

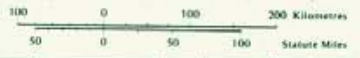
K-Shell Ewin Pass 81(1)A

398

ENVIRONMENTAL



EWIN PASS
PROPERTY





Crows Nest Resources GEOLOGICAL BRANCH

Eau Claire Place, 525 - 3rd Avenue S.W., Calgary, Alberta (403) 232-4855
P.O. Box 2699, Station M, Calgary, Alberta T2P 2M7 Telex 03-822505

LIMITED ASSESSMENT REPORT

March 1, 1982

00 398

Ministry of Energy, Mines and Petroleum Resources
British Columbia

Dear Sirs:

Enclosed please find our report covering work done on the Ewin Pass Project during 1981.

Patrick C. Gilmar and Catharine Pasmeko planned the 1981 geological field program on Ewin Pass B.C. Coal Licences held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited. Pat Gilmar did the field work and Cathy Pasmeko compiled and wrote the report.

Pat Gilmar, B.Sc., graduated in Geology from the University of Calgary in 1978. Prior to his graduation Mr. Gilmar worked as a field assistant for a number of major mining companies in British Columbia and Alberta. Pat Gilmar has been employed with the company as a geologist since 1978.

Cathy Pasmeko, B.Sc., graduated in Geology from McGill University in 1970. Her experience in western Canadian coal dates from 1977 when she worked as a geologist for a major mining company in Calgary. She has been employed by the company as a geologist since 1978 and as a senior geologist since 1981.

Their work was carried out under the supervision of our District Manager, British Columbia, Mr. Frank Martonhegyi.

In my opinion, all of these personnel are fully qualified, by training and experience to prepare this report and this account of work done under their direct supervision.

Yours very truly,

H. G. Rushton, P. Geol.
Vice-President, Exploration

5/CVq.0

**OPEN FILE
CONFIDENTIAL**

EWIN PASS

COAL PROPERTY

Report on Coal Licenses 283, 286 - 289, 1300, Group 330
Kootenay Land District, British Columbia
on Work Done June - September, 1981

Held By: SHELL CANADA RESOURCES LIMITED

Operated By: CROWS NEST RESOURCES LIMITED

N. Lat. $49^{\circ} 58'$ to $50^{\circ} 01'$, W. Long. $114^{\circ} 42'$ to $114^{\circ} 44''$
N.T.S. 82G/15 and 82J/2

February, 1982

Authors:

Patrick C. Gilmar

Geologist

Catharine Pasemko

Senior Geologist

Crows Nest Resources Limited

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- C. Birtley's washing results of 1980 bulk samples
- D. Canmet's carbonization results of 1980 bulk samples
- E. Birtley's washing results of Adit 4, Seam 5

} refer to Confidential
coal analysis file

1.0 SUMMARY

The Ewin Pass Project is part of Group number 330 and includes British Columbia Coal Licences 283, 286 - 289 and 1300 covering approximately 1167 hectares of Crown coal land (see Enclosures 1 and 2, p.3 and 4). The property is held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited, a wholly owned subsidiary of the former. Licences were transferred to Shell Canada Resources in 1979 upon its acquisition of the previous Licencee, the Crows Nest Pass Oil and Gas Company Limited in 1978.

Prior to 1981 exploration on the Ewin Pass Property had consisted of nine rotary drill holes (2133 metres), six diamond drill holes (1370 metres), three adits (171 metres), extensive trenching and detailed geological mapping.

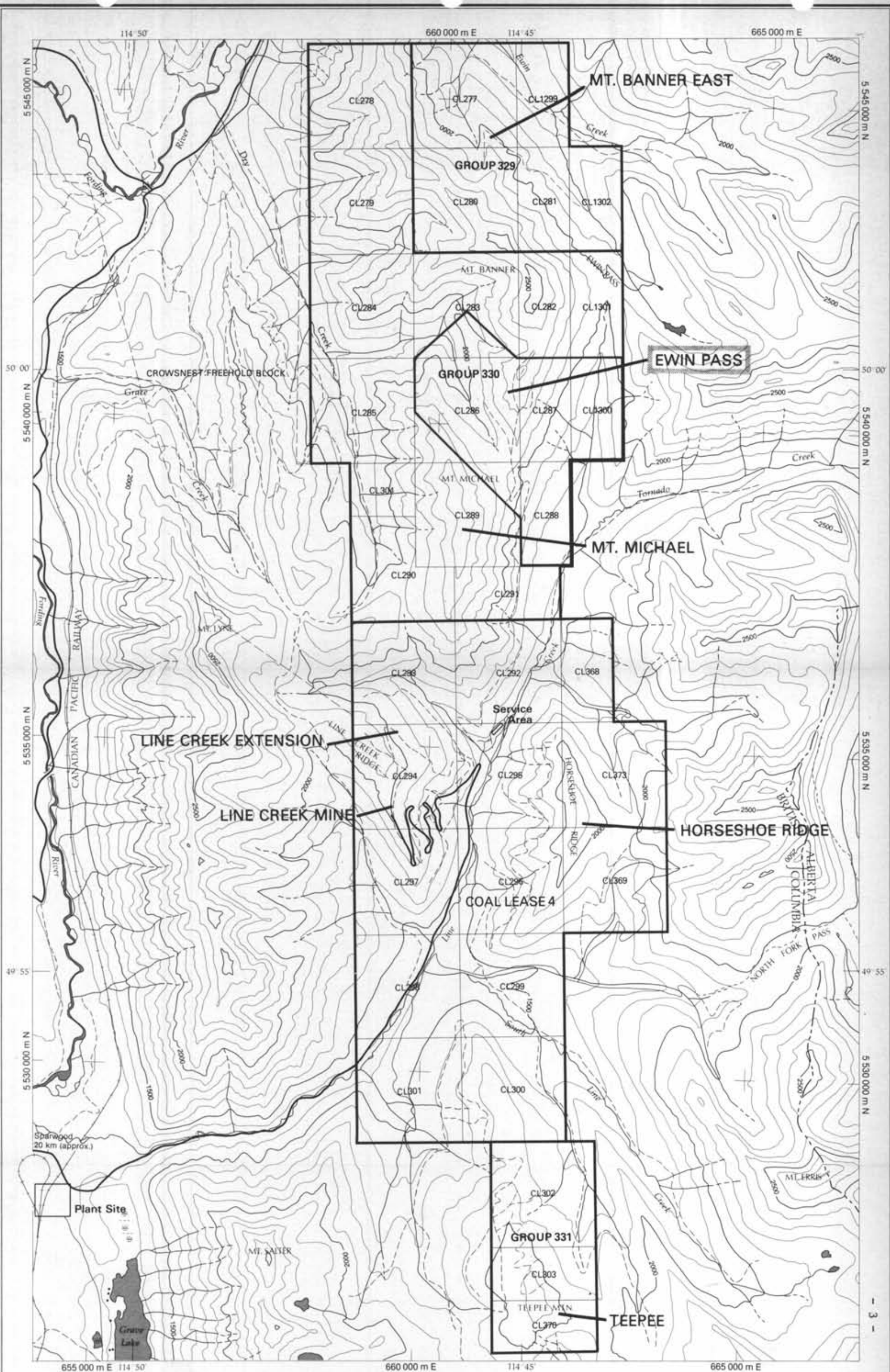
From June to September, 1981, an exploration program was conducted on the Ewin Pass Property that consisted of:

1. Drilling five reverse circulation rotary holes,
2. Driving and bulk sampling one adit,
3. Constructing two spur roads,
4. Location surveys,
5. Extensive reclamation work.

This report is a documentation of the exploration carried out in 1981. Reinterpretation of the geology of Ewin Pass in light of the results of the 1981 exploration program will commence in April, 1982. The Ewin Pass Project is presently in a preliminary prefeasibility (order of magnitude) stage of study.

The Mist Mountain Formation of the Kootenay Group on Ewin Pass Ridge has for some time been thought to contain excellent quality coking coal. Results of 1979 and 1980 bulk sampling confirmed the good quality and excellent coking characteristics for two of the three thickest seams. They average 6.9% ash, 27.3% volatile matter, 65.4% fixed carbon and 8.5 F.S.I. In 1981 a 4.5 tonne bulk sample taken from the fourth thickest seam on the ridge established its excellent quality as well.

Structurally Ewin Pass Ridge is a dip-slope comparable to Line Creek Ridge with an average westward dip of 35° - 40°. The property holds good potential for open pit mining and total geological in place reserves for the property are estimated to be 103 million tonnes.



LINE CREEK EXTENSION

LINE CREEK MINE

COAL LEASE 4

HORSESHOE RIDGE

MT. MICHAEL

MT. BANNER EAST

EWIN PASS

GROUP 331

TEEPREE

CROWSNEST/FREEHOLD BLOCK

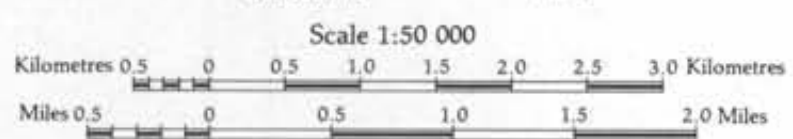
GROUP 329

GROUP 330

Plant Site

Service Area

Reference map produced by the Survey and Mapping Branch, Department of Energy, Mines and Resources in 1973 and updated from 1979 Province of British Columbia 1:100,000 mapping. Metro contours were manually interpolated.



Contour Interval 100m
Transverse Mercator Projection
Universal Transverse Mercator Grid Zone II

Legend

Road: Highway, Main road	
Road: Loose surface, Dry weather	
Track or trail	
Railway	
River	
Stream	
Contours	
Licence boundary	
Licence group boundary	



Crows Nest Resources Limited
EXPLORATION

EWIN PASS
S.E. BRITISH COLUMBIA
INDEX AND
COAL LICENCE MAP

N.T.S. 82G/15 & 82J/2

AUTHOR: C. BASEMCO	SCALE: 1:50,000	ENCLOSURE No.:
DATE: 82-01	REVISED:	CA 276
TITLE:		

CROWS NEST RESOURCES LIMITED (Exploration)

B.C. COAL LICENCES
TENURE STANDING

BLOCK: CENTRAL BLOCK

PROJECT: YEAR: 1981

GROUP: #330

EWIN PASS
MOUNT MICHAEL

DATE: JANUARY 1982

NO.	LICENCE		ACQ/ADM		RENTALS		REQUIREMENT WORK					BUDGET		EXP	POTL	REMARKS
	LEGAL DESCRIPTION	AREA TOTAL AC/HA.	YEAR	FEES \$	ANNUAL \$	TOTAL TO NEXT ANN \$ 10 ³	EXPIRED \$ 10 ³	CURRENT YEAR LIC YEAR	CURRENT YEAR \$	PRE-FULFILMENT YEAR	ANNIVERSARY DATE	CURRENT YEAR AFE	CURRENT YEAR \$ 10 ³	TOTAL \$ 10 ³	SHELL CLASS.	
15 LIC		2889		6,594.8	14,445	85.4	224.6	7 & 8	34,605	10	565,740	JANUARY 31	-	8,063.8	Y	THE LICENCES ARE
278	LOT 6749	259	75													IN GOOD STANDING
279	LOT 6750	259	75													UNTIL JAN 31, 1990
282	W 1/2 6753	130	75													UNDER THE '74 COAL
283	LOT 6754	259	75													ACT AND UNTIL JAN
284	LOT 6755	259	75													31, 1992 UNDER THE
285	LOT 6756	259	75													'78 COAL ACT.
286	LOT 6757	259	75													
287	W 1/2 6758	130	75													
288	W 1/2 6759	130	75													
289	LOT 6760	259	75													
290	LOT 6761	211	75													
291	LOT 6762	133	75													
304	LOT 6783	82	75													
1300	E 1/2 6758	130	74													
1301	E 1/2 6753	130	74													
				WORK DONE	1978	1979	1980		1981							
				MT. MICHAEL	-	-	39,887		242,429							
				EWIN	90,653	250,921	503,514		494,214							

BA-312

Enclosure 2

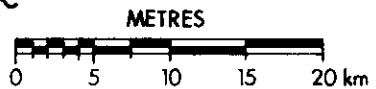
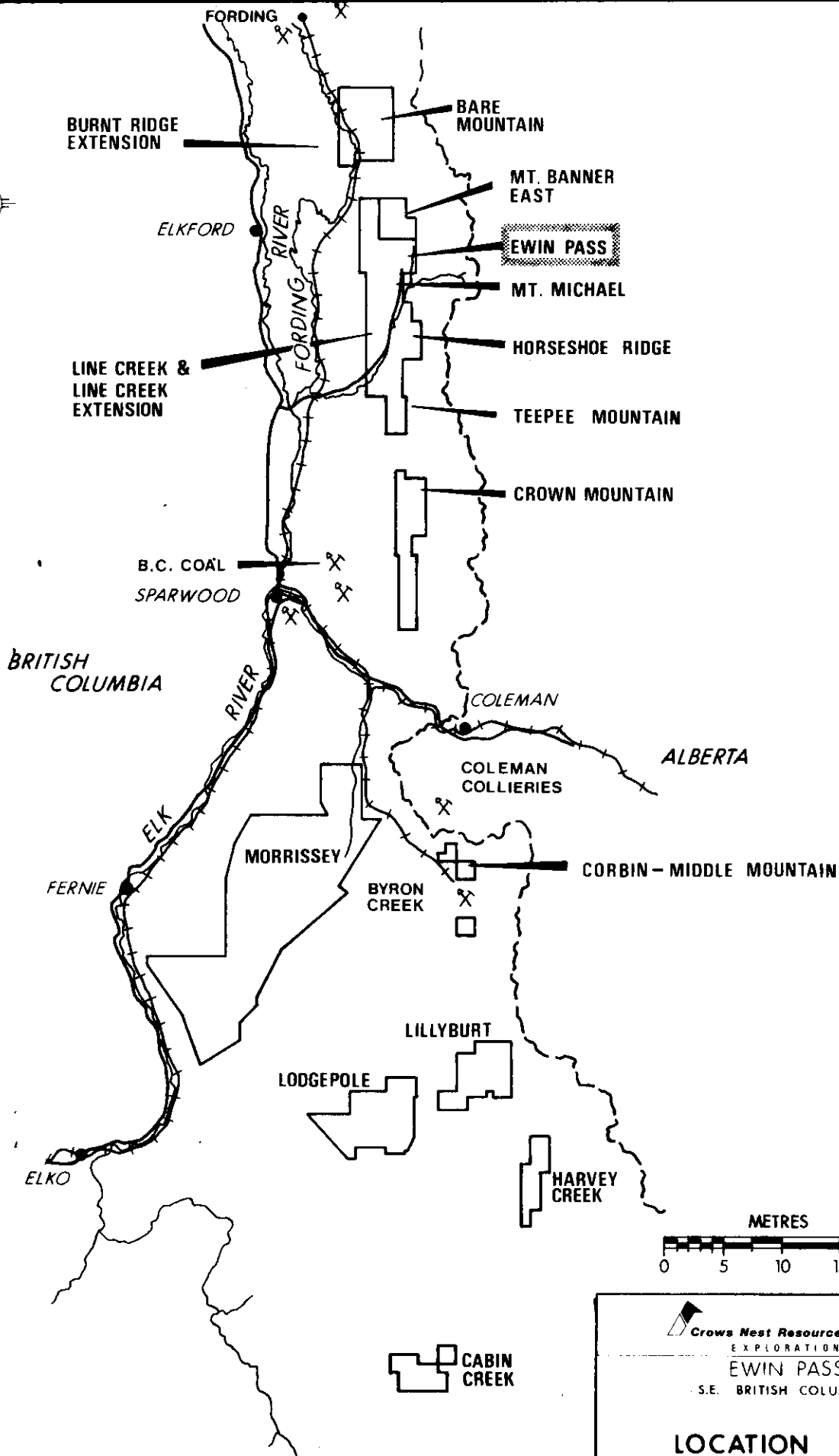
2.0 INTRODUCTION

2.1 General Introduction

The Ewin Pass property lies within the Front Ranges of the Rocky Mountains in southeastern British Columbia. It is thirty-one kilometres north of Sparwood and twenty-two kilometres east of Elkford. The property is located in the middle part of Shell - CNRL's Central Block of licences. There are three other major projects in this block: Mount Michael to the southwest, Horseshoe Ridge to the south and the Line Creek open pit mine development immediately west of Horseshoe Ridge (see Enclosure 3, p.6). The CNRL coal preparation plant is sixteen kilometres from the property.

Geographically the Ewin Pass property extends between:

114° 42' and 114° and 44' of Western Longitude and 49° 58' and 50° 01' of Northern Latitude on NTS map sheets 82 G/15 and 82 J/2.



Crows Nest Resources Limited
EXPLORATION
EWIN PASS
S.E. BRITISH COLUMBIA

LOCATION MAP

AUTHOR C. PASEMKO	SCALE AS SHOWN	ENCLOSURE No. 3
DATE JAN 1982	REVISED	DRAWING No. AA-816
To Accompany		

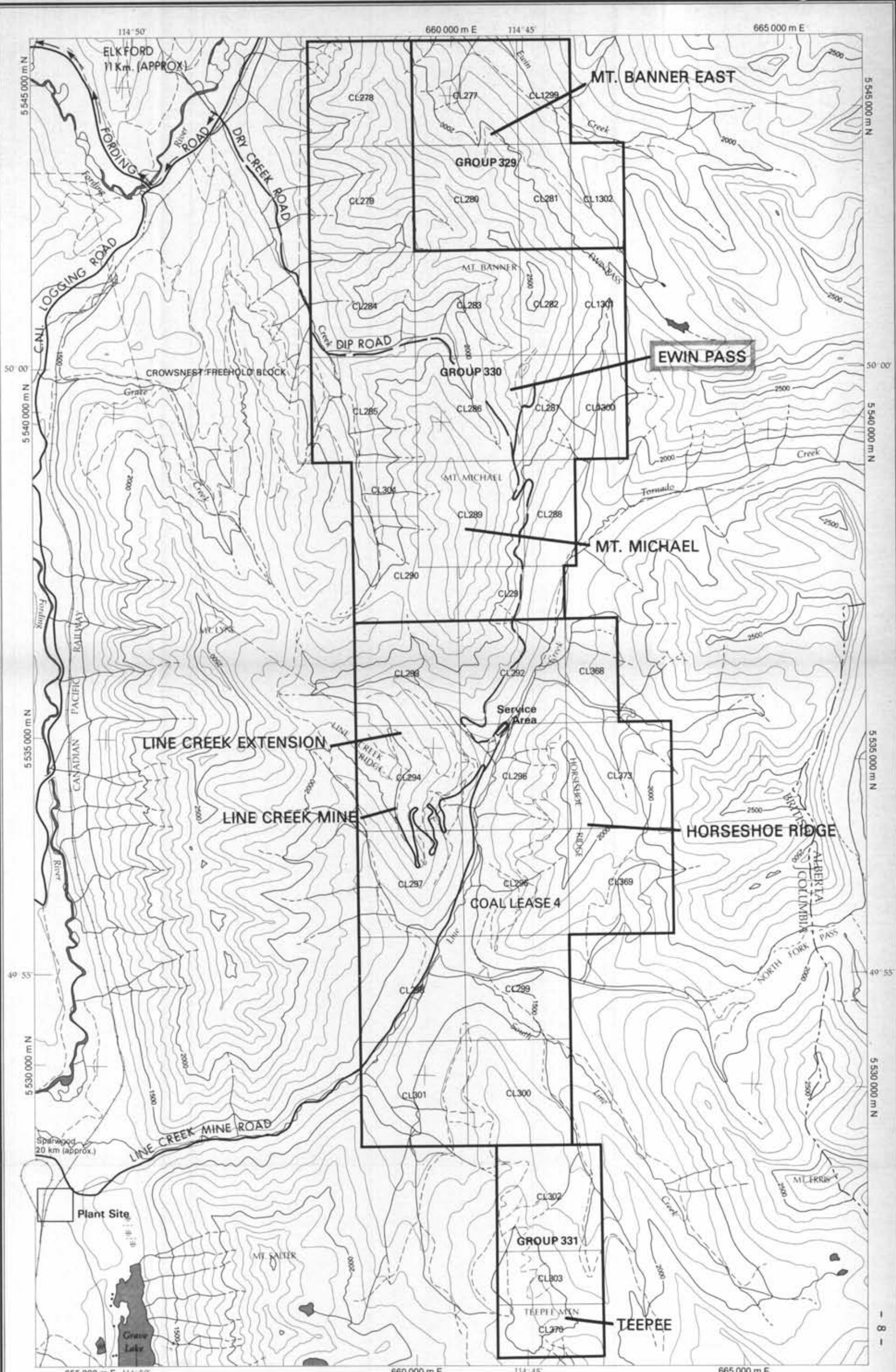
The main access to the property is from Highway 3 one kilometre east of Sparwood. From there it is 18 kilometres along the Elkford Highway, across the Elk River Bridge, 4 kilometres along the Line Creek Mine access road to the Mine Haulroad, 12 kilometres along the Haulroad to the Mine Service Area and 4 kilometres along the four wheel drive road that goes up the east side of the Mount Michael. In addition, there is access to the north part of the property via Dry Creek Road and Dip Road (see Enclosure 4, p.8).

Within the property is a network of old exploration roads throughout the area which is underlain by coal measures of the Kootenay Group.

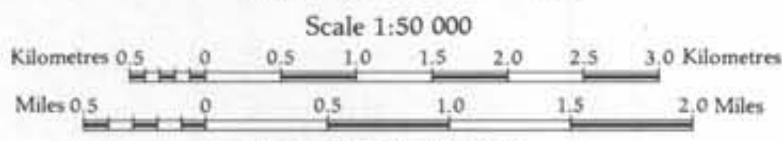
2.2 Summary of Work Done

2.2.1 Pre-1981 Exploration

Between 1968 and 1970 Crows Nest Industries Limited mapped the Ewin Pass property at a scale of 1:12,000 and drilled nine reverse-circulation rotary holes (EP 74 - EP 77, EP 79 - EP 81, EP 83 and EP 84). All holes were drilled on coal licences 286 and 289 (see Enclosure 5 for locations of the drill holes). They were all geophysically logged. In total 2132.6 metres were drilled.



Reference map produced by the Survey and Mapping Branch, Department of Energy, Mines and Resources in 1973 and updated from 1979 Province of British Columbia 1:100,000 mapping. Metric contours were manually interpolated.



Contour Interval 100m
 Transverse Mercator Projection
 Universal Transverse Mercator Grid Zone II

Legend

- Road; Highway, Main road
- Road; Loose surface, Dry weather
- Track or trail
- Railway
- River
- Stream
- Contours
- Licence boundary
- Licence group boundary
- Access road (four wheel drive)



HARVEY ASSOCIATES (1978) LTD.

Crows Nest Resources Limited
 EXPLORATION

EWIN PASS
 S.E. BRITISH COLUMBIA
ACCESS MAP

NTS. 82G/15 & 82J/2

AUTHOR: JASEMKO	SCALE: 1:50000	ENCLOSURE NO. 4
DATE: 82-01	REVISED:	CA 275
To Accompany		

In October, 1970 John T. Boyd Company of Pittsburg, Pennsylvania summarized the Ewin Pass exploration and presented a proposed pit area and reserve calculations for the property.

In 1978 the property was mapped by Shell Canada Resources Limited on scales of 1:24,000 and 1:12,000. Some coal seams were trenched and described. In addition, air photographs of the area were obtained from North West Survey Corp. (Yukon) Ltd. Topographic maps at the scale of 1:5000 and 1:2000 were constructed from these photographs.

In 1979 the proposed pit area of the 1970 Boyd exploration program was mapped in detail at a scale of 1:2000, three adits were driven; 150 metres of trenching was done; and some reclamation work was carried out.

In 1980 the area north of the 1970 proposed pit was mapped in detail at a scale of 1:2000; six holes totalling 1369.2 metres, were diamond drilled and geophysically logged; 5505 metres of road were backhoe trenched and 405 metres were hand trenched off roads; ten tonne bulk samples were taken from two of the three thickest seams for quality and carbonization testing; extensive reclamation work was carried out.

2.2.2 1981 Exploration Program Objective and Work Summary

Objectives of the 1981 Exploration Program were:

1. To gain as much structural and stratigraphic information as possible from reverse circulation rotary drill holes on licences 282, 286 and 287.
2. To bulk sample the fourth thickest coal seam on the property on coal licence 286 for quality and carbonization testing.
3. To do further reclamation on all coal licences on the property.

2.2.2.1 Drilling and Downhole Geophysical Logging

In 1970, nine rotary holes (EP 74 - EP 77, EP 79 - EP 81, EP 83 and EP 84 totalling 2133 metres) were drilled and geophysically logged on Ewin Pass. In 1980 six holes (80 EP DH 101 - 80 EP DH 106 totalling 1370 metres) were diamond drilled and geophysically logged. The location of these holes are shown on Enclosure 5.

In 1981, five reverse-circulation rotary holes totalling 1644 metres were drilled on Ewin Pass and are plotted on Enclosure 5 (EPR 201 - EPR 205). Four of the holes were drilled on existing roads. Hole EPR 202 was drilled on a 250 metre spur road constructed in 1981. An additional 230 metre spur road was constructed for a drill site in 1981 (see Enclosure 5) but due to monetary constraints this hole could not be drilled in 1981. All holes were drilled by SDS (Specialized Drilling Services). Chip samples were taken and described for all holes. Coal chip samples were sent to the CNRL lab in Fernie for quality testing. Four of the holes were geophysically logged by Davies Logging Co. EPR 202 could not be geophysically logged due to caving of the hole.

Enclosure 6, p.12-16 is a summary of drill hole data. Copies of the geophysical logs are in Enclosure 7. Lithologies of the holes are plotted as stratigraphic sections on the Caliper - Natural Gamma - Resistivity - Density logs for EPR 201, EPR 204 and EPR 205, on the Long Spaced Density log for EPR 203 and as a separate strip log for EPR 202. See Enclosure 8 for the drill hole stratigraphic sections.

EPR - 201

DATE: JULY 23, 1981
LOCATION; EWIN PASS C.L. 286
RIG TYPE; REVERSE CIRCULATION ROTARY TH 60
ELEVATION (m): 2111.9
NORTHING: 5,540,186.15
EASTING: 660,754.46
TOTAL DEPTH (m): 345
LOGS RUN: CAL., NAT. GAMMA, RES., DEN., NEUT., DETAILED DEN., LSD.
DEPTH LOGGED (m): 345
LOGGER: DAVIES EXPLORATION LOGGING LTD.
COMMENTS: DRIFT 2.5° BEARING S. 1° W @ 50 m
DRIFT 4.5° BEARING S. 20° W @ 100 m
DRIFT 14° BEARING S. 54° W @ 150 m
DRIFT 19° BEARING S. 59° W @ 200 m
DRIFT 26° BEARING S. 61° W @ 250 m
DRIFT 33.5° BEARING S. 63° W @ 300 m
DRIFT 36° BEARING S. 81° W @ 340 m

COAL INTERSECTIONS

<u>THICKNESS (m)</u>	<u>DEPTH (m)</u>
0.6	10.6 - 11.2
3.3	45.0 - 48.3
0.5	61.2 - 61.7
2.0	104.7 - 106.7
2.0	121.0 - 123.0
0.5	129.2 - 129.7
1.5	139.5 - 141.0
0.7	153.0 - 153.7
8.7	196.3 - 205.0
1.3	208.7 - 210.0
0.8	211.4 - 212.2
7.9	262.8 - 270.7
4.5	276.1 - 280.6
2.9	303.5 - 306.4

EPR - 202

ENCLOSURE 6

DATE: JULY 27/81
LOCATION: EWIN PASS C.L. 286
RIG TYPE: REVERSE CIRCULATION ROTARY TH 60
ELEVATION (m): 2090.9
NORTHING: 5,540,396.03
EASTING: 660,674.37
TOTAL DEPTH (m): 179
LOGS RUN: NONE
DEPTH LOGGED (m): --
LOGGER: --
COMMENTS: HOLE CAVED
CHIP SAMPLES ONLY

COAL INTERSECTIONS

<u>THICKNESS (m)</u>	<u>DEPTH (m)</u>
1.5	71.0 - 72.5
1.0	77.0 - 78.0
0.5	104.5 - 105.0
2.0	110.0 - 112.0
1.0	133.0 - 134.0
1.0	150.0 - 151.0

5/CVg.17

DATE: AUGUST 5, 1981
LOCATION: EWIN PASS C.L. 286
RIG TYPE: REVERSE CIRCULATION ROTARY TH 60
ELEVATION (m): 2935.5
NORTHING: 5,540,834.54
EASTING: 661,092.69
TOTAL DEPTH (m): 377
LOGS RUN: NAT. GAMMA, NEUT., LSD.
DEPTH LOGGED (m): 376
LOGGER: DAVIES EXPLORATION LOGGING LTD.
COMMENTS: DRIFT 0° BEARING 0 @ 50 m
DRIFT 6° BEARING 57° E. @ 100 m
DRIFT 6.25° BEARING 58° E. @ 140 m

COAL INTERSECTIONS

<u>THICKNESS (m)</u>	<u>DEPTH (m)</u>
1.5	47.5 - 49.0
0.7	54.0 - 54.7
2.0	59.0 - 61.0
0.6	92.0 - 92.6
0.8	96.8 - 97.6
0.9	109.1 - 110.0
0.6	124.4 - 125.0
0.6	128.5 - 129.1
1.2	135.1 - 136.3
0.6	139.6 - 140.2
2.0	179.8 - 181.8
0.6	183.8 - 184.4
13.0	190.6 - 203.6
0.9	206.7 - 207.6
3.4	235.6 - 239.0
2.3	248.0 - 250.3
21.7	346.0 - 367.7

DATE: AUGUST 11, 1981
 LOCATION: EWIN PASS C.L. 282
 RIG TYPE: REVERSE CIRCULATION ROTARY TH 60
 ELEVATION (m): 2346.7
 NORTHING: 5,541,072.10
 EASTING: 661,264.81
 TOTAL DEPTH (m): 348
 LOGS RUN: CAL., NAT. GAMMA, RES., DEN., NEUT., DETAILED DEN.
 DEPTH LOGGED (m): 346
 LOGGER: DAVIES EXPLORATION LOGGING LTD.
 COMMENTS: DRIFT 5.5° BEARING N. 47° E @ 50 m
 DRIFT 8.0° BEARING N. 40° E @ 100 m
 DRIFT 10.0° BEARING N. 60° E @ 150 m
 DRIFT 10.25° BEARING N. 90° E @ 200 m
 DRIFT 11.0° BEARING S. 79° E @ 250 m
 DRIFT 11.5° BEARING S. 70° E @ 300 m
 DRIFT 11.5° BEARING S. 57° E @ 345 m

COAL INTERSECTIONS

<u>THICKNESS (m)</u>	<u>DEPTH (m)</u>
2.7	4.0 - 6.7
11.7	18.4 - 30.1
1.1	31.5 - 32.6
4.5	66.3 - 70.8
1.9	77.2 - 79.1
2.1	88.4 - 90.5
1.2	105.4 - 106.6
11.0	160.4 - 171.4
4.8	240.2 - 245.0
8.3	272.8 - 281.1
4.7	302.3 - 307.0

DATE: AUGUST 17, 1981
LOCATION: EWIN PASS C.L. 287
RIG TYPE: REVERSE CIRCULATION ROTARY TH 60
ELEVATION (m): 2428.8
NORTHING: 5,540,868.72
EASTING: 661,294.27
TOTAL DEPTH (m): 395
LOGS RUN: CAL., NAT. GAMMA, RES., DEN., NEUT., DETAILED DEN.
DEPTH LOGGED (m): 395
LOGGER: DAVIES EXPLORATION LOGGING LTD.
COMMENTS: DRIFT 0.25° BEARING N. 33° W @ 50 m
DRIFT 2.° BEARING N. 4° E @ 100 m
DRIFT 4.5° BEARING N. 36° E @ 150 m
DRIFT 4.5° BEARING N. 33° E @ 200 m
DRIFT 4° BEARING N. 49° E @ 250 m
DRIFT 3° BEARING S. 48° E @ 300 m
DRIFT 5° BEARING S. 10° E @ 350 m
DRIFT 6° BEARING S. 12° W @ 390 m

COAL INTERSECTIONS

<u>THICKNESS (m)</u>	<u>DEPTH (m)</u>
0.8	15.8 - 16.6
1.7	18.8 - 20.5
2.3	41.8 - 43.4
28.6	49.8 - 78.4
10.8	110.0 - 120.8
2.4	136.6 - 139.0
1.5	149.6 - 151.1
1.8	153.7 - 155.5
1.4	157.6 - 159.0
13.1	277.3 - 240.4
5.1	325.2 - 330.3
10.2	349.6 - 359.8
4.8	381.8 - 386.6

2.2.2.2 Adit

Adit 4 was driven 73.9 metres into the fourth thickest seam (Seam 5) on Ewin Pass and a 4.5 tonne bulk sample was taken. Target Tunnelling was contracted to do the drivage and take the bulk sample. Channel samples were taken at 3 metre intervals during drivage and were sent to the Crows Nest Resources Lab in Fernie for F.S.I. testing. The F.S.I.'s were performed on an air dried basis and the coal was not washed. The bulk sample was taken at the face when F.S.I. values had been consistently high over a 9 metre interval. The sample was placed in 45 gallon drums and sent first to Birtley Coal and Minerals Testing in Calgary for washing and subsequently to Canmet, Department of Energy, Mines and Resources in Ottawa for carbonization and other tests.

Enclosure 5 shows the location of Adit 4.

Enclosure 9 is a plan view, profile and description of the adit and coal seam, and shows the ash and F.S.I. values for the channel samples.

2.2.2.3 Location Surveys

Location survey of drill holes and spur roads was carried out by Sheltech Canada.

Conventional surveying methods were used to determine locations, elevations and UTM coordinates of 1981 drill locations and of the new spur roads. In all, eleven points were surveyed. Appendix A shows a plot of these points and contains a report on location surveys.

2.2.2.4 Reclamation

The Ewin Pass reclamation program was carried out in July, August and September, 1981. A detailed report on Ewin Pass reclamation is included in Crows Nest Resources Limited Annual Reclamation Report for Coal Exploration to December 31, 1981 - B.C. Reclamation Permit #54. This report was sent to J.D. McDonald, P. Eng., Senior Reclamation Inspector, in Victoria, B.C., in February, 1982. The Ewin Pass segment of the report is in Appendix B.

2.3 List of Licences on Which Work was Performed

The following list shows what work was carried out on which particular coal licence:

<u>Type of Work</u>	<u>Coal Licence Number</u>
Drilling	282, 286, 287
Adit	286
Road Construction	286
Surveying	282, 286, 287
Reclamation	282, 283, 286, 287, 288, 289

5/CVg.23

3.0 GEOLOGY

3.1 General Statement

Bedrock on the Ewin Pass property ranges from Jurassic Fernie Formation to the Lower Cretaceous-Jurassic Kootenay Group. Nomenclature used in this report follows Gibson, 1979. See Enclosure 10, p.21 for the Table of Formations and their descriptions and Enclosure 11, p.22 for a Typical Stratigraphic Section from Ewin Pass Ridge.

3.2 Stratigraphy

3.2.1 Fernie Formation

The Fernie is the oldest formation within the property. It makes up the bottom one half to two-thirds of the east side of Ewin Pass Ridge. It is a marine sequence of rocks dominated by dark-grey to black shales. In approximately 100 metres of the top, there is a transition to the "Passage Beds": a sequence of siltstones, shales and fine-grained sandstones interpreted to be a prograding beach complex.

TABLE OF FORMATIONS

ALBERTA Norris 1959	BRITISH COLUMBIA Newmarch 1953	ALBERTA BRITISH COLUMBIA Gibson 1979 - This Report	ALBERTA BRITISH COLUMBIA Jansa 1972	CENTRAL FOOTHILLS ALBERTA Stott 1975
CADOMIN FM	CADOMIN FM	CADOMIN FM	CADOMIN FM	CADOMIN FM
		Pocaterra Creek Mbr		
	ELK FORMATION	ELK FORMATION	Elk Member	
		GROUP	FORMATION	
Mutz Member		MIST MOUNTAIN FORMATION 300 m	Coal Bearing Member	NIKANASSIN FORMATION
Hillcrest Member	KOOTENAY FORMATION	KOOTENAY		
Adanac Member				
Moose Mountain Mbr	Basal Kootenay Sand	MORRISSEY FORMATION ⁶⁵	Moose Mountain Mbr	
		Moose Mountain Member		
		Weary Ridge Member		
FERNIE FM	FERNIE FM	FERNIE FM	FERNIE FM	FERNIE FM

STRATIGRAPHIC SECTION

DESIGNATION:

PART _____ OF _____

PROJECT:

AUTHOR:

DATE: 19

AREA: **EWIN PASS**

SOURCE OF DATA:

LOCATION: **TYPICAL STRATIGRAPHIC SECTION**

SCALE	CONTROL POINT	INTERVAL	LITHOLOGY	STRIKE & DIP	DESCRIPTION		SAMPLE		
					MAIN	AMPLIFIED			
					SEAM NO.	GROSS COAL SECTION	NET COAL		
350		MIST MOUNTAIN FORMATION						<i>Interbedded Sandstone, Siltstone, & Shale</i>	
									<i>Sandstone</i>
									<i>Interbedded Siltstone & Shale</i>
						4	7.8	7.8	<i>Coal</i>
									<i>Interbedded Sandstone, Siltstone, & Shale</i>
300						5	2.2	2.0	<i>Coal</i>
									<i>Interbedded Sandstone, Siltstone, & Shale</i>
						6	0.8	0.5	<i>Coal</i>
									<i>Interbedded Sandstone & Siltstone</i>
250									<i>Sandstone</i>
								<i>Interbedded Sandstone & Siltstone</i>	
								<i>Sandstone, Conglomerate</i>	
200								<i>Siltstone</i>	
					8	13.5	13.5	<i>Coal</i>	
								<i>Interbedded Sandstone, Siltstone, & Shale</i>	
150								<i>Interbedded Siltstone & Shale</i>	
								<i>Interbedded Siltstone & Shale</i>	
								<i>Sandstone</i>	
100								<i>Siltstone</i>	
					9	8.3	8.0	<i>Coal</i>	
					10B	1.7	1.0	<i>Interbedded Siltstone & Shale</i> <i>Coal</i>	
					10A	1.7	1.0	<i>Coal</i> <i>Interbedded Siltstone & Shale</i>	
50		MORRISSEY FORMATION						<i>Sandstone</i>	
		WEARY RIDGE MEMBER							
		MOOSE MTN MEMBER							
0								<i>Interbedded Siltstone, Sandstone, & Shale</i>	
		PASSAGE BEDS							
50		FERNIE FORMATION						<i>Shale</i>	
		FERNIE SHALE							
100									

3.2.2 Kootenay Group

In southeastern British Columbia and southwestern Alberta the Kootenay Group is part of an eastward thinning wedge of Jura-Cretaceous rocks. The Formation is divided into three rock-stratigraphic units: the Morrissey Formation, the Mist Mountain Formation and the Elk Formation.

3.2.2.1 Morrissey Formation

A massive, cliff-forming sandstone marks the conformable transition from Fernie into the Kootenay Group. This unit is a distinctive marker horizon in southeastern British Columbia and southwestern Alberta. The Morrissey Formation can be divided into two distinct units; a lower slightly argillaceous, less well indurated, thicker bedded unit called the Weary Ridge Member and an upper more siliceous, better indurated, thinner bedded unit called the Moose Mountain Member. These Members have been interpreted as a foreshore beach deposit and a backshore beach deposit respectively.

At Ewin Pass, the Morrissey Formation can be distinctly seen approximately half way up the east side of the ridge at the south end angling its way up the ridge northerly. The Formation is 65 metres thick and is conformably overlain by the Mist Mountain Formation.

3.2.2.2 Mist Mountain Formation

The Mist Mountain Formation is the economically important lithofacies of the Kootenay Group. It is characterized by interbedded dark grey, carbonaceous and argillaceous siltstone, silty shale, mudstone, fine-grained sandstone, minor conglomerate and thin to thick seams of coal. Detailed descriptions of the coal seams present on Ewin Pass Ridge are given in Section 3.4 on Coal Geology. The Mist Mountain Formation has been interpreted as representing either a deltaic or an interdeltic coastal plain marsh development.

The Mist Mountain Formation makes up the top one half to one-third of the east side of Ewin Pass Ridge and most of the west side.

3.2.2.3 Elk Formation

Conformably overlying the Mist Mountain Formation in the Fernie-Sparwood area is the Elk Formation. Thick, cliff-forming sequences of sandstone, coarsening upwards to conglomerate are interbedded with siltstone, mudstone, shale and sporadic, thin seams of coal. This Formation has been interpreted as forming in an alluvial plain environment.

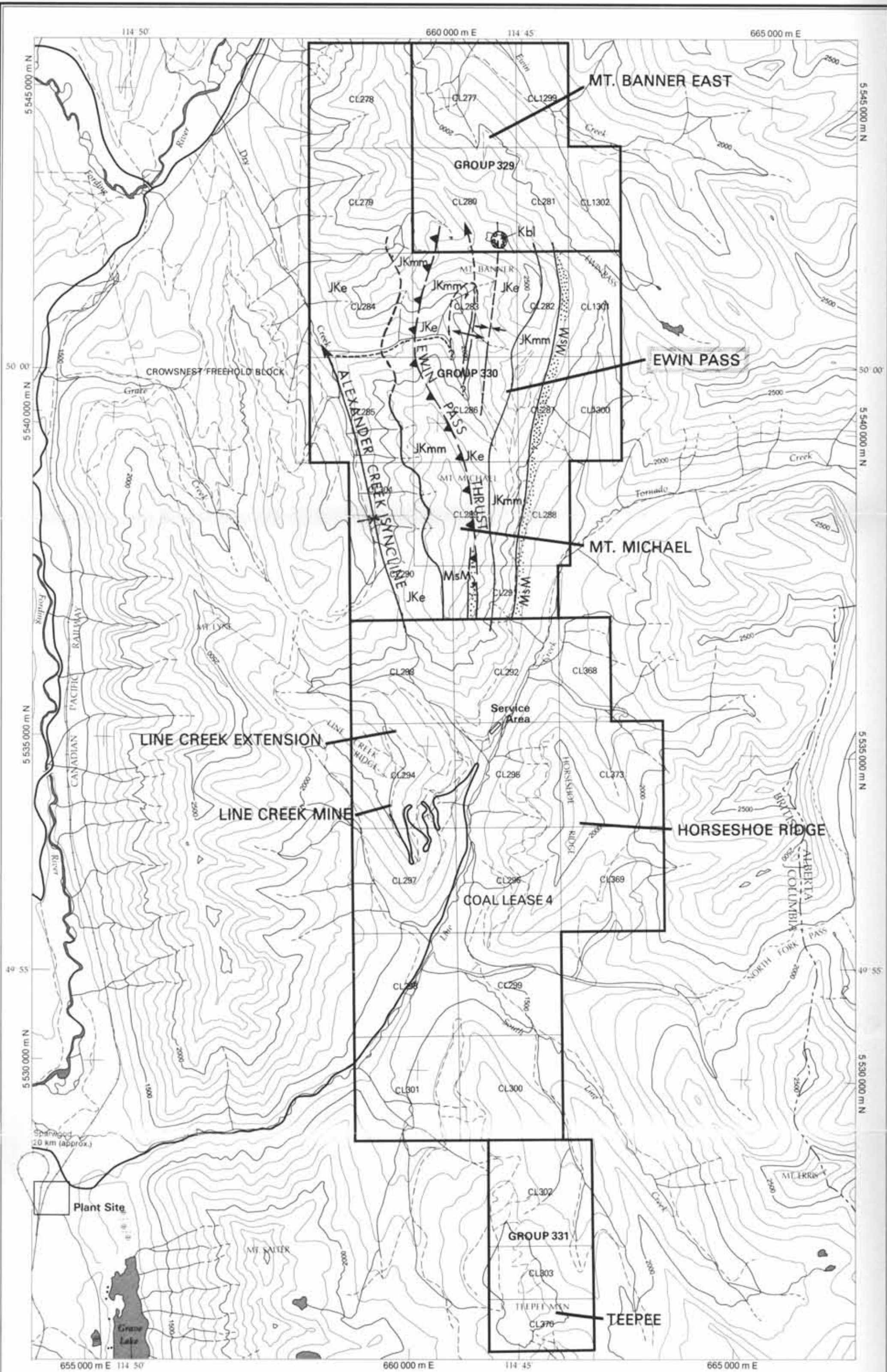
The Elk Formation is present towards the bottom of the west side of Ewin Pass Ridge. In the centre part of the property the Elk is in the valley and does not outcrop. However, in the southwest part of the property, the basal Elk can be distinguished as a persistent sandstone unit on air photographs.

3.3 Structure

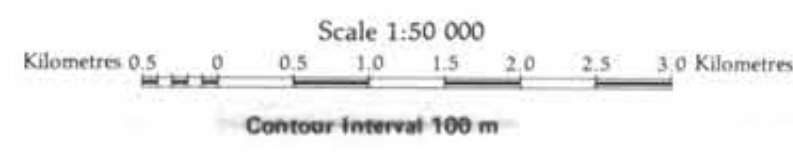
The Kootenay Group in southeastern British Columbia is located in the Front Ranges of the Rocky Mountains within three separate elongate areas, collectively called the Crowsnest Coalfields. The Ewin Pass property is located in the Elk Valley Coalfield which is the most northerly of the Kootenay Coalfields.

The Elk Valley Coalfield is 100 kilometres long and extends in a NNW direction from Crowsnest Pass to the Alberta-British Columbia boundary near Kananaskis Lakes. The Kootenay Group is preserved in structural lows within the coalfield, namely the Alexander Creek Syncline (also called the Fording Syncline) and the down-dropped block of the Erickson Normal Fault. The Ewin Pass property is towards the southern part of the Alexander Creek Syncline on its eastern flank. The syncline is further complicated on this eastern limb by thrust faulting (Ewin Pass Thrust - also called the Fording Thrust). Enclosure 12, p.27 shows the general geological setting of the Ewin Pass property.

Bedding on Ewin Pass Ridge strikes in a general 190-200 direction. Dips on the ridge are to the west varying between 20° and 60°, averaging 37°. In places, especially in the northern part of the area, bedding is overturned to the east. The west side of the ridge approaches a dip-slope.



Reference map produced by the Survey and Mapping Branch, Department of Energy, Mines and Resources in 1975 and updated from 1979 Province of British Columbia 1:250 000 mapping. Metric contours were manually re-interpolated.



- Legend**
- Road; Highway, Main road
 - Road; Loose surface, Dry weather
 - Track or trail
 - Railway
 - River
 - Stream
 - Contours
 - Licence boundary
 - Licence group boundary



- GEOLOGICAL LEGEND**
- CRETACEOUS**
- Kbl** Blairmore Group
- JURASSIC - CRETACEOUS**
- Kootenay Group**
- JKk** Elk Formation
 - JKe** Mist Mountain Formation
 - JKmm** Morristown Formation
 - JKm** Moose Mountain Member
 - MsM** Weary Ridge Member
 - WrM**

- Geological Contact - observed, approximate
- Syncline Axis - showing direction of plunge - observed approximate
- Anticline Axis - observed, approximate
- Thrust Fault - approximate

Crows Nest Resources Limited
EXPLORATION

EWIN PASS
S.E. BRITISH COLUMBIA

GEOLOGIC COMPILATION MAP

NTS 82G/15 & 82J/2
AUTHOR: C. FASEMCKI SCALE: 1:50,000 ENCLOSURE No. 12
DATE: 82-02 REVISION: CA-277

3.4 Coal Geology

Enclosure 11, p.22 shows the coal seams present in the Mist Mountain Formation on Ewin Pass Ridge. The coal seams appear to be correlatable to the seams on Line Creek Ridge; thus, seam numbers correspond to the seam numbering system at Line Creek. Seams 4 through 10B are present on Ewin Pass Ridge with the exception of Seam 7 which is either not present or very thin and discontinuous. There are seams above Seam 4 up to the base of the Elk Member but they have not been mapped in any detail and to date appear to be very thin (less than 1.5 metres thick). The main workable seams are Seams 4, 5, possibly 6, 8 and 9.

The average thickness of Seam 4 from adit, trenching and drill hole information is 8.1 metres. From information to date this seam may be thickening towards the north part of the map area. However, this trend is masked by thrust faulting that occurs within the seam both in outcrop and at depth. Nonetheless, Seam 4 maintains its reputation of being very clean coal.

Seam 5 is 25 metres stratigraphically below Seam 4 and averages 2.5 metres thick. It too appears to be thickening toward the northern part of the map area. However, it may be structural thickening. In Adit 4 Seam 5 is 3.03 metres thick.

Seam 6 is 20 metres stratigraphically below Seam 5 and appears from drill hole information to be a consistently present seam on the property. It averages 0.8 metres thick.

Seam 8 is 85 metres stratigraphically below Seam 6. From drill hole, trench and adit data it averages 13.3 metres thick. This seam thickens in the middle portion of the map area and, like Seams 4 and 5, is affected by faulting in the northern part of the property. Like Seam 4, its quality is consistently good despite structural disturbance.

Seam 9 is 95 metres below Seam 8 and averages 8.3 metres thick. Faulting has repeated this seam twice in the southern three quarters of the map area and three times in the northern quarter. Both outcrop, drill hole and adit information show Seam 9 not to be of as good quality as Seams 4 and 8.

Seam 10B is 6 metres below Seam 9 and averages 1.6 metres thick. Seam 10A is 9 metres below Seam 10B and averages 1.6 metres thick. Both seams are highly shaly.

5/CVg.34

4.0 COAL QUALITY

In 1980, ten tonne bulk samples were taken from Adit 1, Seam 8 and Adit 2, Seam 4 and were sent to Birtley Coal and Mineral Testing in Calgary for washing and then to Canmet in Ottawa for carbonization testing. The washing at Birtley was done on Seam 8 coal and on a composite of Seam 8 and Seam 4 coal. The results are included in Appendix C. The carbonization testing was done on Seam 8 coal, on Seam 4 coal and on a composite of Seam 8 and Seam 4 coals. Canmet's results are in Appendix D.

One of the prime aims of the 1981 exploration program was to obtain a bulk sample of unoxidized coal from Seam 5, the fourth thickest seam on the ridge, for coal and coke testing. A 4.5 tonne sample was taken and sent first to Birtley Coal and Minerals Testing in Calgary and subsequently to Canmet in Ottawa for carbonization testing. The results of the Birtley washing are in Appendix E. The Canmet results have not yet been received.

Chip samples from all coal seams encountered in the 1981 drill program were sent to the CNRL lab in Fernie for quality testing. These quality results have not as yet been received.

5.0 MINEABILITY AND COAL RESERVES

A dip-slope situation exists on Ewin Pass Ridge comparable to the Line Creek Mine area. There are approximately 390 metres of the Mist Mountain Formation of the Kootenay Group preserved on the ridge within which there is an aggregate thickness of 41.3 metres of coal in 5 workable seams. The property is highly amenable to open pit mining.

Two Order of Magnitude Engineering studies have been done on the Ewin Pass Property. In 1970, John T. Boyd Co., on the basis of nine drill holes and geological mapping calculated 33.3 million tons of coal in place of which 20.2 million tons are in the Proven Category and 13.1 million tons are in the Partially Proven Category. In 1980 the Engineering Department of Crows Nest Resources, on the basis of the 1979 Geological Report, calculated 22.3 million tonnes of Proven coal in place. The reserves for both these studies come from similar proposed pits approximately 1.2 kilometres by 0.7 kilometres on the upper flanks of Ewin Pass Ridge.

Geological in place reserves for the Ewin Pass Property are estimated to be 103 million tonnes of which 47 million tonnes are in the Proven Category, 46 million tonnes are in the Probable Category and 10 million tonnes are in the Possible Category.

6.0 COST STATEMENT

Costs for the 1981 exploration program on the Ewin Pass property are tabulated in Enclosure 13, the Application to Extend Term of Licence. The enclosure gives the nature of the expenditures referenced to the coal licences on which work was performed. Total cost of the 1981 Ewin Pass Program was \$494,214.00.

5/CVg.37



Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources

APPLICATION TO EXTEND TERM OF LICENCE

1. LESLIE GRAMANTIK agent for SHELL CANADA RESOURCES LIMITED
(Name) (Name)
P.O. BOX 100 CALGARY
(Address) (Address)
ALBERTA T2P 2M7

Valid FMC No. 244642
278, 279, 282-291, 304

hereby apply to the Minister to extend the term of Coal Licence(s) No(s).
1300, 1301, 15 LICENCES, GROUP NO: 330, 2889 HECTARES
for a further period of one year.

2. Property name EWIN PASS & MOUNT MICHAEL, KOOTENAY LAND DISTRICT

3. I am allowing the following Coal Licence(s) No(s). to forfeit N/A

4. I have performed, or caused to be performed, during the period FEBRUARY 1, 1981 to
JANUARY 31, 1982 work to the value of at least \$ 737,643.00

on the location of coal licence(s) as follows:

CATEGORY OF WORK

CATEGORY OF WORK	Licence(s) No(s).	Apportioned Cost
Geological mapping	285, 286, 288-293, & 304	201,755
Surveys: Geophysical	-	-
Geochemical	-	-
Other (LOCATION)	282, 286, 287	14,557
Road construction	286	15,735
Surface work	286, 289, 290, 291	16,484
Underground work	286	100,686
Drilling	282, 286, 287	234,337
Logging, sampling, and testing	282, 286, 287	54,634
Reclamation	282, 286, 287	53,940
Other work (specify)	-	-
Off-property costs	GEOLOGICAL REPORTS	45,515

5. I wish to apply \$ 737,643.00 of this value of work on Coal Licence(s) No(s). 278, 279, 282-291
304, 1300, 1301

6. I wish to pay cash in lieu of work in the amount of \$ N/A on Coal Licence(s) No(s).

7. The work performed on the location(s) is detailed in the attached report entitled
REPORTS WILL BE SUBMITTED IN 90 DAYS

JANUARY 27, 1982
(Date)

(Signature)

ASSISTANT LANDMAN
(Position)

EWIN PASS GROUP NO: 330

GEOLOGICAL MAPPING Yes No

Area (Hectares) _____ Scale _____ Duration _____

Reconnaissance _____
 Detail: Surface _____
 Underground _____
 Other* (specify) _____

Total Cost \$ _____

GEOPHYSICAL/GEOCHEMICAL SURVEYS Yes No

Method _____
 Grid LOCATION _____
 Topographic _____
 Other* (specify) _____

Total Cost \$ 9,257

ROAD CONSTRUCTION Yes No

Length 1000 M _____ Width _____
 Licence(s) No.(s) _____
 Access to DRILL SITES _____

Total Cost \$ 15,735

SURFACE WORK Yes No

Length _____ Width _____ Depth _____ Cost _____

Trenching _____
 Seam Tracing _____
 Crosscutting _____
 Other* (specify) _____

Total Cost \$ _____

UNDERGROUND WORK Yes No

No. of Adits	Maximum Length	No. of Holes	Total Metres	Cost
1	72 M			
Test Adits				
Other workings* _____				
Total Cost				\$100,686

DRILLING Yes No

Hole Size	No. of Holes	Total Metres	Cost
Core: Diamond _____ Wireline _____			
Rotary: Conventional _____ Reverse circulation 5 1/8"	5	1643	
Other* (specify) _____			
Contractor _____			
Where is the core stored? _____			
Total Cost \$			234,337

LOGGING, SAMPLING, AND TESTING Yes No

Lithology: Drill samples <input checked="" type="checkbox"/>	Core samples <input type="checkbox"/>	Bulk samples <input type="checkbox"/>
Logs: Gamma-neutron <input checked="" type="checkbox"/>	Density <input checked="" type="checkbox"/>	
Other* (specify) _____		
Testing: Proximate analysis <input type="checkbox"/>	FSI <input type="checkbox"/>	Washability <input type="checkbox"/>
Carbonization <input type="checkbox"/>	Petrographic <input type="checkbox"/>	Plasticity <input type="checkbox"/>
Other* (specify) GEOLOGIC LOGGING OF D.H. & ADIT SAMPLES		
Total Cost \$		54,634

RECLAMATION Yes No

Details ROAD RECONTOURING, SEEDING, FERTILIZING

Total Cost \$ 33,940

OTHER WORK (Specify details) Yes No

Cost _____

Total Cost \$ _____

OFF-PROPERTY COSTS Yes No

Details GEOLOGICAL REPORTS (1980 & 1981)

Total Cost \$ 25,625

Total Expenditures \$ 494,214.00

Jan 28/82 (Date)

[Signature] (Signature)

MANAGER - ACCOUNTING CNRL (Position)

*A full explanation of other work is to be included.

GEOLOGICAL MAPPING

Yes No

Area (Hectares) Scale Duration

Reconnaissance 1600 1:2000 & 1:5000 342 MAN. DAYS.

Detail: Surface
 Underground
 Other* (specify)

Total Cost \$ 201,755

GEPHYSICAL/GEOCHEMICAL SURVEYS

Yes No

Method
 Grid LOCATION 9,257
 Topographic
 Other* (specify) LOCATION 5,300

Total Cost \$ 14,557

ROAD CONSTRUCTION

Yes No

Length 1,000 M Width
 On Licence(s) No.(s)
 Access to DRILL SITES

Total Cost \$ 15,735

SURFACE WORK

Yes No

Length Width Depth Cost

Trenching 759 M 0.75 M 1 M
 Seam Tracing
 Crosscutting
 Other* (specify)

Total Cost \$ 19,484

UNDERGROUND WORK

Yes No

No. of Adits Maximum Length No. of Holes Total Metres Cost

Test Adits 1 72M
 Other workings*

Total Cost \$ 100,686

DRILLING

Yes No

Hole Size No. of Holes Total Metres Cost

Core: Diamond
 Wireline
 Rotary: Conventional
 Reverse circulation 5 1/8" 5 1643

Other* (specify)
 Contractor
 Where is the core stored?

Total Cost \$ 234,337

LOGGING, SAMPLING, AND TESTING

Yes No

Lithology: Drill samples Core samples Bulk samples
 Logs: Gamma-neutron Density

Other* (specify)

Testing: Proximate analysis FSI Washability
 Carbonization Petrographic Plasticity

Other* (specify)

Total Cost \$ 54,634

RECLAMATION

Yes No

Details Total Cost \$ 53,940

OTHER WORK (Specify details)

Yes No Cost

Total Cost \$

OFF-PROPERTY COSTS

Yes No

Details GEOLOGICAL REPORTS Total Cost \$ 45,515

Total Expenditures \$ 737,643.00

Jan. 28/82
(Date)

[Signature]
(Signature)

MANAGER - ACCOUNTING CNRL
(Position)

*A full explanation of other work is to be included.

7.0 BIBLIOGRAPHY

- John T. Boyd Co. - Coal Reserve Development as of October 1970, Upper Elk River Coal Field, B.C. - 1970.
- John Fisher & G. Sloan - Geological Report on Work Done May 29, 1978 to August 23, 1978 for North Central Block Project, B.C. Coal Licences Nos. 277 - 293 Inclusive, 304 and 1299, 1300, 1301, 1302 - 1979.
- D. W. Gibson - Sedimentary Facies in the Jura-Cretaceous Kootenay Formation, Crows Nest Pass Area, Southwestern Alberta and Southeastern British Columbia - Bull, C.S.P.G. Vol. 25, No. 4 pp. 767 - 791.
- A.P. Hamblin & R.G. Walker - Storm-dominated Shallow Marine Deposits: the Fernie-Kootenay (Jurassic) Transition, Southern Rocky Mountains - Can. J. Earth Sci. Vol. 16, No. 9, pp. 1673 - 1690.

K-Shell Ewin Pass 81(2)A

398

M E M O R A N D U M

DATE : FEBRUARY 24, 1982
T O : CROWS NEST RESOURCES LIMITED (C.N.R.L.)
FROM : SHELTECH CANADA
SUBJECT: EWIN PASS (4151-F) - S.E. BRITISH COLUMBIA

All survey control in the Ewin Pass area is based on the Crows Nest Control Network using results established from the fall of 1980. The two stations used were '81-200' and '81-202' previously called '80-E2' and '80-E3' respectively.

From these stations seven control points, five drill holes, one adit, and two short roads were surveyed.

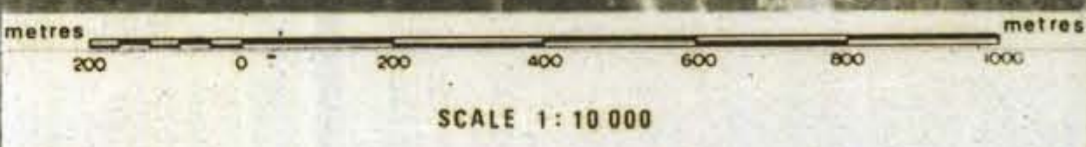
Conventional survey methods using a 1" theodolite and electronic distance measuring equipment were used to obtain survey data. All calculations were done in the UTM system with distances being reduced to plane and bearings referenced to 117°W. The relative accuracy of closed traverses was better than 1/10,000. The results were given to C.N.R.L. personnel in both tabular and map form.



A. L. Melton

RB/cm

s729



LEGEND

	EXPLORATION WORK COMPLETED AND REPORTED		RECLAMATION WORK COMPLETED AND REPORTED			
	PRIOR TO 1978	1978-1980	FERTILIZE AND SEED		RECONTOUR	
			PRIOR TO 1978	1978-80	PRIOR TO 1978	1978-80
NEW ROAD	—	- - -				
MACHINE TRENCHES	—	- - -				
ADITS	—	- - -				
TEST PITS	◇	◇	◇	◇	◇	◇
DRILL SITES	○	○	○	○	○	○
LOG LANDINGS	△	△	△	△	△	△
HELICOPTER PADS	○	○	○	○	○	○
NON RELATED DEVELOPMENT	—					
GROUP OR LEASE BOUNDARY (approx.)	—					
PROSPECT BOUNDARY (approx.)	- - -					

NOTES:

MACHINE TRENCHING SHOWN ONLY WHERE DISTURBANCE ENCOMPASSES AND AREA BEYOND NORMAL ROAD WIDTH, WHERE CONSTRUCTED OFF ROAD AND/OR WHERE IT HAS BEEN RECLAIMED.

ONLY DRILL SITES THAT CONSTITUTE A DISTURBANCE ENCOMPASSING AN AREA BEYOND NORMAL ROAD WIDTH AND/OR HAVE BEEN RECLAIMED ARE SHOWN; OTHERWISE THE DRILL SITE IS CONSIDERED AN INTEGRAL PART OF THE ROAD AND RECLAIMED WITH THE ROAD.

REVIEW AND INTERPRETATION OF INFORMATION PREPARED BY SILVA CONSULTING LTD., NOVEMBER 1981

398 K-Shell Ewin Pass 81(0)A

Crows Nest Resources Limited
EXPLORATION

S.E. BRITISH COLUMBIA
CENTRAL BLOCK
EWIN PASS
SUMMARY OF SURFACE DISTURBANCE AND RECLAMATION

PERMIT NO: C-54 GROUP NO: 330
COAL LICENCES: 283, 286-289, 1300
N.T.S: 82 G-15 & 82 J-2 ORTHOPHOTO MOSAIC

AUTHOR: SILVA LTD SCALE: 1:10,000 ENCLOSURE No: A-6
DATE: 17/11/81 REVISED: DRAWING No: HG-96



5.0 THE 1981 EWIN PASS ENVIRONMENTAL PROTECTION AND RECLAMATION PROGRAM

Block: Central

Group Number: 330

B.C. Coal Licences: 286-289, 291

5.1 SUMMARY

The 1981 Ewin Pass exploration program extended from July to September during which time 0.5 km of new roads were constructed, 14.5 km of old roads were reopened, 5 rotary holes were drilled and 1 adit (No. 4) was driven. Total surface area disturbed was approximately 15.5 hectares and this disturbance is tabulated in the Summary of Surface Disturbance and Reclamation, (see Table 5-1).

The 1981 reclamation program consisted of levelling drill sites, recontouring Adit Site No. 4 and adjacent Adit Site No. 2 (constructed during 1979), seeding and fertilizing these sites and exploration roads. An additional 4.5 km of old exploration roads (mostly on open slopes) were recontoured, seeded and fertilized.

A maintenance seeding and fertilization program was also undertaken and it encompassed all exploration disturbance on the property prior to 1981. The program included seeding and fertilizing approximately 4.0 km of road recontoured during 1980 and approximately 8.5 hectares of early (pre-1978) exploration disturbances not reopened during the 1981 exploration season.

Total area reclaimed during 1981 was approximately 28.0 hectares and is outlined in detail in Appendix 5-I - Detailed Reclamation Field Procedures.



TABLE 5-1

Crow's Nest Resources
LIMITED

SUMMARY OF SURFACE DISTURBANCE AND RECLAMATION FOR 1981

PROJECT: EWIN PASS

BLOCK: CENTRAL

PERMIT NO: C-54

COAL LICENSES: 283, 286-289, 1300

GROUP NO: 330 N.T.S: 82-G-15

AREA DISTURBED CURRENT YEAR (ha): 15.5

AREA RECLAIMED CURRENT YEAR (ha): 28.0

TOTAL AREA DISTURBED TO DATE (ha): 28.0

TOTAL AREA RECLAIMED TO DATE (ha): 28.0

19 <u>81</u> DISTURBANCE			TOTAL AREA DISTURBED TO DATE (ha)	19 <u>81</u> RECLAMATION				TOTAL AREA RECLAIMED TO DATE (ha)	
TYPE	LENGTH (km)	AREA (ha)		RECONTOURED AREA (ha)	SEEDED AND FERTILIZED AREA (ha)	AMOUNT USED SEED/FERTILIZER (kg)	TOTAL AREA RECLAIMED (ha)		
ROADS:	Re-opened	14.5	14.5	4.5	14.5	652/3480	14.5	27.3	
	New	0.4	0.4		0.5	23/120	0.5		
	Outstanding								
	NUMBER								
ADIT SITES:	Re-opened							0.3	
	New	1	0.1	0.3	0.1	5.0/24	0.1		
	Outstanding								
TRENCHES:									
DRILL SITES:	Re-opened							0.4	
	New	5	0.3	0.4		0.3	14/72		0.3
	Outstanding								
MAINTENANCE PROGRAM:	Roads					12.3	554/2950	12.3	
	Drillsites					0.1	5/124	0.1	
	Adits					0.2	10/50	0.2	
OTHER									

As requested by the Ministry of Energy, Mines and Petroleum Resources, Form 7 - Notice of Work on a Coal Licence, and Form 8 - Reclamation Program have been completed and are submitted with this report as Appendix 5-II.

5.2 ROADS

5.2.1 New Roads

New road construction on the Ewin Pass property consisted of two 200-metre extensions to existing roads for exploration purposes (see Map 5-1). The road right-of-ways were inspected on foot and "flagged-in" at a grade of less than 8% prior to equipment work. Right-of-ways were not pre-logged as they were located in non-merchantable timber areas (sparsely spaced stunted conifers). On completion of the road construction slash abatement measures were undertaken to dispose of any road side timber which had been disturbed during the road construction.

When active exploration was completed the roads were hand seeded with Reclamation Seed Mix No. 2 (see Table 2-2) and hand fertilized (see Appendix 5-I - Detailed Reclamation Field Procedures).

5.2.2 Reopened Roads

To obtain access to and throughout the Ewin Pass property approximately 14.5 km of old roads were reopened (see Map 5-1). The main access route to the property (9.5 km) extended from the Line Creek Mine Site (Mine Lease No. 4) to the area of active exploration on the property. The

remaining 5 km of roads were localized on the property in the area of exploration. The roads were reopened with a dozer (Cat D-7) by levelling the road surface, removing fallen trees, clearing out slumped banks and installing culverts at stream crossings where required.

At the end of the season all reopened roads were hand-seeded with Reclamation seed mix No. 2 and hand fertilized. Culverts installed at creek crossings were removed and gully crossings were recontoured with a backhoe (Cat-225) to prevent impoundment of snow or melt water within the drainage. At the end of the season a permanent locked gate was installed across the main access route at a location approximately 1.5 km distance from the Line Creek Mine Site.

5.2.3 Recontoured Roads

The program initiated in 1980 on the Ewin Pass property, to recontour old surface disturbances (dating back to the early 1960's) was continued during 1981. Approximately 13.5 hectares of these disturbances had not been reopened for exploration purposes during the period of 1978-1981. Approximately 4.0 hectares of these disturbances, mostly on open alpine slopes, were completely resloped during 1980 (see Map 5-2). During 1981 another 4.5 hectares of disturbances were recontoured (see Photo 5-1). At the end of the 1981 season a total of 8.5 hectares of old surface disturbances had been recontoured. This resulted in the completion of recontouring all old surface disturbances located on open slopes not presently being used during the current exploration programs.



PHOTO 5-1 An early exploration disturbance located on open slopes
recontoured during 1981 .Date of Photography: September, 1981.

The types of old disturbances which were recontoured consisted of short "cat-pushes", seam traces and exploration roads constructed at grades too steep to be utilized by 4-wheel drive vehicles. Recontouring consisted of filling in the original cut in the slope with the displaced overburden to bring the area of disturbance to the same contour as the surrounding ground. The 1981 recontouring work was performed by a track mounted backhoe (Cat-225) and a dozer (Cat D-7). The dozer was utilized to recover the displaced material from the downhill side and end push it to the uphill side of the disturbance moving the bulk of the material within reach of the backhoe. The backhoe would then complete the backfilling of the material into the cut returning the disturbance area back to its original contour (see Photo 5-2, 5-3). To recontour on steep slopes the dozer 'anchored' the backhoe from the uphill side with a cable to prevent the backhoe from sliding downslope as it was working (see Photo 5-4).

Recontoured areas were hand seeded with Reclamation Seed mix No. 2 and hand fertilized immediately after the recontouring was completed to ensure the seed and fertilizer was incorporated into the "fresh" ground surface before it became hard and compacted (see Appendix 5-I).

5.3 DRILL SITES

The 1981 drilling program consisted of drilling 5 rotary holes (see Map 5-2). The two drill sites EPR-202 and EPR-204 were constructed when access roads to the sites were constructed or reopened. The remaining 3 drill sites; EPR-201, EPR-203, EPR-205 were constructed by widening and levelling existing roads

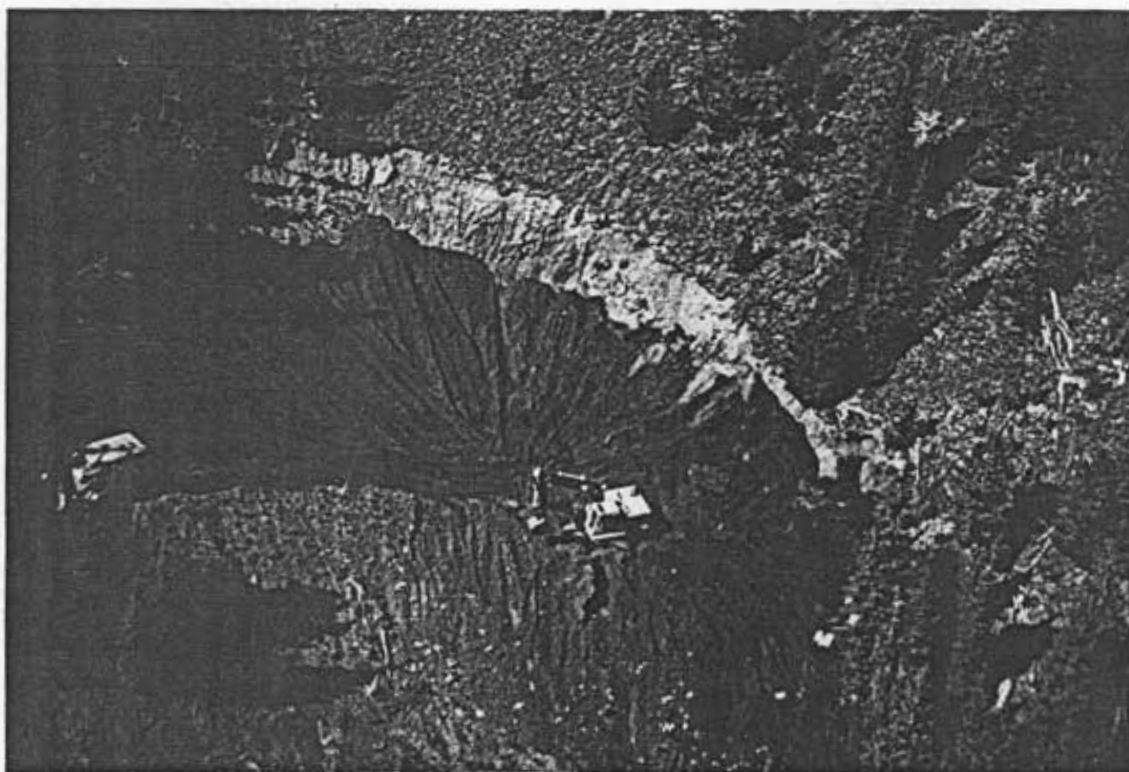


PHOTO 5-2 A backhoe (Cat-225) and a dozer (Cat D-7) recontouring an early exploration disturbance. The dozer is end pushing material from the downhill side to the uphill side of the disturbance. The backhoe is completing the backfilling of material into the cut returning the area to its original contour. Date of Photography: September, 1981



PHOTO 5-3 A completely recontoured early exploration road (1981). Note: recontouring has been done around trees, allowing them to remain standing where possible. Date of Photography: September, 1981

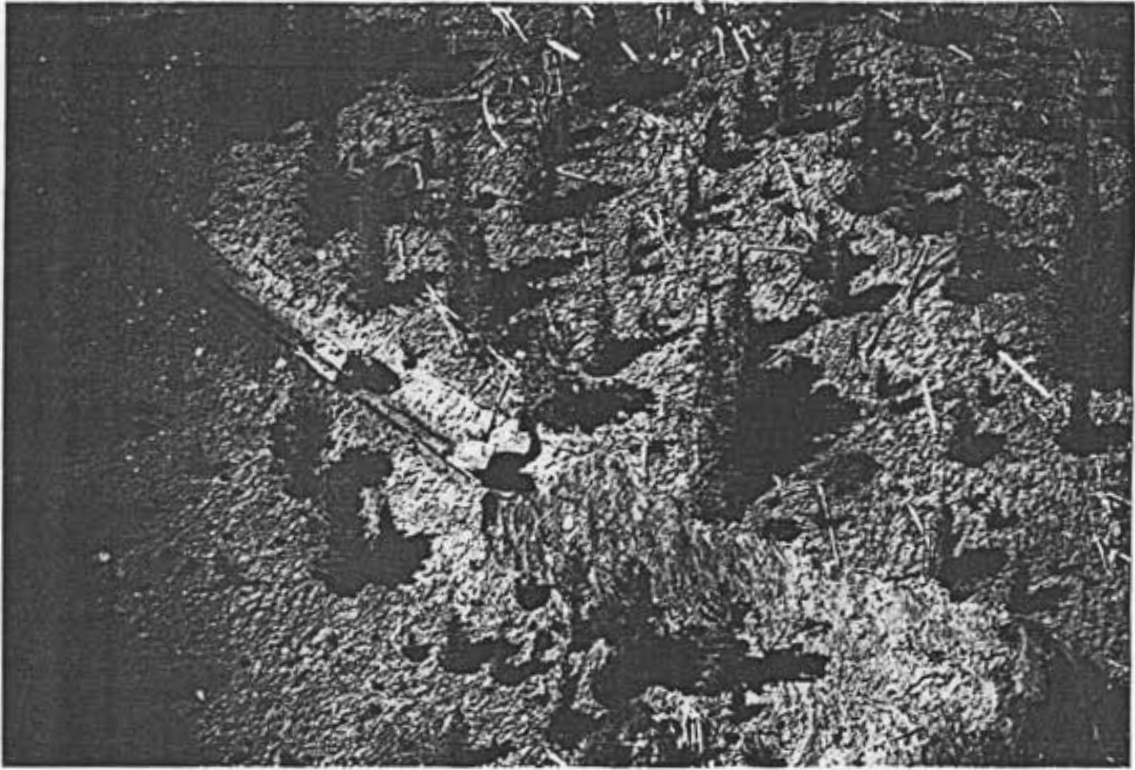


PHOTO 5-4 On this steep section of early exploration road the dozer is "anchoring" the backhoe as it recontours the road. Date of Photography: September, 1981

resulting in a minimum of additional surface disturbance. On completion of drilling operations the drill sites were levelled with a dozer (D-7), hand seeded with Reclamation Seed Mix No. 2 and hand fertilized (see Appendix 5-1).

5.4 ADIT SITES

During the 1981 exploration program one adit (adit No. 4) was driven off the main access road resulting in a minimum of disturbance. Waste coal from the adit was transported by a front-end loader and stored on adjacent adit site No. 2 (constructed in 1979, see Map 5-1). On completion of aditing, the majority of waste coal from adit No. 4 and coal left from adit No. 2 was disposed of by burying and resloping of the No. 2 adit site, with the remainder being disposed of on the road located directly below. Recontouring the adit site required extensive machinery work, performed by a dozer (D-7) and a track mounted backhoe (Cat-225).

Drainage control around the adit sites was established by the construction of contour ditches across the face of the resloped adit site and a drainage ditch from the portal of adit No. 2 downslope to a catch-basin at the base of the resloped adit face. The catch-basin was constructed to facilitate the settling of coal fines out of surface run-off and adit drainage, and to restrict the movement of coal further down the slope. A drainage ditch was installed at the portal of adit No. 4 to ensure drainage was established along the inside ditch of the adjacent access road and directed away from the areas where the coal had been buried or was naturally exposed. The recontoured adit sites and associated disturbances received a double application of seed and fertilizer (see Appendix 5-1).

5.5 MAINTENANCE SEED AND FERTILIZATION PROGRAM

A maintenance seeding and fertilization program was undertaken on disturbances previously seeded and fertilized and not reopened during the 1981 exploration season. The maintenance program was undertaken to encourage a thicker vegetation cover in areas where initial grass germination was sparse and to maintain growth of the existing vegetation (see Photo 5-5).

A total area of 12.5 hectares received a maintenance application of seed and fertilizer. This consisted of 4.5 hectares of disturbance recontoured during 1980, 6.5 hectares of disturbance not reopened during 1981, 2 adit sites (No.1 and No.3) and 6 drill sites constructed during 1980 (see Map 5-1).

Seed was broadcast at an application rate varying between 45-55 kg/ha depending on the site requirement. Fertilizer was spread utilizing a helicopter (Bell-206B) slinging a gas powered seeding bucket at a constant rate of approximately 240 kg/ha (see Photo 5-6 & 5-7).



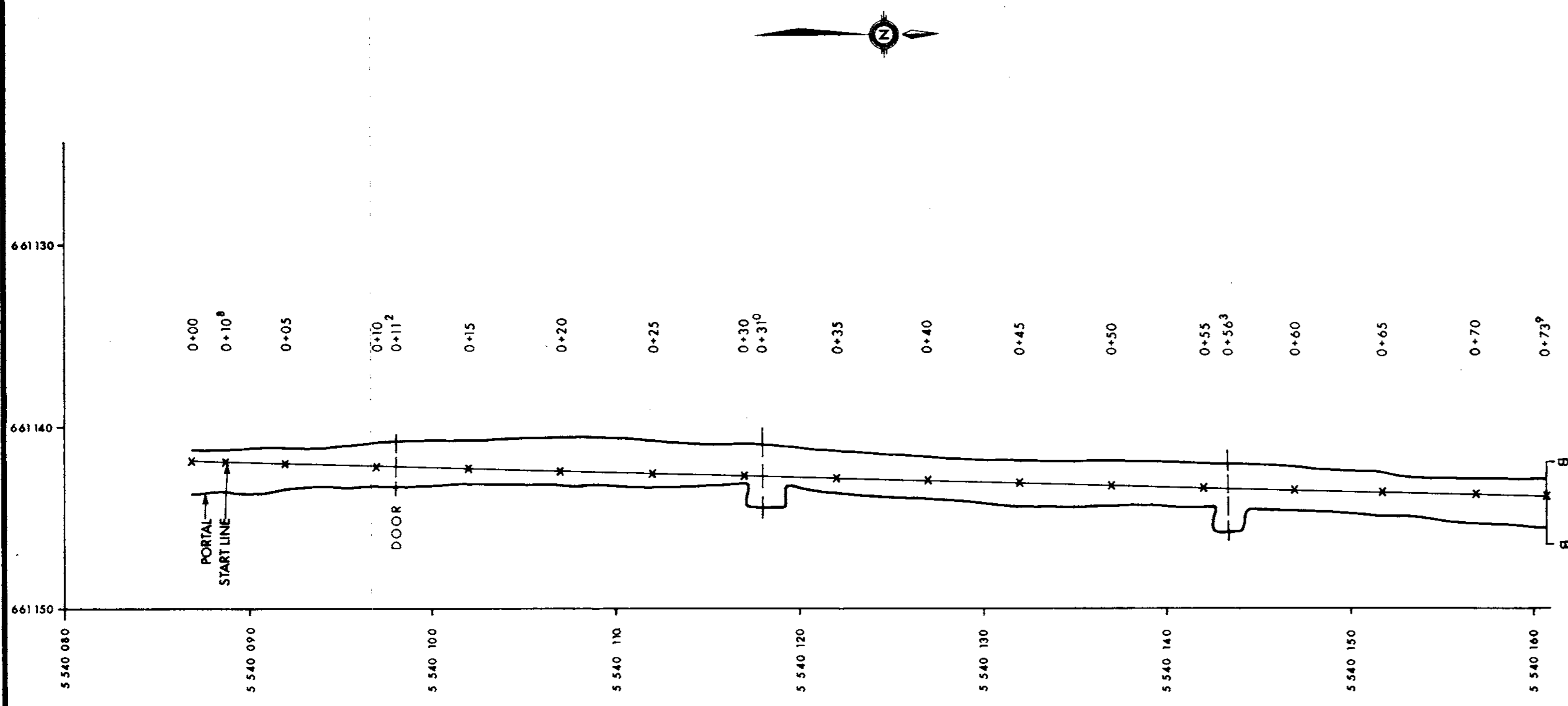
PHOTO 5-5 An early exploration road recontoured, seeded and fertilized in 1980 showing a well established first years growth of vegetation. The area received a maintenance application of seed and fertilizer in 1981. Date of Photography: September, 1981



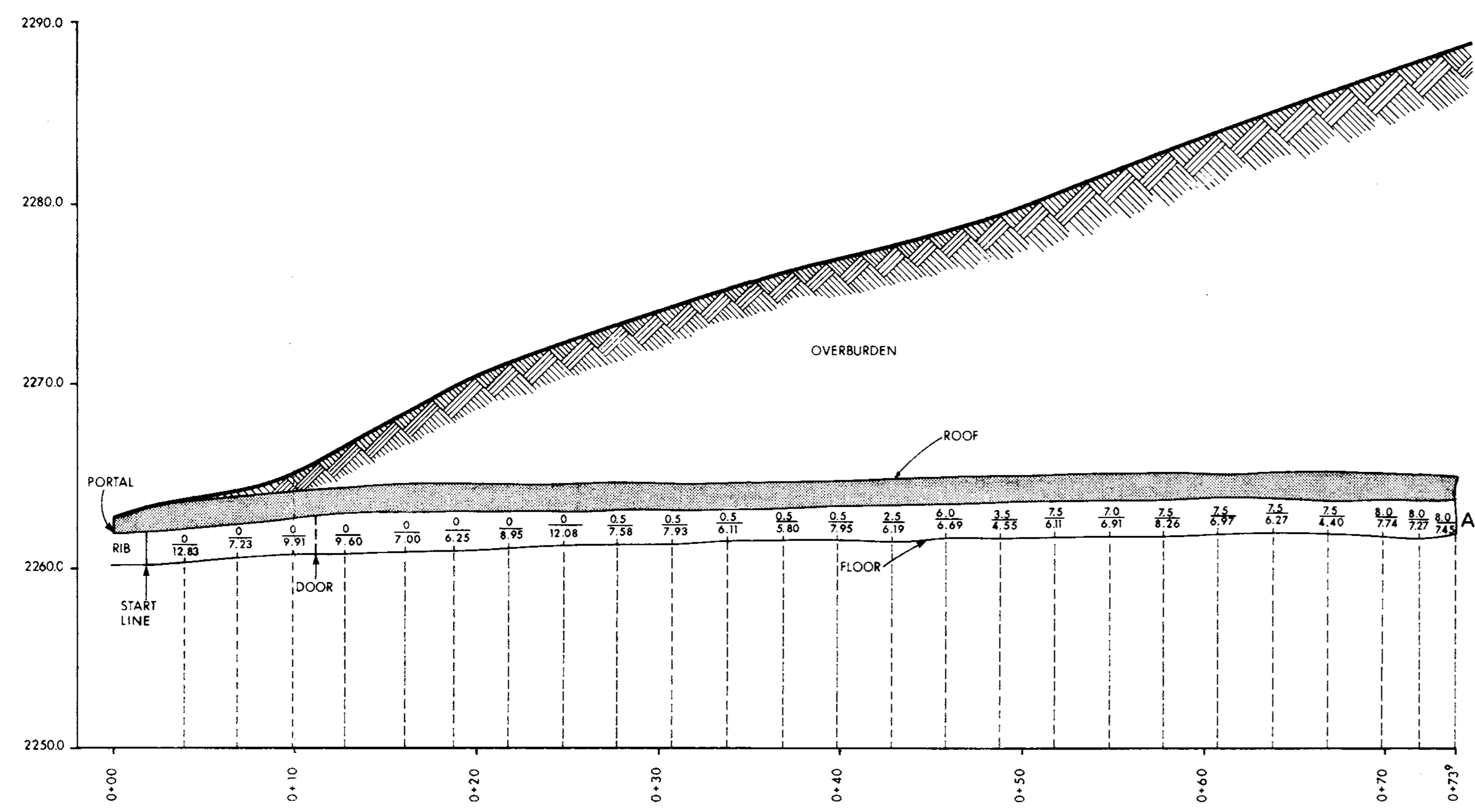
PHOTO 5-6 An early exploration disturbance initially recontoured, seeded and fertilized in 1980 receiving a maintenance application of fertilizer in 1981. The area also received a maintenance application of seed by hand broadcast. Date of Photography: September, 1981



PHOTO 5-7 An early exploration disturbance located on an open slope initially recontoured, seeded and fertilized in 1980 receiving a maintenance application of fertilizer by helicopter in 1981. Date of Photography: September, 1981

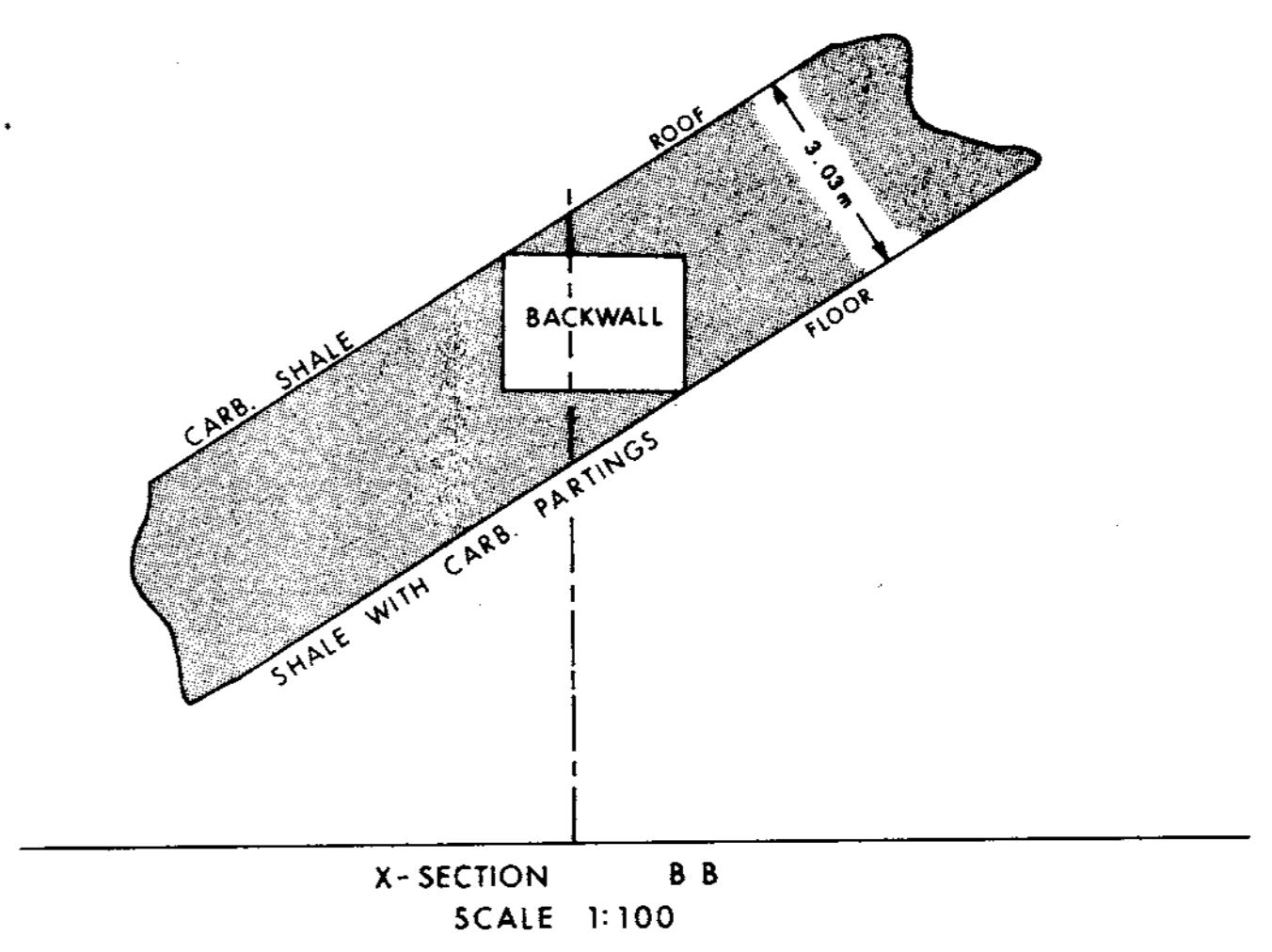


PLAN
SCALE 1:200

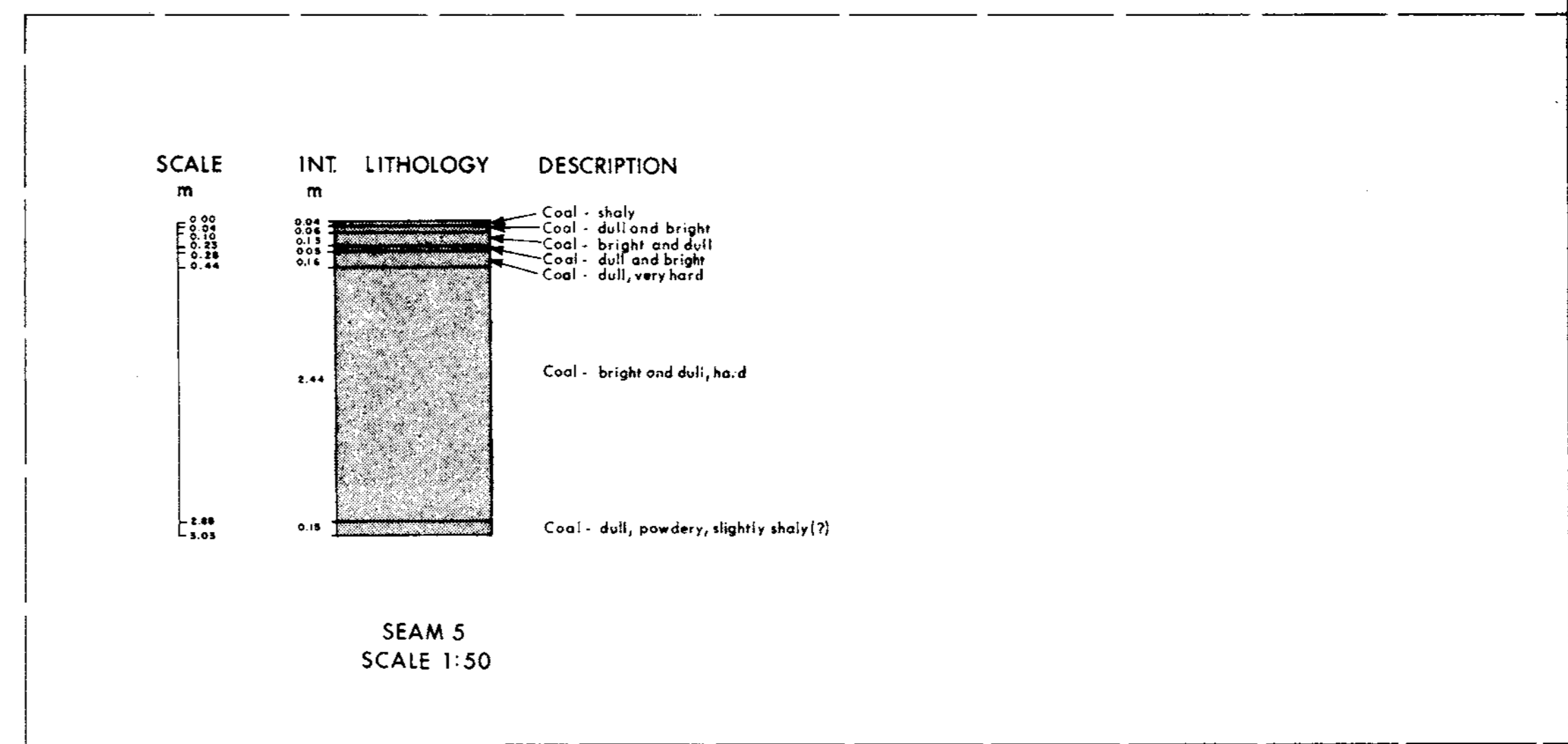


PROFILE
SCALE 1:200

LEGEND
3.5 FSI (UNWASHED)
4.55 %ASH



X-SECTION B B
SCALE 1:100



SEAM 5
SCALE 1:50

STATION	NORTHING	EASTING	ELEVATION
PORTAL (ADIT 4)	5 540 086.95	6 611 141.94	2262.0 (nail) 2260.1 (gr)
BACKWALL (A)	5 540 160.82	6 611 144.00	2261.9 (gr)

Survey performed by Sheltech Canada 1981
All bearings referred to 117°W
All distances are in meters and decimals thereof,
and have been reduced to the UTM plane.

398 Shell Ewin Pass S(2)A

Crows Nest Resources Limited
EXPLORATION
EWIN PASS
S.E. BRITISH COLUMBIA

ADIT 4 SEAM 5

AUTHOR: C. PASEMKO	SCALE: AS NOTED	ENCLOSURE No.: 9
DATE: 82 01 27	REVISED:	DRAWING No: HB-96
To Accompany		

K-Shell Ewin Pass 81(3)A



398

ENCLOSURE
7

**OPEN FILE
CONFIDENTIAL**

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

00 398

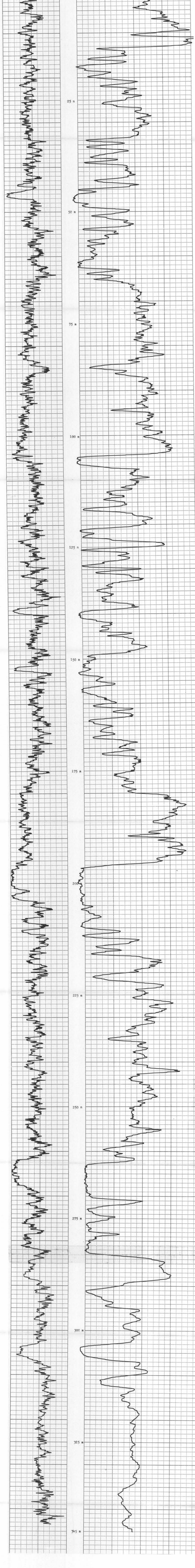
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K-444

Pass 8103, A

DAVIES EXPLORATION LOGGING LTD.	
COMPANY	Chevron, Shell, Rasgazcon
HOLE NUMBER	BP - 201
LOCATION	Bein, Oman
PROVINCE	B. G.
ELEVATION	
LOG TYPE	Natural Gamma & Neutron
DATE	July 21 1981
DRILLED DEPTH	34.5 m
LOGGED DEPTH	34.5 m
ZERO DATUM	G.L.
HOLE DIAMETER	5 1/8"
CASING LENGTH	T. D.
REMARKS	

0 Natural Gamma 20 110 Neutron 710



398

Well
F.N. in Area 81(3)A

DAVIES EXPLORATION LOGGING LTD.

COMPANY: OCEAN LINE RESEARCHERS

HOLE NUMBER: EPR - 201

LOCATION: Baffin Pass

PROVINCE: B.C.

ELEVATION:

LOG TYPE: CALPER NATURAL GAMMA RESISTIVITY DENSITY

DATE: JULY 23 1981

DRIILLED DEPTH: 345 m

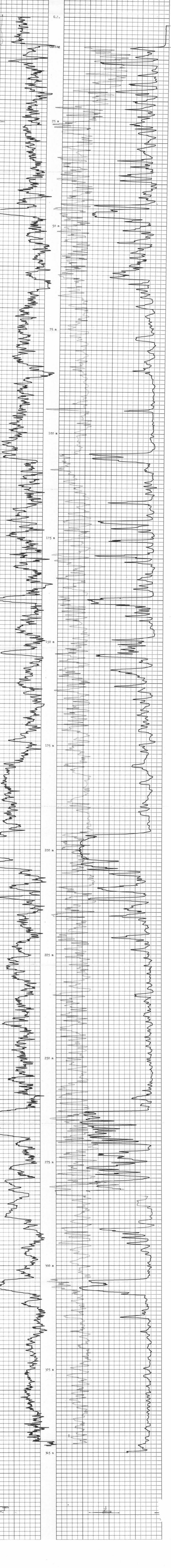
LOGGED DEPTH: 345 m

ZERO DATUM: C.I.

HOLE DIAMETER: 5.175"

CASING LENGTH: 7 m

REMARKS:



398

Sheet
K-Ewan Page 81(2A)



DAVIES EXPLORATION LOGGING LTD.

COMPANY **Greene West Resources**

HOLE NUMBER **EXR - 201**

LOCATION **East P ass**

PROVINCE **B.C.**

ELEVATION

LOG TYPE **MARKER RESISTANCE LOGGING**

DATE **July 27 1991**

DRILLED DEPTH

LOGGED DEPTH

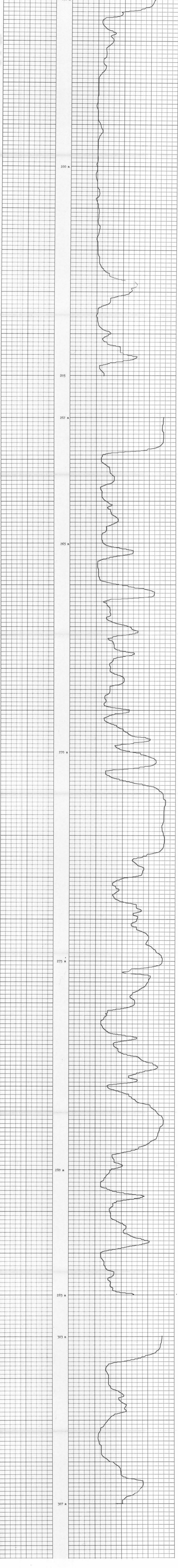
TEST DATUM **C.L.**

HOLE DIAMETER **5 1/8"**

CASING LENGTH

REMARKS

CALPER NATURAL GAMMA RESISTIVITY **Detail** DENSITY



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Shale
K-Ewin Pass 8133A

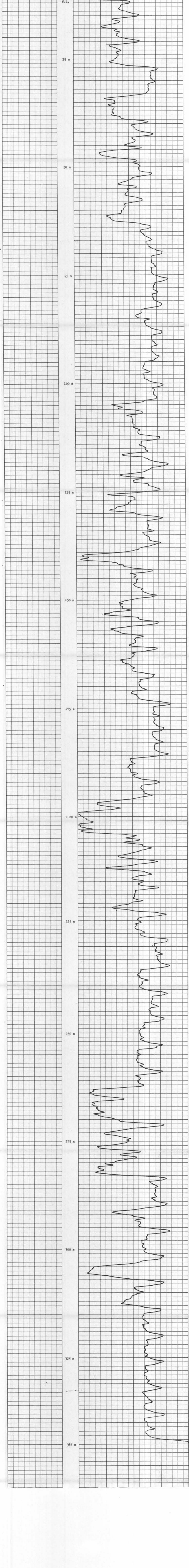
89E

DAVIES EXPLORATION LOGGING LTD.

COMPANY	Crown-Neck Resources
HOLE NUMBER	EP - 201
LOCATION	Brit. Terr.
PROVINCE	B.C.
ELEVATION	
LOG TYPE	Long Speed Density
DATE	July 23 1981
DRILLED DEPTH	36.2 m
LOGGED DEPTH	36.2 m
TRNG DATUM	C.L.
HOLE DIAMETER	5 1/2"
CASING LENGTH	5.0'
REMARKS	

7K I.S.D.

3K



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كوي
K. Ewin Page 81(C2)A

DAVIES EXPLORATION LOGGING LTD.

COMPANY: CROSSBUSH RESOURCES LIMITED

HOLE NUMBER: BTA-203

LOCATION: Batai Pass

PROVINCE: B. C.

ELEVATION:

LOG TYPE: Long Spread Density

DATE: Aug. 5, 1953

DRILLED DEPTH: 377m

LOGGED DEPTH: 376m

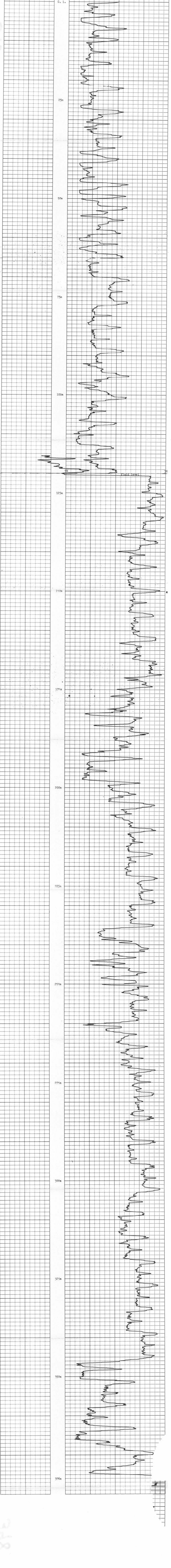
ZERO DATUM: G. I.

HOLE DIAMETER: 5"

CASING LENGTH: 12m

REMARKS: Logged through stable wall drill pipe.

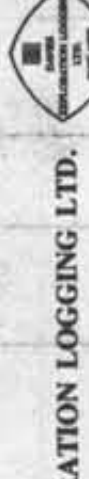
89E

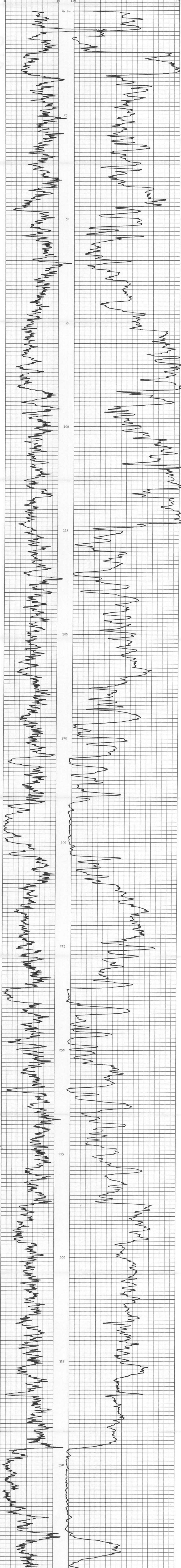


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K-Ewin Pass 81(3)A

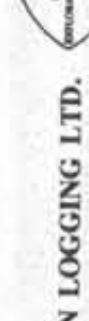
 DAVIES EXPLORATION LOGGING LTD.	
COMPANY	CRUMSEIST RESOURCES LIMITED
HOLE NUMBER	ETR - 209
LOCATION	Bain Pass
PROVINCE	B. C.
ELEVATION	
LOG TYPE	Nature's Gamma & Neutron
DATE	Aug. 5, 1981
DRILLED DEPTH	377m
LOGGED DEPTH	176m
ZERO DATUM	C. I.
HOLE DIAMETER	5"
CASING LENGTH	12m
REMARKS	Logged through double wall drill pipe.



89E

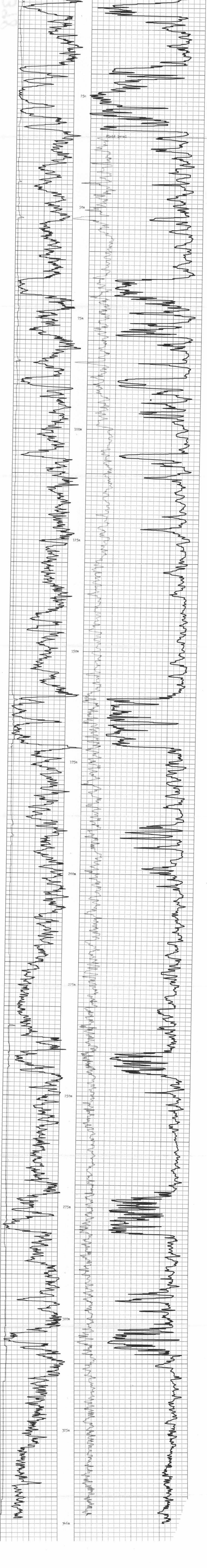
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Year
K. E. Wain, P. 2000
81C31A

 DAVIES EXPLORATION LOGGING LTD.	
COMPANY	CROMBIEST RESOURCES LIMITED
HOLE NUMBER	BEF - 204
LOCATION	BMTB FMSB
PROVINCE	B. C.
ELEVATION	
LOG TYPE	CALIPER, NATURAL GAMMA, RESISTIVITY, DENSITY
DATE	Aug. 11, 1963
DRILLED DEPTH	365m
LOGGED DEPTH	346m
ZERO DATUM	G. I.
HOLE DIAMETER	5 1/2"
CASING LENGTH	2m
REMARKS	


CALIPER NATURAL GAMMA RESISTIVITY DENSITY

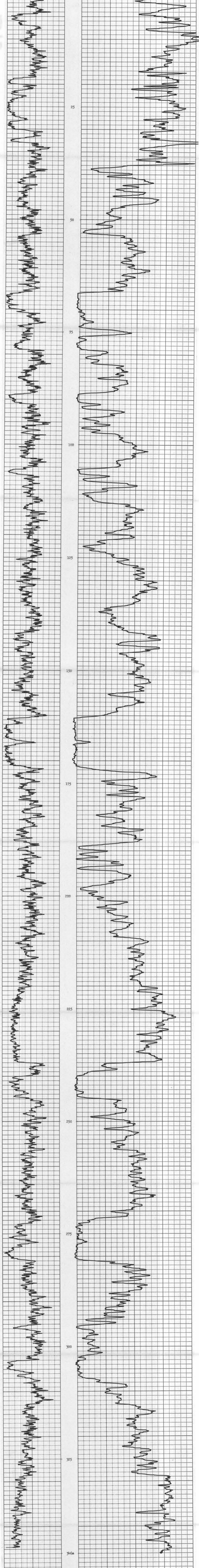
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Sheet
K-Ewin Pass 91(3)A

 DAVIES EXPLORATION LOGGING LTD.	
COMPANY	ORIGINATOR RESOURCES LIMITED
HOLE NUMBER	EPR - 204
LOCATION	Wain Pass
PROVINCE	B. C.
ELEVATION	
LOG TYPE	Natural Gamma & Neutron
DATE	Aug. 11, 1958
DRILLED DEPTH	316m
LOGGED DEPTH	316m
ZERO DATUM	G. L.
HOLE DIAMETER	5 1/2"
CASING LENGTH	T. D. (Depth to end of log)
REMARKS	



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398
Kewin Pass 81(3)A

DAVIES EXPLORATION LOGGING LTD.

COMPANY: DAVIES EXPLORATION LOGGING LTD. RECORDS: LISTED

LOG NUMBER: 81(3)A

LOCATION: Kewin Pass

PROVINCE: B. C.

ELEVATION: _____

LOG TYPE: RESISTIVITY

DATE: Aug. 11, 1951

DRILLED DEPTH: 300m

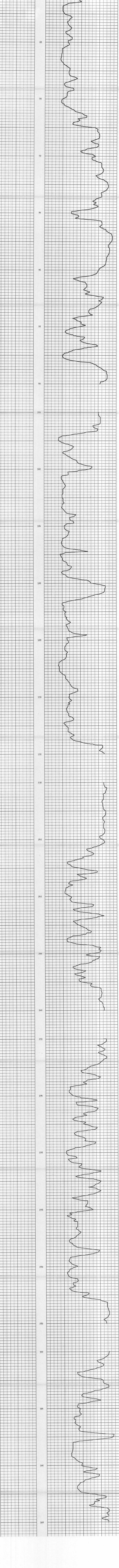
LOGGED DEPTH: 300m

LOG DEPTH: 300m

LOG DIAMETER: 5"

LOG LENGTH: _____


REMARKS: SHALLOO HEADS

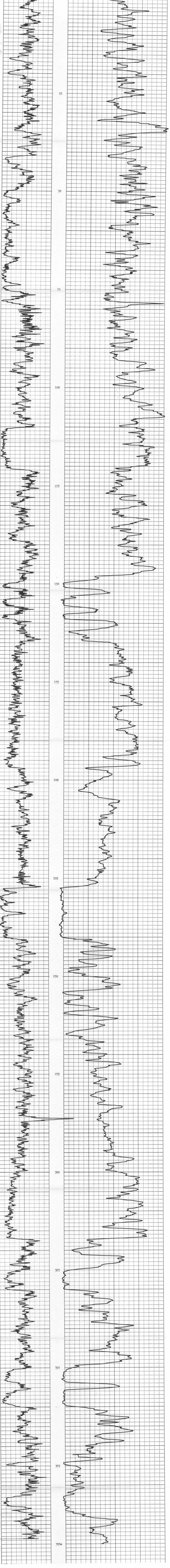


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K-Esain Pw20 8(3)A

 DAVIES EXPLORATION LOGGING LTD.	
COMPANY	CRICKENEST RESOURCES LIMITED
HOLE NUMBER	8PE - 205
LOCATION	Swift Park
PROVINCE	S. C.
ELEVATION	
LOG TYPE	Natural Gamma & Neutron
DATE	Aug. 17, 1957
DRILLED DEPTH	395m
LOGGED DEPTH	395m
LOG DATUM	C. +
HOLE DIAMETER	5 1/2"
CASING LENGTH	
REMARKS	T. 2. (Inside wall pipe)



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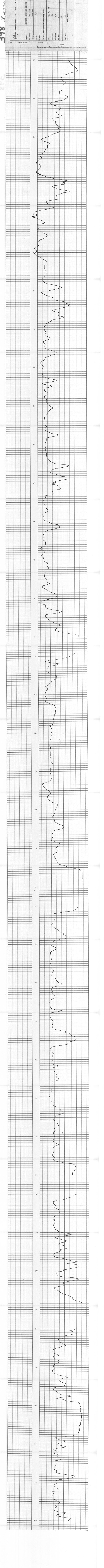
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DAVIES EXPLORATION LOGGING LTD.

COUNTRY: _____
COMPANY: _____
PROJECT: _____
DATE: _____

LOG TYPE: _____
DATE: _____
LOGGED BY: _____
CORRECTOR: _____

LOGGED DEPTH: _____
LOGGED BY: _____
CORRECTOR: _____

LOGGED DEPTH: _____
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CORRECTOR: _____

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LOGGED DEPTH: _____
LOGGED BY: _____
CORRECTOR: _____

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398
K. Edwin P. ... E(3)A



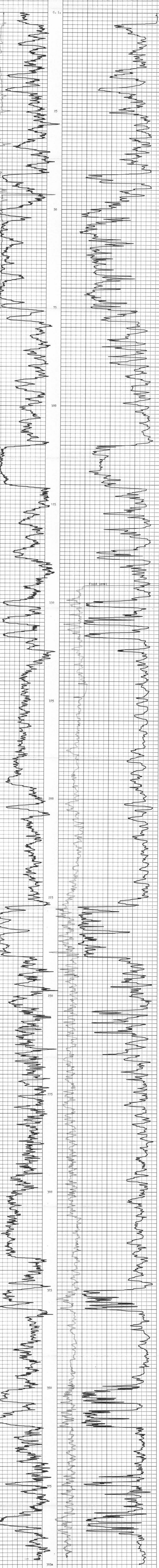
DAVIES EXPLORATION LOGGING LTD.

COMPANY: CHROMENEST RESOURCES LIMITED
HOLE NUMBER: EPR - 205
LOCATION: SMITH PASS

PROVINCE: B. C.
ELEVATION:
LOG TYPE: CALPER NATURAL GAMMA RESISTIVITY DENSITY

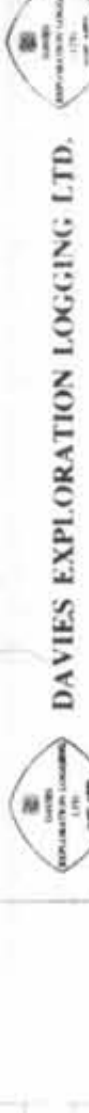
DATE: Aug. 17, 1951
DRILLED DEPTH: 395m
LOGGED DEPTH: 395m
ZERO DATUM: 0. L.
HOLE DIAMETER: 5"

CASING LENGTH: 3m
REMARKS: Density scale change at 14.5m (out of water).



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Shell
K. Edwin Pass 8131A



DAVIES EXPLORATION LOGGING LTD.

Company: Crown West Resources

Well Number: EPR - 201

Location: Basin Pass

Province: B.C.

Elevation:

Log Type: CALPER NATURAL GAMMA RESISTIVITY DENSITY

Date: July 23 1981

Spelled Depth: 345 m

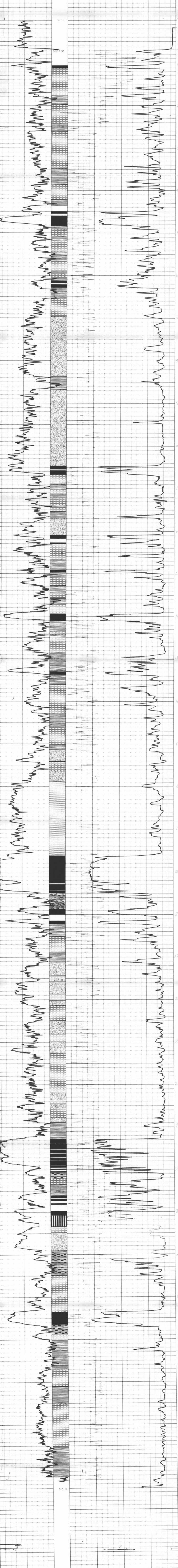
Logged Depth: 345 m

Tool Bit: G.L.

Wire Diameter: 5.1 1/2"

Casing Length: 7 m

Remarks:



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Well
K-Ewin Pass 81(3)A

DAVIES EXPLORATION LOGGING LTD.

COMPANY CROMWELL REFINED LIMITED
WELL NUMBER 218 - 217
LOCATION BATH PASS
PROVINCE S. O.

ELEVATION

LOG TYPE Core Speed Drilling

DATE Aug. 5, 1951

DRILLED DEPTH 377 1/2

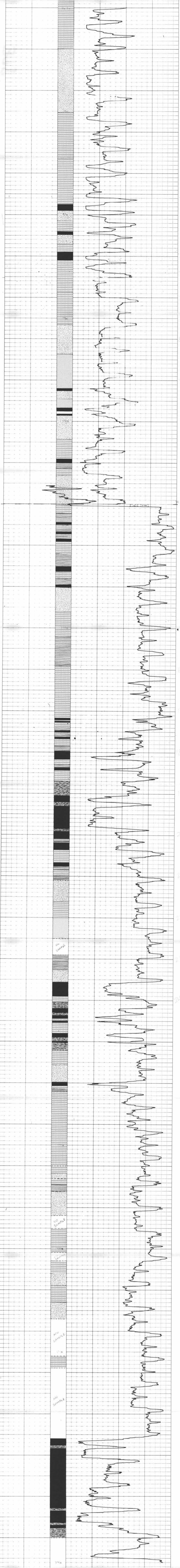
LOGGED DEPTH 377 1/2

LOG DITUM 2. 1.

WELL DIAMETER 5"

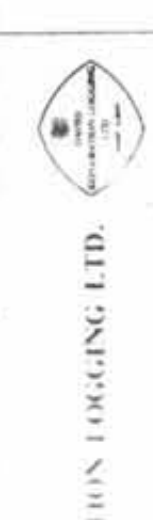
LOGGING LENGTH 17 1/2

REMARKS Logged through double wall drill pipe.



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K-Ewin Pass B(3)A

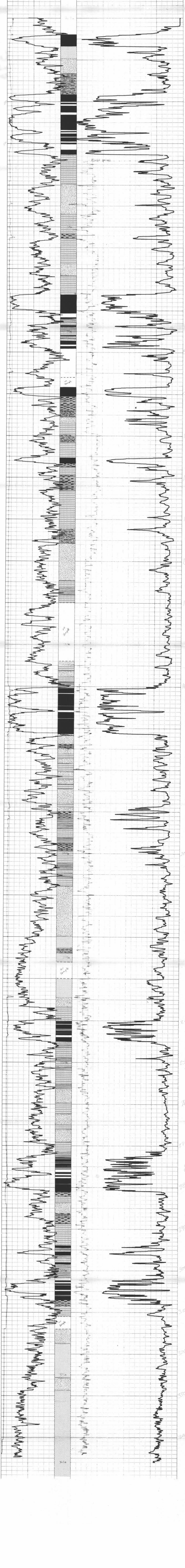


DAVIS EXPLORATION LOGGING LTD.

CLIENT: RESOURCES LIMITED
WELL NO: 704
LOG NO: Balm 7046
PROJECT: B. C.

DATE: Aug. 11, 1967

DRILLED BY: JRE
LOGGED BY: JRE
SUPERVISOR: G. L.
WELL DIAMETER: 5 1/2"
LOGGING LENGTH: 28



WELL NO: 704
LOG NO: Balm 7046
PROJECT: B. C.
DATE: Aug. 11, 1967
DRILLED BY: JRE
LOGGED BY: JRE
SUPERVISOR: G. L.
WELL DIAMETER: 5 1/2"
LOGGING LENGTH: 28

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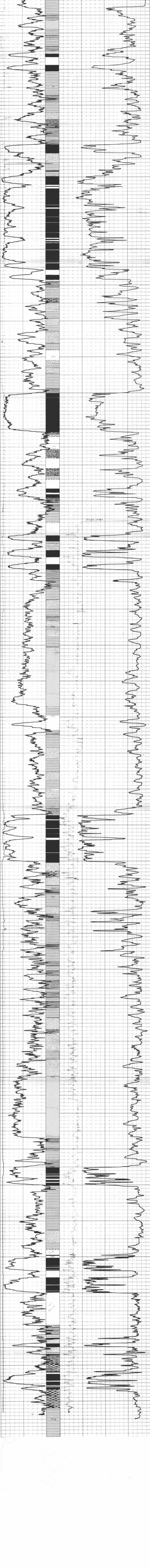
Well
Kilwin Pass 81(3)A



DAVIES EXPLORATION LOGGING LTD.

COMPANY	CROWSBY RESOURCES LIMITED
WELL NUMBER	81A - 995
LOCATION	SWIN FIVE
PROVINCE	S. C.
ELEVATION	

LOG TYPE	CALIPER NATURAL GAMMA RESISTIVITY DENSITY
DATE	Aug. 17, 1951
COILED DEPTH	305m
LOGGED DEPTH	305m
LOG DIAL	C. I.
WIRE DIAMETER	5"
CASING LENGTH	3m
REMARKS	Density scale change at 150m (net of wire).



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390

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well
K. Ewin Pass 81(3)A

STRATIGRAPHIC SECTION

DESIGNATION:

PART 1 OF 1

PROJECT: EWIN PASS
AREA: S.E., B.C.
LOCATION: CL 286

AUTHOR: P. LOCKWOOD
DATE: 1991
SOURCE OF DATA:
ROTARY DRILL - HOLE EPR 201

SCALE	CONTROL POINT	INTERVAL	LITHOLOGY	STRIKE & DIP	DESCRIPTION		SAMPLE
					MAIN	AMPLIFIED	
[m]							
0							
10.0		10.6 11.2		0.6	COAL		
					Siltstone		
					Shale		
20.0					Siltstone		
					Shale		
30.0					Siltstone		
					Shale		
40.0					Siltstone		
					Shale		
45.0					COAL		
		48.3		2.7 3.3	Shale		
					Siltstone		
					Shale		
50.0					Siltstone		
					Shale		
60.0					Siltstone		
					Shale		
		61.2		1.0	Siltstone		
		62.8		1.8 m	COAL		
					Shale		
					Siltstone		
70.0					Sandstone - very fine grain		
					Shale		
80.0					Sandstone - very fine grain - fine grain		
90.0							
100.0							
		104.7		1.6	COAL		
		106.7		2.0 m	Siltstone		
					Shale		
					Siltstone		
					Shale		
					Siltstone		
					Shale		
					Siltstone		
					Shale		
120.0					Sandstone - very fine grain		
		121.0		1.0	COAL		
		123.0		2.0 m	Siltstone		
					Shale		
					COAL		
					Shale		
130.0					Siltstone		
					Shale		
		129.2		0.5 m	Siltstone		
		129.7			Shale		
					Siltstone		
					Shale		
					Siltstone		
140.0					COAL		
		139.5		1.55 m	Shale - COALY		
		141.05			Siltstone		
					Shale		
					Siltstone		
150.0					Shale		
		153.0		0.7 m	COAL		
		153.7			Shale		
					Siltstone		
160.0					Shale		
					Siltstone		
					Shale		
					Sandstone - fine grain		
					Siltstone		
					Sandstone - fine grain		
180.0					Sandstone - medium grain		
190.0							
		196.28		8.32 8.72 m	COAL		
200.0					Shale - carbonaceous		
		205.0					
					COAL		
		208.7		1.3 m	COAL		
210.0					Shale		
		211.4		0.8 m	COAL		
		212.2			Shale		
					Siltstone		
					Shale		
220.0					Sandstone - very fine grain		
					Siltstone		
					Sandstone - very fine grain		
230.0					Siltstone		
					Sandstone - very fine grain		
					Siltstone		
					Sandstone - very fine grain		
240.0					Siltstone		
					Sandstone - very fine grain		
					Siltstone		
					Sandstone - very fine grain		
250.0					Siltstone		
					Sandstone - very fine grain		
					Siltstone		
					Sandstone - very fine grain		
260.0					Shale		
		262.82		6.42 7.89 m	COAL		
					Shale - COALY		
					Siltstone		
270.0					Shale		
		270.71					
					COAL		
					Siltstone		
					Sandstone - fine grain		
290.0					Shale - COALY		
					Siltstone		
300.0					Siltstone		
		303.5		2.9 m	COAL		
		306.4			Shale - COALY		
310.0					Siltstone		
					Shale		
					Siltstone		
					Shale		
320.0					Siltstone		
					Shale		
330.0					Siltstone		
					Shale		
340.0					Siltstone		
					Shale		
350.0					T.D. 345.0 m		

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shell
K-Ewin Pass 81(3)A

STRATIGRAPHIC SECTION

DESIGNATION: CHIP SAMPLES PART 1 OF 1

PROJECT: EWIN PASS
AREA:
LOCATION:

AUTHOR: P. Gilmar DATE: 1981
SOURCE OF DATA:
EPR-202 CHIP SAMPLES
NO GEOPHYSICAL LOGS (CAVED HOLE)

SCALE	CONTROL POINT	INTERVAL	LITHOLOGY	STRIKE & DIP	DESCRIPTION		SAMPLE
					MAIN	AMPLIFIED	
0							
5						NO SAMPLE	
10							
15						Siltstone/ Shale	
20						NO SAMPLE	
25						Siltstone Some calcite	
30						Sandstone	
35						Siltstone	
40						Siltstone/ Sandstone	
45						Sandstone	
50						Siltstone Some calcite	
55						NO SAMPLE	
60							
65						Sandstone	
70		71 m				NO SAMPLE	
72.5		72.5 m				COAL Shaly	
75						NO SAMPLE	
77		77m				COAL Shaly	
78		78m				NO SAMPLE	
80						Siltstone	
85						Shale	
90						Shale Carbonaceous	
95						Shale	
100						Shale Coaly, siltstone, sandstone	
105		104.5m 105m				Siltstone	
110		110m 112m				NO SAMPLE COAL Carbonaceous shale Shale	
115						Shale Carbonaceous	
120						Shale	
125						Shale Carbonaceous	
130						Shale	
133		133m				COAL Carbonaceous shale	
134		134m				Siltstone/ Shale	
140						Siltstone	
145						Siltstone/ Shale	
150		150m 151m				Shale Carbonaceous COAL Carbonaceous shale	
155						Siltstone/ Shale	
160						Siltstone/ Sandstone	
165						Sandstone	
170						Siltstone	
175						Siltstone/ Sandstone	
180						Siltstone	

ORIGINAL FILE #
V4-145

398 ^{Shell} K₇Ewin Pass 81(3)A

STRATIGRAPHIC SECTION

DESIGNATION:

PART 1 OF 1

PROJECT: EWIN PASS

AUTHOR: P. LOCKWOOD

DATE: 1981

AREA: S.E., B.C.

SOURCE OF DATA:
ROTARY DRILL HOLE EPR - 203

LOCATION: CL 286

SCALE	CONTROL POINT	INTERVAL	LITHOLOGY	STRIKE & DIP	DESCRIPTION		SAMPLE
					MAIN	AMPLIFIED	
[m]							
	0					Siltstone	
	10.0					Sandstone - very fine grain	
	20.0						
	30.0					Siltstone	
	40.0						
	47.5m					COAL	
	50.0					Sandstone - very fine grain	
						Siltstone	
					4.7 / 13.5m	COAL	
						Sandstone - very fine grain	
						Siltstone	
	60.0	61.0m				COAL	
						Siltstone	
	70.0						
	80.0					Sandstone - fine grain	
	90.0					Sandstone - medium grain	
	92.0						
					1.7 / 6.6 m	COAL - with fine grain - medium grain sandstone	
	98.6					Sandstone - fine grain	
						Siltstone	
	109.1	110.0			0.9	COAL	
						Shale	
						Siltstone	
	120.0					Sandstone - fine grain	
						Siltstone	
						Shale	
	124.4				1.6 / 4.7 m	COAL - with shale/siltstone	
	129.1					Siltstone	
						Shale	
	135.1	136.3			1.2	COAL	
						Siltstone	
	139.6	140.2			0.6	Shale	
						COAL	
	150.0					Sandstone - very fine grain	
						Siltstone	
						Shale	
	160.0						
						Siltstone	
	170.0						
		171.8					
					4.3 / 12.6 m	COAL - with siltstone/shale splits	
	184.4					Siltstone	
						Shale - black, carbonaceous	
	190.0	190.6			11.25 / 17.0 m	COAL - with carbonaceous shale/siltstone splits	
	200.0						
		20.76				Shale	
						Siltstone	
						Shale	
						Sandstone - very fine grain	
	220.0					Siltstone	
						Sandstone - medium grain	
	230.0					NO SAMPLE	
		235.6				Sandstone - very fine grain	
	240.0				11.9 / 19.7 m	COAL - with siltstone/carbonaceous shale splits	
	250.0	250.3				Shale - carbonaceous	
						Siltstone	
						Sandstone - very fine grain	
	260.0	259.8 / 260.7			0.9 m	COAL	
						Siltstone	
						Shale - carbonaceous	
						Siltstone	
	270.0						
						Sandstone - very fine grain	
						Siltstone	
						Shale	
	290.0					Sandstone - very fine grain	
						NO SAMPLE	
	300.0					Siltstone	
						NO SAMPLE	
						Siltstone	
						Sandstone - very fine grain	
	310.0					Siltstone	
						Sandstone - very fine grain	
	320.0						
						Siltstone	
	330.0						
						NO SAMPLE	
		346.0					
	350.0				19.8 / 21.7 m	COAL - with carbonaceous shale splits	
		367.7					
	370.0						
	380.0					TD 377.0m	

STRATIGRAPHIC SECTION

DESIGNATION:

PART 1 OF 1

PROJECT: EWING PASS

AUTHOR: P. LOCKWOOD

DATE: 19 81

AREA: S.E. B.C.

SOURCE OF DATA:

LOCATION: C.L. 282

ROTARY DRILL HOLE E-PR-204

SCALE	CONTROL POINT	INTERVAL	LITHOLOGY	STRIKE & DIP	DESCRIPTION		SAMPLE
					MAIN	AMPLIFIED	
		4.0m					
		6.75m		2.75m	COAL		
					Sandstone	Medium grain	
		10.0			Sandstone	Fine grain	
					Shale		
		18.40m					
		20.0					
				9.75/ 14.9m	COAL		
		30.0					
		32.60m			Siltstone		
		40.0			Sandstone	Fine grain	
					Siltstone		
					Shale	Coaly	
					Siltstone		
		60.0			Sandstone	Fine grain	
					Siltstone		
		66.30m					
		70.0					
				6.90 / 12.80	COAL	with Siltstone & Shale	
		79.10m					
		88.4m					
		90.0					
		90.5m		2.1m	COAL		
					Shale	coaly	
					Shale	carbonaceous	
					Sandstone	Fine grain	
					Siltstone		
		100.0			Shale	Carbonaceous	
					Siltstone		
		105.4m			COAL		
		106.6m		1.2m	Shale	coaly	
					Siltstone		
		110.0			Shale	Coaly	
					Siltstone		
		120.0			Shale	Carbonaceous	
					Sandstone	fine grain	
		130.0					
					Siltstone		
					Shale		
		140.0			Siltstone		
		150.0					
					Sandstone	fine grain	
					Siltstone		
					Sandstone	fine grain	
		160.0			Siltstone		
		160.45m			Shale		
				9.90m/ 10.95m	COAL		
		170.0					
		171.40m			Sandstone	fine grain	
					Shale	coaly	
					Sandstone	fine grain	
					Siltstone		
					Sandstone	fine grain	
		180.0			Siltstone	fine grain	
					Siltstone		
					Sandstone	fine grain	
					Siltstone		
					Sandstone	fine grain	
		190.0			Siltstone	fine grain	
					Sandstone		
					Shale	coaly	
					Shale		
					Siltstone		
					Shale	coaly	
		200.0					
					Siltstone		
					Shale		
					Siltstone		
					Shale		
					Siltstone		
		210.0					
					Sandstone	fine grain	
		220.0					
					Sandstone	medium grain	
					Shale		
					Sandstone	medium grain	
		230.0					
					Sandstone	medium grain	
					Sandstone	fine grain	
		240.0			Siltstone		
		240.2m					
				3.52/ 4.8m	COAL		
		245.0m			Shale		
					Siltstone		
		250.0			Shale		
					Siltstone		
					Shale		
					Siltstone		
					Shale		
					Sandstone	fine grain	
		260.0					
					Sandstone	medium grain	
					Sandstone	fine grain	
					Sandstone	medium grain	
					Sandstone	fine grain	
		270.0			Siltstone		
		272.8m			Shale		
				7.30/ 8.30m	COAL		
		280.0					
		281.10m			Shale	coaly	
					Siltstone		
					Sandstone	fine grain	
					Shale	coaly	
		290.0					
					Siltstone		
		293.90m			1.65/ 4.46m	COAL	with shale and siltstone
					COAL		
		298.35m			Shale		
		300.0					
		302.3m					
				3.22/ 4.80m	COAL		
		307.0m			Shale		
					Siltstone		
		310.0					
					Sandstone	fine grain	
		320.0					
					Sandstone	medium grain	
					Sandstone	fine grain	
		330.0					
					Sandstone	medium grain	
		340.0					
		350.0					
					TD 348.0m		

398 ^{Spill} K. Ewin Pass 8(C3)A

STRATIGRAPHIC SECTION

DESIGNATION:

PART 1 OF 1

PROJECT: EWIN PASS

AUTHOR: P. LOCKSWOOD

DATE: 1981

AREA: S.E. B.C.

SOURCE OF DATA: ROTARY DRILL - HOLE EPR 205

LOCATION: CL 287

SCALE	CONTROL POINT	INTERVAL	LITHOLOGY	STRIKE & DIP	DESCRIPTION		SAMPLE
					MAIN	AMPLIFIED	
[m]							
						Siltstone	
						Shale	
						Sandstone - medium grain	
10.0						Siltstone	
						Shale	
						Siltstone	
						Shale	
		15.8		0.8		Sandstone - medium grain	
		16.6				COAL	
20.0		18.8		1.7		COAL	
		20.5				Siltstone	
						Shale	
30.0						Siltstone	
						Sandstone - fine grain	
						Shale - carbonaceous	
						Shale	
40.0		41.0				Siltstone	
						Shale	
						COAL	
						Sandstone - fine grain	
						Siltstone	
						COAL	
						Siltstone - fine grain	
50.0						Sandstone	
						COAL	
						COAL	
						COAL	
						COAL	
60.0				26.53			
				38.40			
						COAL	
						COAL	
70.0						COAL	
						COAL	
						COAL	
80.0		78.4				Siltstone	
						Shale	
						Siltstone	
						Shale - COALY	
						Sandstone - fine grain	
						Siltstone	
90.0						Sandstone - fine grain	
						Siltstone	
						Sandstone - fine grain	
						Siltstone	
100.0						Sandstone - fine grain	
						Siltstone	
						Sandstone - fine grain	
						Siltstone	
110.0		110.04				Shale	
						COAL	10.76
						Shale - COALY	
120.0		120.8				Siltstone	
						Shale - carbonaceous	
130.0						Shale - carbonaceous	
						Siltstone	
						Shale - carbonaceous	
						Siltstone	
140.0		136.6		1.80		COAL	
		139.0		2.40 m		Shale - carbonaceous	
						Siltstone	
						Shale	
						Siltstone	
150.0		149.6				COAL	4.80
						COAL	10.40 m
160.0		159.0				Shale	
						Siltstone	
						Sandstone - fine grain	
170.0						Siltstone	
						Shale	
						Sandstone - fine grain	
						Siltstone	
						Sandstone - fine grain	
180.0						Siltstone	
						Sandstone - fine grain	
						Sandstone - medium grain	
190.0						Siltstone	
						COAL - shaly	
200.0						Shale	
						Siltstone	
210.0						Sandstone - fine grain	
						Siltstone	
						Sandstone - fine grain	
220.0						Siltstone	
						Sandstone - fine grain	
						Siltstone	
230.0		227.17				COAL	11.65
						COAL	13.05 m
240.0		240.35				Sandstone - fine grain	
						Shale - COALY	
						Sandstone - fine grain	
250.0						Siltstone	
						Shale	
						Siltstone	
						Sandstone - fine grain	
260.0						Shale	
						Siltstone	
						Shale	
270.0						Siltstone	
						Shale	
						Siltstone	
						Shale	
280.0						Siltstone	
						Sandstone - fine grain	
						Shale - COALY	
290.0						Sandstone - fine grain	
						Siltstone	
						Sandstone - fine grain	
300.0						Sandstone - medium grain	
						Siltstone	
310.0						Shale	
						Siltstone	
						Shale	
320.0						Siltstone	
						Shale	
		325.2				COAL	3.96
						COAL	5.05 m
330.0		330.25				Siltstone	
						Sandstone - fine grain	
						Siltstone	
340.0						Sandstone - fine grain	
						Siltstone	
350.0		349.55				COAL	7.25
						COAL	10.27 m
360.0		359.82				Shale	
						Siltstone	
						Shale	
370.0						Siltstone	
		372.5				COAL - with sandstone	1.35
						COAL	4.50 m
						Shale - carbonaceous	
380.0		377.0				COAL	3.55
						COAL	4.85 m
		381.80				Shale - COALY	
390.0						Siltstone	
		386.65				TD 395.0m	
400.0							
410.0							