils, water source areas, springs and seepage areas;</p> <p>b) creating disturbed, compacted or bared soils that exceed the amount specified in section 9.3 – Soils;</p> <p>c) natural meadows unless approved by Alberta.</p>	<p>Unless otherwise approved by Alberta, roads and landings shall avoid:</p> <p>a) unstable soils, water source areas, springs and seepage areas;</p> <p>b) creating disturbed, compacted or bared soils that exceed the amount specified in section 9.3 – Soils;</p> <p>c) Rough Fescue native grassland ; and</p> <p>d) natural meadows.</p>
11.4.20	<p>Crossing intermittent or ephemeral watercourses within harvest areas shall be avoided when possible. When the crossings are necessary, they shall be constructed at specified locations using appropriate watercourse crossing structures.</p>	<p>Crossing of intermittent or ephemeral watercourses not previously identified within harvest areas shall be avoided when possible. When the crossings are necessary, they shall be constructed at specified locations using appropriate watercourse crossing structures with notification provided to Alberta.</p>
11.4.23 g)	<p>the soil cap and separation layer is removed as soon as harvest and hauling is complete;</p>	<p>the structure is removed as soon as harvest, hauling and reforestation operations are completed unless a proposal to leave crossing structures in place is approved by Alberta and an acceptable monitoring program is in place.</p>

Table of Contents

1.0 GROUND RULE SCOPE	1
1.1 REGULAR REVIEWS	1
2.0 THE TOPICS	1
3.0 OPERATIONAL PLANNING.....	2
3.1 PLANNING PROCESS	2
3.2 COMPARTMENT ASSESSMENT (CA).....	3
3.3 GENERAL DEVELOPMENT PLAN (GDP)	4
3.4 FOREST HARVEST PLAN (FHP).....	5
3.5 ANNUAL OPERATING PLAN	10
3.6 SALVAGE PLANNING.....	11
4.0 UTILIZATION.....	12
4.1 STAND UTILIZATION	12
4.2 TREE UTILIZATION	16
5.0 INTEGRATION WITH OTHER USERS	17
5.1 INTEGRATION WITH FOREST OPERATORS.....	17
5.2 FOREST RECREATION AND TOURISM.....	18
5.3 TRAPPING.....	19
5.4 RANGELAND RESOURCES	19
5.5 FOREST AESTHETICS	20
5.6 HISTORICAL RESOURCES	21
6.0 WATERSHED PROTECTION.....	22
7.0 HABITAT MANAGEMENT.....	29
7.1 LANDSCAPE PLANNING AND HARVEST AREA DESIGN	29
7.2 HARVEST AREA DESIGN AND LAYOUT.....	30
7.3 DEBRIS MANAGEMENT AND WILDFIRE PROTECTION	32
7.4 STRUCTURE RETENTION.....	35
7.5 UNDERSTOREY PROTECTION.....	40
7.6 FISHERIES AND THE AQUATIC ENVIRONMENT	41
7.7 SPECIES OF SPECIAL MANAGEMENT CONCERN	42
7.7.1 Grizzly Bear	42
7.7.2 Key Wildlife and Biodiversity Zone.....	44
7.7.3 Fine Filter and other Species.....	46
7.7.4 Trumpeter Swan.....	49
8.0 SILVICULTURE	50
8.1 PLANNING	50
8.2 REFORESTATION PROGRAM.....	51
8.3 SILVICULTURE OPERATIONS	53
9.0 SOILS	54

10.0 FOREST HEALTH	57
10.1 INSECT AND DISEASE	57
10.2 WEED MANAGEMENT	58
11.0 ROADS	59
11.1 ROAD CLASSIFICATION	59
11.2 ROAD PLANNING AND DESIGN	62
11.3 ROAD CONSTRUCTION, MAINTENANCE AND RECLAMATION.....	63
11.4 WATERCOURSE CROSSINGS	67
11.5 ACCESS CONTROL.....	72
11.6 CAMPS AND FACILITIES.....	73
12.0 REPORTING.....	74
Figure 1.Soil Compaction Risk	56
Table 1.SHS Assessment (Variance Reporting)	15
Table 2.Watercourse Classification.....	24
Table 3.Standards and Guidelines for Operating Beside Watercourses	26
Table 4.Road Classification and Design.....	60
Table 5.Acceptable Crossing Structures.....	67
Appendix 1 - Role of Regulated Forestry Professionals (RFP) in Forest Management	75
Appendix 2 - Debris Disposal Policy	77
Appendix 3 - Directive for Weed Management.....	80
Appendix 4 – GLOSSARY	85
Appendix 5 – FHP/AOP CHECKLISTS	94
Appendix 6 – Directive 2006-04	97
Appendix 7 – External Information Letter 2010-02 Fescue Grassland Information Letter – Principles for Minimizing Surface Disturbance	103

1.0 GROUND RULE SCOPE

Ground rules are the practices used in planning and conducting timber harvesting operations which constitute the methods used to implement decisions made in the Forest Management Plan (FMP) and other higher level plans such as Integrated Resource Plans (IRP). In the event that these strategic plans do not exist, the ground rules shall establish practices that minimize the chance of negative impacts from roads, timber harvesting and forest management operations and activities. Authorizations by Alberta do not imply authorization under federal legislation and requirements, notably the federal Fisheries Act and Migratory Birds Convention Act. The proponent must seek advice and approvals of the federal agencies (Department of Fisheries and Oceans, Environment Canada) regarding federal legislation requirements.

Authorization of the Annual Operating Plan (AOP) does not constitute waiver or exemption from the ground rules or any statutory requirement, nor is authorization of the AOP verification of compliance with the ground rules or any statutory requirement.

The Delegated Authority (Alberta) has the authority to approve Annual Operating Plans and may also waive or amend the application of specific ground rules in unusual or special circumstances. However, waivers or amendments shall be completed in writing and must conform to departmental policy, the Forests Act, the Timber Management Regulation, the Public Lands Act and all other applicable provincial legislation or statutes. Ground rule waivers identified in the FHP meet the intent of “in writing” as required above.

1.1 REGULAR REVIEWS

The intent is to have an annual review of ground rules if requested by either forest disposition holders or Alberta. This is not meant to be a complete redevelopment but rather an opportunity to fine-tune the ground rules. It is expected that regular reviews will allow participants to plan revisions more systematically and to correct any inconsistencies or problems. It will also create the ability to regularly consider modifications that reflect the best and most current knowledge and tools available.

2.0 THE TOPICS

Each topic includes a purpose, discussion, and ground rule heading. All ground rules shall be written following this format.

PURPOSE

A statement of what the topic is designed to accomplish.

DISCUSSION

Include background information, research knowledge, and reasons for the concern. The discussion shall focus on why a ground rule is needed. Alternative actions or solutions could also be discussed here.

GROUND RULES

These are definitive statements of the desired results to be achieved and a clear indication of what is expected. **The ground rules shall be relevant, measurable, understandable and achievable.**

3.0 OPERATIONAL PLANNING

3.1 PLANNING PROCESS

PURPOSE

The operational planning process is designed to expedite the implementation of the FMP. Where management direction has not been established through an approved FMP, then required decisions shall be made during this operational planning process.

DISCUSSION

The planning process includes five main components:

1. **Approved Forest Management Plan (FMP)**
 - Spatial Harvest Sequence (SHS) for first two 10-year periods
 - Approved Long Term Road Network
2. **Compartment Assessment (CA)** – A CA may be required when information or major issues are identified that in Alberta’s opinion, have not been addressed in the FMP. In the event that the SHS is deemed by Alberta to be inconsistent with the objectives and strategies in the approved FMP, a compartment assessment describing current issues, may be required. (see section 3.2)
3. **General Development Plan (GDP)** - The GDP gives a comprehensive description of a forest operator's proposed harvest strategy, road building plans, and reclamation operations for a five-year period, and includes all active licences and permits. The GDP is used to guide integration of activities. (see section 3.3)
4. **Forest Harvest Plan (FHP)** – The FHP is a map and associated report describing the laid out harvest plan. (see section 3.4)
5. **Annual Operating Plan (AOP)** – The AOP describes operations in detail through a series of components that shall be submitted together at the same time, or as individual submissions on a schedule approved by Alberta:
 - a) Operating Schedule and Timber Production;
 - b) Applicable Forest Harvest Plans;
 - c) Compartment Assessments as required;
 - d) Reforestation Program;
 - e) Forest protection supplement;
 - f) Road Plan.(see section 3.5)

3.2 COMPARTMENT ASSESSMENT (CA)

PURPOSE

To address significant issues that have arisen since the approval of the FMP.

DISCUSSION

It is recognized that circumstances change over time and it is possible that the SHS approved in the FMP may prove to be inappropriate. Where Alberta deems it necessary, a CA shall be completed to adjust the operational plan for the area. CAs may be necessary when major new issues or information have been identified since FMP approval and make the SHS inconsistent with the objectives and strategies of the FMP. (e.g., forest fire, insect or disease, species of special management concern, a major change in land use direction or an unacceptable variance of >20% of the SHS/compartments/decade as determined by the Delegated Authority and the manager of Forest Management Branch (FMB)).

The forest disposition holder shall be consulted by Alberta prior to making a decision on the requirement for a CA. The CA shall describe how the new issues will be incorporated into the FHP and identify a timeline for submission, review and approval by Alberta. The C05 FMU is operated by quota holders with no landbase tenure and thus ability to obtain data is limited. A CA may be a joint responsibility of Alberta and the quota holders based on the issue to be addressed. Where the quota holders are required to complete the CA, Alberta will provide existing data to the operators for use in their CA. For the FMA, the CA and the required data or analysis is the responsibility of the FMA holder. In completing the CA, forest disposition holder must consult with stakeholders. The CA provides an opportunity to recommend alternative management strategies at the time of operational planning if warranted.

GROUND RULES

- 3.2.1 Alberta shall decide on the boundaries of the area on which a CA is required after consultation with the forest disposition holder.**
- 3.2.2 If a CA is required, the operator must receive Alberta's approval for the CA prior to the submission of a FHP.**
- 3.2.3 A CA is considered current if it has been approved by Alberta and the FHP is submitted to Alberta within three years of CA approval.**
- 3.2.4 The CA shall include any maps, analyses, and reports deemed necessary by Alberta to adequately address the issues.**

3.3 GENERAL DEVELOPMENT PLAN (GDP)

PURPOSE

To provide a projection of activities for the next five years to:

- a) guide the integration of activities;
- b) schedule timber disposition administration activities;
- c) predict cut control status;
- d) co-ordinate the development and reclamation of roads.

DISCUSSION

The primary components of the GDP include a forecast of the areas scheduled for harvest for a five year period and a summary of variance from the SHS for existing FHPs or long-term road plans outlined in the FMP. The GDP must also include the current status and forecast of the respective annual allowable cuts (AACs) and cut control period for each of the operators within the planning area where overlapping operations exist. This could be either a joint submission by all forest disposition holders or separate submissions containing consistent information between them.

In addition to outlining the projected wood supply forecast, the GDP shall also include details regarding but not limited to road requirements, fish and wildlife, recreation, grazing, access management, aesthetics, Firesmart and forest health issues within the planning area. Fish and Wildlife will annually provide FWMIS information for years 2 through 5 of the GDP, to forest operators for use in FHP development to ensure protection of known sensitive sites.

First Nations consultation of the GDP is a requirement of the Alberta's First Nations Consultation Guidelines on Land Management and Resource Development.

GROUND RULES

- 3.3.1 **The GDP submission date is the first work day on or after April 1 of each year with the First Nations record of consultation submitted by September 1 unless otherwise approved by Alberta. Alberta shall respond with approval or conditions to approval by October 1 of the year of submission. The GDP shall be approved subject to an appraisal by Alberta and once approved it replaces the previously approved GDP. The AOP for the upcoming year/period is covered by the GDP submitted the previous year. Two hard copies and one digital copy each for C05 and FMA operations shall be submitted to Alberta.**
- 3.3.2 **The GDP shall contain a summary of any proposed variances from the spatial harvest sequence.**
- 3.3.3 **The GDP shall describe volume supply (by area), road standards and construction schedule, and reclamation activities. The plan is a notification to Alberta of proposed activities and exceptions (see 3.3.2) to guide future regulatory activities. Other forest operators affected by the GDP must agree in writing to the GDP before it will be approved. It is the responsibility of the operator to ensure that an over-cut exceeding that allowed in their tenure document is not exceeded. (see section 5.1.1)**
 - 3.3.3.1 **The company and Alberta shall meet prior to layout of the area identified in the GDP to clarify issues such as: start date of field recon, reviewing licence boundary in relation to CTP program, public interest in the area, new resource data, and any other factors that could affect harvest planning and scheduling.**

The intent is to identify known sites of specific interests, e.g. mineral lick, natural barriers, unique habitat feature, known long term random campsites and to proactively mitigate impacts on them. This is not to be used for re-evaluating or amending the SHS or FMP objectives.

3.3.4 When a change in a company's general development strategy is proposed after the GDP is received, or after a GDP is approved by Alberta a revision shall be submitted to Alberta.

3.3.5 The GDP consists of the following:

1. Schedules with the following information:
 - a) the areas to be harvested each year of the next five-year period;
 - b) timber production summary table for all dispositions (by year);
 - c) Class I, II and III road developments showing planning and construction time lines, access management and the status of Department License of Occupation (DLO) applications;
 - d) DLO roads are to be monitored, and all outstanding and anticipated reclamation work related to DLO road and stream crossings, may be submitted under separate cover at a future date agreed to by Alberta as a component of the road use and reclamation plan – submitted for information purposes only;
 - e) a brief description of potential issues arising from the proposed harvest activities that have been identified through discussions with Alberta or other known resource users;
 - f) a commitment that rare ecosections and ecosites have been addressed as per the FMP. Alberta may request to meet with the company to validate this commitment;
 - g) proposed and actual volumes in satellite storage yards; and
 - h) a description of variances (as per 3.3.2) from the SHS and five year access plan.
2. A map (of appropriate scale) that shows the following:
 - a) the mill site location;
 - b) proposed haul routes (differentiating existing roads from roads to be constructed) and primary routes to be used for reforestation access;
 - c) satellite storage yard locations;
 - d) the C05 timber dispositions and FMA compartments showing the operating period within the 5 years;
 - e) other important forest resource areas or facilities that could be directly affected by logging; and
 - f) the general location of routes, dispositions and facilities where reclamation work is scheduled and where roads and watercourse crossings are reclaimed.

3.4 FOREST HARVEST PLAN (FHP)

PURPOSE

To describe the laid out harvest and road design

DISCUSSION

The primary components of an FHP are a map and report that clearly show and document the harvest area boundaries, roads and water crossings for the compartment. The design shall be valid for five years from the time of approval, unless issues deemed significant by Alberta arise during

this period. Significant issues identified through the GDP shall be addressed in the FHP. Prior to layout, the company and Alberta will have a discussion of proposed activities/issues that could affect harvest planning and scheduling, see 3.3.3.1.

GROUND RULES

- 3.4.1 An FHP shall be approved by acceptance if:**
- a) validated by a regulated forestry professional (RFP);
 - b) variances of less than 20% of the area sequenced in the SHS by compartment per decade;
 - c) the harvest area (ha) does not exceed 100% of the total area in the SHS by compartment per decade as tracked in the GDP; and
 - d) it adheres to all ground rules as per the FHP checklist. (see Appendix 5)

Alberta shall notify the company by acknowledging receipt within 5 working days of submission. The notification date will be documented by Alberta as the date on which the FHP is approved. Where the FHP does not meet one or more of the above standards, the FHP shall undergo a review by Alberta. Alberta shall respond with approval or conditions to approval within 30 calendar days. Variances from the SHS shall be reported in the FHP in a format acceptable to Alberta (see section 4.1)

- 3.4.2 If a CA was completed, the FHP shall undergo a full Alberta referral and review to ensure the direction in the CA has been implemented. Alberta shall respond within 30 calendar days.**

- 3.4.3 All FHPs submitted by operators who harvest more than 30,000 m³ each year from crown land, must be validated by a RFP. Validation means that the OGRs were followed and the SHS was followed or variances identified.**

- 3.4.4 Other forest operators affected by the FHP must agree, in writing, with the FHP before it will be approved. (see section 5.1.1)**

- 3.4.5 Maps shall accurately show the following information:**
- a) the approved forest inventory at a minimum 1:20,000 scale;
 - b) approved SHS and variances to the SHS and compartment boundary; (see 4.1.1)
 - c) all Class I – III roads within harvest areas and harvest area boundaries for all timber operators;
 - d) all inter block Class IV roads and all watercourse crossings except for ephemeral crossings shall be laid out and shown;
 - e) current dispositions and reserves (e.g., registered trapline boundaries, permanent sample plot locations);
 - f) watercourses, their classifications and protective buffers;
 - g) springs, water source and seepage areas;
 - h) road corridors and DLO numbers and classes for both existing and proposed roads. Locations of access control measures existing and proposed; and
 - i) boundary and opening number on previously harvested areas (until performance survey), and available existing trails, designated trails, seismic lines, power lines, pipelines and access routes.

- 3.4.6 In addition to the FHP map, the following information is required:**
- a) area (ha), and volume for each proposed coniferous harvest area;
 - b) summary table of variances from the SHS; (see section 4.1)

- c) regeneration stratum for each harvest area (based on dominant or largest area of pre-harvest stratum within the harvest area, or stratum conversion if known; (see Directive 2005-01 for further details)
- d) summary table of block and road specific ground rule amendment requests and justification;
- e) potentially affected dispositions (e.g. FGL, DRS, other timber dispositions) and notations (e.g. PNT, CNT);
- f) for C05 the GLIMPS info will be provided with the issuance of a timber license;
- g) for C05 FMU, identified areas of rare plants shall be addressed, (abundance will be used to determine the appropriate management strategy);
- h) description of how the CA is addressed in the FHP;
- i) identification of watercourse crossing location;
- j) access control methods employed;
- k) table showing status of non-DLO roads (see section 11.2.3.3) if status isn't designated on the map. This may be submitted as part of the road use and reclamation plan;
- l) description of integration with other users (see section 5).

3.4.7 The company shall follow FMP integrated land management (ILM) strategies or access development strategies when developing roads. Alberta may approve amendment requests that differ from these strategies after discussions with the company.

3.4.8 Where applicable the following comments shall be described for each harvest area:

- a) block comments may be included on the individual block map;
- b) watercourse classification and protective buffer;
- c) rationale for roads crossing grasslands (applicable in C05 FMU and Rough Fescue PNT);
- d) layout bordering restricted areas (e.g., permanent sample plots (PSPs), private land);
- e) identification of understorey (see section 7.5);
- f) harvest area-specific structure retention and woody debris management strategies;
- g) tactics to address forest health issues;
- h) protection of roadside vegetation - applicable or not, and how to be done;
- i) strategies to address sight distance concerns with an attempt to maintain sight distance of 400 m or less;
- j) proposed spur roads and watercourse crossings location;
- k) important wildlife sites and mitigation measures as defined in section 7.7.3 (this information shall be made available for resource planning purposes only through Fish and Wildlife);
- l) historical site considerations;
- m) soil protection measures when any of the following are present:
 - identified unstable areas, water-source areas, springs or seepages;
 - steep or sustained slopes or grades (>30%);
 - unfrozen operating conditions.

3.4.9 All amendments to harvest plans must be justified and submitted to Alberta in writing. RFP validation of all amendments is required. Any changes must be incorporated into the as-built plan.

3.4.9.1 Changes meeting the following criteria are considered 'Minor Amendments', and require only company RFP validation and notification to Alberta. Minor amendments don't require Alberta's approval, provided all appropriate

background checks (e.g. GLIMPS) have been made and rationale for the change has been provided (changes can be implemented prior to notification but must be reported no later than seven working days after implementation). Changes shall not adversely affect buffers established for the protection of riparian areas, wildlife sites, historical resources, designated recreation trails or aesthetic values:

- a) Additions to the approved AOP harvest area boundary where the final area does not vary from the area in the approved FHP by more than five percent for blocks greater than 10 ha, or more than .5 ha for blocks less than or equal to 10 ha. Any additions to block areas must be approved by a company supervisor prior to the change being carried out. Any resulting variances from the approved SHS must be categorized and reported as per 4.1.1. This ground rule does not apply to CTPs and DTPs;
- b) Deletions to the approved AOP harvest area boundary where the final area does not vary from the area in the approved FHP by more than ten percent for blocks greater than 10 ha, or more than 1.0 ha for blocks less than or equal to 10 ha. Any deletions to block areas must be approved by a company supervisor prior to the change being carried out and cannot exceed the variance tolerance in 3.4.1. Any resulting variances from the approved SHS must be categorized and reported as per 4.1.1. This ground rule does not apply to CTPs and DTPs;
- c) Exterior block roads moved to existing access or conventional seismic lines where re-growth is less than 3 m and within 100 m of the approved AOP access. A company supervisor shall approve this move prior to the change being carried out;
- d) Exterior block roads requiring the development of new Right-of-Way (ROW) clearing (not detailed above) that are moved up to two ROW widths from the approved FHP road location. ROW is considered to be the maximum ROW allowed in Table 4 for the class of road proposed. A company supervisor shall approve this move prior to the change being carried out;
- e) The inter block road within the block boundary may be moved as required, provided the total disturbed area does not exceed the amount allowed in Section 9.3 and no additional watercourse crossings are required;
- f) Added crossings on intermittent water courses shall be reported on a monthly basis;
- g) Any change to the approved AOP not listed in 3.4.9.1 shall be treated as an AOP amendment and requires the approval of Alberta prior to implementation. Alberta will provide the company feedback and/or approval of the AOP amendment within 10 working days of the submission.

3.4.10 Detailed harvest area plans (DHAP) are required when there is higher than average potential for environmental damage. Harvest areas that require a DHAP could be

identified at a meeting held to develop the FHP. This doesn't preclude the company from developing additional DHAPs. Circumstances that merit DHAPs are:

- a) areas of steep topography (sustained slopes exceeding 40%) requiring specific road location and construction or specialized harvesting equipment;
- b) unstable slopes are generally to be avoided but if this is not possible it is necessary to plan operations carefully to minimize impacts;
- c) harvest areas with numerous water source areas, seepages, intermittent, or ephemeral watercourses;
- d) harvest areas that contain or border sensitive wildlife areas;
- e) harvest areas requiring understorey protection using protection techniques (see section 7.5);
- f) harvest areas located near high-value aesthetic (FMP), high value recreation areas, tourism areas, and facilities;
- g) partial harvests, excluding commercial thinning (CT) and pre-commercial thinning (PCT);
- h) when harvesting is used as a tool to control insects and disease infestations;
- i) planned harvest areas exceeding 80 ha in C05 or 100 ha in the SLS FMA. Section 7.4 outlines requirements for structure retention in these larger harvest areas.

The DHAP shall include a map of appropriate scale to the issue(s) and describe how the concern will be addressed in operations. DHAPs are submitted to Alberta along with the FHP.

- 3.4.11 Where additional non SHS harvest areas are added adjacent to existing harvest areas, the total of the two harvest areas cannot exceed the maximum harvest area size specified in the FMP. When the existing harvest area regeneration reaches 30 years of age for C05 and 20 years for SLS's FMA, this no longer applies.

3.5 ANNUAL OPERATING PLAN

PURPOSE

To annually authorize all road, harvest and forest management activities for the operator.

DISCUSSION

The AOP articulates in detail the activities proposed for the current year and must be approved by Alberta before timber operations shall commence. The AOP components include:

- a) Operating Schedule and Timber Production;
- b) Applicable Forest Harvest Plans;
- c) Compartment Assessments as required;
- d) Reforestation Program;
- e) Forest Protection Supplement;
- f) Road Use and Reclamation Plan;

Individual components of the AOP may be approved without approval of the entire AOP, e.g., reclamation plan, reforestation program.

Refer to Appendix 1 for RFP validation requirements

For timber permit operators and small quota holders who harvest less than 30,000 m³ annually, Alberta has alternate AOP submission requirements.¹

Where grazing timber agreements are required within the AOP area, the company will submit the GTA with the initial AOP.

GROUND RULES

- 3.5.1 The AOP submission date is April 1 of each year unless otherwise approved by Alberta. Alberta shall respond with approval or conditions to approval within 30 calendar days. The AOP shall be appraised by Alberta in accordance to the AOP checklist (see appendix 5) with approval subject to the outcome of the appraisal.**
- 3.5.2 The Operating Schedule and Timber Production; Reforestation Program; Forest Protection Supplement; and Road Plan are submitted as in 3.5.1 above, unless otherwise agreed to by Alberta. The schedule for submitting any necessary CA and FHPs may be different.**
- 3.5.3 Only harvest areas and roads with FHP approval shall be scheduled for operations in the AOP submission.**
- 3.5.4 The AOP shall contain the following components:**
 - a) **The map(s) referred to in 3.4.5 above including shape files of approved FHP harvest areas.**
 - b) **Administrative and timber production information:**
 - I. name of disposition holder(s);**
 - II. number of the disposition(s);**
 - III. date of submission and effective period;**

¹ TM118 form

- IV. location of mill where timber will be manufactured or processed, unless alternative reporting has been approved;
 - V. where all volumes (deciduous and coniferous) will be charged (quota, deciduous timber allocation, FMA, Commercial Timber Permit);
 - VI. proposed harvest volume to be harvested by timber disposition;
 - VII. Community Timber Program operators shall include all road use agreements;
 - VIII. scaling methodology (e.g., weigh scale, other arrangements) (not necessary if otherwise submitted);
 - IX. utilization standards;
 - X. declaration or list of land use notifications, and date of notification (see section 5.0).
- c) **Operating Schedule – a table which outlines:**
 - I. list of harvest areas proposed for harvest (including area and volume with totals);
 - II. list of roads proposed for construction, maintenance and reclamation for non-DLO roads, except spur roads. It includes watercourse crossings to be built or installed or removed/maintained;
 - III. declaration of outstanding operational items, or an agreement with Alberta on reporting of outstanding operational items;
 - IV. debris disposal;
 - d) **Annual Reforestation Program (see section 8.2)**
 - e) **Forest protection supplement which covers suppression equipment (see section 7.3)**
 - f) **CA if applicable**

3.6 SALVAGE PLANNING

PURPOSE

Salvage planning shall be implemented when necessary to reduce loss of fibre.

DISCUSSION

Under certain circumstances, planning shall be expedited to reduce the loss of fibre from fire; disease or insect infestation; blowdown; or other such unforeseen disturbances.

Salvage planning shall not be used when:

- a) the disturbance regime is slow moving and can be accommodated under conventional planning timeframes and protocols;
- b) the regime is not an imminent threat to green fibre;
- c) fibre loss is deemed to be within an acceptable range.

Salvage planning does not confer rights to the planner to ignore other values, or the inherent value of a natural disturbance. It does allow for consideration of all values and for prompt, qualified, professional opinion to drive the process.

GROUND RULES

- 3.6.1 **Salvage planning is initiated on the natural disturbance when deemed appropriate by Alberta. The company can identify areas where salvage planning may be necessary.**

- 3.6.2 A FHP for the salvage area must be developed, and shall form part of the AOP. Modified timelines and content for the FHP shall be considered by Alberta. Detailed requirements may be published from time to time by Alberta. It is expected that there will be substantial discussion to resolve significant issues with Alberta before the FHP is submitted.

4.0 UTILIZATION

4.1 STAND UTILIZATION

PURPOSE:

Track variance from the approved Forest Management Plan (FMP) SHS as well as total area harvested in order to:

- ensure a sustainable harvest level and future forest objectives are maintained through operations adhering to the FMP;
- improve information for the next FMP (e.g., landbase, yields);
- make decisions around FHP Acceptance.

DISCUSSION

The *Alberta Forest Management Planning Standard, Annex 1, Section 6.0 Harvest Planning Standards* indicates scheduling of stands through the FMP - SHS is dependent upon the timber merchantability criteria allocated in the disposition holder's tenure document (e.g., FMA, quota certificate) and the management assumptions used in the timber supply analysis (TSA). Pertinent assumptions are comprised of deletions from the net landbase (e.g., subjective deletions, stream buffers, protected areas) and parameters that determine a stand's eligibility for harvest (e.g. earliest age of harvest). The SHS results from the analysis of these TSA inputs coupled with basic field reconnaissance. The SHS identifies spatially (subunit and location) and temporally (period) the queue of stands that will produce the sustainable timber harvest level (AAC) and desired future forest condition.

Adhering to the SHS is imperative to achieving the timber supply forecasts and the forest conditions expected. With increased levels of variance from the SHS, there is greater risk that the operational harvesting will not allow the FMP to realize its objectives and forecasted outcomes. Operational variance is unavoidable but must be effectively managed.

During the FHP planning process, an operator will select an area over which to plan a series of harvest areas (blocks) for a period of up to 5 years. This is considered the FHP planning unit and is typically smaller than an FMA defined compartment or subunit. Within the FHP planning unit, the operator will address all the 1-10 year SHS assigned to that operator, deciding on either a harvest prescription, or a decision to not harvest at all (deletion) to delay harvest outside the first 10 year period (deferral) or to delay harvest till later in the first period (bypassed stand). Where deletions, deferrals, or bypassed stands consist of entire AVI polygons, specific justification is required.

Variance shall be monitored and reported where:

- 1) **Merchantable Stands** scheduled in the first decade of the SHS are not harvested in that decade; and

- 2) **Special Features** not identified in the FMP net landbase are encountered during layout or harvesting and are deleted from the SHS.

Timber Harvest Planning and Operating Ground Rules require timber operators to protect special features through detailed harvest planning and careful operations. (e.g. riparian buffers, steep slopes, sensitive sites, cultural/heritage sites, areas with high aesthetic value shall be removed from the SHS.)

Disposition holders shall complete Table 1 as they monitor the operational implementation of their plans against the SHS.

Definitions:

Additions – Any area planned for harvest, or which has been harvested that is not part of the 10 year SHS in the approved FMP. Additions will be divided into two categories: substantial and slivers.

Actual Harvested Area is the as-built harvested area in the FHP.

Approved FMP 10 Year SHS – Is the total SHS area within the compartment for the first 10 years of the approved Spatial Harvest Sequence.

Deferral – any area included in the 10-year SHS that will not be harvested during the current FMP. Deferrals are not removed from the contributing landbase, as there is an expectation they will be harvested later in a future FMP. Deferrals will be divided into two categories: Substantial or Slivers. Deferrals are those stands or portions of which are operable, not isolated, and should be available under current technological and economic constraints for future harvest.

Deletion - Any area included in the 10-Year SHS that will never be harvested under current planning assumptions and technical constraints. This area shall be tracked spatially and removed from the contributing landbase in the subsequent FMP. Deletions are divided into two categories: Substantial or slivers.

Planned Area For Harvest - Is the total area of the SHS laid out in the FHP, and includes the information for all previously approved FHPs (either planned or as-built) information for the same compartment.

Provincial Base 10 Yield Stratum- One of ten Alberta yield stratum defined in the yield projection Interpretive Bulletin in the Alberta Forest Management Planning Standard (AFMPS)

Slivers- any polygon component of variance (addition, deferral or deletion) less than 2ha in size. Generally these are long, narrow features along the edge of a block. Slivers exclude stand-alone features (blocks not bordering or not being adjacent to SHS polygons). Slivers do not contribute to variance calculations but shall be tracked and reported separately. Sliver deletions and sliver deferrals can be aggregated together (e.g. Sliver Deletions & Deferrals)

Subunit or Compartment - Operational subunits of an FMU delineated by environmental, operational or watershed characteristics.

FHP Planning Unit: Operational subunit of an FMU, delineated by environmental, operational, or watershed characteristics. An FHP is the operational plan for a planning unit, and may be a compartment, sub-unit or an area of a smaller scale. FHP Planning units are discrete, and FHPs for the same operator cannot overlap spatially with the exception of access routes.

Substantial- any polygon component of variance (addition, deferral or deletion) other than Slivers

Variance – any deviation from the 10-year Spatial Harvest Sequence (SHS) in the approved Detailed Forest Management Plan (DFMP). Variance is classified into one of these three categories: Additions, Deletions or Deferrals.

GROUND RULES

- 4.1.1 Companies shall submit a map to show the comparison of the SHS to the laid out FHP highlighting all substantial deletions, deferrals, and additions.
- 4.1.2 Variance shall be reported by stratum/compartments for each FHP/GDP. The table shall include the minimum information as per Table 1.
- 4.1.3 Total FHP/GDP variance shall be calculated using the following:

$$\text{SHS Variance (Additions \%)} = \frac{\text{Area of Substantial Additions}}{\text{Area of Approved 10 yr SHS}} \times 100$$

A FHP will be appraised when FHP variance exceeds 20%.

- 4.1.4 Area of Substantial Additions shall not exceed the sum of Area in Substantial Deletion and Substantial Deferrals.
- 4.1.5 Variance from the SHS shall be monitored and reported by subunit or compartment. The cumulative variance for all FHPs shall be reported by subunit and reported annually in the GDP (or as-built report). The table shall include updated information as per Table 1. Where the planned compartment variance by decade is greater than 20%, Alberta will assess the need for a CA per section 3.2.
- 4.1.6 Additions shall be monitored annually and summarized by stratum/compartments and reported as per the table above. Stands currently not part of the net landbase that are found to be productive merchantable landbase may be considered for addition with Alberta's approval (non-contributing landbase).
- 4.1.7 Justification shall be provided in the FHP (block comments) in the following instances:
- i. entire deleted or deferred stands;
 - ii. entire stand additions (adjacent to planned SHS blocks) from outside the 11-20 yr. SHS;
 - iii. entire and partial stand additions (not adjacent to planned SHS blocks) from outside the 11-20 yr. SHS.

4.2 TREE UTILIZATION

PURPOSE

To utilize all merchantable trees and pieces in a merchantable stand as defined by the timber disposition and the FMP.

DISCUSSION

Tree utilization assumptions in the FMP must be followed so that sustainability is not affected.

GROUND RULES

- 4.2.1 The tree/piece utilization standards are stated in the applicable timber disposition and shall normally be one of the following standards.

Coniferous Utilization Standards

15/11 Utilization

- **Merchantable Tree:** one that has a minimum diameter of 15 cm outside bark at stump height (30 cm) and a usable length of 4.88 m to a 11 cm top diameter (inside bark).
- **Merchantable Piece:** one that is 2.44 m (plus 5 cm trim allowance) or longer, with an 11 cm (inside bark) small end, where rot content or form does not render it unusable.

Deciduous Utilization Standards

15/10 Utilization

- **Merchantable Tree:** one that has a minimum stump diameter of 15 cm outside bark and a merchantable length of 4.88 m or greater to a 10 cm top diameter (inside bark), or to the point where the stem is unusable or there is no central stem due to heavy branching.
- **Merchantable Piece:** one that is 2.44 m or longer to a 10 cm (inside bark) small end, where rot content or form does not render it unusable.

Salvage Operations

19/13 Utilization

- This standard may be adopted by Alberta to encourage recovery of timber damaged by fire, blowdown, or insects and diseases in coniferous and deciduous stands.
- **Merchantable Tree:** one with a minimum diameter of 19 cm outside bark at stump height (30 cm) and a merchantable length of 5.0 m or greater to a 13 cm top diameter (inside bark).
- **Merchantable Piece:** one that is 2.44 m (plus 5 cm trim allowance) or longer, to a 13 cm (inside bark) small end, where rot content or form does not render it unusable.

- 4.2.2 Coniferous and deciduous log butts or large ends exhibiting advanced decay greater than 50% in area of the cut surface (basal area) may be bucked at 0.61 m intervals or less to 50% sound wood.

- 4.2.3 Maximum stump height when measured from ground level shall be no more than 30 cm or that used in the timber supply analysis for the FMP (e.g., 15 cm). Exceptions may be approved in the FHP (e.g., to delineate harvest areas, create rub posts for

understory protection). Where stumps are left to delineate areas (e.g., harvest areas, create rub posts for understorey protection, or to delineate poorly defined watercourses) they shall be approximately 30 m apart and no higher than 2 m.

- 4.2.4 As per the Debris Management and Structure Retention ground rules, forest operators are permitted to leave merchantable volume in harvest areas if the approved FMP identifies specific stand structure retention strategies. In the absence of FMP guidance, the standards in section 7.4 apply.
- 4.2.5 All trees/pieces used in the construction of crossing structures may be scattered or piled along the ROW or in the harvest area, but they shall not be piled in riparian areas, natural meadows, or non - forested rangeland areas unless otherwise approved by Alberta.
- 4.2.6 The timber operator shall not be required to manufacture an unmerchantable tree. See the stump end of the tree for a buncher cut or a processor cut to determine if the piece is a merchantable piece or an unmerchantable tree.
- 4.2.7 Company processing practices cannot make an unmerchantable piece from a merchantable tree or merchantable piece.

5.0 INTEGRATION WITH OTHER USERS

5.1 INTEGRATION WITH FOREST OPERATORS

PURPOSE

To ensure that planning, harvesting and reforestation in overlapping dispositions are carried out efficiently and with a minimum of environmental impact.

DISCUSSION

Due to overlapping tenures, integration of activities between the various operators is essential. Alberta monitors the integration of roads and harvesting, but the responsibility for co-ordinating plans and operations lies with the operators.

Integration of activities is necessary to:

- a) reduce the amount of time roads are open;
- b) reduce disturbance of wildlife;
- c) enable prompt reforestation.

GROUND RULES

- 5.1.1 All operators with timber dispositions in an area covered by an FHP/GDP must agree to the FHP and GDP before approval is granted. If agreement cannot be reached after all meaningful consultation has taken place, the following dispute resolution process can be implemented. Areas of disagreement will be documented and forwarded to the Senior Area Forester for review with the reviewing Forester. Depending on the exact nature of the disagreement, Alberta will either: 1) facilitate a dispute resolution process; or 2) direct the operators on areas of disagreement through conditions of approval. If either proponent disagrees with the determination of the Senior Area Forester, they may appeal the decision to the Program Manager.

- 5.1.2 All roading, harvesting and silviculture operations shall be completed at a time and in a manner that enables effective reforestation and minimizes road access.**
- 5.1.3 SLS shall follow their referral process with the energy sector to minimize the industrial footprint.**

5.2 FOREST RECREATION AND TOURISM

PURPOSE

To manage the implications of forest management activities on forest recreation.

DISCUSSION

Potential exists for increased public awareness and for increased recreational opportunities through co-ordination with forest management practices. Alberta and the company may explore opportunities to upgrade or relocate existing trails through normal timber operations.

Within C05, some areas adjacent to designated random recreation sites have not been included in the net landbase and therefore are not part of the SHS.

Many methods of engaging the public during the forest planning process are used by forest operators. For information on Spray Lake Sawmills public consultation process see their website. www.Spraylakesawmills.com.

GROUND RULES

- 5.2.1 Operational tactics to mitigate impacts on recreation and tourism shall be described in the GDP and FHP. This may include reclamation/restoration of non-designated trails.**
- 5.2.2 The forest operator shall work with groups that have raised concerns with the operator or have been identified by Alberta. When requested, the company shall provide a summary of stakeholder contact.**
- 5.2.3 Operators shall restore designated recreational trails and their associated watercourse crossings that are affected by their operations.**
- 5.2.4 Once planting activity is complete, the company shall reclaim AOP roads (reclamation will not allow for future quad access even for the company). This may be waived where the company and Alberta ensure the trail system is sustainable.**
- 5.2.5 Alberta will provide the location of designated random camping areas to the company where recreational opportunities are limited. These shall be recognized in the FHP.**
- 5.2.6 As per the SLS FMP, the company shall meet with Alberta on an annual basis to review FHP submissions. This meeting will include a review of aesthetics, recreational values for the area and mitigation measures.**

5.3 TRAPPING

PURPOSE

To avoid damage to the infrastructure associated with Registered Fur Management Areas (RFMA) and to reduce the impact on trapping opportunities.

DISCUSSION

Communication with the owner and/or operator of a trapline is a key element in minimizing the impact of timber operations. Discussions held early in the planning process allow both the trapper and the forest operator to work co-operatively, with the least amount of disruption to their individual operations.

To facilitate communication between forest operators and trappers, Fish and Wildlife shall annually update the list of RFMAs and owners. Upon request the local Fish and Wildlife office shall provide the relevant list of trappers to the forest operators before January 1 of each year.

GROUND RULES

- 5.3.1 A representative of the forest operator shall personally contact, or send a registered letter to the senior partners of a RFMA during the preparation of the GDP and FHP. Information such as cabin locations, trails and other improvements, or concerns shall be noted at this stage. During the development of the FHP information and concerns shall be integrated into the plan. The forest operator shall provide the trapper the opportunity to review the approved FHP map.**
- 5.3.2 At least ten days prior to commencing operations, the forest operator shall notify the senior trapline holder, preferably by personal contact that timber operations are beginning in the RFMA.**

5.4 RANGELAND RESOURCES

PURPOSE

To integrate forest and range management operations.

DISCUSSION

The goal is to develop a co-operative, long-term relationship between grazing disposition holders and forest operators to sustain fibre and forage resources.

At the GDP, FHP and AOP stages of planning, the emphasis is to integrate harvesting, silviculture, and grazing schedules to ensure the sustainability of timber, forage, wildlife and watershed values (i.e., wildlife habitat, watershed protection). Specific harvesting and reforestation operations and grazing systems would be identified within components of the AOP.

Effective communication between the timber and grazing operators is necessary. Discussions held early in the planning process are intended to enable the grazing disposition holder and the forest operator to work co-operatively minimizing the disruption to their individual operations. Directive SD 2011-03 or successors, integration of grazing and timber activities will provide direction to guide the overlapping operations of grazing and timber disposition holders.

GROUND RULES

- 5.4.1 The forest operator shall conduct all operations in accordance with the **Grazing Timber Integration Manual and Directive SD 2011-03**.
- 5.4.2 Natural meadows and other non-forested rangeland areas > .4 ha not identified by AVI but discovered during operations, shall be treated according to 5.4.1 and Appendix 7 - External Information Letter 2010-02 Fescue Grassland Information Letter – Principles for Minimizing Surface Disturbance.
- 5.4.3 The company shall not perform any Silviculture treatments on natural meadows and other non-forested rangeland areas occurring within cutblocks unless otherwise approved by Alberta. High stumps (<1 m) or structure retention can be retained around the meadow to identify them.
- 5.4.4 The company shall not deck timber within natural meadows or other non-forested rangeland areas, unless otherwise approved by Alberta.

5.5 FOREST AESTHETICS

PURPOSE

To manage the visual impact of timber operations on the forest landscape.

DISCUSSION

The objective is to mitigate the impact of timber operations on the visual quality of the forest landscape by:

- identifying the location of forest landscapes and other areas of high visual and scenic value, and setting objectives for their management;
- addressing visual quality issues in the FMP.

Areas considered highly sensitive are those:

- a) within, adjacent to or viewed from recreational sites and tourist developments;
- b) seen from elevated viewpoints;
- c) adjacent to or viewed from major travel corridors (roads, lakes and rivers), rural/urban forest interface and site-specific areas identified during the referral and public review process;
- d) adjacent to primary and secondary highways in Alberta.

Tactics to reduce the impacts of timber harvest and reforestation on visual quality may include: partial or selection cutting, retention of forest structure and lesser vegetation or large patches of structure retention deferred for future harvest, at strategic vantage points in the harvest area, modification of harvest area design, low impact scarification techniques, vegetative buffers, and utilizing natural topography.

GROUND RULE

- 5.5.1 Highly sensitive areas shall be assessed and tactics shall be employed in the FHP to mitigate the impacts of harvesting and reforestation on visual quality.

5.5.2 The potential visual impact of harvesting and reforestation activities within harvest areas located in highly sensitive areas shall be considered during harvest planning and operations. Visual management practices shall be incorporated into the FHP to temper adverse visual impacts. This includes:

- **detailed block plans addressing block boundaries and road locations for areas rated high;**
- **areas rated high require a more detailed analysis of aesthetics prior to harvest design;**
- **areas rated medium will be investigated further with stakeholder involvement;**
- **areas rated low are treated as normal unless specifically identified by stakeholders.**

5.6 HISTORICAL RESOURCES

PURPOSE

To ensure that forest operators identify and protect historical and cultural resources.

DISCUSSION

There are many thousands of historical resources (e.g., archaeological and paleontological sites) located on Alberta's Crown land. In keeping with the requirements of Alberta Culture and Tourism, forest operators shall develop and implement a process for identifying and protecting resources that are regulated by the Historical Resources Act.

GROUND RULES

- 5.6.1 Historical resource records are confidential and shall not be shared with the public.**
- 5.6.2 If a previously unknown historical resource is discovered during road building, harvesting, or silviculture operations, the operations that may directly affect the historical resource shall cease and Alberta Culture and Tourism shall be notified.**

6.0 WATERSHED PROTECTION

PURPOSE

To manage the implications of timber operations on water quality, quantity, and flow regime by:

- minimizing the potential for sedimentation in watercourses;
- preventing soil, logging debris and deleterious substances from entering watercourses;
- maintaining aquatic and terrestrial habitat;
- complying with the Water Act.

DISCUSSION

The FMP shall address watershed water quantity and flow issues. Ground rules define operating practices to protect water quality and riparian values.

Riparian areas adjacent to watercourses and water source areas perform a number of ecological functions. Riparian areas help to regulate stream flows (storage and release of surface and groundwater), reduce sheet, rill and gully erosion, and moderate stream temperature. Functional riparian areas provide bank stability, debris for creating aquatic habitats and provide a source of food and nutrients for aquatic organisms. Riparian areas also provide habitats supporting a high diversity of wildlife species and other terrestrial biota, and provide corridors that can link different landscape and habitat features.

Authorizations by Alberta do not imply authorization under federal legislation and requirements, notably the federal Fisheries Act. The proponent must seek advice and approvals of the federal agencies (Department of Fisheries and Oceans) regarding federal legislation requirements.

GROUND RULES

- 6.0.1 Watercourses shall be classified according to Table 2, Watercourse Classification. In the event the channel classification is not distinctly evident, the width shall be determined by the average of measurements taken at 50 m intervals at representative points of undisturbed stream channel over the length of the watercourse bordering the block.**
- **a minimum of four measurements are required with the measurement location flagged for audit purposes;**
 - **the channel width is the horizontal width of the channel between high-water marks (mean or annual), or the rooted vegetation on the banks, measured at right angles to the direction of flow. Multiple unvegetated channel widths are summed to represent total channel width;**
 - **where the distance bordering the block is not enough for four measurements reduce the measurement interval as required.**
- 6.0.2 Where an approved FMP does not provide an estimate of increased water yield, the following applies.**
- 6.0.2.1 Watersheds shall not be unduly affected by large harvest areas or harvesting large amounts of timber in a watershed unless otherwise approved in the FMP. Predicted average annual water yield increases should not exceed 15% within third-order streams. Companies will report the predicted increase in water yield annually in a mutually agreeable format.**

- 6.0.3** Measures must be implemented, including temporary and permanent erosion control measures, to minimize erosion and sedimentation into the watercourse or waterbody.
- 6.0.4** Riparian protection areas shall be established as in Table 3, Standards and Guidelines for Operating beside Watercourses. Where uncertainty exists on the classification of the watercourse, the watercourse protection area shall be that required by the higher class of watercourse.
- 6.0.5** All unmapped or incorrectly classified watercourses encountered during operations shall be given the appropriate protection as described in Table 3.
- 6.0.6** Unless otherwise approved in a FMP, proposed amendments to the standards in Table 3 must provide rationale that aquatic and terrestrial objectives are met. Any such proposals shall undergo a full review by Alberta as a component of the FHP review.
- 6.0.7** Sediment, logging debris or deleterious materials (e.g., fuels, oils, greases, industrial or household chemicals or refuse) shall not be deposited into the water or onto the ice of any watercourse or water body during road construction, maintenance, harvesting, reclamation, or silviculture operations.
- 6.0.8** Equipment shall cross watercourses only at approved crossings.
- 6.0.9** Unless approved by Alberta, logs shall not be decked in watercourses, riparian areas, or seepage areas.
- 6.0.10** Authorized in-stream activities in fish-bearing watercourses shall be scheduled to avoid disturbing migration, spawning and incubation of fish species, and carried out in such a manner as to avoid stream sedimentation.
- 6.0.11** Beaver ponds shall have the same classification as the watercourse flowing out of the pond as measured at a representative width within 50 m of the dam.
- 6.0.12** Harvesting is not permitted within water source areas during non-frozen periods.
- 6.0.13** Channels on slopes greater than 20% which only flow during runoff events shall be protected as intermittent watercourses as per Table 3.

Table 2. Watercourse Classification

Watercourse Classification					
Classification	Physical Description	Portion of Year Water Flows	Channel Width for Classification	Fisheries/Wildlife Values	Potential Impacts
Class “A” Waterbodies	Not applicable	Not applicable	Not applicable	Known habitats critical to the continued viability of locally or regionally important fish species; Habitat areas are sensitive enough to be damaged by any type of in-stream activity or changes to water quality or flow regime.	Fish and fish habitat affected by sediment load, turbidity, disposition of sediment, chemical contamination or alteration of stream flow
Class “B” Waterbodies	Not applicable	Not applicable	Not applicable	Key broadly distributed habitat areas important to the continued viability of a population of locally or regionally important fish species; Habitat areas are sensitive enough to be potentially damaged by in-stream activities; Potential short and long-term effects of in-stream activities considered to have detrimental effects on, and are high risk to, the survival of fish populations.	Fish and fish habitat affected by sediment load, turbidity, disposition of sediment, chemical contamination or alteration of stream flow
Large Permanent	Major streams or rivers; Well-defined flood plains; Often wide valley bottoms.	All year	Non-vegetated channel width > 5 m	Resident and migratory fish populations; Important over wintering, feeding and rearing habitat; Important wildlife feeding/travel corridors.	Water quality often reflects all upstream land use impacts and natural processes; Primarily sedimentation of stream channels; Loss of wildlife habitat, restriction of movement.
Small Permanent	Permanent streams; Often small valley bottoms; Bench floodplain development. Banks and Channel well defined.	All year but may freeze completely in the winter or dry up during periods of drought.	1 meter to < 5 meters	Significant insect populations; Important spawning and rearing habitat; Resident and migratory fish populations; Over wintering for non-migratory species; Important wildlife feeding/travel corridors.	Primarily sedimentation of stream channels; Water quality and water yield; Fish population sensitive to siltation; Loss of stream bank fish habitat; Loss of wildlife habitat, restriction of movement.
Transitional	Often small valley bottoms; Bench floodplain development.	All year but may freeze completely in the winter or dry up seasonally or during periods of drought.	0.5 meters to < 1 meter	Significant insect populations; Important spawning and rearing habitat; Resident and migratory fish populations; Over wintering for non-migratory species; Important wildlife feeding/travel corridors.	Primarily sedimentation of stream channels; Water quality and water yield; Fish population sensitive to siltation; Loss of stream bank fish habitat; Loss of wildlife habitat, restriction of movement.

Continued...

Table 2. Watercourse Classification

Watercourse Classification					
Classification	Physical Description	Portion of Year Water Flows	Channel Width for Classification	Fisheries/Wildlife Values	Potential Impacts
Intermittent	Small stream channels Small springs are main source outside periods of spring runoff and heavy rainfall. Distinct channel development. Channel usually has no terrestrial vegetation; Usually some bank development.	During the wet season or storms Dries up seasonally and during drought	< .5 meters	Food production areas; Potential spawning for spring spawning species; Drift invertebrate populations in pools and riffles; Spring fed areas may provide spawning potential for fall spawning species.	Sedimentation from bank and streambed damage will damage fish spawning and invertebrate habitat as well as downstream fish habitat; Water quality and water yield.
Ephemeral	Often a vegetated draw connected to a higher order watercourse.	Flows only during or immediately after rainfall or snowmelt	Little or no channel development; Flow area is usually vegetated.	Siltation may impact fish habitat downstream.	Sedimentation downstream due to ground disturbance.
Water-Source Areas	Areas with saturated soils, surface flow or seepages contributing directly to stream flow	All year May or may not freeze in winter	No channel development, but may be pronounced vegetation changes.	Year-round springs provide potential value to fall spawning fish; Potential high-use areas terrestrial wildlife.	Disturbance may cause downstream sedimentation; Interruption of winter flow may disrupt fish egg incubation; Loss of mineral licks.
Lakes	Large water collection areas permanently filled with water	Normally frozen in winter	Shorelines defined by absence of permanent terrestrial vegetation.	Important fish-bearing habitat; Important bird nesting/rearing areas.	Aesthetic values may be disrupted; Potential for wildlife disturbance; Local sedimentation.
Oxbow Lakes	Large water collection area formed when oxbow cut off from main river channel Often vegetated	Normally frozen in winter	N/A	Important habitat for ungulates.	Thermal cover/grazing areas.

Table 3. Standards and Guidelines for Operating Beside Watercourses

Watercourse Classification	Roads, Landings, and Bared Areas ¹	Watercourse Protection Areas	Operating Conditions Within Riparian Areas and Water Source Areas Where Operations are Approved	
			Tree Felling	Equipment Operation
Class “A” Waterbodies	Not permitted within 100 m of high water mark of mapped Class “A” watercourse unless approved by Alberta. Any existing roads may be maintained at present classification standards. Any proposed watercourse crossings within 2 km upstream of mapped Class “A” watercourse must be identified in the FHP and approved in the AOP.	No disturbance or removal of timber within 100 m of the high water mark unless approved by Alberta; No duff disturbance of intermittent (min 10 m vegetated buffer) or ephemeral drainages (minimum 5 m vegetated buffer) within 2 km upstream of Class A waterbody.	Not permitted without specific Alberta approval.	Not allowed without specific Alberta approval.
Class “B” Waterbodies	Not permitted within 60 m of high water mark of mapped Class “B” watercourse unless approved by Alberta. Any existing roads may be maintained at present classification standards. Any watercourse crossings within 500 m upstream of mapped Class “B” watercourse must be identified in the FHP and approved in the AOP.	No disturbance or removal of timber within the appropriate riparian area specified by stream type unless specifically approved in the AOP; No duff disturbance of intermittent (minimum 10 m vegetated buffer) or ephemeral drainages (minimum 5 m vegetated buffer) within 500 m upstream of Class B waterbody.	Trees shall be felled so that they do not enter watercourse. Should slash or debris enter the watercourse immediate removal is required without a machine entering the watercourse.	Where removal of timber within 60 m is approved, no machinery is permitted within 30 m of the high water mark.
Large Permanent	Not permitted within 100 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	No disturbance or removal of timber within 60 m of high water mark unless specifically approved in the AOP. No removal of timber shall be approved within 10 m of the high water mark; Watercourses with deeply incised unvegetated banks shall have the buffer start from the top of the incised valley and not the high water mark.	Trees shall be felled so that they do not enter watercourse. Should slash or debris enter the watercourse immediate removal is required without a machine entering the watercourse.	Where removal of timber within 60 m is approved, no machinery is permitted within 20 m of the high water mark;
Small Permanent	Not permitted within 30 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	No disturbance or removal of timber within 30 m of high water mark unless specifically approved in the AOP. No removal of timber shall be approved within 10 m of the high water mark; Watercourses with deeply incised unvegetated banks require discussion prior to submission of the FHP to determine appropriate protection requirements.	Trees shall be felled so that they do not enter watercourse. Should slash or debris enter the watercourse immediate removal is required without a machine entering the watercourse.	Where removal of timber within 30 m is approved, no machinery is permitted within 20 m of the high water mark.

Continued...

Table 3. Standards and Guidelines for Operating Beside Watercourses

Watercourse Classification	Roads, Landings, and Bared Areas ¹	Watercourse Protection Areas	Operating Conditions Within Riparian Areas and Water Source Areas Where Operations are Approved	
			Tree Felling	Equipment Operation
Transitional	Not permitted within 30 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	No disturbance or removal of timber within 10 m from the high water mark or to the top of the break in slope where the break occurs within 15 m.	Trees shall be felled so that they do not enter watercourse. Should slash or debris enter the watercourse immediate removal is required without a machine entering the watercourse.	Heavy equipment may operate within 20 m only during frozen or dry periods. No skidding through watercourse except on snow/ice bridge or logfill. Crossings must be planned with adequate crossings to be removed on completion of operations. Where fish and spawning movements have been identified, special crossings that do not obstruct upstream fish passage or cause stream siltation may be required.
Intermittent	Not permitted within 30 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	Buffer of brush and lesser vegetation to be left undisturbed along the channel. Width of buffer shall vary according to soils, topographical breaks, water source areas and fisheries values.	Trees shall be felled so they do not enter watercourses, unless otherwise approved by Alberta. Should slash or debris enter the watercourse, immediate removal is required without the machine entering the watercourse.	Heavy equipment may operate within 20 m only during frozen or dry periods. No skidding through watercourse except on snow/ice bridge or logfill. Crossings must be planned with adequate crossings to be removed on completion of operations. Where fish and spawning movements have been identified, special crossings that do not obstruct upstream fish passage or cause stream siltation may be required.
Ephemeral	Construction not permitted within a watercourse or water source area.	Buffer of undisturbed vegetation in wet gullies, Class "A" and "B" waterbody tributaries to be left undisturbed.	Accumulations of slash and debris to be removed progressively	Skidding shall only be during dry or frozen conditions. Temporary crossings to be removed on completion of operations. On Class "A" and "B" waterbody tributaries, special crossing structures that do not cause stream siltation may be required.
Lakes (little or no recreation, waterfowl or sportfish potential)	Not permitted within 100 m of high water mark unless specifically approved in the AOP.	On lakes exceeding 4 ha in area, no disturbance of timber within 100 m of high water mark except where specifically approved in FHP. Where approval is granted to remove timber within the 100 m zone, no timber shall be removed within 30 m of the high water mark.	Trees shall be felled so they do not enter watercourses, unless otherwise approved by Alberta. Should slash or debris enter the watercourse, immediate removal is required without the machine entering the watercourse	If timber removal is approved, no machinery to operate within 40 m of the high water mark.

Table 3. Standards and Guidelines for Operating Beside Watercourses

Watercourse Classification	Roads, Landings, and Bared Areas ¹	Watercourse Protection Areas	Operating Conditions Within Riparian Areas and Water Source Areas Where Operations are Approved	
			Tree Felling	Equipment Operation
Lakes (with recreational, waterfowl or sport fish potential)	For shorelines not located within reserved areas, no disturbances shall be permitted within 200 m of the high water mark unless specifically approved in the AOP.	On lakes exceeding 4 ha in area, no disturbance or removal of timber within 100 m of the high-water mark. Alberta may require additional protection in the FHP; On lakes less than 4 ha, removal of timber prohibited within 30 m of the high-water mark and any removal within 100 m requires Alberta's approval.	Trees shall be felled so they do not enter the waterbody, unless otherwise approved. Should slash or debris enter the watercourse, immediate removal is required without the machine entering the watercourse.	Consideration must be given to aesthetics when harvesting adjacent to lakes with recreational potential.
Water Source Areas and Areas Subject to Normal Seasonal Flooding	Construction not permitted unless approved in the AOP; No log decks permitted; The number of stream crossings must be minimized; No disturbance of organic duff layers or removal of lesser vegetation.	Treed riparian management zone of at least 20 m on all water source areas; No harvest of merchantable trees or disturbances of lesser vegetation unless specifically approved in the AOP; Buffer width may be altered according to its potential to produce surface water, provided it is approved in the AOP	Heavy machinery not permitted with in water source areas during unfrozen soil conditions. Minimal disturbance or removal of duff or lesser vegetation. Timber may be harvested if stream sedimentation is the only resource concern, provided there is no disturbance of the organic soils and lesser vegetation when harvesting the trees. On unstable areas subject to blowdown, merchantable trees shall be carefully harvested from water source areas to minimize root disturbances of duff layers and watercourse damming.	Road construction, timber harvest, reforestation and reclamation shall be done with equipment capable of operating without causing excessive disturbance to the soil layers. Heavy equipment is not permitted during moist or wet soil conditions, but may be operated during frozen periods. No soil caps or depositing of soil permitted on roads in water source areas, unless a separation layer is incorporated or the road is designed to provide adequate surface and sub-surface drainage away from the road bed. Where a separation layer is used, the soil cap shall be removed as operations are completed.
Oxbow Lake	Construction not permitted within 100 m of oxbow lake unless specifically approved in the FHP.	The buffer shall encompass the area from the high water mark of the main watercourse to 20 m beyond the high water mark of the oxbow lake. Oxbow lakes outside the buffer of the main watercourse shall be treated as watersource areas.	Heavy equipment not permitted around oxbow lakes during unfrozen conditions. Trees shall be felled so they do not enter the waterbody, unless otherwise approved. Should slash or debris enter the watercourse, immediate removal is required without the machine entering the watercourse.	Approved activities shall be done with equipment capable of operating without causing excessive disturbance.

¹Recommended buffers on Class “A” and “B” waterbodies are not a requirement of the Code of Practice for Watercourse Crossings. “Mapped” Class “A” and “B” watercourses refer to maps in Schedule 6 of the Code of Practice for Watercourse Crossings. Definitions of Class “A” and Class “B” as per the Code of Practice are not applicable where the appropriate Water Act exemption applies.

7.0 HABITAT MANAGEMENT

7.1 LANDSCAPE PLANNING AND HARVEST AREA DESIGN

PURPOSE

To implement timber operations in a manner that ensures landscapes maintain biodiversity and ecosystem function.

DISCUSSION

Forest operators are expected to manage the forest cover in a manner that maintains biodiversity and ecological integrity. The SHS approved in the FMP is the mechanism by which the forest cover is managed.

Within landscapes managed for timber production, landscape patterns; cover types; and seral stages can be managed to produce a desired future forest. The coarse filter approach to maintaining biodiversity in managed landscapes involves managing for suitable amounts and patterns of all forest cover types and all seral stages, along with managing for inherent natural spatial and temporal variability.

The variability of natural disturbances shall be considered when planning harvest area size and shape. This variability will help to provide habitat for species that are dependent on natural disturbance regimes. The use of Alberta Vegetation Inventory (AVI) polygon boundaries will help to plan this variability. Use of natural features as harvest area boundaries is consistent with natural disturbance and shall be used whenever possible.

Landscape planning requires that targets be set that are measurable. Targets describe the amount of each landscape element that will be created, maintained, or managed, as well as the spatial and temporal variability (expressed as a range) of each. Creating variability in natural landscapes is important because element amounts vary between landscapes, and the requirements of biota also vary. Targets will be refined over time using analysis based on natural disturbances, natural succession processes, current and historical conditions within the region, sub-region and ecodistrict or ecoregion.

Wildlife species of special management concern are major considerations in the selection of the SHS in the FMP.

Wildlife movement corridors are required to ensure that animals with large home ranges find passage between and within managed landscapes. When planning for wildlife habitat and movement corridors, the following factors shall be considered: watercourse classification/profile/pattern and associated valley definition, timber types and proximity to watercourses, travel corridor width, harvesting method, harvest area shape, continuity of forest cover or adjacency/size of forest patches.

GROUND RULES

If not otherwise addressed in an approved FMP, SHS or structure retention strategy, the following ground rules shall apply:

- 7.1.1 Adjacent watersheds of small permanent watercourses shall have wildlife corridors connecting their uplands (the measurement includes the full regulated watercourse**

buffer width on both sides of the watercourse). This corridor should be focused on natural travel corridors and may contribute towards structure retention targets.

7.2 HARVEST AREA DESIGN AND LAYOUT

PURPOSE

To provide direction for designing harvest areas.

DISCUSSION

Detailed planning of harvest areas must address reforestation, wildlife habitat (e.g., line of site, hiding cover, sensitive sites), watercourse protection, integration with other land uses, understorey protection, structure retention, road development and reclamation, and visual quality.

The following items affect harvest area size and shape:

- current inventory polygon boundaries;
- tree species, age and silvicultural characteristics;
- habitat requirements of species of management concern and species at risk;
- key wildlife zones;
- amount and distribution of non-productive lands and immature treed lands;
- location and size of watercourses and buffers;
- location of roads, pipelines and power lines;
- topographic features;
- presence of viable understorey;
- retention of shrub and tree patches;
- accessibility to all or part of the compartment;
- potential blowdown of peripheral and within-harvest area trees;
- insects and diseases;
- visual sensitivity.

In the absence of a SHS, a preliminary harvest plan will be required in addition to the forest harvest plan.

PRELIMINARY HARVEST PLAN

The primary components of the preliminary harvest plan (PHP) includes a verification of timber merchantability, accessibility, and condition; and outlines a preliminary harvest design showing all existing and proposed harvesting activity within a defined area.

The defined area, which should be consistent with the approved GDP, should also identify and classify all watercourses, critical wildlife habitat, as well as existing trails, seismic, power lines, and access within the planning area.

During the development of the PHP, efforts shall be made by the operator to notify all overlapping disposition holders and stakeholders that may be affected by the proposed development.

GROUND RULES

In the absence of a SHS the following ground rules apply:

- 7.2.1 A preliminary harvest plan (PHP) shall be developed and submitted for approval by Alberta which incorporates a two-pass harvest system, or multiple entry system where agreed to.**

- 7.2.1.1 A PHP shall be completed and approved by Alberta in the absence of a SHS.
- 7.2.1.2 The PHP will verify merchantable and unmerchantable timber types.
- 7.2.1.3 Maps shall accurately show the following information:
- a) the approved forest inventory;
 - b) area (ha) and coniferous and deciduous volume for each proposed harvest and reserve area;
 - c) all proposed roads within the harvest area boundaries;
 - d) current dispositions and reserves (e.g., registered trapline boundaries, permanent sample plot locations);
 - e) watercourses, their classifications and protective buffers;
 - f) the location of all known springs, water source, and seepage areas;
 - g) road corridors and DLO numbers and classes for both existing and proposed roads.;
 - h) planned water course crossing locations;
 - i) current information on previous harvest areas, existing trails, seismic lines, power lines, pipelines and access routes;
 - j) sensitive wildlife areas as per section 7.7.3.11;
 - k) mark known important wildlife sites (e.g., mineral licks, nesting sites, denning and birthing sites) (work with F&W to determine method for identifying these sites);
 - l) proposed integrated harvest areas.
- 7.2.1.4 Road design and location shall be described for all roads joining harvest areas, and DLO roads to be constructed for extraction of timber from all proposed harvest areas. These road comments include the following:
- a) road design and classification;
 - b) choice of corridor location and width;
 - c) considerations made for other road users;
 - d) considerations made for non-timber users;
 - e) integration of existing roads into the design.
- 7.2.1.5 Where two or more overlapping timber dispositions shall be harvested, the respective companies shall cooperatively develop an integrated harvest plan. (see section 5.1.1)
- 7.2.2 Where a two-pass harvest is planned, all timber stands in a timber disposition that currently meet the merchantability standards and are near, at, or older than rotation age shall be included in the harvest design. No more than 50% of the merchantable area shall be in first pass blocks.
- 7.2.2.1 **Pine and Deciduous Harvest Area Sizes:** Harvest areas in deciduous stands or in stands where pine comprises 40% or more of the merchantable timber volume (evenly distributed throughout the harvest area) may be up to 100 hectares in area unless otherwise approved by Alberta, but shall average no more than 60 hectares.
- 7.2.2.2 **Spruce Cutblock Size:** Cutblocks in spruce timber may be clearcut to a maximum area of 24 hectares in patches, or to a maximum area of 32 hectares in strips where no part of the harvest area is further than 150 m from a suitable seed source. When a forest operator with responsibility for reforestation commits, in writing, to treat and plant the harvest area within 24 months of harvesting, the operator may increase the harvest area size to that allowed for pine and deciduous. (see 7.2.2.1)

7.2.2.3 Subsequent-pass harvest areas may be approved for harvest when previously cut harvest areas are reforested to Survey Manual standards or successors, and the following height requirements are met:

- a) Coniferous or deciduous harvest areas: regeneration has reached 30 years old for C05 or 20 years old for the FMA where a two-pass harvest is planned.

7.2.3 Irregular or natural boundaries shall be employed in the FHP harvest area design to minimize line of sight for wildlife or aesthetic purposes. New harvest designs in areas previously harvested shall create natural boundaries.

Ground rules 7.2.4 – 7.2.8 apply to both a spatial and non-spatial harvest plan.

7.2.4 Line of sight shall be minimized where harvest areas are adjacent to accessible permanent Class I, II or III roads. Targets for the limits of line of sight shall be 400 m, but may be exceeded if justified in FHP.

7.2.5 Where roads are adjacent to blocks, roadside lesser vegetation shall be protected where possible in harvest areas to limit the line-of-sight distance across the harvest area, unless otherwise approved by Alberta. To minimize breaks in the vegetation screen, only one road entry point shall be commonly allowed into the harvest area.

7.2.6 Direct distance to wildlife hiding cover should not exceed 200 m.

7.2.7 Alberta permanent sample plots shall not be disturbed or harvested unless such action is approved by Alberta.

In the C05 FMU:

7.2.8 For meadows greater than 5 ha in size, at least 50% of the meadow's lineal edge shall have unharvested leave stands of at least 50 m wide. The unharvested leave stands may be in one continuous patch or in multiple smaller patches that together equal at least 50% of the perimeter. To achieve this, all deciduous shall be left and coniferous shall be deferred until the regeneration bordering the remainder of the meadow is 3 m tall.

- Meadows are defined on Alberta Vegetation Inventory (AVI) as HF (herbaceous - forbs), HG (herbaceous - grassland), SC (shrub closed) or SO (shrub open).
- 50 m is a minimum width, however, the objective is to leave useable wildlife hiding/thermal cover adjacent to the meadow.
- Structure retention should be used to maintain mature forest along portions of these meadows to provide variable habitat.

7.3 DEBRIS MANAGEMENT AND WILDFIRE PROTECTION

PURPOSE

To manage the amount and distribution of woody debris left in harvest areas to:

- minimize wildfire risk, particularly near communities;
- optimize ecological benefits;
- minimize the loss of productive landbase;
- to minimize the risk of wildfires, and to improve fire suppression capability.

DISCUSSION

Debris or slash accumulation resulting from timber harvest operations must, as a priority, be redistributed or disposed of to minimize the risk of wildfire ignition and spread. However, it is recognized that some retention of debris is valuable from an ecological perspective, and that debris retention shall occur to emulate natural forest floor accumulations. Ecological benefits include microtine habitat, furbearer habitat (when piled), and soil nutrient inputs. When debris is maintained, it must be in such a distribution and amount to: 1) minimize wildfire risk as a priority; 2) minimize the amount of productive landbase loss by limiting lost area available for deciduous species suckering, or tree planting; and 3) provide ecological benefit (coarse filter vs. fine filter).

Landscape-level issues regarding the risk of large fires are addressed in the development of the SHS. The FMP shall develop objectives, strategies and tactics that consider the risk of occurrence and spread of fire at the stand and landscape levels.

Opportunities may exist to implement fuel reduction, isolation and conversion on the landscape while accounting for other values. Where applicable, forest operators shall follow the guidelines in the FireSmart Protecting Your Community from Wildfire manual.

Acceptable methods of reducing slash hazards are defined in Alberta policy Debris Disposal Requirement for Logging Operations (see Appendix 2).

C05 FMP

Coarse woody debris (CWD) is defined as wood (logs or pieces) lying at an angle of less than 45 degrees from the ground and with a diameter greater than 7.5 cm. It includes the following:

- clusters of large-diameter downed logs;
- naturally occurring, non-merchantable downed logs scattered through the harvest area;
- small unburned brush piles;
- single green trees that are dying and/or snags subject to blowdown (ultimately becoming CWD);
- other slash.

The amount of dispersed CWD will vary in each harvested area (compartment); however, the Alberta policy document *Debris Management Standards for Timber Harvesting Operations*, dated March 15, 2010 (or its successors) and the *Forest Prairie and Protection Act and Regulations* must be followed.

No wildlife piles are allowed within the 10 km zone of FireSmart plans; Crowsnest Community Zone plan, and Castle Mountain Resort Zone Plan. Strategies for retention/recruitment for CWD outside the 10 km FireSmart zones that should be considered include:

- windthrown trees contribute to CWD; therefore, not all windthrow areas have to be salvaged;
- single tree retention for future recruitment of large piece sizes;
- stump-side processing, tree tops and breakage;
- hazard trees that have to be cut down, should be retained on site;
- piles should contain coarse wood (log diameter greater than 7.5 cm) and limbs.

The operator is responsible for reporting on CWD through the timber and reforestation operations monitoring directive 2006-04 or its replacement.

GROUND RULES

- 7.3.1 Slash accumulations resulting from timber harvesting, road, and campsite construction shall:**
- a) **be disposed of within 24 months; or**
 - b) **be left or spread in a manner that does not inhibit site prep activities or natural seedling development.**
 - c) **be partially disposed of where Alberta determines the dispersed slash has created an unacceptable fire risk. Alberta will provide the company with timely direction on slash disposal.**
- 7.3.2 Slash fuel accumulation is not permitted within 5 m of the perimeter of the harvest area. The bordering undisturbed forest floor shall be used as a benchmark to determine what constitutes a significant accumulation (blowdown event areas would not be considered undisturbed). Unacceptable accumulations include piles of trees or non-merchantable timber, and tops or branches deposited during logging that could create fuel ladders for fire bordering the stand.**
- 7.3.3 Piling and burning operations shall:**
- a) **not be conducted during the fire season, unless otherwise approved in the Forest protection supplement in the AOP;**
 - b) **require a post burning survey to ensure all holdover fires are extinguished.**
- 7.3.4 Leave naturally occurring, non-merchantable wood scattered throughout the harvest area.**
- 7.3.5 The FHP shall comply with direction provided in Community Firesmart Plans.**
- 7.3.6 The forest protection supplement of the AOP shall contain the following:**
- a) **duty Roster;**
 - b) **list of company woodlands personnel and their fire control training;**
 - c) **key company contacts;**
 - d) **heavy equipment resource list;**
 - e) **small hand tool resource list and their location;**
 - f) **company communication system and numbers and call-signs;**
 - g) **fire prevention policies;**
 - h) **fire prevention strategies;**
 - i) **fire prevention priorities (high values at risk);**
 - j) **fire operations schedule (i.e., harvesting and silviculture activities within the fire season);**
 - k) **identification of barriers to fire spread.**

7.4 STRUCTURE RETENTION

PURPOSE

- To create temporary refuges for forest biota to re-colonize harvest areas.**
- To maintain snags and live residual trees in harvested areas for biota that depend on these structures following natural disturbances.**
- To provide wildlife thermal and hiding cover within harvest areas throughout the rotation.**
- To provide wildlife travel corridors within large harvest areas and compartments.**

DISCUSSION

The retention of trees, snags and woody debris in harvest areas is a key component of ecologically based forest management. The retention of structure within harvest sites is intended to provide stand conditions more analogous to those created by natural disturbance events. Single tree retention, tree clumps and snags increase the structural diversity of the regenerating stand, retain some late seral conditions such as a multi-layered canopy, provide a future supply of large snags and downed logs, and increase microsite variability for a more diverse plant understorey. This structural diversity provides habitat opportunities for wildlife species that would not otherwise be available. In addition, retention of structure in a harvest block provides ecological sites from which plant and animal species can disperse onto the surrounding harvest block.

The purpose of these guidelines is to provide strategies and targets on how to create ecological diversity across the landscape and within the harvest blocks. Implementation of these procedures will help to provide many values and ensure ecological diversity and habitat opportunities for all plant and wildlife species.

The placement of stand structure in a harvest block is an art and a science, and it is of primary importance that a wide range of structure remains on the landscape. Uniformity is not desired, and the forest practitioner designing residual structure retention areas must use professional judgment in applying stand structural guidelines.

The following principles will guide implementation of stand level procedures:

- Some form of vertical and horizontal structure will be retained in most harvested areas.
- It is acknowledged that amounts will vary within individual blocks with greater amounts of retention as harvest block size increases.
- Sensitive sites shall be protected.
- Opportunities for both current and short-term wildlife habitat purposes shall be enhanced.
- Loss of nutrients from the forest ecosystem shall be minimized.

Components of Stand Level Retention

- single-tree, small clump (less than 0.01 ha) retention;
- large clump (0.01 or greater up to 15 ha) retention;
- snag retention;
- unique site retention.

Strategies for Single Green Tree and Small Clump Retention

Single green tree retention is defined as single trees or groupings of up to five trees left standing in a harvest area. Small clump retention is defined as small groups of trees covering an area less than 0.01 ha in size, growing together, that are left standing undisturbed in the harvest area.

Good choices for single-tree retention include:

- dying trees that are safe to leave;
- subalpine fir and larch, Douglas fir and all deciduous species;

- wolf trees or trees with heavy branching or poor form;
- wildlife trees (e.g., with nests, cavities);
- single trees located in sensitive sites;
- all Limber pine and Whitebark pine encountered.

Strategies for Large Clump Retention

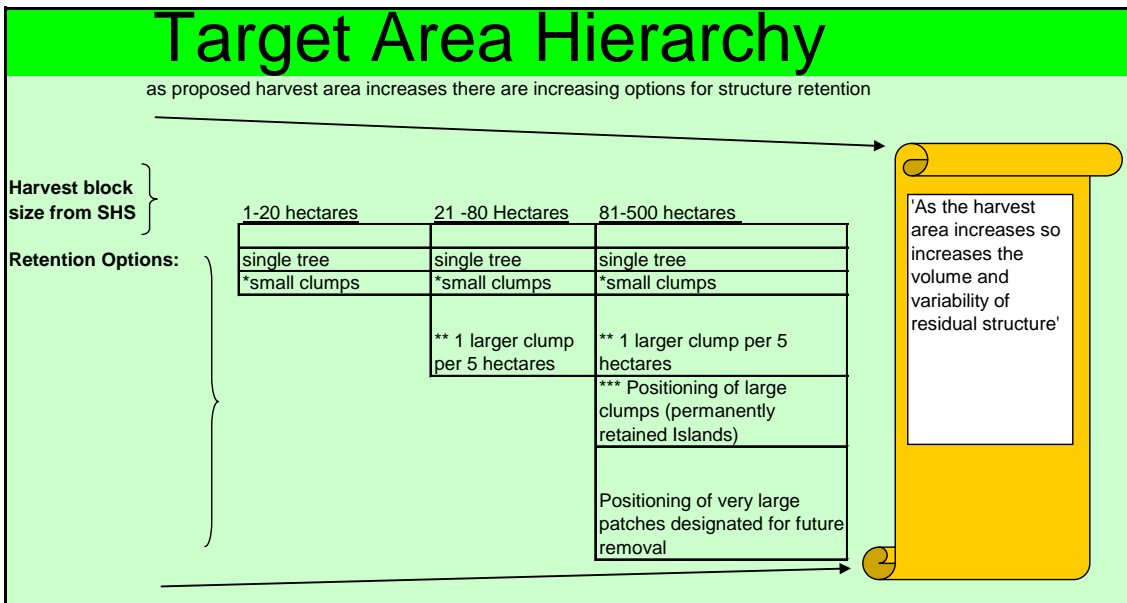
Large clump retention is defined as a group of trees that are left standing in the harvest block, and which take up greater than 0.01 ha (100 m²) of the area of a harvest block. The shape of clump retentions may vary widely.

Trees to consider for retention in large clumps include:

- understory trees that also contain mature merchantable and/or non-merchantable trees;
- merchantable conifer that are windfirm;
- areas containing shrubs, understory or unique sites;
- located around groupings of snags, wolf trees or wildlife trees;
- wet areas (i.e., ephemeral creeks, water source areas, etc.) within the harvest block;
- inoperable areas within the harvest block (e.g., steep slopes pitches, sensitive soils).

General Strategies for Structure Retention

- Retention of clumps (small and large) is preferable to single trees. See C05 table below.
- Stand retention will comprise merchantable stems representing all diameter classes found in the proposed harvest block, as well as non-merchantable standing and downed trees.
- Merchantable trees will be left based on site-specific objectives and general stand strata.
- Retention clumps will vary in size and shape, generally ranging from individual trees to clumps that are several hectares in size. The distribution patterns and size will depend on conditions in each block.
- Try to locate some larger retention clumps within 30-50 m from the edge of the harvest block to allow ease of access for wildlife (e.g. Grizzly Bears).
- Clump placements should represent the variety of topography found in harvest blocks (i.e., clumps need to be placed on flat ground as well as steep terrain).



- * **Small clumps are groups of trees taking up an area of less than 0.01 hectares (i.e. 100m²) and large clumps are groups of trees taking up an area of greater than 0.01 hectares.**
- ** **Large clumps can be located in blocks smaller than 21 hectares recognizing that variability within a range is desired.**
- *** **Large clumps can be positioned together to form permanently retained islands. This combining of clumps process also can apply to harvest blocks smaller than 80 hectares based on local circumstance and the discretion of the forestry practitioner.**

Pure, even-aged, conifer stands present fewer opportunities for leaving structure; however, retention will be designed such that some will be available for harvest in future passes during the rotation period. Blocks larger than 100 ha may be planned to have more than 5% retention where a strategy to return 30-90 years for C05 and no less than 20 years later for the SLS FMA is proposed. Where these stands can be left with minimal volume loss, they should be retained for a minimum of 60 years for C05 and a minimum of 20 years for the SLS FMA to provide mature habitat within a large harvest area. Upon final removal of these retention patches, the target is still to retain 3% in C05 and 1% in the SLS FMA of the standing merchantable trees over the rotation.

Strategies for Snag Retention

Snags are defined as a standing dead tree within the harvested area. The objective is to leave all snags standing recognizing safety considerations. Retention of full height snags within protected clumps is preferred; however, where safety is an issue, and snags are desired, live trees may be “safely topped off” around 6 m to create snags, bird perches and potential cavity nests. The primary target size for topped off trees is in tree diameter classes greater than 35 cm when measured at breast height. Safety is the first priority in determining whether a dead or dying snag should remain standing within a block.

Strategies for protection of Unique Ecological Sites in C05

Unique ecological sites are defined as sites that contain natural features of special value for wildlife and plant species and may include the following:

- Small clumps of old forest remnants from previous fires or old logging, clusters of large-diameter downed logs, small bogs and wetlands, wildlife trees, treed rocky outcrops, sites immediately surrounding dens, hibernacula, mineral licks, Whitebark or Limber pine.

Every effort should be made to identify all unique sites during planning and layout.

Strategies for Retention in Pine Focus Blocks Associated With Mountain Pine Beetle

As a priority, structure retention shall focus on non-pine species.

GROUND RULES

C05 FMU

- 7.4.1 The operator shall retain an average of 3% structure retention by landscape management unit with allowable variance from 0 – 5%.**
- 7.4.2 Blocks with more than 5% retention may include a strategy to return 30-90 years later for the larger patches.**

- 7.4.3 For harvest blocks over 20 ha in size, an average of 1 small clump per hectare and at least 1 additional large retention clump for every 5 ha harvested shall be retained.
- 7.4.4 For stands in the Porcupine Hills, structure retention shall be in accordance with the Porcupine Hills Harvesting and Silviculture Strategies: Minimizing the Risk to Successful Regeneration of Cutovers January 2005. (FMB Document).
- 7.4.5 In pure pine types the following applies:
- retain Douglas fir, Whitebark pine, Limber pine, Alpine fir, Alpine larch or any other species found as single trees or as clumps;
 - retain spruce where sheltered or protected in clumps by other species;
 - remove those merchantable spruce stems standing greater than 9 m in height that are not found within protected clumps;
 - retain all deciduous species;
 - pine as required to meet requirements.

Spray Lake Sawmill FMA

7.4.6 The operator shall retain structure retention as per the following table:

AVI Leading Species	Structural Retention Strategy	
	Block Size < 100 ha	Block Size > 100 ha
Conifer Pine and Spruce	Individual tree and small patch (1% by volume)	Large patch (>4 ha)
Deciduous and Mixed Wood	Deciduous trees and understory conifer	Deciduous trees and understory conifer

The following apply to both C05 FMU and the SLS FMA.

- 7.4.7 Retention clumps will vary in size and shape, generally ranging from individual trees to clumps that are several hectares in size.
- 7.4.8 Forest operators shall retain snags in the following manner:
- retention of full height snags is a priority;
 - leaning snags or trees of non-merchantable species that are greater than 6 m in height that create a safety hazard may be felled to create safe working conditions;
 - snags within 40 m of roads, camps, landings, fence lines, power lines and machine maintenance areas may be felled to create safe working conditions.
- 7.4.9 The following are guidelines for the spatial distribution of structure:
- retain structure near woody debris piles (and vice versa);
 - retain structure near the harvest area boundary to create a gradual ecotone between the harvest area and un-harvested forest;
 - retain structure in patterns and locations that minimize the potential for blowdown;
 - retain structure near ephemeral draws and intermittent streams.

- e) **retain structure around known wildlife features e.g. bear dens, clumps of bear rub trees etc.**

7.5 UNDERSTOREY PROTECTION

PURPOSE

To protect coniferous understorey during timber harvesting and reforestation operations.

DISCUSSION

The main objective of this ground rule is to protect coniferous understoreys (understorey) that will contribute to future forest values. Understorey protection must be practiced in all stand types containing white spruce understorey. Techniques will vary depending on whether the stand is defined as coniferous or deciduous landbase.

Two understorey protection techniques are considered:

- **Avoidance** – Used in deciduous stands, or in coniferous stands with a coniferous understorey, and low density stands and/or highly aggregated (clumped) understorey distribution. Wind buffering tactics and pre-planning not specifically required.
- **Protection** – Used in the coniferous landbase. Wind buffering tactics utilizing structure retention, pre-planned strip harvest/skid trails.

The following factors shall be considered when planning for protection of understoreys:

1. **Landbase Assignment From Approved FMP:** coniferous or deciduous
2. **Understorey Characteristics:** species, density and height, the health and vigour of the understorey, the size and wind permeability of the crown, height-diameter ratio (slenderness coefficient)
3. **Site Conditions:** soil conditions that may limit rooting (e.g., depth to water table), topographic features that may enhance or diminish wind-firmness, adjacent stand features and impacts on understorey wind firmness.

The C05 SHS shall specify stands with understorey sequenced for harvest. Where the understorey contributes to the timber supply, the overstorey has not been sequenced for harvest. The remainder of understorey stands in the C05 timber supply analysis do not contribute to the growing stock.

GROUND RULES

- 7.5.1 **Detail on avoidance techniques shall be described in the FHP.**
- 7.5.2 **Understorey ‘avoidance’ shall be practiced on the entire landbase.**
- 7.5.3 **Understorey discovered in the field, but not previously identified shall be avoided.**

7.6 FISHERIES AND THE AQUATIC ENVIRONMENT

PURPOSE

To conduct timber operations in a manner that shall minimally affect:

- **the health, diversity and natural distribution of aquatic biota;**
- **the quantity and productive capacity of the aquatic environment, including fish habitat; and**
- **fisheries management objectives identified in the FMP**

DISCUSSION

Current provincial and federal legislation require that the aquatic environment and fisheries resources in Alberta must be protected.

Timber operations can directly affect the aquatic environment and fish habitat in a number of ways. Tree removal in riparian areas and along stream banks can alter light intensity, nutrient supply, sediment inputs, water temperatures, stream bank stability and recruitment of large woody debris to the watercourse. Watercourse crossings, if not properly designed, can create physical barriers to the movement of fish and other aquatic biota along watercourses. Roads and ditches can intercept and transport sediments from the upland source to crossing sites where they are deposited in the watercourse. Upland timber harvesting can also affect watershed water yield and flow regimes. These effects can lead to changes in aquatic primary productivity, food-web pathways, aquatic species abundance and distribution, and channel morphology.

The primary strategy for maintenance and protection of the aquatic environment and fish habitat values is to maintain treed buffers along watercourses and water bodies and adopt rigorous watercourse crossing and erosion control measures. Alternate management proposals for riparian areas would be considered to support aquatic environment and fisheries management objectives in the area, where acceptable to Alberta.

Authorizations by Alberta do not imply authorization under federal legislation and requirements, notably the Navigable Waters Protection Act and Federal Fisheries Act. The proponent must seek advice and approvals of the appropriate federal agencies regarding federal legislation requirements.

Additional ground rules for any work carried out in and around watercourses are found in section 11.4 – Watercourse Crossings.

GROUND RULES

- 7.6.1 All waterbodies and permanent watercourses are presumed to be fish bearing or support fish-bearing habitat. However, The company may confirm the distribution of fish and fish habitat within the planning areas by:**
- checking the Fisheries and Wildlife Management Information System (FWMIS), Water Act Codes of Practice and fisheries inventory data, or where no fish data are found see c) below;**
 - conducting new inventories; or**

c) consulting with the appropriate Area Fisheries Management Biologist.

7.6.2 For any activity that disturbs or alters the bed and banks of a fish-bearing waterbody, an assessment of the potential effects on fish and fish habitat must be conducted by an individual with expertise in fisheries and aquatic assessment methods and habitat mitigation measures. For assessment requirements and methods, refer to Schedule 4 of the Code of Practice for Watercourse Crossings

7.7 SPECIES OF SPECIAL MANAGEMENT CONCERN

PURPOSE

To conduct planning and timber operations in a manner that shall:

- **conserve and plan for an agreed upon level of effective habitat for species of special management concern including, grizzly bear, Southern Headwaters at Risk Project (Sharpe species): Wolverine, Harlequin Duck, Long-toed Salamander, Western Toad, Pileated Woodpecker, Clark’s Nutcracker, and others as determined by Alberta from time to time;**
- **maintain effectiveness of wildlife movement corridors;**
- **maintain effective habitats for wintering ungulates adjacent to natural meadows.**

7.7.1 Grizzly Bear

DISCUSSION

The SHS and FMP shall address the harvesting program that is agreed will create the desired future forest, taking into consideration the full range of values including habitat for species of special management concern.

Grizzly bears are classified as a “Threatened” species under the Alberta Wildlife Act and as a species of “Special Concern” under the national COSEWIC system. The Federal Species at Risk Act (SARA) shall apply to grizzly bears in Alberta. A provincial grizzly bear recovery process has been initiated which may have implications for timber harvest in Alberta.

Timber operations in grizzly bear range can affect grizzly bear populations directly or indirectly in three main ways: 1) altering natural and human caused bear mortality rates through the creation and maintenance of open access routes; 2) altering the amount, quality, and effectiveness of grizzly bear habitat; and 3) displacing and causing undue sensory disturbance to individual grizzly bears.

Landscape level planning is necessary to ensure the availability of effective habitat and managing man-caused mortality risk for grizzly bears. The indicators of suitable landscape conditions for grizzly bears are habitat effectiveness, security areas, mortality risk, open route density and habitat connectivity. Specific strategies for landscape planning for grizzly bear shall be agreed upon in the FMP and at the CA level.

Creating and maintaining open access routes have negative effects on grizzly bear populations through increased mortality risk, disturbance and displacement. These negative effects shall be managed by minimizing the amount, tenure and class of new access roads, and by reviewing and acting upon management options (i.e., access management, reclamation strategies for existing routes, avoiding or minimizing access development in critical grizzly bear habitat and by using grizzly bear habitat maps in planning new access).

Landscape fragmentation can threaten the maintenance of large carnivore populations (e.g., grizzly bear, black bear, wolverine, wolf, and cougar). Key habitat patches for large carnivores have been

identified through a modeling process that focuses on grizzly bears. Wildlife corridors that connect these patches have also been identified.

GROUND RULES

7.7.1 Grizzly Bear

The Grizzly Bear Recovery Plan has been approved by Alberta. Strategies from the recovery plan have been implemented provincially through Fish and Wildlife with respect to BearSmart principles. Access management strategies continue to be worked on at the provincial level

Planning

In core and secondary areas, temporary roads used for timber operations are not considered to be open routes if harvest is during the winter months and if effective access control is used during non-frozen conditions. (see 11.5.3 and 11.5.5)

7.7.1.1 Where an approved SHS and FMP strategy is not provided, a CA must be completed that addresses the following issues within identified grizzly bear core/secondary areas:

- a. provide an agreed upon habitat effectiveness (including mortality risk) supply forecast including the amount, type, and spatial arrangement of grizzly habitat (completion of this forecast is subject to more technical direction from Alberta);**
- b. the amount, alignment, standard (road type) and longevity (tenure) of all access roads;**
- c. use of and improvements to existing access roads;**
- d. identification of access control methods, road reclamation plan and schedule, which will also consider options for reforestation of roads. This shall take into account options for existing “traditional” access routes;**
- e. protection of key grizzly bear habitat features (as identified by Alberta and company);**
- f. proposed summer operations.**

7.7.1.2 Companies shall minimize the amount, class, and tenure of roads in identified grizzly bear core and secondary areas.

7.7.1.3 Preference shall be given to development and use of winter (frozen ground) roads since this reduces negative impacts on grizzly bear, permits minimization of long-term infrastructure, and facilities reclamation.

7.7.1.4 Summer roads and crossings should attempt to avoid riparian corridors. Those routes that lie within riparian corridors shall minimize the ROW width and reduce vehicle speeds through construction standards and company operating procedures

7.7.1.5 Roads, skid trails, landings and campsites shall be located where they avoid natural meadows and den locations.

7.7.1.6 New road applications in core and secondary grizzly bear areas shall be planned to include a schedule of reclamation and/or deactivation to minimize the establishment of long-term permanent access.

- 7.7.1.7 Structure retention shall be used to protect areas of concentrated grizzly bear rub trees. F&W will provide the location of these to forest operators.**
- 7.7.1.8 Retention areas should be used in harvest areas to provide hiding cover and connectivity to forest patches.(see Section 7.4)**
- 7.7.1.9 Except where identified and agreed upon within the FHP, only temporary roads (classified as closed to the public) shall be constructed.**
- 7.7.1.10 Where required by Alberta, effective forms of public access control for highway vehicles shall be maintained. Control of highway vehicle use of any open temporary or permanent access route may be required.**
- 7.7.1.11 Reclamation techniques used on access roads shall prevent motorized vehicle use.**
- 7.7.1.12 Summer harvesting in core grizzly bear range shall minimize the creation of open routes. (see Section 11.5)**

7.7.2 Key Wildlife and Biodiversity Zone

DISCUSSION

Elk and moose are high profile species in C05 and the SLS FMA. Both species are appreciated for their intrinsic value and for consumptive purposes. Elk summer and winter ranges and migratory corridors are found throughout this area. Recent forest fires within the C05 forest should increase the habitat quality for elk, as vegetation succession favours this species.

It is recognized that in some cases work will occur throughout the winter season to take advantage of frozen ground access and to minimize impacts on grizzly bear habitat where they overlap. Frozen ground operations using frozen ground roads take precedent over early-in/early-out. In such situations, completing operations in Key Wildlife and Biodiversity Zone areas earlier in the winter season (i.e., December, January), remains a viable management alternative. To avoid repeated entries the company may propose in the FHP, to work later into the AOP year in order to complete all operations in the area.

South-facing valley slopes have relatively lower snow accumulations and warmer bedding sites and as such are important wintering areas for elk. Riparian areas and shrub meadow complexes are especially important wintering areas for moose. Forest cover adjacent to these meadow areas plays an important role as hiding and thermal cover.

Key ungulate winter ranges play a disproportionately large role, given their localized size and distribution, in maintaining the overall productivity of regional ungulate populations. These ranges ensure that a significant proportion of the breeding population survives to the next year. Females not only have to survive, they have to be in good enough shape in the spring to provide a healthy new crop of young.

Habitat effectiveness, including maintenance of thermal cover, foraging areas and escape cover is important for ungulates. Timber operations within and adjacent to key wintering areas adds stress and increases energy drain for animals. They may be forced to move about unnecessarily and even relocate to less favourable habitat. This becomes an increasingly significant factor as winter progresses. Activities associated with timber harvest can also create temporary and permanent access that exposes animals to additional non-industrial disturbances, increased levels of harvest from licensed and non-licensed hunting, and to increased predator efficiency.

In the interest of maintaining productive and sustainable ungulate populations, operating ground rules must reflect an understanding of the biology of these animals and the importance of their key winter ranges. These must serve two primary purposes:

- a. protection of the long term integrity and productivity of key ungulate winter ranges; and
- b. avoidance of direct and indirect disturbance to animals that are using these winter ranges especially during the mid-to late-winter period.

Ground Rules

7.7.2 Agreed upon critical winter ungulate habitat in the SLS FMA (see 3.3.3.1) shall have:

- a) **Non-forested areas (AVI veg classes HG, HF, SC and SO) require adjacent hiding/thermal cover to maintain their effectiveness. These areas will be agreed to at the FHP;**
 - b) **maximize retention near these critical winter ranges where possible;**
 - c) **see 7.2.8 for further requirements for C05.**
- 7.7.2.1 As an alternative to winter (frozen ground) roads, summer roads may be developed and used, provided that road width and grade are minimized. Preferentially, summer roads shall be temporary “dry weather” routes, with use suspended when ground conditions are unfavourable.**
- 7.7.2.2 Temporary roads shall be built within one year of harvest operations. Temporary roads shall be re-contoured and reclaimed (and potentially reforested) within 18 months of completion of harvesting and hauling operations, unless otherwise agreed to in the operating schedule.**
- 7.7.2.3 The amount, tenure and class of new access roads shall be minimized and consistent with the land use objectives in regionally defined key wildlife zones (regional LFD land use referral maps). Access development will strive to minimize new human infrastructure.**
- 7.7.2.4 The alignment and standard of new long-term and permanent access roads must be identified and agreed upon within the five year access plan.**
- 7.7.2.5 Any proposed new crossings of rivers and creeks must be identified and agreed upon with Alberta; new permanent crossings will require justification.**
- 7.7.2.6 Where possible all access roads shall avoid known key habitat features.**
- 7.7.2.7 Use of existing access roads must be described in the FHP, with particular reference to public access management, any proposed road improvements and ongoing maintenance. Potential opportunities for partial or complete route closure and/or reclamation following planned harvesting and silviculture shall be discussed.**
- 7.7.2.8 Mechanical thinning and selective use of herbicides as approved by Alberta may occur within this zone.**
- 7.7.2.9 Timber operations shall be conducted to mitigate the impacts on critical winter habitat and calving areas. Priority is to plan to avoid timing**

restrictions. Where unavoidable, early access to these and being out as early as possible is a priority.

7.7.2.10 Stand tending activities shall only remove competing vegetative growth that interferes with free-to-grow standards in order to maintain browse availability.

7.7.2.11 The FHP shall indicate that key ungulate and biodiversity zone maps have been consulted when changes to the spatial harvest pattern are being considered.

7.7.2.12 Existing lesser vegetation, or where agreed to, treed buffers comprising the visual screening along Class I-III roads bordering shrub meadows shall be maintained to limit line of sight across meadows.

7.7.2.13 Star Creek will be managed in a shelterwood/partial cut regime to ensure other values are recognized and elk habitat is favoured (part of an FM activity in objective 30 of C05 FMP)

7.7.2.14 Timber harvesting shall be managed to provide hiding cover for wildlife and facilitate wildlife movement in the following corridors:

- a) **in a West Castle Wildlife corridor along a portion of the east side of the West Castle Road 774, as identified in Appendix 7 of the C05 FMP;**
- b) **within a strip 1,600 m (1 legal mile) in width bordering the Rocky Mountain Forest Reserve boundary within the Crowsnest Corridor;**
- c) **along the Highway 22 corridor—where the highway bisects the Rocky Mountain Forest Reserve.**

7.7.2.15 The following Silviculture and access roading requirements shall be met:

- a) **where possible, reforestation treatments should be planned as soon after harvest as possible;**
- b) **while considering safety, position bends in the roads at junctions to minimize line of sight**

7.7.3 Fine Filter and other Species

DISCUSSION

Additional habitats of selected wildlife species require maintenance of undisturbed habitats (e.g., breeding or denning locations). These species require specific sites in order to complete all or part of their life cycles.

Pure strain West slope Cutthroat Trout has been listed provincially under Alberta's Wildlife Act Regulations as a threatened species. the Alberta Westslope Cutthroat Trout Recovery Plan was approved in March 2013 and provides direction on the management of this species.

Southern Headwaters At Risk Project, (SHARP) identifies a number of focal species whose spatial and compositional requirements for habitat are most representative of those of a large number of species. This focus ensures their persistence and that of multiple species at risk in the southern headwaters area.

SHARP species that are found in or near the C05 FMU include: Wolverine, Harlequin Duck, Long-toed Salamander, Western Toad, Pileated Woodpecker and Clark's Nutcracker.

Ground Rules

Best Management Practices for SHARP species are identified in the following ground rules:

Wolverine:

- 7.7.3.1** No timber harvesting shall occur in or near cirque basins, talus slopes, boulder fields, and avalanche paths in the sub-alpine forest. A minimum 60 m treed buffer shall be left where harvesting occurs near these areas.
- 7.7.3.2** Leave downed trees and wood debris in identified wolverine habitat.

Harlequin Duck

- 7.7.3.3** Seventy one ha of identified Harlequin Duck nesting areas have been removed from the net harvestable landbase to ensure protection of this habitat. Harvest planning along the Livingstone River should consult with the TSA theme map for Harlequin Ducks. Maintenance of ground rule buffers on the remainder of the watercourses will protect habitat for this species. (see Alberta Species at Risk Report #105)

Long Toed Salamander and Western Toad:

- 7.7.3.4** Ponds found during field operations (layout or harvesting) that contain these species shall have a 100 m treed buffer left and the regional biologist will be contacted.

Pileated Woodpecker:

Potential cavity trees include dead trees more than seven meters tall with broken trunks or live trees where decay has softened the wood. Decay is strongly associated with the presence of conks, dead branches, branch stubs, trunk cracks, and swelling.

- 7.7.3.5** Retain all, current and some potential cavity trees, as well as some future cavity trees.
- 7.7.3.6** Retain large (greater than 30 cm) live or dead deciduous or dead coniferous trees where deciduous is absent, that have rectangular nesting holes on the trunk.

Clark's Nutcracker:

- 7.7.3.7** Where Clark's Nutcrackers are found, the company shall leave scattered conifers on the outskirts of openings, preferably on south-facing slopes and on sites protected from the wind.

The following apply to both C05 and SLS FMA:

Bull Trout and Pure Strain Westslope Cutthroat

Locations of existing Bull Trout and pure strain Westslope Cutthroat Trout can be identified using the Fisheries and Wildlife Management Information System (FWMIS), the associated Fish and Wildlife Internet Mapping Tool (FWMIT) and consultation with Alberta. Within these identified areas:

- 7.7.3.8** Operational planning by the company should incorporate the use of Alberta's Wet Areas Mapping tool to identify areas that are sensitive to disturbance. Field confirmation of these sites including depth to water, potential disruption of groundwater flows, and areas at high risk of erosion

in wet or riparian areas can be a useful tool in determining road and crossing location.

7.7.3.9 Detailed Harvest Area Plans (DHAP) for operations shall be submitted.

7.7.3.10 Watercourse(s) shall be treated as Class “A” as per Table 3.

Whitebark and Limber Pine

Whitebark and Limber Pine are widespread throughout the C05 FMU which contains the largest number of stems in the province. Whitebark and Limber pine are in decline throughout Alberta due to an alien invasive fungus, white pine blister rust. In addition, both species are under threat from MPB and long standing fire suppression that has affected successional processes. Both species are listed as “Endangered” under Alberta’s Wildlife Act and a provincial recovery strategy is currently being drafted.

7.7.3.11 All clumps and identified single trees of Limber and Whitebark Pine shall be protected, unless removal is required due to unavoidable road alignment. Written approval is required.

7.7.3.12 If the company determines that destruction of Whitebark or Limber Pine stems is unavoidable in order to operate then a formal request to Alberta for approval must be made. The company shall provide justification, site description and map including GPS location, photos and description and estimate of the number of stems to be removed.

Other Species

7.7.3.13 Sensitive sites listed below shall be protected by retention of an undisturbed, forested buffer (or other management technique) from the edge of the opening associated with these sites, or from the centre of sites without openings. Both Alberta and the forest operator shall make a reasonable effort to identify sensitive sites in the FHP. Sites discovered in the field shall receive the same buffer as those sites previously identified in planning. Buffer widths and duration shall be agreed to in the FHP.

7.7.3.14 In the event that site-specific buffers or other management techniques are not agreed to in the FMP and FHP, the following buffer widths shall apply:

Sensitive Site	Width of Buffer
Breeding Sites and Hibernacula of Species At Risk	
Salamanders, Amphibians and Reptiles	100 m
Bat Hibernacula	100 m
Colonial Bird Nesting Area	100 m
Sandhill Crane Nesting Area	100 m
Wolverine Den	100 m
Mineral Licks	100 m
Bear Den	100 m
Raptor Nest Tree	100 m
Natural Springs, Beaver Ponds with no	20 m-buffer of lesser vegetation

outflow channel, or other natural ponds

7.7.4 Trumpeter Swan

DISCUSSION

The FHP shall describe the harvesting program that is agreed will create the desired future forest, taking into consideration the full range of values including habitat for species of special management concern.

Trumpeter swans are not found nesting in the C05 FMU or the SLS FMA however these OGRs cover white zone lands in southern Alberta including the Cypress Hills area therefore this provincial direction will remain.

Trumpeter swans are classified as a “Species of Special Concern” under the Alberta Wildlife Act. The Recommended Land Use Guidelines for Trumpeter Swan Habitat in Alberta” located at <http://www3.gov.ab.ca/srd/fw/landuse/index.html> provides background, intent, and specific direction for managing industrial work near trumpeter swan breeding wetlands. Locations of breeding wetlands are found on provincial land use referral maps. A provincial trumpeter swan recovery process has been initiated which may have implications for timber harvest in Alberta.

Trumpeter swans are sensitive to human disturbance, and human activity in breeding areas may decrease survival of eggs or cygnets. Trumpeter swans that are disturbed may not nest or may abandon an existing nest. Therefore, the breeding population continues to be dependent on current management practices and habitat protection.

Timber harvest planning and operating ground rules must reflect the sensitive nature of this species. These operating rules serve three primary purposes:

- a) protection of the long-term integrity and productivity of trumpeter swan breeding habitat;
- b) avoidance of industrial disturbance to trumpeter swans during nesting and rearing of cygnets; and
- c) minimize the access created near swan lakes to reduce the potential for secondary disturbance of trumpeter swans from recreational use.

During the breeding season (April 1 to Sept. 30), low-level (<2000’) aircraft flights may disturb trumpeter swans. Low-level aircraft flights are discouraged over identified trumpeter swan lakes or water bodies.

GROUND RULES

7.7.4 Trumpeter Swan

7.7.4.1 From April 1 to Sept. 30, there shall be no harvesting, hauling, road building or scarification activity within 800 m of the high water mark on identified trumpeter swan breeding lakes or water bodies.

7.7.4.2 There shall be no timber harvesting within 200 m of the high water mark on identified Trumpeter Swan breeding lakes or water bodies.

7.7.4.3 An area 200-500 m from the high water mark on identified trumpeter swan breeding water bodies shall be managed in a manner that provides additional protection for the swans. Special measures shall be determined on a site-specific basis during the FHP. Special measures within this zone shall include site preparation that reduces the potential for future vehicular access, no general application of herbicides, and attempts to limit maximum line of sight to 100 m. Attempts to retain sufficient structure to contribute to a “forested” habitat in this zone are encouraged. Techniques that limit line of sight and contribute to the treed buffer of the wetland are encouraged.

7.7.4.4 There shall be no development of long-term infrastructure (roads and camps) within 500 m of the high water mark on identified trumpeter swan breeding water bodies. Only seasonal winter routes shall be permitted within the 500 m buffer.

8.0 SILVICULTURE

PURPOSE

To plan and implement silvicultural practices that result in reforested stands that meet approved regeneration standards.

DISCUSSION

A reforestation program is required by Alberta under Timber Management Regulation (TMR) 143.1. The reforestation program is a component of the AOP and contains reforestation prescriptions by strata, and a schedule of treatments for the upcoming year. The proposed reforestation program provides a link between reforestation operations and the FMP. The reforestation program must be based on the most current knowledge of treatments (by strata) which lead to reforestation success in terms of reforestation standards. Reforestation prescriptions are a critical point in the sustainable forest management planning system where growth and yield strata targets from the FMP are delivered through well-planned silviculture treatments. Knowledge of how sites respond to different treatments result in better treatments, and greater probability of success in meeting growth and yield strata targets for height, stocking, density and ultimately, strata volumes.

An acceptable silvicultural process includes:

- site assessment (pre or post harvest) based on ecosite classification;
- a prescription table or ‘matrix’ of silviculture treatments or tactics for specific strata;
- regeneration standards based on yield curve strata targets for alternative regeneration systems (ARSs);
- an annual treatment schedule of activities
- an assessment/survey system and feedback mechanisms to ensure regeneration data is used to refine the prescription matrix.

GROUND RULES

8.1 PLANNING

8.1.1 The conditions outlined by Alberta must be met prior to planning reforestation of balsam fir or alpine fir as an acceptable species. See Directive 2001-01 or successors.

8.1.2 Harvest layouts bordering previously harvested areas shall avoid damaging regeneration.

8.1.3 Reforestation timelines prescribed by Alberta shall begin at the start of the timber year following the end of the timber year when the harvest area has received skid clearance from Alberta, or from a company representative pursuant to a self-inspection agreement between the company and Alberta.

8.1.4 Where requested by Alberta, the company shall submit a map or shape files showing where genetically improved stock is deployed.

For C05 only:

8.1.5 The company shall ensure that the pre-harvest yield strata proportions are maintained by landscape management unit (LMU) by quadrant. The original species mix and proportion can be achieved by LMU and not necessarily by harvest area. The following strategy shall be followed:

8.1.5.1 Where sufficient seed exists, drag scarification may be the priority.

8.1.5.2 Where harvest areas have to be planted, consideration should be given to reforest to the secondary species found in the block at the time of harvest.

8.2 REFORESTATION PROGRAM

8.2.1 The reforestation program shall be submitted:

- a) before March 1 for silviculture operations commencing between May 1 and October 31; or**
- b) before September 1 for silviculture operations commencing between November 1 and April 30; or**
- c) as otherwise specified in a FMA, or at a time agreed to by Alberta;**
- d) the company shall submit the reforestation program by April 1.**

8.2.2 Harvest areas (openings) shall be clearly identified (e.g., maps, spatial files, or delineation on the ground through visual markings). Where stumps are left to delineate areas (e.g., harvest areas) they shall be approximately 30 m apart and no higher than 2 m.

8.2.3 The reforestation program shall include the following components and information:

- a) silviculture prescription;**
- b) proposed silviculture treatment schedule;**
- c) maps as requested by Alberta; and**
- d) proposed blocks for declaration in lieu of survey and re-treatment.**

a) Silviculture Prescription

The Forest Management Plan contains a Silviculture Strategy table for prescriptions specific to different forest stratum. Changes to the approved strategy in the FMP are outlined in the AOP.

Proposals for herbicide application shall be submitted for approval in accordance with approved vegetation management strategies and Alberta requirements. (see Herbicide

Reference Manual) Herbicide proposals are a component of the reforestation program in the AOP, but may be submitted separately from the AOP.

Commercial thinning proposals shall be submitted for approval as part of the AOP unless otherwise agreed by Alberta, in accordance with Alberta's requirements.

b) Proposed Silviculture Treatment Schedule

The silviculture treatment schedule shall contain the following information:

- opening number;
- a list of harvest areas and the estimated area (ha) to be treated;
- the reforestation strata standard for each harvest area (see below for more detail);
- season or date of activity – summer vs. winter.

The following proposed reforestation activities for each harvest area (or stand) shall be listed:

- I. Site Preparation – mechanical or chemical treatment
- II. Planting – primary species, trees/block, and notification if outside approved seed zone as per FGRMS
- III. Seeding – species and notification if outside approved seed zone
- IV. Leave for Natural – species
- V. Secondary species may be planted if a seeding failure
- VI. Manual Tending – type (cleaning vs spacing or combination)
- VII. Fertilization – type of fertilizer
- VIII. Herbicide/Insecticide application – type of chemical and method (ground vs. aerial) and target species for insecticide
- IX. Commercial Thinning
- X. Regeneration Surveys – establishment and performance
- XI. Cone/cuttings collection – if unknown, Alberta shall be notified regarding collections as per the 'Standards for Tree Improvement in Alberta
- XII. "Let it grow" as a retreatment strategy.

Should the proposed reforestation activities for a harvest area change after AOP approval, the following items require an amendment to the AOP:

- changing to a treatment not approved in the silviculture strategy table for the specific strata;
- additional harvest areas to be treated by any means of treatment;
- the remaining changes require notification to Alberta through ARIS (Alberta Regeneration Information System) reporting.

If a harvest area is declared sensitive, the forest operator shall provide additional information beyond the strategic and tactical levels (see section 3.4.10). This information shall include the actual techniques (e.g., type of site preparation machine) and their expected impact on the harvest area attribute(s) that make it a sensitive site (e.g., providing frequent furrow trenching breaks on downhill run to reduce erosion).

Note that proposals to deploy seed or vegetative material outside the seed zone or breeding region require prior approval of the Provincial Seed Officer at the Alberta Tree Improvement and Seed Centre.

Sample Silviculture Treatment Schedule

Opening Number (ARIS)	Harvest Area (ha)	Preliminary Strata Declaration	Activity	Activity Area (ha)	Season	Comment
4251120144	10	C	Mounding	4	Winter	

c) Map

As part of the reforestation program, a map may be requested (at Alberta’s discretion the FHP map may be used) that identifies:

- I. all harvest areas to be treated, and all roads and stream crossings used (designating their season of use) for access;
- II. the reforestation map shall include all harvest areas from integrated operations.

d) A listing of harvest areas where a declaration is proposed in lieu of a survey for areas not likely to meet regeneration standards (per TMR 141.9) and harvest areas where re-treatment is proposed (per TMR 142.1.)

- I. blocks where ‘let it grow’ is the retreatment strategy will require survey information supporting re-treatment rationale;
- II. may be submitted for review and approval at any time throughout the year for approval to ensure timeliness of treatments.

See Section 12.0 REPORTING for reforestation activity reporting requirements.

8.3 SILVICULTURE OPERATIONS

- 8.3.1 Site preparation and other silviculture activities must follow the same AOP conditions and ground rule standards which apply to timber operations (i.e., stream crossing requirements, watercourse buffers, tree/understorey retention, and Forest Soils Conservation Guidelines).
- 8.3.2 Site preparation shall ensure that nutrients and logging debris are left on site and not moved down slope.
- 8.3.3 Herbicide, pesticide and fungicide use shall be performed in accordance with Alberta requirements.
- 8.3.4 Site preparation equipment shall be cleaned and free of restricted and noxious weed seed or plant parts before entry into the working area or before mobilizing between projects (where risk of spread is high).
- 8.3.5 Planting boxes shall be disposed of within 24 months of logging (skid clearance) and are to be removed to an appropriate disposal facility if ground access exists or the block does not contain any debris piles. If ground access does not exist, boxes may be securely placed within existing debris piles for disposal by burning. All plastic shall be removed from boxes and disposed of at an approved waste disposal site prior to burning.

9.0 SOILS

PURPOSE

To conduct timber harvest, road construction, reforestation and reclamation operations in a way that shall:

- minimize the potential for soil erosion;
- prevent soil, logging debris and deleterious substances from entering watercourses;
- ensure that the capability of the site to support healthy forest tree growth is maintained.

DISCUSSION

Minimizing soil displacement, compaction and rutting/puddling during road construction, harvesting, and silvicultural operations are a primary concern. Soils are most at risk of compaction and rutting/puddling when the soil is moist or wet, with the more poorly drained soils remaining wetter longer. The soils are equally at risk in the winter months if they are wet and the soil has not frozen, which is a common occurrence. Rehabilitation of compacted soil in harvest areas (off – road) is seldom an option because they are generally wet and additional machine traffic will often cause more soil damage. Therefore, protection of soil is best achieved in choice of equipment, staff training and advanced planning of operations. In terms of advanced planning, it is recommended that a pre-harvest site assessment include the evaluation of soil drainage class across the harvest area delineating sensitive areas with imperfectly and poorly drained soils. Management of field operations shall involve operating on soils when they are as dry as possible. The weather and percentage of sensitive areas in the harvest area shall be taken into account when scheduling areas for harvesting. Following a long dry period in summer, the sensitive sites shall be scheduled accordingly.

GROUND RULES

Pre-harvest planning

- 9.1 Areas susceptible to rutting, puddling or compaction shall be harvested during dry or frozen conditions (e.g., harvest areas with predominantly imperfectly-poorly drained soils).**
- 9.2 Timber harvesting shall not occur on any area where the likelihood of soil water table increases following harvesting is high, and the risk that the reforested area will not achieve the regeneration standard is also high.**

Harvesting

- 9.3 The total area covered by temporary roads, bared processing areas, and soil displaced during timber harvesting operations shall not exceed 5% of each harvest area without Alberta's approval. Blocks less than 7 ha or narrow blocks (averaging less than 100 metres from boundary to boundary) may exceed 5% with these blocks reported on the as-built.**

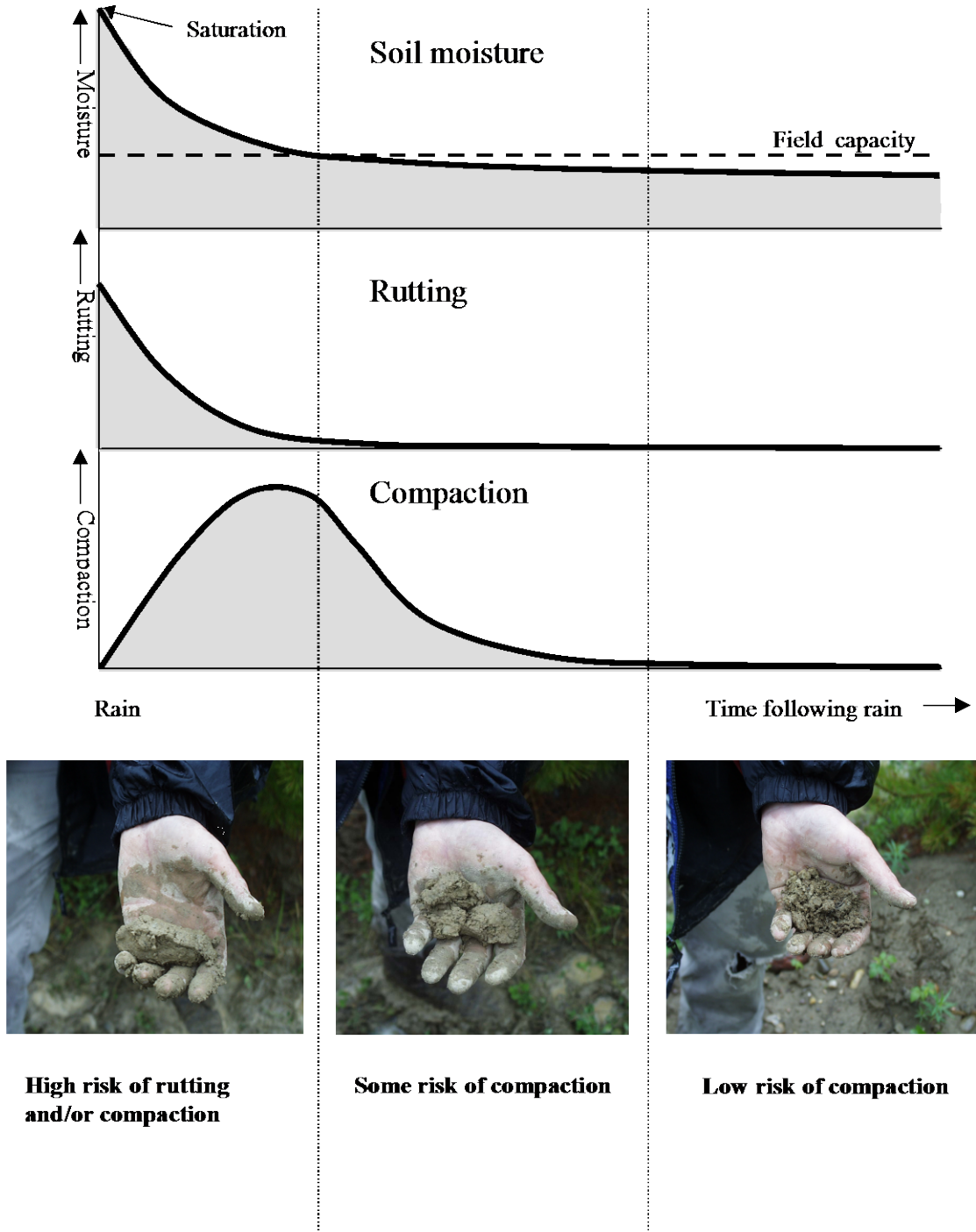
- 9.4 Operations shall not occur during heavy rainfall or when soil conditions are above field capacity (saturated).**
- 9.5 Minimize the machine traffic on sensitive areas, depending on soil susceptibility to disturbance according to the results of a hand test. (see figure 1)**
- 9.6 Operations shall cease when instances of multiple ruts in a limited area are created that are clearly related to operations during unfavourable ground conditions.**
- 9.7 Erosion and soil disturbance must be minimized, with effort made to retain organic matter and soil nutrients.**

Post-harvest reclamation/reforestation

- 9.8 Site preparation creating linear disturbance patterns, shall be oriented to minimize channelling of water downslope and to ensure sediment is not directly entering watercourses.**

Figure 1. Soil Compaction Risk

Change in soil moisture and susceptibility to compaction and rutting following rainfall



Courtesy of Andrei Startsev, Alberta Research Council

10.0 FOREST HEALTH

10.1 INSECT AND DISEASE

PURPOSE

**To minimize the risk of occurrence, and spread of insects and disease, which have the potential to impact forest management objectives.
To prioritize the salvage of timber damaged by insects and disease.**

DISCUSSION

The impact of certain insects and diseases shall be addressed when planning harvesting, silviculture operations, and surveys. Several biotic and abiotic forest health agents affect the growth and survival of trees. Each agent poses a threat to the forest. Priority for management shall be given to those agents that have the greatest impact or could potentially cause the most damage by:

- a) increasing the wildfire hazard;
- b) reduction or loss of merchantable volume;
- c) detracting from landscape aesthetics.

The following ground rules do not supersede the management strategies of species of special management concern. Alberta will provide direction where insects or disease concerns overlap with strategies for species of special management concern.

GROUND RULES

10.1.1 Harvest plans and operations shall be prioritized in stands with insect and disease issues. Variance from the SHS to address insect or disease issues may be acceptable if approved by Alberta. Infected and infested stands shall be ranked based on the type and intensity of insect and disease present, or the presence of dead trees. Stands or trees shall be ranked for treatment or harvest as follows:

Rank 1: Stands or trees with the presence of mountain pine beetles or spruce beetles.

Rank 2: Stands with a significant number of dead or dying trees resulting from fire, insects or disease, and windthrow.

Rank 3: Stands infected with mistletoe, spruce budworm, forest tent caterpillar, root disease (Tomentosis, Armillaria) or jack pine budworm.

Rank 4: Stands infected with needle cast, Western gall rust, root collar weevils, Atropellis or other miscellaneous forest health agents.

10.1.2 Management tactics are based on the Forest Protection ranking as follows:

Rank 1 stands or trees: Control measures must be undertaken before adult beetles take flight, either through harvest or single tree treatment. Alberta and forest operators shall work co-operatively to prevent spread through aggressive action.

Rank 2 stands: Shall be addressed through salvage planning process (see section 3.6, Salvage Planning). Highly unpredictable spread therefore, salvage planning is initiated.

Rank 3 stands: To manage dwarf mistletoe operators shall:

- create a 20 m wide mistletoe-free zone adjacent to the harvest area; or
- create a 20 m wide non-host buffer beside the harvest area perimeter; or
- reforest the harvest area to a non-host species.

Any wildlife tree patches shall consist of non-pine species where possible. For other pests, contact Alberta.

Rank 4 stands: Generally, no control is required for mature stands. Regenerated stands affected by Western gall rust or root collar weevils may require site treatments. Contact Alberta.

- 10.1.3 Insect and disease assessment information shall be utilized in the CA. Where a CA is not required, the assessment information will be used to develop the GDP. Where new infestations are found, or for known infestations already sequenced through the SHS, they shall be addressed in the FHP.
- 10.1.4 Any infestation of Rank 1 agents and all data must be reported to Alberta immediately.
- 10.1.5 Where dues relief is requested, mistletoe infected stands shall be surveyed using the Hawksworth system.
- 10.1.6 Where the impact of mistletoe is unclear and affecting management decisions, the company shall conduct a field assessment using the Hawksworth six class dwarf mistletoe rating system.

10.2 WEED MANAGEMENT

PURPOSE

To minimize the impact of noxious and prohibited noxious weeds.

DISCUSSION

The invasion of noxious and prohibited noxious weeds in the forested area of Alberta negatively affects the integrity of the ecosystem. Weeds may alter natural processes and displace plant species that naturally occur in the area.

Under Alberta legislation, the occupant (or owner if there is no occupant) must control all noxious weeds and destroy all prohibited noxious weeds.

GROUND RULES

- 10.2.1 Forest operators shall follow Alberta's requirements (Directive 2001-06) for weed management in forestry operations. (see Appendix 3).
- 10.2.2 All equipment used for timber operations shall be cleaned and free of noxious or prohibited noxious weed seed or plant parts before entry into the working area or before mobilizing between projects (where risk of spread is high).

11.0 ROADS

11.1 ROAD CLASSIFICATION

PURPOSE

To define a road classification system that provides guidelines to all forest operators.

DISCUSSION

As roads are one of the most significant components of forest harvesting operations, forest operators along with Alberta shall co-ordinate and integrate road planning and construction plans with other resource operators. This classification system will provide consistent working guidelines to be used in planning and operations to facilitate integration. It is important to identify not only construction schedules but closure and reclamation timelines as well. Long term planning of access roads is a significant tactic to address landscape access issues.

GROUND RULES

- 11.1.1 The operator shall utilize the classification system described in Table 4 during planning and operations.**
- 11.1.2 All roads, regardless of class, with a lifespan of greater than three years shall be built under the authority of a DLO**

Table 4. Road Classification and Design

Road Description and Tenure	Planning Requirements	Layout ¹	Design and Construction Descriptions ¹		Borrow Pits ¹	Timber Salvage ¹	Debris ¹	Erosion/Sediment Control ¹
			Right of Way					
			Clearing Width	Road Surface Width				
<p>Class I</p> <p>Primary Permanent</p> <p>All Weather</p> <p>20+ Years</p>	<p>Identified in higher-order plans (i.e., long term access plans).</p> <p>Phased planning approach shall be followed.</p> <p>License of Occupation (DLO) required.</p> <p>Detailed design plan (see “guidelines”).</p>	<p>Centre line marked. Side ribbons required.</p>	30-40 m	8-12 m	<p>Location identified prior to construction environmental field report (EFR) or as per submitted temporary field authority (TFA).</p>	<p>As per TMRs and EFR under DLO.</p>	<p>Total disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area.</p>	<p>Progressive reclamation concurrent with construction. Cross drains and ditch blocks dictated by slope and soil conditions. Drainage water to be diverted off the ROW in as short a distance as possible.</p>
<p>Class II</p> <p>Secondary Permanent</p> <p>All Weather or Dry Weather</p> <p>5 – 20+ years</p>	<p>Identified in higher-order plans (i.e., long term access plans).</p> <p>DLO required.</p> <p>Detailed design plan: through route selection process a need for detail shall be assessed (i.e., need for cross-sectional profiles based on sensitive area identification).</p>	<p>Centre line marked. Side ribbons may be required for DLO roads and sensitive sites.</p>	20-30 m	5-10 m	<p>Location identified prior to construction EFR or as per submitted TFA.</p>	<p>As per TMRs and EFR under DLO.</p>	<p>Total disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area.</p>	<p>Progressive reclamation concurrent with construction. Cross drains and ditch blocks dictated by slope and soil conditions. Drainage water to be diverted off the ROW in as short a distance as possible.</p>

Table 4. Road Classification and Design (continued)

Road Description and Tenure	Planning Requirements	Layout ¹	Design and Construction Descriptions ¹		Borrow Pits ¹	Timber Salvage ¹	Debris ¹	Erosion/Sediment Control ¹
			Right of Way					
			Clearing Width	Road Surface				
Class III Tertiary Permanent Winter or Dry Weather Up to 20 Years	Phased planning approach must be followed if road is to be used for more than five years. DLO Required if > than 3 years.	Centre line marked. Side ribbons may be required for DLO roads and sensitive sites.	7-20 m	5-10 m	Location identified prior to construction (EFR) or as per submitted TFA.	As per TMRs and EFR under DLO.	Total disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area.	Progressive reclamation concurrent with construction. Cross drains and ditch blocks dictated by slope and soil conditions. Drainage water to be diverted off the ROW in as short a distance as possible.
Class IV Temporary Winter or Dry Conditions Up to three Years	Details to be addressed in development plans. Approved under the cover of an AOP.	Centre line marked. As-built inside harvest area road locations submitted annually. Harvest area access roads mapped.	7-20 m	5-10 m	Location identified prior to construction or as per submitted TFA.	As per FHP.	Partial disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area	Progressive reclamation concurrent with construction. Cross drains and ditch blocks dictated by slope and soil conditions. Drainage water to be diverted off the ROW in as short a distance as possible. See 11.3.3

1 For Department License of Occupation (DLO) roads, actual specifications and/or requirements may be different in approved Disposition document.

11.2 ROAD PLANNING AND DESIGN

PURPOSE

To outline the plan to construct, maintain and reclaim roads.

DISCUSSION

The impacts of roads shall be recognized as long-term. It is therefore important that the initial placement of roads be carefully examined. Resource values shall be assessed during the process in order to best mitigate impacts or enhance benefits associated with those values.

Long term road corridor plans shall be developed in the FMP that meet the requirements of corridor plans as identified below in section 11.2.2. All road construction, maintenance and reclamation shall be directed by strategies outlined in the FMP.

The submission of road plans will assist Alberta to facilitate the integration of access management among all resource users (e.g., oil and gas industry). Road plans shall forecast corridor development linking all compartments and other industrial developments.

Safety needs to be addressed throughout the road planning process.

GROUND RULES

11.2.1 Long-Term Roads (Class I, II, III)

Road Planning

11.2.1.1 Forest operators shall annually submit a road use and reclamation plan along with a construction schedule in the GDP. Proposed variances from the FMP long-term corridor plan require Alberta's approval. The minimum scope of the road construction schedule shall be a five-year forecast with the content requirements being:

Map showing:

- existing forest operator roads by class including un-reclaimed non-DLO roads;
- other existing roads if the digital information is available;
- proposed forest operator corridors, including corridors approved in the FHP;
- access control points – See section 11.5 Access Control.

11.2.2 Planning Process

Corridor Planning

11.2.2.1 Forest operators with overlapping tenures shall consult each other to ensure consistency in their corridor planning.

11.2.2.2 Forest operators shall advise other industrial operators of their road plans and strive to integrate road access with those operators.

11.2.3 Temporary Roads: Class III and Class IV (with a lifespan up to three years from start of construction).

11.2.3.1 These roads shall be built as per the approved AOP. Only roads with FHP approvals shall be included in the AOP submission. Upon request as-built road plans shall be submitted to Alberta by the forest operator in a format acceptable to Alberta.

11.2.3.2 Proposed loop roads will be discussed prior to FHP approval.

11.2.3.3 In the road use and reclamation plan, the forest operator shall submit a table tracking the status of all non DLO roads over two years old. These roads shall be reclaimed as soon as timber operations are complete or within three years of construction.

11.3 ROAD CONSTRUCTION, MAINTENANCE AND RECLAMATION

PURPOSE

The roads shall be constructed, maintained and reclaimed in a timely manner to minimize environmental impacts.

GROUND RULES

11.3.1 General

11.3.1.1 Existing access (e.g., seismic lines, trails, existing roads), shall be used as a priority wherever practical and feasible.

11.3.1.2 Road ROWs shall be cleared according to standards established in Table 4, road comments, and any additional conditions approved in the FHP.

11.3.1.3 Temporary road construction activities that are required outside an approved ROW can be considered incidental to construction and will be approved as part of the AOP provided the following is met:

- a) Be immediately adjacent to AOP approved disposition (temporary road and associated ROW only);
- b) Be reclaimed or reforested in the same fashion as the adjacent AOP approved disposition (if applicable);
- c) Be without conflict of existing dispositions and/or adjacent land uses; AND
- d) Be an activity type and within the parameters as described below:
 - **Log Decks or Decking Areas:**
 - i. ≤ 0.18 hectares in size;
 - ii. Located on average ≥ 400 metres apart
 - **Bank Stabilization:**
 - i. Related to hill cuts impacted during construction;
 - **Push Outs:**

- i. ≤ 0.04 hectares in size;
- ii. Located on average ≥ 800 metres apart. Where this distance is not feasible due to operational constraints, line of sight between push outs should be minimized.

11.3.1.4 Unless otherwise approved by Alberta, roads and landings shall avoid:

- a) unstable soils, water source areas, springs and seepage areas;
- b) creating disturbed, compacted or bared soils that exceed the amount specified in section 9.3;
- c) Rough Fescue native grassland ; and
- d) natural meadows.

11.3.2 Construction

11.3.2.1 Roads, skid trails and landings shall be placed in locations and constructed so that soil erosion, damage to streambeds and sedimentation of watercourses are minimized.

11.3.2.2 On those parts of the ROW not used for grade construction, disturbance to the duff and organic soil shall be minimized to reduce damage to the roots of bordering trees and to provide a protective soil cover.

11.3.2.3 With Alberta's approval, trees with root systems seriously damaged by road construction activities shall be removed from the edge of a road cut.

11.3.2.4 The fill required for road construction shall be taken from the ROW when feasible.

11.3.2.5 All borrow pits required off the ROW must be authorized by Alberta or an appropriate land use disposition before they are developed.

11.3.2.6 All sand and gravel pits off the ROW must be authorized under an appropriate disposition.

11.3.2.7 Removal of sand and gravel from within the channel or floodplain of any watercourse is prohibited.

11.3.2.8 Active long-term roads shall be properly maintained to reduce wheel or track ruts, and to minimize watercourse sedimentation from erosion and traffic during adverse weather.

11.3.3 Erosion Control/Prevention

11.3.3.1 Erosion and sediment control shall be implemented as per Table 4.

11.3.3.2 Initial erosion control measures shall be concurrent with grade construction. Preferably, no more than a two kilometre length of bared surface shall be developed between the time the sub-grade is constructed and the completion of erosion control activities.

11.3.3.3 Constructed roads require erosion control and stabilization of disturbed soils.

11.3.3.4 Ditches shall be constructed to the same gradient as the road and shall be deep enough to drain the sub-grade, unless limited by topography. Ditch backslopes shall have a regular profile from the top of the cut to the bottom with no hanging banks or vertical cuts.

11.3.3.5 Water from roads, ditches and bared soil surfaces shall not be permitted to drain directly into watercourses. Where vegetated buffers alone do not retard water and sediment movement effectively, appropriate obstructions (e.g., logs, rocks, mounds) or sediment control structures shall be installed to dissipate the flow of water and capture sediment prior to entering the watercourse.

11.3.3.6 Cross-drainage culverts and other drainage devices shall be installed as road sub-grade construction progresses. Cross-drainage structures shall:

- a) reduce water movement along ditches;**
- b) divert water from the ROW into the surrounding vegetation directly as possible;**
- c) provide cross movement for water from seeps and springs;**
- d) be installed with adequate spillways or downspouts where they drain onto unstable or bare soil.**

11.3.3.7 Re-vegetation shall be completed concurrent with operations or as soon as soil conditions permit during the following growing period. Existing ditch vegetation shall be protected during road maintenance wherever possible and re-established where necessary.

11.3.3.8 A portion of the debris from clearing and strippings from road and landing construction shall be retained and used for re-vegetation and erosion control on disturbed areas.

11.3.4 Reclamation

11.3.4.1 Once initial silviculture treatment activity is complete, the company shall reclaim AOP roads. (Reclamation will not allow for future quad access even for the company unless the need for future silviculture treatment or growth and yield plots is demonstrated) (see 11.3.4.7)

11.3.4.2 Certified weed free seed shall be used when seeding is used for reclamation. Any required reclamation work shall be completed following Native Plant Revegetation Guidelines for Alberta (February 2001) or its replacement. When seeding is required, Alberta and the company shall meet to discuss the appropriate seed mixes and certificates of analysis.

11.3.4.3 Roads under DLO that are no longer required shall be reclaimed, and require a Letter of Clearance.

11.3.4.4 All borrow and gravel pits no longer required must be reclaimed (re-contoured to stable slopes and re-vegetated as per 11.3.4.2) unless approval has been given to allow water to fill the pit for wildlife or wildfire purposes.

Seasonal Erosion Control

11.3.4.5 Certain roads that are not used continuously throughout the year may require intermediate erosion control measures such as:

- a) shallow surface cross drainage structures based on slope and soil type;
- b) re-established drainage;
- c) slope stabilization;
- d) removal of ruts impeding cross drainage structures or directing water directly into watercourses;
- e) access control measures.

Deactivation

11.3.4.6 Roads that are not immediately required but necessary for future operations shall be reclaimed to the following standards unless otherwise approved in the AOP.

- a) watercourse crossing and drainage structures that have a high risk of erosion or failure are removed, and stream banks and approaches reclaimed;
- b) all potentially erodible slopes are stabilized through rollback, seeded to approved vegetation species, and cross drainage structures to disperse runoff and suspended sediment into undisturbed areas;
- c) access closure structures are installed where required.

Total Reclamation

11.3.4.7 Roads and associated bared areas that are no longer required shall be permanently reclaimed by completing all of the following:

- a) decompacting, and returning them to an acceptable landform;
- b) removing all watercourse crossing and drainage structures and reclaiming stream banks and approaches; (see section 11.4.27)
- c) installing cross drainage structures, rolling back topsoil (including slash and logging debris) and re-vegetate erodible bared surface areas as per 11.3.4.2;
- d) reforesting disturbed areas inside harvest areas and where mutually agreed to, outside of the harvest area; and
- e) establishing access closures where required.

11.4 WATERCOURSE CROSSINGS

PURPOSE

To provide guidance so that crossings are constructed, maintained and reclaimed in a manner that ensures negative environmental impacts are minimized and fish and fish habitat are protected.

DISCUSSION

It is important to implement watercourse crossings of acceptable standards to meet the needs of all users. Of primary importance is protection of the aquatic environment. It is intended that water quality, fish passage, bank stability and aquatic fauna habitat are not compromised during watercourse crossing construction, maintenance and reclamation.

The planning of watercourse crossings must consider tenure, user integration, timing constraints, existing plans and assessments, and pertinent policy and legislation. Watercourse crossings shall be designed, installed, maintained and deactivated in accordance with all applicable policy and legislation.

GROUND RULES

11.4.1 The company shall require approval for any crossing structure not listed in table 5 for the appropriate watercourse type.

Table 5. Acceptable Crossing Structures

Stream Classification	Acceptable Structure	
	Non-Frozen	Frozen
Ephemeral	Log Fill	Log Fill
	Culvert	Snow Fill
	Bridge	Culvert
	Low Profile Crossing	Bridge
		Low Profile Crossing
Intermittent	Modified Log Fill	Log Fill
	Log Fill	Snow Fill
	Culvert	Culvert
	Bridge	Bridge
Transitional Small Permanent	Modified Log Fill	Log Fill
	Culvert	Snow Fill
	Bridge	Culvert
		Bridge
Small Permanent	Modified Log Fill	Log Fill
	Culvert	Snow Fill
	Bridge	Culvert
		Bridge
Large Permanent	Bridge	Bridge
	GRS Structure	

- Unless previously identified in the AOP, notification of crossing type to Alberta is required on the first operations report after installation,
- Any change within a category only requires notification to Alberta.
- Modified log fill can be used on streams less than 1.5 m wide. It consists of a pipe supported by logs and constructed as defined in 11.4.21.
- All crossings shall maintain water flow or potential for water flow.
- Low profile crossings are used where bank protection is achieved through simple freezing in during frozen conditions or levelling the road in non-frozen conditions.
- Bridge includes native timber bridge, temporary bridge decks, geotextile reinforced structures (GRS) and ice bridges.

11.4.2 Intermittent and higher-order streams shall be classified in the FHP.

11.4.3 Proposed watercourse crossing structures and locations shall be identified in the FHP as per 3.4.5.

11.4.4 Unless otherwise approved, watercourse crossings shall:

- maintain fish passage on fish bearing water;**
- minimize erosion and sedimentation;**
- have bridges that don't allow debris, soil or deleterious material to fall into watercourse;**
- have stable approaches;**
- be at right angles to the watercourse;**
- be at locations where the channels are well defined, unobstructed and straight;**
- be at a narrow point along the watercourse;**
- allow room for direct gentle approaches;**
- have no direct drainage from either the road surface or ditches; and**
- have erosion control structures during construction.**

11.4.5 Watercourse crossings shall accommodate peak stream flows at the following levels as measured using a method acceptable to Alberta:

- long-term roads (Class I – III) – shall be designed for a minimum of 1:50 year flood levels; and**
- temporary roads (Class IV) – shall be designed for a minimum of 1:25 year flood levels with the exception of temporary winter crossings that are removed before break-up.**

11.4.6 On approaches to watercourse crossings, the organic soil layer and lesser vegetation shall not be stripped from portions of the ROW not needed for the road grade.

11.4.7 Any in-stream activities shall be scheduled to avoid migration, spawning and incubation periods of migratory or resident fish species (restricted activity periods). Mitigative measures approved by Alberta may allow for deviations from the in-stream timing constraints.

11.4.8 Fish passage for migratory or resident species must be maintained at all watercourse crossings on fish-bearing waterbodies.

11.4.9 The flow of the watercourse must be maintained at all times when carrying out in-stream activities, unless otherwise approved under the Water Act.

- 11.4.10 Measures must be implemented to minimize the duration and amount of disturbance of the bed and banks of the watercourse or waterbody. Where damage to the bed and banks of a watercourse occur, appropriate measures to restore the bed and banks must be undertaken.**
- 11.4.11 During timber operations measures must be implemented to prevent the deposition of soil, logging debris or other deleterious substances and materials that are toxic, or an immediate threat to fish and other aquatic organisms into any watercourse. Where possible any such substances or materials unavoidably deposited in a watercourse must be removed immediately and reported to Alberta.**
- 11.4.12 Measures must be implemented to prevent the transfer of biota that are not indigenous to the environment at the watercourse-crossing site.**
- 11.4.13 Stream crossings shall be kept free of accumulated debris. Culverts plugged with ice shall be reopened to prevent flooding during spring thaw.**
- 11.4.14 Interim erosion control measures (e.g., silt fences, matting, or gravel check dams) must be implemented and maintained until permanent vegetation and erosion control measures are established where necessary.**
- 11.4.15 Stream crossings that fail shall be reclaimed or replaced (if necessary) with more appropriate crossing structures as soon as possible.**
- 11.4.16 Bridge abutments shall not constrict the normal stream channel, unless approved by Alberta. Where stream banks must be built up to construct a bridge abutment, soil shall be brought in and deposited from the end of the grade – no equipment shall enter the stream channel. Bridge spans must extend beyond stream banks and abutment walls.**
- 11.4.17 The use of bridges is preferred on fish-bearing streams; however, steel culverts may be permitted where they will not restrict upstream passage of fish.**
- 11.4.18 Culverts for all classes of streams must be designed properly sized and installed to prevent erosion at both the inflow and outflow ends of the structure. Culverts shall be of sufficient length beyond the fill with the overburden properly backsloped and stabilized to prevent sediment from entering the watercourse, and the ends of the culvert open at all times. On a potentially fish bearing watercourse, any culvert that becomes a hanging culvert must be correctly re-installed as soon as possible.**
- 11.4.19 Properly constructed logfills (see 11.4.21 below) on temporary roads may be used as per Table 5. As soon as the temporary road is abandoned, logfills shall be removed so that no soil is allowed into the water channel. Logfills installed during frozen periods shall be removed before the spring thaw. A bottom layer of logs may be left in place when removing the logfill to provide for summer crossing of ephemeral watercourses.**
- 11.4.20 Crossing of intermittent or ephemeral watercourses not previously identified within harvest areas shall be avoided when possible. When the crossings are necessary, they shall be constructed at specified locations using appropriate watercourse crossing structures with notification provided to Alberta.**
- 11.4.21 A properly constructed logfill has all of the following:**

- a) enough logs to adequately fill an ephemeral draw or watercourse channel so that when the logs are removed there is little or no damage to the banks or channel bottom;
- b) logs delimbed and bucked to at least 1.5 m longer than the grade fill at each end;
- c) logs covered by a layer of suitable material that separates the soil from the logs, which shall permit total removal of the soil cap;
- d) cables laid under logs to allow for easy removal, or other provisions for removal that do not disturb the banks or watercourse.

11.4.22 In fish-bearing watercourses, any negative impacts on the stability and fish habitat values of stream banks must be minimized. Any damage to streambanks and the corrective measures taken by the company shall be reported to Alberta within seven days of the occurrence.

11.4.23 A native timber bridge may be used as per Table 5, provided that all of these requirements are met:

- a) bridge abutments do not restrict stream channel;
- b) a brow log is installed on both sides of the bridge deck to prevent soil from entering the stream;
- c) except for ephemeral draws, no equipment enters the stream channel, unless approved by Alberta;
- d) timber of suitable size and strength is available for construction;
- e) the span extends beyond stream bank and abutment walls;
- f) a separation layer is used between soil cap and timber;
- g) the structure is removed as soon as harvest, hauling and reforestation operations are completed unless a proposal to leave crossing structures in place is approved by Alberta and an acceptable monitoring program is in place.

11.4.24 Snow-fills may be used as per Table 5 provided that all of the following requirements are met:

- a) sufficient clean snow exists to fill creek channel;
- b) bank integrity is maintained;
- c) any soil cap installed over the snow is removed prior to break-up;
- d) measures are in place to prevent soil or other debris from entering stream channel or ice surface;
- e) stream flows are not impeded.

11.4.25 Ice bridges may be used as per Table 5 provided that all of the following requirements are met:

- a) no capping material is used on the bridge;
- b) winter stream flows are not impeded;
- c) approaches of snow and ice constructed of sufficient thickness to protect the stream bank;
- d) appropriate ice thickness exists to bear necessary load requirements;
- e) no alterations to streambed or bank are required;

11.4.26 Each operator shall establish a monitoring program acceptable to Alberta, for their watercourse crossings. Documentation as to current condition, repair requirements, or removal dates of the crossing structures must be maintained and made available to Alberta upon request.

11.4.26.1 The company shall conduct inspections during harvest operations ensuring proper functioning of watercourse crossing structures. Results shall be reported on the monthly inspection report.

11.4.27 Watercourse crossings that are no longer required shall be reclaimed with the objective of minimizing any sediment from entering the watercourse. Their condition shall be monitored annually until they are satisfactorily stabilized meeting the following requirements:

- a) removing all watercourse crossing and drainage structures and reclaiming stream banks and approaches;**
- b) cross-ditching approaches, rolling back topsoil (including slash and logging debris) and within one year re-vegetating erodible bared surface areas with vegetation capable of maintaining bank stability (e.g., this may include the use of sedges and willow cuttings).**

11.5 ACCESS CONTROL

PURPOSE

To manage existing and proposed surface access recognizing key resource values.

DISCUSSION

The impacts of roads on resource values may require mitigation through access control measures. Wildlife, sensitive areas (i.e., historical sites, soils), protection of road quality and safety are reasons for implementing access control. A number of strategies and tactics are available for controlling or restricting access.

Access control measures for long-term roads shall be identified through the submission and review of the phased planning process and DLO conditions. For temporary roads, the FHP shall be the mechanism used in identifying access control requirements.

Targets for open and closed road density by sub-region and land management unit shall be established by Alberta. Upon completion further discussion will be required to implement into the ground rules.

The following list of access control methods identifies a number of options that may be implemented:

- physical barriers (e.g., gates; barricades, pilings, crossing removal);
- road condition (e.g., berms, ditches, road standard, selective grade removal, roll-back, no snow removal);
- regulatory (e.g., sanctuaries, timing restrictions, signage).

GROUND RULES

- 11.5.1 Where access control has been identified as an objective in strategic land use plans, Alberta shall consult with the forest operator to determine an access control strategy.**
- 11.5.2 In designated areas, Alberta may direct forest operators to restrict road access during specified periods, implemented in accordance with Alberta policy. Restricted access issues shall be dealt with differently depending on whether the road is new access or is existing access. All closures of existing access must be submitted to the minister or his authorized delegate for approval whereas new access shall have the terms defined in the approval of the disposition.**
- 11.5.3 To address agreed upon critical habitat (e.g., elk calving grounds) conditions of approval for DLO roads and AOP roads will address access control, signage, road closure and any public notification requirements.**
- 11.5.4 New access roads must be integrated with forest land use zone road networks where PLUZs exist.**
- 11.5.5 After hauling is complete, initial access points shall have physical barriers and signage to discourage use by on highway vehicles. These would be put up by the company with monitoring as agreed to with Alberta. The signage is provided by Alberta.**

11.6 CAMPS AND FACILITIES

PURPOSE

To give guidance to forest operators so that the planning, construction, maintenance and reclamation of camps and miscellaneous facilities is done in a manner that minimizes negative impacts on the forest environment.

DISCUSSION

Camps and other facilities are often a necessary part of operations in remote areas. Forest operators require that such facilities operate in an efficient and cost-effective manner and are implemented without compromising the integrity of the environment.

Some of the best practices for camps and facilities include:

- place sites out of visual and auditory range from mineral licks and key wildlife areas or use a default of one kilometre;
- safe camp locations are a priority. Therefore, an evaluation of all potential risks shall be conducted prior to selecting a final camp location;
- camps and fuel storage sites shall be identified in the annual **forest protection** supplement when proposed locations are known;
- camps shall be kept clean. Proper mechanisms for the disposal of hazardous and non-hazardous waste shall be implemented;
- camp food and garbage storage shall minimize the potential for problems with wildlife. Recommend following the Bear Smart guidelines for specific mitigation relating to bears. Problems with wildlife shall be dealt with in consultation with Alberta.

GROUND RULES

- 11.6.1 Any facility or camp that shall be in place for more than twelve consecutive months requires an appropriate disposition under the Public Lands Act. Temporary field authorities (TFAs) are required for camps to be in place less than twelve consecutive months.**
- 11.6.2 Any facility or camp must adhere to all provincial regulations related to the camp (i.e., Public Health Act – *Work Camp Regulation*).**
- 11.6.3 Where feasible, forest operators shall establish temporary camps and/or other facilities within either new harvest areas or existing clearings (i.e., gravel and borrow pits).**
- 11.6.4 Temporary fuel storage sites shall not be located within 100 m of any channelled watercourse.**

12.0 REPORTING

PURPOSE

To ensure that timber operation activities are reported to Alberta in order to maintain an accurate and current database across the province.

DISCUSSION

Silviculture and harvest operations reporting and monitoring is necessary to ensure legislated requirements are met in all treatment areas. Ground rules governing operations reporting are required to ensure consistency among forest operators. The intent of activity reporting is to communicate that a given activity has occurred, where it occurred and when it occurred. This information shall also be used for annual and stewardship reports and shall be validated by an RFP.

GROUND RULES

SILVICULTURE AND HARVEST ACTIVITY REPORTING

- 12.0.1 Forest operators who conduct silviculture work on their disposition shall report the details of all work completed in the previous year annually into ARIS no later than May 15. The required information is outlined in the ARIS Industry Operations Manual. Information shall be submitted in accordance with all requirements of the manual and associated policy directives.**
- 12.0.2 Alberta may require additional reporting for forest management activities such as thinning, herbicide, pesticide spraying, or fertilization. Alberta shall consult with the company on the appropriate format of such reports. Reporting of herbicide projects are as per Alberta requirements.**
- 12.0.3 Companies harvesting more than 30,000 m³/yr. shall follow Directive 2006-04 and shall carry out periodic inspections of active timber operations and report the information to Alberta in a format acceptable to Alberta. Shape files of as built harvest area maps shall be submitted to Alberta by an agreed upon time each year showing all harvest areas from the previous year's operations.**
- 12.0.4 As built plan submitted by August 31 annually - includes shape files (or other digital format as approved by Alberta) for harvest boundaries and road location, and crossing locations from the previous year's harvest.**

Appendix 1 - Role of Regulated Forestry Professionals² (RFP) in Forest Management

The Alberta Government is committed to sustainable management of forests on public land to provide benefits and opportunities for Albertans. Alberta relies on the professional integrity of RFPs to enhance the effectiveness of forest resource management planning, implementation and harvest activity, while recognizing the interdisciplinary nature of forest management planning.

Alberta requires a RFP to submit the components of forest management plans, annual operating plans and harvest activity reporting, as identified in this annex, for approval.

1.0 Validation by a RFP

RFPs shall validate their submitted work by one of the following methods:

- i. signing using their professional title and registration number; or
- ii. stamping and signing using the seal provided by a *College*; or
- iii. using other mechanisms approved by Alberta.

1.1 Significance of RFP Validation

RFP *validation* provides assurance to Alberta that work is *accurate* and has been prepared with *due diligence*. Government RFPs shall review *validated work* by conducting a reasonable assessment for accuracy and shall take appropriate *corrective actions* where *validated work* is not *accurate*.

The documentation required to demonstrate *due diligence* is viewed as a significant source for validating accuracy. Alberta will not accept inadequate documentation and may refer such occurrences to the Complaints Director of the appropriate *College*.

1.2 Approval of Validated Work

Alberta's approval does not transfer the accountability for the plan or its implementation from the organization or the submitting RFP to Alberta or its staff. Government RFPs who review submissions are accountable for their reviews and any direction provided to the organization. *Approval of validated work* shall be addressed as described below.

1.2.1 Appraisal

Work with far-reaching and significant potential effect if inaccurate (such as but not limited to timber supply analysis, GDP). *Validation* of this type of work demonstrates confidence the work is *accurate*; however, due to its potential significance, it is both necessary and important to examine the work carefully. Approval shall be granted after the work has been reviewed by appropriate RFPs to assess accuracy. The timeline for this shall be established by Alberta and will vary depending on the nature of the *validated work*. Those preparing work for appraisal are advised to communicate with the reviewing government RFPs regularly and effectively to minimize confusion over the standards expected of the work.

1.2.2 Acceptance

Work with a more limited potential effect (such as, but not limited to silviculture reports, operations inspections). The work is considered approved on the date Alberta acknowledges receipt of the work. Alberta shall notify the organization by acknowledging receipt within five working days of submission. The notification date will be documented by Alberta as the start date for FHP approval. Alberta shall periodically check the work and supporting documentation to verify its accuracy.

² Refer to Alberta Definitions

2.0 Work Validated by a RFP

All entities that conduct timber harvesting or silvicultural activities on public land, except those harvesting less than 30,000 m³ annually from public land, must validate the items described below (the list of work to be validated may be amended from time to time by Alberta to adapt to change).

2.1 Forest Management Plans

The entire *forest management plan* shall be approved through an appraisal and must be validated by the senior RFP responsible for its preparation.

The following components must be validated by the RFP most directly responsible for their preparation. An RFP validated checklist describing the extent of compliance with applicable standards for each component shall be included with each submission:

- i. yield projections and all associated data and analyses – for appraisal;
- ii. vegetation inventory data – for appraisal;
- iii. landbase description (analysis and report) – for appraisal;
- iv. silviculture strategies (refer to Annex 1, standard 5.5 on managed assumptions)– for appraisal;
- v. forecasting (timber supply analysis) – for appraisal;
- vi. harvest planning (*spatial harvest sequence*) - for appraisal;
- vii. monitoring reports - annual - for acceptance; stewardship – for appraisal.

2.2 Annual Operating Plans³

The minimum *validation* requirements are as follows:

- i. general Development Plan – for appraisal;
- ii. compartment Assessments - for appraisal;
- iii. forest Harvest Plan – for acceptance;
- iv. road plan and **forest protection** supplement – for acceptance;
- v. reforestation Program – for acceptance⁴.

2.3 Harvesting and Reforestation Activities

Accurate and timely submission of timber production and sales information is important and must be validated. The activities related to reporting timber production and sales must be approved by the senior RFP responsible for the submission.

The following components of timber production and sales must be validated by the RFP directly responsible for their preparation:

- i. scaling populations (TM262) – for appraisal;
- ii. timber production audits – for acceptance;
- iii. letters of Understanding – for appraisal;
- iv. statutory declarations of production – for appraisal;
- v. harvest tenure standings – for acceptance;
- vi. timber production reporting – for appraisal;
- vii. silviculture information - regeneration surveys, ARIS submissions and silviculture operations reports, regeneration strata balance/swap/trade summaries – for acceptance;
- viii. field operations inspection reports – for acceptance;
- ix. herbicide reports – for acceptance.

³ AOPs are approved subject to a review by Alberta. Where a compartment assessment has been completed the CA, FHP and AOP shall be appraised by Alberta.

⁴ Where thinning plans, herbicide plans, and reforestation prescriptions vary from FMP silviculture strategies the silviculture program shall be appraised by Alberta.

Appendix 2 - Debris Disposal Policy

BRANCH: WILDFIRE MANAGEMENT	MARCH 15, 2010
SECTION: WILDFIRE PREVENTION	
DEBRIS MANAGEMENT STANDARDS FOR TIMBER HARVEST OPERATIONS	
<p>1. AUTHORITY</p> <ul style="list-style-type: none">○ Alberta Sustainable Resource Development (SRD)	
<p>2. PURPOSE</p> <ul style="list-style-type: none">● To provide standards for debris management in timber harvesting operations in compliance with the <i>Forest and Prairie Protection Act</i> (FPPA) and the <i>Forests Act</i>. Compliance will reduce the threat of wildfire to communities and other values within the Forest Protection Area.	
<p>3. POLICY</p> <ul style="list-style-type: none">○ The FPPA defines debris management standards for debris produced from timber harvest operations. Timber and reforestation activities must comply with the FPPA and the <i>Forests Act</i>. The standards will be enforced.○ The <i>Debris Management Standards for Timber Harvest Operations</i> policy is effective March 1, 2010 and may be revised. In addition to the management of debris through disposal, this policy also applies to debris retained for reforestation, wildlife habitat or other landscape management objectives.	
<p>4. APPLICATION AND IMPLEMENTATION OF THE DEBRIS MANAGEMENT STANDARDS</p> <ul style="list-style-type: none">● Debris management strategies must be linked to landscape objectives and must not conflict with the FPPA. The loss of productive land base resulting from timber harvest operations (debris piles, roads, landings) within the harvest area must not exceed the specifications outlined in applicable Operating Ground Rules. (As per the Timber Management Regulations of the <i>Forests Act</i>.)	
<p>A. Level II Mountain Pine Beetle Control Debris Management Standards</p> <p>The standards specified under sections B, C, or D and the FPPA apply.</p>	
<p>B. FireSmart Debris Management Standards</p> <p>During harvest operations, there is a need to manage debris to minimize the risk of wildfire to communities or other values at risk. In order to minimize this risk, the following standards shall be applied:</p> <ul style="list-style-type: none">I. Within the FireSmart Community Zone (Generally a 10 kilometre buffer of the community's development centre.), debris management strategies, for any purpose, must not include the retention of debris piles for reforestation, wildlife habitat or other landscape management objectives.	

- II. Outside of the FireSmart Community Zone, debris pile retention for reforestation, wildlife habitat or other landscape management objectives may be considered an acceptable debris management strategy. Retention is subject to SRD Forestry Program Manager approval through the Annual Operating Plan and in accordance with the standards described herein.

C. Wildlife Habitat and Biodiversity Debris Management Standards

Debris piles that are retained in the harvest area outside the FireSmart Community Zone for wildlife habitat or landscape biodiversity objectives must adhere to the following guidelines:

- I. If the strategy involves random scattered piles throughout the harvest area, the following standards apply:
 - Height of piles must not exceed 2 metres
 - Base diameter of piles must be no greater than 3 metres
 - Distance between piles must be no less than 25 metres
 - Distance from block edge must be no less than 25 metres
- II. If the strategy involves random scattered piles made up of chip residue from chipping operations throughout the harvest area, the following apply:
 - Height of piles must not exceed 2 metres
 - Base diameter of piles must be no greater than 3 metres
 - Distance between piles must be no less than 15 metres
 - Distance from block edge must be no less than 25 metres
- III. If the strategy involves piling of debris at roadside, piles must meet the following standards:
 - Piles can only be left along roads scheduled for reclamation and abandonment following the completion of reforestation (i.e. scarification, planting)
 - Piles must be compacted to a maximum of 2 metres in height, 3 metres in width, 12 metres in length and perpendicular to the road
 - A group of piles may consist of a maximum of 5 piles with a spacing of 6 metres of slash free area between each pile within the group
 - Pile groups must be separated by a 50 metre slash free spacing

D. Reforestation Debris Management Standards

Debris piles or windrows created from reforestation operations must adhere to the following specifications:

- I. If the strategy results in debris piles, the following standards apply:
 - Height of piles must not exceed 2 metres
 - Base diameter of piles must be no greater than 3 metres
 - Distance between piles must be no less than 25 metres
 - Distance from block edge must be no less than 25 metres
- II. If the strategy results in windrows (large logs, humus, and duff), the following standards apply:
 - Windrows must not be greater than 2 metres in height

- Windrows must not be greater than 3 metres in width
- Windrows must not exceed an average of 75 metres in length and must have slash free spacing of 8 metres
- Distance from block edge must be no less than 25 metres

E. Enforcement / Approval

SRD will serve as the "one window" for industry contact and approval and will complete field inspections as required.

Debris piles to be disposed of must be in conjunction with the terms of these standards and the two year timeline set out in the FPPA. SRD will issue an "Order to Reduce or Remove a Fire Hazard" when debris piles have not been properly disposed of in accordance with this Policy and the Annual Operating Plan approved by the department.

Forest Industry may apply to SRD for a one-year extension where drought conditions have prevented them from completing disposal through burning operations. The SRD Forestry Program Manager must approve the extension.

Where debris disposal by burning is the strategy, Industry must report all burning locations to SRD one month before the start of the fire season.

F. Review Process

Research will be carried out by FPInnovations to assess the threat of wildfire associated with debris resulting from timber harvest operations. If findings indicate that standards within this policy directive are not sufficient to support wildfire hazard reduction, the standards and policy will be modified.

G. Cross Reference

Forest and Prairie Protection Act
 Forest and Prairie Protection Regulations, Part I and Part II

H. Contact

Hugh Boyd, Director
 Wildfire Prevention Section
 780-427-7811

<p>DATE:</p>	<p>APPROVED BY:</p> <p>_____</p> <p>— Bruce Mayer, Executive Director, Wildfire Management Branch</p>
---------------------	--

**Appendix 3 -
Directive for Weed
Management**

Directive No. 2001-06

<u>Subject</u>	Weed Management in Forestry Operations
<u>Purpose</u>	To implement effective weed management programs administered by holders of <i>Forests Act</i> dispositions engaged in forestry operations. This policy applies only to <i>Forests Act</i> dispositions.
<u>Policy</u>	<p>Section 60 of the <i>Public Lands Act</i> sets out a disposition holder’s responsibility with respect to noxious and restricted weeds on dispositions issued under that Act. Similarly, Section 31 of the <i>Weed Control Act</i> requires that the occupant (or if the land is unoccupied, the owner) of land destroy all restricted weeds, control all noxious weeds and prevent the spread or scattering of nuisance weeds.</p> <p>The weed control duties on holders of dispositions issued pursuant to the <i>Public Lands Act</i> are reasonably clear and would apply to such dispositions that are issued in relation to forestry operations (e.g., camps, roads, processing sites and other associated land uses). It is, however, not entirely certain as to how the courts would interpret and apply the definition of “occupant” under the <i>Weed Control Act</i> in respect of timber dispositions issued under the <i>Forests Act</i>.</p> <p>In terms of forestry operations, the vast majority of weed management situations should fall under either the <i>Public Lands Act</i> or the <i>Weed Control Act</i>. This Directive attempts to address weed management, in a forest operations context, where neither of these two Acts apply.</p> <p>The Crown’s goal is to address weed management issues on a landscape level, as opposed to on a disposition by disposition level. To accomplish this, a two step approach will be taken. Firstly, the disposition document and annual operating plans (AOP) will be used to describe the disposition holder’s obligations with respect to weed management activities. Secondly, the Land and Forest Service (LFS) (and ideally, municipalities) will establish landscape level, co-operative weed management groups, with a mandate to developing a single management plan for all stakeholders involved.</p> <p>Invasive weeds can alter the ecosystem’s natural processes and displace native, threatened, and endangered vegetation and habitat. For these reasons, forest companies are expected to assist in managing weeds in the forested area of Alberta.</p>

Procedure

Amendment of Annual Operating Plans and Dispositions

In order to address situations that fall outside the requirements of either the *Public Lands Act* or the *Weed Control Act* all AOPs prepared and submitted for timber dispositions are to include the following condition. Additionally, this statement is to be incorporated into the disposition itself upon issuance or renewal.

“{*Disposition holder*} shall, with respect to the land contained in this timber disposition, prevent the establishment of and control all noxious and restricted weeds to which the *Weed Control Act* applies, in a manner acceptable to the Minister.”

The Minister will consider the “*Recommended Standards of Good Practice for Prevention*”, described in the **Guidelines** section to be the minimum level of performance for all disposition holders. Where a disposition holder or weed management group (as described below) prepares a plan outlining weed management, the commitments in that plan will become the standards to which the disposition holder or parties to the group will be expected to meet. This plan will be approved, where appropriate, by the Regional Director.

Co-operative Weed Management Groups

The LFS will establish co-operative weed management groups where willing participants are identified. The specific purpose of the groups will depend on the level of current involvement the individual participants have in weed management. Where participants are currently managing weeds, the purpose of the group may be to review individual existing weed management plans to identify opportunities for co-operative management. Where participants are not currently involved in weed management the purpose of the group may be to develop a single weed management plan for all group participants, or to assist individuals in the development of individual plans if desired.

The role and degree of involvement of LFS staff on these groups will depend on the make-up and desires of each individual group. Typically, the LFS will convene and co-ordinate weed management group meetings, in addition to other roles defined by the group. Forest Management Division staff will work with Forest Area staff to develop provincially consistent Terms of Reference for each group, and provide technical expertise and support where possible. Each group will select its own chairperson and define the roles for each member.

Weed management plans should address inventory, control, education, and prevention. Once a co-operative or individual weed management plan is agreed to, that plan will be implemented through the individual’s AOP. The results of this implementation will be used as the benchmark to which the Minister’s satisfaction for weed control and prevention is measured (i.e., vis-à-vis the AOP clause described above).

Guidelines

To assist in determining whether a disposition holder’s weed management activities are acceptable to the Minister, the following guidelines describe the four essential aspects of weed management: goals, prevention, inventory and control. All of these should be considered when developing weed management activities and plans.

A. Goals

The goals should be specific to noxious and restricted weed prevention, inventory and control. They can be short-term and long-term, as is the nature of weed management.

B. Recommended Good Standards of Practice for Prevention

1. Limit Soil Disturbances

To limit the establishment of weed infestations, prevent unnecessary soil disturbances wherever possible.

2. Clean Equipment

Practice due diligence by ensuring that all equipment and vehicles are free of weed seeds and plant parts before arriving on a job site. All agricultural implements or any equipment knowingly exposed to weeds are to be pressure washed prior to use in forested areas.

3. The Use of Straw Bales for Erosion Control

The use of straw bales for erosion control is discouraged in the Green Area. Unlike hay, it is very difficult to determine if the straw bales are free of weed seeds. Therefore, certified “weed free” hay bales acquired from producers with a “Certificate of Inspection” should be used for erosion control.

4. Use Certified “Weed Free” Seed for Re-vegetation of Disturbed Sites

Canada #1 Seed, approved under the *Canada Seed Act*, ***may not be*** weed free. To ensure a seed mix is virtually weed free, a purchaser can request a “Certificate of Seed Analysis.” To get a more detailed “Certificate of Seed Analysis”, the purchaser can request a larger seed sample analyzed, rather than the typical 25g sample to improve the confidence of the analysis. Alternatively, one can start with pure seed and then prepare the seed mix manually.

5. Rapid Response to Weed Infestations

Because a single plant and small infestations are easier to control than large infestations, it is important to manage weeds proactively. To do this effectively, industry and LFS field staff should be trained in the identification of restricted and noxious weeds, and the importance of destroying individual weed plants and reporting new infestations.

C. Inventory

A weed management program is most effective with an accurate account of existing weed infestations. Inventorying is most effective during the months of June through September, when most plants are in bloom and are the most easily recognized. “Noxious” and “Restricted” weed species to be surveyed are listed in the *Weed Designation Regulation (138/80)*. Additionally, the *Weed Control Act* provides municipalities with the authority to designate other species of local concern as restricted or noxious. For this reason

weed surveyors should obtain a list of restricted and noxious weeds from the municipal district(s) within which they are surveying.

D. Prioritizing Areas for Control Measures

As some areas within which weeds are managed consist of a large land base, control throughout the entire area is not feasible. Specific areas should be targeted each year, based on priorities. When prioritizing areas for control treatments, many factors must be considered to deliver the most effective and efficient control program. The following example criteria are not ranked in order of importance, with exception of *Restricted and Noxious*:

1. Restricted vs. Noxious

Target restricted weed infestations over noxious weed infestations. Control of restricted weeds should be implemented immediately following their discovery.

2. Location of Infestation

Target infestations in highly traveled areas over those in isolated areas, thereby limiting the threat of seeds or plant parts being Tran located.

3. Size of Infestation

Target small infestations before large ones, as it is easier to gain control of small infestations. This also applies to outlying pockets of larger infestations, which should be controlled prior to tackling the larger infestation. When dealing with a large infestation, a “contain and control” strategy (targeting outlying pockets, and/or the perimeter of the infestations) is an excellent option when resources are not available to control an entire infestation.

4. Weed Species

To prevent their establishment, target weed species that are less abundant on a regional basis. When controlling infestations, target the weed species with the greatest ecological impacts. In many situations this may be difficult to quantify, although generally speaking it can be done. For instance, a weed infestation encroaching on a habitat of an endangered plant species would have a higher priority than an infestation among common or non-native vegetation.

5. Co-operative Control Opportunities

Co-operative control is the most effective and efficient method to control weed infestations that span multiple dispositions or border of responsibility. Unless one is adopting a “contain and control” strategy, generally it is not a good idea to control only part of an infestation.

E. Control Options

When selecting a control method, it is important to note that different species respond differently to each method. The most efficient programs will have an integrated control plan that includes both prevention and one or more of the following control methods:

- ◆ **Mowing / Cutting** - Effective for perennial weeds. Careful monitoring and proper

timing are necessary for this to be a viable option. If a site is mowed over several years, well-developed root systems can eventually be depleted. Weeds should not be mowed once seed set has occurred, as this will aid in spreading seed.

- ◆ **Hand Pulling** - Effective for annual or biennial weeds, especially when dealing with small infestations or individual plants. Hand pulling may have to be done annually (before seed set) for several years, as dormant seeds in the soil may continue to germinate. If any weeds are pulled when in flower, they must be bagged and burned, as they will set seed if they are left on the ground.
- ◆ **Herbicide Application** - Very effective but will not guarantee 100% control. Sites may have to be revisited again the next year for follow-up treatments. Several herbicides are effective for each weed species. Chemical selection should be determined by site, weed species, existing desirable vegetation, and whether or not a residual effect is wanted. Assistance with selecting a herbicide and application rate can be obtained through a Municipal District, County Agricultural Fieldman, or Certified Pesticide Applicator.
- ◆ **Biological Control** - This method of control is the introduction of insects or diseases that attack or infect a specific weed species. Biological control agents can be difficult to obtain, and in some cases they are in the testing phase to determine effectiveness. Information regarding the biological control of weeds can be obtained through the Alberta Research Council in Vegreville, Alberta.

Authorities **Weed Control Act** - provincial legislation describing weed control and management requirements.

Weed Designation Regulation - lists weed species designated as restricted, noxious and nuisance in Alberta.

Forests Act - describes the requirements with respect to forest allocation.

Cross - Reference ◆ **FPD Policy 16.0 - Restricted and Noxious Weed Management Jurisdiction**
◆ **Land and Forest Service “Forest Management Herbicide Reference Manual”**

Doug Sklar 422-4590
Hideji Ono 422-8801

Contacts

Approved

Appendix 4 – GLOSSARY

Alberta	The Department of Sustainable Resource Development, including the Public Lands and Forests Division, Fish and Wildlife Division, and Forest Protection Division or as amended from time to time.
Alberta Vegetation Inventory (AVI)	An inventory of vegetation and forest stands including non-vegetated areas.
Analysis	A detailed examination of a body of data, a series of decisions, or the implications of one or more policies, and a determination of what this examination reveals about the nature, function and/or relationships in effect.
Annual allowable cut (AAC)	The volume of timber that can be harvested under sustained-yield management in any one year, as stipulated in the pertinent approved forest management plan. In Alberta it is the quadrant cut divided by the number of years in that quadrant, usually five.
Annual Operating Plan (AOP)	A plan prepared and submitted by the forest operator each year, which provides the authorization to harvest. An AOP is a requirement of the Timber Management Regulation. (See section B 1.4)
Approval	Issued by Alberta. Approval Decision is prepared outlining significant items considered in plan approval and outlining conditions to be met within specified time periods by the Organization or a decision made by Alberta on an AOP.
As built harvest boundary	An opening number accompanied by a spatial depiction of the harvest area generated either from cutover photography or from GPS technology capable of 3 m or better accuracy.
Assumptions	A judgmental decision made by a planner or decision maker that supplies missing values, relationships, or societal preferences for some informational component necessary for making a decision
Audit	An official examination and verification of records, activities, accounts, actions, operations, etc., against stated standards of performance and compliance.
Bared soil	Any soil where the organic layers and vegetation have been removed.
Borrow pit	A small quarry or excavation, which provides material for use in the construction project. [Revised from Dunster]
Buffer	Used in several contexts. 1 In protecting critical nesting habitat areas, the buffer is an area of forest land that reduces the impacts of adjacent activities on the critical area. The dangers associated with adjacent disturbances might include wind-throw or wind damage to nest trees and young birds in the nest, increased predation and loss of interior forest conditions. 2 A strip of land between two areas under different management regimes. Pesticide buffer zones are used to limit the possible drift, run-off or leachate of pesticide from a site into other areas, such as waterbodies or creeks. Streamside buffers are used to limit the effects of logging on creeks, such as siltation, loss of shading, loss of nutrient inputs from trees and degradation of riparian zones. The size and composition of the buffer zone depends on its intended function. 3 An area maintained around a sample or experimental plot to ensure that the latter is not affected by any treatment applied to the area beyond the buffer. 4 In GIS work, a new polygon computed on distance from a point, line or existing polygon. 5 In managing biosphere reserves, an area or edge of a protected area. Examples of compatible activities might include tourism, forestry, agroforestry, etc. The objective of the buffer zone is to provide added protection for the core reserve area. [Dunster]
Coarse filter	Conservation of land areas and representative habitats with the assumption that the needs of all associated species, communities, environments and ecological processes will be met. [Dunster]
College	The College of Alberta Professional Foresters (CAPF) or the College of Alberta Professional Forest Technologists (CAPFT).
Commercial Thinning	A partial cut where trees of a merchantable size and value are removed to provide an interim harvest while maintaining a high rate of growth on the remaining, well-spaced, final crop trees. Used to capture volume likely to succumb to competition pressures and be lost to disease, insect, or dieback.
Commercial timber permit (CTP)	A timber disposition issued under Section 22 of the Forests Act authorizing the permittee to harvest public timber.
Compaction	A transfer of wheel pressure to soils causing collapse of large air-filled pores, a type of

	disturbance when tire imprint is often invisible under the duff layer. Soil susceptibility to compaction is maximal when soil is at field capacity, which can be detected by stability of hand cast. Most of soil compaction occurs during the first passes of equipment because soil gains strength with each additional pass.
Compartment	A subsection of an FMA for which operational plans are developed.
Connectivity	A measure of how well different areas (patches or a landscape are connected by linkages, such as habitat patches, single or multiple corridors, or "stepping stones" of like vegetation. The extent to which conditions among late successional/climax forest areas provide habitat for breeding, feeding, dispersal and movement of late successional - or climax-dependent wildlife or fish species. Natural landscapes often tend to be better connected than those that have been heavily influenced and disturbed by human activities. Consequently, there is a body of opinion that the best way to avoid fragmentation of landscapes is to maintain, or re-establish, a network of landscape linkages. At a landscape level, the connectivity of ecosystem functions and processes is of equal importance to the connectivity of habitats. [Dunster]
Constraints	The restriction, limiting, or regulation of an activity, quality or state of being to a predetermined or prescribed course of action or inaction. Constraints can be a result of policies or political will; management direction, attitudes and perceptions; or budget, time personnel and data availability limitations; or, more typically, a complex interaction of all these factors. [Dunster]
Corridor	1 A physical linkage connecting two areas of habitat and differing from the habitat on either side. Corridors are used by organisms to move around without having to leave the preferred habitat. A linear habitat patch through which a species must travel to reach habitat more suitable for reproduction and other life sustaining needs. Many corridors, linking several patches of habitat, form a network of habitats. The functional effectiveness of corridors depends on the type of species, the type of movement, the strength of the edge effects and its shape. 2 An area of uniform width bordering both or one side of a lineal feature, such as a stream or route. [Dunster]
Cross-drainage structures	Culverts or other drainage structures that permit water to move from one side of a road to the other, normally under the road grade.
Deactivation	Taking a road out of active use through implementation of erosion control measures, road blocks and/or other methods.
Deciduous timber allocation (DTA)	A quota of deciduous timber.
Delegated Authority	The personnel located at the Regional or District level charged with supervision of all forest management activities in a defined Region or District. It can also mean someone who is authorized to approve an AOP.
Deleterious material	Section 34(1) of the Fisheries Act defines "deleterious substance" as: (a) any substance that, if added to water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or (b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.
Department License of Occupation (DLO)	A disposition issued by Alberta authorizing occupation of a linear corridor, often for an access road.
Desired Future Forest	A spatially explicit projected range of conditions of the forest landscape 100+ years into the future. The range of forest conditions defines the goal towards which forest management will be directed. It is our best guess today on the arrangement of forest age classes, roads and habitats that will provide for a set of objectives and desired outcomes that have been identified for the area.
Displaced soil	Mixed mineral, surface and sub-surface horizons that have been deposited off the road or

	disturbed surface to a depth of 15 cm or greater.
Disturbance patterns	The spatial and temporal arrangement of disturbances.
Ditch blocks	Barriers constructed across ditches to retard water flow, to redirect water from the ditch or to form a small catch basin.
Drought	Extended period of below average precipitation causing a lowering of the water table. Generally occurs over several years but locally may happen seasonally. Signs would be lowering of lake levels and drying of streams that would normally flow all year.
Due Diligence	<p>- taking and documenting steps to ensure that the desired outcome is achieved or that the chances of a negative consequence or outcome is minimized.</p> <ul style="list-style-type: none"> - ensuring completeness, correctness, consistency and repeatability. - demonstrating how conclusions were reached. - using mechanisms, such as but not limited to checklists and standard operating procedures, to demonstrate that appropriate procedures were followed and to ensure that no relevant steps or considerations were missed. - keeping and maintaining appropriate files and filing systems as well as document retention policies and practices.
Duff	The organic horizons of the soil profile (LFH). Commonly referred to as the forest floor.
Dwarf mistletoe	<i>Arceuthobium americanum</i> Nutt.
Ecological integrity	The quality of a natural, unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species and ecosystem diversity assured for the future. [Dunster]
Environmental field report (EFR)	A document that must be submitted for most green area disposition applications as required under the Public Lands Act. The disposition applicant completes the EFR, which includes details on construction practices and environmental issues, and contains operating conditions that apply to the approved disposition. The EFR forms part of the approval for the Public Lands Act disposition.
Features	The features represented on a map which describe the physical aspects of the harvest design (e.g., harvest area boundaries, roads, buffers, wildlife habitat).
FireSmart Community Zone	A standard 10 kilometre radius around the community extending from the Wildland Urban Interface Zone. A unique data set will be gathered for this zone for community protection planning to provide a fundamental linkage between FireSmart Communities and FireSmart Landscapes
FireSmart Landscape Zone	This zone extends beyond the FireSmart Community Zone overlapping multiple jurisdictions at a broad landscape level. This zone focuses on mitigating the likelihood of large, high intensity, high severity fires. Fire, Forest and Land Management planning are integrated and designed to reduce the negative ecological, economic and social impacts of wildfire while maximizing the positive attributes of wildfire.
FireSmart Landscapes	The philosophy that seeks to mitigate the likelihood of large, high intensity and high severity fires. FireSmart landscapes are designed to recognize the interaction between ecological, economic and social impacts, hence maximize the positive ecological impacts and minimize the negative economic and social impacts.
Floodplains	Flat land bordering a stream or river onto which a flood will spread. The underlying materials are typically unconsolidated and derived from past stream transportation activity. The extent of the floodplain varies according to the volume of water, and its 50-year-old floodplain would be defined by the largest flood that would, on average, occur once within a 50-year-period, estimated from historic stream flow records. [Dunster]
Forest Health	A condition of the forest; a forest is considered healthy if it can sustain itself to meet the specific forest land management objectives of today or in the future.
Forest Management Agreement (FMA)	A contract between the province of Alberta and the FMA holder whereby the province provides an area-based Crown timber supply. In return, the FMA holder commits to the following: Managing the timber resource on a perpetual sustained yield basis, taking into consideration a broad range of forest values in determining forest management practices. Meeting defined economic objectives, including capital investment and job creation, and seeking out new business opportunities that provide measurable economic benefits for both the

	<p>province and the FMA holder.</p> <p>The FMA gives the FMA holder the right to access Crown fibre. In return, the FMA holder commits to forest management responsibilities, which may change from time to time.</p>
Forest Management Unit (FMU)	An administrative unit of forest land designated by the Minister, as authorized under Section 14(1) of the <i>Forests Act</i> .
Forest operations	Includes all activities related to timber harvesting, including site assessments, planning, road construction, harvesting, reclamation and reforestation.
Forest operator	The timber disposition holder or person responsible for controlling harvest planning and operations in the timber disposition. It also refers to those persons working on behalf of the disposition holder while conducting forest operations.
Forest tent caterpillar	<i>Malacosoma disstria</i>
Forests Act, the	The legislative statute that authorizes the Minister to administer and manage the forested lands of Alberta.
Full Review	An evaluation of the acceptability for approval of a submitted document involving referrals to government departments, independent experts, or others as appropriate, and a risk analysis prior to Alberta granting approval to the submitting Organization.
Genetic Diversity	The genetic variability within a population or a species; the number and relative abundance of alleles. Genetic diversity can be assessed at three levels: Diversity within breeding populations, Diversity between breeding populations within any one geographic area, Diversity within the species
Grazing disposition	An authorization issued by Alberta for the purpose of domestic livestock grazing on public land (i.e., lease, license, permit, or preference quota).
Ground Rules	Standards for operational planning and field practices that must be measurable and auditable and based forest management plan objectives.
Guideline	A preferred or advisable course of action respecting land and resource management. Guidelines imply a degree of flexibility, based on administrative judgment or feasibility of applying the guideline, and are consequently not normally enforceable through legal means.
Harvest area	A specified land area with defined boundaries where timber harvesting is scheduled, or has occurred. (commonly referred to as a cut block)
Harvest Level	A volume or area of timber determined through timber supply analysis available for harvest on an annual sustainable basis within a DFA. A harvest level is not an AAC unless approved by the Minister.
Hiding cover	See “ <i>sight distance</i> .”
High-water mark	Stream course water levels corresponding to the top of the unvegetated channel or lakeshore.
Historical resource	Any work of nature or man that is primarily of value for its paleontological, archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest, including, but not limited to, the structure or object and its surrounding site.
Insects and Diseases	Biological, physiological, and environmental agents that have an adverse effect on the health of the forest. These agents include insects; nematodes; micro-organisms (viruses, bacteria, fungi); parasitic plants; mammals; birds; and non-infectious disorders caused by climate, soil, applied chemicals, air pollutants and other physiographic conditions.
Integrated resource plan	A regional plan developed by provincial government agencies in consultation with the public and local government bodies. It provides strategic policy direction for the use of public land and its resources within the prescribed planning area. It is used as a guide for resource planners, industry and publics with responsibilities or interests in the area.
Inter-block Road	Any temporary road extending through a block to reach another block. It ends at the edge of the last block connected to the road.
Jack pine budworm	<i>Choristoneura pinus</i>
Landing	Any area where logs are gathered for processing or further transport to a mill site.
Landscape	A landscape (or LMU) is a heterogeneous area in which the pattern of the mosaic of local ecosystems or land uses is repeated in similar form throughout kilometres wide area (after Forman 1986). Landscapes may coincide with a climatic, physiographic or ecological boundary. However, landscapes are not strictly ecologically based and include human use and

	modification of the area.
Large residual tree	A residual tree with a diameter measured at breast height (DBH) greater than the approximate average merchantable tree DBH of the harvest area.
Large woody debris	Woody material > 1 cm in diameter, stumps and snags < 1.3 m tall and dead trees leaning > 45 degrees. The woody material left on site after logging including both pre-existing and harvest-generated material (downed boles, limbs, tops and stumps). Includes highly decomposed and vegetated material as long as it is recognizable as woody.
Lesser vegetation	Combination of shrubs, forbs and/or grasses.
Logfill	Stream crossings constructed with logs placed in a streambed parallel to the flow of the water.
Loop road	An inter block road that connects to a primary access road at two locations.
Mature stands	Stands that have reached rotation age or have a decreasing growth rate.
Meadows	Meadows are defined on Alberta Vegetation Inventory (AVI) as HF (herbaceous - forbs), HG (herbaceous - grassland), SC (shrub closed) or SO (shrub open).
Mountain pine beetle	<i>Dendroctonus ponderosae</i>
Non-traditional access	Access with conditions on the disposition limiting its use by the public.
Noxious Weed	A plant designated under the Weed Regulation (AR 171/2001) of the Weed Control Act.
Organization	The proponent charged with developing the FMP. This may be a corporation, cooperative, or a public agency.
Partial cutting	A treatment where significantly less than 100% of the trees are harvested from a stand or area. It includes commercial thinning, even when the intention is leading to a final clearcut.
Pattern	The arrangement of forest stands or harvest units.
Permanent roads	Roads that will be in use for more than five years.
Permanent sample plots (PSP)	A fixed or variable area plot established for (forest) sampling and measurement purposes, and designed for remeasurement.
Pre-commercial Thinning	A silvicultural treatment to reduce tree density in young stands, carried out before the stems reach merchantable size. The intent is to concentrate the site's growth potential on fewer trees thereby accelerating stand development and reducing the time to final harvest, retaining more live crown, creating opportunities for future commercial thinning activities and improving stand operability.
Prescribed burn	The planned use of carefully controlled fire to accomplish predetermined management goals (e.g., site preparation for planting, reduction of fire hazards or pest problems, improvement of the ease with which the site can be traversed, and creation of better quality browse for wildlife). [Dunster]
Prohibited debris	Any flammable debris or waste material that, when burned, may result in the release of dense smoke, offensive odours or toxic air contaminants. It includes: (a) Garbage or refuse from commercial or industrial operations (b) Rubber or plastic, or anything containing or coated with rubber or plastic or similar substances (c) Used oil from internal combustion engines, hydraulic oil and lubricants (d) Motor vehicle tires.
Quota	The timber quota is a share of the allowable cut of coniferous timber within a forest management unit.
Reclamation of roads	Permanent removal of watercourse crossings; re-contouring of road crown and ditches; reseeding or planting of the former right-of-way.
Recreation Site/Forest Land Use Zones (PLUZ)	Includes areas designated by Alberta as Ecological Reserves, Wilderness Areas, Wildland Parks, Provincial Parks, Heritage Rangelands, Natural Areas, Recreation areas, and Recognized Random Camp Sites or designated trails as shown in the C5 FMP or on PLUZ maps.
Regeneration	The renewal of a tree crop by natural or artificial means. It may also refer to the young crop itself.
Regulated Forestry Professional	A Registered Professional Forester (RPF) on the Registered Professional Forester Register of the College of Alberta Professional Foresters (CAPF) or a Registered Professional Forest Technologist (RFPT) on the Registered Professional Forest Technologist Register of the College of Alberta Professional Forest Technologists (CAPFT).
Reserve	In its strictest sense, an area of land designated as being off-limits to any exploitive activities

	that might change the nature of the area. Not all reserves are so tightly controlled. [Dunster]
Residual structure	Standing structure that is taller than 3 m, within a harvested area. Areas buffered for sensitive ecological or wildlife habitat may be included for residuals. Required buffers for lakes and small and large permanent streams are not included. This includes non-merchantable trees and shrubs, live merchantable trees, snags and stubs.
Residual tree	A live canopy tree that is spatially within a harvested area. Areas buffered for sensitive ecological or wildlife habitat may be included for residuals. Required buffers for lakes, small and large permanent streams are not included.
Resources	Physical and intrinsic features of the land, including but not limited to timber, wildlife, water and soil.
Restricted Weed	A plant designated under the Weed Regulation (AR 171/2001) of the Weed Control Act.
Review	Acceptance or appraisal conducted by Alberta
Right-of-way (ROW)	A cleared area, usually linear, containing a road and its associated features such as shoulders, ditches, cut and fill slopes, or the area cleared for the passage of utility corridors containing power lines or over- or under-ground pipelines. Typically, the right-of-way is a specially designated area of land having very specific rights of usage attached. Rights-of-way may be owned by someone else. [Dunster]
Riparian area or management zone	(1) The band of land that has a significant influence on a stream ecosystem or is significantly affected by the stream. It often has specialized plant and animal communities associated with it. [Anon] (2) Terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils that exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows. The riparian zone is influenced by, and exerts an influence on, the associated aquatic ecosystem. [Dunster]
Root collar weevils	<i>Hylobius</i> spp.
Rotation	The period of years required to establish and grow even-aged timber crops to a specified condition of maturity.
Ruts	Machine depressions in the soil which are determined by depth and length: where the depth of the organic dark humus material is greater than 30 cm, a rut is a depression that shears the organic layer of soil (a sheared organic will expose a vertical face greater than 20 cm of the organic layer). Where the depth of the organic material is less than 30 cm, a rut is a depression exceeding 10 cm into the mineral soil. Length: An impacted area meeting the rut depth criteria that is greater than 4 m long. A continuous track with a rut less than 4 m because of stumps, logs or rocks lifting the vehicle will still count as a rut if the total length of the smaller holes is greater than 4 m.
Rutting/ puddling	A paste-like behaviour of wet soil when most of the soil pores are filled with water and soil literally flows from underneath the wheel to the sides and upward forming visible tire imprint into the mineral soil. Intensity/depth of rutting is directly related to the number of equipment passes. Soil is considered susceptible to rutting when it forms a stable hand cast.
Sensitive sites	Sites that have soil, water, slope, aesthetic, vegetation or wildlife characteristics that require special protection beyond the normal precautions described in the ground rules. They may be complex if many values or issues are involved.
Seral stages	A stage in succession. A series of plant community conditions that develop during ecological succession from a major disturbance to the climax stage. Most common characteristics/classifications include tree species and age.
Sight distance	The distance at which 90% or more of an adult big game animal is hidden from the view of a human. This distance may vary from one stand to another.
Silt fence	Permeable fabric barriers installed along the contour to filter surface water runoff and trap sediment from sheet or overland flow and prevent it from entering streams.
Silviculture	The theory and practice of controlling the establishment, composition, health, structure and growth of forests in order to achieve specified management objectives.

Site preparation	Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment favourable for survival of suitable trees during the first growing season. Altering the ground cover, soil or microsite conditions can create this environment; using biological, mechanical or manual clearing; prescribed burns; herbicides or a combination of methods. [Dunster]
Skid trail	An unimproved temporary forest trail suitable for use by equipment such as bulldozers and skidders in bringing trees or logs to a landing or road.
Small patch	A patch of less than 0.2 ha of undisturbed canopy forest surrounded by harvested area. The patch must be composed of at least four canopy trees. At least two of the trees in the patch should be large residual trees.
Snag	A dead tree that is taller than 2 m.
Soil Displacement	A loss of nutrient-rich organic layers, and top mineral soil as a result of harvesting activities. Bare mineral soil is susceptible to raindrop impact causing soil crusting, increased surface runoff, and erosion.
Soil disturbance	In the context of the 5% maximum allowable area within a harvest area, includes bared landing areas, temporary roads, displaced soils or ruts.
Spatial Harvest Sequence	A stand level map depicting forest stands scheduled for timber harvesting that are feasible to be operated by the organization. SHSs are generally prepared for 20 years.
Species at risk	Any species known to be “at risk” after formal detailed status assessment and designation as “Endangered” or “Threatened” in Alberta. The list of species is maintained by Alberta.
Species of management concern	Species within the forest management planning area that have an identified value (social, economic, ecological) and are managed to ensure their continued protection and/or use. This includes species that are hunted or trapped, as well as those that are endangered or threatened.
Spruce beetle	<i>Dendroctonus rufipennis</i>
Spur Road	<i>Any temporary road within the block boundary not part of the inter-block road.</i>
Stakeholders	Includes all persons with a disposition on the land as well as recognized interest groups eg. trail users, off highway vehicles, or watershed groups.
Stand	A community of trees sufficiently uniform in species, age, arrangement or condition as to be distinguishable as a group in the forest or other growth in the area. A stand may also be that polygon as defined in the AVI or Phase III inventory.
Strippings	Layers of humus-bearing topsoil and fine woody material above mineral soil that have been stripped off during road or landing construction.
Stub	A large residual tree that has been “topped off” at approximately 6 m to create an artificial snag.
Subunit	Portions of an FMU delineated by environmental, operational or watershed characteristics.
Suppression capability	The effectiveness of traditional fire suppression tactics. It is an objective evaluation of initial attack response time, access for ground support resources, water availability and terrain which might adversely impact movement of resources.
Sustainable forest management (SMF)	Management to maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social and cultural opportunities for the benefit of present and future generations.
Temporal	Of, or limited by, time. [Webster’s]
Temporary field authority (TFA)	An authority issued under Section 19 of the Public Lands Act by an Alberta officer to grant short-term land use activities on public land in the White or Green Areas. The TFA may or may not be related to an existing disposition that has also been issued under the Public Lands Act. The concept is to provide field-level service to an applicant, with access to public land for a specific purpose/use/activity, for a term of less than or equal to one year.
Temporary road	Roads that are part of a harvest area or that connect harvest areas, and are built, used and reclaimed before expiry of the Annual Operating Plan (AOP) or reclaimed within three years of construction.
Thermal cover	Generally, an area of at least 10 ha having a coniferous canopy at least 10 m in height, with at least 70% crown closure and a minimum width of 200 m. This cover is used by animals to assist in their temperature regulation during extreme weather conditions.
Timber disposition	Licenses and permits that allow forest operators to harvest from Crown lands.

Timber Management Regulation	The legislative statute that describes the mechanism and regulations by which the forested lands of Alberta are managed. The Regulation is associated with the Forests Act.
Timber Operations	Includes all activities related to timber harvesting including site assessments, planning, road construction, harvesting, reclamation and reforestation.
Timber supply analysis (TSA)	Calculations/computer models with built-in assumptions regarding forest growth patterns, used to determine the annual allowable cut (AAC).
Timing constraints	A restriction or limitation on when an activity may be carried out.
Trapper	Holder of a trapping license.
Understorey	The trees and other woody species growing under the canopies of larger adjacent trees and other woody growth. [Dunster]
Unstable slope	Slopes of loose or poorly consolidated materials beyond the angle of repose, geological features having a high probability of failure, or soils that will not support loads.
Utilization	The portion of the stand or individual tree used for manufacture of wood products, defined in terms of piece length and diameter at each end. Minimum standards for utilization are defined in the timber disposition.
Validated work (Validation)	Work that has been prepared by, or reviewed and approved by an RFP. These professionals are subject to an enforceable code of ethics and standards of practice and are expected to complete their work with due diligence to ensure such work is accurate. The RFPs who validate the work may have done the work themselves, contracted the work to be done, or supervised those who did the work, but in any case, the validating RFPs are accountable for the work being prepared with due diligence and being accurate. If more than one RFP is involved in preparing the work, the RFP that is most directly involved in the work is to validate the work.
Values at risk	A listing of values which may be at risk of being reduced by wildfire. In order to complete a spatial “priority” evaluation, information regarding values is required.
Variance (SHS)	Any deletion to a stand scheduled in the spatial harvest sequence. Additions to stands identified in the spatial harvest sequence are not considered variance but are tracked in section 4.1 of the ground rules.
Viable understorey	Trees of desirable merchantable species that are windfirm and of sufficient vigour that they will continue to grow after harvest.
Water source area	That portion of a watershed where soils are water-saturated and/or surface flow occurs and contributes directly to streamflow. The area of saturated interflow associated with a stream.
Watercourse	The bed, bank or shore of a river, stream, creek or lake or other natural body of water, whether it contains or conveys water continuously or intermittently.
Watercourse Crossing Types	A structure inserted into or over the channel of a watercourse that allows access over the watercourse. Acceptable crossing types are listed in Section 11.4.
Watershed	An area of land, which may or may not be under forest cover, that drains water, organic matter, dissolved nutrients and sediments into a lake or stream. The topographic boundary, usually a height of land, that marks the dividing line from which surface streams flow in two different directions. [Dunster]
Western gall rust	<i>Endocronartium harknesii</i>
Wildlife	Any species of amphibian, bird, fish, mammal and reptile found in the wild, living unrestrained or free roaming and not domesticated. Some definitions include plants, fungi, algae and bacteria. [Dunster]
Wildlife corridor	A strip of forest with a minimum width of 100m that connects two forested areas.
Wildlife zone	As defined on Fish and Wildlife Referral Maps.
Windfirm	The ability of a tree or stand of trees to remain standing post harvest.
Yield Curve	Graphical representation of a yield table.

List of Initialisms

AAC	Annual Allowable Cut
AF	Alberta Agriculture and Forestry
AOP	Annual Operating Plan
ARS	Alternative Regeneration Standard
ARIS	Alberta Regeneration Information System

AVI	Alberta Vegetation Inventory
CA	Compartment Assessment
CAPF	College of Alberta Professional Foresters
CAPFT	College of Alberta Professional Forest Technologists
CNT	Connotative Notation
CT	Commercial Thinning
CTPs	Commercial Timber Permits
DHAP	Detailed Harvest Area Plan
DFMP	Detailed Forest Management Plan
DLO	Department License of Occupation
DRS	Departmental Reserve
DTPs	Deciduous Timber Permits
EFR	Environmental Field Report
FGL	Forest Grazing Lease
FERIC/FP Innovations	Forest Engineering Research Institute of Canada
FHP	Forest Harvest Plan
FMA	Forest Management Agreement
FMP	See definitions - Forest Management Plans (generic)
FMU	Forest Management Unit
FPPA	Forest and Prairie Protection Act
FWMIS	Fish and Wildlife Management Information System
GDP	General Development Plan
ILM	Integrated Landscape Management
IRP	Integrated Resource Management Plan
LFS	Land and forest Service
LOC	License of Occupation
LSAS	Land Status Automated System
NSR	Not Satisfactorily Restocked
OGRs	Operational Ground Rules
PCT	Pre-commercial Thinning
PNT	Protective Notation
PSPs	Permanent Sample Plots
QAC	Quadrant Allowable Cut
RFMA	Registered Fur Management Areas
RFP	Regulated Forestry Professional
ROW	Right of Way
RPF	Registered Professional Forester
RPFT	Registered Professional Forest Technologist
SHS	Spatial Harvest Sequence
STIAA	Seed and Tree Improvement Association of Alberta
TFA	Temporary Field Authority
TMR	Timber Management Regulation made under the Forests Act
TSA	Timber Supply Analysis

Appendix 5 – FHP/AOP CHECKLISTS

Forest Harvest Plan Checklist - Revised January 2016				
Area _____	Disposition Number _____			
Company _____	Date Disposition Issued _____			
Submission Date _____	Date Disposition Expires _____			
APPROVAL ITEM	Yes/No (Company)	INITIAL/DATE (Agriculture and Forestry (AAF))		
1) Has the FHP been validated by an RFP?				
2) Is the Planned SHS Variance <20% compartment/decade?				
3) Is the sum of proposed area to harvest and previously harvested area (since SHS approval) less than or equal to 100% of the SHS area?				
4) Is a Compartment Assessment required?				
5) Does the FHP adhere to all Ground Rules?				
A. Administrative Considerations				
<ul style="list-style-type: none"> • Has a copy of the FHP been provided to: <ul style="list-style-type: none"> - Area Forester? _____ - Forest Officer? _____ - Fish & Wildlife? _____ - Other? _____ • Is the FHP consistent with approved higher order plans (DFMP, SHS, GDP)? _____ • Has the required disposition been issued and is active? _____ • Is the FHP complete and legible? <ul style="list-style-type: none"> - maps _____ - block tables _____ - detailed harvest area plans (DHAP) where requested or required _____ - contingency plans _____ 	Company (Y,N,N/A)	Company Comments (optional)	AAF (Y,N,N/A)	AAF Comments (optional)
B. Utilization				
<ul style="list-style-type: none"> • Has the SHS variance been reported and summarized for the FHP? _____ • Does the utilization standard match tenure document? _____ • Are the deviations from utilization standards identified, explained and justified (rub posts, high stumps, retention, etc)? If there are no deviations, enter N/A. _____ 				
C. Ground Rule Deviations - Complete if answered "NO" to Approval Item #5 (top of page), otherwise enter N/A				
<ul style="list-style-type: none"> • Have all the blocks containing ground rule deviations been identified? _____ • Has an explanation and justification been provided for all ground rule deviations? _____ 				
D. Integration with Other Users.				
<ul style="list-style-type: none"> • If the plan is not integrated, has an explanation and justification been provided? _____ • Has the recipient of incidental volumes and chargeability been identified? If there are none, enter N/A. _____ • Have all the effected trappers been identified and contacted? If there are none, enter N/A. _____ • Have known trapper cabins, trails and other improvements been identified and integrated into the plan? If there are none, enter N/A. _____ • Have known recreational groups been identified and contacted where issues have been observed? If there are none, enter N/A. _____ • Has a GTA been completed and grazing disposition holders been contacted (Directive SD 2011-03)? If there are none, enter N/A. _____ • Have the required historical resource assessments been completed and, if necessary, integrated into the plan? _____ • Have all issues raised by other users or the public regarding this plan been documented? If there are none, enter N/A. _____ • Have potential land use conflicts been documented and mitigated (PNT, CNT, road use agreements, etc)? If there are none, enter N/A. _____ 	Company (Y,N,N/A)	Company Comments (optional)	AAF (Y,N,N/A)	AAF Comments (optional)
E. Access Management (temporary access only)				
<ul style="list-style-type: none"> • Have access management measures been described and identified (location, timing, signage, etc)? If there are none, enter N/A. _____ 				

F. Sensitive Sites			
· Have aesthetic/recreation concerns been addressed? If there are none, enter N/A.	_____	_____	_____
· Have water source areas been identified and potential impacts mitigated? If there are none, enter N/A.	_____	_____	_____
G. Road Design			
· Have the location, design and width of temporary road corridors been identified? If there are none, enter N/A.	_____	_____	_____
· Has a list of watercourse crossings including watercourse classification been provided? If there are none, enter N/A.	_____	_____	_____
· Have any crossings not exempt under the <i>Water Act</i> been identified? If they are all exempt, enter N/A.	_____	_____	_____
· Have existing access/DLOs which have been integrated into the plan been identified on the map? If there are none, enter N/A.	_____	_____	_____
H. Wildlife			
· Have wildlife zones within the planning area been identified and incorporated into the plan (as per OGR Section 7.7)? If there are none, enter N/A.	_____	_____	_____
· Have blocks with timing restrictions been identified? If there are none, enter N/A.	_____	_____	_____
· Have all known sensitive wildlife sites been addressed (mineral licks, raptor nests, den sites, etc)? If there are none, enter N/A.	_____	_____	_____
I. Insect, Disease & Fire			
· Does the FHP comply with direction provided in Community Firesmart Plans? If there are no plans, enter N/A.	_____	_____	_____
· Have known insect and disease infestations been identified and described? If there are none, enter N/A.	_____	_____	_____
· Have mitigation strategies for infestation, diseases or endangered timber been described? If there are none, enter N/A.	_____	_____	_____
· Have debris disposal methods been identified?	_____	_____	_____
J. Silviculture			
· Have any watercourse crossings that will be maintained for silviculture purposes been identified? If there are none, enter N/A.	_____	_____	_____
· Has a pre-harvest strata declaration been included for each opening?	_____	_____	_____
<p>-FHP's are approved through acceptance and will be considered approved on the date Alberta acknowledges receipt of the work. -Alberta shall notify the organization by acknowledging receipt within 5 working days of submission. -The notification date will be documented by Alberta as the start date for FHP approval. -Alberta shall periodically check the work and supporting documentation to verify its accuracy. -At any time, approval can be revoked where Alberta learns the FHP is inaccurate or deficient in content.</p>			

Company Validation		
_____	_____	_____
Submitting RFP Validation	Company	Date

AAF Validation	
_____	_____
Reviewing RFP Validation	Date

Note: This Checklist should reflect regional or FMA Operating Ground Rules - this is a template.
Note: Appraisal of the FHP is required if "No" has been indicated on any of the above Approval Items.

Annual Operating Plan (AOP) Checklist - Rev. January 2016

Area	_____	Volume Summary (m3)	Conifer	Deciduous
Company	_____	Quadrant Allowable Cut	_____	_____
Disposition Number	_____	Quadrant Production to date	_____	_____
Date Disposition Issued	_____	Quadrant Volume Remaining	_____	_____
Date Disposition Expires	_____	Proposed Production (AOP year)	_____	_____
Submission Date	_____			

APPROVAL ITEM	YES/NO (Company)	INITIAL/DATE (Agriculture and Forestry (AAF))
Validated by RFP		
AOP has an approved FHP(s)		

	Company (Y,N,N/A)	Company Comments (optional)	AAF (Y,N,N/A)	AAF Comments (optional)
Administration				
<ul style="list-style-type: none"> Have digital copies of AOP been provided to: <ul style="list-style-type: none"> - Area Forester - Forest Officer - other Have any FHP conditions been addressed? If there are none, enter N/A. Is the Company requesting dues relief with an explanation and justification? Has an Opening update verification been submitted - all blocks logged in the previous year cross referenced against the ARIS report? Have any amendments to AOP components been submitted and justified (reforestation program, GDP, FHP) 	_____	_____	_____	_____
Operating Schedule (as per section 3.5.4 c)				
<ul style="list-style-type: none"> Has a table been submitted for all blocks scheduled for harvest including area & volume by species with totals? Has a list of temporary roads proposed for construction, maintenance & reclamation including watercourse crossings to be built or installed or removed/maintained been provided? Has a declaration of outstanding operational items, or an agreement with Alberta on reporting of outstanding operational items been provided? Have outstanding operations been identified (debris disposal, hauling, clean-up, reclamation, etc)? Are requested amendments to any AOP components explained (reforestation program, road plan, etc)? 	_____	_____	_____	_____
Applicable Forest Harvest Plans (as per section 3.4)				
<ul style="list-style-type: none"> Do all blocks included in the AOP have FHP approval? 	_____	_____	_____	_____
Reforestation Program (as per section 8.2)				
<ul style="list-style-type: none"> Is the proposed silviculture treatment schedule provided? Are summaries of stratum declarations, stratum changes, final stratum, QAC adjustments provided? Proposed blocks are listed for declaration in lieu of survey & re-treatment Are seed inventories sufficient as per FGRMS manual section 11.2 or otherwise approved by AAF? 	_____	_____	_____	_____
Wildfire Protection (as per section 7.3)				
<ul style="list-style-type: none"> Is the Forest Protection Supplement complete and provided? 	_____	_____	_____	_____
Road Plan (as per section 11.2)				
<ul style="list-style-type: none"> Are all roads scheduled to be built under authority of the AOP planned to have a lifespan of <= 3 years? Is a table tracking the status of all non DLO roads over two years old submitted? Are all required watercourse crossings documented in the monitoring program as per section 11.4.26? 	_____	_____	_____	_____
General Development Plan (as per section 3.3)				
<ul style="list-style-type: none"> Has a summary of variance as per section 4.1 been provided? Has a summary of volume supply by area been provided? Has an DLO road construction and reclamation schedule been provided? Has a GDP schedule & map as per section 3.3.5 been provided? Have consultation activities been completed as per the First Nations Consultation Guidelines? 	_____	_____	_____	_____

Company Sign Off		
_____	_____	_____
Submitting RFP Validation	Company	Date

AAF Sign Off	
_____	_____
Reviewing RFP Validation	Date

Note: The AOP shall be appraised by Alberta in accordance to the AOP checklist, with approval subject to the outcome of the appraisal.

Appendix 6 – Directive 2006-04



Forest Management Branch Directive

Directive No.	2006-04	Date	May 1, 2006
Subject	Timber and Reforestation Operations Monitoring		
Purpose	<p>To clearly outline the requirements for reporting of forest operations by the forest industry to the Department. The intent is to make reporting expectations clear and provide certainty to both the forest industry and the Department.</p> <p>To establish a common understanding between Public Lands and Forests Division (PLFD) and industry field staff that monitor forest operations to ensure expectations are clear regarding interpretation of field standards outlined in timber harvest planning and operating ground rules.</p>		
Policy	<p>FMA holders and quota holders ("forest companies") who harvest more than 30,000 m³/year under tenure are to report their forest operations for compliance with timber harvesting ground rules and the approved Annual Operating Plan.</p> <p>Reforestation activities are reported through the reforestation program of the company Annual Operating Plan, and submitted electronically to the Alberta Regeneration Information System by May 15 annually, as per the protocols in the <i>ARIS Industry Operations Manual</i>.</p> <p>Forest company timber operations and reforestation reports will be validated by a Registered Forest Practitioner.</p> <p>Variation from this policy or procedures must be approved by the Executive Director of Forest Management Branch.</p>		
Procedure	<p><u>Forest Company Reporting</u></p> <p>Reporting the status of active timber operations on a regular basis is a mechanism of timely communication between the forest company and PLFD. Periodic reporting also allows PLFD to focus monitoring efforts at appropriate stages of forest operations. Forest companies will report on the status of active timber operations (by disposition or FMA compartment) on a schedule agreed between the forest company and PLFD 'home' Area Manager. The minimum reporting timeframe is monthly. The minimum required information in such reports is outlined in the reporting template in Appendix 1. A summary report in this format will be submitted to PLFD at the end of the timber year (by May 1 annually).</p> <p>Variation from this form is acceptable, if approved by the 'home' PLFD Area Manager, and if the same information is provided as with the template in Appendix 1.</p>		

Most forest companies keep a record of their monitoring activities on cutblocks as part of existing self-reporting agreements with the local PLFD Area office or documentation requirements related to forest certification. Operational items requiring field review by the forest company are defined in the applicable timber harvest planning and operating ground rules. The minimum information for inspection of each cutblock is outlined in the form in **Appendix 2**. Variation from this form template is acceptable, if approved by the 'home' PLFD Area Manager, and if the same minimum information is provided. The completed cutblock inspection form must be made available to PLFD staff on request for PLFD inspection and monitoring purposes.

Variances to ground rules and the approved Annual Operating Plan must be reported to the PLFD Area office immediately (within 48 hours) upon discovery. Explanation of the details on items of variance from approved AOP or ground rules (and documentation on the cutblock inspection form) is necessary. Potential non-compliance 'incidents' must be documented on the cutblock inspection form and through phone call, fax, or e-mail explaining:

- 1) What happened and why
- 2) How the incident has or will be actioned
- 3) Preventative measures to avoid similar incidents in the future
- 4) Notification to other government agencies (ie. Alberta Environment) depending on variance issue.

Forest Operations Monitoring

PLFD staff will periodically monitor industry forest operations and verify inspection information received.

The frequency of PLFD field inspections to verify company reports will be determined according to risk-rating protocol assessed for the timber disposition or FMA operating area.

A pre-operations meeting and/ or a joint field inspection shortly after operations commence should occur between the PLFD inspecting officer and forest company supervisor. The purpose of the meeting or joint-inspection is to establish a common understanding regarding field operations expectations in relation to the ground rules and the approved AOP.

Definitions **Skid Clearance** – Phase in harvest operations where all merchantable timber felled has been transferred or ‘skidded’ from the stump to decking sites or landings for further processing and hauling. Date of skid clearance is critical in that it establishes the year in which the reforestation clock starts.

Final Clearance – Phase in harvest operations where the cutblock is complete, merchantable timber has been hauled, variance from ground rules or the approved Annual Operating Plan has been addressed, and reclamation (including interior block roads) is complete unless partial reclamation is necessary for future access.

Reclamation – Seasonal, partial, and total reclamation defined in the ground rules.

Authorities **Section 100 (b) Timber Management Regulation and Forest Management Agreements** – requirements to comply with timber harvest planning and operating ground rules as a standard condition in licences and permits issued, and in FMA documents. Reporting of operations is a requirement in ground rules.

Forests Act 29 (1) and Section 143.2 Timber Management Regulation – requirements to report reforestation operations.

Contacts Scott Milligan, Manager, Harvesting & Renewal Section (780) 422-0672
Jamie Bruha, Senior Forester, Timber Operations, HRS (780) 415-8561

Approved _____
D.(Doug) A. Sklar
Executive Director
Forest Management Branch

Appendix 1 – Monthly Reporting Form

<i>Date Submitted</i>		{Insert Forest Company Name Here}						
<i>Name of Submitting RFP and RFP #</i>								
<i>Name of field inspector (if different from above)</i>								
<i>Disposition/ Operating Unit</i>								
Block / Road #	Approval Date (AOP approval or amendment date)	Cutblock Status (check one)			Road Reclamation Status (check one)			Variance from AOP? If yes, describe in comments referencing specific block or road
		In Progress	Skid Clearance	Final Clearance	Seasonal	Partial	Total	
Comments:								

Appendix 7 – External Information Letter 2010-02 Fescue Grassland Information Letter – Principles for Minimizing Surface Disturbance

External



Lands Division
Rangeland Management Branch
Updated March 23, 2010

Information Letter 2010-02

Foothills Fescue Grassland Principles for Minimizing Surface Disturbance

Purpose

The purpose of this Information Letter is to minimize the surface disturbance of foothills fescue (*Festuca campestris*) grasslands. Alberta Sustainable Resource Development (SRD) has placed Protective Notations (PNT) on specified public lands known to include foothills fescue grassland. The location of public land parcels with Protective Notation can be determined by SRD Land System Automated Search.

The purpose of the PNT is not to restrict development but to alert industry to the environmental and economic risk. This Information Letter identifies the expectations for planning and development standards through key development principles for all potential surface disturbance related activity in foothills fescue grasslands. Potential surface disturbance related activity is defined to include all development activity that requires surface soil disturbance. This includes but is not limited to:

- oil and gas development including geophysical exploration;
- mineral exploration and development, including mines, quarry pits and associated infrastructure;
- forest industry timber extraction infrastructure;

- transportation infrastructure, including burrow pits;
- electric energy transmission lines and associated infrastructure;
- renewable energy development and associated infrastructure;
- communications related development and infrastructure;
- road access through public land for country residential development;
- recreational facilities and associated infrastructure;
- range improvement infrastructure required for livestock production.

The background document entitled: ***Industrial Activity in Foothills Fescue Grasslands, Guidelines for Minimizing Surface Disturbance*** is designed to alert industry to the sensitivities of foothills fescue grasslands within a multiple resource valued landscape; where land use practices must be carefully integrated. It details why they are particularly sensitive to surface soil disturbance with limited potential for restoration success.

As our knowledge increases, this information will be further expanded and updated in a comprehensive companion document to support this information letter.

Government
of Alberta ■

Key Development Principles

These principles have been developed from minimum disturbance practices in native prairie grasslands and the emerging concepts of Integrated Land Management (ILM).

- 1) Early notification and consultation with the SRD Public Land Management Specialist responsible for the area is required prior to entry for survey.
- 2) The foothills fescue grasslands are susceptible to invasion by non-native plant species such as smooth brome, timothy, Kentucky bluegrass and weeds. Invasion can occur within soil disturbances, with the added potential to spread off site. Risk assessment during the planning process, minimizing surface soil disturbance, implementing control measures and post development monitoring are required to reduce the impact of non-native plant species invasion.
- 3) The key guiding principle is **avoidance** of foothills fescue grassland. Avoidance is accomplished by siting development within or adjacent to existing man-made disturbances or non-native cover areas. Avoidance is achieved through knowledge of the location and ecological status of foothills fescue plant communities. The site selection team is expected to include qualified rangeland professionals and experienced industrial construction personnel.
- 4) Industry is expected to consult the principles outlined in ERCB Information Letter IL2002-1 **Principles for Minimizing Surface Disturbance in Native Prairie and Parkland Areas**. Although the IL and guidelines were developed specifically for the petroleum industry, the principles and guidelines are applicable to all surface disturbance related activity proposed for foothills fescue grasslands.
- 5) Foothills fescue grasslands are located within more complex land forms than other native prairie grasslands. Industry is expected to take advantage of new technologies designed to reduce surface disturbance. Evaluating the success of new technology is essential to determining the most appropriate methods for reducing surface soil disturbance in foothills fescue grasslands.
- 6) Detailed development plans are required in digital and spatial format (shape files) to facilitate integrated land management within SRD. These plans must consider the footprint of the project's full development potential early in the planning process and the surface disturbance required for the desired outcome. Integrated access management plans, developed in consultation with other area land use stakeholders, are required to reduce the impact of multiple land use activities. These principles are required for energy developments in ERCB IL93-9.
- 7) Foothills fescue grasslands play a significant role in the storage and release of groundwater resources. The engagement of a suitably qualified hydro-geologist in the development planning process is recommended.
- 8) Onsite environmental inspection by suitably qualified environmental professionals is recommended during development activity to ensure environmental protection measures are communicated, understood and implemented.
- 9) Timing of disturbance related activity is a key factor in reducing the impact to foothills fescue grasslands. Disturbance related activity should be planned to occur after the growing season, and must occur under suitably dry or frozen soil conditions.
- 10) Detailed restoration plans are required for all surface soil disturbances. The plans must include comprehensive monitoring and maintenance programs. Industry should be aware that the restoration of foothills fescue grassland requires considerable economic investment and long term commitment.

Further information:

ERCB Information Letter IL 2002-1 **Principles for Minimizing Surface Disturbance in Native Prairie and Parkland Areas** and ERCB Information Letter IL 93-9 **Oil and Gas Developments Eastern Slopes (Southern Portion)**<http://www.ercb.ca>. Click on Industry Zone > Rules, Regulations and Requirements.