

**Timber Supply Review
Patterson Sawmill
Forest Management Application FA001828**

By Rafe Smith
Silviculture Operations Coordinator
Forest Development Services

Introduction

During October and Early November of 2000 a review of the timber supply in the area of Pine Point and Little Buffalo River was conducted to verify the potential for a harvesting operation. Concern was noted over the absence of a recent inventory in the areas applied on in FA001828.

Research

Research involved all available sources of information.

The license application and ecological assessments were reviewed.

Danny Patterson was interviewed and provided oblique aerial photos of the area around Pine Point.

A 1961 inventory of the Buffalo River area was reviewed. This inventory covered the area near Pine Point but not the Little Buffalo River area.

The Pine Point cutblock layout was inspected and a volume cruise was performed to assess the potential of the stand.

The Landsat image of the entire application and surrounding area was reviewed to identify additional timber resources in the area.

1: 20,000 aerial photography of the Little Buffalo River area and the Pine Point area was analyzed.

A helicopter was chartered to fly the application areas and to assess the timber and condition of the surrounding forest.

Observations

The proposed Pine Point harvest blocks were laid out in large, softwood dominated stands identified on the Buffalo River inventory. The stands cover 1873 hectares of land. The stand listing described the forest there as 50% to 75% softwood, 41 to 60 feet (12.3m to 18m) tall, 21% to 40% crown closure, site class III, with a 20% stand shrub cover.

The operational cruise of the stand was carried out in the operable areas within the stand. 25 plots, fixed at 200m², were tallied. All trees 17cm dbh or greater were counted and an average height was measured. Not all plots were installed within the cutblock lay out, but none of the plots were placed in shrub, juvenile or otherwise unmerchantable timber areas. Practical operability of the surrounding stand was the main criteria for plot placement. Plots were placed randomly within practicable working range and detailed notes were taken to describe the stand at each area.

The cruise revealed that the timber laid out is mature to over mature. Many trees exhibited dead and rotten branches, and some of the trees had rotten cores. Some of the stand had suppressed understory at low densities. Severe spruce budworm defoliation was evident, and bark beetle damage was also present in some areas. In general the merchantable timber of the area is in poor health and beginning to drop out of the stand. The stand should be considered prime for harvest as its value as a timber resource is in decline.

There are patches of healthy regeneration present, and patches of spruce regeneration of all ages in the proximity of the inventory. Diameters averaged around 30cm. Tree heights ranged from 18m to 25m. This corresponds to the heights described in the stand listing, as it must be noted that the trees are now 40 years older than at the time of the inventory. The inventory also averaged the heights of trees across a broad land area, whereas the timber laid out represents samples of the dominant trees of that population.

The helicopter flight of the area revealed that the general shape and composition of the stand as indicated in the inventory map is accurate. The composition to the northern end of the stand is jack pine or smaller spruce. There are patches of juvenile spruce, and jack pine with spruce understory. There are also bands of aspen throughout the stand. Approximately 10% to 15% of the stand is composed of timber suitable for harvest.

Gross spruce volumes ranged from 33m³/ha to 335m³/ha, with a mean sawlog volume of 193m³/ha. 92% of the plots exceeded 80m³/ha. According to aerial site photos Patterson's have laid out 143 ha of blocks, and have identified another 107 ha for future operations. Of this area, approximately 40% will have marginal volume and will probably prove to not be economically feasible to harvest. There is more merchantable timber, in the range of 10,000m³ or more, in the area that has not been laid out or identified for harvest that will contribute to the practical volume of the area. By estimation based on the research data there is approximately 35,000m³ to 45,000m³ of merchantable sawlogs in the area around Pine Point.

The timber Patterson's have identified west of the Little Buffalo River is a continuation of the same forest as the wood near Pine Point. It occurs along beach ridges and covers extensive land area. Most of the prime, mature timber occurs in the vicinity of Salt Lake, although there are smaller stands and scattered timber to the north and west as well. The trees in question appear to be of similar age, composition, and height as those laid out near Pine Point. Farther south the forest appears to have been burned, and the spruce stands of that area are much younger. Some are nearing merchantable size, but are still

less than 80 years old. According to site observations, analysis of the Landsat data and the 1994 aerial photo series, approximately 600 ha of concentrated, merchantable spruce forest exists in the area, in addition to smaller stands scattered to the north and west of the main stands. Estimates of the main body of the wood range from 70,000m³ to 100,000m³, with additional resource scattered throughout the area.

It should also be noted that although Patterson's have applied on the timber lying to the west of the river there are extensive spruce stands to the east in the same proximity. It is likely that there is much more timber on the east side of the river than the west. This timber is part of the same forest as the timber Patterson has expressed interest in.

Conclusion

Ecologically, there are no special considerations that apply to the stands in the area, and regeneration efforts will be standard fare. Harvesting the area will be easily accomplished by application the Timber Harvesting Guidelines.

There is more timber available in the application area that has not been identified in detail and thus not included in this assessment of the resource. There are also considerable juvenile spruce resources in the area that will continue to add to the existing timber supply with time.

Review of the forest resource in the Pine Point and Little Buffalo River area indicates that there is sufficient timber volume available to sustain a small 10,000m³ harvesting operation for 10 to 14 years.

200m plot
GPS N 60° 50' 26.1
W 114° 10' 26.4 2 pins

Plot #2

Tree #	SP	DBH	Height
1	A	28.0	
2	SW	22.1	19.5
3	A	25.2	
4	SW	17.5	
5	SW	17.5	
6	SW	12.3	
7	A	27.4	
8	SW	12.0	
9			
10			

Young forest in older stand
Aspen starting to be over topped
Some SW regrow
Taller older spruce outside plot

FIELD

200m fixed area plot
GPS N 60° 50' 24.9
W 114° 10' 21.8 2 pictures

Plot #3

Tree #	SP	DBH	Height
1	SW	19	
2	SW	22.4	
3	SW	19.7	
4	A	28.9	
5	SW	19.4	
6	SW	24.7	
7	SW	26.7	
8	SW	23.3	21.0
9			
10			

Older forest of snags
A dropped out of stand
Few Dunks mostly aspen
SW skinned but still
- end of DKE

FIELD

200m² 2 plots GPS N 60 S 19.4
Plot 6 W 124 10 36.0

Tree #	SP	D/bh	Height
1	Sw	24.8	
2	Pi	24.3	19.5
3	Sw	26.7	
4	A	24.2	
5	A	24.1	
6	A	20.5	
7			
8			
9			
10			

- white sand
- A over topped
- open pocket
- 10m SW 1.1 P/S
- upland
- young, 8m SW 1.1 S/D/H
- managed by budworm
- out of pattern to be cut but still in stand
- 1.1 A randomly in ground
- A in bull trap

FIELD

200m² plot GPS 60 S 08.4
Plot 7 W 01 51.3

Tree #	SP	D/bh	Height
1	Sw	24.3	
2	Sw	21.4	
3	Sw	23.9	
4	Sw	21.4	
5	Sw	21.9	
6	Sw	24.3	
7	Sw	25.3	21m budworm
8			smaller heights broken
9			
10			

10 small trees between 15-17cm

- All underlining decadent
- 10% of dead branches
- suppressed trees
- in time have younger stuff in poor health
- it is out of over topped
- 400-500 stems/ha

FIELD

2 pins

GPS 60° 50' 00.63
114° 09' 46.7

Plot 9

Tree #	SP	DBH	Height
1	SW	23.8	
2	SW	22.0	
3	SW	21.7	29.5
4	SW	19.0	
5	SW	18.5	
6	SW	22.1	
7	SW	25.0	
8	SW	22.9	
9	SW	24.0	
10	SW	21.0	
11	SW	21.4	
12	SW	24.5	
13	SW	29.1	
14	SW	20.4	
15	SW	18.5	
16	SW	15.1	small tree height 10-12m
17	SW	21.5	
18	SW	21.5	
19	SW	21.5	
20	SW	21.5	

- with open no canopy

- old stem no A callus at 2.5m

FIELD

200m 2 pins

GPS 60° 50' 04.3
114° 09' 45.6

Plot 9

Tree #	SP	DBH	Height
1	SW	26.3	
2	SW	27.4	
3	SW	21.0	10.5 canopy 10m
4	SW	22.8	canopy 10m
5	SW	23.2	
6	SW	23.9	
7	SW	20.4	
8	SW	19.9	
9	SW	17.0	
10	SW	23.0	
11	SW	19.9	
12	SW	23.0	

200m

- A it not barked 10m

- 5.0m 5.0

FIELD

T. plots end of block 2 GPS 60°50'02.9" 114°01'44.4"

Plot 10

Tree #	Sp	DBH	Height
1	SL	32.4	2 m
2	SL	25.0	
3	SL	23.8	
4	SL	22.3	
5	SL	25.0	
6	SL	25.0	
7	SL	20.8	
8	SL	23.5	
9	SL	22.8	
10	SL	22.8	
11	SL	18.5	
12	SL	16.5	

A dayton (Gillberg oak (small))
- followed road and out through blocks

FIELD

End of Line
Coffee Fire
GPS 60°50'05.5" 114°01'07.2"

12:57	Main cutline between block 4 & 2
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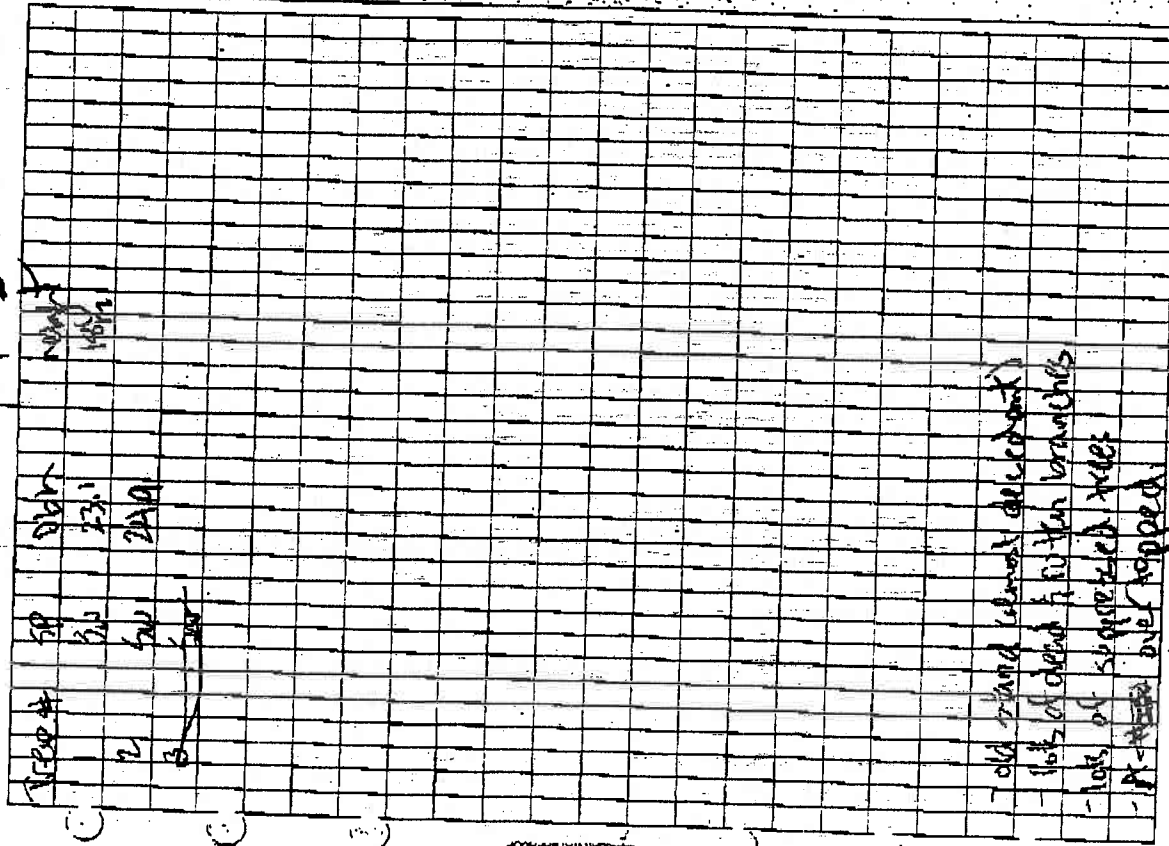
FIELD

100m² plot

GPS 60° 50' 04.4"
114° 11' 03.1"

2 plots

Plot 11



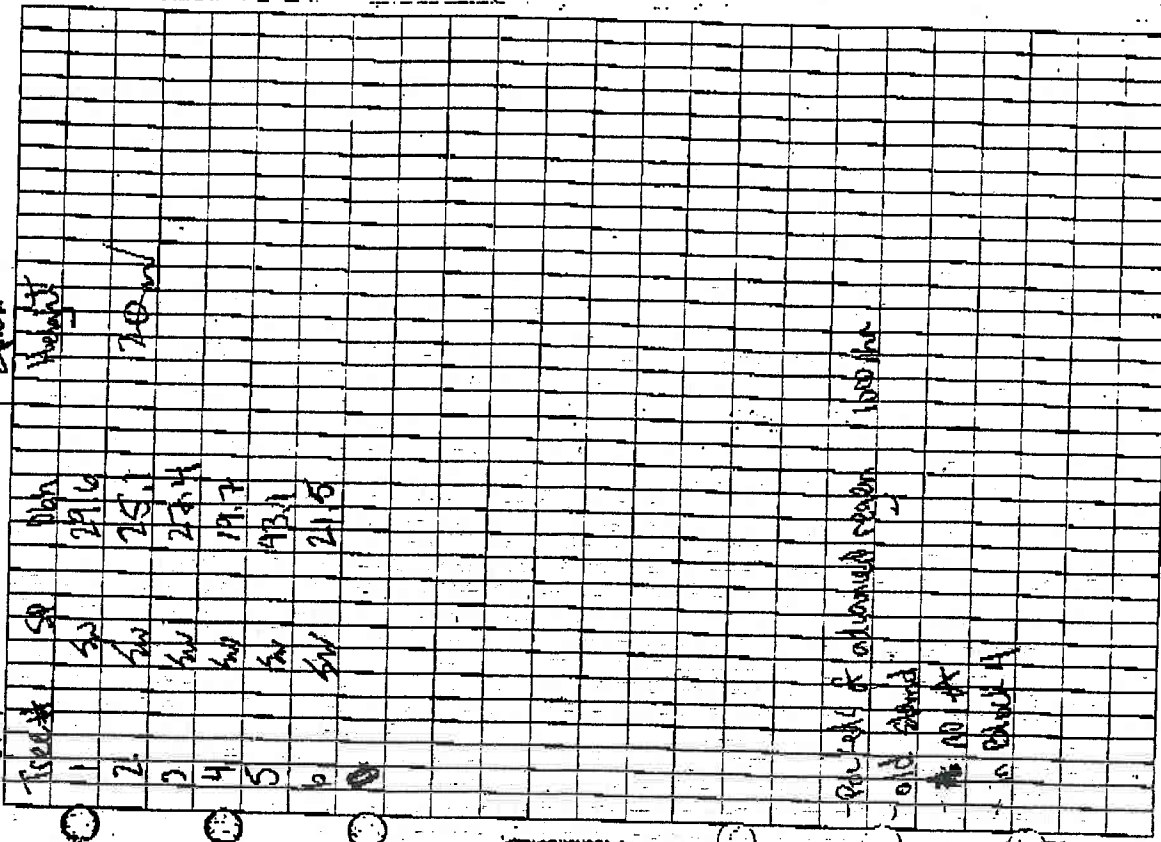
FIELD

100m² plot

GPS 60° 50' 04.7"
114° 10' 58.4"

2 plots

Plot 12



FIELD

GPS 60°50' 04.5"
114°11' 09.4"

200m

Plot 15

Tree #	SP	DBH	Height
1	SW	22.4	
2	SW	22.6	
3	SW	22.6	
4	SW	30.3	24m
5	A	23.4	
6	SW	19.2	
7	A	26.7	
8	SW	26.3	
9	SW		
10	SW		

- well open
 - fair size, 20 (spotted)
 - old SW 11' P
 - significant A component
 - very mature cogen

200m plot

GPS 60°50' 3.0"
114°11' 11.6"

Plot 16

Tree #	SP	DBH	Height
1	SW	18.9	
2	SW	23.0	
3	SW	25.2	
4	SW	25.3	22.5m
5	SW	25.4	
6	SW	27.4	
7	SW	21.6	
8	SW		
9	SW		
10	SW		

- A dropping out
 - SW 11'
 - old

FIELD

FIELD

200m² plot
GPS 60° 59' 49" 57.5"
114° 11' 42.5"

Plot 23

1810

Tree #	SP	DBH	Height
1	SW	19.6	
2	SW	30.1	
3	SW	29.8	
4	SW	21.0	
5	SW	33.3	
6	SW	30.9	
7	SW	30.3	
8	SW	29.0	
9	SW	29.0	23m
10	SW	21.0	
11	SW	18.9	

- typical site
- A overtopped & dropped out

FIELD

200m² plot

GPS 60° 51' 21.2"
114° 12' 45.7"

Plot 24 block 1

1810

Tree #	SP	DBH	Height
1	SW	31.3	
2	A	25.3	SW 24.5
3	A	20.8	A-22.2-23
4	A	23.4	
5	A	22.9	
6	SW	31.2	
7	SW	32.0	
8	A	18.6	
9	A	21.6	
10	A	21.2	
11	A	23.4	
12	A	24.2	

- lower & wider than stands South.
- fine advance regent
- mature A in understory
- SW getting old (Dead cotton branches)

FIELD

200m² plotGPS 60° 51' 20.3"
114° 12' 18.9"

Plot 25

Tree #	SR	Date	Height
1	Sw	30.0	Sw - 24m
2	Sw	30.0	A - 21m
3	Sw	30.0	
4	A	42.0	
5			
6			
7			
8			
9			
10			
+ 10 present - Sw dropping out of canopy - A is low + budworm present - woodbores in trees (Sw)			

FIELD

**TERMS AND CONDITIONS
INCLUDED IN AND FORMING PART OF
TIMBER CUTTING PERMIT #TP001828a & TP001828b**

The following terms and conditions are included in Timber Cutting Permit #TP001828a & TP001828b pursuant to Section 36.1 (1) of the *Forest Management Regulations*, issued to PATTERSON SAWMILL LTD. at 60 PATTERSON ROAD, HAY RIVER, NWT.

1. The Timber Cutting Permit Holder, hereinafter referred to as the "Permit Holder", shall harvest timber only in the area specified in these Timber Cutting Permits, and referred to as Pine Point Area (60-50 North 114 - 11 West approximately).

Time

2. The Permit Holder will advise the Forest Management Officer (herein after called an Officer) at the Department of Resources, Wildlife and Economic Development in FORT RESOLUTION, NWT; (867) 394-4596, 24 (twenty-four) hours in advance of the start of timber operations.
3. The Permit Holder shall in a progressive manner, and, within three months of the expiration of this Permit, remove, demolish, or otherwise dispose of, in a manner satisfactory to an Officer;
 - a. All buildings or structures and equipment constructed or brought to the Permit area under the authority of this Permit.
 - b. All debris resulting from cutting and removal of timber.
 - c. All timber harvested under this Permit.

Operating Plan

4. The Permit Holder shall not commence timber operations until the Permit Holder's Operating Plan in respect of these Timber Cutting Permits has been approved pursuant to Section 19.(4) of the *Forest Management Regulations*.
5. The Permit Holder shall carry out his timber operation in accordance with the approved Operating Plan.

Terms and Conditions Included in and Forming Part of TP001828a & TP001828b

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Machinery and Equipment

6.
 - a. All machinery and equipment associated with this operation shall be confined to those routes or areas designated in an approved Operating Plan.
 - b. Should deviation from an approved Operating Plan be required while conducting this operation, the Permit Holder shall obtain approval in writing prior to implementation of any change.
 - c. The Permit Holder shall not establish any additional facilities within the Permit area without prior written approval.
7. The Permit Holder shall use only the equipment specified in an approved Operating Plan, unless otherwise authorized in writing.

Access Roads, Skid Trails and Landings

8.
 - a) The Permit Holder shall use existing roads, trails and seismic lines as access routes where directed to do so by an Officer.
 - b) The Permit Holder shall not construct any road greater than ten (10) metres in width, unless otherwise approved by an Officer.
9. The Permit Holder shall not construct skid trails greater than seven (7) metres in width.
10. The Permit Holder shall not clear or construct landings greater than 0.4 hectares in size including the area required for debris and overburden piles.
11. The Permit Holder shall restore landings in a manner to ensure that between two and five centimetres of humus remains atop the mineral soil, following completion of timber transport, except around piles to be burned as per Condition 22.
12. The Permit Holder shall not construct more than three (3) landings for every twenty (20) hectares of harvest block.

Timber Harvesting Standards

13. The Permit Holder shall carry out harvesting in accordance with the pre-harvest silvicultural prescriptions specified and approved for the harvest blocks in the approved Operating Plan, and in accordance with the specifications listed in Appendix 1: Harvesting Techniques, attached.

Terms and Conditions Included in and Forming Part of TP001828a & TP001828b

14. The Permit Holder shall harvest and utilize all timber to a maximum top diameter of ten centimetres (four inches).
15. The Permit Holder shall carry out timber harvesting in a progressive manner, and no merchantable timber shall be left behind during the harvesting operations; except as directed in writing by an Officer.
16. Where timber is left, which, in the opinion of an Officer should have been cut, the Officer may require the Permit Holder to return and harvest such trees before cutting any other trees.

Brush and Debris Disposal

17.
 - a. Unless otherwise stated in the approved Operating Plan the Permit Holder shall as rapidly as the cutting operation progresses remove all limbs from the trees which are felled.
 - b. All limbs shall be removed within the designated cut block, before the log is removed to the landing.
 - c. All tops will be removed on or adjacent to the landings. All tops will be piled in the centre of landings once said landing is not being used.
 - d. The unused parts of harvested trees shall be lopped and scattered, and made to lie flat on the ground in a manner satisfactory to an Officer.
18. The Permit Holder shall fell and remove all leaner trees and debris from residual timber stands, as directed by an Officer.
19. Where an Officer is of the opinion that refuse or debris on the Permit area is excessive, the Officer may order the Permit Holder to take what ever action the Officer deems necessary to eliminate the problem, in such time as the Officer deems necessary.
20.
 - a. The Permit Holder shall burn all combustible garbage and debris in a container acceptable to an Officer.
 - b. The Permit Holder shall keep all garbage and debris in a covered metal container until disposed of.
21. The Permit Holder shall dispose of all debris at landings by burning or as specified in the approved Operating Plan.

Terms and Conditions Included in and Forming Part of TP001828a & TP001828b

Prevention and Control of Forest Fires

22. The Permit Holder shall not commence or continue any activities under this Timber Cutting Permit during the Closed Season, until a Plan for the Prevention and Control of Forest Fires has been submitted and approved.
23. The Permit Holder shall implement the approved Plan for the Prevention and Control of Forest Fires, prior to commencing any activities under this Permit during the Closed Season
24. The Permit Holder shall maintain a three metre fire guard to mineral soil around all debris piles which are to be burned.
25. No debris will be spread within three metres of the edge of any clearings or cut block.
26. The Permit Holder shall supervise all fires until such time as the fire is out.
27. Spark arrestors are required on all chainsaws, chimneys, engines and incinerators in use during the Closed Season.
28. No burning shall take place during the Closed Season unless the Permit Holder has obtained a Permit To Burn.
29. During the Closed Season, all fires shall be reported to the area office of the Department of Resources, Wildlife and Economic Development in Fort Resolution, NWT; (867) 394-4596, or to the Department of Resources, Wildlife and Economic Development Forest Management Division at 1-800-661-0800.

Protection of Wildlife, Fisheries, Recreational, Aesthetic, Ecological Values

30. The Permit Holder shall take measures to ensure protection of Wildlife, Fisheries, Recreational, Aesthetic, Ecological Values, as specified in terms and conditions included in the approved Operating Plan, or as specified by an Officer.
31. The Permit Holder shall take measures to identify and protect equipment (traps, etc.) and trails in the harvesting area being used by traditional resource harvesters (trappers, other resource harvesters, etc.) from damage resulting from timber operations conducted under the authority of this Permit.

Terms and Conditions Included in and Forming Part of TP001828a & TP001828b

Damage to Residual Stands

32. The Permit Holder shall avoid causing excessive damage, as determined by an Officer, to residual stands of timber. All boundary zones are to be marked with both Orange Flagging and Orange Paint.
33. The Permit Holder shall limit the number of access roads or trails avoiding excessive damage to residual stands.
34. The Permit Holder shall limit the transporting of equipment to access roads and trails only.

Petroleum Fuel Storage

35. The Permit Holder shall not allow petroleum products to spread to surrounding lands or into water bodies
36. All spills shall be reported immediately to the 24-hour spill line at (403) 920-8130.

Timber Scaling

37. All timber cut and harvested shall be measured at the Permit Holder's expense by a timber scaler Licenced in the Northwest Territories.
38. All timber shall be scaled in accordance with the approved Scaling Manual of the Northwest Territories, and in accordance with a signed Scaling Agreement between the Department of Resources, Wildlife, & Economic Development, Government of the Northwest Territories and the Permit Holder.

Letter of Clearance

39. The obligations of the Permit Holder with respect to this operation do not cease until the Permit Holder is in possession of a letter of clearance from the Forest Management Supervisor.

Other Matters Not Inconsistent with the *Forest Management Regulations*

40. Nothing in these Terms and Conditions precludes the Permit Holder from obligations under the Territorial Lands Act and other applicable Federal and Territorial Legislation.

Terms and Conditions Included in and Forming Part of TP001828a & TP001828b

41. The Permit Holder shall

- a. Provide for compensation to Deninu Ku'e First Nations for impacts on their traditional harvest areas at a rate of \$2.00 per cubic metre of timber harvested as reported on verified scale returns. Payment shall be to Deninu Ku'e First Nations made on or before May 31, 2001.
- b. Provide, in addition to condition 41.a. above and prior to commencement of Timber Operations, for a compensation fund of \$5000 in total in respect of both Timber Cutting Permits TP001828a and TP001828b, available to and/or in trust for the harvesters affected by Timber Operations authorized under this Permit.

The foregoing terms and conditions included in and forming part of Timber Cutting Permit TP001828a and Timber Cutting Permit TP001828b pursuant to Section 36.1(1) of the *Forest Management Regulations*, have been read and understood.

Timber Cutting Permit Holder

Date

Forest Management Supervisor

Date

Terms and Conditions Included in and Forming Part of TP001828a & TP001828b

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**TIMBER CUTTING PERMIT #TP001828a & TP001828b
Patterson Sawmill Ltd.**

**2000-2001 OPERATING PLAN
Appendix 1: Harvesting Techniques**

Harvesting Techniques.

The following harvest standards and conditions shall be observed in a timber operation conducted under the authority of this timber cutting permit.

Harvesting :

1. Designated skid trails shall be used and shall not exceed 7 metres in width, and shall be established a minimum of 14 metres apart.
2. All White Spruce 17.8 cm or larger at DBH shall be harvested from the harvest area
3. Clear Cut Harvest blocks shall be limited to an average of 15 hectares in size with no blocks greater than 20 hectares.
4. All harvest blocks shall have a maximum sight distance of 200 metres.
5. All advanced growth and regeneration within a harvest block will be protected from unnecessary damage.
6. Protection buffers shall be retained along all watercourses and associated riparian areas to protect from adjacent timber harvesting operations as directed by an Officer., and in accordance guidelines specified for Watercourse (Riparian Area) Protection Buffers in *Northwest Territories Timber Harvest Planning and Operating Ground Rules (Draft June 2000)*.

**Terms and Conditions Included in and Forming Part of TP001828a & TP001828b
Appendix 1: Harvesting Techniques**

December 21, 2000

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