CABIN CREEK

COAL EXPLORATION

1980

Coal Licences Group 244, Licences 595-601 Inclusive and 4742 (8 total)

Kootenay Land District, Southeast British Columbia

National Topographic Series: 82 G/2 (Lower Flathead)

Latitude and Longitude: 49 degrees, 08 minutes north,
114 degrees, 43 minutes west

Owner: Shell Canada Resources Limited

Operator: Crows Nest Resources Limited

Consultant and Author: Dennis E. Bell, P. Geol.
Max Air Exploration Limited
P.O. Box 878
Jasper, Alberta
T0E 1E0

Field Work: September, 1980

Submission Date: May 28, 1981

CNRL Coal Land Disposition Map HH 36B

1/Rd.1

PROFESSIONAL VERIFICATION REPORT

Entitled: Cabin Creek Coal Exploration, 1980
Kootenay Land District
Southeast British Columbia
B.C. Coal Licences
Nos: 595-601 Inclusive, and 4742

Mr. Dennis E. Bell carried out the 1980 geological field program on the Cabin Creek, British Columbia coal licences held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited.

Dennis E. Bell, B.Sc., graduated in Geology from Dalhousie University in 1965. Since 1968 he has specialized in basic field mapping, structural interpretation, and exploration supervision in the coking coal belt of British Columbia and Alberta. He has worked on projects similar to Cabin Creek for such major coal companies as Manalta Coal Ltd., Luscar Ltd., Fording Coal Ltd., and Petrocan. Mr. Bell is registered as a Professional Geologist in the Association of Professional Engineers, Geologists, and Geophysicists of Alberta.

I consider the aforementioned geologist to be well qualified to undertake responsibilities he was assigned for this project. I am satisfied that the attached report dated May 29, 1981, has been competently prepared and justly represents the information obtained from this project.

J.J. Crabb, P. Eng.

May 28, 1981

TABLE OF CONTENTS

ILLUSTRATIONS

APPENDICES

1/Rd.4

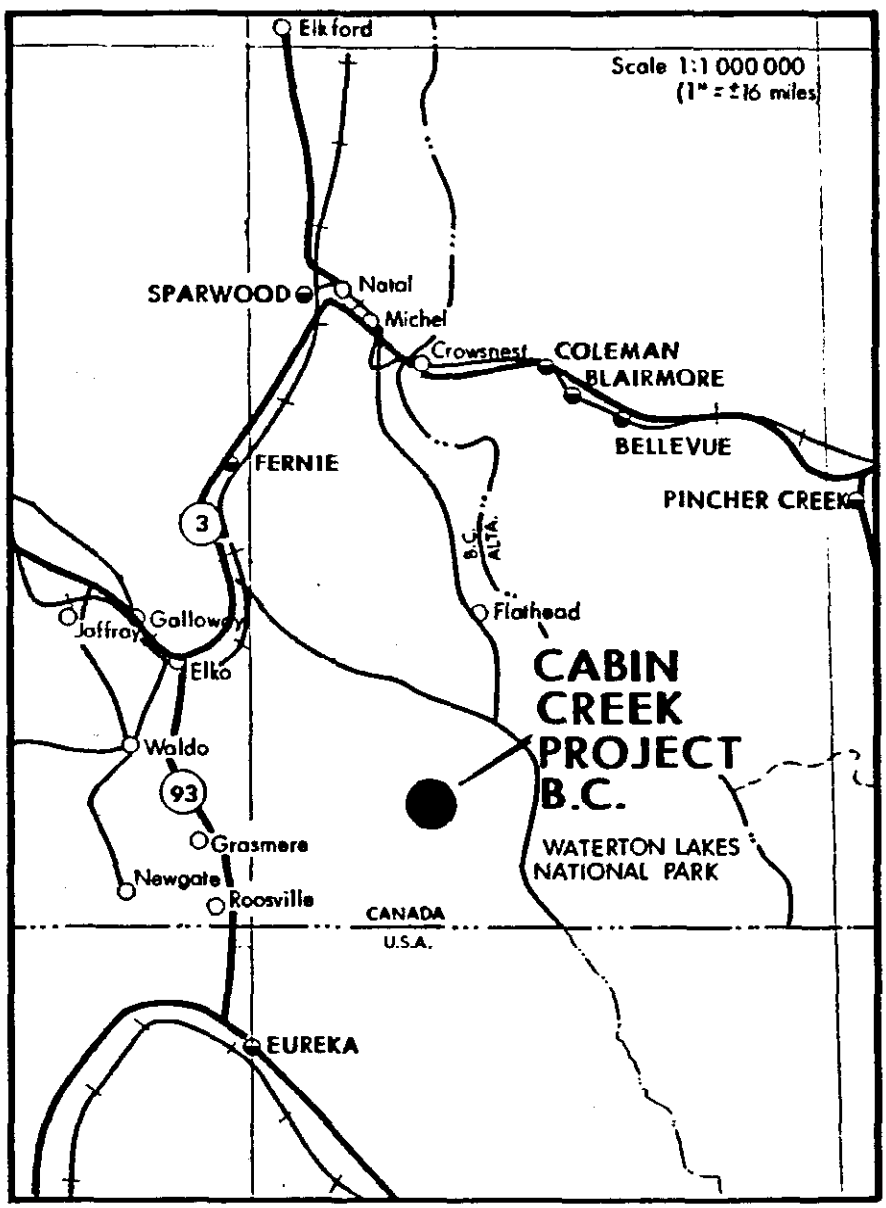
CROWS NEST RESOURCES LIMITED
SHELL CANADA RESOURCES LIMITED

Report on Coal Licences

595 to 601 Inclusive

and

4742



CABIN CREEK PROJECT

KOOTENAY DISTRICT B.C.

1.0 SUMMARY

In September, 1980 the author spent seven days, including mobilization, demobilization, and bad weather, doing detailed geologic mapping of 1:5,000 scale on one (595) of the eight Cabin Creek, southeast British Columbia Crows Nest coal licences.

Licence 595 covers a small erosional remnant of Kootenay Group sediments that is isolated from the main body of the Cabin Creek licences, which themselves cover a longer and larger erosional remnant of the same sediments with already-proven coal reserves (see 1978 and 1979 reports).

The object of the mapping was to determine if there was a posibility of occurence of uneroded Kootenay high enough in the geologic section to contain the two thicker coal seams found in the other Cabin Creek licences two km to the southwest across the intervening Storm Creek.

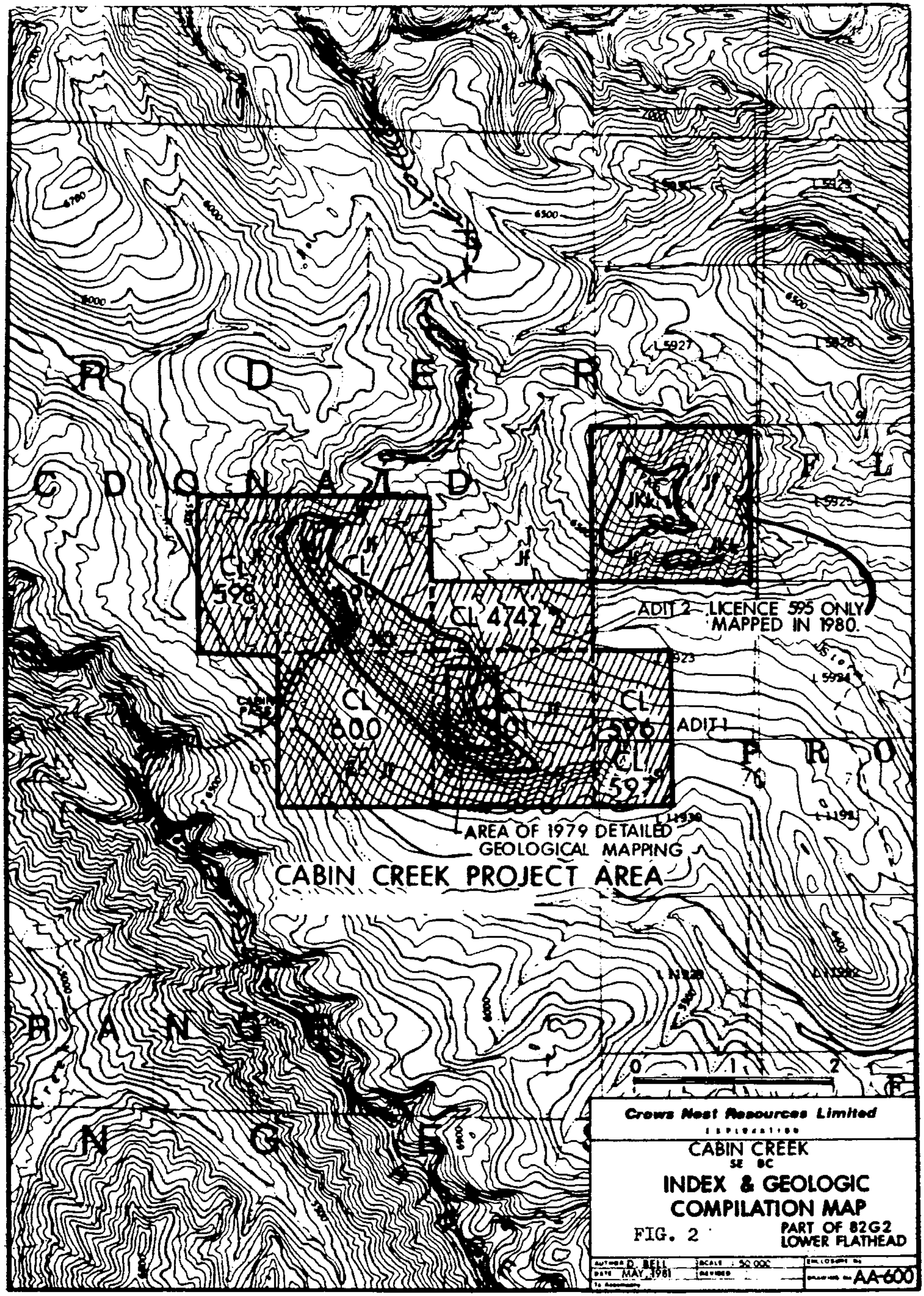
The mapping was done on foot, partly in traverses up from the valley bottom and partly from helicopter, by the author and one companion. The terrain is mostly steep, awkward, forested, and brushy.

The results indicate that the licence does contain, entirely within its boundaries, a section of Weary Ridge and Moose Mountain Members (i.e. the Fernie Passage Beds and Basal Sandstone of older terminology) and possibly some of the lowermost Mist Mountain Formation (i.e. Coal-Bearing Member) beds.

Several further days of detail mapping, with a couple of pairs of hand-trenchers to expose the four bloom and outcrop occurrences of coal discovered, would be in order.

The geology is unexpectedly complex. Exposure of outcrop is considerably less than satisfactory. No unified overall structural form is yet evident to the author.

The following page, Fig. 2, Index and Geologic Compilation Map, outlines the licences, topography, and coal-bearing terrain. The symbol Jf indicates Jurassic Fernie Group sediments, of non-interest, and the symbol JKk outlines the Jurassic-Cretaceous Kootenay Group prospective sediments.



MACDONALD RANGE
FLATHEAD
CL 598
CL 600
CL 4742
CL 596
CL 597
ADIT 1
ADIT 2
LICENCE 595 ONLY
MAPPED IN 1980.
AREA OF 1979 DETAILED
GEOLOGICAL MAPPING
CABIN CREEK PROJECT AREA
L 5927
L 5928
L 5925
L 5924
0
1
2
Crows Nest Resources Limited
EXPLORATION
CABIN CREEK
SE BC
INDEX & GEOLOGIC
COMPILATION MAP
FIG. 2
PART OF 82G2
LOWER FLATHEAD
AUTHOR D. BELL
SCALE 1:50 000
DATE MAY 1981
AA-600

2.0 INTRODUCTION

2.1 Coal Land Tenure

Eight licences (595-601 inclusive and 4742) compose Group 244, 1426 hectares. Licence 595, the only licence examined in 1980, comprises 259 hectares, and its boundaries coincide with Lot 5926.

The following table, entitles "Fig. 3, B.C. Coal Licences Tenure Standing, Cabin Creek", gives details of tenure.

FIG. 3

CROWS NEST RESOURCES LIMITED
EXPLORATION

B. C. COAL LICENCES TENURE STANDING

BLOCK: CABIN CREEK
GROUP: #244
PROJECT: CABIN CREEK
KOOTENAY LAND DISTRICT
YEAR: 1980 - 81
DATE: MAY, 1981

PROJECT NAME	PROJECT LICS. TOTAL NO.	PROJECT AREA TOTAL AC/HA	BLOCK NAME	BLOCK LIC. TOTAL NO.	BLOCK AREA TOTAL AC/HA	GROUP NO.	GROUP LICS. TOTAL NO.	GROUP AREA TOTAL AC/HA	GROUP YEAR	LICENCE NO.	LICENCE LEGAL DESCRIPTION	LICENCE AREA TOTAL AC/HA	ACQ/ADM YEAR	ACQ/ADM FEES $10³	RENTALS ANNUAL $	RENTALS TOTAL TO NEXT ANNV $10³	REQUIREMENT WORK EXPIRED $10³	REQUIREMENT WORK CURRENT YEAR LIC. YEAR	REQUIREMENT WORK CURRENT YEAR $	REQUIREMENT WORK FOR FULFILMENT YEAR	REQUIREMENT WORK FOR FULFILMENT $	REQUIREMENT WORK ANNIVERSARY DATE	BUDGET CURRENT YEAR AFE	BUDGET CURRENT YEAR $10³	EXP TOTAL $10³	POTL SHELL CLASS	COMMITMENTS, J. V. OTHER THAN B.C. GOV'T DESCRIPTION	REMARKS
CABIN CREEK	8	1426	CABIN CREEK	8	1426	244	8	1426					76 79	101	7,130	34	79.6	286	17,625	8 6+					540	Y		
													75	101	8,480	32.1	77	6	18,000	9	128,000	FEB. 28				Y		
										595	LOT 5926	259																
										596	SW¼ 5923	65																
										597	NW¼ 11,930	65																
										598	UNSURVEYED	65																
										599	UNSURVEYED	130																
										600		259																
										601		259																
											TOTAL	1296																
										4742	UNSURVEYED	130	79	0.01	650	1.9	2,600	2	1,625	8+	26,520	FEB. 28				Y		
						PRIOR TO 1979								WORK DONE	PRIOR TO'78	1978	1979		1980									
						106	7	1296 Ha 3200 Ac						$	-	221,144	19,134		9,986									

GENERAL REMARKS: [illegible] COAL DEVELOPMENT POTENTIAL IS [illegible] UNLESS OTHERWISE STATED, LICENCES HELD BY [illegible] IS THE OPERATOR.

2.2 Location, Geography, and Physiography

and

2.3 Access

The 1978 Cabin Creek report by J. Horachek contains an excellent location and access section (Section 2, Regional Setting), including mileages and route for rail. The reader is referred to this report.

Licence 595, the only one of the Cabin Creek licences examined in 1980, is separated from the main block of the other seven Cabin Creek licences by the erosion of Storm Creek, a tributary to Cabin Creek. The distance across the valley is approximately two km and makes licence 595 in effect a separate block.

The Storm Creek valley has been clear-cut for timber, and there is a network of logging trail reaching up close to, but not quite into, the Kootenay sediments of the licence. Most of this is presently impassable.

The mapping crew hacked out one landing site for a helicopter; it is on a cliff edge at 2125 m (6980 feet) and landing is difficult. Future work should be preceeded by a further chain-sawed site.

The terrain is steep and forested, with a lot of low-level brush.

2.4 Environment

Almost the whole of the Kootenay-bearing terrain in licence 595 is above 2,000 m (6560 feet), and the peak of the knob is 2214 m (7264 feet). The climate and exposure to wind and weather reflect this high altitude.

The forest cover is mostly a combination of south- and west-facing patchy forest and brush, sunlit and dry, and north- and east-facing denser and wetter forest. This is a typical Rocky Mountain character. No part of the licence is above treeline.

The north- and east-facing cirques and slopes may be expected to have snow into late May.

3.0 WORK DONE

3.1 Summary of Previous Work

In 1978 Crows Nest successfully completed two adits, one into each of the two thick (4 and 10m) seams left as erosional remnants in the main block of seven Cabin Creek licences on the southwest side of Storm Creek. The structure is simple, and there is an in-place reserve of 8.2 million tonnes of medium volatile bituminous coal, showing washed sample F.S.I.s of 5 1/2 to 6 1/2. No geologic mapping, other than that inside the adits, was done. The report is by J. Horachek, presently in the Calgary head office.

In 1979 the author spent three days of detailed chained mapping in the immediate area of the adits. This was meant to be a start of the approximate month of detail mapping that could be done. This is covered in the 1979 report. No equipment work was done in 1979.

3.2 Scope and Objective of 1980 Exploration

From the air, cliffs and patches of Moose Mountain Member (Basal Sandstone) boulders are easily identifiable over the knob centered in licence 595. In addition, reconnaissance foot mapping of a previous year had turned up a hand-trenchable occurrence of coal on the knob.

The objective of the mapping was to outline the extent and nature of the Kootenay part of the erosional remanant knob. Previous work had been confined to the larger remnant covered by the seven southwestern Cabin Creek licences.

The particular objective was to examine how much space there was, structurally, within which coal beds may occur, and to outline whatever structural shapes may be apparent or deducible.

3.3 Work Done in 1980

The author spent approximately five days in detail mapping on licence 595, and outlined an area of approximately half to three quarters of a square kilometer irregularly crowning this northwest Cabin Creek knob underlain by Weary Ridge, Moose Mountain, and possibly some lowermost Mist Mountain (formerly Coal-Bearing Member) beds.

The positions of three other coal bloom or outcrop occurrences were mapped as well as the position of the coal noted in the original reconnaissance.

3.4 Costs of Work Done in 1980

Detailed costs of the 1980 Cabin Creek geologic program are contained in the Application To Extend Term Of Licence on the following pages.

Total cost of the 1980 program is calculated to be $9,986.

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

APPLICATION TO EXTEND TERM OF LICENCE

I, Bolton Agnew (Name) agent for Shell Canada Resources Limited (Name)

PO. Box 100 (Address)
Calgary, Alberta, . T2P 2H5

(Address)

Valid FMC No. 207568

hereby apply to the Minister to extend the term of Coal Licence(s) No(s). 595 to 601 Inclusive, and 4742, 8 licences, 1426 Hectares

for a further period of one year.

2. Property name Cabin Creek, Group No. 244, 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 28, 1980 to February 27, 19 81, work to the value of at least $ 9,986.20 on the location of coal licence(s) as follows:

CATEGORY OF WORK	Licence(s) No(s).	Apportioned Cost
Geological mapping	595 - 601 and 4742	9,762.70
Surveys: Geophysical		
Geochemical		
Other		
Road construction		
Surface work		
Underground work		
Drilling		
Logging, sampling, and testing		
Reclamation		
Other work (specify)		
Off-property costs		223.50

5. I wish to apply $ 9,986.20 of this value of work on Coal Licence(s) No(s). 595 to 601 Incl. and 4742

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 Cabin Creek Geological Report 1980 will be submitted in ninety days

(Date)

(Signature)

Land Supervisor
(Position)

(FORMS AND REPORT TO BE SUBMITTED IN DUPLICATE)

CATEGORY OF WORK

GEOLOGICAL MAPPING Yes ☒ No ☐

		Area (Hectares)	Scale	Duration
Reconnaissance				
Detail:	Surface	1500	1:5000	5 Man-Days
	Underground			
*Other (specify)				
			Total Cost	$ 9,762.70

GEOPHYSICAL/GEOCHEMICAL SURVEYS Yes ☐ No ☒

Method
Grid
Topographic
*Other (specify)

Total Cost $

ROAD CONSTRUCTION Yes ☐ No ☒

Length Width
On Licence(s) No(s).
Access to

Total Cost $

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
Test Adits					
*Other workings					
				Total Cost	$

DRILLING Yes ☐ No ☒

		Hole Size	No. of Holes	Total Metres	Cost
Core:	Diamond				
	Wireline				
Rotary:	Conventional				
	Reverse circulation				
*Other (specify)					
Contractor					
Where is the core stored?					
				Total Cost	$

LOGGING, SAMPLING AND TESTING Yes ☐ No ☒

Lithology:	Drill samples	☐	Core samples	☐	Bulk samples	☐
Logs:	Gamma-neutron	☐	Density	☐		
*Other (specify)						
Testing:	Proximity analysis	☐	FSI	☐	Washability	☐
	Carbonization	☐	Petrographic	☐	Plasticity	☐
*Other (specify)						

OTHER WORK (specify details) Cost

Drafting 223.50

Total Cost	$ 223.50
On-property costs	9,762.70
Off-property costs	223.50
Total Expenditures	$ 9,986.20

Feb 25/87
(Date)

(Signature)

Manager - Accounting, CNRL
(Position)

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

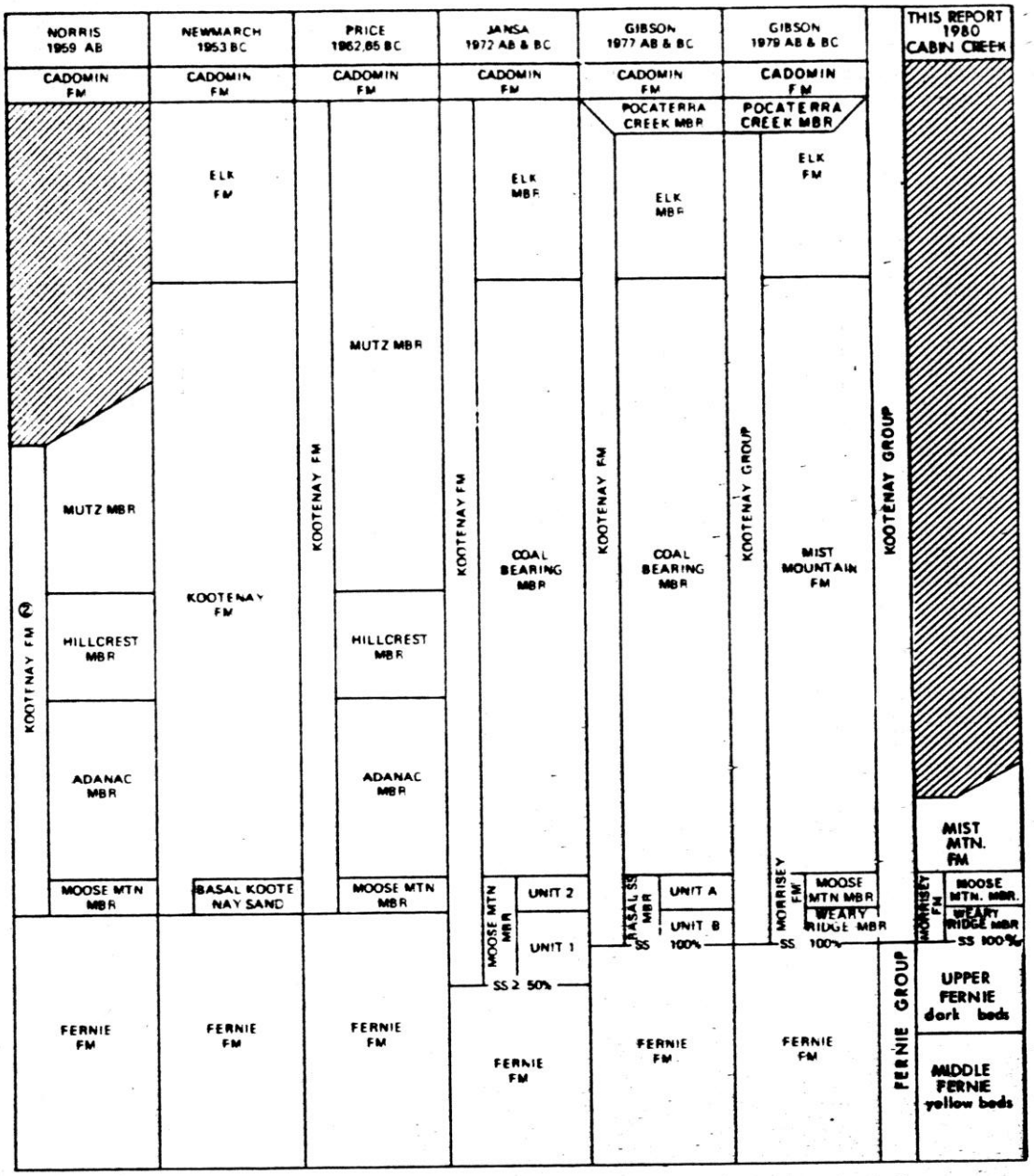
4.0 GEOLOGY

4.1 Regional Geology and 4.2 Stratigraphy

As this 1981 mapping of less than a week's duration is a continuation of the 1979 and 1978 Cabin Creek geologic work, details of regional and stratigraphic geology are not reproduced here. The reader is referred particularly to J. Horachek's 1978 report, in which the stratigraphic sequence of the main southwestern block of licences is discussed.

In addition, the reader is referred to the carefully selected bibliography included as section 6.0 in this report.

On the following page is Fig. 4, Cabin Creek formational Diagram, which summarizes the terminology and sequence. On it is the last column on the right, showing the author's terminology for this 1980 licence 595 mapping. It is uncertain how much, if any, of the coal-bearing Mist Mountain Formation is left, as the coal occurrences noted in the mapping (four) may be beds equivalent to the coal noted by the author in the thick sequence of Moose Mountain-equivalent sandstones above the orange-weathering Weary Ridge in the main block of licences southwest across the creek.



① Name 'Kootenay' from Dawson, 1886

Crows Nest Resources Limited
EXPLORATION

SE BRITISH COLUMBIA

FORMATIONAL DIAGRAM
CABIN CREEK

Figure 4

AUTHOR D.E. BELL SCALE N.T.S. ENCLOSURE No.
DATE MAY, 1981 REVISED DRAWING No. AA-601

There is also coal in this interval on Crows Nest's Lodgepole property. The problem is that the Basal or Moose Mountain Sandstones in this southern portion of the coal fields are apparently much thicker than elsewhere to the north, and it may be easier to think of these sandstones as equivalents only.

4.3 Structural Geology

The structure of the knob covered by licence 595 appears to remain unsolved at the present. The author found a wide variety of strike and dip, almost omni-present faulting in what little outcrop there is, and hidden faulting as evidenced by the unexpected altitudes of some of the units. The licence is, in short, as much a mystery as the southwest main block is simple.

Particularly missing is that typical Rockies' coal terrrain character of topographic ridge and recessive interval which facilitates structural work on many coal licences (the southwest Cabin Creek terrain containing the already-proven reserve is a fine example). Part of this is due to the glacial erosion involved in the cirque building on the north and east sides of the licence, and part is no doubt due to the copious faulting, which has broken up the natural erosional character.

4.4 Results of the Mapping Program

The basic question at the start of the mapping was both stratiraphic and structural: is there Mist Mountain section (i.e. formerly Coal-Bearing Member) in licence 595, and if there is, how much of it is there and what is its shape?

The author answers a qualified yes to the presence of Mist Mountain section. To start with, there is a normal, albeit structurally confused, sequence of Middle Fernie yellow silty limestones, then dark Upper Fernie marine siltstones and shales, then the orange-weathering Weary Ridge sandstones and siltstones (i.e. the Fernie Passage Beds of earlier terminology). The next section is composed of what is probably a series of hard, light-grey weathering, massive, prominent, medium- and coarse-grained sandstones. These are equivalent, laterally, to the Moose Mountain or Basal Sandstne to the north. But thicknesses are several times greater, and there are known thin coal and coaly beds within this interval. These may account for the four coal occurrences identified for hand trenching.

The problem is that exposure is poor, and the author does not yet know the thickness of this sandstone succession. This thickness would be easily measurable across the valley to the southwest, but that part has not yet been mapped.

Therefore it may be that one or more of the coal occurrences are in part of what may be lowermost Mist Mountain beds and this is what the author's intuition tells him. an educated guess But he also feels that there is probably not enough Mist Mountain left to have section as high as the two thick seams on the southwest side of the valley.

There is enough outcrop available around the north, east, and south sides, mostly in the form of small cliffs lines and steep shale banks, to say that the extent of the Kootenay section is fairly well defined in those directions. The west side, however, is somewhat open.

The southwest-facing side of the knob is much gentler, and contains no ridge or cliff lines. By the time the creek is reached, the section is definitely Fernie, but the contact between the Fernie and the Kootenay in this direction is not placed definitely on the geologic map. Tree-top examination by helicopter has revealed no outcrop, but there are scattered patches and boulders of Basal (Moose Mountain) or possibly Mist Mountain sandstones extending down this slope. The author feels that the contact may be topographically expressed, and probably occurs at the break between the flatter, higher and lower, steeper ground on this slope.

The problem is the structural complexity. The single hole would not help much for detail, but the basic starting point in determining the structure of the block appears to be to find out just how much Kootenay really is there. The hole could be an inexpensive rotary hole; good chip logging and good gamma-neutron logging would easily establish the Weary Ridge and Fernie.

A week's hand-trenching by a single pair of trenchers is also in order on the four coaly occurrences.

6.0 SELECTED BIBLIOGRAPHY

(1) Bell, D.E., 1979, "Cabin Creek Geological Report": internal Crows Nest Resources Limited and filed with B.C. Energy, Mines, and Petroleum Resources.

(2) Gibson, D.W., 1977, "The Kootenay Formation of Alberta and British Columbia - a Stratigraphic Summary": Geol. Surv. Canada, Paper 77-1A.

(3) Gibson, D.W., 1977, "Sedimentary Facies in the Jura-Cretaceous Kootenay Formation, Crowsnest Pass Area, Southwestern Alberta and Southeastern British Columbia": Bull. Canadian Petroleum Geol., v. 25 no. 4, pp 767 - 791.

(4) Gibson, D.W., 1979, "The Morrisey and Mist Mountain Formations - Newly Defined Lithostratigraphic Units of the Jura-Cretaceous Kootenay Group, Alberta and British Columbia": Bull. Canadian Petroleum Geol. v. 27, no. 2, pp 183 - 208.

(5) Hamblin, Anthony P., and Walker, Roger G., 1979, "Storm-Dominated Shallow Marine Deposits: the Fernie - Kootenay (Jurassic) Transition, Southern Rocky Mountains": Can. J. Earth Sci., 16, 1673 - 1690.

(6) Horachek, J., 1978, "Report on Exploration of the Cabin Creek Project": internal Crows Nest Resources Limited, and filed with B.C. Energy, Mines, and Petroleum Resources.

(7) Jansa, L., 1972, "Depositional History of the Coal-Bearing Upper Jurassic - Lower Cretaceous Kootenay Formation, Southern Rocky Mountains, Canada": Geol. Soc. America Bull., v. 83, pp 3199 - 3222.

(8) Newmarch, C.B., 1953, "Geology of the Crowsnest Coal Basin, with Special Reference to the Fernie Area": B.C. Dept. Mines, Bull. 38.

(9) Norris, D.K., 1959, "Type Section of the Kootenay Formation, Grassy Mountain, Alberta": Alberta Soc. Petroleum Geol. J., v.7, pp 223 - 233.

(10) Price, R.A., 1962, "Fernie Map-Area, East Half, Alberta and British Columbia, 82 G E1/2": Geol. Surv. Canada, Paper 61-24.

(11) Price, R.A., 1964, "Flathead Map-Area, British Columbia and Alberta": Geol. Surv. Canada Memoir 336.

APPENDIX A

Abbreviations Legend, Geological Base Maps 1:5,000

This part of the legend for the 1:5,000 map sheets is inserted here due to space limitations on the sheets themselves.

1/Rd.20

ABBREVIATIONS LEGEND

GEOLOGICAL BASE MAPS

SCALE 1:5 000

1.	Sizes	cm	centimeters true thickness
		m	meters true thickness
2.	Lithologic Types	cg, cgs	conglomerate, -s
		md	mudstone
		sh	shale
		slt	siltstone
		ss	sandstone
		qzt	quartzite, -itic
3.	Grain Sizes	bld, blds	boulder, -s
		cb, cbs	cobble, -s
		pb, pbs	pebble, -s
		cs	coarse-grained sandstone
		ms	medium-grained sandstone
		fs	fine-grained sandstone
		vfs	very fine-grained sandstone
4.	Bed Thickness	fiss	fissile
		flgy	flaggy
		msv	massive
		plty	platey
5.	Bedding	bd, bds	bed, -s
		intbd	interbedded
		x-bd	cross-bedded
6.	Colours	blk	black
		brn	brown
		grn	green
		gry	gray
		rsty	rusty
		lt	light
		drk	dark
7.	Miscellaneous	otc, otcs	outcrop, -s
		occ	occasional
		mnr	minor
		cov	covered
		rcv	recessive
		res	resistant
		hd	hard
		ovln	overlain
		unln	underlain
		wth, wthg	weathers, weathering

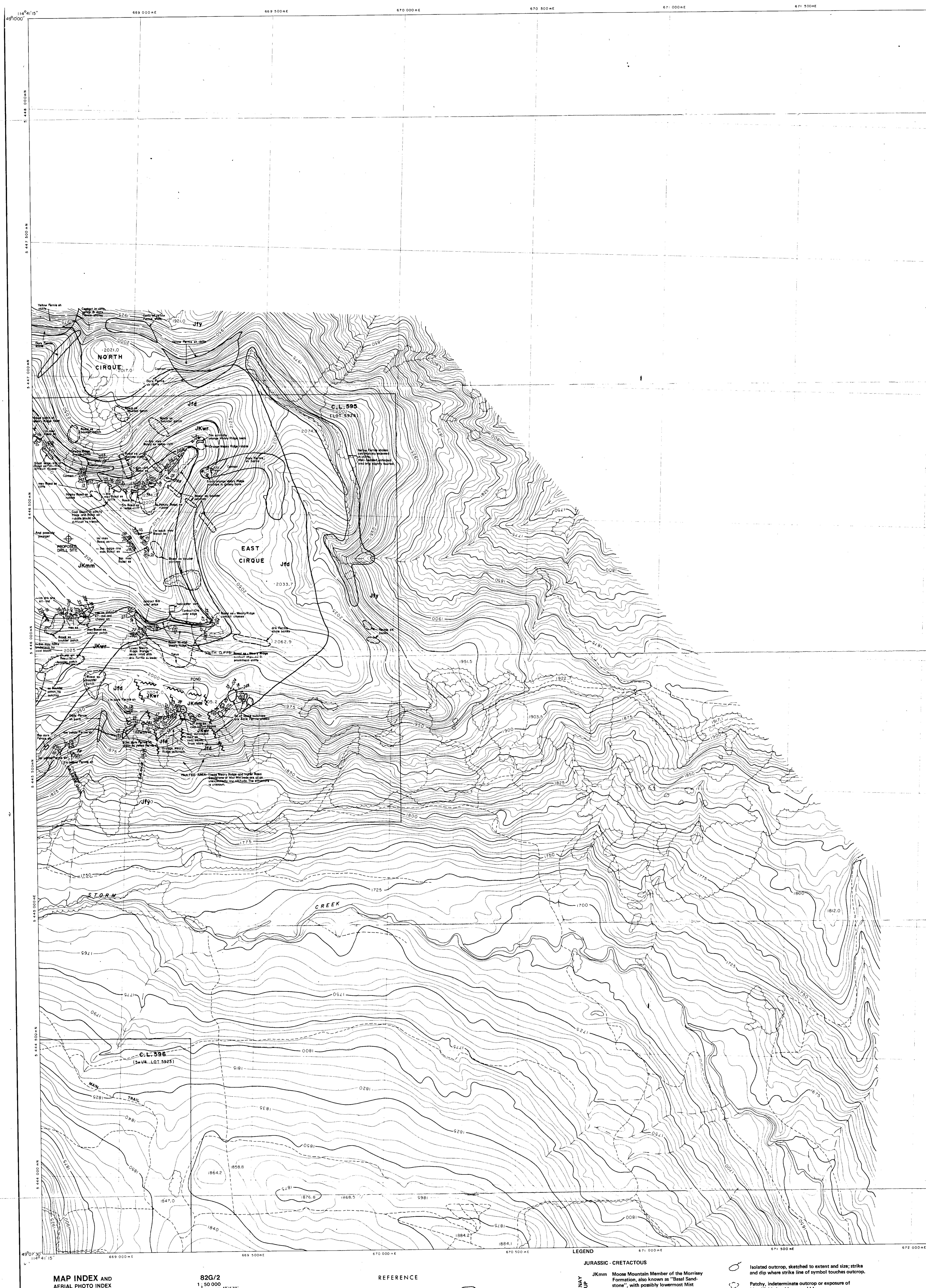
1/Rd.21

APPENDIX B

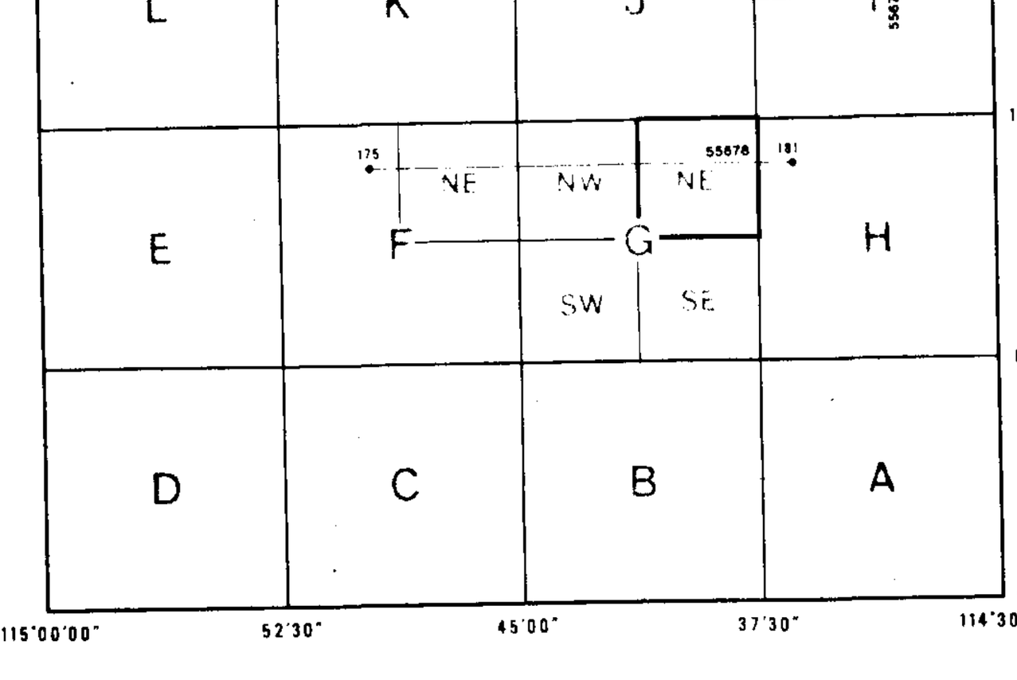
1:5,000 Geologic Base Maps (two)

HA 78 and HA 78A

1/Rd.22


114°41'15"
49°10'00"
669 000mE
669 500mE
670 000mE
670 500mE
671 000mE
671 500mE
672 000mE
5 448 000mN
5 447 500mN
5 447 000mN
5 446 500mN
5 446 000mN
5 445 500mN
5 445 000mE
5 444 500mN
5 444 000mN
49°07'30"
114°41'15"
NORTH CIRQUE
EAST CIRQUE
C.L.595 (LOT 5926)
C.L.596 (Sw1/4 LOT 5923)
Jfy
Jfd
JKwr
JKmm
Yellow Fernie sh cliffs
Contact in cliffs, yellow & dark Fernie shales
Cliffs of yellow Fernie shale
Yellow Fernie sh cliffs
Dark Fernie shale
Contact
Dark Fernie sh cliffs
Basal ss boulder patch
Small patch of Weary Ridge float
1m msv Basal ss
Weary Ridge orange cliffs
5m scratchy orange Weary Ridge beds
Orange Weary Ridge rubble
Dark Fernie sh banks
Small orange Weary Ridge outcrops in grassy bank
Basal ss boulder patches
Yellow Fernie shales continuously exposed in cliffs; Well-bedded, unfolded and only slightly faulted.
Small ledge-line of Basal ss ~10-15m; difficult to see
msv Basal ss cliffs
Patchy Basal ss rubble
Coal bloom in patchy trees and Basal ss rubble. Would be difficult to trench
And possibly younger
PROPOSED DRILL SITE
1m each msv Basal ss
~3m ledge-line msv Basal ss
3m msv Basal ss
contact 8m over edge
helicopter site
Contact 10m over edge
Basal ss - Weary Ridge contact crosses
drk Fernie shale banks
Fernie sh banks
SOUTH CLIFFS: Basal ss - Weary Ridge contact exposed in prominent cliffs
Lower Weary Ridge orange beds intbd with drk Fernie sh beds
Talus
POND
All of these outcrops are dark Fernie shales
FAULTED AREA: These Weary Ridge and higher Basal Sandstone or Mist Mtn beds are at an unexpectedly low altitude. The structure is unknown.
Orange Weary Ridge outcrops
STORM CREEK
MAIN TRAIL
2021.0
2017.0
1921.0
2074.8
2204.0
2033.7
2062.9
2004.0
2005.2
1951.5
1922.7
1903.5
1917.1
1812.0
1864.2
1858.8
1847.0
1876.8
1868.5
1884.2
1884.1

MAP INDEX AND AERIAL PHOTO INDEX



REFERENCE

MAIN ROAD	RIVER, LAKE
SECONDARY ROAD	INTERMITTENT RIVER
TRACK OR TRAIL	TREED AREA
RAILWAY	LINE OF TREES
HEDGE FENCE	INDIVIDUAL TREES
BRIDGE CULVERT	VERTICAL INTERVAL
CUT FILL	DEPRESSION
SWAMP	SPOT HEIGHT
DRILL HOLE	CONTROL POINT

MAP PROJECTION : UNIVERSAL TRANSVERSE MERCATOR
CENTRAL MERIDIAN REFERENCE 117° W.

PREPARED BY :
NORTH WEST SURVEY CORPORATION (YUKON) LTD.
JOB NO. 78-109

LEGEND

JURASSIC - CRETACTOUS

KOOTENAY GROUP

JKmm Moose Mountain Member of the Morrisey Formation, also known as "Basal Sandstone", with possibly lowermost Mist Mountain beds.

JKwr Weary Ridge Member of the Morrisey Formation, also known as the "Orange Passage Beds" of the Fernie.

FERNIE GROUP

Jfd Upper Fernie: dark-weathering marine beds ("dark Fernie shales").

Jfy Middle Fernie: yellow-weathering marine limy beds ("yellow Fernie shales").

Thrust fault, position defined.

Thrust fault, position approximate

Fault other than thrust, position defined, with relative displacements.

Fault other than thrust, position approximate.

Anticline

Syncline

Isolated outcrop, sketched to extent and size; strike and dip where strike line of symbol touches outcrop.

Patchy, indeterminate outcrop or exposure of identifiable boulders or rubble.

Outcrop with exposed contact.

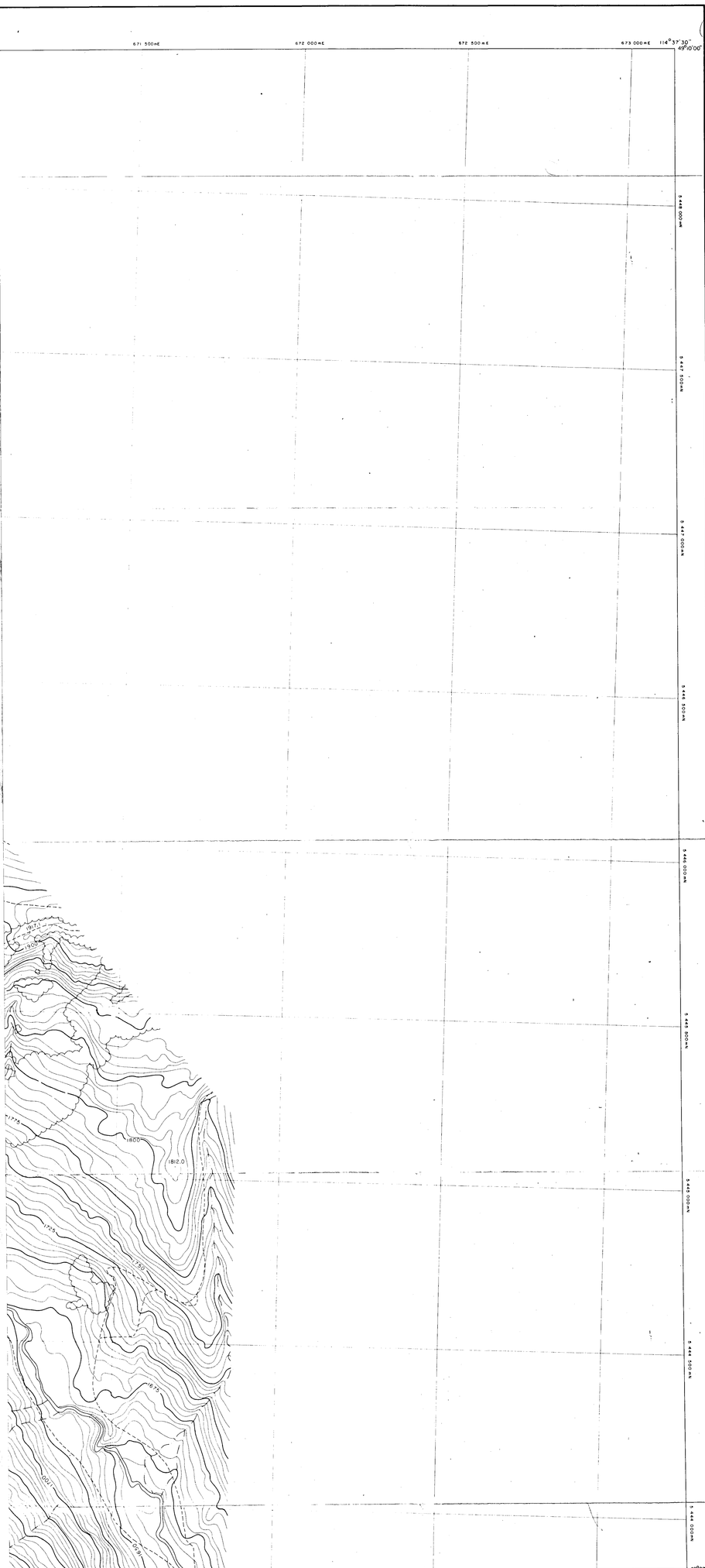
Contact surface trace, approximate only.

Contact surfact trace, assumed only.

NOTE: See 1980 Report, Appendix A, for Abbreviations Legend.

METRES 100 50 0 100 200 300 400 500 METRES

SCALE 1 : 5 000



Isolated outcrop, sketched to extent and size; strike and dip where strike line of symbol touches outcrop.

Patchy, indeterminate outcrop or exposure of identifiable boulders or rubble.

Outcrop with exposed contact.

Contact surface trace, approximate only.

Contact surface trace, assumed only.

NOTE: See 1980 Report, Appendix A, for Abbreviations Legend.

METRES 100 50 0 100 200 300 400 500 METRES

SCALE 1 : 5 000

Crows Nest Resources Limited

EXPLORATION

CABIN CREEK
S.E. B.C.

1980
GEOLOGIC MAP

380

AUTHOR: D.E. BELL	SCALE: 1:5000	ENCLOSURE No.: APPENDIX 'B'
DATE: MAY, 1981	REVISED:	DRAWING No: HA-78
To Accompany		

82 G 2 NORTH EAST ZONE G

HA-33

49° 10' 00" 114° 45' 00"

664 500 mE | 665 000 mE | 665 500 mE | 666 000 mE | 666 500 mE | 667 000 mE | 667 500 mE

5 448 000 mN
5 447 500 mN
5 447 000 mN
5 446 500 mN
5 446 000 mN
5 445 500 mN
5 445 000 mN
5 444 500 mN
5 444 000 mN

C.L. 598
C.L. 599
C.L. 600

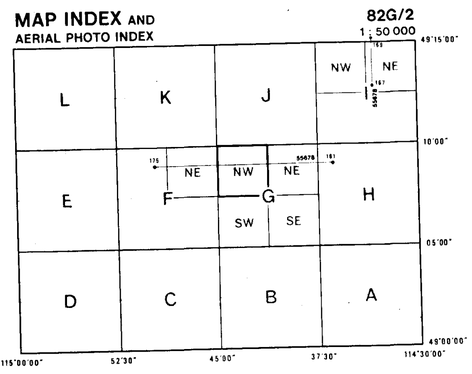
Jfy

49° 07' 30" 114° 45' 00"

664 500 mE | 665 000 mE | 665 500 mE | 666 000 mE | 666 500 mE | 667 000 mE | 667 500 mE

MAP INDEX AND AERIAL PHOTO INDEX

82G/2
1 : 50 000



REFERENCE

MAIN ROAD
SECONDARY ROAD
TRACK OR TRAIL
RAILWAY
HEDGE FENCE
BRIDGE CULVERT
CUT FILL
SWAMP
DRILL HOLE
RIVER, LAKE
INTERMITTENT RIVER
TREED AREA
LINE OF TREES
INDIVIDUAL TREES
VERTICAL INTERVAL
DEPRESSION
SPOT HEIGHT
CONTROL POINT

MAP PROJECTION : UNIVERSAL TRANSVERSE MERCATOR
CENTRAL MERIDIAN REFERENCE 117° W.

PREPARED BY :
NORTH WEST SURVEY CORPORATION (YUKON) LTD.
JOB NO. 78-109

LEGEND

JURASSIC - CRETACTOUS

KOOTENAY GROUP

JKmm — Moose Mountain Member of the Morrisey Formation, also known as "Basal Sandstone", with possibly lowermost Mist Mountain beds.

JKwr — Weary Ridge Member of the Morrisey Formation, also known as the "Orange Passage Beds" of the Fernie.

FERNIE GROUP

Jfd — Upper Fernie: dark-weathering marine beds ("dark Fernie shales").

Jfy — Middle Fernie: yellow-weathering marine limy beds ("yellow Fernie shales").

Thrust fault, position defined.
Thrust fault, position approximate
Fault other than thrust, position defined, with relative displacements.
Fault other than thrust, position approximate.
Anticline
Syncline

Isolated outcrop, sketched to extent and size; strike and dip where strike line of symbol touches outcrop.
Patchy, indeterminate outcrop or exposure of identifiable boulders or rubble.
Outcrop with exposed contact.
Contact surface trace, approximate only.
Contact surfact trace, assumed only.

NOTE: See 1980 Report, Appendix A, for Abbreviations Legend.

METRES 100 50 0 100 200 300 400 500 METRES

SCALE 1 : 5 000

665 500mE 666 000mE 666 500mE 667 000mE 667 500mE 668 000mE 668 500mE 114°41'15" 49°10'00"

5 448 000mN 5 447 500mN 5 447 000mN 5 446 500mN 5 446 000mN 5 445 500mN 5 445 000mN 5 444 500mN 5 444 000mN

C.L. 595 (LOT 5926)

C.L. 599

C.L. 600

C.L. 601

C.L. 4742

Jfy 1975

Jfd

JKwr

JKmm

Contact between yellow & dark Fsh

Dark Fernie sh

Yellow Fernie sh

Dark Fernie sh bank (possible only)

Yellow Fernie sh banks & outcrop

1923

SCRUB BUSH

Scattered sp boulder patch

Scattered sp boulders

Sparse sp boulder patch no outcrop

NO OUTCROP VISIBLE FROM HELICOPTER

STORM

TRAIL

MAIN CREEK

1980 Impassable stream crossings

2026.0 2064.0 2044.0 2003.0 1967.0 1864.0 1856.0 1846.0 1767.0 2005.0

665 500mE 666 000mE 666 500mE 667 000mE 667 500mE 668 000mE 668 500mE 114°41'15" 49°07'30"

REFERENCE

RIVER, LAKE
INTERMITTENT RIVER
TREED AREA
LINE OF TREES
INDIVIDUAL TREES
VERTICAL INTERVAL
DEPRESSION
SPOT HEIGHT
CONTROL POINT

ECTION : UNIVERSAL TRANSVERSE MERCATOR
CENTRAL MERIDIAN REFERENCE 117° W.

) BY :
NORTH WEST SURVEY CORPORATION (YUKON) LTD.

LEGEND

JURASSIC - CRETACTOUS

KOOTENAY GROUP

JKmm Moose Mountain Member of the Morrisey Formation, also known as "Basal Sandstone", with possibly lowermost Mist Mountain beds.

JKwr Weary Ridge Member of the Morrisey Formation, also known as the "Orange Passage Beds" of the Fernie.

FERNIE GROUP

Jfd Upper Fernie: dark-weathering marine beds ("dark Fernie shales").

Jfy Middle Fernie: yellow-weathering marine limy beds ("yellow Fernie shales").

Thrust fault, position defined.

Thrust fault, position approximate

Fault other than thrust, position defined, with relative displacements.

Fault other than thrust, position approximate.

Anticline

Syncline

Isolated outcrop, sketched to extent and size; strike and dip where strike line of symbol touches outcrop.

Patchy, indeterminate outcrop or exposure of identifiable boulders or rubble.

Outcrop with exposed contact.

Contact surface trace, approximate only.

Contact surfact trace, assumed only.

NOTE: See 1980 Report, Appendix A, for Abbreviations Legend.

METRES 100 50 0 100 200 300 400 500 METRES

SCALE 1 : 5 000

Crows Nest Resources Limited

EXPLORATION

CABIN CREEK
S.E. B.C.

1980 GEOLOGIC MAP

380

AUTHOR: D.E. BELL	SCALE: 1:5000	ENCLOSURE No: APPENDIX 'B'
DATE: MAY, 1981	REVISED:	DRAWING No: HA-78A
To Accompany		

82 G 2 NORTH WEST ZONE G

HA-33C

APPENDIX C

1:50,000 Coal Land Disposition Map (one)

CNRL Map HH 36B

1/Rd.23

Joins 82 G/7

247000m. E.

CL 594
HARVEY CREEK GROUP #105 (SHELL – CNRL)

CL 595
CL 598
CL 599
CL 4742
CL 600
CL 601
CL 596
CL 597

CABIN CREEK GROUP # 244 (SHELL – CNRL)

SAGE CREEK APPLICATIONS (SAGE CREEK COAL LTD.)

SAGE CREEK (SAGE CREEK COAL LTD.)

R A N G E S

M O U N T A I N S

F L A T H E A D

B A S I N

P R O V I N C I A L

F O R E S T

245000m E.

COAL LAND TENURE

COMPANY COLOR CODE	FREEHOLD	LICENCES
SHELL - CNRL		
SAGE CREEK COAL LTD.		
KAISER RESOURCES LTD.		
DOMINION OF CANADA		
BYRON CREEK COLLIERIES		
COLEMAN COLLIERIES LTD.		
FORDING COAL LTD AND OTHER CP COMPANIES		
ELCO MINING LTD.		

BORDER OF SHELL-CURL GROUPS BLOCK ETC.

APPLICATION FOR ABOVE

OUTLINE OF HOLDINGS BY OTHER THAN SHELL-CURL.

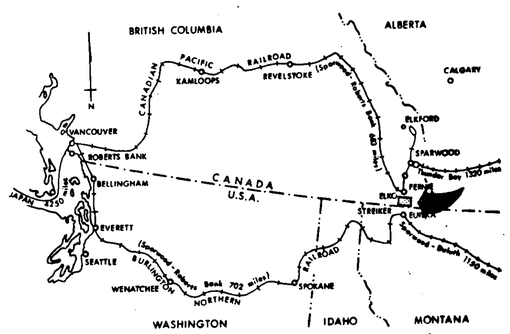
APPLICATION FOR B.C. COAL LICENCE BY OTHER THAN SHELL-CURL

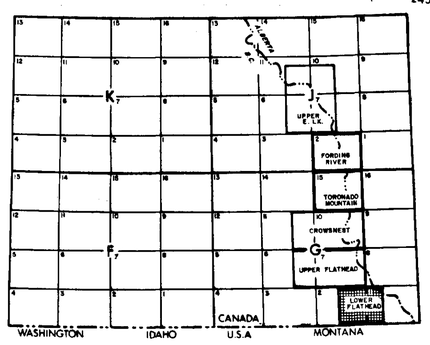
B.C. COAL LICENCE BORDER SHELL-CURL ONLY.

SCALE 1: 50,000

MILES 0 1 2

METRES 1000 0 1000 2000 3000





SHELL CANADA RESOURCES LIMITED
COAL DEVELOPMENT

LOWER FLATHEAD
KOOTENAY LAND DISTRICT
SOUTHEASTERN B.C.

LAND MAP

SHELL – CNRL
LICENCE GROUPS
105 1 of 2
244 1 of 1

PROJECTS
HARVEY CR 1 of 2
CABIN CR 1 of 1

NTS 82 G/1 W(PART) - G/2

AUTHOR: F. Martonhegyi	SCALE: 1:50 000	DRAWING No.: HH-368
DATE: Sept. 1977	REVISED: March 1980	ENCLOSURE No.: Appendix C
To Accompany		

380