WOODLOT LICENCE W1832 SITE PLAN

This Site Plan is consistent with high level plans. No FDP covers this site plan therefore; few elements that would normally be covered under a FDP have been incorporated into this site plan in order to comply with WLFMR.

Woodlot Licence	**W1832**	Cutting Permit	**B**	Block	**1**	Opening #	
Total Area (ha)	**55.4**	Net Area to be Reforested (NAR) (ha)	**46.3**	Non-Productive - Natural (ha)	**2.0**	Non-Productive - Un-Natural (ha)	**3.9**
Area of Reserve (ha)	**3.2**	Type of Reserve	Wildlife tree patches	Air Photo #s	BCC98051 #174-175		
Harvest Method	SU 1: Ground Based with random/dispersed skidding to pre-identified trails. SU2: Ground based by directionally falling trees away from this SU and avoiding any machinery within this SU due to high compaction hazard. Alternative to SU 2: Ground based on dry to moist or frozen soils conditions or suitable snowpack.						
Silvicultural System	SU 1: Clear cut with reserves SU 2: Clear cut with reserves						
Comments:	Cut block greater than 40 ha: as per the OSPR 11(3)(b)(i)(A) block size is greater than 40 ha in order to recover timber that is damaged or imminent risk to be damaged by mountain pine beetle. In addition, cutblock incorporates the following structural characteristics of natural opening: irregular block boundaries to create an irregular forest edge, retention of variety of tree species (other than Pl) and high quality of wildlife tree patches. The forest in SU 1 is a variable density lodgepole pine stand on benched terrain with a low component of Douglas-fir and larch. The stand regenerated following the 1912 fire. A combination of sanitation, salvage and mountain pine beetle host removal will be completed in SU 1. Consequently, all lodgepole pine stems in SU 1 will be removed. This lodgepole pine forest has been severely infested by mountain pine beetle since 2002. Current lodgepole pine mortality levels are approaching 80% in most of SU 1. The stand contains a variable component of Douglas-fir and larch stocking. Density ranges form nil to 20 stems per hectare. All live trees other than Pl will be retained for wildlife trees and visual management, except where retention is impossible for operational reasons and except for stems with a low diameter to height ratio which will become more prone to blowdown following the reduction in canopy closure. The forest in SU 2 is a classic mesic site Kootenay Mix stand found along the streams and ephemeral streams in this block. The main forest canopy regenerated following fire in 1912, and is composed of Douglas-fir, red cedar, lodgepole pine, and aspen. A combination of sanitation, salvage and mountain pine beetle host removal will be completed in SU 2. Consequently, all lodgepole pine stems in SU 2 will be removed. This lodgepole pine forest has been severely infested by mountain pine beetle since 2002. Current lodgepole pine mortality levels are approaching 80% in most of SU 2. SU 2 contains a variable component of red cedar, Douglas-fir and aspen stocking. All live trees other than Pl will be retained for wildlife trees and visual management, except where retention is impossible for operational reasons and except for stems with a low diameter to height ratio which will become more prone to blowdown following the reduction in canopy closure. Machine traffic in SU2 will be minimized, but where required, skid trials will cross SU2. The location where skid trail cross SU2 will be identified prior to trail construction. In most cases, the skid trail will cross at a narrow point in SU 2. Creek channels will be re-established and cleaned of logging debris at these crossing points following harvesting.						

SU	NAR (ha)	Biogeoclimatic Ecosystem Classification			Regeneration Method	Preferred Species	Acceptable Species
		Zone	Variant	Site Series			
1	41.8	ICH	mw2	03	Planting	Pl, Fd, Lw	Pw, Cw, Hw
2	4.5	ICH	mw2	$01^{(90\%)}/05^{(10\%)}$	Planting	Pl, Fd, Lw, Sx, Cw, Hw	Pw, At, Ac, Ep

Comments:	Deciduous stocking in SU2 is not a management goal, but accepting deciduous stems recognizes the current presence of deciduous tree species in this harvest area, and the high biodiversity and wildlife habitat value of deciduous species.
Elevation range if planting is Fd, Lw, Cw, Hw, Pw, At, Ac, Ep specified	1185 to 1440 meters

SU	Regen Date (yrs)	FG Date (yrs)	MITD (m)	TSS (sph)	MSSpa (sph)	MSSp (sph)	Maximum Density (sph)	Post Spacing Density (sph)	Min. FG Ht by Species		Crop Tree to Brush %
									Species	Ht (m)	
1 & 2	Planted : 4y Natural: 7y	15	Planted: 1.5 Natural: 2.0	1200	700	600	10000	2000	Pl, Pw, Lw Fd other	2.0 1.4 1.0	150

PERMANENT ACCESS STRUCTURES

Rationale for greater than 7% of the total cutblock area being occupied by permanent access structures:

The complex skidding pattern required to access this oddly shaped block while avoiding skidding through riparian management zones requires a higher than usual length of road and number of landings per hectare of harvested area.

Roads	Length	1875m	Width	15m	Area	2.8 ha	
Landings	Number:	5	Length	50 m	Width	25 m	Area 0.6 ha
Small Decking Areas	Number:	8	Length	40 m	Width	15 m	Area 0.5 ha
Skid/Forwarder Trails	Length	m	Width	3 m	Area	ha	

Total Cutblock Area (ha)	55.4ha	**Total Area of Permanent Access (ha)**	3.9ha	**Maximum % of the Total Cutblock Area to be occupied by Permanent Access Structures**	7.0%

Trails that will be used for repeated harvest entries are proposed as permanent access structures.	No
Roads, landings, borrow pits, or quarries within this cutblock are proposed for rehabilitation.	No

REHABILITATION MEASURES

Describe the structures to be rehabilitated as well as the measures and timing for rehabilitation if the measures in the WLFMR **will not** be used

Structures	Rehabilitation of all excavated or bladed trails is planned except where the cumulative impact of getting the larger machine (excavator) to the rehab site will be greater than the impact of the initial bladed trail. (The small excavator available to rehab the bladed trails has a track base of 2.7 meters, whereas the small cat used for skidding has a track base of 2.0 m)	**Measures and Timing**	As per WLFMR and within a year following completion of harvesting.

SOIL DISTURBANCE SU 1

Maximum Percentage of the Net Area to be Reforested to be occupied by Soil Disturbance: 12% of NAR

Rationale for greater than 5% of the NAR being occupied by soil disturbance:

A combination of terrain features, block shape, and non-timber management objectives leads to increased soil disturbance in this block:

- The dendritic block boundary follows tongues of timber into mesic swales between rocky, non-productive terrain. This boundary design will reduce the visual impact of the harvesting. A separate trail is required to access each narrow swale, but the ratio of area to be reforested to trail length is lower than for the rest of the block. This increases the proportion of NAR affected by soil disturbance.
- To protect water resources, skid trails will be designed to minimize the crossings of ephemeral creeks and subhygric sites, and to facilitate falling and yarding away from these locations. This will result in more riser trails than would be required on a site without ephemeral creeks, and in a greater proportion of the NAR affected by soil disturbance.
- The dendritic block shape, which is dissected by ephemeral creeks, wetland areas, and retained timber patches, will require 5 full sized landings and 8 smaller decking areas to log. A simple, square block of the same area, on a site without impediments to skidding patterns, would require only 4 large landings. This increases the proportion of NAR affected by soil disturbance.
- In summary, this block is subdivided into a number of small, discreet operating units by natural features: creeks, wetlands, rock ridges, and slope breaks. Each operating unit requires a separate skid trail network, serviced by haul roads and appropriate landings. The complex transportation system results in an expected 12% soil disturbance in the Net Area to be Reforested.

Compaction Hazard	Low	Erosion Hazard	Low	Displacement Hazard	Moderate

SOIL DISTURBANCE SU 2					
Maximum Percentage of the Net Area to be Reforested to be occupied by Soil Disturbance: 5% of NAR					
Rationale for greater than 5% of the NAR being occupied by soil disturbance: N/A					
Compaction Hazard	**High**	**Erosion Hazard**	**Low**	**Displacement Hazard**	**Moderate**

EXCAVATED OR BLADED TRAILS				
Cutbanks into Mineral Soil	Maximum Ht. (cm)	90 cm	The equipment to be used for trail construction if other than excavator	Cat and/ or excavator
	Average Ht. (cm)	50 cm		

Approximate location where the trails will be built

- Known major bladed trails are shown on the site plan map. Dispersed excavated or bladed trails will also be constructed to move between small benches throughout the block. Trails in these locations cross 40% to 50% slopes to reach mountain pine beetle infested areas on moderately sloped terrain. Rehabilitation of all excavated or bladed trails is planned except where the cumulative impact of getting the larger machine (excavator) to the rehab site will be greater than the impact of the initial bladed trail. (The small excavator available to rehab the bladed trails has a track base of 2.7 meters, whereas the small cat used for skidding has a track base of 2.0 m). Potentially only minor segment of excavated or bladed trails will not be rehabilitated but will be deactivated.
- Deactivation measures will be implemented following harvesting operation. Bladed trails will be left in a stable and maintenance free condition. Trails will be waterbarred and cross ditched as required to reestablish and maintain natural drainage patterns.

If within a Community Watershed	Soil Erosion Hazard	Low	Risk of Sediment Delivery to Stream	Low

WILDLIFE TREE STRATEGY	
Selection Criteria	**8% must be retained, patches and/or single trees (Fd, Lw, Cw)**
Level of Retention	The woodlot 1832 is covered by a "Comprehensive Plan for Wildlife Tree Retention for WL1832" dated August 2002. Further designation of Wildlife Tree Patches is not required. However, the large forested wetland along the western edge of the block is exceptionally valuable wildlife habitat, and will be made into a designated Wildlife Tree Patch as will several smaller wet areas within the block. In all, 3.2 ha of wildlife tree patches are designated within this harvest area. In addition, single tree retention throughout the block will contribute to the wildlife tree habitat. All residual trees will be left as full cycle trees contributing to the future wildlife tree and coarse woody debris needs.

MEASURES FOR COARSE WOODY DEBRIS

Current CWD ground cover is low and contributes to 1 to 5m^3/ha. Little CWD from the pre-1912 stand survives, and some second growth trees (mainly Pl) have died to contribute to the current CWD levels. The diameter range for the existing CWD is 10cm to 30cm. The objective is to increase existing CWD by avoiding broadcast burning treatment and leaving all non-merchantable logs on site. Where post-harvest CWD levels are excessive and create a fire hazard, the first option will be to scatter CWD pieces throughout the harvest site to create a more even distribution. A second option will be to machine pile excessive CWD and burn those piles in order to reduce fire hazard. Larger pieces of CWD should be retained as dispersed pieces rather than piled, as larger pieces are deficient. The anticipated average volume per hectare of CWD will range between 1 to 10 m3/ha with piece sizes ranging from 10 to 40cm.

Large trees retained after harvesting will be available for future CWD inputs. All residual trees will be left as full cycle trees contributing to the future wildlife tree and coarse woody debris needs

KNOWN UNGULATE WINTER RANGE

Post harvest stand structure or description of trees to be removed

There is no Known Ungulate Winter Range covering the area of this plan. However, ungulate forage areas are found throughout the block in areas with deciduous shrub layers. The following measures will maintain ungulate range values:

- Some deciduous shrubs (maple, birch and willow) will be slashed during logging. The new growth will provide ungulate browsing opportunities.
- The large wildlife tree patch in the block will provide ungulate habitat and forage for the foreseeable future.

FOREST HEALTH	
Mountain pine beetle	Approximately 80% of the Pl stems included in this block has been infested with mountain pine beetle within the last three years.
Measures:	The block is located over the majority of the mountain pine beetle infested area located in the SE corner of the woodlot. Sanitation, salvage and removal of residual susceptible hosts will be completed; consequently all Pl stems will be removed within the block. Allow for removal of currently infested mountain pine beetle trees within one tree length outside the block boundaries.
Root rot	There is a root rot center located along the western boundary adjacent to a small wetland
Measures:	The root rot center is included in a wildlife reserve zone and harvesting operations will avoid the root rot center.

RIPARIAN MANAGEMENT					
Riparian Class of Feature	S6	**Designation on Map**	"Stream S6"	**Falling and/or Skidding or Yarding Across a Stream**	**Yes**
Post Harvest Stand Structure	All tree species other than lodgepole pine growing within a 10 meter buffer around each watercourse and wetland will be retained. Post harvest density will range from 0 to 24 m^2/ha of basal area. The average basal area retention will be 6 m^2/ha.				
Comments:	Most of the streams included in the block are ephemeral or permanent none-classified watercourses (NCD) with the exception of three watercourses classified as S6. One of the classified S6 is Holt Creek which is a tributary to Dumont Creek. None of the watercourses are fishbearing streams. A non-classified wetland is located on the Western boundary of the block. No riparian management zone is required under the Forest Practices Code around the wetland, however, there will be a 10m riparian management zone around the wetland.				
Trees to be Retained	**Species**	Fd, Lw, Cw, Hw, Pw, At, Ac, Ep			
	Characteristics	25 to 30m tall ranging from 10 cm to 50 cm dbh			
	Function	Maintain channel stability			
Minimum	**Basal Area (m2/ha)**	**0**	**or**	**Trees/ha**	**or** **Number of Trees**
Harvesting is proposed in the RMZ of an S4, S5 or S6 stream that is a direct tributary to a known temperature sensitive S1, S2, S3 or S4 stream and there are currently sufficient numbers of shade trees in the RMZ.(Yes/No)					**No**
Harvesting is proposed in the RMZ of an S4, S5 or S6 stream that is a direct tributary to a S1 S2 or S3 stream or a marine-sensitive zone and there are sufficient numbers and distribution of trees in the RMZ to provide or contribute significantly to the maintenance of stream bank or channel stability. (Yes/No)					**No**
Measures for debris management if falling and/or skidding or yarding across a stream is proposed	Remove debris and restore natural stream patterns				

NON-TIMBER RESOURCES AND RESOURCE FEATURES IN OR ADJACENT TO THE CUTBLOCK	
Feature(s)	Measures to protect or accommodate or the reason for not protecting the feature(s)/ comments:
Cultural heritage resources and Archaeological sites	Based on an Archaeological overview re-assessment of woodlots in arrow district, dated May 15, 1997, completed by Kotenai West Consulting Ltd., the area under this plan was not recommended for AIA because it "does not have sufficient potential for archaeological site placement".
Visual	The harvest area under this plan will impact the midground and background viewscapes from Highway 6 south of Winlaw and Slocan River Road south of Winlaw. Strict adherence to visual management objectives is not expected because the harvest area and harvest pattern have been determined by the extent of mountain pine beetle infestation. However the use of the following techniques will mitigate the visual impact of the harvest unit: • Long straight boundaries will not occur over 80%+ of ht block perimeter. Straight boundaries will occur in the south east portion of the block, where it abuts the W1832 boundary. • Boundaries will follow rock outcrops and topographic breaks in many locations. • Most of the block boundary will be irregular, following tongues of timber of mesic sites between forested non-productive rock ridges. • The lower block boundary will be feathered into standing timber by Douglas-fir and larch leave trees • Retained islands of wetland forest, wildlife tree patches, and forested non productive areas will break up the scale of the opening.

Watershed	The watershed management objective for the W1832 is to have no detrimental impact on the quantity, quality and /or timing of flow of water supplies in the domestic use watersheds. No domestic or agricultural water intakes are known to be located within W1832. However, the area of this block is tributary to streams and springs which have water intakes. The area under this plan is located in the upper reach of Dumont Creek (class 2 watershed) and North Fork Creek (class 3 sub-basin watershed). Dumont Creek watershed has extensive settlement and development in lower elevation areas, and high domestic and irrigation water demands. Most of the block (32.2 ha) covered by this Site Plan is located in the Dumont watershed above the H60 line. The current ECA of Dumont Creek sits at 14.6%. The area covered by this site plan will increase the ECA by 8.7% to 23.3% total. Attached the equivalent clearcut assessment table for domestic watersheds. North Fork Creek has no licensed water users, but is a tributary to Winlaw Creek. North Fork Creek enters Winlaw Creek above all known PODs and provides a significant proportion of the water flow in Winlaw Creek. Another part of the block (18 ha) covered by this Site Plan is located in the North Fork Creek watershed above the H60 line. The current ECA of North Fork Creek sits at 1%. The area covered by this site plan will increase the ECA by 4% to 5% total. Attached the equivalent clearcut assessment table for domestic watersheds
Recreation	No recreation features are present in the area of this plan

SIGNATURE OF WOODLOT LICENSEE OR PERSON AUTHORIZED ON BEHALF OF THE WOODLOT LICENSEE(S)	**RPF SIGNATURE AND SEAL**
_____ _____ Signature Date (yy/mm/dd)	
SIGNATURE FOR DISTRICT MANAGER APPROVAL	
_____ _____ Signature Date (yy/mm/dd)	_____ 2004/12/07 RPF Signature and Seal Date (yy/mm/dd) Julie Castonguay RPF Name (Printed)

Equivalent Clearcut Assessment Table for Domestic Watersheds

Map Reference	Watershed Name	Watershed Area (ha)	Existing ECA%	Proposed Harvesting Area (ha)	Proposed ECA%
82F063	Dumont Creek	596	15%	32.2	23%
82F063	North Fork Creek	798	1%	18.0	5%

Explanations for differing from the Woodlot Licence W1832 Management Plan #1

The harvesting described in this site plan is required to comply with the standards and objectives set out in Management Plan #1 for Woodlot Licence W1832 (March 2000). However, the site plan will not meet several standards from this higher level plan. The reason for this is that the MP did not adequately consider the implications of extensive salvage operations in pine beetle attacked lodgepole pine stands with extensive levels of mortality. The MP does not reflect the implications for riparian forest retention, partial cutting, and block size when the pine component in large, pine leading species stands is dead. Specific points of variance are discussed below.

Section 6.4.7 of the MP states "bar ground skidding traffic from riparian ecosystems". This definitive statement is a editing mistake in the MP. It is intended to make a commitment not to skid down or along riparian features, but it was not intended to prevent all crossings of riparian features. The text should contain the modifying clause “except at suitable designated crossings”.

Section 6.4.7 of the MP also sets a goal of retaining 50% of the net timber yield in Riparian Management Zones (RMZ). This goal cannot be met in the current proposed harvest area because more than 50% of the trees are dead in many of RMZ’s. All tree species other than pine will be retained in the RMZ, and in the harvest area in general. This will not equal 50% of net site productivity in many areas, due to the mountain pine beetle outbreak causing high levels of mortality.

Section 6.5 of the MP specifies that small clearcuts with significant retention may be used in pine stands in the area covered by this SP, but the current proposed harvesting is a fairly large clearcut with reserve. We are deviating from this goal because the majority of the trees included in this block are dead or are in imminent risk of dying from mountain pine beetle infestation. Therefore, it is no longer feasible to gradually harvest these stands over a period of several decades using partial cutting and small clearcut blocks.

Section 6.5 of the MP also sets the goal of directing 15% of net site productivity to full cycle trees. There are areas within the proposed harvesting where the stands contain a significant Douglas-fir and larch component that will be retained after harvesting, and where this goal will be met. However, this goal will not be met in extensive areas with 85% or more pine stocking with over 80% or more stem mortality – the trees required to meet the goal are no longer alive.

Section 6.11 on visual quality management sets the goal of using “a variety of partial cutting approaches which will maintain sufficient forest cover to meet either Retention or Partial Retention." The proposed harvesting will not meet this goal, as the block extent and proportion of standing timber cut have been determined by beetle mortality patterns. Fortunately, terrain features, stand composition, and insect activity patterns make it possible to meet many of the other basic principles of visual management set out in this section of the MP and other visual management guides.