1998/99 Forest Renewal BC Funded

WATERSHED RESTORATION PROGRAM COMPLETION REPORT

(Telkwa Watershed)

Prepared for:
Pacific Inland Resources
(A Division of West Fraser Mills Ltd.)

Prepared by :

Ed Withers, Watershed Restoration Supervisor
Silvicon Services Inc.
December 1998

Table of Contents

WATERSHED RESTORATION PROGRAM
COMPLETION REPORT

1.0 Introduction

This report summarizes the road deactivation project carried out for the 1998 season, as part of the FRBC funded, Watershed Restoration Program. The proponent of this project was Pacific Inland Resources (PIR), a division of West Fraser Mills Ltd. Silvicon Services Inc., conducted many of the activities associated with this project, utilizing information and maps produced for PIR by Sterling Wood Group Inc., Triton Environmental Consultants and Wildstone Engineering Ltd. The road deactivation occurred within PIRs Telkwa River watershed chart area, located south and east of Telkwa. The total area of the Telkwa chart is 140 000 hectares. The chart area is broken down into sub-watershed units. The sub-watershed units are described as, Coffin Lake, Goathorn Creek, Pine Creek, Howsen Creek, Cumming Creek, Jonas Creek and Winfield Creek.

According to Sterling Wood Group Inc., there are 10km of public highway, 70km of Forest Service Road, 430 km of secondary and forestry spur roads, 60km of hydroline and gas pipeline access roads and 40km of abandoned roads. A considerable portion of the unused roads has revegetated. Many of these old road systems have begun to deteriorate and cause culvert and slope failures and excess sedimentation.

2.0 Purpose

The purpose of road deactivation is to stabilize the road prism, restore surface drainage patterns, restore streambank and hillslope stability, maintain water quality and to ensure IRM and access requirements are met.

There are three main objectives to road deactivation:

1. control of slope hydrology
2. control of slope geometry
3. control of erosion

3.0 Road deactivation process

This project entailed the field review and upgrading of old prescriptions (produced for PIR in 1996), contract tendering and supervision of deactivation works.

During the field review, it was felt that the old prescriptions no longer adequately covered the new standard requirements of road deactivation. Also, because of the amount of time between the initial prescriptions and the field review, it was found that many of the field markings had been removed.

After the field review was finished, writing of the prescriptions took place. 1:10 000 scale maps were created depicting the location of roads and prescribed activities along these roads.

Contracts for the "works phase" of the road deactivation were written and put out for tender through the selective bidder process. After all bids were collected, a contractor was selected for the deactivation works.

To ensure the quality of road deactivation, supervision of the contractor during the works was conducted by Silvicon Services Inc.

4.0 Deactivation by Sub-unit

This section briefly describes each of the Telkwa watershed sub-units. There is a short description of activities within each of the sub-units. Level of deactivation and vehicle access are also explained. Following the description is a table showing distances, activities, level of deactivation and vehicle access for each road system within the described sub-unit. Following the table are the prescriptions for each road system, with special construction notes preceding a 1:10 000 map sheet.

Telkwa Watershed Sub-Units	total road km	level of deactivation	vehicle access
Coffin Lake 110 road	28.801	permanent	ATV
Coffin Lake 170 road	28.54	semi-permanent to permanent	4x4 or ATV
Coffin Lake 150 road	16.255	permanent	ATV
Goathorn and Howsen Creek	17.775	permanent	4x4 ATV
Pine, Cumming, Jonas, and Winfield Creek	31.735	permanent	4x4 ATV

4.1 Coffin Lake

The Coffin Lake area is located southeast of Telkwa and is accessed by the Lawson Road. Most of the Coffin Lake area was deactivated to permanent state allowing for ATV access. However, the beginning of the 170 main (road system E98-517) was deactivated to semi-permanent state allowing 4x4 access. Most of the deactivation in the Coffin Lake area required the standard culvert removals and cross ditches to meet road deactivation objectives, but there were a few special circumstances.

In two separate places, the 170 mainline crosses Coffin Creek, which runs north and drains into Coffin Lake. At the lower crossing, the stream is classified as an S5 stream. At this site, the two main culverts had been blocked and the third overflow culvert had also been blocked or not of adequate size to handle the subsequent build up of water. The road washed out and buried the two main culvert outlets leaving an impassable cut through the road prism and unstable stream banks. In this case, the deactivation prescription called for the removal of the three culverts and the pullback of the road approaches to Coffin Creek, allowing for ATV access. At the upper crossing, Coffin Creek is classified as an S6 stream. At this site, the two culverts in place were blocked and the stream changed its course flowing down the road location, washing out the road subgrade and creating a new streambed. The stream then joined the original stream channel roughly 150-200 metres downstream from the original channel. It was felt that the new stream channel should be left in place to reduce the amount of siltation that would be caused from re-routing the stream back to its original channel and because of the risk of Coffin Creek returning to the new channel after it was diverted. The new stream banks were pulled back to a 1.5:1 slope to increase stability.

Coffin Creek is crossed a third time on a lower road system (EM7-510). At this point Coffin Creek is classified as an S3 stream. This crossing consisted of a 6 metre span wooden bridge. The deck planking, log abutments and log stringers were quite rotten and the bridge was deemed unsafe for vehicle traffic. The prescription called for the removal of the bridge and the sloping of the approaches for ATV access.

Both Claus Rygaard, Engineering/ Mining Liaison Officer of the MOF Dease Lake Field Office, and Rick Kiem, Senior Habitat Protection Officer of the MOELP, were consulted before the prescriptions were completed and before any construction in or around this stream was conducted. Their input into the prescription pertaining to this crossing removal was requested. Care was taken to minimize machine crossings and to maintain the integrity of the stream.

One other activity worth mentioning is a rock quarry on road system E98-517. It was felt that the quarry was unsafe due to the amount of loose rock above the cut. As much rock as could safely be reached with an excavator was pushed over the edge and the slope above the cut was made as stable as possible.

The Coffin Lake area is considered important wintering ground for moose and deer. Therefore, Rick Kiem of the MOELP requested that cross ditches within this area be dug deep enough to create a formidable barrier to hunters that intend to use their 4x4s to access this area. It is felt that this objective was met.

4.1.1. Coffin Lake Final Prescriptions

Table 1 COFFIN LAKE 110 ROAD SYSTEM DEAVTIVATION Contract Number 98-FRBC-13

ROAD SYSTEM LABEL	ROAD NAME	LENGTH KM	# OF CROSS DITCHES	# OF CULVERTS FOR REMOVAL	REQUIRED EQUIPMENT	OTHER REQUIRED CONSTRUCTION	LEVEL OF DEACTIVATION	VEHICLE ACCESS
E98-033	MAIN	3.98	39	9	small - medium		PERMANENT	ATV
	SPUR C	0.757	8	1	crawler or rubber		PERMANENT	ATV
	SPUR D	0.252	3	0	tired excavator		PERMANENT	ATV
	SPUR E	0.785	9	0			PERMANENT	ATV
	SPUR F	1.735	18	1			PERMANENT	ATV
	SPUR G	0.48	5	0			PERMANENT	ATV
	SPUR G1	0.265	3	0			PERMANENT	ATV
	SPUR H	0.11	1	0		- remove sill logs	PERMANENT	ATV
	SPUR K	0.93	4	0			PERMANENT	ATV
EM7-531	SPUR A	1.837	20	6	medium - large crawler excavator	- outslope road surface - fill pullback light-heavy	PERMANENT	ATV
	SPUR B	0.395	8	0			PERMANENT	ATV
066-3B-170	MAIN	1.297	15	0	small - medium		PERMANENT	ATV
EM7-517	SPUR A	1.368	9	0	crawler or rubber		PERMANENT	ATV
	SPUR B	0.331	4	0	tired excavator		PERMANENT	ATV
E98-082	SPUR A	1.75	27	3	small - medium		PERMANENT	ATV
	SPUR B	0.305	7	0	crawler or rubber		PERMANENT	ATV
	SPUR D	2.757	38	10	tired excavator		PERMANENT	ATV
	SPUR E	1.886	14	1			PERMANENT	ATV
	SPUR F	0.18	2	1			PERMANENT	ATV
CP511-082	SPUR G	4.815	47	0	small - medium		PERMANENT	ATV
	SPUR H	0.261	1	1	crawler or rubber		PERMANENT	ATV
	SPUR J	0.325	2	1	tired excavator		PERMANENT	ATV
TOTALS		26.801	284	34				

Additional Notes:
Average depth of fill over metal culverts is 80 cm
Maximum depth of fill over metal culverts is 1.5 m
Where possible, culverts will be salvaged, destroyed culverts will be burried at a nearby specified site
Contractor will be required to place a warning sign, provided by PIR, at the beginning the 170 road system
Contractor will be required to grass seed all deactivated sites

E98-033 Contract number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

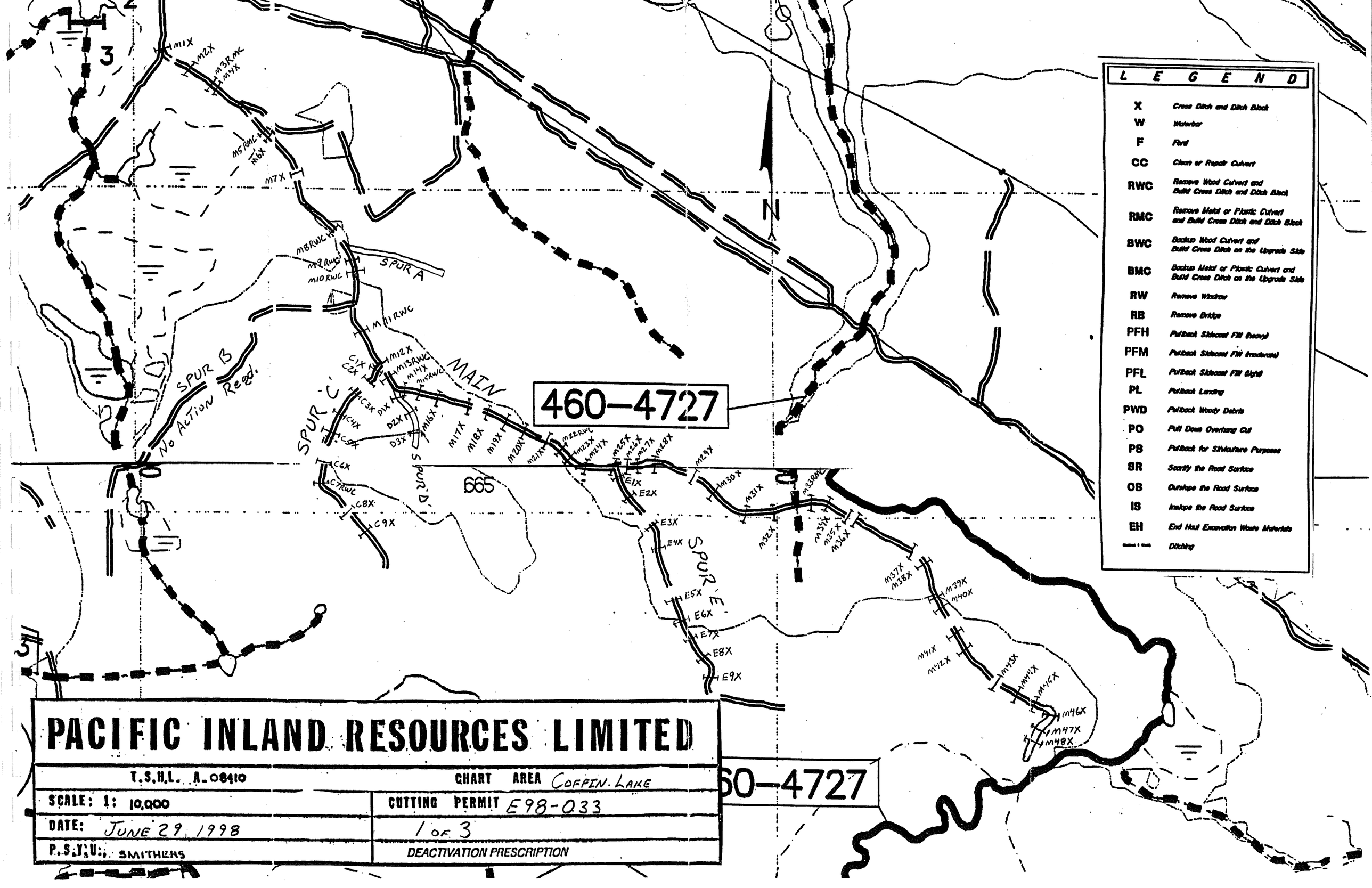
Branch fo the 110 MAIN

- remove wood box culverts and/or woody debris, located along main road, crush and spread on road surface

SPUR H

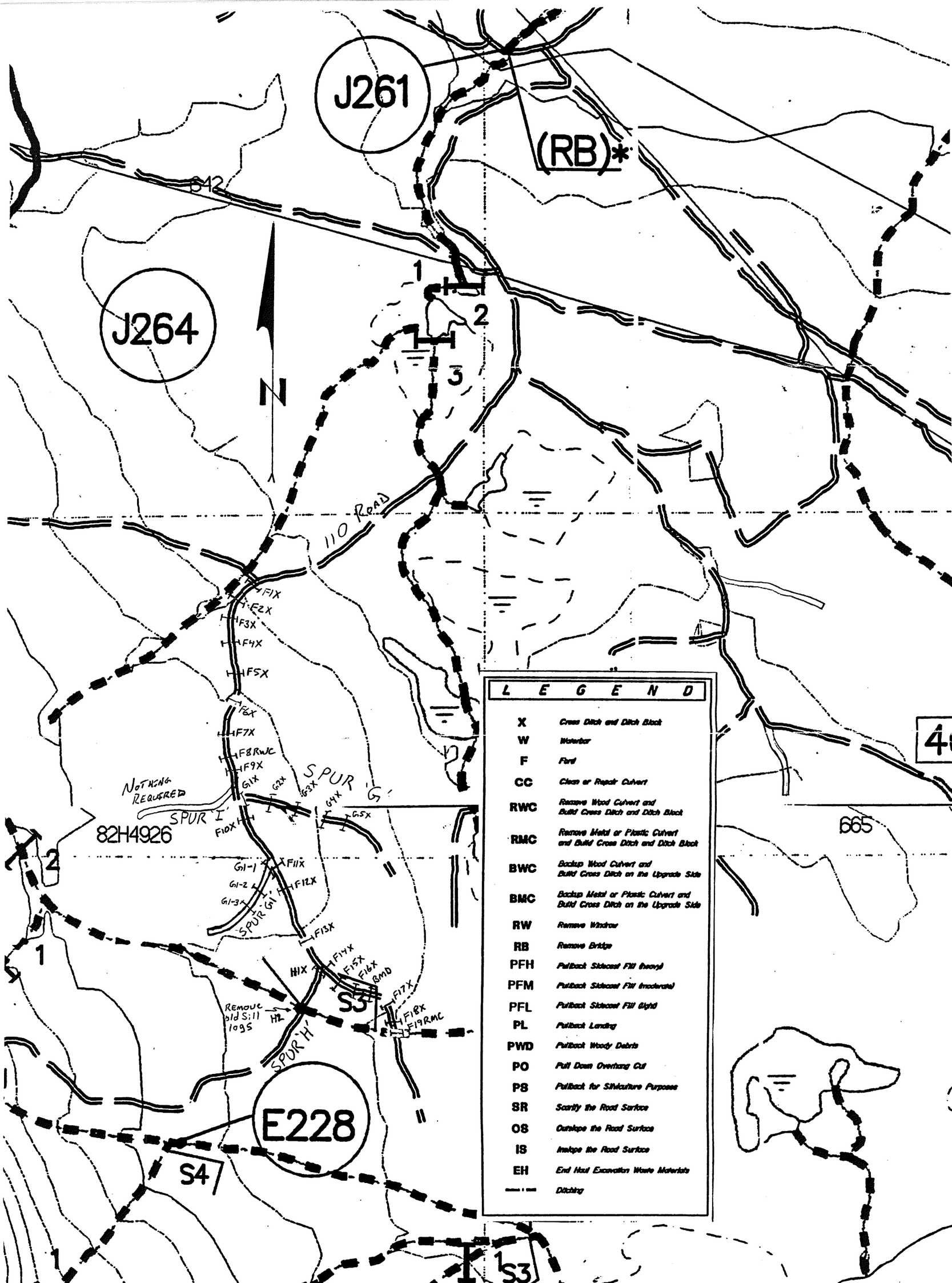
H2PWD - ermove old sill logs from stream, crush and spread on road surface

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



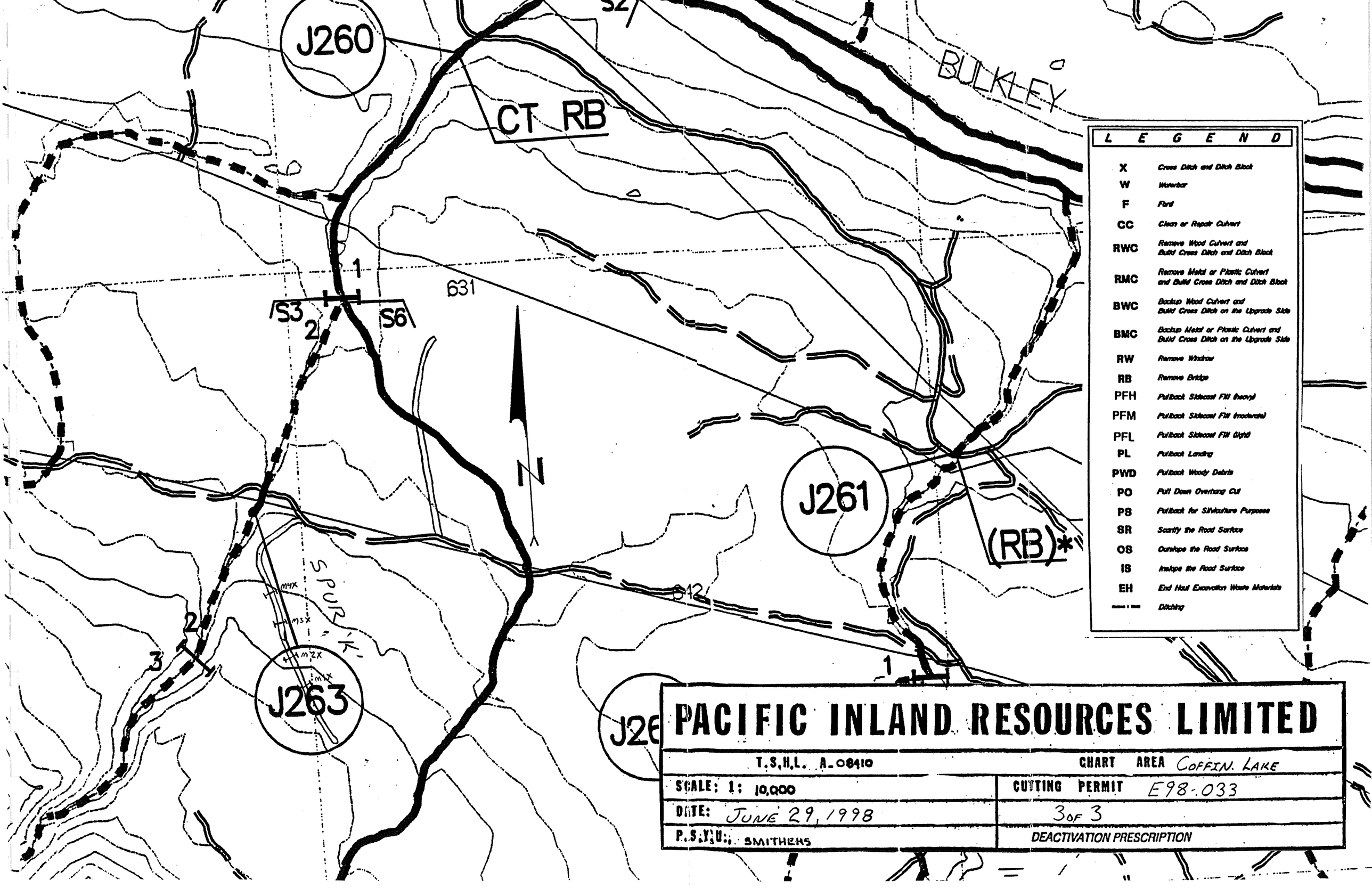
PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA COFFIN LAKE
SCALE: 1: 10,000	CUTTING PERMIT E98-033
DATE: JUNE 29, 1998	1 OF 3
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION



PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA COFFIN LAKE
SCALE: 1: 10,000	CUTTING PERMIT E98-033
DATE: JUNE 29, 1998	2 OF 3
P.S.Y.U: MI 15	DE VAT PRES PTIC



PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA COFFIN LAKE
SCALE: 1: 10,000	CUTTING PERMIT E98-033
DATE: JUNE 29, 1998	3 OF 3
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

EM7-531 Contract number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

SPUR A

A8PFM

- moderate pullback of fill slope required to A9RMC(roughly 40 metres)

A9RMC

- heavy pullback of fill slope required to A10PFL(roughly 60 metres)

A10PFL

- light pullback of fill slope required for roughly 170 metres

A12RMC

- moderate pullback of fill slope required to A13RMC (roughly 30 metres)

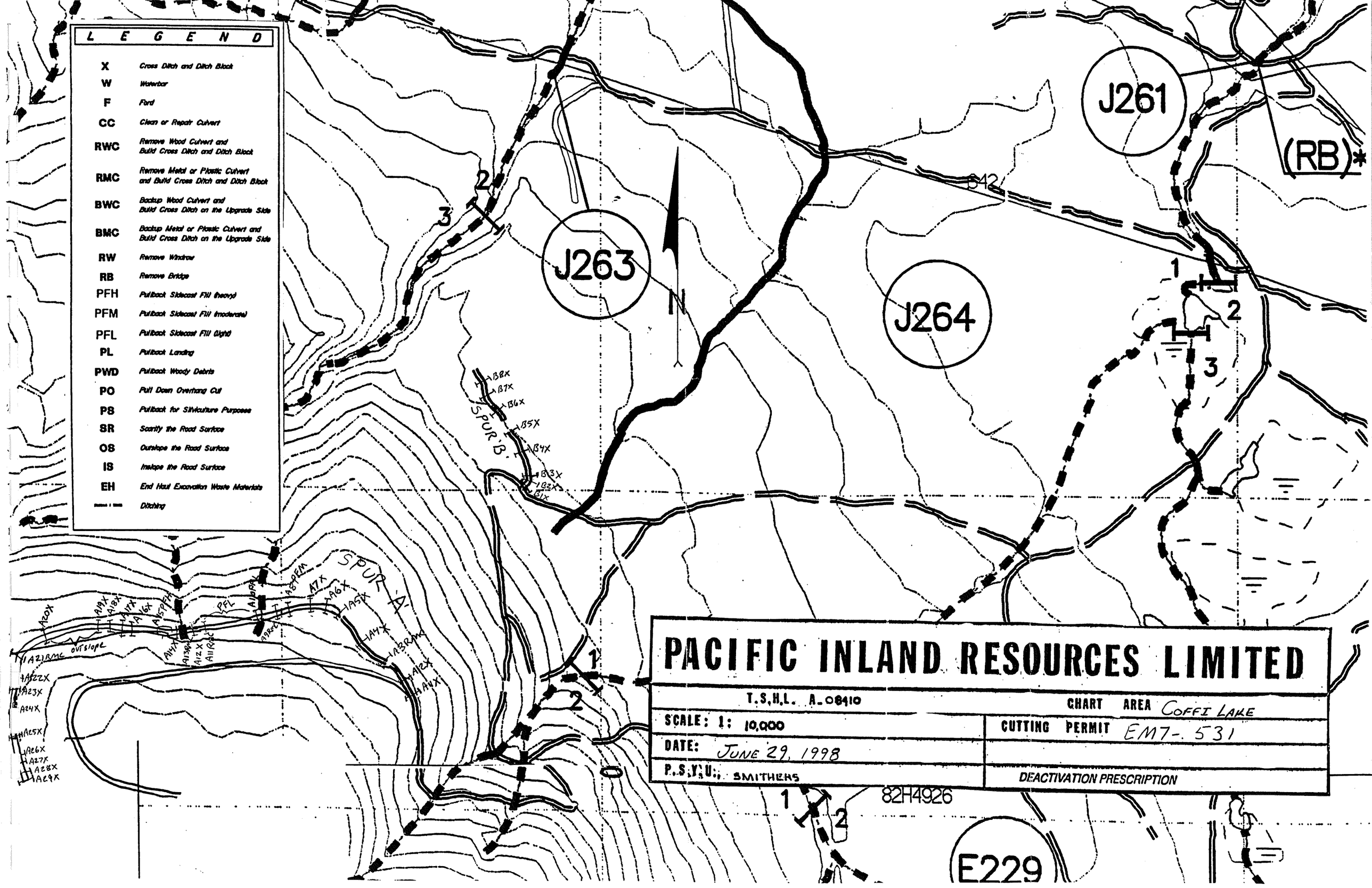
A15PFH

- heavy pullback of fill slope required for roughly 45 metres

A20X

- out slope road for roughly 115 metres

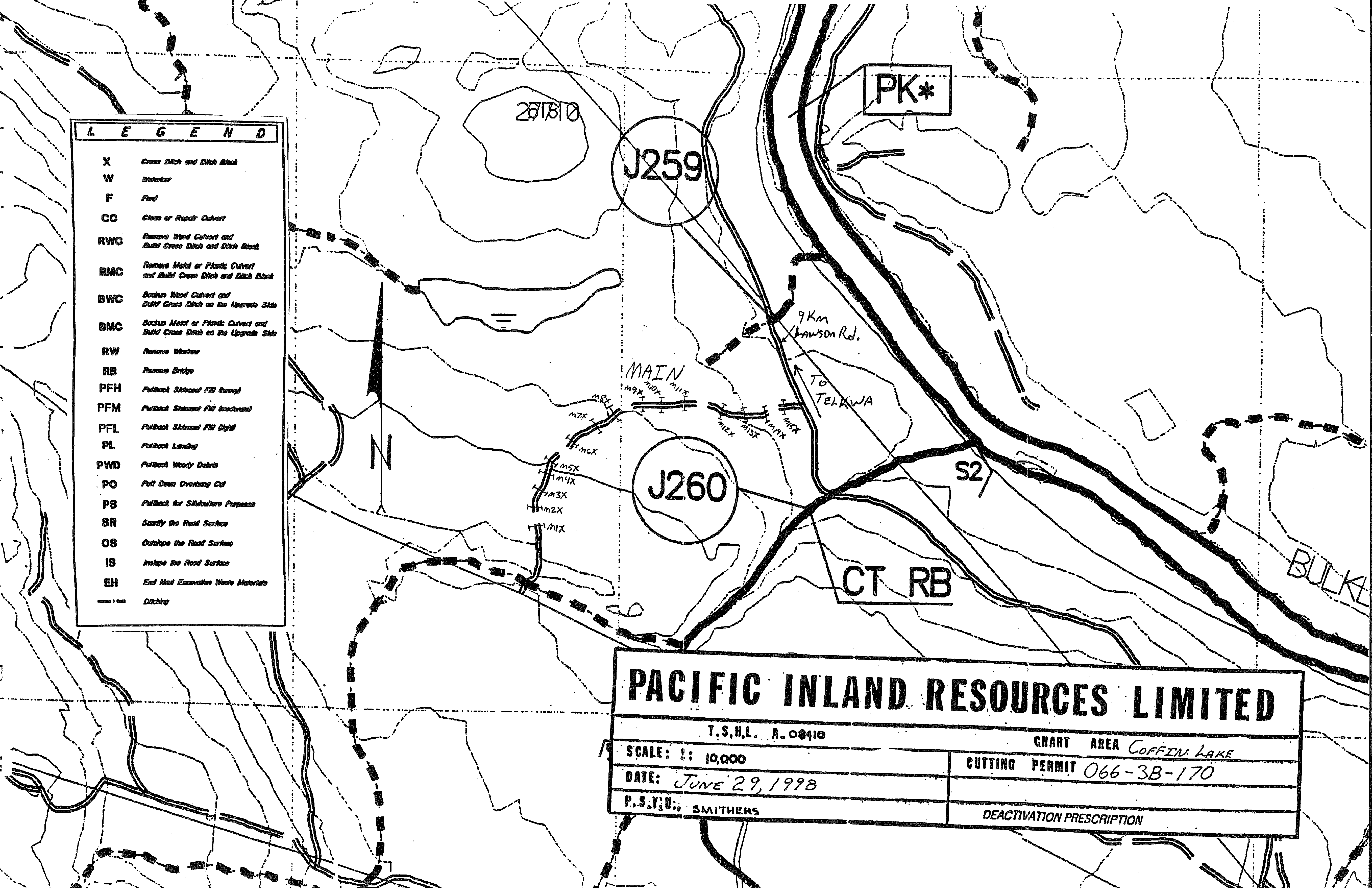
* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites


LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
J261
J263
J264
E229
542
82H4926
(RB)*
SPUR 'B'
SPUR 'A'
outslope
PACIFIC INLAND RESOURCES LIMITED
T.S.H.L. A_08410
CHART AREA COFFI LAKE
SCALE: 1: 10,000
CUTTING PERMIT EM7-531
DATE: JUNE 29, 1998
P.S.Y.U.: SMITHERS
DEACTIVATION PRESCRIPTION

066-3B-170 Contract number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
N
J259
J260
PK*
S2
CT RB
MAIN
9Km Lawson Rd.
To Telkwa
M1X
M2X
M3X
M4X
M5X
M6X
M7X
M8X
M9X
M10X
M11X
M12X
M13X
M14X
M15X
BULKL
PACIFIC INLAND RESOURCES LIMITED
T.S.H.L. A-08410
CHART AREA COFFIN LAKE
SCALE: 1: 10,000
CUTTING PERMIT 066-3B-170
DATE: JUNE 29, 1998
P.S.Y.U.: SMITHERS
DEACTIVATION PRESCRIPTION

EM7-517 Contract number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites

LEGEND

X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Windrow
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
---|---	Ditching

CT RB

BULKLEY

S31

PK*

631

S6

A1X

A2X

A3X

A4X

SPUR 'A'

A5X

A6X

A7X

A8X

A9X

SPUR 'B'

B1X

B2X

B3X

B4X

N

J261

(RB)*

542

1

2

3

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA COFFIN LAKE
SCALE: 1: 10,000	CUTTING PERMIT EM7-517
DATE: JUNE 29, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

E98-082 Contract number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

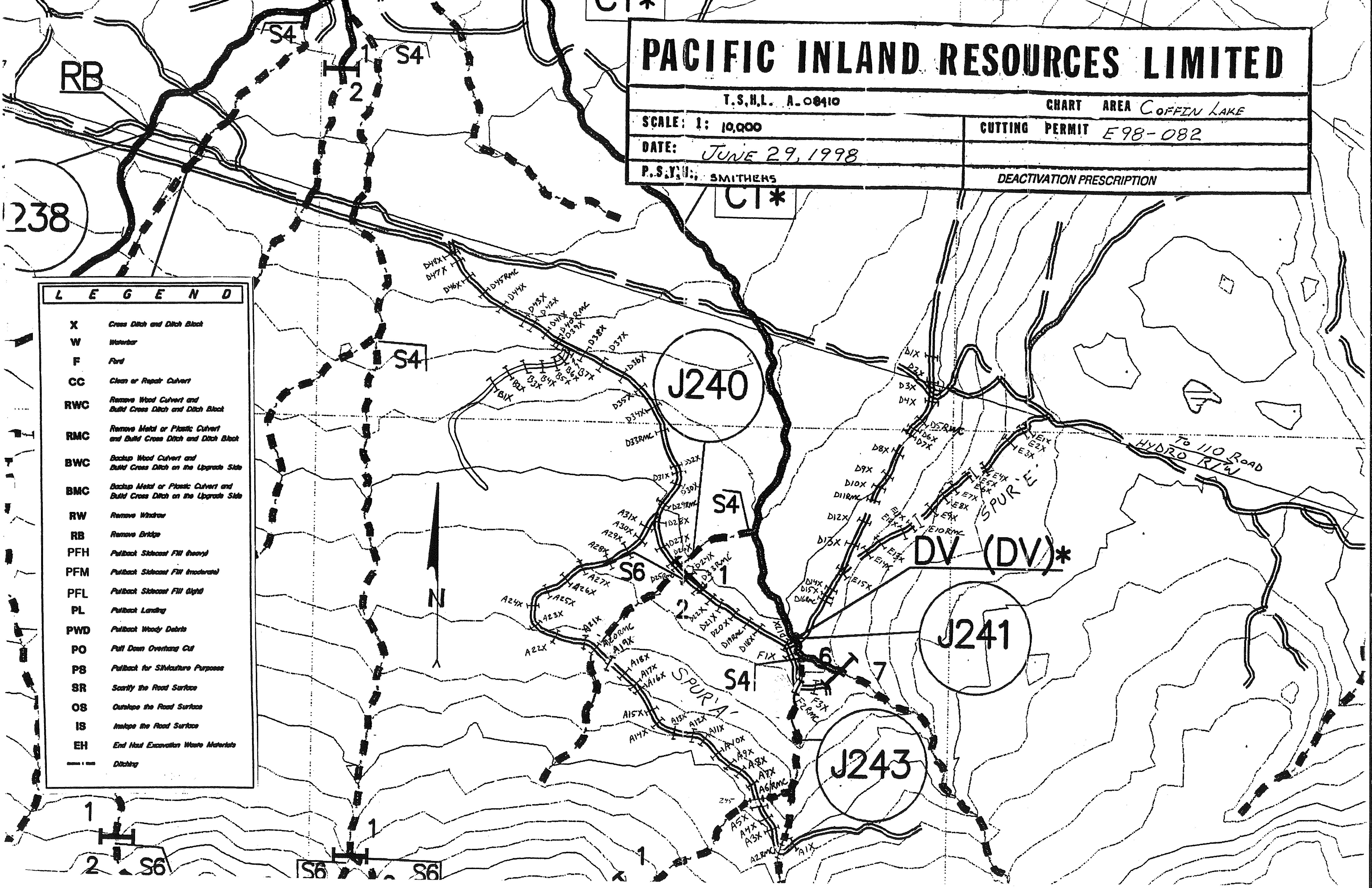
SPUR A
A2RMC

- remove culvert, armour stream banks with non-erodible material

SPUR F
F2RMC

- care should be taken in the removal of this culvert to minimize sedimentation in this S4 class stream

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites


PACIFIC INLAND RESOURCES LIMITED
T.S.H.L. A-08410
CHART AREA Coffin Lake
SCALE: 1: 10,000
CUTTING PERMIT E98-082
DATE: June 29, 1998
P.S.Y.U.: SMITHERS
DEACTIVATION PRESCRIPTION
LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
RB
238
S4
CT*
J240
J241
J243
S6
DV (DV)*
SPUR 'A'
SPUR 'E'
TO 110 ROAD
HYDRO R/W
N

CP511-082 Contract number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

SPUR G

G1X

- heavy runoff is occuring from the Hydro right of way, continue the cut channel as a cross ditch

G29X

- continue cross ditch across junction of skid trail

SPUR H

H2RMC

- deposit excavated fill material at top of hill

SPUR J

J1RMC

- deposit excavated fill material at top of hill

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites

L E G E N D	
X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Waterbar
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
—|—	Ditching

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A_08410	CHART AREA COFFIN LAKE
SCALE: 1: 10,000	CUTTING PERMIT CP511-082
DATE: JUNE 30, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

Table 1 COFFIN LAKE 170 ROAD SYSTEM DEAVTIVATION Contract Number 98-FRBC-13

ROAD SYSTEM LABEL	ROAD NAME	LENGTH KM	# OF CROS DITCHES	# OF CULVERTS FOR REMOVAL	REQUIRED EQUIPMENT	OTHER REQUIRED CONSTRUCTION	LEVEL OF DEACTIVATION	VEHICLE ACCESS
E98-078	170 MAIN	2.6	22	8	small - medium	75 metres light pullbac	SEMI-PERM	ATV
	SPUR F	0.2	2	1	crawler or rubber	stream bank armouring	SEMI-PERM	ATV
	SPUR G	0.5	4	1	tired excavator	remove culverts restore stream	PERMANENT	ATV
E98-083	SPUR A	1.1	10	1	small - medium	removal of	PERMANENT	4X4
	SPUR B	0.8	6	0	crawler or rubber	corderoy	PERMANENT	4X4
	SPUR C	1.8	20	4	tired excavator		PERMANENT	ATV
	SPUR D	1	12	3			PERMANENT	ATV
	SPUR E	0.2	2	1			PERMANENT	ATV
E98-517	170 MAIN	3.5	34	0	small - medium	- failsafe culverts	SEMI-PERM	4X4
	SPUR A	0.04	1	1	crawler or rubber	with cross ditch-8	PERMANENT	ATV
	SPUR B	1.8	17	2	tired excavator	- bury abandoned car	PERMANENT	ATV
	SPUR C	0.6	1	0			PERMANENT	ATV
	SPUR D	0.4	5	0	medium sized	- clean up quarry	PERMANENT	ATV
	SPUR E	1.5	15	2	crawler excavator	rock	PERMANENT	ATV
	SPUR F	0.2	3	1	small - medium	- failsafe culverts with	PERMANENT	ATV
	SPUR G	0.9	13	2	crawler or rubber	cross ditch and install	PERMANENT	ATV
	SPUR H	0.6	4	3	tired excavator	extra culvert-1	PERMANENT	ATV
EM7-510	MAIN	3.5	36	11		remove wooden	PERMANENT	ATV
	SPUR A	0.9	11	0		6 metre bridge	PERMANENT	4X4
	SPUR A1	0.8	9	1	small - medium		PERMANENT	ATV
	SPUR B	0.3	4	3	crawler or rubber		PERMANENT	ATV
	SPUR D	1.9	16	6	tired excavator		PERMANENT	ATV
	SPUR D1	0.3	3	2			PERMANENT	ATV
	SPUR D2	0.5	3	1			PERMANENT	ATV
E98-033	140 main	2.1	27	4	small - medium	bury scrap metal	PERMANENT	ATV
	SPUR A	0.2	3	0	crawler or rubber		PERMANENT	ATV
	SPUR B	0.3	2	0	tired excavator		PERMANENT	ATV
TOTALS		28.54	285	58				

Additional Notes:
Average depth of fill over metal culverts is 80 cm
Maximum depth of fill over metal culverts is 1.5 m
Where possible, culverts will be salvaged, destroyed culverts will be burried at a nearby specified site
Contractor will be required to place a warning sign, provided by PIR, at the beginning the 170 road system
Contractor will be required to grass seed all deactivated sites

E98-078 Contract Number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

170 MAINLINE

(1) M1RMC

- remove 3 culverts from this washout. two culverts are directing streamflow under ground. Pullback material from approaches and deposit at the old landing site at the junction roughly 50 metres previous to this site. Material to be spread and grass seeded.
- after culverts have been pulled, non-corodible material salvaged from road surface and road prism should be placed in road bed to stabilize.
- Base of stream should be minimum 8 metres wide, sloped back to allow for ATV access and armoured with rock. Rock can be found at the quarry site on spur D

(2) M2RMC

- remove culvert, construct cross ditch with armour to prevent erosion into crossing M1RMC
- place salvaged non-erodible material at outlet of crossditch to slow and filter water before it enters the larger stream below.

(3) M14RMC

- no ditch block

(4) M16RMC

- Problem: two 600 mm culverts have caused creek to overflow and run down road, washing out road and creating new creekbed, which eventually returns to original channel approximately 100 metres downstream.
- Solution: remove culverts blocking old drainage then block drainage completely retaining the new channel as it's permanent course.

(5) M18PFL

- light pullback of streambanks to a slope not less than 2 to 1, from M16RMC to roughly 75 metres downstream, to avoid further slumping of streambanks
- operator should avoid crossing stream more than necessary
- streambanks should be armoured with heavy armour where culverts are to be removed
- excess material to be placed away from stream banks and grass seeded

(6) M20RMC

- no ditch block

(7) M21X

- no ditch block

(8) M31RMC

- no ditch block

SPUR G

(1) G3RMC

- no ditch block

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required

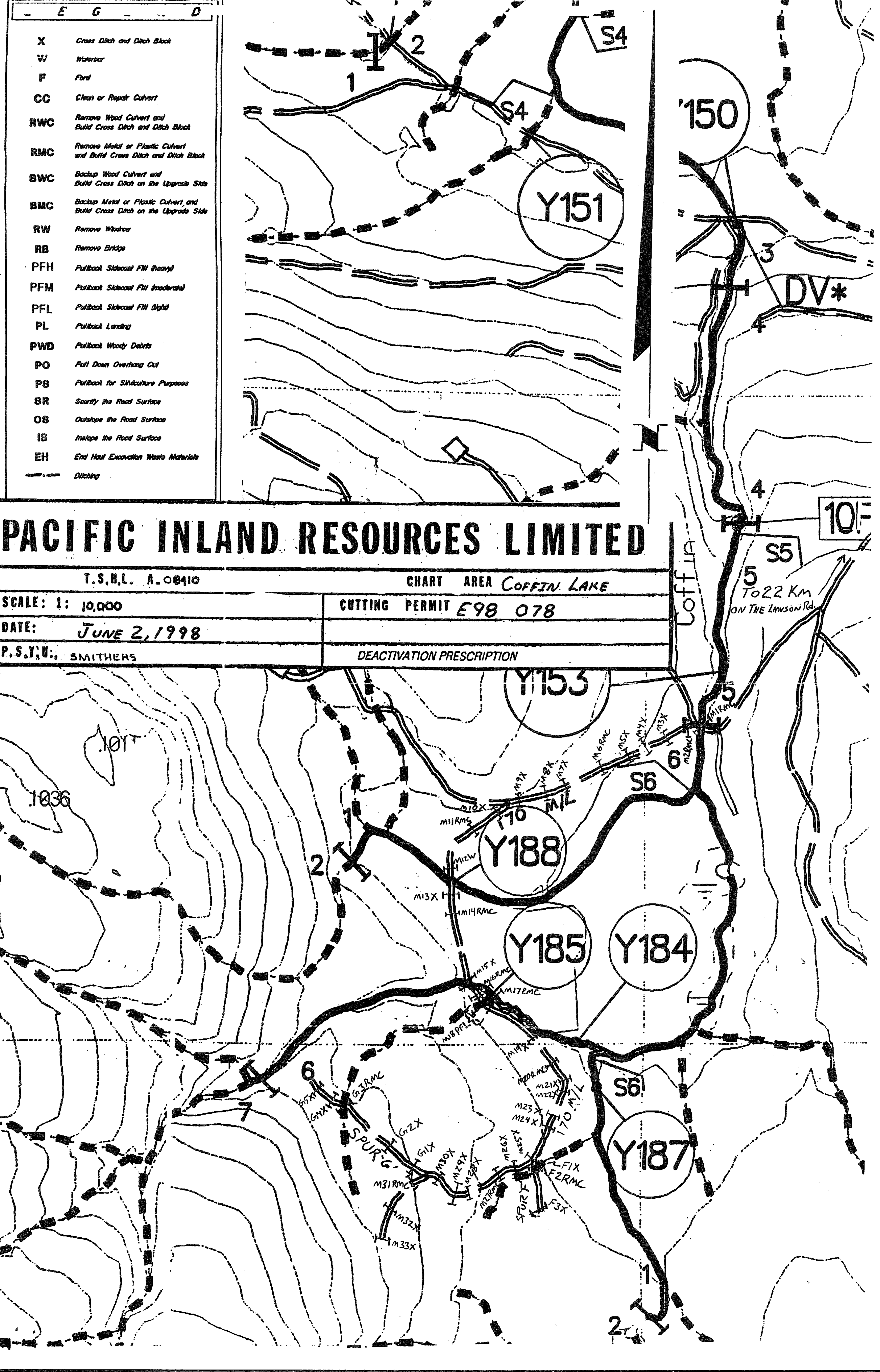
* crush if possible and bury metal debris at nearest landing sites

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A_08410	CHART AREA Coffin Lake
SCALE: 1: 10,000	CUTTING PERMIT E98 078
DATE: June 2, 1998	
P.S.Y.U.: Smithers	DEACTIVATION PRESCRIPTION

LEGEND

X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Windrow
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
—·—	Ditching



E98-083 Contract Number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

SPUR A

(1) A1X

- cross ditch
- fill material to be end hauled, spread and grass seeded at junction on east side of stream.

(2) A4RMC

- remove culvert, construct cross ditch at 115 degrees

(3) A8X

- only a shallow cut cross ditch is necessary

(4) A9X

- only a shallow cut cross ditch is necessary

(5) A11X

- only a shallow cut cross ditch is necessary

SPUR B

(1) B4X

- only a shallow cut cross ditch is necessary

(2) B5X

- only a shallow cut cross ditch is necessary

(3) B6X

- only a shallow cut cross ditch is necessary

SPUR C

C2RMC

- cross ditch at different angle than culvert to be removed

C10RMC

- remove corduroy on both sides of culvert
- end haul material to junction of spur F

C12RMC

- ditch away outlet of cross ditch

C18X

- a long cross ditch will be necessary to breach the berm

C19X

- cut the cross ditch just above the rock outcrop

SPUR D

(1) D6RMC

- end haul excess material to landing below

(2) no treatment is necessary beyond D14X as the road surface is very wet and poses no future problems

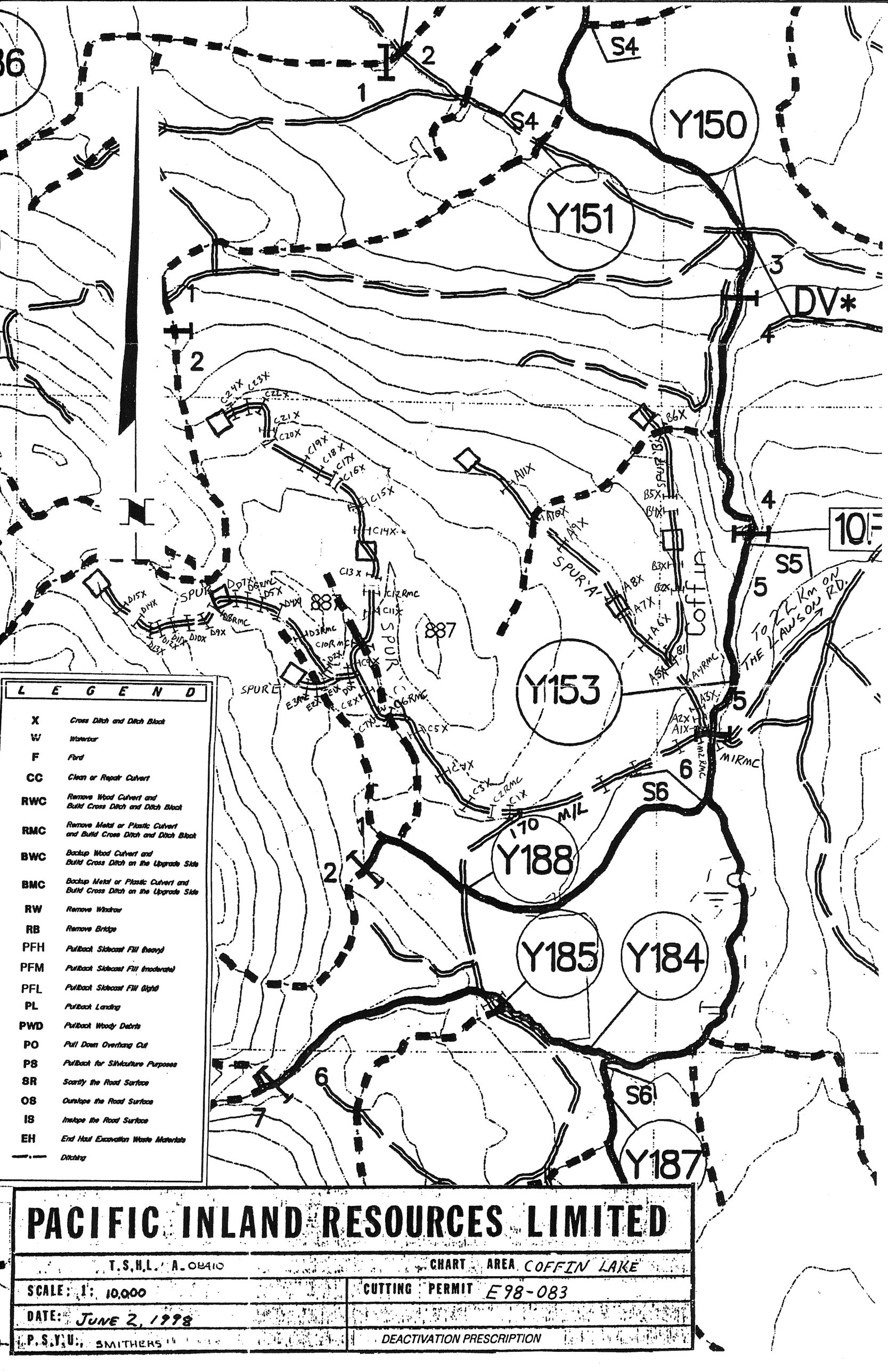
SPUR E

(1) E1RMC

- end haul fill material to pit at 30 metres on spur F
- re-contour drainage to U-shape

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage

* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



LEGEND

X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Windrow
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
—·—	Ditching

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L.: A_08410	CHART AREA: COFFIN LAKE
SCALE: 1: 10,000	CUTTING PERMIT: E98-083
DATE: JUNE 2, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

E98-517 Contract Number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

170 MAINLINE

(1) MA1

- no treatment is necessary for this culvert must be maintained for ditchline drainage of the Lawson road

(2) MA5BMC

- backup culvert, construct cross ditch, on downslope side and armour to prevent erosion in the event that the culvert fails

(3) MA6BMC

- backup culvert, construct cross ditch, on downslope side
- Leave the existing metal culvert as is
- install used culvert above the existing culvert to re-direct the stream to it's natural direction, placing the inlet of the culvert where the stream hits the road fill and the outlet of the culvert approximately two metres above the outlet of the original culvert.
- dig a shallow swale between the two culverts and compact the sight.
- construct a ditch block, below the installed culvert, with compacted non-erodible material

(4) MA7BMC

- build shallow swale over the culvert
- do not build cross ditch

(5) MA10BMC

- backup culvert and clean out inlet of culvert

(6) MA13BMC

- two metal culverts, backup culverts with one cross ditch and clean out inlet and outlet of culverts

(7) MA21BMC

- two metal culverts, backup culverts with one cross ditch and clean out inlet and outlet of culverts

(8) MA23X

- breach berm to prevent downstream ponding

(7) MA26BMC

- backup culvert, no ditch block

SPUR A

(1) A1RMC

- no ditch block
- remove the old cross ditch roughly 10 metres along spur

(2) A2X

- Bury abandoned car onsite

SPUR B

(1) B8X

- water has cut a trench across landing

- cross ditch should extend across the landing, dug deeper and have a minimum base of 1.5 metres
- cross ditch should follow the direction of the present trench

(2) B15RMC
- remove culvert, remove woody debris from road prism and place on top of road surface, crush woody debris as much as possible

SPUR D

(1) D5X
- cross ditch
- dangerous rock quarry - overhanging and falling rock
- hoe to follow existing trail up face of quarry and knock down all rock with potential of falling
- once all dangerous rock is knocked down, material to be sloped up against rock wall
- some of this rock can be used as armour for stream crossings in the area

(2) D1X
- build the cross ditch above the ditchline of the main road to avoid intercepting water from the main road

SPUR E

(1) E4RMC
- remove culvert, remove woody debris from road prism and place on top of road surface, crush woody debris as much as possible

SPUR G

(1) G9X
- no ditch block
- remove woody debris

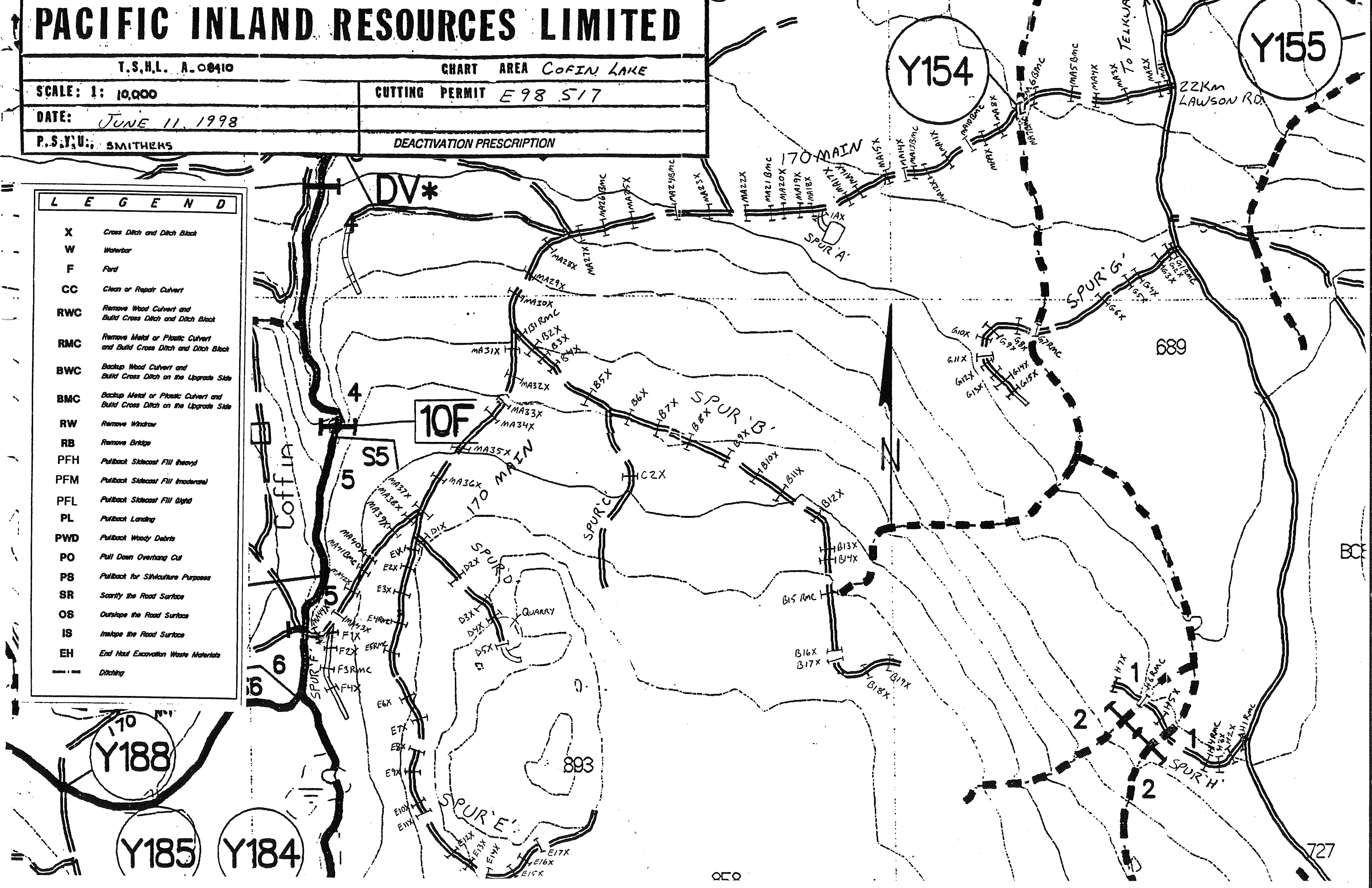
* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A_08410	CHART AREA *Cofin Lake*
SCALE: 1: 10,000	CUTTING PERMIT *E98 517*
DATE: *June 11, 1998*	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

LEGEND

X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Windrow
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
	Ditching



EM7-510 Contract Number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

MAIN ROAD

(1) MB5X

- some rock below surface, may move cross ditch 2 metres uphill

(2) MB14RMB

- do not try to cross this bridge
- remove bridge (6 m bridge) - sill logs rotten, planking and stringers rotten and breaking
- remove fill material from approaches before removing sill logs
- slope the approaches to the stream and armour with non-erodible material to reduce siltation during runoff and heavy rains- coarse material can be found at a small quarry on spur A
- this is an S3 class fish stream so care should be taken to reduce siltation and avoid crossing more than absolutely necessary
- end haul material can be placed on spur C, wooden debris should be placed on top of end haul material
- stream bank approaches and fill material to be seeded

(3) MB24RMC

- Inferred S4 class stream
- extra care should be taken when pulling culvert so as not to cause excessive siltation

(4) MB26RMC

- Inferred S4 class stream
- extra care should be taken when pulling culvert so as not to cause excessive siltation

(5) MB29RMC

- Inferred S4 class stream
- extra care should be taken when pulling culvert so as not to cause excessive siltation

SPUR A

(1) A5X

- only a shallow ditch needed, no need to cut into rock

SPUR B

- road is heavily overgrown with alder and very wet, avoid destroying vegetation as much as possible and repair excessive rutting if it occurs

SPUR D

(1) D15RMC

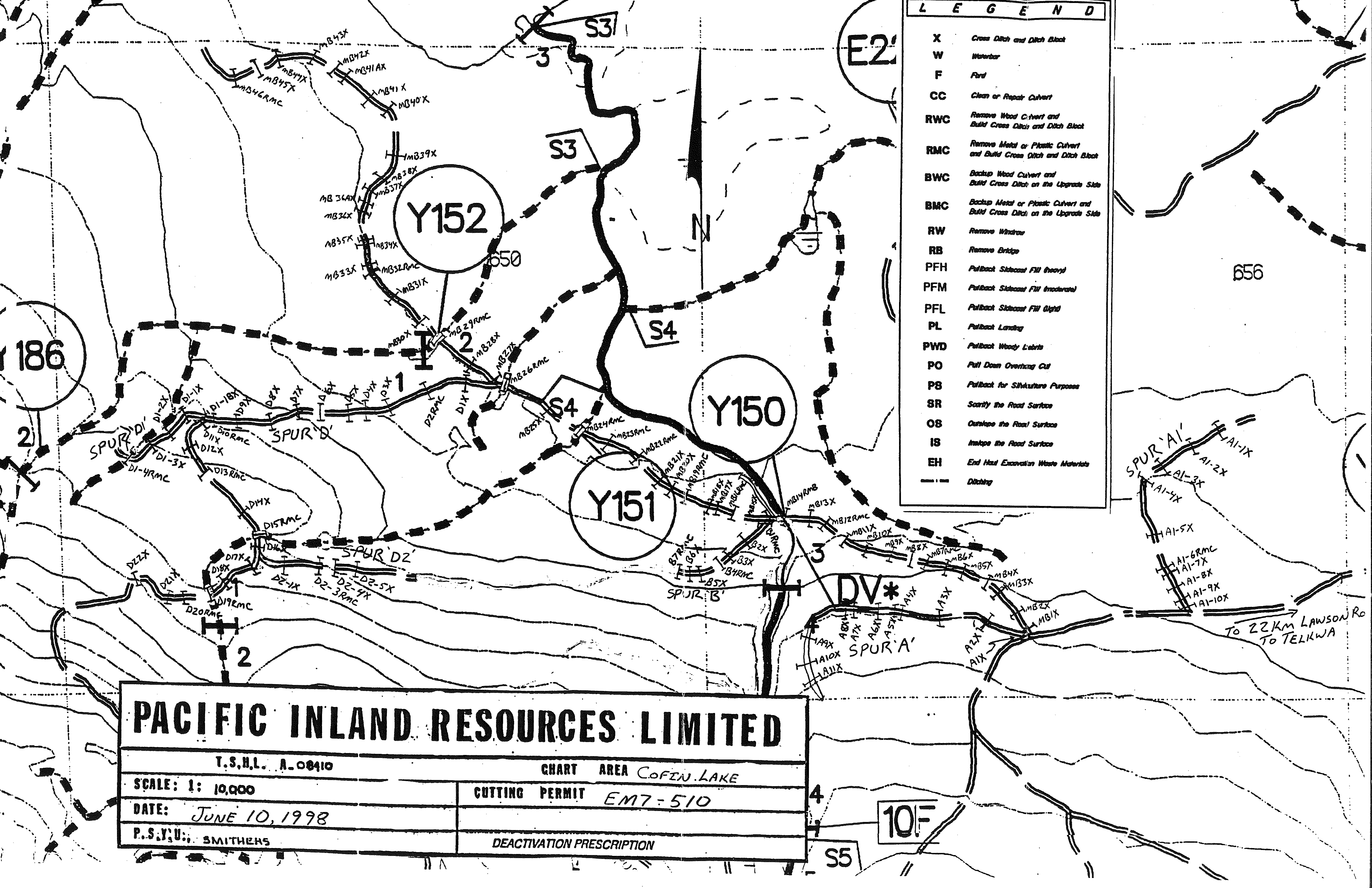
- remove culvert
- fill to be removed and placed on near side, approximately 15 metres away in wide spot, spread and seeded

(2) D19RMC

- remove culvert
- place fill on near side of stream on shoulder of road
- hoe will have to throw material twice in order to place properly

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage

* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites


LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
Y152
Y186
Y150
Y151
E22
N
S3
S4
S5
650
656
10F
DV*
SPUR 'D'
SPUR 'D1'
SPUR 'D2'
SPUR 'B'
SPUR 'A'
SPUR 'A1'
TO 22Km LAWSON RD TO TELKWA

PACIFIC INLAND RESOURCES LIMITED

T.S,H,L. A_08410	CHART AREA COFIN LAKE
SCALE: 1: 10,000	CUTTING PERMIT EM7-510
DATE: JUNE 10, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

E98-033 Contract Number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

140 MAIN

- no deactivation is planned for beyond M31X
- road beyond is swampy and access with machinery would cause much damage
- present access is ATV only

SPUR B

- junction - scrap metal to be buried

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A_08410	CHART AREA COFFIN LAKE
SCALE: 1: 10,000	CUTTING PERMIT E98-033
DATE: JUNE 10, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

LEGEND

X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Windrow
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
	Ditching

E225

Y150

Y151

Y155

J284

J2

S3

S4

140 MAIN

SPUR 'B'

APPROX. 20.5Km ON THE LAWSON RD

To TEAKE

656

689

DV*

Table 1 COFFIN LAKE 150 ROAD SYSTEM DEAVTIVATION Contract Number 98-FRBC-13

ROAD SYSTEM LABEL	ROAD NAM	LENGTH KM	# OF CROS DITCHES	OF CULVERT FOR REMOVAL	REQUIRED EQUIPMENT	OTHER REQUIRE CONSTRUCTION	LEVEL OF DEACTIVATION	VEHICLE ACCESS
E98-090	150 MAIN	6.015	75	15	small - medium		PERMANENT	ATV
	SPUR A	0.313	5	0	crawler or rubber		PERMANENT	ATV
	SPUR B	0.4	3	1	tired excavator		PERMANENT	ATV
	SPUR C	0.5	10	0			PERMANENT	ATV
	SPUR D	2.736	25	5			PERMANENT	ATV
	SPUR E	0.465	0	1			PERMANENT	ATV
	SPUR F	1.175	16	0			PERMANENT	ATV
	SPUR F1	1.618	16	2			PERMANENT	ATV
	SPUR G	1.533	14	2		Remove Windrow	PERMANENT	ATV
	SPUR H	1.5	17	0			PERMANENT	ATV
TOTALS		16.255	181	26				

Additional Notes:
Average depth of fill over metal culverts is 80 cm
Maximum depth of fill over metal culverts is 1.5 m
Where possible, culverts will be salvaged, destroyed culverts will be burried at a nearby specified site
Contractor will be required to place a warning sign, provided by PIR, at the beginning the 170 road system
Contractor will be required to grass seed all deactivated sites

E98-090 Contract number 98-FRBC-13

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

150 MAIN

- upgrade road deactivation from semi-permanent to permanent

M35X - start cross ditch 10 - 15 metres above road

M53X - start cross ditch 15-20 metres inside landing

M67X - remove corderoy, crush and spread on road surface

M71X - cross ditch - remove woody debris exposed in the ditch cut, crush and spread on road surface

SPUR B

B3RMC - possible metal culvert buried deep, cut cross ditch deep enough to drain pond

SPUR D

D35X - ensure cross ditch is built across skid trail below road

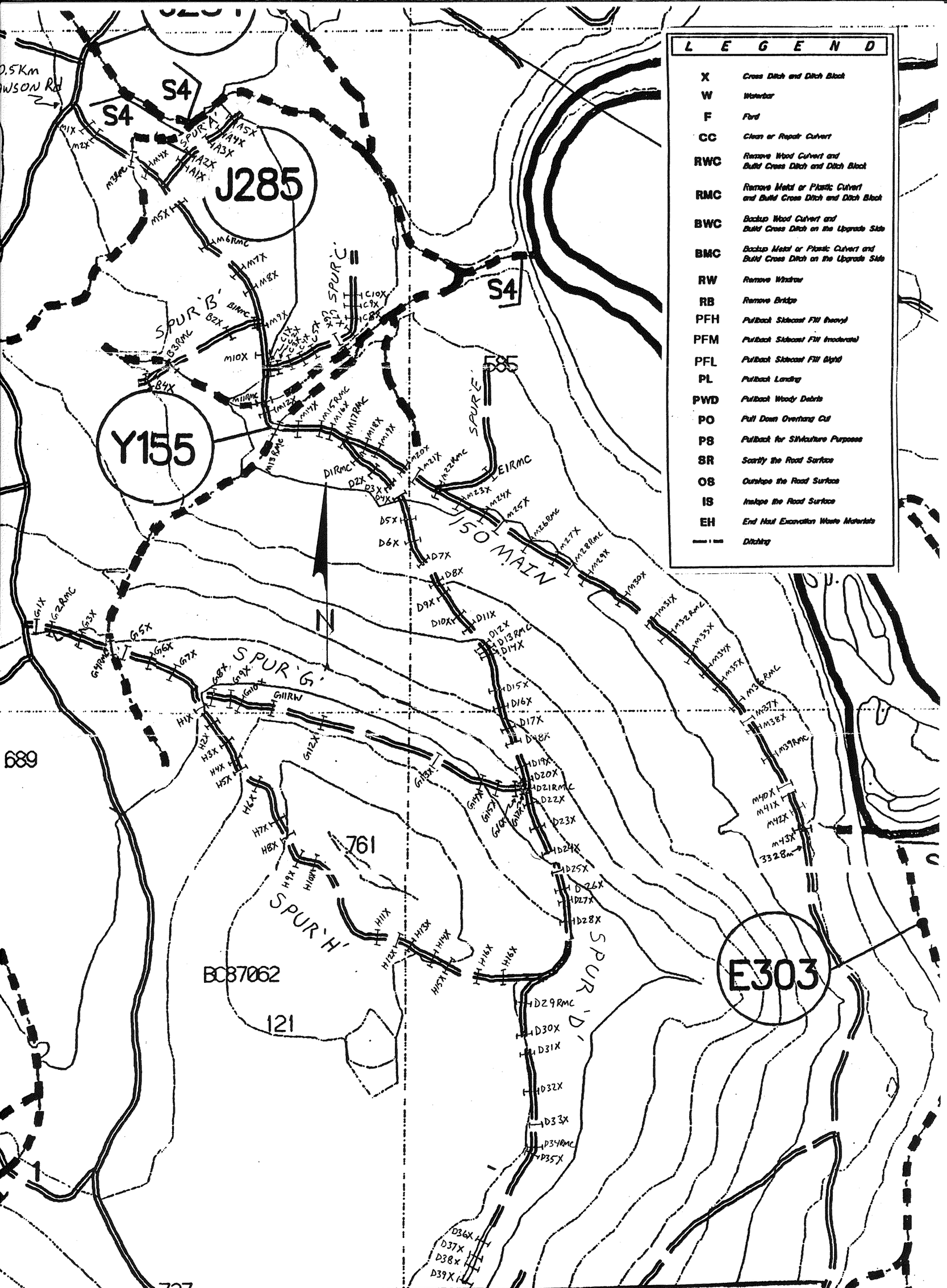
- gravel pit between D28X and D29RMC is a good location to bury metal debris

SPUR F1

F1-13RMC - pullback approaches to 2:1, remove woody debris. compact the approaches and place non-erodible material to prevent siltation

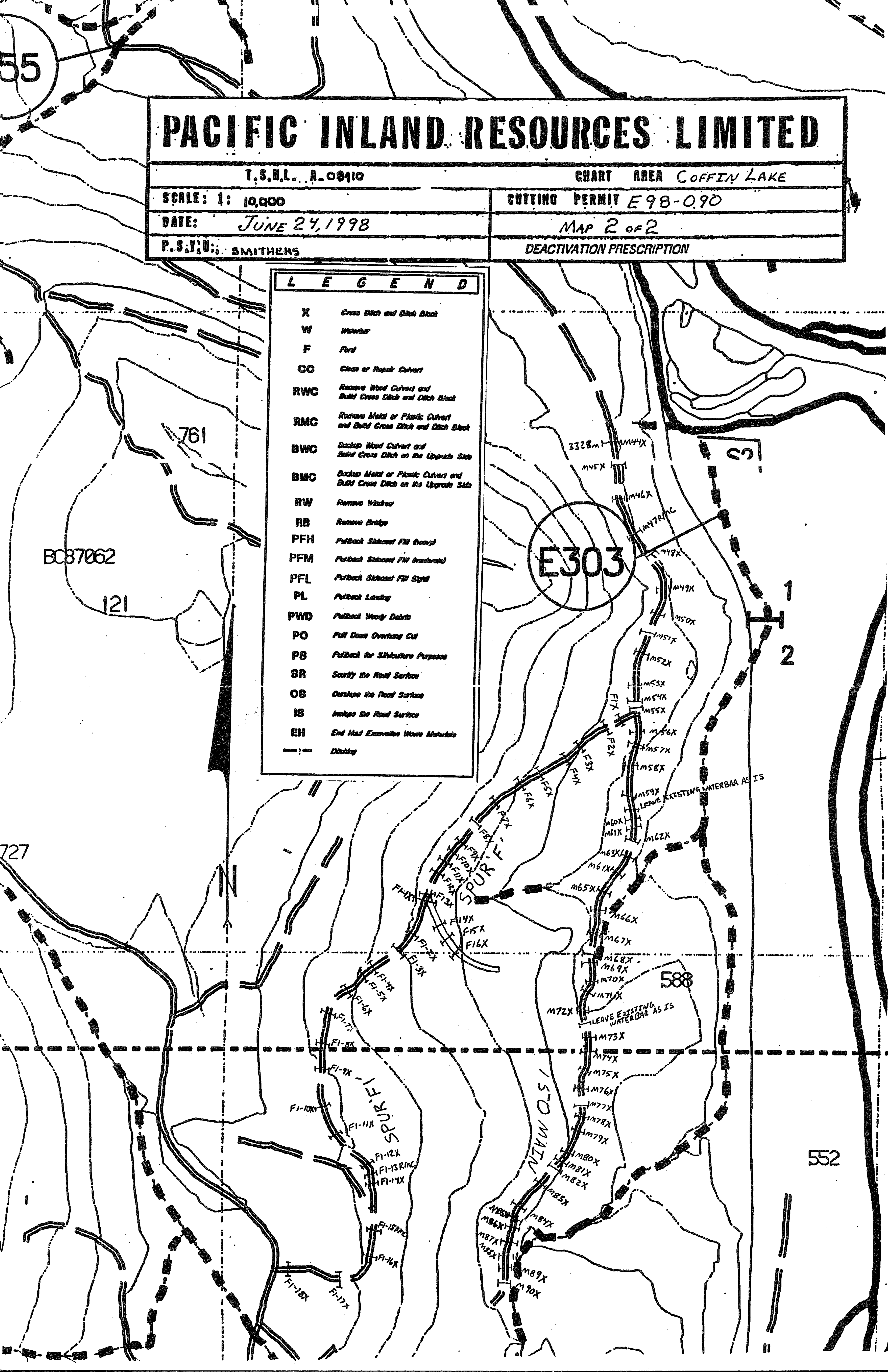
- crush woody debris and spread over road surface

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA COFFIN LAKE
SCALE: 1: 10,000	CUTTING PERMIT E98-090
DATE: JUNE 24, 1998	MAP 1 OF 2
	DEACTIVATION PRESCRIPTION



PACIFIC INLAND RESOURCES LIMITED
T.S.H.L. A-08410
CHART AREA COFFIN LAKE
SCALE: 1: 10,000
CUTTING PERMIT E98-090
DATE: JUNE 24, 1998
MAP 2 OF 2
P.S.Y.U.: SMITHERS
DEACTIVATION PRESCRIPTION
LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
E303
SPUR 'F'
SPUR 'F1'
1 5 O MAIN
LEAVE EXISTING WATERBAR AS IS
LEAVE EXISTING WATERBAR AS IS
3328m
N
55
761
BC87062
121
727
588
552
1
2

4.2 Goathorn Creek and Howsen Creek

The Goathorn Creek and Howsen Creek areas are located roughly south and southwest of Telkwa and accessed from Coalmine road and the 120 FSR. These areas were deactivated to a permanent state allowing 4x4 or ATV access. Cross ditches and culvert removal was deemed to be adequate in these areas for deactivation purposes.

Much of the Goathorn Creek area is currently owned and being utilized by Manalta Coal Ltd. Kendal Umscheid, Senior Exploration Technologist from Manalta Coal Ltd., was contacted and his input into deactivation on their private land was requested. The response that was received from Manalta was that they did not want PIR conducting any road deactivation on their private land, as they have plans for those road systems (i.e., the 120 cutoff).

4.2.1. Goathorn Creek and Howsen Creek Final Prescriptions

Table 1 GOATHORN CREEK and HOWSEN CREEK ROAD DEAVTIVATION Contract Number 98-FRBC-14

ROAD SYSTEM LABEL	ROAD NAM	LENGTH KM	# OF CROS DITCHES	OF CULVERT FOR REMOVAL	REQUIRED EQUIPMENT	OTHER REQUIRED CONSTRUCTION	LEVEL OF EACTIVATIO	VEHICLE ACCESS
065-55	SPUR A	0.784	1	2	small - medium crawler or rubber tired excavator		PERMANENT	ATV
067-6	MAIN	0.902	14	0			PERMANENT	ATV
EM7 500-1	SPUR A	1.093	7	2			PERMANENT	4WD
	SPUR B	0.52	4	2			PERMANENT	4WD
	SPUR C	0.675	5	5			PERMANENT	4WD
	SPUR D	1.027	17	3			PERMANENT	4WD
	SPUR G	0.9	9	4			PERMANENT	4WD
EM7 500-5	SPUR A	0.978	8	5			PERMANENT	4WD
	SPUR B	0.521	5	1			PERMANENT	4WD
	SPUR A1	0.305	4	1			PERMANENT	4WD
EM7-509	SPUR A	0.93	11	2			PERMANENT	4WD
	SPUR B	1.175	11	4			PERMANENT	4WD
CP 597	SPUR A	0.51	5	3			PERMANENT	ATV
	SPUR B	0.107	1	1			PERMANENT	ATV
EM7 525	MAIN A	0.43	12	0			PERMANENT	4WD
	MAIN B	0.41	4	1			PERMANENT	4WD
064-043	SPUR A	2.396	22	3		minor outslope (15m)	PERMANENT	ATV
	SPUR B	0.321	4	0			PERMANENT	ATV
EM7-067	SPUR 067	0.783	11	3			PERMANENT	ATV
064-050	SPUR C	0.908	9	3			PERMANENT	ATV
E98-091	MAIN B	2.1	30	10			PERMANENT	ATV
TOTALS		17.775	194	55				

Additional Notes:
Average depth of fill over metal culverts is 60 cm
Maximum depth of fill over metal culverts is 1.5 m
Where possible, culverts will be salvaged, desroyed culverts will be burried at a nearby specified site
Contractor will be required to place a warning sign, provided by PIR, at the beginning of each road system
Contractor will be required to grass seed and fertilize all deactivated sites

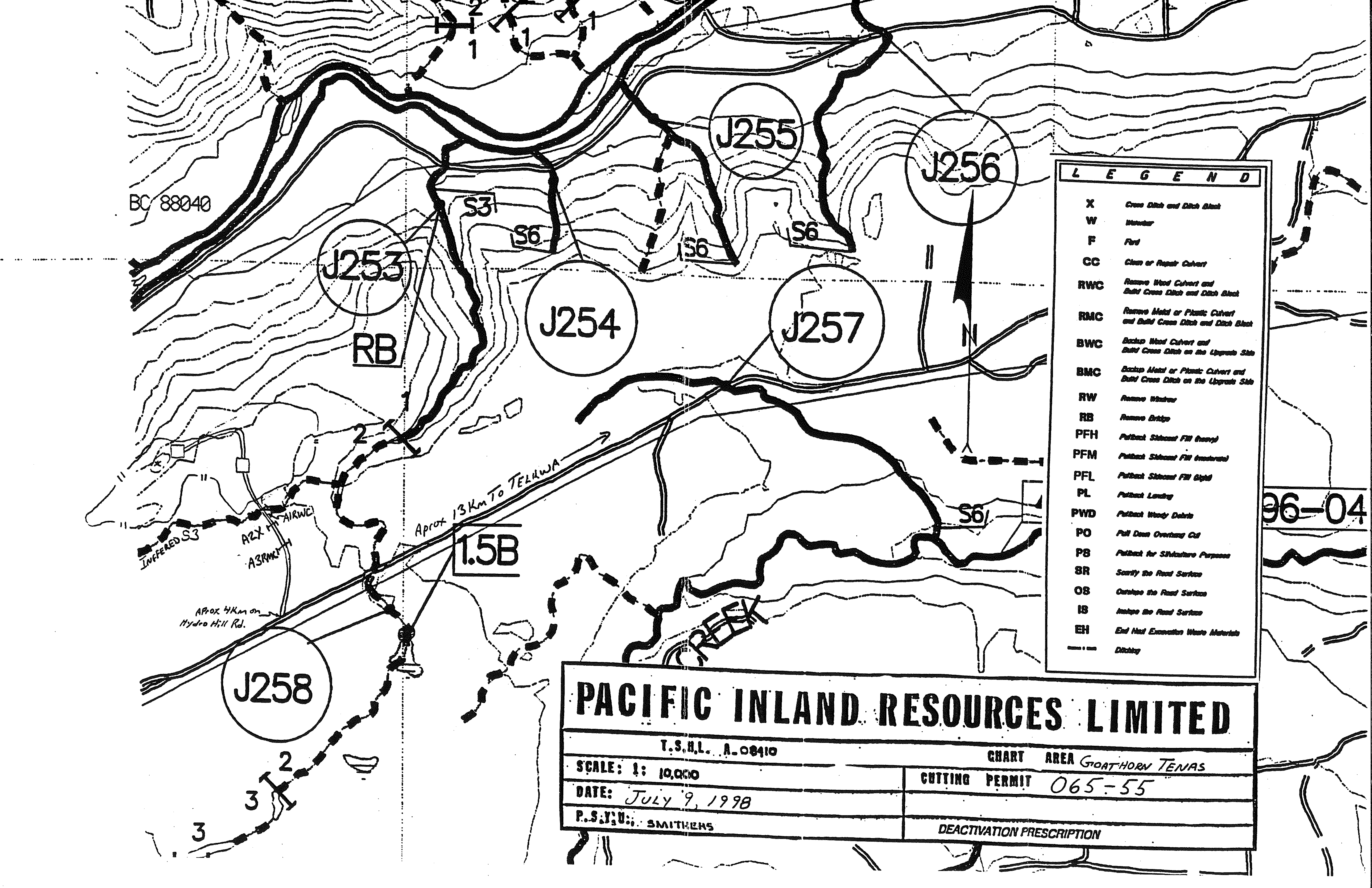
065-55 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

SPUR A

A1RWC
- remove wood box culvert.
- remove fill and place at nearest landing site
- remove wood debris, crush and place on road surface

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites


BC 88040
J253
J254
J255
J256
J257
J258
RB
S3
S6
S6
S6
S6
1.5B
N
CREEK
96-04
Aprox 13 Km To TELKWA
Aprox 4Km on Hydro Hill Rd.
INFFERED S3
A2X
A1RWC
A3RMC
L E G E N D
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
PACIFIC INLAND RESOURCES LIMITED
T.S.H.L. A 08410
CHART AREA GOAT HORN TENAS
SCALE: 1: 10,000
CUTTING PERMIT 065-55
DATE: JULY 9, 1998
P.S.Y.U.: SMITHERS
DEACTIVATION PRESCRIPTION

067-6 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA GOATHORN TENAS
SCALE: 1: 10,000	CUTTING PERMIT 067-6
DATE: JULY 9, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

CV

DV

K106

K107

K108

K109

K110

K111

S1

S2

S3

S6

APROX 1.7Km To TEZKWA
To APROX 7Km 103 Rd.

A14X
A13X
A12X
A11X
A10X
A9X
A8X
A7X
A6X
A5X
A4X
A3X
A2X
A1X

N

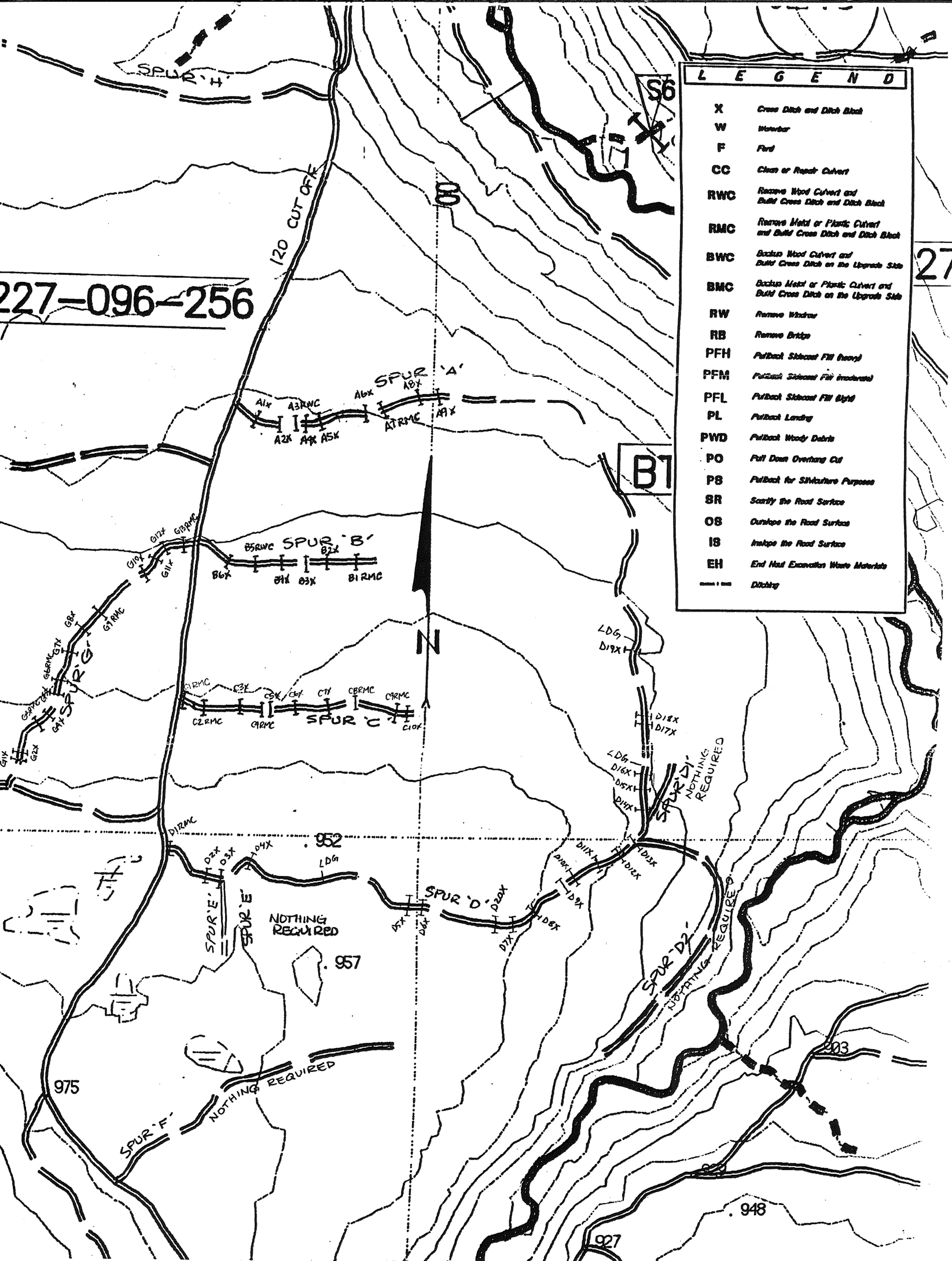
LEGEND

X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Washout
RB	Remove Bridge
PFH	Pullback Sidecast Fill (Hand)
PFM	Pullback Sidecast Fill (Mechanical)
PFL	Pullback Sidecast Fill (Hybrid)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overburden Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
	Ditching

EM7 500-1 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA GOATHORN CREEK
SCALE: 1: 10,000	CUTTING PERMIT EM7-500-01
DATE: JULY 21, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

DV 7162

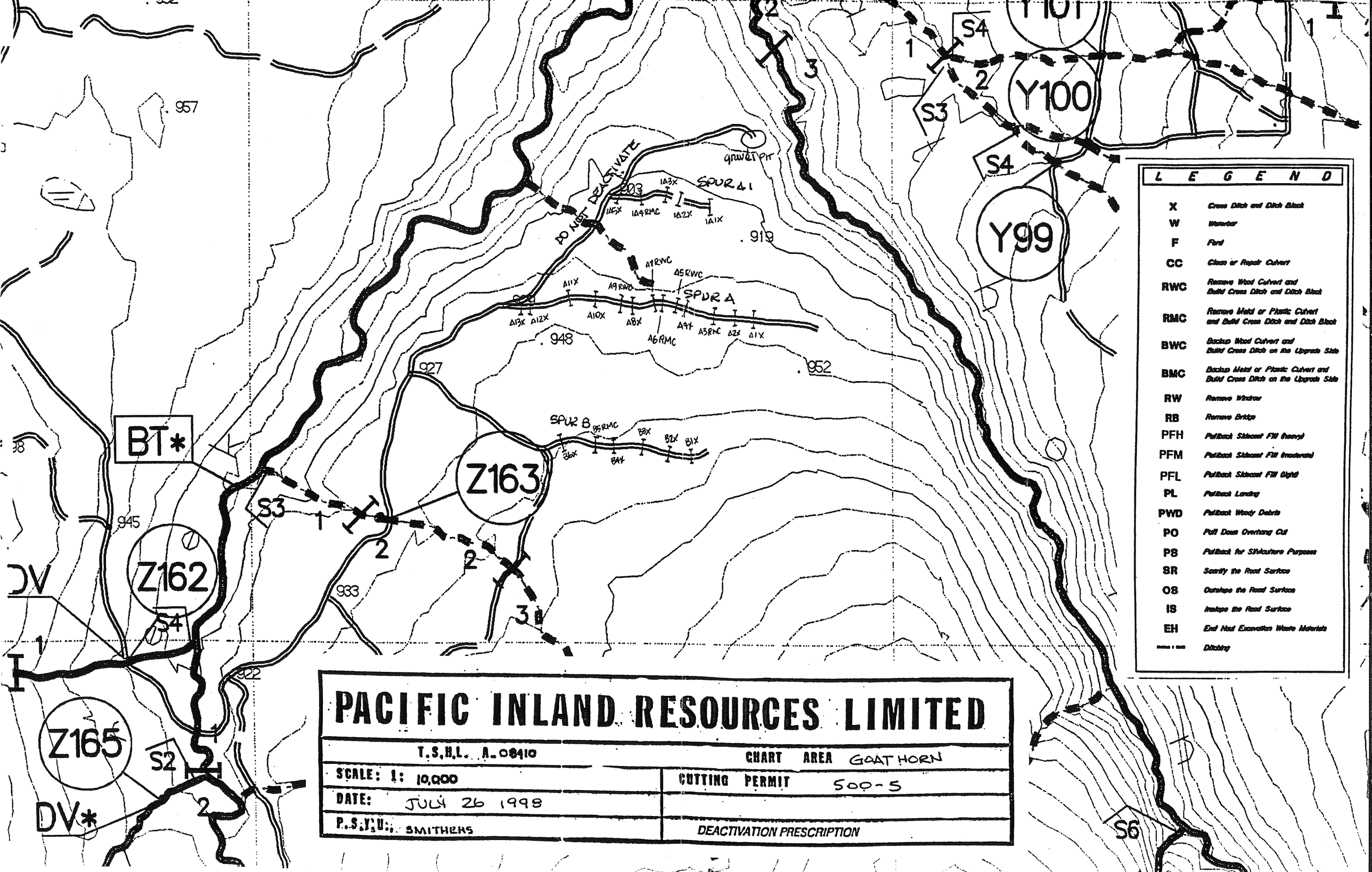
EM7 500-5 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

MAIN

- do not deactivate

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA GOAT HORN
SCALE: 1: 10,000	CUTTING PERMIT 500-5
DATE: JULY 26 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

L E G E N D

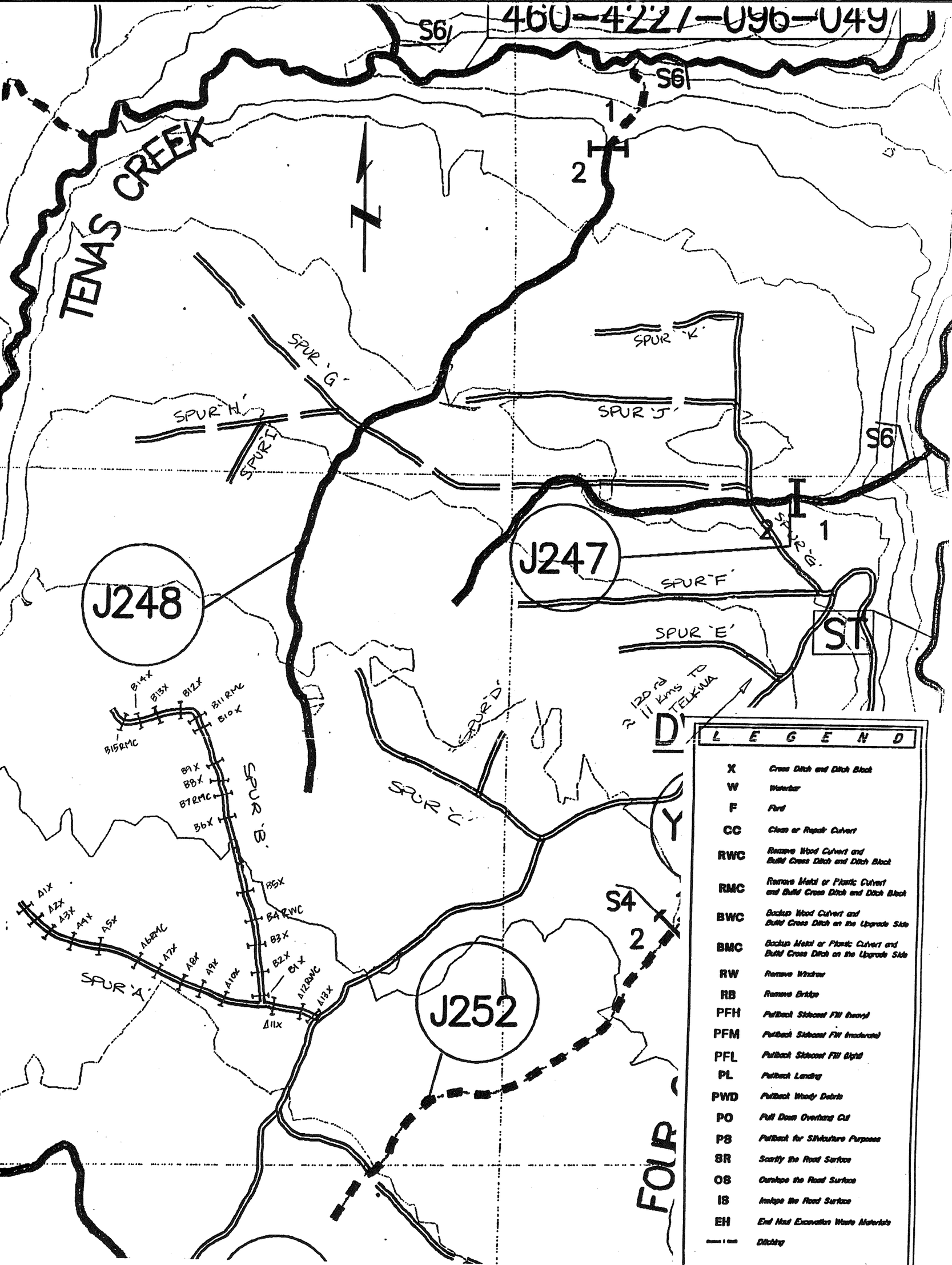
X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Windrow
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
—·—	Ditching

EM7-509 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites

460-422/-096-049



LEGEND

X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Windrow
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
——|——	Ditching

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410

CHART AREA GOATHORN CRK.

SCALE: 1: 10,000

CUTTING PERMIT EM7 509

DATE: JULY 29, 1998

P.S.Y.U.: SMITHERS

DEACTIVATION PRESCRIPTION

CP 597 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

SPUR B

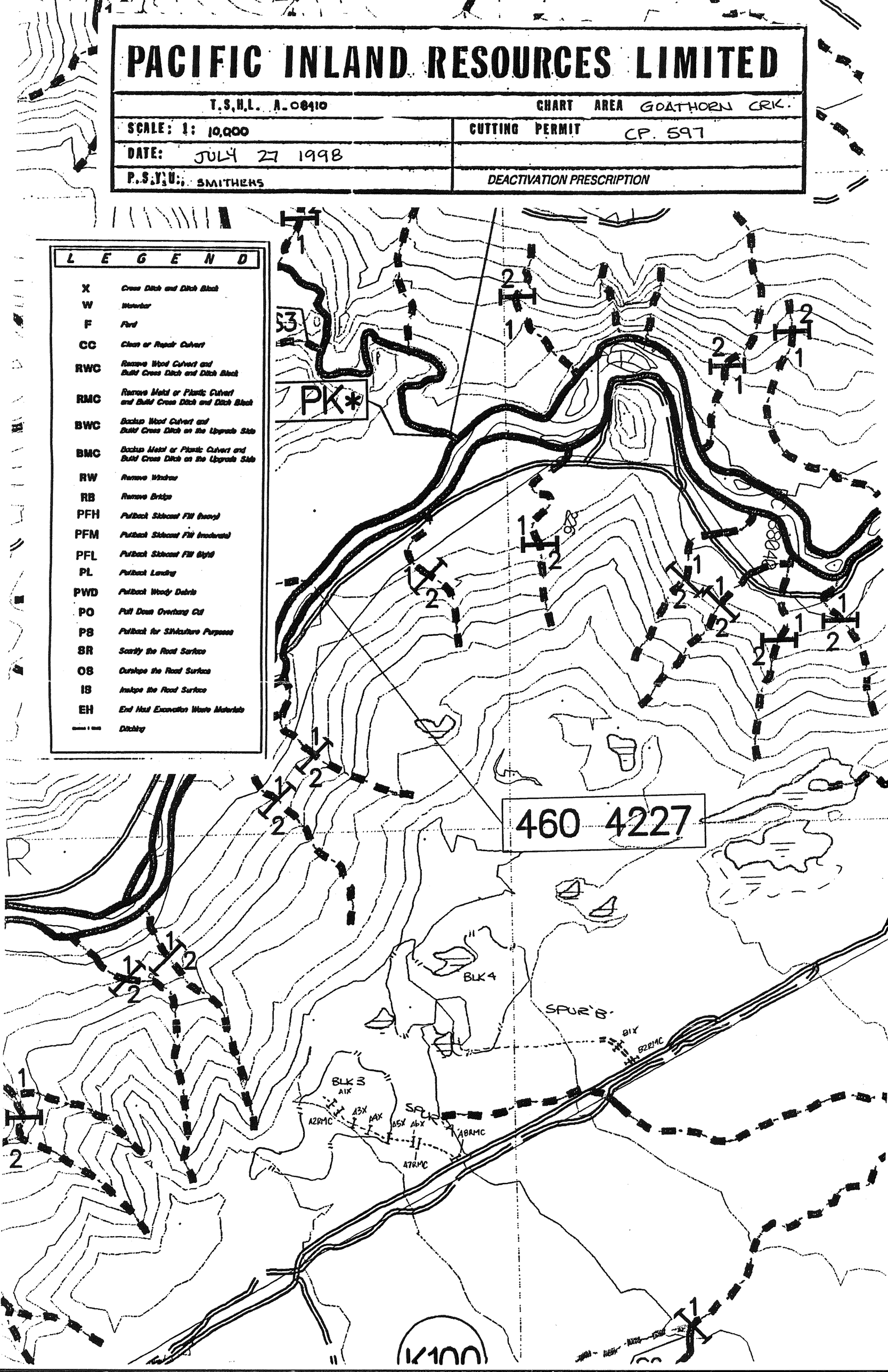
B1X

- cross ditch to allow drainage from swamp

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA GOATHORN CRK.
SCALE: 1: 10,000	CUTTING PERMIT CP. 597
DATE: JULY 27 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION



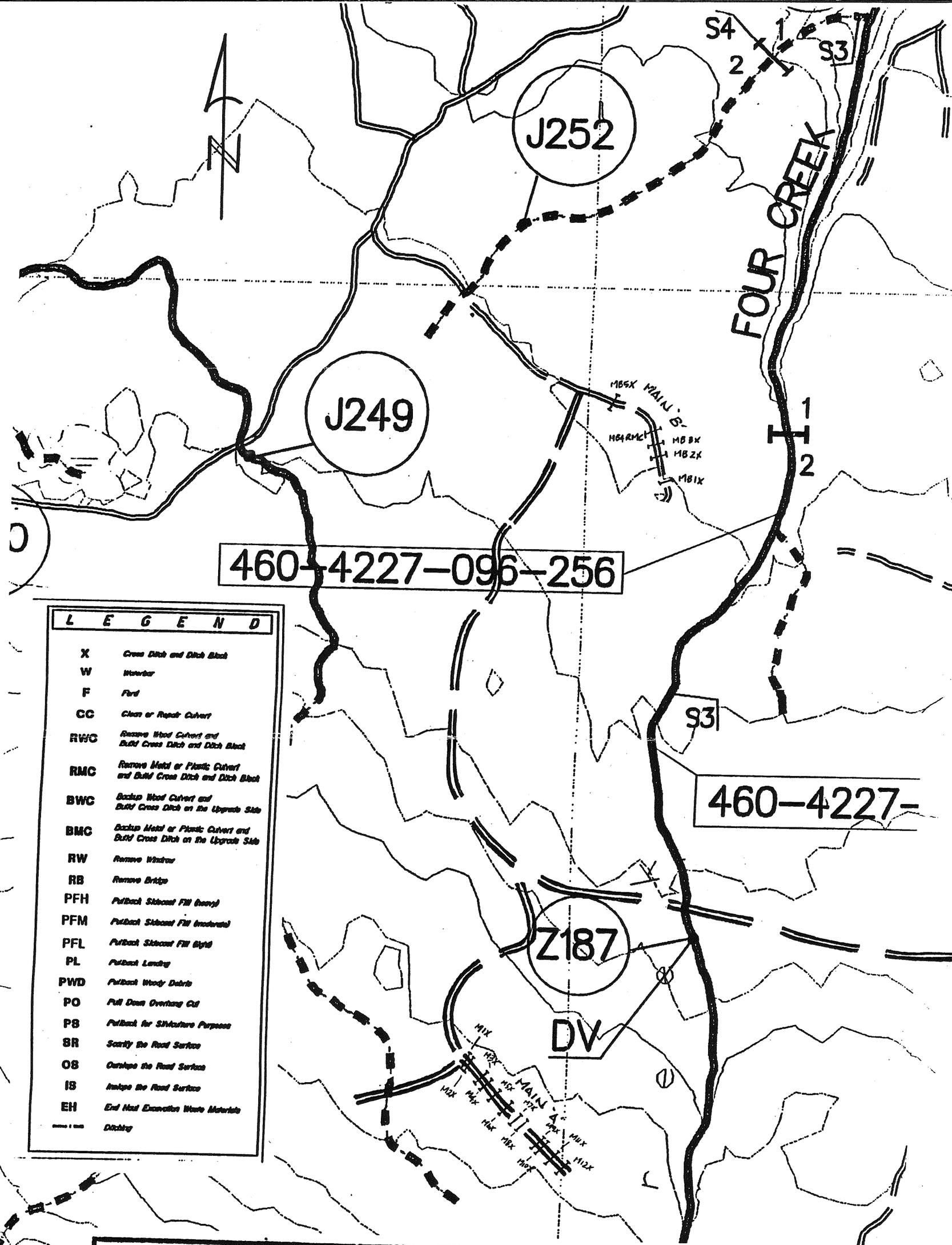
EM7-525 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

MAIN A

- this road has been partially deactivated
- clean up and improve existing cross ditches and waterbars

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



L E G E N D	
X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Window
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
----	Ditching

PACIFIC INLAND RESOURCES LIMITED

T.S.N.L. A-08410	CHART AREA GOATHORN CRK.
SCALE: 1: 10,000	CUTTING PERMIT EM7 525
DATE: JULY 28, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

064-043 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

SPUR A

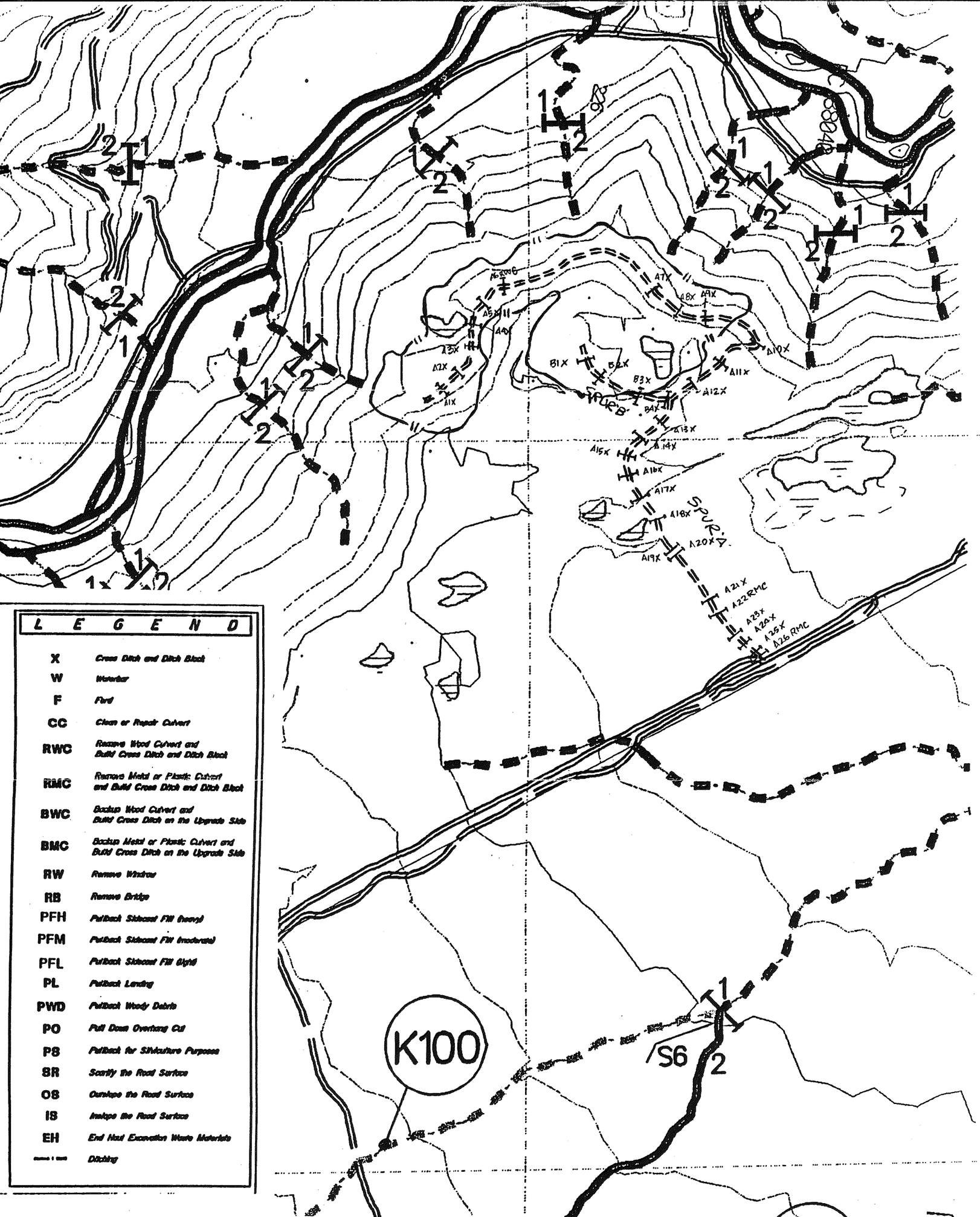
A3X
- build cross ditch to drain overflow from swamp, do not drain swamp

A6RWC
- possible metal culvert buried under debris
- remove fill material (roughly 2.5 metres deep)
- deposit fill aprox. 25 metres away on landing on north side of ditch
- remove woody debris, crush and spread on fill material

A10X
- deep cross ditch
- remove fill material (roughly 3.0 metres deep)
- deposit fill aprox. 25 metres away on landing on north side of ditch
- remove woody debris, crush and spread on fill material

A15OS
- crown the road surface to shed water for roughly 15 metres

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



LEGEND	
X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Windrow
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
——·——	Ditching

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA GOATHORN CRK
SCALE: 1: 10,000	CUTTING PERMIT 064 : 043
DATE: JULY 28, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

460 4227

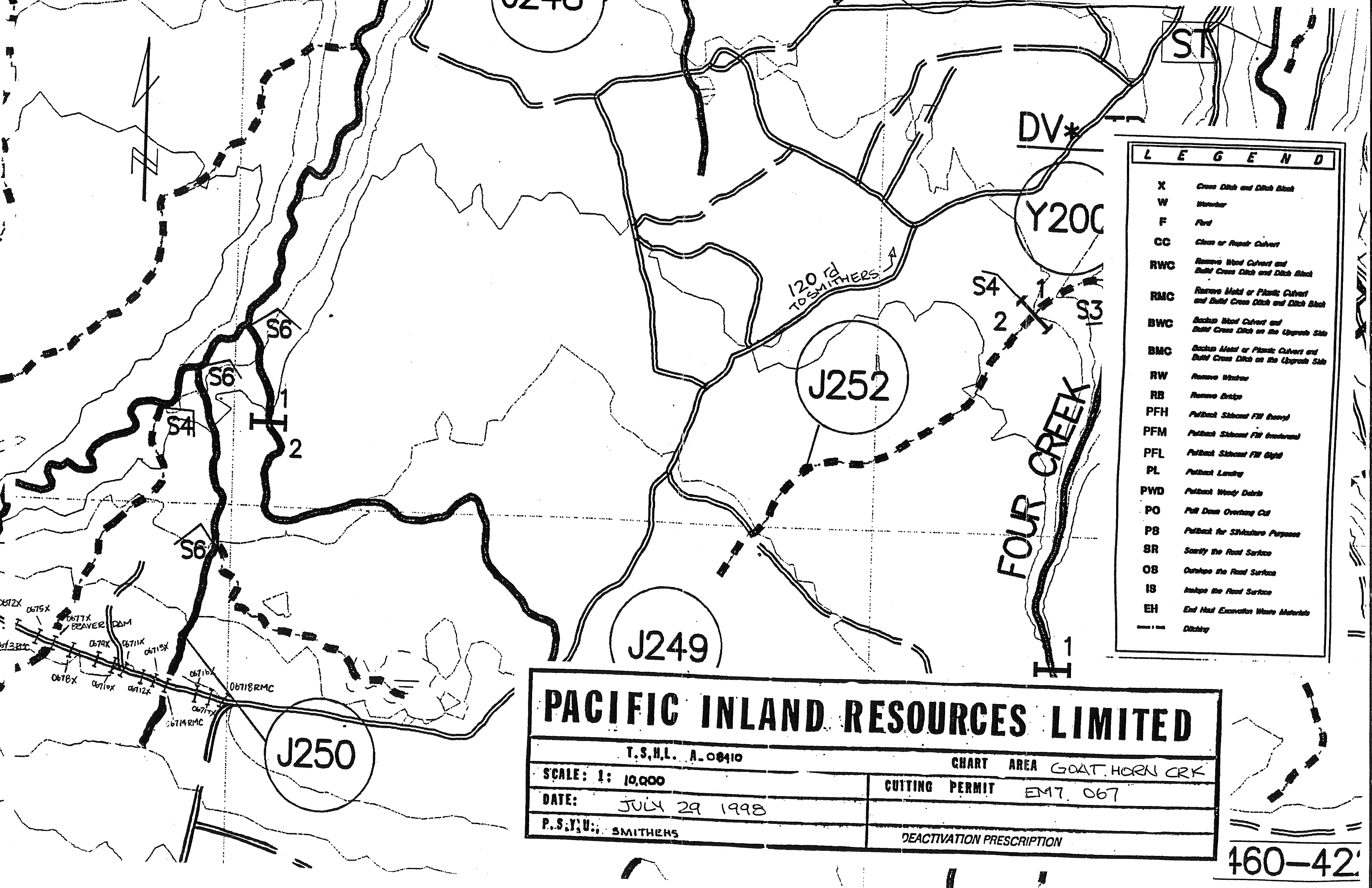
EM7-067 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

SPUR 067

067-7X
- beaver activity
- build cross ditch to drain overflow from pond, do not drain pond

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



J252
J249
J250
Y200
S6
S6
S6
S4
S4
S3
ST
DV*
1
2
120 rd TO SMITHERS
FOUR CREEK
BEAVER DAM
0672X
0675X
0677X
0679X
06711X
06713X
0673RMC
0678X
06710X
06712X
06716X
06718RMC
06717X
06714RMC
LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
PACIFIC INLAND RESOURCES LIMITED
T.S.H.L. A_08410
CHART AREA GOAT HORN CRK
SCALE: 1: 10,000
CUTTING PERMIT EM7 067
DATE: JULY 29 1998
P.S.Y.U.: SMITHERS
DEACTIVATION PRESCRIPTION
460-42

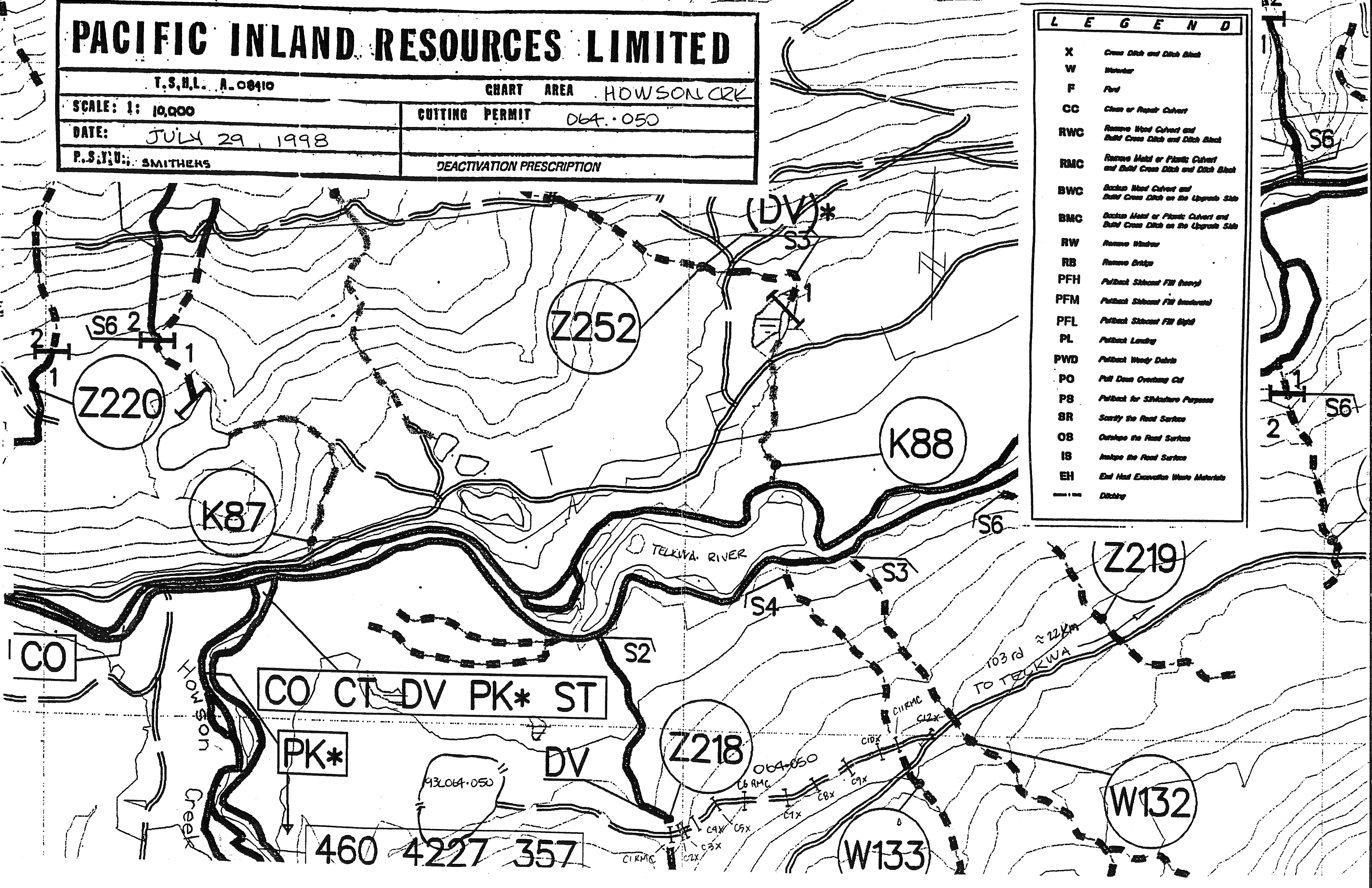
064-050 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

SPUR C

C1RMC
- large metal culvert washed out
- remove fill material from approaches (roughly 2.5 metres deep)
- deposit fill aprox. 35 metres away at top of the hill on near side of stream
- spread fill material, attempt to leave the alder standing throughout the pile, grass seed
- use coarse material on approaches to reduce erosion
- it may be necessary to clear the road to access the site with a gravel truck as the road is heavily brushed in

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites


PACIFIC INLAND RESOURCES LIMITED
T.S.H.L. A_08410
CHART AREA HOWSON CRK
SCALE: 1: 10,000
CUTTING PERMIT 064.050
DATE: JULY 29, 1998
P.S.Y.U.: SMITHERS
DEACTIVATION PRESCRIPTION
LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
(DV)*
S3
Z252
S6
Z220
K88
K87
TELKWA RIVER
S6
S3
Z219
S4
CO
S2
103 rd ≈ 22 Km
TO TELKWA
CO CT DV PK* ST
Howson Creek
PK*
DV
Z218
064-050
93L064.050
W132
W133
460 4227 357

E98-091 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

MAIN B

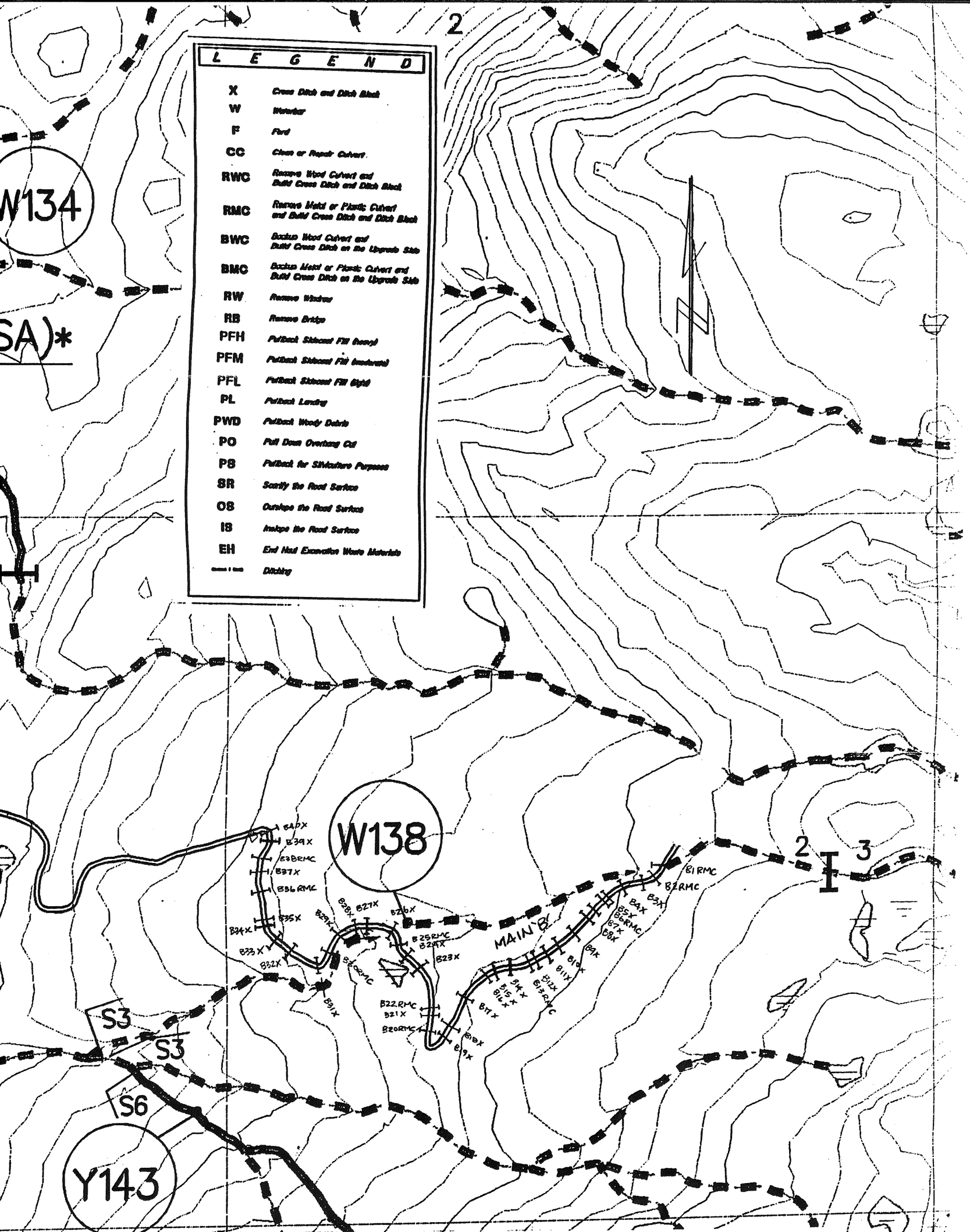
B6RMC
- remove woody debris from road prism
- crush and spread on road surface

B13RMC
- remove metal culvert
- locate mouth of cross ditch to realign stream at edge of landing

B25RMC
- remove metal culvert
- remove fill to recontour gully

B30RMC
- remove two metal culverts
- remove fill to recontour gully

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest suitable landing sites



PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA HOWSON CRK.
SCALE: 1: 10,000	CUTTING PERMIT E98-091
DATE: JULY 30, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

4.3 Pine Creek, Cumming Creek, Jonas Creek and Winfield Creek

These areas are located west of Telkwa and are accessed by way of the Telkwa River FSR (1000 FSR). These areas were deactivated to a permanent state allowing 4x4 or ATV access. Cross ditches and culvert removal was deemed to be adequate in these areas for deactivation purposes.

There were two sections on two separate roads within road system EM7-533, that required heavy fill pullback to reduce the risk of road failure and restore the hillslope to its natural state. The first section is roughly 115 metres long on a road with an over steepened cutslope and fillslope that was dry raveling. The fillsope was pulled back and placed against the cutslope bringing the slope back to the angle of repose. The second section is roughly 30 metres long and located at the end of spur M, off the end of a landing. In this situation, the slash pile from the landing was pushed over the edge and left overhanging a small stream during harvesting of the block. It was felt that the slash could eventually slump into the stream and cause a debris torrent. This slash was pulled back and placed near the center of the landing. This slash can be left or disposed of by burning.

4.3.1. Pine Creek, Cumming Creek, Jonas Creek and Winfield Creek Final Prescriptions

Table 1 PINE, CUMMING, JONAS AND WINFIELD CREEK ROAD DEACTIVATIO Contract Number 98-FRBC-16

ROAD SYSTEM LABEL	ROAD NAM	LENGTH KM	# OF CROS DITCHES	OF CULVERT FOR REMOVAL	REQUIRED EQUIPMENT	OTHER REQUIRED CONSTRUCTION	LEVEL OF EACTIVATIO	VEHICLE ACCESS
E98 044/099	PINE MAIN	1.604	14	6			PERMANENT	4WD
Pine creek	MAIN C	2.95	37	9			PERMANEMT	ATV
	SPUR A	2.128	27	7			PERMANENT	4WD
	SPUR B	1.611	7	2			PERMANENT	4WD
EM7 533	**SPUR A**	**1.637**	**17**	**4**			**PERMANENT**	**ATV**
Cumming	**SPUR B**	**0.816**	**12**	**0**			**PERMANENT**	**ATV**
Creek	**SPUR C**	**1.062**	**10**	**3**	**small - medium**		**PERMANENT**	**ATV**
	SPUR D	**1.027**	**8**	**5**	**crawler or rubber**		**PERMANENT**	**ATV**
	SPUR E	**0.266**	**2**	**0**	**tired excavator**		**PERMANENT**	**ATV**
	SPUR G	**1.926**	**19**	**8**			**PERMANENT**	**ATV**
	SPUR H	**0.75**	**9**	**2**			**PERMANENT**	**ATV**
	SPUR I	**3.218**	**36**	**5**	**medium - heavy crawler excavator**	**Pull back side fill heavy (115 m)**	**PERMANENT**	**ATV**
	SPUR J	**0.39**	**4**	**0**	**small - medium**		**PERMANENT**	**ATV**
	SPUR K	**0.386**	**3**	**0**	**crawler or rubber tired excavator**		**PERMANENT**	**ATV**
	SPUR M	**3.826**	**24**	**8**	**medium - heavy crawler excavator**	**Pull back side fill heavy (30m) Bury wire rope**	**PERMANENT**	**ATV**
	SPUR N	**0.812**	**8**	**1**			**PERMANENT**	**ATV**
	SPUR O	**0.39**	**1**	**2**	**small - medium**		**PERMANENT**	**ATV**
	SPUR P	**0.163**	**2**	**0**	**crawler or rubber**		**PERMANENT**	**ATV**
	SPUR Q	**0.03**	**0**	**1**	**tired excavator**		**PERMANENT**	**ATV**
	SPUR R	**0.07**	**1**	**0**			**PERMANENT**	**ATV**
	SPUR S	**0.07**	**1**	**0**			**PERMANENT**	**ATV**
E98 - 023	SPUR A	1.032	7	4			PERMANENT	4WD
Jonas Creek	SPUR B	1.968	9	2			PERMANENT	4WD
CP 532 1&2	MAIN	1.699	11	1			PERMANENT	ATV
Winfield Creek	SPUR A	0.786	2	1			PERMANENT	ATV
	SPUR B	0.21	2	1			PERMANENT	ATV
CP 532	SPUR E	0.753	5	2			PERMANENT	ATV
Winfield Creek	SPUR F	0.078	1	1			PERMANENT	ATV
	SPUR G	0.077	0	1			PERMANENT	ATV
TOTALS		31.735	279	76				

Additional Notes:
Average depth of fill over metal culverts is 60 cm
Maximum depth of fill over metal culverts is 1.5 m
Where possible, culverts will be salvaged, desroyed culverts will be burried at a nearby specified site
Contractor will be required to place a warning sign, provided by PIR, at the beginning of each road system
Contractor will be required to grass seed and fertilize all deactivated sites

E98-044/099 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

Pine Creek Main

PM5RMC

- remove deep metal culvert
- remove woody debris from road prism
- crush and spread on road surface

MAIN C

C8X

- dig mouth ofcross ditch wide to collect full drainage

C11RMC

- remove metal culvert
- remove woody debris
- define channel and armour with coarse material

C46BMC

- this metal culvert has been blocked by beaver activity and a large pond created
- leave the culvert in place but create a cross ditch to keep the water level from flooding the road surface
- armour the cross ditch with non erodible material

SPUR C

MR6X

- remove woody debris exposed from cross ditch

MR8X

- place a ditch block on the downhill side of the cross ditch as well as the uphill

M13RMC

- remove metal culvert
- dig cross ditch aproximately 30 metres above and far enough below to extend past landing site

MR14RMC

- remove metal culvert
- recontour small gully by removing fill

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest suitable landing sites

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA PINE CRK.
SCALE: 1: 10,000	CUTTING PERMIT E98.044/099
DATE: JULY 30, 1998	MAP 1 OF 2
DWG: SMITHERS	DEACTIVATION PRESCRIPTION

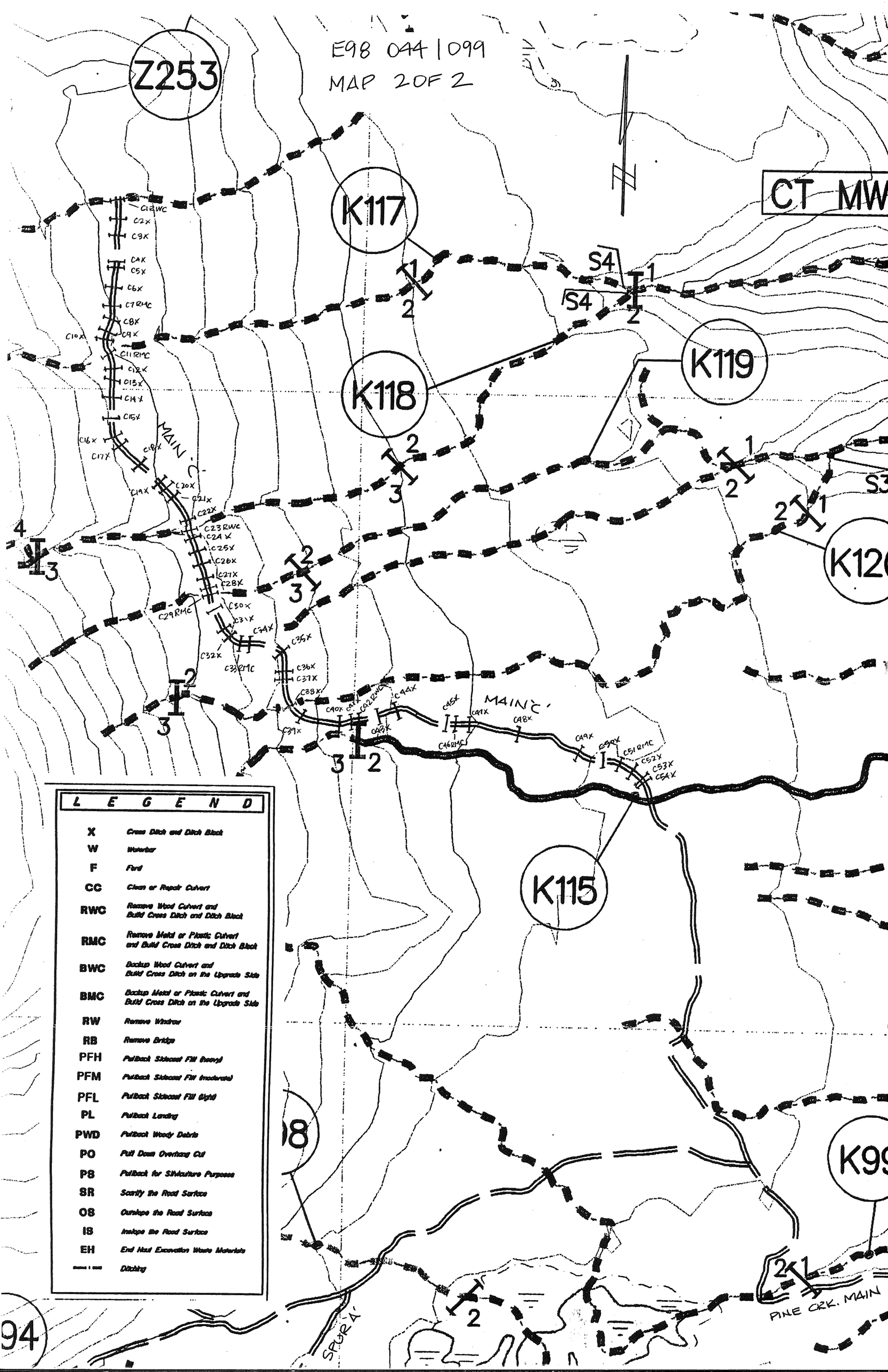
LEGEND

X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Washout
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
---|---	Ditching

K94 K97 K98 K99

MAIN 'C'

SPUR 'A' SPUR 'B' PINE CRK MAIN


E98 044 | 099
MAP 2 OF 2
Z253
K117
K118
K119
K115
K120
K99
CT MW
MAIN 'C'
SPUR 'A'
PINE CRK. MAIN
LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching

EM7-533 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

SPUR C

C2RMC

- remove deep metal culvert
- recontour gully by removing fill

SPUR G

G16X

- very long cross ditch starting at trees on uphill side and ending at bottom side of brush pile
- approximately 50 metres long
- remove ditchblock from above the cross ditch on the uphill side of the road

G27RMC

- extend cross ditch across spur E

SPUR I

I32PFH

- pull back fill material and place at base of cutslope
- place woody debris from pull back on top and spread
- recontour slope with quad access
- grass seed this site immediately

SPUR M

M1PFH

- the slash piles around the western edge of the landing may be unstable
- to avoid slumping into the streambed below and possible debris torrent pullback slash to approximate centre of the landing

M2BMD

- bury wire rope

M24RWC

- remove wood culvert
- use fill material to outslope road surface prior to the empty approach to this crossing
- crush and spread the woody debris on the road surface

M30X

- ditch out past bench below road to avoid water from saturating bench

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest suitable landing sites

MAP 1 of 3

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA CUMMING CRK
SCALE: 1: 10,000	CUTTING PERMIT EM7 533
DATE: AUG 4. 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

1500 rd

SPUR 'D'

SPUR 'C'

SPUR 'B'

SPUR 'A'

SPUR 'I'

SPUR 'S'

Z89

RB

K84

K85

K86

K88

S4

S2

S6

S3

(DV)*

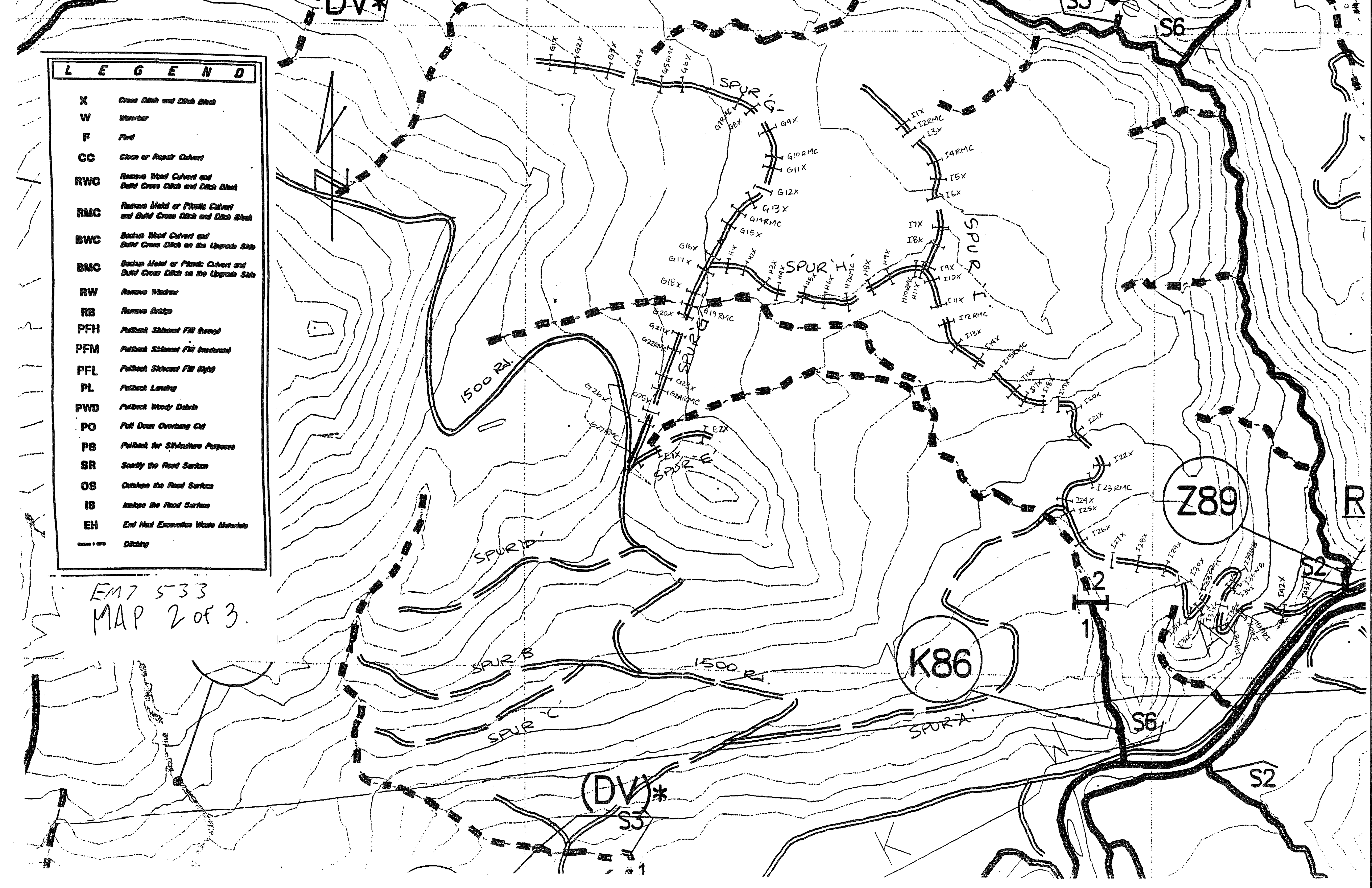
S3

Z252

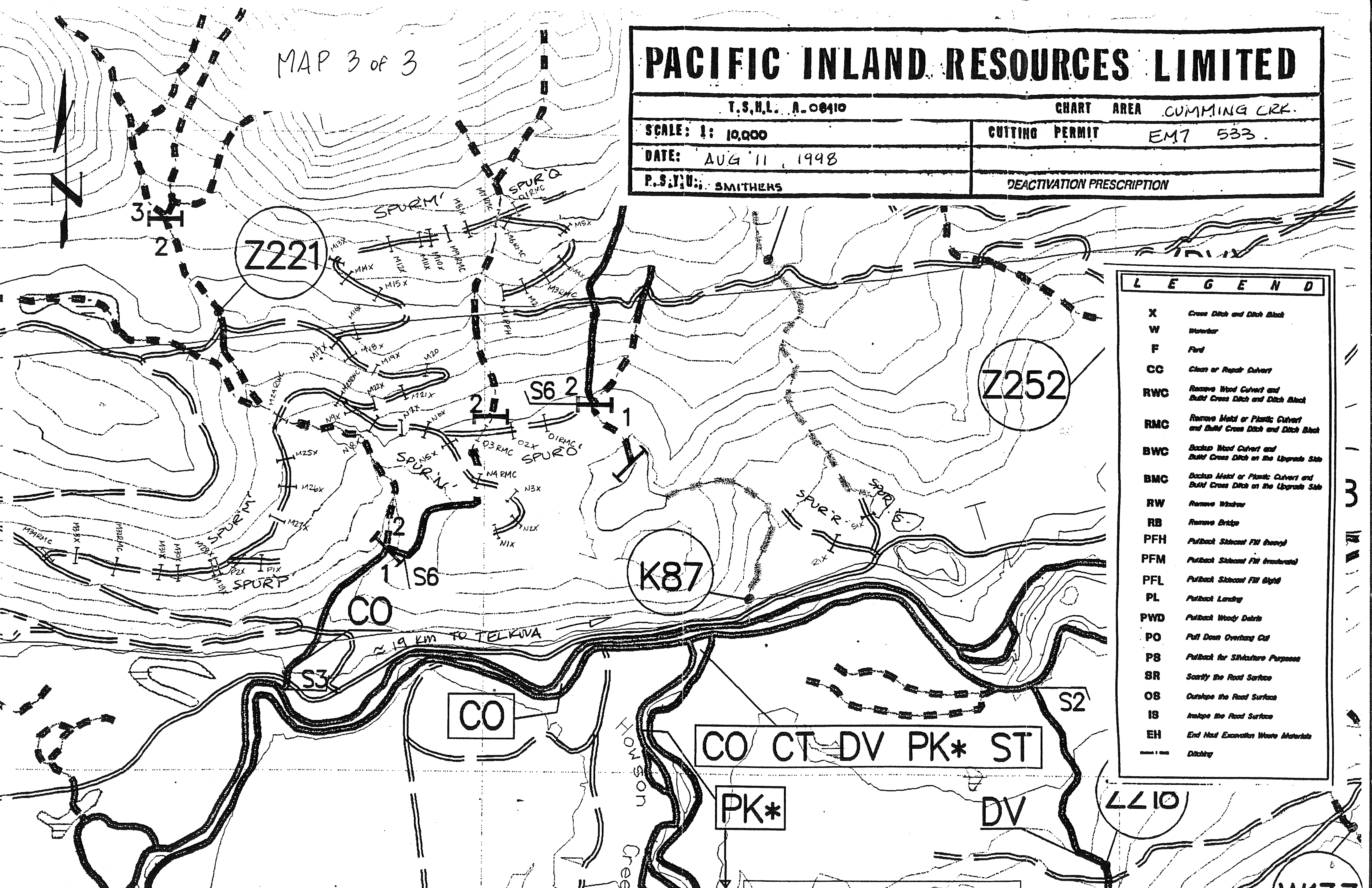
TELKWA RV. RD. ≈ 16KM TO TELKWA

1900 rd

Z217



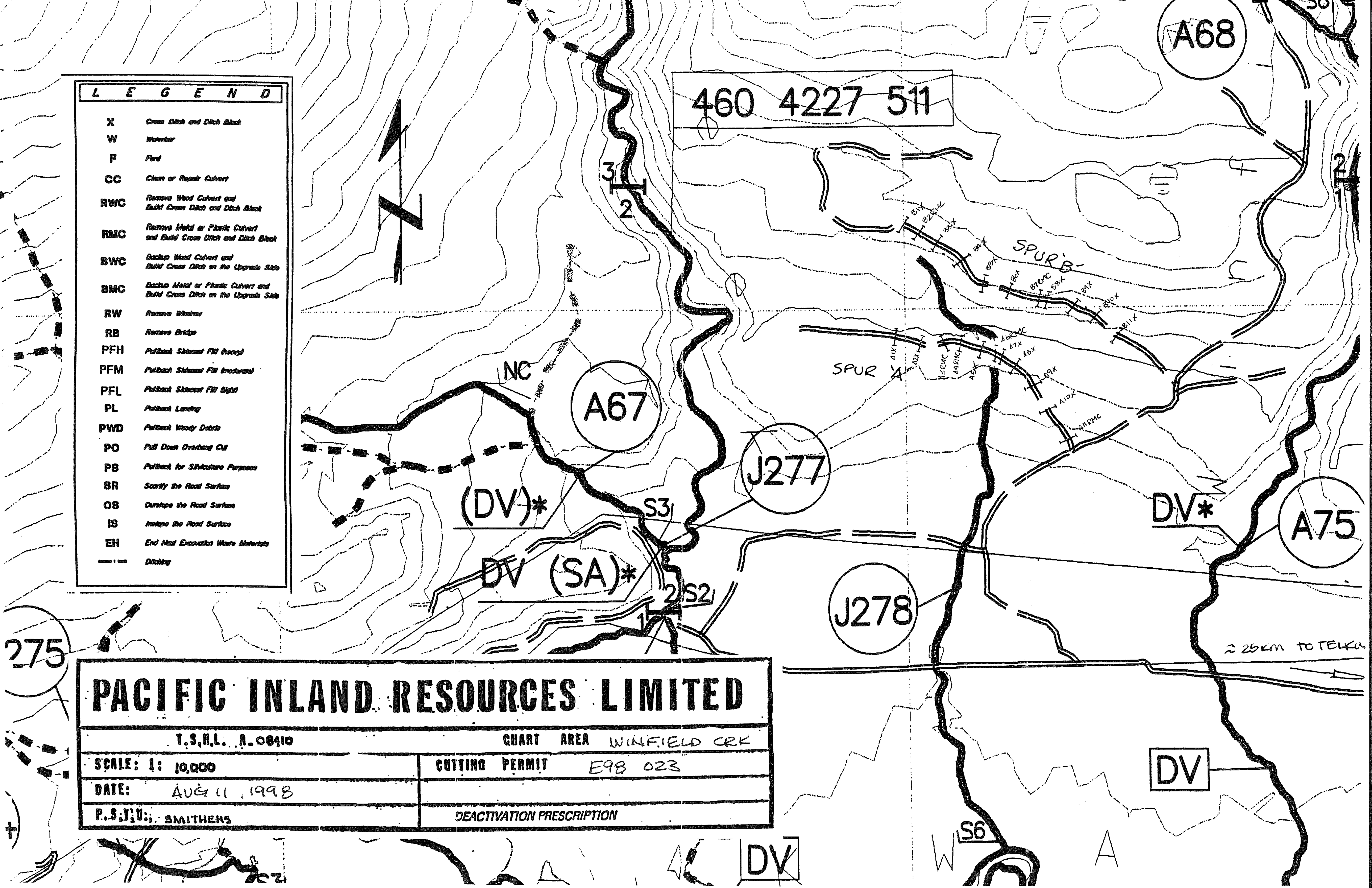
LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
EM7 533
MAP 2 of 3
D-V*
S3
S6
S2
Z89
K86
(DV)*
1500 Rd.
SPUR 'G'
SPUR 'H'
SPUR 'I'
SPUR 'E'
SPUR 'D'
SPUR B
SPUR 'C'
SPUR 'A'


MAP 3 of 3
PACIFIC INLAND RESOURCES LIMITED
T.S.H.L. A-08410
CHART AREA CUMMING CRK.
SCALE: 1: 10,000
CUTTING PERMIT EM7 533.
DATE: AUG 11, 1998
P.S.Y.U.: SMITHERS
DEACTIVATION PRESCRIPTION
LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
Z221
Z252
K87
SPUR M'
SPUR Q
SPUR O
SPUR N
SPUR M
SPUR P
SPUR R
SPUR S
S6
S3
S2
CO
CO CT DV PK* ST
PK*
DV
~19 KM TO TELKWA
Howson Creek

E98-023 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
460 4227 511
A68
A67
J277
J278
A75
275
NC
(DV)*
DV (SA)*
DV*
DV
S3
S2
S6
SPUR 'A'
SPUR 'B'
≈ 25 KM TO TELKWA
PACIFIC INLAND RESOURCES LIMITED
T.S.H.L. A 08410
CHART AREA WINFIELD CRK
SCALE: 1: 10,000
CUTTING PERMIT E98 023
DATE: AUG 11, 1998
P.S.Y.U.: SMITHERS
DEACTIVATION PRESCRIPTION

532-1+2 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites

PACIFIC INLAND RESOURCES LIMITED

T.S.H.L. A-08410	CHART AREA WINFIELD CRK.
SCALE: 1: 10,000	CUTTING PERMIT CP 532 1&2
DATE: AUG 12, 1998	
P.S.Y.U.: SMITHERS	DEACTIVATION PRESCRIPTION

E150

2 S5

4F

M12WC
M2X
M3X
M4X
M5X
M6X
M7X
M8X

MAIN

SPUR A

B1X
B2RMC
SPUR B
B3X
B4X

B1X
B2X
B3X

M9X
M10X
M11BMC
M12X

A76

(SA)*

A77

K114

J279

S4

S3

S2

≈ 24 km TO TELKWA

DV* RB*

S3

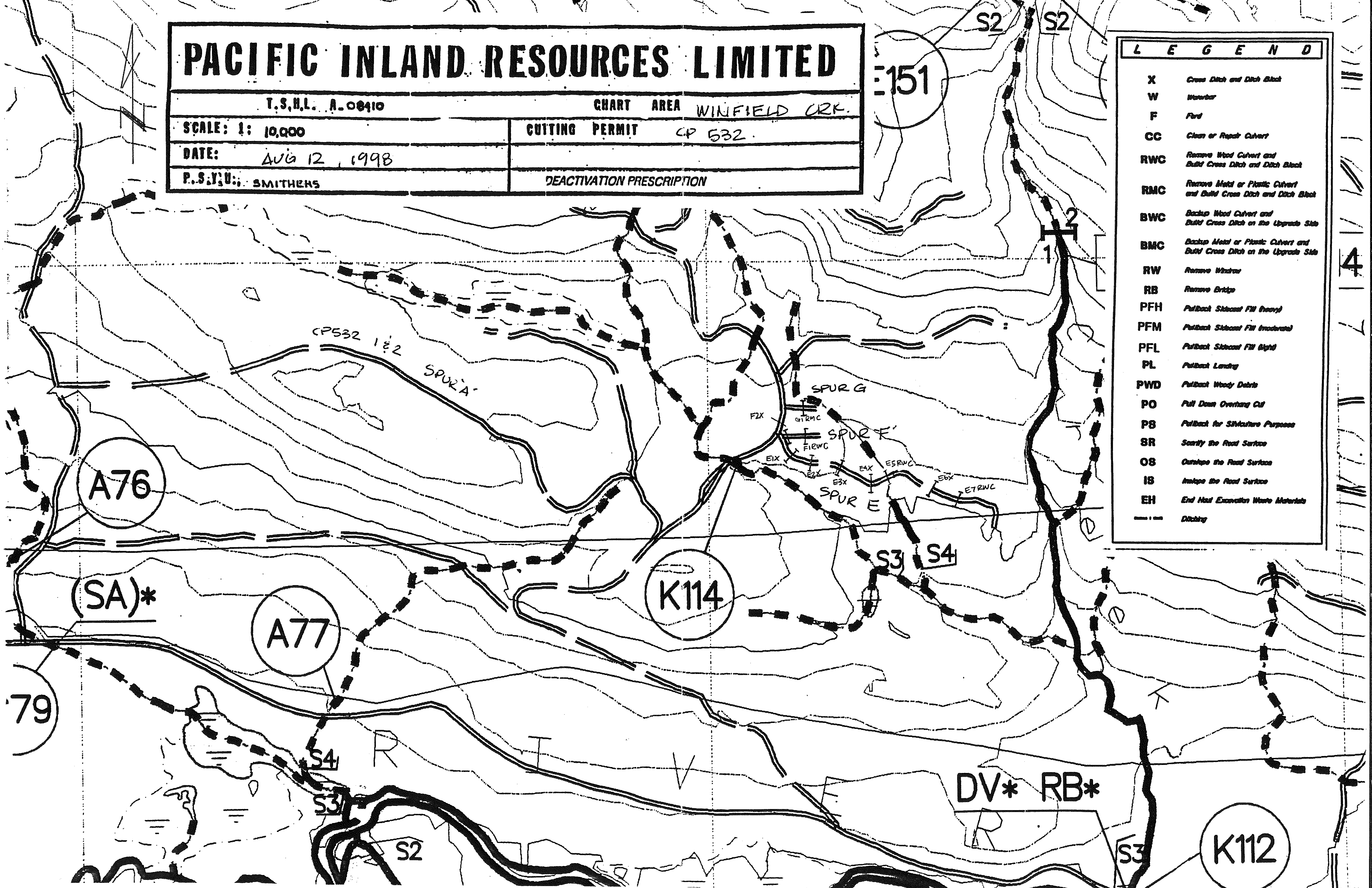
LEGEND

X	Cross Ditch and Ditch Block
W	Waterbar
F	Ford
CC	Clean or Repair Culvert
RWC	Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC	Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC	Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC	Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW	Remove Washout
RB	Remove Bridge
PFH	Pullback Sidecast Fill (heavy)
PFM	Pullback Sidecast Fill (moderate)
PFL	Pullback Sidecast Fill (light)
PL	Pullback Landing
PWD	Pullback Woody Debris
PO	Pull Down Overhang Cut
PS	Pullback for Silviculture Purposes
SR	Scarify the Road Surface
OS	Outslope the Road Surface
IS	Inslope the Road Surface
EH	End Haul Excavation Waste Materials
	Ditching

CP532 Contract Number 98-FRBC-14

SPECIAL CONSTRUCTION NOTES FOR OPERATOR

* In all cases where a berm exists at the outlet of a crossditch, the berm must be breached to allow for proper drainage
* Where a cross ditch is placed in a swale, and drainage occurs from both directions, a ditch block is not required
* crush if possible and bury metal debris at nearest landing sites



PACIFIC INLAND RESOURCES LIMITED
T.S.H.L. A-08410
CHART AREA WINFIELD CRK.
SCALE: 1: 10,000
CUTTING PERMIT CP 532
DATE: AUG 12, 1998
P.S.Y.U.: SMITHERS
DEACTIVATION PRESCRIPTION
LEGEND
X Cross Ditch and Ditch Block
W Waterbar
F Ford
CC Clean or Repair Culvert
RWC Remove Wood Culvert and Build Cross Ditch and Ditch Block
RMC Remove Metal or Plastic Culvert and Build Cross Ditch and Ditch Block
BWC Backup Wood Culvert and Build Cross Ditch on the Upgrade Side
BMC Backup Metal or Plastic Culvert and Build Cross Ditch on the Upgrade Side
RW Remove Windrow
RB Remove Bridge
PFH Pullback Sidecast Fill (heavy)
PFM Pullback Sidecast Fill (moderate)
PFL Pullback Sidecast Fill (light)
PL Pullback Landing
PWD Pullback Woody Debris
PO Pull Down Overhang Cut
PS Pullback for Silviculture Purposes
SR Scarify the Road Surface
OS Outslope the Road Surface
IS Inslope the Road Surface
EH End Haul Excavation Waste Materials
Ditching
E151
S2
S2
CP532 1&2
SPUR 'A'
SPUR G
SPUR 'F'
SPUR E
F2X
G1RMC
F1RWC
E1X
E2X
E3X
E4X
E5RWC
E6X
E7RWC
A76
K114
S3
S4
(SA)*
A77
79
S4
S3
S2
DV* RB*
S3
K112

4.4 Pine Creek

Within the Pine Creek area there was one road, known as the Old Pine Creek road, that was deactivated as a separate contract. The prescription for this road was previously produced by Jim Morrison P.Eng. of Wildstone Engineering in 1996. Jim Morrison felt that the original prescription should be reworked before construction could start. His reason was that two years had passed between the time of the original prescription and the deactivation phase and because of some changes in the stability of the ground. Jim Morrison was contracted to revise the prescription.

A slide that had occurred in an area where the cut slope and fill slopes were oversteepened. The prescription for this specific portion of the road was the most significant change to the prescription. The site around the slide was walked and it was found that at the top of the cut slope a ditch had been cut to direct water away from an erodible slope. This ditch seems to have been directed toward a section of the hill that is unstable. It was felt that the redirecting of water onto this unstable slope may have triggered this slide. Furthermore, there were a number of large stress cracks found near the head of the slide. A landslide rehabilitation data card was completed along with a topographical site survey.

Recommendations for the site included recontouring of the hillside, reducing the cut slope angle to 1.5 : 1 and revegetating the slope with appropriate grasses to reduce erosion as well as rerouting the ditch at the scarp to drain into a natural drainage site. The site survey, produced by Silvicon Services Inc., was given to Wildstone Engineering Inc., and was used to determine the volume of material to be removed from the site. It was determined that roughly 1200 m^3 of soil would be cut. Some of this material could be pushed onto the road from the top and piled onto the road against the cut slope. The rest could be end hauled to a dump site at the beginning of the road.

During the working of this site, a D4 low ground pressure crawler tractor worked in conjunction with a Hitachi 200 excavator to remove the material from the top of the hill to the road below. A Hitachi 300 excavator then loaded trucks to haul away the material. It was estimated that the actual volume of material end hauled was closer to 2500 m^3. Two large Cottonwoods that were adding weight to the hill slope were felled across the slope in hopes that they would help to stabilize the erodible material by trapping seed and sedimentation as it moves down the hill, especially during runoff. The construction was conducted by Pidherny Contracting Ltd., and the supervision by Silvicon Services Inc.

The rest of the Old Pine Creek road was deactivated using techniques such as light to heavy fill pull back, outsloping, culvert removal, gully restoration and cross ditching. The entire road was deactivated to a permanent state without allowing for vehicle access. In places, the road has been completely removed to restore the slope as close to its natural angle as possible. The completed Old Pine Creek road deactivation was walked and signed off by Jim Morrison P.Eng, of Wildstone Engineering confirming that the deactivation was conducted appropriately and in accordance with the deactivation prescription.

It has been recommended in the prescription that the entire hillside above and below Pine Creek Road be monitored annually by an individual experienced in slope stability.

Revegetation of the deactivated Old Pine Creek road was completed by Aspen Creek Contracting Ltd. Revegetation included grass seeding. Since the grass seeding was completed late in the fall, there is a concern that the seed may not take or that the grass' root system will not establish itself well enough to survive the winter. It is recommended that the area be looked at immediately in the spring and reseeded if necessary.

4.4.1. Pine Creek Final Prescriptions

OLD PINE CREEK ROAD

PROFESSIONAL DEACTIVATION PRESCRIPTION

TELKWA RIVER WATERSHED

FRBC Contract No.: 98-FRBC-09

Prepared for:

Pacific Inland Resources

(A Division of West Fraser Mills Ltd.)

Submitted by:

Wildstone Engineering Ltd.

102-3310 Skaha Lake Road, Penticton, BC, V2A 6G4
Tel. (250) 493-3947 Fax. (250) 493-9238
e-mail. wse@wildstone.com

August 1998

TABLE OF CONTENTS

II. LIST OF FIGURES

III. LIST OF TABLES

1.0 INTRODUCTION

Mr. Jay Baker, Forest Renewal Coordinator for Pacific Inland Resources (PIR) in Smithers, B.C., authorized this project. Forest Renewal British Columbia (FRBC) is funding this project through the Watershed Restoration Program (WRP). This Professional Deactivation Prescription (PDP) is a follow-up assessment to the Level II Professional Assessment completed in 1997 by Wildstone Engineering Ltd (WSE). The PDP is being completed on Old Pine Creek Road as the assessment completed in 1997 is dated and a new slide has occurred on Old Pine Creek Road. This PDP contains two parts: an updated deactivation prescription for 2.3 km of Old Pine Creek Road and the completion of a Landslide Site Prescription for a slide that occurred recently on Old Pine Creek Road.

The 1997 report completed by WSE should be used in conjunction with this report.

2.0 DESCRIPTION OF WATERSHED

2.1 Location

The site investigated is in the Telkwa River watershed, which is in the Bulkley Forest District of the Prince Rupert Forest Region. The confluence of the Telkwa River is approximately 16 km south of Smithers along Highway 16. Figure 2.1 .1 illustrates Old Pine Creek Road in relation to the Telkwa Forest Service Road.

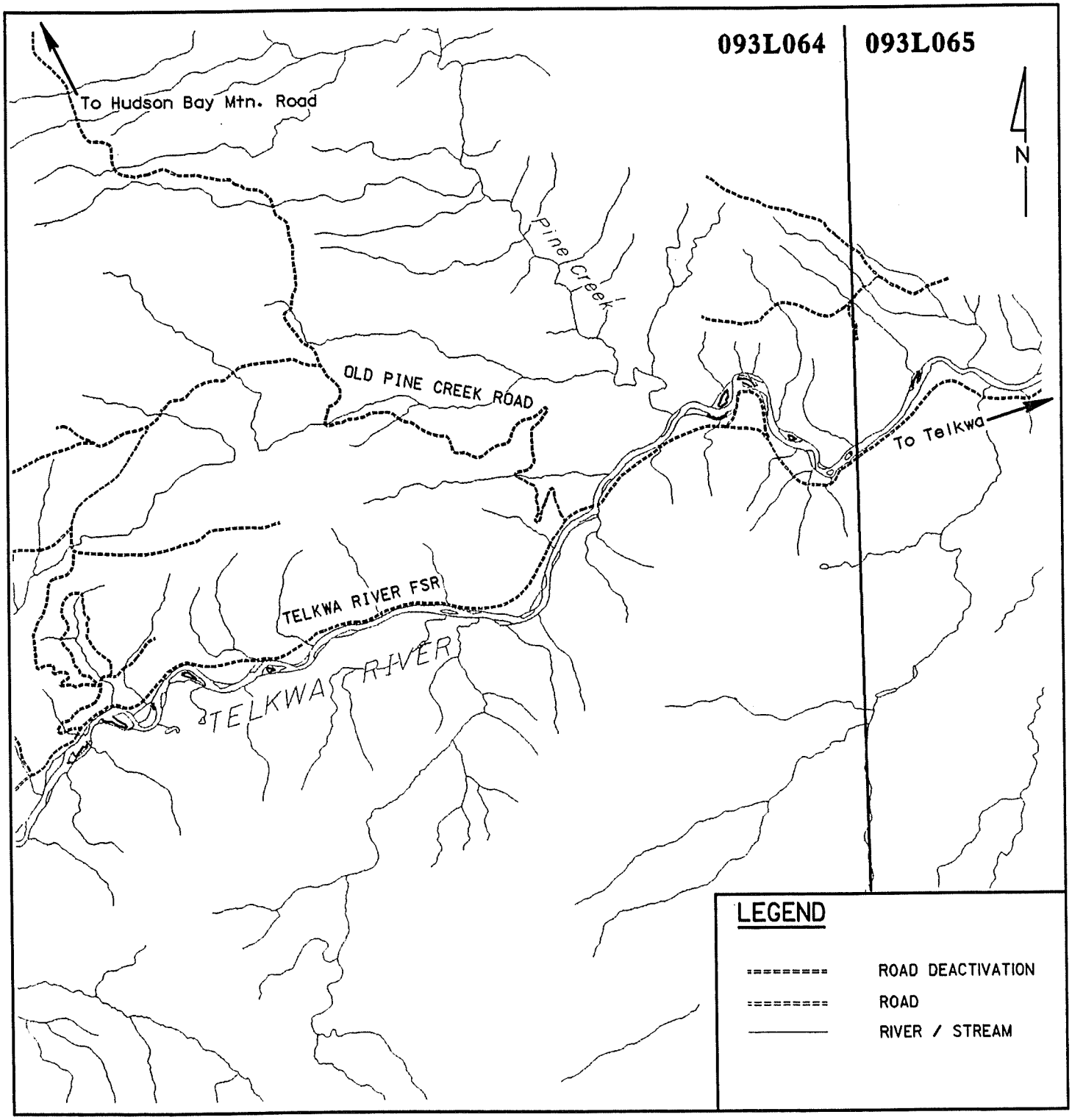


Figure 2.1.1- Old Pine Creek Road Site Location Plan

2.2 Topography and Surficial Geology

The headwaters of the Telkwa River originate in the Bulkley Range, which is part of the Hazelton Mountains. The Telkwa River flows east to meet the Bulkley River at the Village of Telkwa; the Bulkley then flows northwest to drain into the Skeena River at the Town of Hazelton. The major tributaries of the Telkwa River include Tsai Creek, Winfield Creek, Howson Creek, Cumming Creek, Pine Creek, Tenas Creek, and Goathorn Creek.

Elevations in the Telkwa River watershed range from approximately 550 m above sea level at the confluence to over 2000 m at the headwaters.

The local bedrock consists of sedimentary and volcanic rocks. It consists primarily of the rocks of the Hazelton Group: andesite, tuff, sandstone, mudstone and basalt. Some intrusive igneous and metamorphic rocks of granitic origin are also present.

The surficial geology of the watershed has been modified by Pleistocene glaciation. Glacial melt water has deposited terraces of sand and gravel, while glacial lakes have deposited finer lacustrine sediments of silt and clay. Till is also common in the watershed. Erosion has modified many of the materials and landforms created by the glaciers, leaving deeply incised valleys that are susceptible to landslides.

2.3 Climate and Hydrology

The climate in the watershed varies between the headwaters and the mouth of the Telkwa. Because of their proximity to the coast, the headwaters receive about 150-200 cm of precipitation annually; further inland, however, the lower reaches receive only about 50 cm of annual precipitation. The watershed encompasses several biogeoclimatic zones, ranging from sub-boreal spruce (SBS mc2) at lower elevations (up to approximately 1200 m) to Engelmann spruce-subalpine fir (ESSF mk) at higher elevations (approximately 900-1700 m). The alpine tundra zone occupies the highest elevations in the watershed.

According to flow records from Water Survey Canada, annual peak flows within the watershed generally occur during the spring freshet in May or June. Warm temperatures melting snow at higher elevations cause these peak flows. Precipitation may also cause high flows in the fall (October-November).

2.4 Land Use

The Telkwa River watershed contains numerous natural resources that are used commercially and privately. Forestry is the largest user of resources; there are also some mining interests in the watershed. Although a number of licensees have permits to extract timber, Pacific Inland Resources (PIR) is the only licensee currently operating in the area. The Telkwa River is used for fishing, canoeing and kayaking, and hiking and hunting are also popular activities in the watershed.

3.0 METHODOLOGY

3.1 Office Review

The first stage of the PDP was a review of relevant information about the site, including :

- 1977 air photos
- 1993 air photos 1:20,000 TRIM maps
- 1:20,000 Forest Cover maps
- 1:50,000 soils maps
- 1:50,000 geology maps
- reports

3.2 Field Assessment

The fieldwork consisted of a field assessment of Old Pine Creek Road. The site visit was conducted by Jim Morrison, P.Eng. and Edward Jesse on July 1, 1998. A further survey of the site topography for the landslide was completed by Silvicon on July 10, 1998. Observations and recommendations for the deactivation and landslide prescription are contained in the following sections.

4.0 GENERAL

4.1 Background

Old Pine Creek road, also known as the "108 Road", is located approximately 8.5 km along the Telkwa River FSR (Figure 4.1.1). The road was built in the early 1970s to access the Cumming Creek harvest unit. The road is built on steep, fine glacial fluvial materials. This section experiences creep as well as periodic debris slides. A second access road was later built from Hudson Bay Mountain Road, thereby allowing the high hazard section of the Pine Creek Road to be permanently deactivated.

The Old Pine Creek Road was identified as a high priority area in the Telkwa River Watershed *Level I Overview Assessment: Roads, Hillslopes and Gullies.* The first 2.3 km of this road is built on very steep terrain and has both natural and road related failures. This section of the report will provide a permanent deactivation prescription for the 2.3 km section of Pine Creek road and a landslide site prescription.

Forest road deactivation is a method employed on all British Columbia forest roads to ensure that natural drainage patterns are established, or reestablished, in a maintenance free manner. The BC Ministry of Forests has three levels of road deactivation:

- temporary,
- semi-permanent, and
- permanent.

Temporary deactivation is used on roads where regular use is suspended up to three years. Semi-permanent deactivation is used where regular use is suspended indefinitely. Permanent deactivation is generally for situations where the road is non-status and is no longer required for timber hauling or silviculture activities. Permanent deactivation does not necessarily equate to road closure, however, access may be restricted based on the type of deactivation works scheduled for

implementation. Permanent deactivation is commonly the most labour intensive of the three levels of road deactivation and usually includes the following:

- removing existing stream culverts and restoring channel and bank stability,
- backing up stream culvert excavations with cross-ditching if the stream channel is expected to overflow,
- replacing existing cross-drain culverts with cross-ditching and ditch blocks,
- constructing additional cross-ditches where necessary (i.e. on steep grades or switchbacks, at ditches prone to plugging, where ponding may occur, etc.) removing all bridge superstructures,
- removing bridge substructures where failure will affect downstream resources,
- removing road surface windrows,
- outsloping/insloping the road surface where applicable,
- pulling back potentially unstable sidecast fill onto the outslope road grade without exceeding its angle of repose, and
- revegetating exposed soil surfaces.

5.0 ASSESSMENT

The fieldwork for the Old Pine Creek Road prescriptions was completed by Jim Morrison, P.Eng. and Ed Jesse on July 1, 1998. The fieldwork reviewed and modified the previous road deactivation prescription completed by WSE in 1997. The permanent road deactivation prescriptions follow the methodology outlined in the *Watershed Restoration Program Schedule A* for:

- Road Deactivation/Repair Prescriptions.
- Landslide Rehabilitation Procedure.

The procedure for the permanent road deactivation prescriptions is as follows:

1. The entire road section had been referenced with a Trimble Pathfinder Pro XL Global Positioning System (GPS) from the intersection of the Telkwa River FSR to the end of the section to be deactivated. Deactivation prescriptions were marked or flagged. Specific types of deactivation are shown in Table 5.1.2. Stations previously field marked with wooden stakes were flagged and new stations installed. Figure 4.1.2 enclosed at the end of this report illustrates the road section traversed and subsequent road deactivation prescriptions.

2. A standard road modification summary was completed as per Schedule A of the watershed restoration program contract, refer to Table 5.1.1.

The procedure for the landslide site prescription is as follows:

1. The recent landslide was investigated and rehabilitation methods explored by Jim Morrison, P.Eng. on July 1, 1998. Subsequently, on July 10, 1998, a Landslide Rehabilitation Data Card (Appendix A) and a topographical site survey was completed by Silvicon Services Ltd. Utilizing information derived from the LRAP, site survey, and an on-site review, a landslide rehabilitation plan was then completed by WSE.

2. A standard landslide site prescription summary was completed as per Schedule A of the watershed restoration program contract, refer to Table 5.2.1.

5.1 Observations and Conclusions for Road Deactivation

The following observations and conclusions should be read in conjunction with Figure 4.1.2 (enclosed at back of report).

Site 1 - Site 9

It appears that Old Pine Creek Road has not been used for hauling timber since the mid 1980's. There are some old cross ditches at Sites 1, 3, 5 and 6; however, they do not all appear to be working effectively. The slope of the road along this section ranges from 8% to 16%. The right-of-way through here seems to have been revegetated with a variety of grasses, clovers and wildflowers as well as naturally regenerated shrubs. The road is built from cuts and fills between Sites 8 and 9. The fill slope along here is well vegetated.

Site 10 - Site 19

This is the most problematic section of Old Pine Creek Road. The road cuts through very fine-grained materials with steep side slopes. The exposed cut slopes range from 70% to 90% and will continue to fail until they have reached their angle of repose, which are approximately 60% in this area.

Site 16 is the most severe example of mass wasting on the Old Pine Creek Road. The cut slope is about 22 meters long at a gradient of 78% and the fill slope, which has a gradient of about 84%, has a number of tension cracks along the edge of the road. This site rates as a very high surface soil erosion hazard, as per the Forest Practices Code. There are signs of past slope stabilization work: some riprap near the base of the fill slope and a machine excavated ditch with berm above the cut slope. This ditch was constructed in an effort to divert surface run-off from the exposed cut slope. Furthermore, it appears that the entire area was revegetated with a variety of coniferous and deciduous trees, grasses, clovers, horsetails and wildflowers. These measures appear to have slowed the rate of erosion.

A debris slide has occurred immediately south of site 15 since the original road deactivation prescription. A specific rehabilitation for this area is discussed in section 5.2.

Site 20 - 29

Old Pine Creek Road crosses a small unnamed creek in a steep gully at Site 20. From Site 22 to 23 the road has small cuts and fills. The pistol butt tree trunks and surface tension cracks along the hill slope of this section indicate soil creep. The slopes between Site 23 and Site 29 range from 4% to 13%. This section of the Old Pine Creek Road is built on long uniform stable ground.

Site 30 - 39

This, the final section of the Old Pine Creek Road to be permanently deactivated, is constructed on slopes ranging from 3% to 10%. The pistol butt tree trunks on the hill slope indicate that there may be soil creep along this section; however, the road appears to be stable. Site 39 is the end of the section that will be permanently deactivated. The change in elevation between the beginning and the end of the 2.3 km Old Pine Creek Road section is approximately 200 meters.

5.1.1 Recommendations

Table 5.1.1 is a road modification summary, which contains general information for completing the road deactivation.

Table 5.1.1: Road Modification Summary – Bulkley Forest District

Watershed Name or Operating Area:	Telkwa River Watershed
Licensee	Pacific Inland Resources
Road Name or Number (reference to key map)	Old Pine Creek Road or 108 Road
☐ temporary access (less than 60 days) ☐ road currently under permit ☐ road to be placed under permit ☐ Bridge or culvert replacement design x road not in use and not under permit	Permit no: non applicable

Description of Works: Permanently deactivate 2.3 kilometers of Old Pine Creek Road.	
List of Attachments describing the work (e.g. engineered drawings and specifications): all information for completing works enclosed or attached to this report.	
X Recommend MOF add project to their Forest Development Plan.	_____ Licensee's representative initials

Additionally provide a written description of known site safety concerns and, operational timing windows required for environmental or other reasons.

Signatures

Licensee representative:

_____
Licensee signature

Professional certification for prescription development:

I hereby certify that this prescription was prepared:

- consistent with the requirements of this contract, the FPC and the applicable IWRP, while
- addressing the requirements of other agencies

PROFESSIONAL ENGINEERING J. K. MORRISON BRITISH COLUMBIA ENGINEER

Aug 13/98

_____ P.Eng.
Professional Engineer

District Manager approval:

_____
District Manager

date:_____

The road deactivation measures are field staked or have been reflagged and are described in Tables 5.1.2.

Table 5.1.2: Permanent Road Deactivation Prescriptions

Reference Station	Chainage[1] (m)	Prescription
1	0+053	Start of road deactivation prescriptions. Install a berm to prevent vehicular access.
2	0+127	Install cross ditch*.
3	0+195	Improve existing cross ditch.
4	0+257	Install cross ditch.
5	0+300	Install cross ditch to accept ditch and upslope water.
6	0+320	Install cross ditch.
7	0+371	Install armored waterbar that will maintain the natural drainage*.
8	0+384	Start heavy fill pullback*. A**=3.5m B**=5m.
9	0+465	Start light pullback and end heavy fill pullback. A=4m B=4m. Install waterbar.
9.5	0+475	Small slump on fillslope below landing. Pull back scarp and reinstate ditch.
10	0+487	End light pullback and start heavy pullback. A=4m B=5m.
11	0+528	Continue heavy fill pullback. A=5m B=4m.
12	0+608	Remove metal culvert*.
13	0+615	13 and 14 are same point. Continue heavy fill pullback. Install armored waterbar that will maintain the natural drainage. Start light fill pullback. A=4m B=3m.
14		See above point 13.
15	0+690	Continue heavy fill pullback. A=4.5m B=5m.
15.5	0+709	Continue heavy fill pullback. A=4.5m B=7m.
16	0+728	Continue heavy fill pullback. A=4m B=5m.
17	0+770	End heavy fill pull back. Start light fill pullback. A=5m B=3m.
18	0+797	End light fill pullback. A=3.5m B=5m. Install cross ditch.
19	0+847	Install waterbar. May use waste material if outsloped.

Table 5.1.2 (con't)

Reference Station	Chainage[1] (m)	Prescription
20	0+881	Remove metal culvert as per the details. Armor sideslopes and outlet. May outslope with waste material.
21	0+904	Remove metal culvert. End of outsloping with waste material.
22	0+912	Start outsloping of road surface @2%*.
22.5	1+003	Install cross ditch.
23	1+035	Remove metal culvert. End outsloping of road surface. Install cross ditch.
24	1+108	Install cross ditch.
25	1+143	Install cross ditch.
26	1+218	Install cross ditch.
27	1+273	Install cross ditch.
28	1+513	Install cross ditch.
29	1+588	Install cross ditch.
30	1+709	Start outsloping of road surface @2%. Install waterbar.
31	1+775	Continue outsloping of road @2%. Install waterbar.
32	1+837	Continue outsloping of road @2%. Install waterbar.
33	1+981	Continue outsloping of road @2%. Install waterbar.
34	2+065	Continue outsloping of road @2%. Install waterbar.
34.5	2+100	Install cross ditch.
35	2+142	Continue outsloping of road @2%. Install waterbar.
36	2+234	Continue outsloping of road @2%. Install waterbar.
37	2+279	Continue outsloping of road @2%. Install waterbar.
38	2+337	End outsloping of road surface. Install cross ditch.
39	2+368	End of road deactivation prescriptions. Install a berm to prevent vehicular access.

[1] Chainage starts at intersection of the Telkwa River FSR and Old Pine Creek Road.

* Specific details for prescriptions as per Table 5.1.3.

** Dimensions of pullback are shown on Figure 5.1.1.

Use the following reference diagram to determine the amount of fill pullback at each specified site:

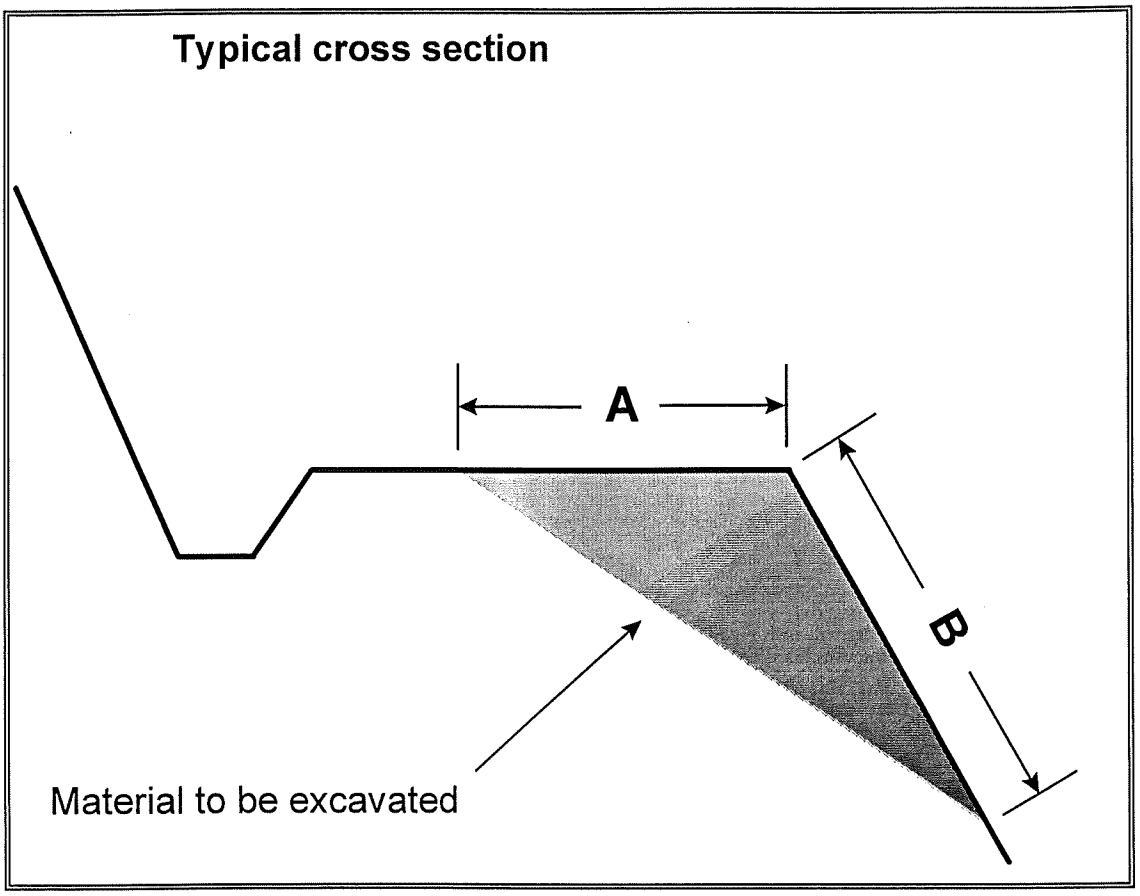


Figure 5.1.1: Fill Pullback Reference

*All lengths for "A" and "B" are approximations.

Use the following table to understand deactivation activities:

Table 5.1.3: Road Deactivation Details

Field Note, Report, and Map Symbol	Field Mark	Detail of Prescription Activity
X	X	**Construct cross ditch and ditch block.** Excavate a ditch across the road at a minimum skew angle of 30 degrees (or as marked in the field) and at a depth no less than 600mm with armouring, as appropriate to divert both road surface water and ditch water off or across the road. The cross ditch also includes construction of a substantial ditch block to ensure no water flows down the road ditch. In erodible materials, the cross ditch channel and outlet must be protected with rocks of sufficient size and shape to prevent surface soil erosion.
W	W	**Construct waterbar.** Excavate a shallow ditch across a road or logging trail at an angle to collect and direct roadway surface water off the road to the fill side. The depth of the waterbar ditch should be no less than 600mm. Berms are unnecessary for this road, as there will be no vehicular traffic traveling this road after the deactivation works are completed. In erodible materials, the waterbar ditch channel and outlet must be protected with rock of sufficient size to prevent erosion.
RMC	RMC	**Remove metal culvert.** Dispose of existing culvert to an approved site. If it is a stream culvert then construct a channel to match the natural width and gradient of the stream. Slope channel sides to no less than 30% and no more than 60%.
PFH	PFH	**Pull back sidecast fill (heavy).** For stability reasons retrieve sidecast fill materials. All material reached by full extension of the excavator bucket should be removed. Fill slope should be pulled back to a slope that resembles the original natural topography. The fill retrieved should be placed tightly against the inside of the roadway and contoured to recreate natural cross slope topography. The roadway ditch must be filled and made inoperable. Old road surface should slope slightly outward. There should be no areas left that will allow water to accumulate along the former road surface. The old ditch should not trap or direct ground water. Make sure you leave no windrow or spoil.
PFL	PFL	**Pullback sidecast fill (light).** Same as pull back sidecast heavy except that volumes of material will be less than the PFH volumes.
OS	OS	**Outslope the road surface.** The sections of road in this deactivation report should be outsloped to a 2% grade.

5.1.2 Construction Notes

5.1.2.1 General

All fill pullback, culvert removal, and armouring should be completed using a Hitachi EX300 with a hydraulic thumb attachment, or equivalent. All road outsloping, cross ditching, and waterbar installation should be completed using a Caterpillar D6E or larger with an angle blade and ripper, or equivalent. The revegetation/reclamation prescriptions outlined in Section 5.1.2.2 must be considered when the project is scheduled.

Details illustrating the common deactivation measures to be implemented for this project are included in Figures 5.1.2 to 5.1.5.

5.1.2.2 Revegetation/Reclamation

The final phase of the permanent deactivation of the Old Pine Creek Road is the rehabilitation of all exposed soils with appropriate vegetation methods and seed mixes. The primary objective of the vegetation is to minimize surface soil erosion of the exposed mineral soils on the cut/fill slopes, the recent debris slide and to reclaim the growing site from the existing road surface. Moreover, the revegetation/reclamation will help prevent migration of sediments from entering the Telkwa River.

Time is of the essence when undertaking revegetation and reclamation the sites. To ensure the highest rate of revegetation, seeding should be completed

- immediately after the ground disturbance,
- when there is moisture in the soil,
- after the final spring frost, and
- before the first rainfall after the ground disturbance.

When the road deactivation prescriptions outlined in Table 5.1.2 are completed, all disturbed sites should be left with irregular surfaces; this will allow the soil to trap moisture and promote seed germination. The road surfaces that have not been disturbed by either fill pullback or road outsloping works should be decompacted by a bulldozer with ripper attachment.

A variety of different seeding, bioengineering and revegetation methods were evaluated for this project. Probability of success, practicality, efficiency and cost effectiveness were all considered in determining that a helicopter slung seeder will be the most suitable method for the job. The seed mix in Table 5.1.4 should be introduced to all of the newly disturbed areas.

Table 5.1.4: Recommended Seed Mixture[1]

Species	Variety	% by weight	% by live seed	kg of seed
Alsike Clover	common	10.2	15.0	10
Birdsfoot Trefoil	Leo	12.7	10.0	13
Annual Rye Grass	common	31.4	15.0	31
Creeping Red Fescue	Boreal	34.8	45.0	35
Orchard Grass	common	10.9	15.0	11
	Total	100.0%	100.0%	100

[1] Use Certified or Canada #1 Grade seeds.
[2] When ordering the seed mix, check with the supplier for seed availability, substitutes may be necessary.

To ensure an adequate coverage of seed, an application rate of 100kg/ha should be employed. Although all of the sites will have been disturbed to promote vegetation, dry fertilizer will be necessary. An application of 300kg/ha of 13-16-10 (N-P-K) may be used for this job. It is recommended that a soil sample be taken and analyzed before using this blend of fertilizer to ensure the proportions are appropriate for the site.

5.1.2.3 Common Deactivation Works

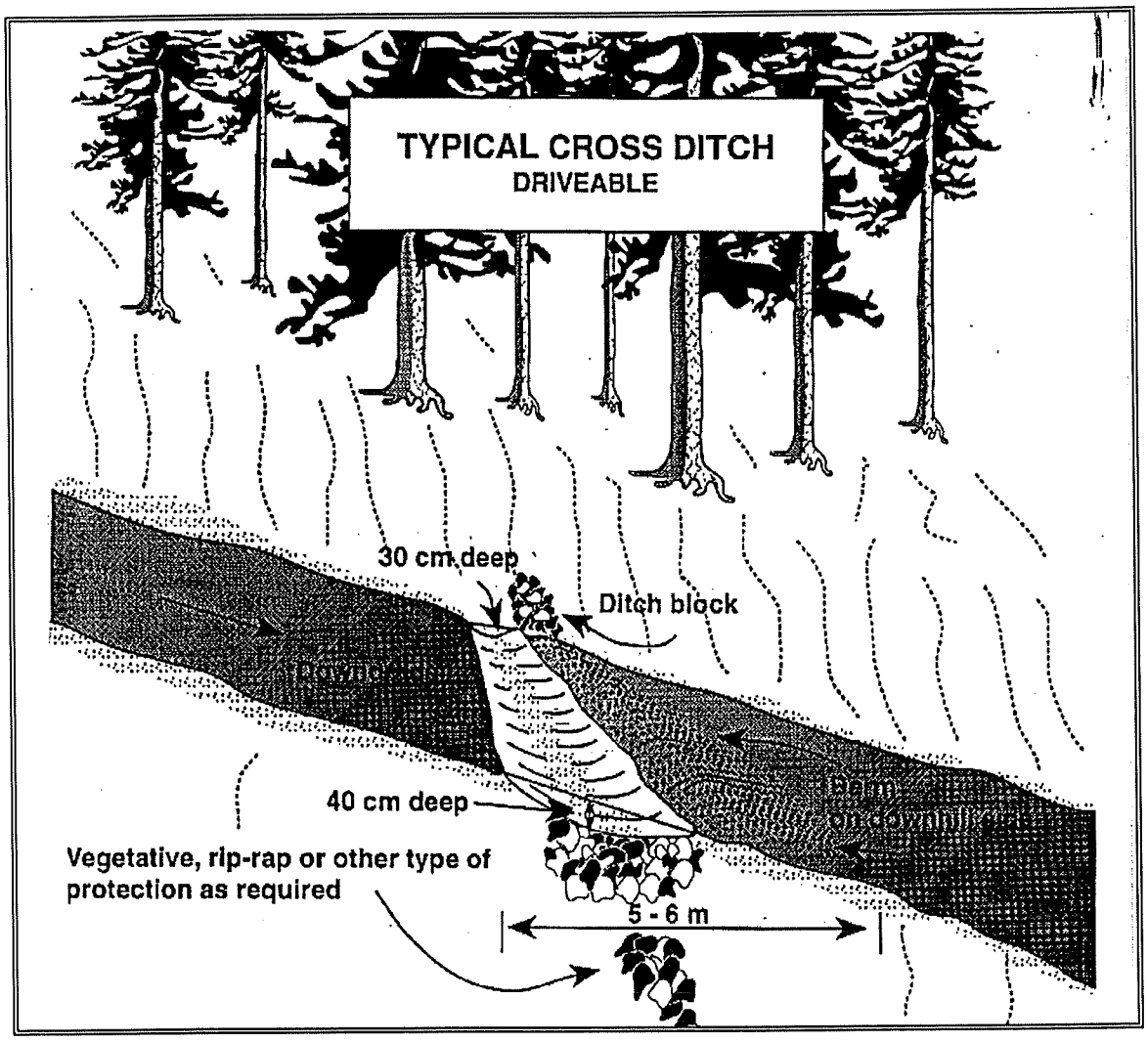


Figure 5.1.2: Typical Cross-ditch

* Refer to Table 5.1.3 for a description.

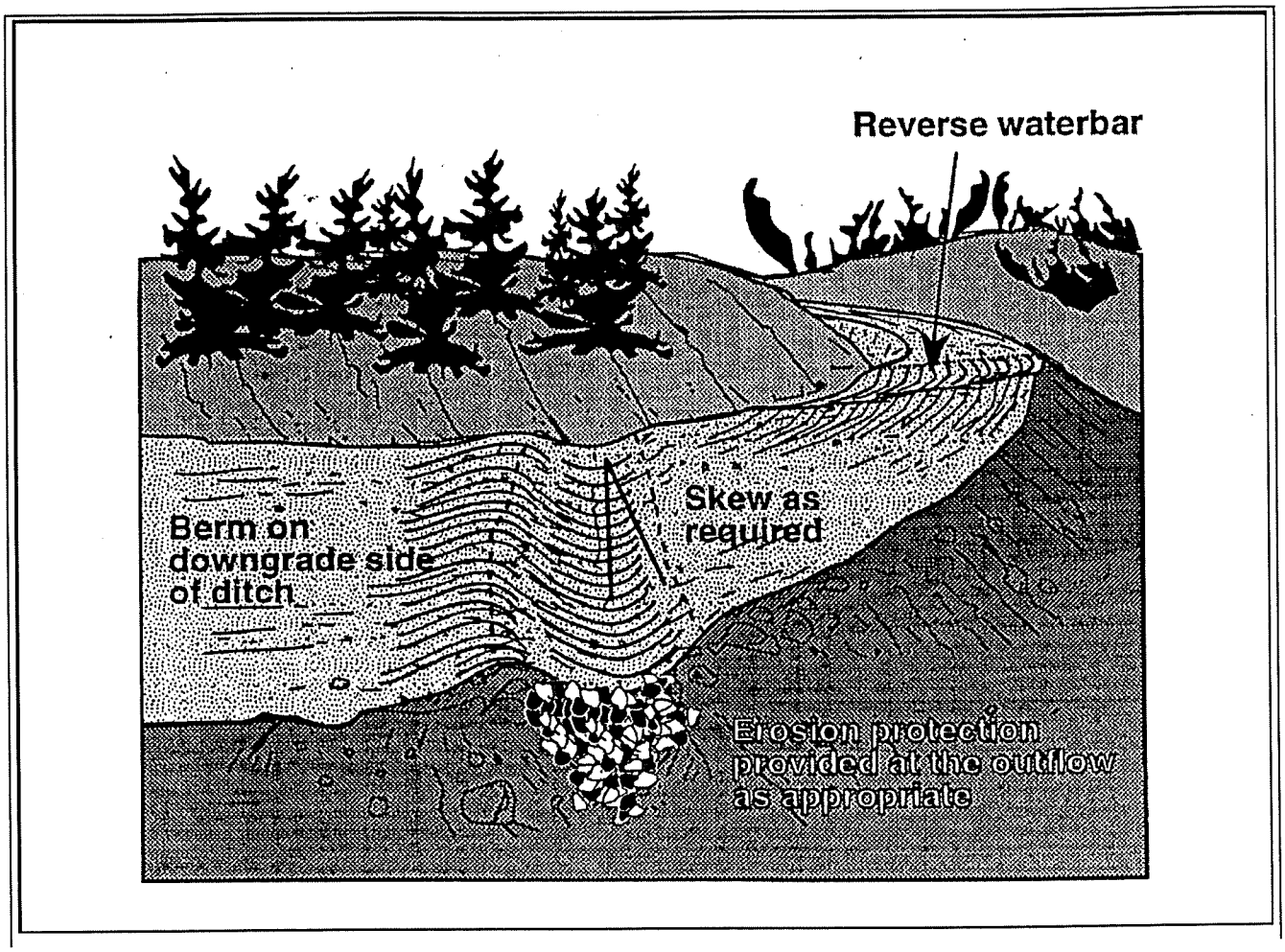


Figure 5.1.3: Typical Waterbar

*Refer to Table 5.1.3 for a description.

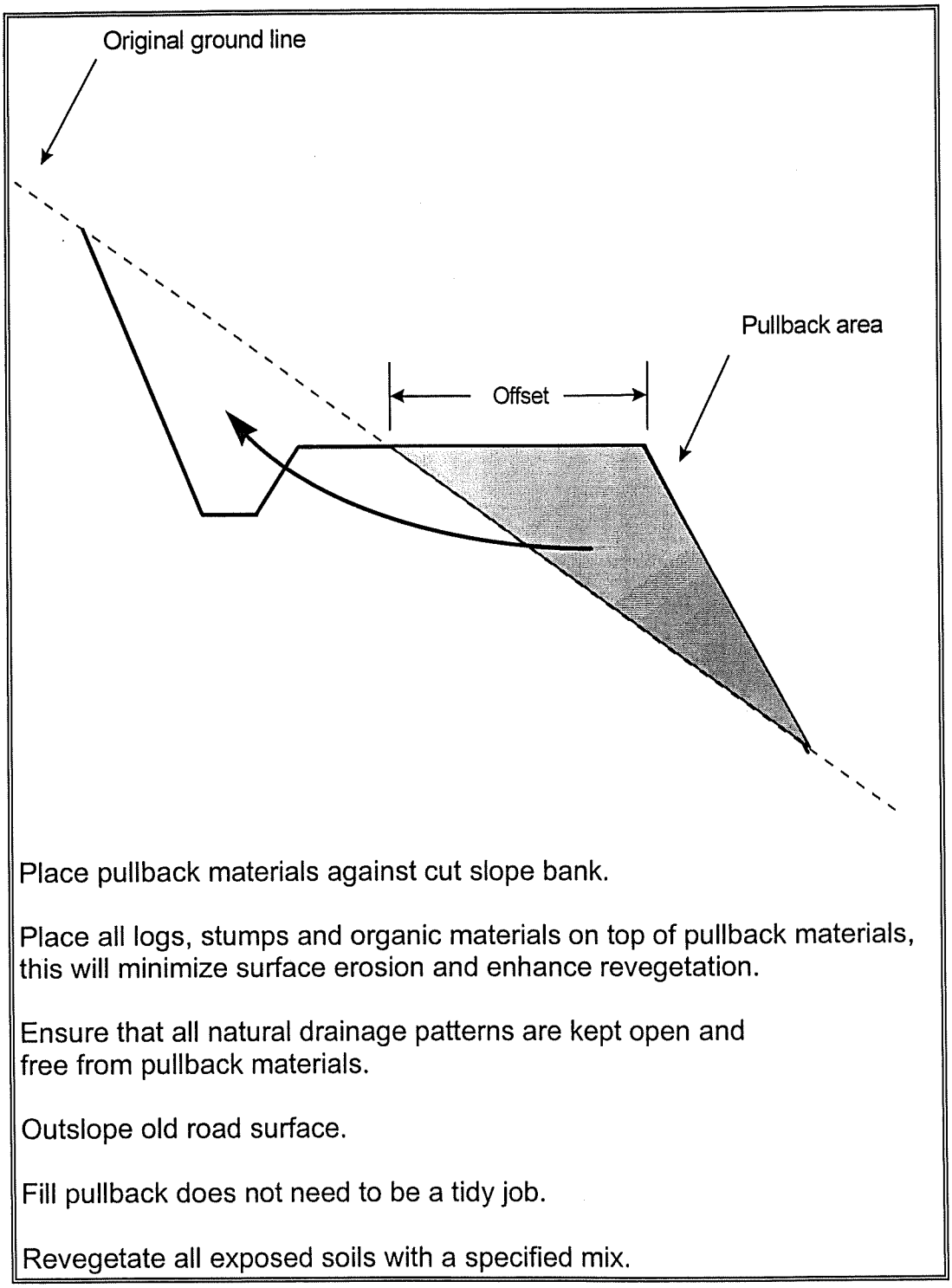
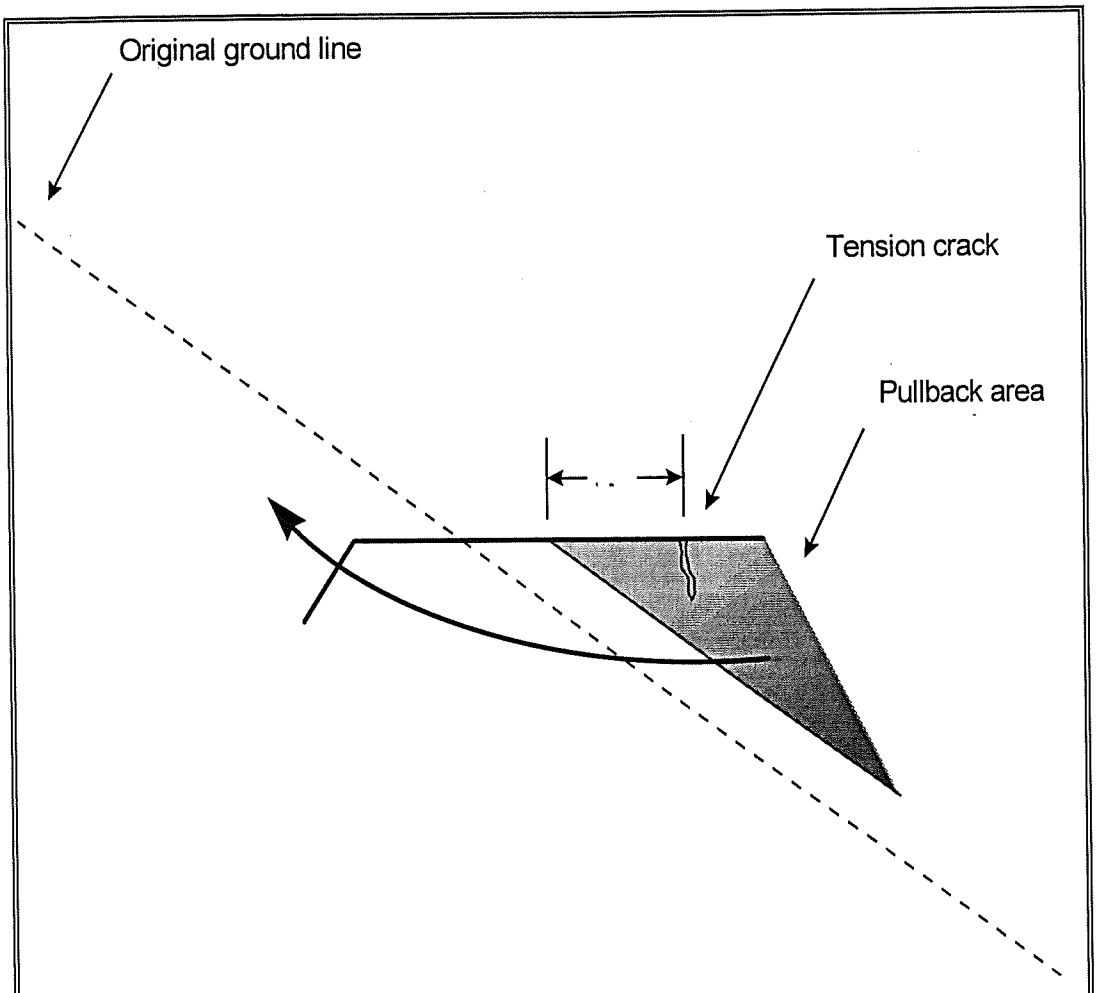


Figure 5.1.4: Example Fill Pullback (Heavy)

*Refer to Table 5.1.3 for a description.



Place pullback materials against cut slope bank.

Place all logs, stumps and organic materials on top of pullback materials, this will minimize surface erosion and enhance revegetation.

Ensure that all natural drainage patterns are kept open and free from pullback materials.

Outslope old road surface.

Fill pullback does not need to be a tidy job.

Revegetate all exposed soils with a specified mix.

Figure 5.1.5: Example Fill Pullback (Light)

*Refer to Table 5.1.3 for a description.

5.2 Observations and Conclusions for Landslide Rehabilitation

Landslide Site

Just before site 15 (station 0+690) on Old Pine Creek Road (see Figure 4.2.1, enclosed at end of report) a slide was triggered as a result of an oversteepened slope in fine-grained glacialfluvial soils. In addition, there may have been excess moisture entering the slide scarp area as a result of a man-made berm and ditch located above the scarp. Numerous tension cracks were found above and in the headscarp area. It was apparent that the headscarp will continue to migrate further back into the hill unless the area is stabilized. A Landslide Rehabilitation Data Card was completed and is attached as Appendix A.

A review of the site survey completed by Silvicon indicates four other tension cracks to the southwest of the existing headscarp. Theses tension cracks are above existing slopes in the 70% to 80 % range.

5.2.1 Recommendations

The most cost-effective solution for stabilizing the hillside, considering that the road below is to be permanently deactivated is to reduce the slope angle. The existing slope in or near the slide ranges from 30 to 150%. By reducing the slope angle to 1.5 to 1.0 and revegetating the slope with appropriate grasses the potential for further slide activity will be minimal. Rerouting the outlet of a manmade drainage berm above the slide into a natural shallow gulley will also stabilize the soils. Bioengineering of the slope is not considered to be a cost-effective solution.

With respect to the tension cracks observed by Silvicon to the southwest of the existing headscarp, it is Wildstone's judgement that there is little that can be done to mitigate their potential for triggering a new slide. They are situated above

slopes in the 70 to 80 % (1.2 - 1.4 to 1.0) range which in these soil types if they remain dry should not trigger a slide. With the permanent deactivation below, which will improve the toe support at the bottom of the slope, the potential for another slide will be minimal. It is, however, strongly recommended that the entire hillside above and below Pine Creek Road be monitored annually by an individual experienced in slope stability.

All construction works are to be supervised and certified by a professional engineer.

Table 5.2.1- Prescription Summary contains the basic information for rehabilitating the landslide.

Table 5.2.1: Landslide Prescription Summary - Bulkley Forest District

Watershed Name or Operating Area:	Telkwa River Watershed
Licensee	Pacific Inland Resources
Site No. (referenced to the key map)	Before site 15 on Figure 4.2.1
Rehabilitation Objective	Stabilize slide area and reduce mass wasting.
x request exemption from Silviculture Prescription (FPC Act Sec. 22 or 30): *(specify the reason for the request) Not Required.*	Approved: _____ *District manager Initials*

This prescription contains:

X Assessment of stability by professional (or by a qualified person as determined by the DM)

X Specifications of mechanical treatments required for stabilization (or mitigate hazards)

☐ Prescription for Mitigation of Gully Hazards in untorrented Gully

☐ Specifications of mechanical treatments for Impact Aversion (gullies or channel training)

☐ Bioengineering Prescription

x Revegetation Prescription (Landslide Rehabilitation Assessment Procedure)

☐ Silviculture Prescription

☐ Other:

Additionally provide a written description of known site safety concerns and, operational timing windows required for environmental or other reasons.

Signatures

Licensee representative:

_____
Licensee signature

Professional certification for prescription development:
I hereby certify that this prescription was prepared:

- consistent with the requirements of this contract, the FPC and the applicable IWRP, while
- addressing the requirements of other agencies

PROFESSIONAL ENGINEER J. K. MORRISON BRITISH COLUMBIA

Aug 13/98

_____ P.Eng.
Professional Engineer

District Manager approval:

_____
District Manager

date:_____

5.2.2 Construction Notes

5.2.2.1 General

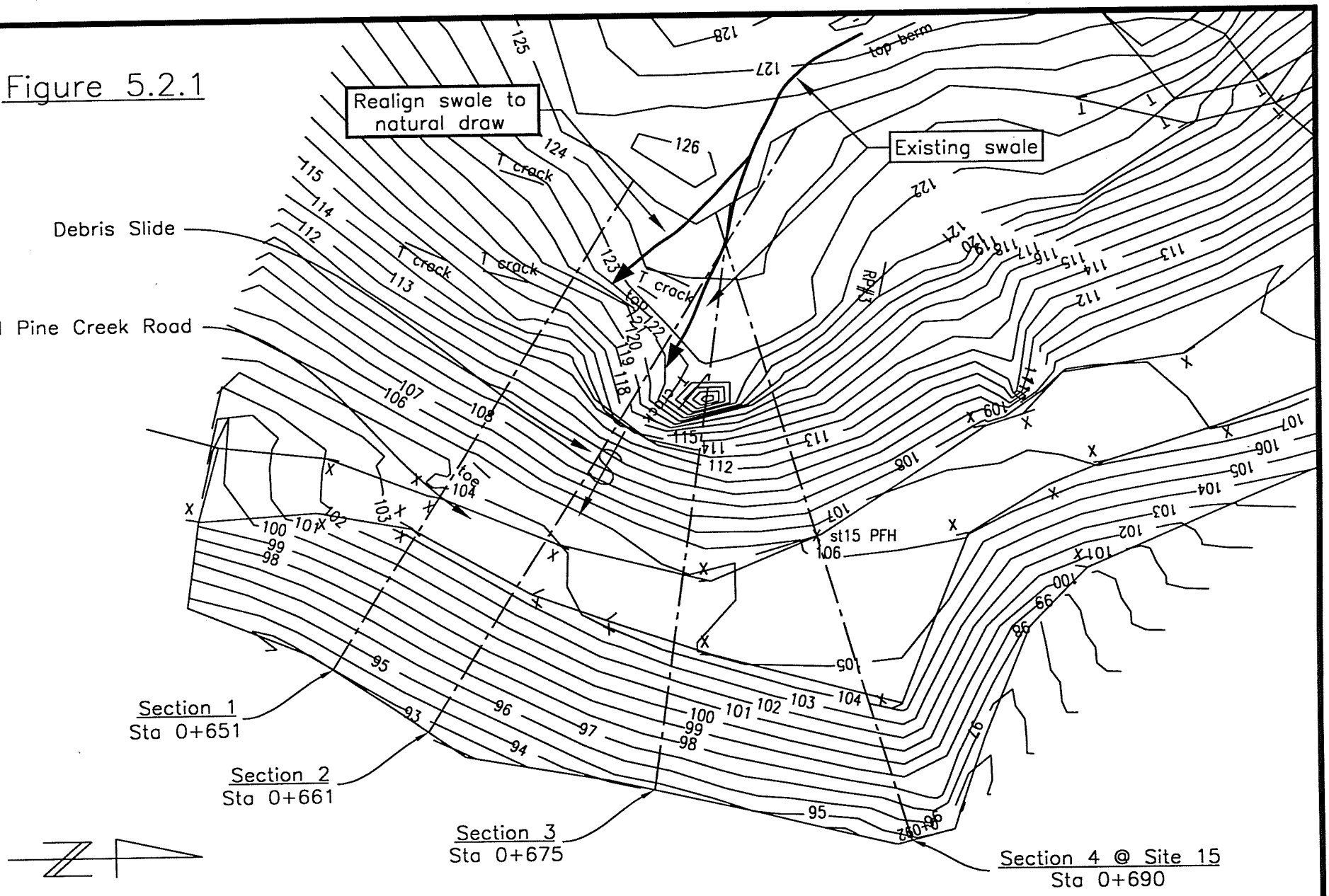
The rehabilitation of the slide area will consist of recontouring the existing steep slopes to a uniform slope of 1.5 to 1.0. Figure 5.2.1 is a topographic plan view of the area. Figures 5.2.1 through 5.2.5 show four cross sections of the existing and proposed new slopes. Orientation for excavating to the slopes shown on the cross sections can be made from Site 15, which is marked in the field. It is recommended that a bulldozer be used to push material downslope to the 1.5 to 1.0. The material that is not used as fill is to be loaded and hauled to a dumpsite located off of Old Pine Creek Road near the entrance on to the Telkwa Forest Service Road. The approximate volume of soil to be cut is 1200 m^3.

In addition, the existing drainage swale located within a manmade berm located above the slide is to be regraded to ensure that any runoff water is directed away from the existing headscarp and down the natural draw located to the southwest of the slide.

Equipment that will be used for the permanent road deactivation may also be used for the slide rehabilitation. The bulldozer would be more effective if a U blade was used rather than an angle blade. Whatever equipment and attachments are used, it is essential the equipment operators are experienced in this type of work. Access for equipment to complete the works above the slide will be via an old cat trail located 100 meters up from the slide on Old Pine Creek Road. The cat trail will require minimal grubbing and shall to be deactivated to its existing state when the landslide rehabilitation work is completed.

Following the completion of the landslide rehabilitation works, all exposed soils are to receive the same revegetation treatments as per previous road deactivation section 5.1.2.

Figure 5.2.1



Base data supplied by Silvicon Services Ltd.

HORIZONTAL SCALE	VERTICAL SCALE	FIELD BOOK	DESIGN BY	DRAWN BY
1:500	1:500		JKM	TDE

DATE: 13/08/98

DRAWING No.: PCRSP

SHEET No.:

APPROVED

Wildstone Engineering Ltd.

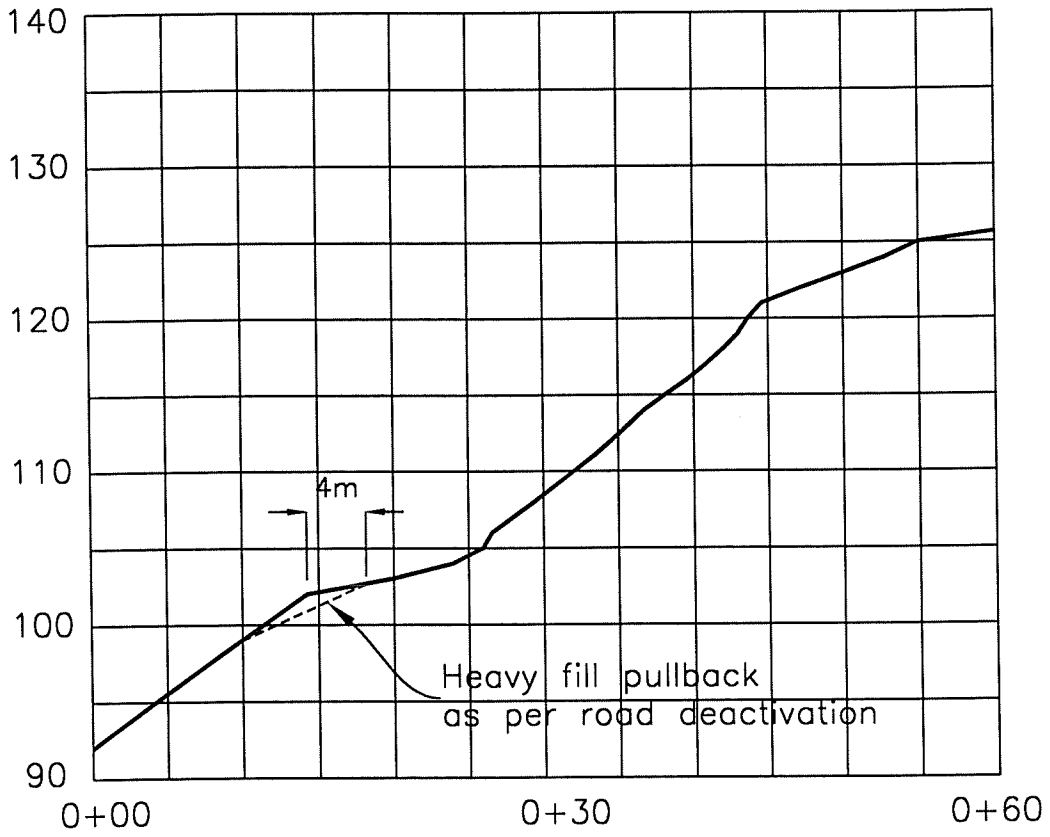
102 - 3310 Skaha Lake Road, Penticton, BC

PINE CREEK LANDSLIDE
REHABLITATION PLAN

Figure 5.2.2

SECTION 1

Station 0 + 651



Cross sectional information based on data supplied by Silvicon Services Ltd.

HORIZONTAL SCALE	VERTICAL SCALE	FIELD BOOK	DESIGN BY	DRAWN BY
1:500	1:500		JKM	TDE

DATE: 13/08/98

DRAWING No.: 5.2.2

SHEET No.:

APPROVED

Wildstone Engineering Ltd.

102 - 3310 Skaha Lake Road, Penticton, BC

PINE CREEK LANDSLIDE REHABILITATION

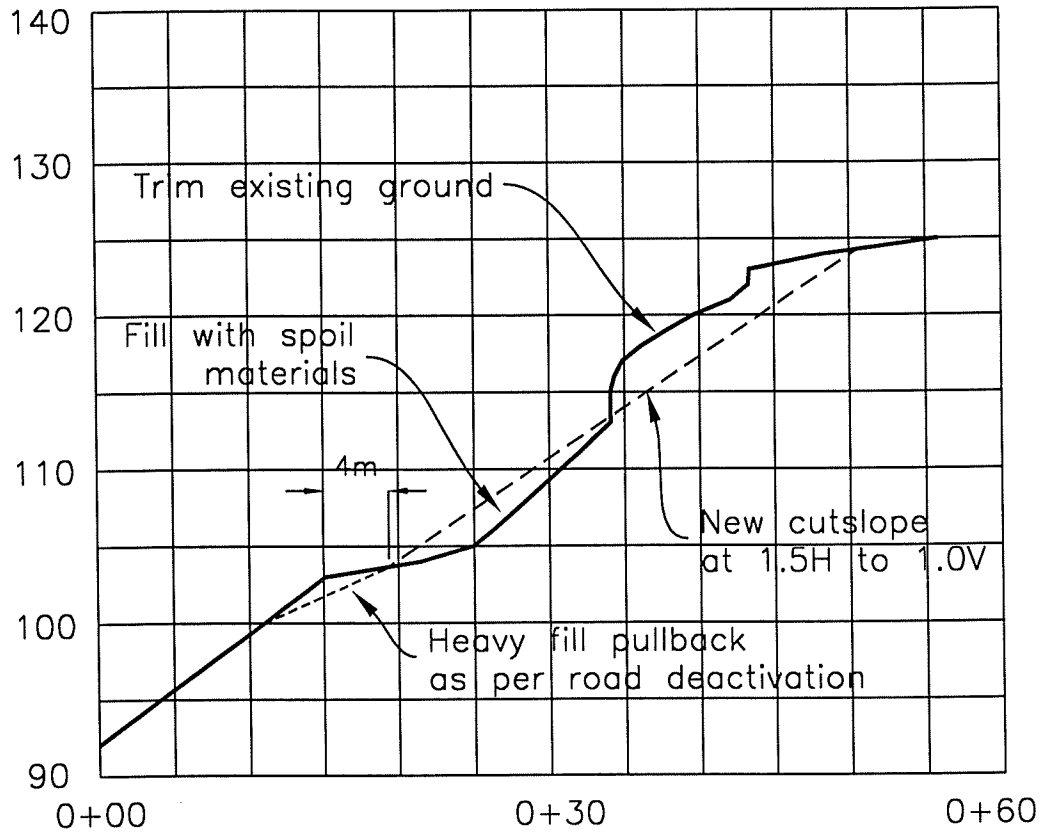
CROSS SECTION 1

Figure 5.2.3

SECTION 2 (DEBRIS SLIDE)

Station 0 + 661

Cut existing slope to 1.5H to 1.0V



Cross sectional information based on data supplied by Silvicon Services Ltd.

HORIZONTAL SCALE	VERTICAL SCALE	FIELD BOOK	DESIGN BY	DRAWN BY
1:500	1:500		JKM	TDE

DATE: 13/08/98

DRAWING No.: 5.2.3

SHEET No.:

APPROVED

Wildstone Engineering Ltd.
102 - 3310 Skaha Lake Road, Penticton, BC

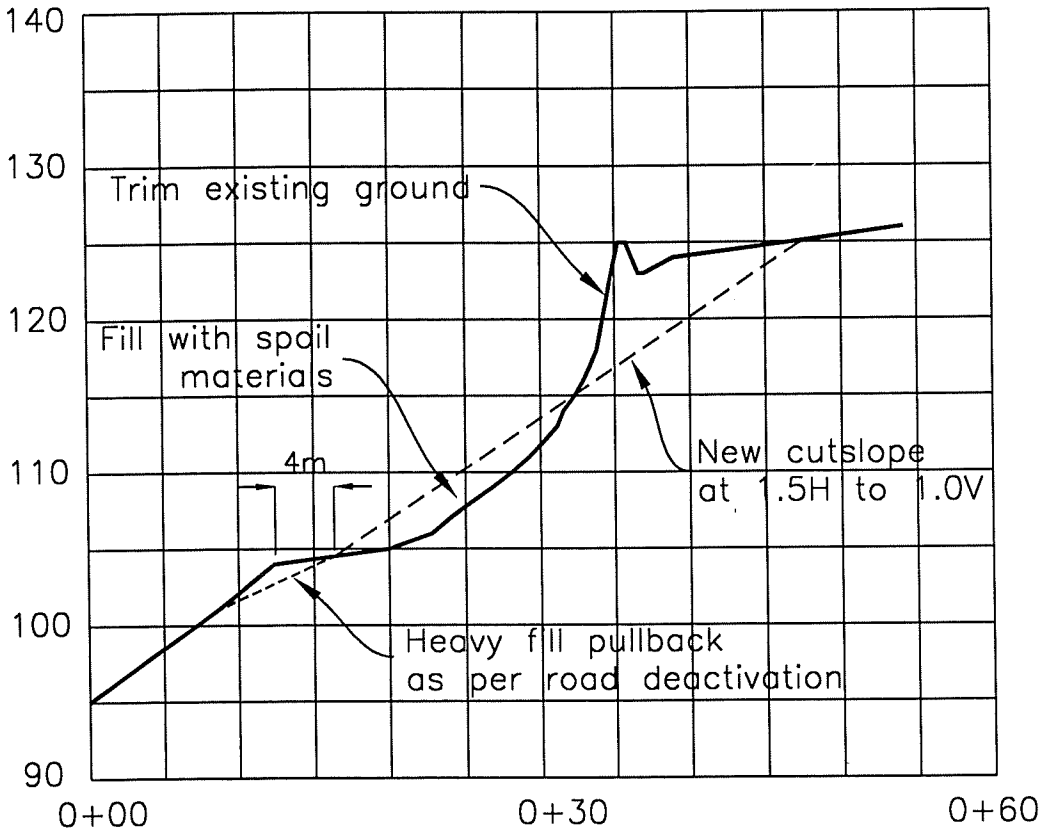
PINE CREEK LANDSLIDE REHABILITATION
CROSS SECTION 2 (DEBRIS SLIDE)

Figure 5.2.4

SECTION 3

Station 0 + 675

Cut slope to 1.5H to 1.0V



Cross sectional information based on data supplied by Silvicon Services Ltd.

HORIZONTAL SCALE	VERTICAL SCALE	FIELD BOOK	DESIGN BY	DRAWN BY
1:500	1:500		JKM	TDE

DATE: 13/08/98

DRAWING No.: 5.2.4

SHEET No.:

APPROVED

Wildstone Engineering Ltd.

102 - 3310 Skaha Lake Road, Penticton, BC

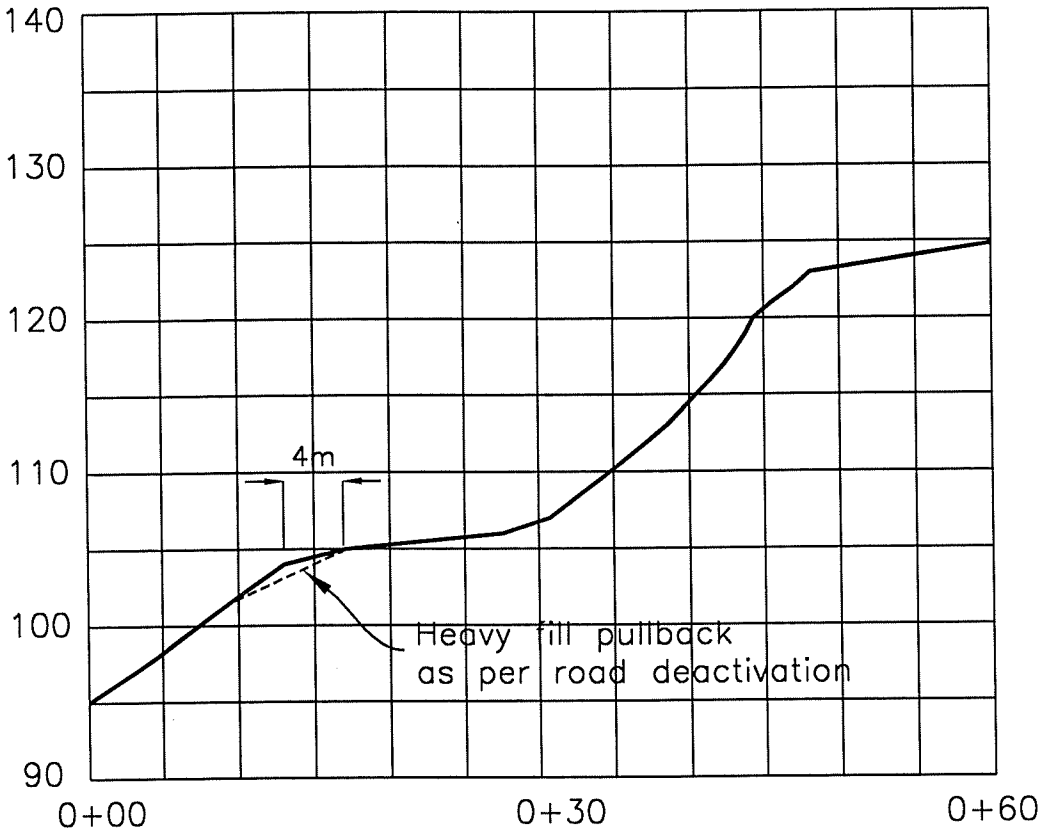
PINE CREEK LANDSLIDE REHABILITATION

CROSS SECTION 3

Figure 5.2.5

SECTION 4

Station 0 + 690



Cross sectional information based on data supplied by Silvicon Services Ltd.

HORIZONTAL SCALE	VERTICAL SCALE	FIELD BOOK	DESIGN BY	DRAWN BY
1:500	1:500		JKM	TDE

DATE: 13/08/98

DRAWING No.: 5.2.5

SHEET No.:

APPROVED

Wildstone Engineering Ltd.
102 - 3310 Skaha Lake Road, Penticton, BC

PINE CREEK LANDSLIDE REHABILITATION
CROSS SECTION 4

6.0 ESTIMATED PROJECT COST

Equipment rates are based on the 1995-1996 *BC Hydro Equipment Rental Guide.* Excavator rates are adjusted to include a hydraulic thumb attachment and brush guard. Bulldozer rates are adjusted to include a ripper. The cost does not include consultant's fees or supervision costs.

Table 6.1: Estimated Quantities and Costs

Item No.	Description of Work	Unit	Quantity [1]	Rate	Total
1	Cross ditch - average	each	17	$ 85.00	$ 1445
2	Water bar - average	each	11	$ 50.00	$ 550
3a	Sidecast Pullback - heavy	m^3	3500	$ 3.40	$ 11900
3b	Sidecast Pullback - light	m^3	300	$ 3.40	$ 1020
4a	Remove & dispose of metal culvert - Fill Cover up to 1 m	each	3	$ 100.00	$ 300
4b	Remove & dispose of metal culvert - Fill Cover 2 m to 3 m	each	1	$ 1500.00	$ 1500
5	Outslope Road Surface	m	751	$ 1.50	$ 1127
6	Road Surface Ripping	m	1134	$ 2.13	$ 2415
7	Revegetation - heli seeding	ha	6	$ 250.00	$ 1500
8	Erosion Protection - Load, Haul and Place at Streams	each	1	$ 230.00	$ 230
9	Equipment travel [2]				
	Excavator (w/ thumb)	hr	3	$ 160.00	$ 480
	Bulldozer (w/ ripper)	hr	2	$ 142.00	$ 284
	Tandem Dump Truck	hr	4	$ 60.00	$ 240
10	Mobilization & Demobilization	hr	8	$ 80.00	$ 640
11	Warning Signs	l.s.	1	$ 100.00	$ 100
12	Foreman	hr	30	$ 32.00	$ 960
12a	Spotter	hr	50	$ 20.00	$ 1000
13	Cut and fill for landslide rehabilitation	m^3	1500	$ 5.00	$ 7500
	Subtotal				**$ 32,171**
13	Contingency	%	20		$ 6,434
				Total Project Cost	**$ 38,605**

NOTES

[1] The quantities shown in Quantity column are estimations only.
[2] The distance the machine travels from the work start point to the point where work is completed

7.0 CONCLUSIONS

Wildstone Engineering Ltd. has conducted field assessments of Old Pine Creek Road and concludes:

Old Pine Creek Road Deactivation

A 2.3 km section of this road has been scheduled for closure. Permanent road deactivation measures will be necessary to re-establish natural drainage patterns and to revegetate the existing road surface.

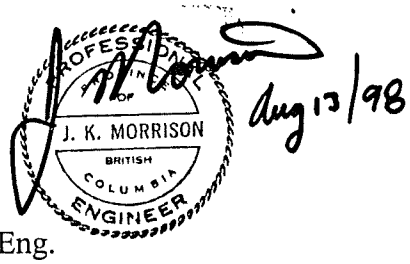
Landslide Rehabilitation

A review of 1959 aerial photography does not reveal slide activity above or below the present road. Therefore, if the rehabilitation measures as outlined in this report are completed successfully, the hillslope should be stabilized to the same state that it was prior to the construction of Old Pine Creek Road.

The construction work is to be supervised by experienced personnel from the Ministry of Forests, or by a professional engineer.

If you have any questions about the content of this report, please call our office.

Yours very truly,



Jim Morrison, P.Eng.

8.0 REFERENCES

Beaudry, Pierre G.; Schwab, James W.; Septer, Dirk. B.C. Forest Service, Forest Sciences Section, Smithers, B.C., Suspended Sediment, Telkwa River Watershed, Data Report April to October, 1990. January 31, 1991.

Beaudry Pierre G.; Schwab, James W., B.C. Forest Service, Bulkley Forest District. Telkwa Watershed: A Forest Hydrology Analysis. October, 1989.

Caterpillar. Caterpillar Performance Handbook (22nd ed.). Caterpillar Inc, October, 1991.

Chatwin, S.C., Howes, D.E., Schwab, J.W. and Swanston D.N., Province of British Columbia, Ministry of Forests, Research Branch. A Guide for Management of Landslide-Prone Terrain in the Pacific Northwest (2nd ed.). Research Branch, Ministry of Forests, 1994.

Coupé, Ray (ed.), MacKinnon, Andy (ed.) and Pojar, Jim (ed.). Plants of Northern British Columbia. Lone Pine, 1992.

Drinkwater, Bob (ed.), Province of British Columbia, Prince Rupert Forest Region. Seeding Manual, Prince Rupert Forest Region (Draft). February, 1993.

Forest Renewal B.C. 1996/97 Handbook for Land-Based Programs. Crown Publications Inc., November, 1995.

Goldman, Steven J.; Jackson, Katharine; Bursztynsky, Taras A. Erosion and Sediment Control Handbook., McGraw Hill Inc., 1986.

Gottesfeld, Allen; Geology of the Northwest Mainland: the Geology and Paleontology of the Skeena, Nass, and Kitimat Drainages of British Columbia. Kitimat Centennial Museum Association, 1985.

R.E. Graham Engineering Ltd. Road Study: Chicken Mountain 120 Road for Pacific Inland Resources Ltd. Prince George, August, 1994.

Humar, Franc; John, D.M.; Ministry of Forests, Prince Rupert Region. Telkwa Drainage Access Options Study. June, 1993.

Humar, Franc; Ministry of Forests, Prince Rupert Forest Region. Project to Upgrade Telkwa F.S.R. from 0 to Winfield Creek. August 12, 1992.

Humar, Franc; Ministry of Forests, Prince Rupert Forest Region. Telkwa F.S.R. Access Upgrade to Winfield Creek. October 16, 1992.

Johnston, N.T.; Moore, G.D; Province of British Columbia, Ministry of Environment, Lands and Parks and Ministry of Forests. Watershed Restoration Technical Circular No. 1: Guidelines for Planning Watershed Restoration Projects. Crown Publications Inc., October, 1995.

Meidinger, Del (ed.) and Pojar, Jim (ed.), B.C. Ministry of Environment . Ecosystems of British Columbia. Crown Publications Inc., February, 1991.

Moore, G.D.; Province of British Columbia, Ministry of Environment, Lands and Parks and Ministry of Forests. Watershed Restoration Technical Circular No. 3:Resource Road Rehabilitation Handbook: Planning and Implementation Guidelines (Interim Methods). Crown Publications Inc., July, 1994.

Province of British Columbia, B.C. Hydro and Power Authority and B.C. Rail Ltd.. Equipment Rental Rate Guide 1995 - 1996. Crown Publications Inc., March, 1995.

Province of British Columbia, Cariboo Forest Region, Clearwater Forest District. Reclamation/Revegetation Guidelines. March, 1996.

Province of British Columbia, Ministry of Environment, Lands and Parks and Ministry of Forests. Watershed Restoration Technical Circular No. 4: Forest Site Rehabilitation Handbook (Interim Methods). Crown Publications Inc., July, 1994.

Province of British Columbia, Ministry of Forests and Ministry of Environment, Lands and Parks. *Forest Practices Code* Fish-Stream Identification Guidebook. July, 1995.

Province of British Columbia, Ministry of Transportation and Highways. Highway Engineering Design Manual. Crown Publications Inc., August, 1995.

Province of British Columbia, Ministry of Transportation and Highways. Standard Specifications for Highway Construction. Crown Publications Inc, 1993.

Septer, D; Schwab, J.W.; Province of British Columbia, Ministry of Forests Research Program. Rainstorm and Flood Damage: Northwest British Columbia 1891-1991. 1995.

Sterling Wood Group Inc. Telkwa River Watershed, Level I Assessment: Roads, Hillslopes, and Gullies. Victoria, B.C., February, 1996.

Tehara, S.S.; Ministry of Forests, Prince Rupert Forest Region. Telkwa River Drainage: Main Road Access and Development Study. 1994.

Wildstone Engineering Ltd., Level II Professional Assessment of four sites within the Telkwa River Watershed. Penticton, B.C., April, 1997.

BRITISH COLUMBIA

LANDSLIDE REHABILITATION DATA CARD

DATE Y M D	RECORDED BY	
98 07 15	Ed Withers · Jessee	
WATERSHED: Telkwa		FAILURE NO.
HEADSCARP LOCATION (UTMs / Elevation)		PHOTO NO.

GEOTECHNICAL ASSESSMENT REQUIRED? [X] Yes [ ] No — TYPE [X] Road [ ] Clearcut [ ] Natural

FAILURE ORIGIN [ ] os [ ] ls [X] cs [ ] gh [ ] gc [ ] gs

VISUAL CONCERN [ ] High [X] Moderate [ ] Low — ACCESSIBILITY [ ] Good [X] Moderate [ ] Poor

AGE [ ] < 1 yr. [X] 1-3 yrs. [ ] 4-10 yrs. [ ] > 10 yrs. — STREAM CONNECTIVITY [ ] Direct [X] Indirect [ ] No connection

TABLE I: PHYSICAL DATA

SEG. NO.	SEGMENT DESCRIPTOR	LENGTH (m)	WIDTH (m)	PATH SLOPE	PATH AZIM.	DRAINAGE CLASS	SURFICIAL MATERIALS
1	os / g — sc / f (os circled)	3.5	14.4	150+	297	P	GF+
2	os / g — sc / f (sc circled)	23.0	10.0	60%	297	P	GF.
3	os / g — sc / f (f circled)	14.0	16.0	12%	297	P	GF
	os / g — sc / f						
	os / g — sc / f						

[illegible margin notes]

TABLE II: PLANTABILITY DATA

SEG. NO.	SOIL HORIZON	SOIL TEXTURE	% COARSE	% EP	PL DEPTH (cm)	% PL
1	A / B / C	Sandy loam	0-20	0-20	5-10cm	0-20%
2	A / B / C	sandy loam	~~0-20~~	0-20	>15cm	>70%
3	A / B / C	sandy loam	0-20	0-20.	>15cm	>70%
	A / B / C		?	?		
	A / B / C					

TABLE III: TREATMENT / PRESCRIPTIONS

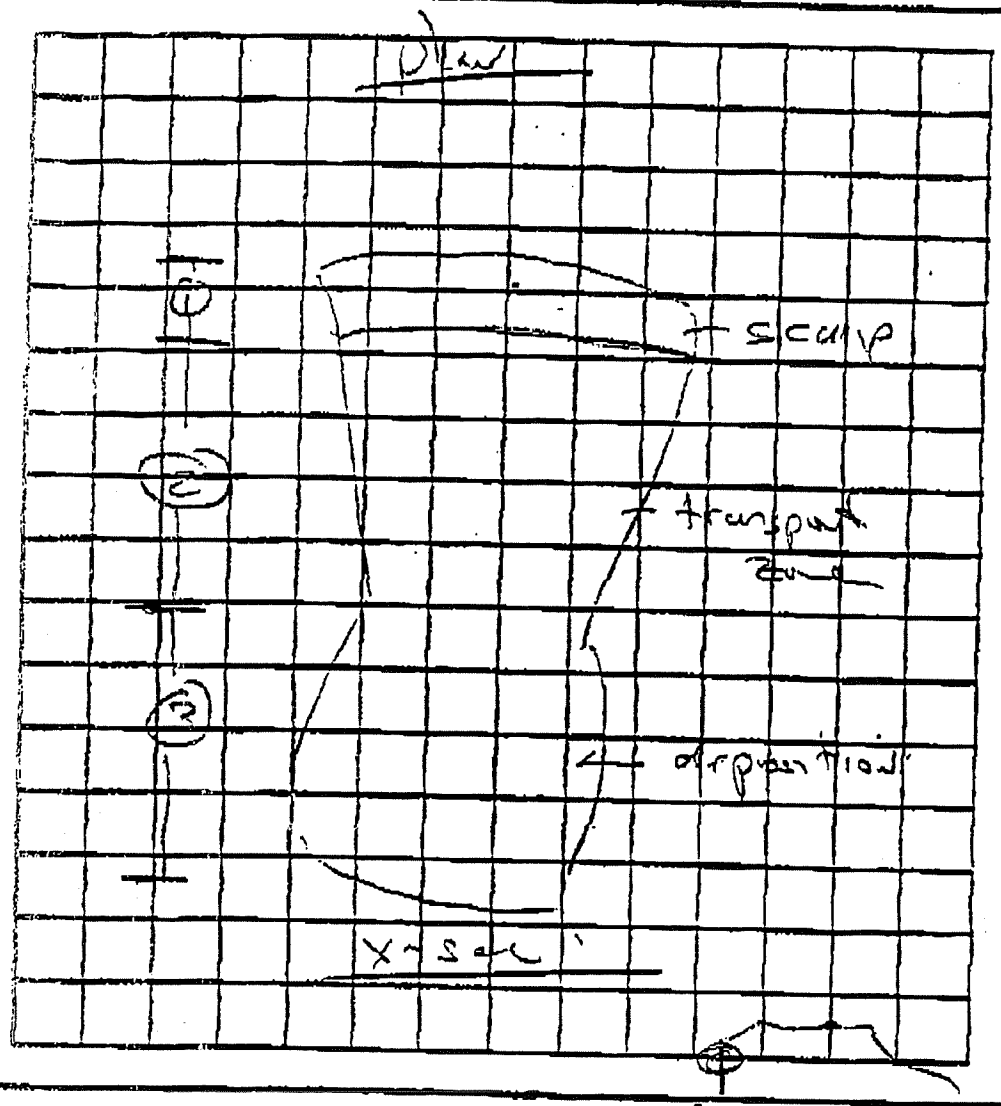
SEG. NO.	% GRASS COVER	% COVER S+H	% COVER C	% COVER Total	SEEDING f	SEEDING h	SEEDING d	PLANTING S	PLANTING H	PLANTING C	ADDITIONAL
1	0	0	0	0	✓	✓	✓	—	—	—	grass
2	1%	0	0	1	✓	✓	✓	—	—	—	grass
3	10%	60	0	70	✓	✓	✓	—	—	—	grass

FS 422-1 RVA 96/2

TABLE IV: SKETCH

DIAGRAM SCALE

PHOTO NO.



COMMENTS

WATERSHED RESTORATION PROJECT
OLD PINE CREEK ROAD
ROAD DEACTIVATION


HITACHI


HITACHI

APPENDIX A - Documentation

July 2, 1998

Claus Rygaard
Engineering / mining Liaison Officer
Ministry of Forests
Dease Lake Field Office
Bulkley/Cassiar District
Bag 2000
Dease Lake, B.C.
V0C 1L0

Dear Claus

Please be advised that, as a part of the Forest Renewal B.C. funded watershed restoration program, road deactivation within Pacific Inland Resources' operating area, specifically, Goathorn Creek, Howsen Creek, Pine Creek, Jonas Creek and Winfield Creek, will soon be underway. Work in that area is expected to commence on August 26-28, 1998.

In 1997, the District Manager approved the prescriptions for deactivation. They were field checked and upgraded in June, 1998. No major changes have been made to the prescriptions.

Please find enclosed a 1:50 000 locator map and a package of prescriptions maps at 1:10 000. In addition, I have enclosed the field notes for the revisited prescriptions and the District Manager's letter of approval for your reference.

Please use the attached maps to form a Schedule 'B' for the 'Works Standard Agreement' between the Ministry of Forests and Pacific Inland Resources. We would appreciate your prompt attention to this matter, as we must have the Standards Agreement executed before the field activities can commence.

These prescriptions form the last prescriptions to be worked for thew 1998 field season.

Should you have any questions or require any further information, please do not hesitate to contact Jay Baker or me at (250) 847-3680.

Yours truly

Ed Withers

Watershed Restoration Supervisor
West Fraser Mills Ltd., Pacific Inland Resources

EW:cs
encl

July 2, 1998

Dick McDiarmid
Ministry of Forests
Bulkley/Cassiar District
Bag 6000
Smithers, B.C.
VOJ 2NO

Dear Dick McDiarmid

Please be advised that, as a part of the Forest Renewal B.C. funded watershed restoration program, road deactivation within Pacific Inland Resources' operating area will soon be underway. The Coffin Lake area will be the first area to be deactivated. Work in that area is expected to commence on July 20, 1998.

In 1997, the District Manager approved the prescriptions for deactivation. They were field checked and upgraded in June, 1998. No major changes have been made to the prescriptions.

Please find enclosed a 1:50 000 locator map and a package of prescriptions maps at 1:10 000. In addition, I have enclosed the field notes for the revisited prescriptions and the District Manager's letter of approval for your reference.

Please use the attached maps to form a Schedule 'B' for the 'Works Standard Agreement' between the Ministry of Forests and Pacific Inland Resources. We would appreciate your prompt attention to this matter, as we must have the Standards Agreement executed before the field activities can commence. Additional maps will be forwarded to you as further contracts are developed, and these maps can then be attached to our original Standards Agreement.

Should you have any questions or require any further information, please do not hesitate to contact Jay Baker or me at (250) 847-3680.

Yours truly.

Ed Withers

Watershed Restoration Supervisor
West Fraser Mills Ltd., Pacific Inland Resources

EW:cs
encl

July 6, 1998

Rick Keim
Senior Habitat Protection Officer
Ministry of Forests
Bulkley/Cassiar District
Bag 6000
Smithers, B.C.
VOJ 2NO

Dear Rick

We recently sent Dick McDiarmid a copy of the Deactivation prescriptions for the Coffin Lake area. The District Manager signed off these prescriptions in June, 1997, and Pacific Inland Resources will proceed with the deactivation near the end of this month.

We are writing you at this time to ask for your input with respect to special signage in this area with respect to wildlife use and/or fish stream crossings. We will then attempt to incorporate your requests into our deactivation work.

Should you have any questions or concerns, please do not hesitate to contact Ed Withers, Watershed Restoration Supervisor, or me at (250)847-3680.

Yours truly

Jay Baker
Forest Renewal Co-ordinator
West Fraser Mills Ltd., Pacific Inland Resources

July 9, 1998

Dick McDiarmid
Ministry of Forests
Bulkley/Cassiar District
Bag 6000
Smithers, B.C.
VOJ 2NO

Dear Dick McDiarmid

Please be advised that, as a part of the Forest Renewal B.C. funded watershed restoration program, road deactivation within Pacific Inland Resources' operating area will soon be underway. The Coffin Lake area will be the first area to be deactivated. Work in that area is expected to commence on July 20, 1998.

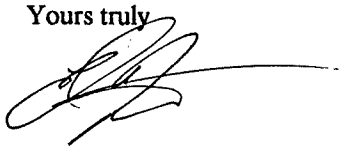
In 1997, the District Manager approved the prescriptions for deactivation. They were field checked and upgraded in June, 1998. No major changes have been made to the prescriptions.

Please find enclosed a 1:50 000 locator map and a package of prescriptions maps at 1:10 000. In addition, I have enclosed the field notes for the revisited prescriptions and the District Manager's letter of approval for your reference.

Please use the attached maps to form a Schedule 'B' for the 'Works Standard Agreement' between the Ministry of Forests and Pacific Inland Resources. We would appreciate your prompt attention to this matter, as we must have the Standards Agreement executed before the field activities can commence. The prescriptions included form the last prescriptions for the Coffin Lake area. Additional maps will be forwarded to you as further contracts are developed, and these maps can then be attached to our original Standards Agreement.

Should you have any questions or require any further information, please do not hesitate to contact Jay Baker or me at (250) 847-3680.

Yours truly



Ed Withers

Watershed Restoration Supervisor
West Fraser Mills Ltd., Pacific Inland Resources

EW:cs
encl

Silvicon
SERVICES INC.

P.O. Box 490
3560 Victoria Drive
Smithers, B.C. V0J 2N0
Ph. (250) 847-3680
Fax (250) 847-2530
E-mail: silvicon@mail.netshop.net

August 13, 1998

Claus Rygaard
Engineering / Mining Liaison Officer
Dease Lake Field Office
B.C. Ministry of Forests
Bulkley Cassiar Forest District
Bag 2000
Dease Lake, B.C.
V0C 1L0

Re: Certification Report, WRP Road Deactivation, Contract 98-FRBC-13 (Phase I)

Dear Claus:

In compliance with the Works Schedule 'A' of the WRP Standards Agreement for the above mentioned contract, please accept this letter as certification that the works have been completed in general conformance with the relevant road deactivation prescriptions.

In this package, please find a summary map indicating the roads deactivated under this phase of the contract (Coffin Lake area), and a table indicating the extent of deactivation completed for those roads. Please note that a total of **26.801 kilometers** of road has been permanently deactivated, **no landslides or gullies have been treated,** and that approximately **0.63 hectares** of treated ground has been revegetated.

No areas under this phase of the contract required deactivation prescriptions prepared by a professional engineer of geoscientist, and as such, no professional certification of works other than this are included herein.

I have included a copy of the road inspection report prepared by yourself, and signed by my assistant, Ed Withers, as additional information. With respect to that report, the revegetation of the area in question will be complete this week, the deactivation signs will be posted outside private property, and due to mobilization (lowbedding) logistics, the crossditches on the private property will be filled in prior to the end of the complete contract. Your comment on the slope angle of the cross ditches has been duly noted. I hope that these minor issues will not preclude payment for the works performed.

If you require further information, or need clarification on any issue related to this package, please contact either Ed Withers or myself at (250) 847-3680.

Yours truly,

Steven R. Webb, RPF
Project Supervisor, Engineering

encl.

British Columbia

Forests

MAP # 1 OF 3

MAP OF: COFFIN LAKE AREA

OPENING NO. /

FOREST REGION: PR RUPERT 02

DISTRICT: CASSIAR 29

CONTRACT No: 22175 · 80/SBM 98112 Date JULY 22, 1998

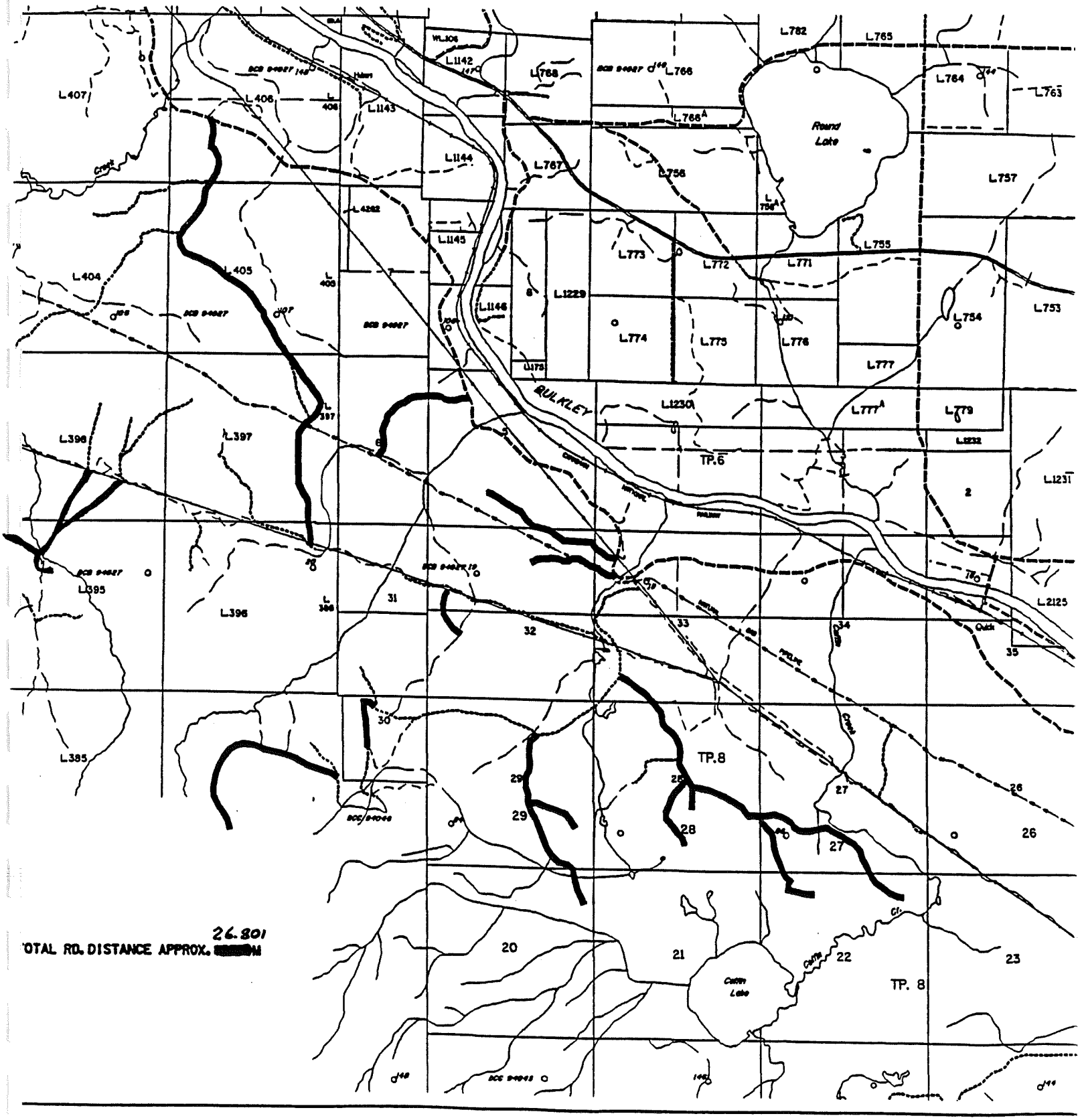
Ref. Map 93 L 055, 064 + 065

Scale 1: 50,000

Area hectares ±

Drawn by

Revised by Date



TOTAL RD. DISTANCE APPROX. 26.801 KM

Table 1 COFFIN LAKE 110 ROAD SYSTEM DEAVTIVATION Contract Number 98-FRBC-15

ROAD SYSTEM LABEL	ROAD NAME	LENGTH KM	# OF CROSS DITCHES	# OF CULVERTS FOR REMOVAL	REQUIRED EQUIPMENT	OTHER REQUIRED CONSTRUCTION	LEVEL OF DEACTIVATION	VEHICLE ACCESS
E98-033	MAIN	3.98	39	9	small - medium crawler or rubber tired excavator		PERMANENT	ATV
	SPUR C	0.757	8	1			PERMANENT	ATV
	SPUR D	0.252	3	0			PERMANENT	ATV
	SPUR E	0.785	9	0			PERMANENT	ATV
	SPUR F	1.735	18	1			PERMANENT	ATV
	SPUR G	0.48	5	0			PERMANENT	ATV
	SPUR G1	0.265	3	0			PERMANENT	ATV
	SPUR H	0.11	1	0		- remove sill logs	PERMANENT	ATV
	SPUR K	0.93	4	0			PERMANENT	ATV
EM7-531	SPUR A	1.837	20	6	medium - large crawler excavator	- outslope road surface - fill pullback light-heavy	PERMANENT	ATV
	SPUR B	0.395	8	0			PERMANENT	ATV
066-3B-170	MAIN	1.297	15	0	small - medium crawler or rubber tired excavator		PERMANENT	ATV
EM7-517	SPUR A	1.368	9	0			PERMANENT	ATV
	SPUR B	0.331	4	0			PERMANENT	ATV
E98-082	SPUR A	1.75	27	3	small - medium crawler or rubber tired excavator		PERMANENT	ATV
	SPUR B	0.305	7	0			PERMANENT	ATV
	SPUR D	2.757	38	10			PERMANENT	ATV
	SPUR E	1.886	14	1			PERMANENT	ATV
	SPUR F	0.18	2	1			PERMANENT	ATV
CP511-082	SPUR G	4.815	47	0	small - medium crawler or rubber tired excavator		PERMANENT	ATV
	SPUR H	0.261	1	1			PERMANENT	ATV
	SPUR J	0.325	2	1			PERMANENT	ATV
TOTALS		26.801	284	34				

Province of British Columbia Ministry of Forests

ROAD INSPECTION REPORT

(ON REVERSE, SEE CHECKLIST OF CODES AND PROBLEMS NOTED)

DATE Y M D	FILE NO.	CUTTING PERMIT NO.	ROAD PERMIT NO.	AMENDMENT NO.	SECTION NO.
98 | 08 | 11		E98082		/	/

LICENSEE: PIR → ALSO ROAD 110

FOREST REGION	FOREST DISTRICT	LOCAL ROAD NAME	ROAD NO.
RUPERT	BULKLEY / CASSIAR	/	

INSPECTION TYPE: ☐ CONSTRUCTION ☐ MAINTENANCE ☒ DEACTIVATION

km	NON-COMPLIANCE ITEMS (BY CODE OR DESCRIPTION)	PROBLEMS NOTED	RECOMMENDED REMEDIAL ACTION (BY CODE OR DESCRIPTION)
1)	DEACTIVATION COMPLETED AS PER PRESCRIPTIONS - ALL SIGNS IN PLACE		
2)	CP F98082 STILL REQUIRES SEEDING		
3)	2 CROSS DITCHES ON PRIVATE LAND TO BE FILLED BACK IN AND THE DEACTIVATION IS TO BE TAKEN OFF OF PRIVATE LAND.		

COMMENTS: WATCH THE DRAINAGE ANGLE - SOME DITCHES WILL HAVE PROBLEMS DRAINING WATER

: WORK STARTED JULY 22/98

COMPLETED AUG 7/98

12 DAYS TO FINISH 26.8 km

PRODUCTION = 2.23 km / DAY

SIGNATURES					
INSPECTOR		Y M D 98 | 08 | 12	LICENSEE REPRESENTATIVE		Y M D 980813
FIELD OPERATIONS SUPERVISOR		Y M D	RESOURCE OFFICER, ENGINEERING		Y M D

FS 50 HTH 94/5 **DISTRIBUTION:** WHITE - DISTRICT OR LICENSEE; CANARY - CUTTING PERMIT FILE; PINK - ROAD PERMIT FILE; GREEN - RESOURCE OFFICER, ENGINEERING OR INSPECTOR

August 14, 1998

Kendal Umscheid
Senior Exploration Technologist
Manalta Coal Ltd.

Dear Kendal

Thankyou for your input into PIRs road deactivation. As per our phone conversation on August 13, 1998 we will not be deactivating any roads within your private lands, specifically the 120 cuttoff road. We will, however continue with our plans for deactivation on your coal lease in the Goathorn creek area. Once again we thank you for your co-operation in these matters.

Work in that area is expected to commence on August 26-28, 1998. If you have any further information or feel that road deactivation in this area may hamper your operations please contact us before the 21st of August.

Should you have any questions or require any further information, please do not hesitate to contact Jay Baker or myself at (250) 847-3680.

Yours truly

Ed Withers

Watershed Restoration Supervisor
West Fraser Mills Ltd., Pacific Inland Resources

EW:cs
encl

August 14, 1998

Claus Rygaard
Engineering / mining Liaison Officer
Ministry of Forests
Dease Lake Field Office
Bulkley/Cassiar District
Bag 2000
Dease Lake, B.C.
V0C 1L0

Dear Claus

Please be advised that, as a part of the Forest Renewal B.C. funded watershed restoration program, road deactivation within Pacific Inland Resources' operating area, specifically, Goathorn Creek, Howsen Creek, Pine Creek, Jonas Creek and Winfield Creek, will soon be underway. Work in that area is expected to commence on August 26-28, 1998.

In 1997, the District Manager approved the prescriptions for deactivation. They were field checked and upgraded in June, 1998. No major changes have been made to the prescriptions.

Please find enclosed a 1:50 000 locator map and a package of prescriptions and maps at 1:10 000. In addition, I have enclosed the field notes for the revisited prescriptions and the District Manager's letter of approval for your reference.

Please use the attached maps to form an addition to Schedule 'B' for the 'Works Standard Agreement' between the Ministry of Forests and Pacific Inland Resources.

These prescriptions form the last prescriptions to be worked for the 1998 field season.

Should you have any questions or require any further information, please do not hesitate to contact Jay Baker or me at (250) 847-3680.

Yours truly

Ed Withers

Watershed Restoration Supervisor
West Fraser Mills Ltd., Pacific Inland Resources

EW:cs
encl

Silvicon
SERVICES INC.

P.O. Box 490
3560 Victoria Drive
Smithers, B.C. V0J 2N0
Ph. (250) 847-3680
Fax (250) 847-2530
E-mail: silvicon@mail.bulkley.net

September 28, 1998

Claus Rygaard
Engineering / Mining Liaison Officer
Dease Lake Field Office
B.C. Ministry of Forests
Bulkley Cassiar Forest District
Bag 2000
Dease Lake, B.C.
V0C 1L0

Re: Certification Report, WRP Road Deactivation, Contract 98-FRBC-14 (Phase IV)

Dear Claus:

In compliance with the Works Schedule 'A' of the WRP Standards Agreement for the above mentioned contract, please accept this letter as certification that the works have been completed in general conformance with the relevant road deactivation prescriptions.

In this package, please find a summary map indicating the roads deactivated under this phase of the contract (Cumming Creek area), and a table indicating the extent of deactivation completed for those roads. Please note that a total of **16.839 kilometers** of road has been permanently deactivated, **no landslides or gullies have been treated**, and that approximately **0.9 hectares** of treated ground has been revegetated.

No areas under this phase of the contract required deactivation prescriptions prepared by a professional engineer or geoscientist, and as such, no professional certification of works other than this are included herein.

If you require further information, or need clarification on any issue related to this package, please contact me at (250) 847-3680.

Yours truly,

Ed Withers
Watershed Restoration Supervisor

encl.

BRITISH COLUMBIA

File: 22175-80/SBM98112

August 28, 1998

Ed Withers
Silvicon Services Ltd.
PO Box 490
350 Victoria Drive
Smithers, British Columbia
V0J 2N0

RE: Pacific Inland Resources WRP - Coffin Lake Area

Dear Ed Withers:

Regarding our discussion on August 18, 1998 on the requirements for the RPF signature on the Engineered prescription for the Pine Creek road deactivation.

I will not be requiring the RPF signature as long as the Professional Engineer signature along with his stamp has been placed on the prescription.

Also. in response to Mr. Steven R. Webb' letter dated August 13, 1998, I do not see any problems with certifying all works in Phase 1 as complete and no delay in payments should be expected. The comments were not meant as anything but advisory for future works.

Please find attached to this letter the Schedule B's for the Works Standard Agreement. In particular the Pine, Goathorn, Howsen, Jonas, and Winfield Creeks. Please have these signed by the appropriate Pacific Inland Resource's personnel and return to this office for final signatures.

Yours truly,

Claus Rygaard
Engineering/Mining Liaison Officer
Bulkley/Cassiar Forest District
Dease Lake Field Office

Attachments

Ministry of Forests

Bulkley/Cassiar Forest District

Location:
3333 Tatlow Road
Smithers, BC

Mailing Address:
Bag 6000
Smithers, BC
V0J 2N0

Tel: 250-847-6300
Fax: 250-847-6353

Silvicon
SERVICES INC.

P.O. Box 490
3560 Victoria Drive
Smithers, B.C. V0J 2N0
Ph. (250) 847-3680
Fax (250) 847-2530
E-mail: silvicon@mail.bulkley.net

September 17, 1998

Claus Rygaard
Engineering / Mining Liaison Officer
Dease Lake Field Office
B.C. Ministry of Forests
Bulkley Cassiar Forest District
Bag 2000
Dease Lake B.C.
V0C 1L0

Re: Certification Report, WRP Road Deactivation, Contract 98-FRBC-09

Dear Claus:

In compliance with the works Schedule 'A' of the WRP Standards Agreement for the above mentioned contract, please accept this letter as certification that the works have been completed in general conformance with the relevant road deactivation prescription.

In this package, please find a summary map indicating the road deactivated under this contract (Pine Creek Area), and a table indicating the extent of deactivation completed for this road. Please note that a total of **2.4 kilometers** of road has been permanently deactivated leaving no access to motorized vehicles. One landslide of roughly **0.05 hectares** in size was treated and one small gully was restored. The revegitation of this road will fall under the responsibility of another contract (98-FRBC-09A).

The prescription for this contract was prepared by Jim Morrison, P.Eng. of Wildstone Engineering Ltd. The site has been walked by Jim Morrison and myself to ensure the quality of the work is acceptable. Please accept this letter as professional certification that the works have been completed in general conformance with the relevant road deactivation prescription.

If you require further information, or need clarification on any issue related to this package, please contact either Jim Morrison at (250) 493-3947 or myself at (250) 847-3680.

Yours Truly,

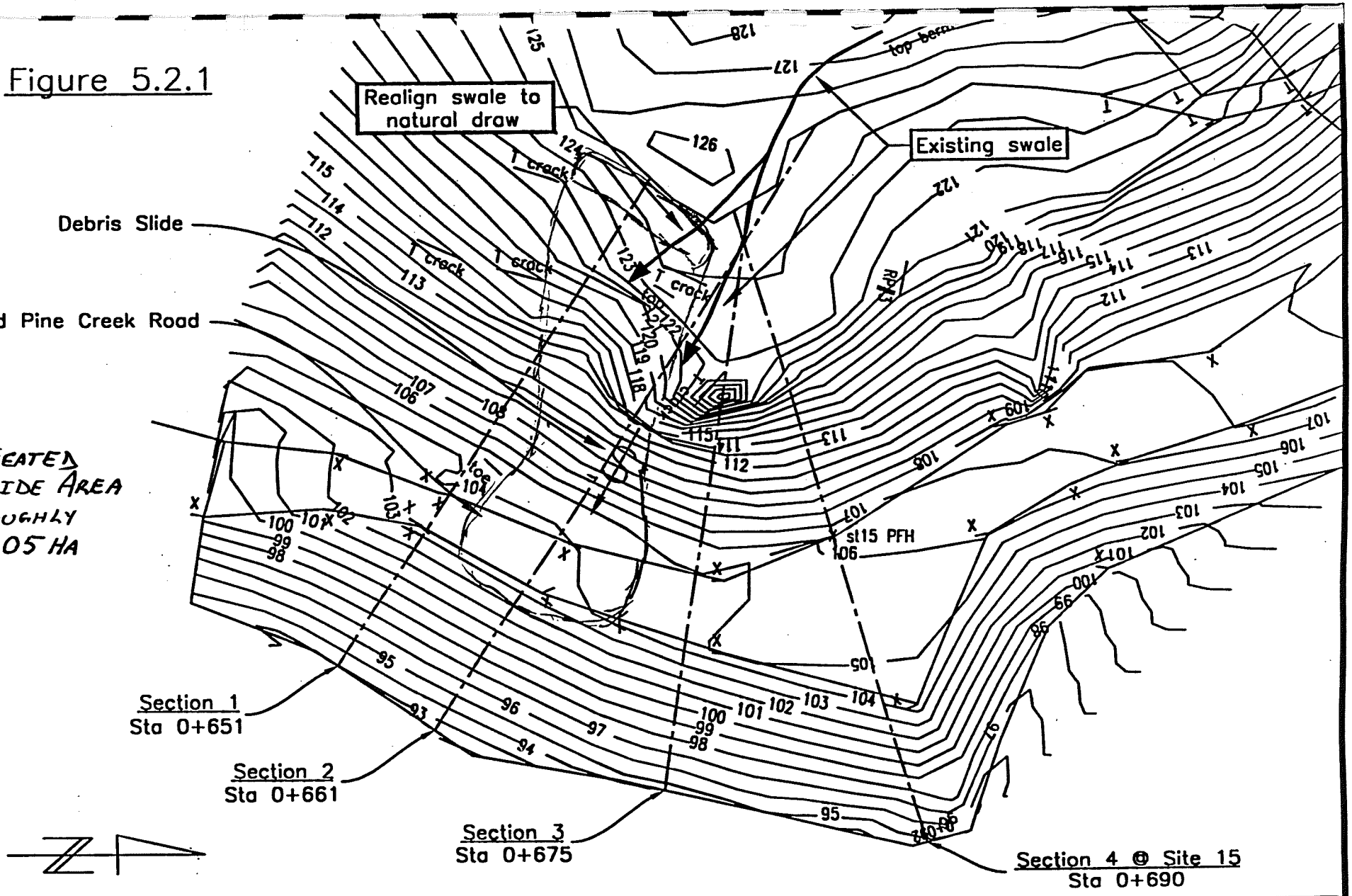
Ed Withers
Watershed Restoration Supervisor
West Fraser Mills Ltd., Pacific Inland Resources

Professional certification that the works have been completed in general conformance with the relevant road deactivation prescription. Contract number 98-FRBC-09.

Signature Sep 17/98

P.Eng.
Professional Engineer

Figure 5.2.1



Base data supplied by Silvicon Services Ltd.

HORIZONTAL SCALE	VERTICAL SCALE	FIELD BOOK	DESIGN BY	DRAWN BY
1:500	1:500		JKM	TDE

DATE: 13/08/98

DRAWING No.: PCRSP

SHEET No.:

APPROVED

Wildstone Engineering Ltd.

102 - 3310 Skaha Lake Road, Penticton, BC

PINE CREEK LANDSLIDE REHABLITATION PLAN

The road deactivation measures are field staked or have been reflagged and are described in Tables 5.1.2.

Table 5.1.2: Permanent Road Deactivation Prescriptions

Reference Station	Chainage[1] (m)	Prescription
1	0+053	Start of road deactivation prescriptions. Install a berm to prevent vehicular access.
2	0+127	Install cross ditch*.
3	0+195	Improve existing cross ditch.
4	0+257	Install cross ditch.
5	0+300	Install cross ditch to accept ditch and upslope water.
6	0+320	Install cross ditch.
7	0+371	Install armored waterbar that will maintain the natural drainage*.
8	0+384	Start heavy fill pullback*. A**=3.5m B**=5m.
9	0+465	Start light pullback and end heavy fill pullback. A=4m B=4m. Install waterbar.
9.5	0+475	Small slump on fillslope below landing. Pull back scarp and reinstate ditch.
10	0+487	End light pullback and start heavy pullback. A=4m B=5m.
11	0+528	Continue heavy fill pullback. A=5m B=4m.
12	0+608	Remove metal culvert*.
13	0+615	13 and 14 are same point. Continue heavy fill pullback. Install armored waterbar that will maintain the natural drainage. Start light fill pullback. A=4m B=3m.
14		See above point 13.
15	0+690	Continue heavy fill pullback. A=4.5m B=5m.
15.5	0+709	Continue heavy fill pullback. A=4.5m B=7m.
16	0+728	Continue heavy fill pullback. A=4m B=5m.
17	0+770	End heavy fill pull back. Start light fill pullback. A=5m B=3m.
18	0+797	End light fill pullback. A=3.5m B=5m. Install cross ditch.
19	0+847	Install waterbar. May use waste material if outsloped.

Table 5.1.2 (con't)

Reference Station	Chainage[1] (m)	Prescription
20	0+881	Remove metal culvert as per the details. Armor sideslopes and outlet. May outslope with waste material.
21	0+904	Remove metal culvert. End of outsloping with waste material.
22	0+912	Start outsloping of road surface @2%*.
22.5	1+003	Install cross ditch.
23	1+035	Remove metal culvert. End outsloping of road surface. Install cross ditch.
24	1+108	Install cross ditch.
25	1+143	Install cross ditch.
26	1+218	Install cross ditch.
27	1+273	Install cross ditch.
28	1+513	Install cross ditch.
29	1+588	Install cross ditch.
30	1+709	Start outsloping of road surface @2%. Install waterbar.
31	1+775	Continue outsloping of road @2%. Install waterbar.
32	1+837	Continue outsloping of road @2%. Install waterbar.
33	1+981	Continue outsloping of road @2%. Install waterbar.
34	2+065	Continue outsloping of road @2%. Install waterbar.
34.5	2+100	Install cross ditch.
35	2+142	Continue outsloping of road @2%. Install waterbar.
36	2+234	Continue outsloping of road @2%. Install waterbar.
37	2+279	Continue outsloping of road @2%. Install waterbar.
38	2+337	End outsloping of road surface. Install cross ditch.
39	2+368	End of road deactivation prescriptions. Install a berm to prevent vehicular access.

[1] Chainage starts at intersection of the Telkwa River FSR and Old Pine Creek Road.

* Specific details for prescriptions as per Table 5.1.3.

** Dimensions of pullback are shown on Figure 5.1.1.

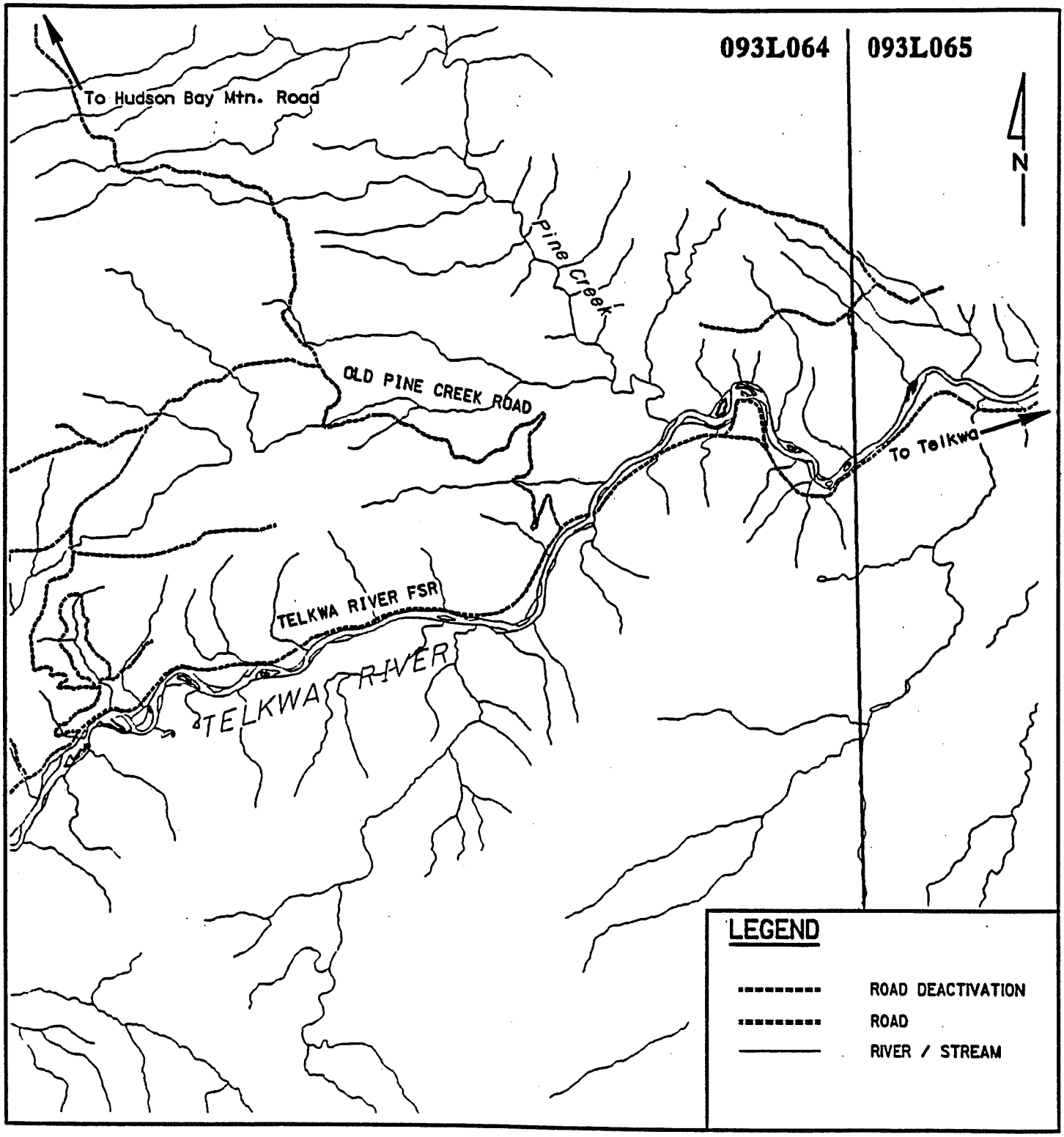


Figure 2.1.1- Old Pine Creek Road Site Location Plan

BRITISH COLUMBIA Ministry of Forests

Quality Certificate

For inspection of work delivered under standards agreements

A) IDENTIFICATION

Standards Agreement No.	22175-80 / SBM 98/12	Activity	Road Deactivation
District	Bulkley / Cassiar	Licensee	Pacific Inland Resources (A Division of West Fraser Mills)
MYA or Annual Agreement	SBM 98/12	Date	Oct. 16/98

B) UNITS INCLUDED IN QUALITY CERTIFICATION: Pine Creek Road - Hill Stabilization

C) UNIT INSPECTED: Pine Creek Road (Fill in a separate sheet for each unit field checked)

1.	Quality reported by Licensee Inspector	100 %
2.	Overall quality of unit	100 %
3.	Payment percent	100 %
4.	Number of hectares reported by Licensee Inspector as treated	2.4 km ~~ha.~~
5.	Number of hectares treated	2.4 KM ha
6.	Assessments recommended to FRBC (write in N/A if none) (Itemize in the comment section or attach an additional sheet)	$ N/A
7.	Estimated cost of rework required, if any. (write in N/A if non required) (Itemize in the comment section or attach an additional sheet)	$ N/A

8. Comments:

Professionally Engineered Deactivation Plan - Certified as correct by Engineer upon work completion

CERTIFICATE COMPLETED BY: _____ Ministry Representative (Signature)

Cross Bedard Ministry Representative (Printed Name)

Attachments: _____

Silvicon
SERVICES INC.

P.O. Box 490
3560 Victoria Drive
Smithers, B.C. V0J 2N0
Ph. (250) 847-3680
Fax (250) 847-2530
E-mail: silvicon@mail.bulkley.net

September 28, 1998

Claus Rygaard
Engineering / Mining Liaison Officer
Dease Lake Field Office
B.C. Ministry of Forests
Bulkley Cassiar Forest District
Bag 2000
Dease Lake, B.C.
V0C 1L0

Re: Supervision and field checks of, WRP Road Deactivation, Contract 98-FRBC-14

Dear Claus:

Please be advised that I will be away for most of October. As such I will no longer be as available for supervision or field checks, as with the previous contracts. In my place, however will be Jason Thomson, FIT. Jason has taken part in the Forest Road Deactivation course, worked on many of the prescriptions for the contract and is familiar with the quality of work expected for the completion of the contracts. Jason will contact you as each of the remaining phases are completed. I will stay in touch with Jason and try to be available should any problems arise. It has been a pleasure working with you and hope to work with you again on future projects.

If you require further information, please contact Jason or myself at (250) 847-3680.

Yours truly,

Ed Withers
Watershed Restoration Supervisor

encl.

October 7, 1998

Claus Rygaard
Engineering / Mining Liaison Officer
Dease Lake Field Office
B.C. Ministry of Forests
Bulkley Cassiar Forest District
Bag 2000
Dease Lake, B.C.
V0C 1L0

Re: Certification Report, WRP Road Deactivation, Contract 98-FRBC-14 (Phase IV and V)

Dear Claus:

In compliance with the Works Schedule 'A' of the WRP Standards Agreement for the above mentioned contract, please accept this letter as certification that the works have been completed in general conformance with the relevant road deactivation prescriptions.

In this package, please find a summary map indicating the roads deactivated under this phase of the contract (Cumming Creek, Jonas Creek and Winfield Creek area), and a table indicating the extent of deactivation completed for those roads. Please note that a total of **16.839 kilometers** for phase IV and **6.603 kilometers** of road for phase V, has been permanently deactivated, **no landslides or gullies have been treated**, and that approximately **0.7 hectares** of treated ground has been revegetated.

No areas under this phase of the contract required deactivation prescriptions prepared by a professional engineer or geoscientist, and as such, no professional certification of works other than this are included herein.

If you require further information, or need clarification on any issue related to this package, please contact me at (250) 847-3680.

Yours truly,

Ed Withers
Watershed Restoration Supervisor

encl.

Silvicon
SERVICES INC.

P.O. Box 490
3560 Victoria Drive
Smithers, B.C. V0J 2N0
Ph. (250) 847-3680
Fax (250) 847-2530
E-mail: silvicon@mail.bulkley.net

October 15, 1998

Claus Rygaard
Engineering/Mining Liaison Officer
Dease Lake Field Office
B.C. Ministry of Forests
Bulkley Cassiar Forest District
Bag 2000
Dease Lake B.C.
V0C 1L0

RE: Certification Report, WRP Road Deactivation, Contract 98-FRBC –13 (Phase III)

Dear Claus

In compliance with the Works Schedule "A" of the WRP Standards Agreement for the above mentioned contract, please accept this letter as certification that the works have been completed in general conformance with the relevant road deactivation prescriptions.

In this package, please find a summary map indicating the roads deactivated under this phase of the contract (Coffin Lake Area) and a table indicating the extent of deactivation completed for those roads. Please note that a total of 16.255 kilometers for phase III has been permanently deactivated, no landslides or gullies have been treated and that approximately 0.4 hectares of treated ground has been revegetated.

No areas under this phase of the contract required deactivation prescriptions prepared by a professional engineer or geoscientist and as such, no professional certification of worked other than this are included herein.

If you require further information, or need clarification on any issue related to this package, please contact me at (250) 847-3680.

Yours truly,

Steven R. Webb, R.P.F.
Project Supervisor, Engineering

SW:me

Encl.

BRITISH COLUMBIA

Ministry of Forests

Quality Certificate

For inspection of work delivered under standards agreements

A) IDENTIFICATION

Standards Agreement No.	22125-80 / SBM 98112	Activity	ROAD DEACTIVATION
District	BULKLEY / CASSIAR	Licensee	PACIFIC INLAND RESOURCES (A DIVISION OF WEST FRASER MILLS)
MYA or Annual Agreement	SBM 98112	Date	OCT. 16/98

B) UNITS INCLUDED IN QUALITY CERTIFICATION: EM7-533 ; E98-023 ; CP532-182 ; CP 532 AND GOATHORN AREA
CUMMING CREEK ; JONAS CREEK ; WINFIELD CREEK, GOATHORN

C) UNIT INSPECTED: _____ (Fill in a separate sheet for each unit field checked)

1.	Quality reported by Licensee Inspector PHASES 1->5	100 %
2.	Overall quality of unit	100 %
3.	Payment percent	100 %
4.	Number of hectares reported by Licensee Inspector as treated	23.442 km ~~ha~~
5.	Number of hectares treated	23.442 km ~~ha~~
6.	Assessments recommended to FRBC (write in N/A if none) (Itemize in the comment section or attach an additional sheet)	$ N/A
7.	Estimated cost of rework required, if any. (write in N/A if non required) (Itemize in the comment section or attach an additional sheet)	$ N/A

8. Comments:

SOME DEACTIVATION SIGNS TO BE RE-INSTALLED

CERTIFICATE COMPLETED BY: _____ (Ministry Representative (Signature)) CLAUS BOOMS (Ministry Representative (Printed Name))

Attachments: _____

BRITISH COLUMBIA

Ministry of Forests

Quality Certificate

For inspection of work delivered under standards agreements

A) IDENTIFICATION

Standards Agreement No. 98-FRBC-13 Activity ROAD DEACTIVATION

District BULKLEY/CASSIAR Licencee WEST FRASER MILLS (PIR)

MYA or AA No. _____ Date SEPT. 16/98

B) UNITS INCLUDED IN QUALITY CERTIFICATION: E98-078, E98-083, E98-517, EM7-510, E98D3.

C) UNIT INSPECTED: E98-078, E98-083, E98-517, PART OF EM7-510 (PHASE II)

1. Quality reported by Licensee Inspector 100 %
2. Overall quality of unit 100 %
3. Normal payment percent equivalent if different than #2 above _____ %
4. Number of ~~hectares~~ Km reported as treated 28.54 ~~ha~~ Km
5. Number of ~~hectares~~ Km treated 28.54 ~~ha~~ Km
6. Assessments recommended to FRBC (write in N/A if none) $ N/A
7. Estimated cost of rework required, if any. (write in N/A if non required) $ N/A
8. Comments:

ALL WORKS ID'd COMPLETED

CERTIFICATE COMPLETED BY: _____ CLAUS RYDAHL

Ministry Representative (Signature) Ministry Representative (Printed Name)

Attachments: _____

BRITISH COLUMBIA

Ministry of Forests

Quality Certificate

For inspection of work delivered under standards agreements

A) IDENTIFICATION

Standards Agreement No. 22175-80/SBM98112 Activity ROAD DEACTIVATION

District BULKLEY/CASSIAR Licencee PACIFIC INLAND RESOURCES (A DIVISION OF WEST FRASER MILLS)

MYA or AA No. SBM98112 Date AUGUST 13/98

B) UNITS INCLUDED IN QUALITY CERTIFICATION: E98-033, EM7-531, 066-38-170, EM7-517, E98-082, CP511-08

C) UNIT INSPECTED: PHASE #1

1. Quality reported by Licensee Inspector 99 %
2. Overall quality of unit 99 %
3. Normal payment percent equivalent if different than #2 above ~ %
4. Number of ~~hectares~~ Km reported as treated 26.801 ~~ha~~ Km
5. Number of ~~hectares~~ Km treated 26.801 ~~ha~~ Km
6. Assessments recommended to FRBC (write in N/A if none) $ N/A
7. Estimated cost of rework required, if any. (write in N/A if non required) $ N/A
8. Comments:
   - SOME SEEDING STILL REQUIRED - ± 15Km HAVE BEEN SEEDED TO DATE
   - PRODUCTION RATE @ ± 2.5 Km/DAY (AVERAGE)
   - GOOD JOB TO DATE!

CERTIFICATE COMPLETED BY: CRyggaard
Ministry Representative (Signature)

CLAUS RYGAARD
Ministry Representative (Printed Name)

Attachments: COPY OF EXHIBIT A MAP FOR PHASE #1

BRITISH COLUMBIA

Ministry of Forests

Quality Certificate

For inspection of work delivered under standards agreements

A) IDENTIFICATION 22175-80/

Standards Agreement No. SBM 98112

District Bulkley / Cassiar

MYA or Annual Agreement MYA SBM 98112

Activity Road Deactivation

Licensee PIR

Date Nov 9/98

B) UNITS INCLUDED IN QUALITY CERTIFICATION: Goathorn, Howsen Creek & Pine Creek

C) UNIT INSPECTED: _____ (Fill in a separate sheet for each unit field checked)

1.	Quality reported by Licensee Inspector	100 %
2.	Overall quality of unit	100 %
3.	Payment percent	100 %
4.	Number of hectares reported by Licensee Inspector as treated	26.068 ha/km
5.	Number of hectares treated	26.068 ha/km
6.	Assessments recommended to FRBC (write in N/A if none) (Itemize in the comment section or attach an additional sheet)	$ /
7.	Estimated cost of rework required, if any. (write in N/A if non required) (Itemize in the comment section or attach an additional sheet)	$ /

8. Comments:

CERTIFICATE COMPLETED BY: _____ Claus Rogers

Ministry Representative (Signature) Ministry Representative (Printed Name)

Attachments: _____

BRITISH COLUMBIA

Ministry of Forests

Quality Certificate

For inspection of work delivered under standards agreements

A) IDENTIFICATION 22175-80/

Standards Agreement No. SBM 98112

District Bulkley/Cassiar

MYA or Annual Agreement MYA SBM 98112

Activity Road Deactivation

Licensee PIR

Date Nov 9/98

B) UNITS INCLUDED IN QUALITY CERTIFICATION: Coffin Lake Area (Phase III)

C) UNIT INSPECTED: _____ (Fill in a separate sheet for each unit field checked)

1. Quality reported by Licensee Inspector 100 %
2. Overall quality of unit 100 %
3. Payment percent 100 %
4. Number of hectares reported by Licensee Inspector as treated 16.255 ~~ha~~ km
5. Number of hectares treated 16.255 ~~ha~~ km
6. Assessments recommended to FRBC (write in N/A if none) $ /
   (Itemize in the comment section or attach an additional sheet)
7. Estimated cost of rework required, if any. (write in N/A if non required) $ /
   (Itemize in the comment section or attach an additional sheet)
8. Comments:

CERTIFICATE COMPLETED BY: Ohjgaard
Ministry Representative (Signature)

Claus Rasses
Ministry Representative (Printed Name)

Attachments: _____

APPENDIX B - Telkwa River Watershed
Road Deactivation Map
1:50 000


WEST FRASER MILLS LTD
PACIFIC INLAND RESOURCES
1998- 2003 TELKWA FOREST DEVELOPMENT PLAN
BULKLEY NAD83
FEBRUARY 25, 1999
1999 PROPOSED AMENDMENT
WEST FRASER MILLS LTD.
PACIFIC INLAND RESOURCES
MAP TITLE
WATERSHED RESTORATION PROGRAM
1998 ROAD DEACTIVATION
TELKWA WATERSHED
Project Funded By: FOREST RENEWAL B.C.
DATE
SCALE
DRAWN BY
LEGEND
-P- ATV- P- ATV- P- ATV-
-SP-4WD- SP-4WD- SP-4WD-
-P- NA- P- NA- P- NA-
-P- 4WD- P- 4WD- P- 4WD-