

K-SHELL MOUNT BANNER EAST, 80(1)17

825/2

"MOUNT BANNER EAST
PROSPECT"

SHELL CANADA RESOURCES LTD.
C.L.# 277,280,281,
1299

G.R. SLOWN
Apr. 30/81

432

COPEN FILE CONFIDENTIAL

MOUNT BANNER EAST PROSPECT

REPORT ON COAL LICENCES 277, 278, 281, 1299

PART OF GROUP NO. 266

HELD BY: SHELL CANADA RESOURCES LIMITED

OPERATED BY: CROWS NEST RESOURCES LIMITED

KOOTENAY LAND DISTRICT

BRITISH COLUMBIA

FOR WORK DONE IN PERIOD

JUNE, 1980 TO OCTOBER, 1980, INCLUSIVE

LATITUDE 50°01'30" WEST

LONGITUDE 114°45'30" WEST

MAP REFERENCE N.T.S. 82J/2

APRIL 30, 1981

PREPARED BY: G. R. SLOAN

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

00 432

MOUNT BANNER EAST

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PROFESSIONAL VERIFICATION OF REPORT

ENTITLED: MOUNT BANNER EAST PROSPECT
Report on Coal Licences 277, 278, 281, 1299
Part of Group No. 266
Held By: Shell Canada Resources Limited
Operated By: Crows Nest Resources Limited
Kootenay Land District
British Columbia

Mr. Garth R. Sloan planned and carried out the 1980 geological field program on Mounta Banner East B.C. Coal Licences held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited. He also prepared this report. Mr. Frank Martonhegyi supervised activity of this program under general direction of the undersigned.

Garth Sloan, Geological Technologist, graduated in Coal Resources Technology from the Northern Alberta Institute of Technology in 1978. Since graduation Mr. Sloan has worked on a variety of coal properties in British Columbia for Shell Canada Resources Limited and Crows Nest Resources Limited.

Frank Martonhegyi, M.E., graduated in Mining Geological Engineering from the University of the Heavy Industry, Hungary in 1962; and received post-graduate training at the University of Saskatchewan, Saskatoon, in 1969-1971. His experience in Western Canadian coal exploration since 1971 includes positions with:

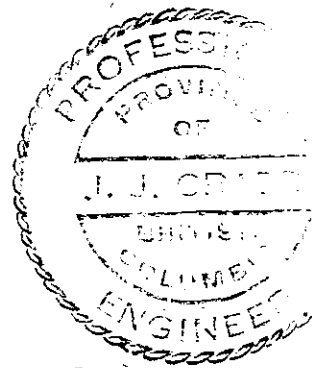
- CanPac Minerals Ltd., Calgary, Alberta
- Shell Canada Resources Limited, Calgary, Alberta
- Crows Nest Resources Limited, Calgary, Alberta.

Professional Verification of Report (continued)

His prior experience includes underground coal mining geology, geotechnical engineering and geochemistry in Hungary, Austria and Canada.

He currently holds the position of District Manager - Exploration, B.C. and other Canadian Projects, for Crows Nest Resources Limited.

I consider the aforementioned geologist and technologist to be well qualified to undertake responsibilities they were assigned on this project. I am satisfied that the attached report dated April 30, 1981, has been competently prepared and justly represents the information obtained from this project.



J. J. Crabb
J. J. Crabb, P. Eng.

April 30, 1981.

1.0 SUMMARY

Exploration for coal is in a "grass roots" stage on the Mount Banner East Prospect. It is part of the Elk Valley Coalfield in the Rocky Mountains of Southeastern British Columbia at Latitude $50^{\circ}01'30''$ North and Longitude $114^{\circ}45'30''$ West. Elkford is the nearest town, 12 kilometres to the west. It is 2.5 kilometres to the nearest existing railway, on which it is approximately 1180 kilometres to the Vancouver area coal ports.

Jura-Cretaceous Kootenay Formation coal bearing sequences of some 435 metres include over 50 metres of coal in at least thirteen seams in the prospect area. Analysis of core samples indicate a low to medium volatile bituminous coal quality.

Potential for eight million tonnes of low (3.5:1) overburden ratio open pit mineable geological in-place reserves have been identified. The prospect is located in a small creek valley east of Mount Banner, being the surface expression of a syncline. This syncline plunges southward under Mount Banner East which limits the open pit potential. There are four seams greater than 5 metres thick. These also have an underground mining potential particularly in the area where dips are less than 20 degrees.

1.0 Summary (continued)

Crows Nest Resources Limited's 1980 Mount Banner East Exploration Program included reconnaissance geological mapping, ~~hand~~ trenching, construction of a 3.6 kilometre bulldozer access road, backhoe trenching, continuous core (diamond) drilling of 319 metres in one hole, reclamation, coal analyses and tests, and this report accounting for the work. Total expenditures amounted to \$247,051.

Completion of detailed geological mapping and hand trenching is recommended for 1981 to conclude the "grass roots" exploration stage. Further drilling is recommended for the future when a thorough evaluation of the open pit and underground potential is warranted.

The Mount Banner East Prospect is located in the northeastern corner of the Central Block, Group No. 266, B.C. Coal Licences held by Shell Canada Resources Limited, operated by its whollyowned subsidiary, Crows Nest Resources Limited.

2.0 INTRODUCTION

2.1 Coal Land Tenure

Fifteen B.C. Coal Licences (No's: 277, 278, 279, 280, 281, 284, 285, 290, 293, 294, 297, 298, 301, 304 and 1299) comprise Group No. 266 covering approximately 3402 hectares in south-eastern British Columbia's Kootenay Land District. These Licences are held by Shell Canada Resources Limited and operated by its wholly-owned subsidiary, Crows Nest Resources Limited. The last transaction concerning these Licences took place in 1979 when they were transferred to Shell Canada Resources Limited upon its acquisition of the previous Licensee, Crows Nest Pass Oil and Gas Limited.

Figure 1 shows the location of these licences which comprise Group No. 266. Figure 2 is a summary of the coal land tenure standing.

This report accounts for work performed in 1980 on licences 277, 278, 281, 1299, the Mount Banner East Prospect at the northeastern end of Group No. 266.

2.2 Location and Physiography

The prospect is located in the Rocky Mountains of southeastern British Columbia, in an area regionally known as the Upper Elk Valley. More closely, it is on the east side of the Fording River Valley, 12 kilometres by air from the town of Elkford. It is centered approximately at Latitude 50°01'30" North and Longitude 114°45'30" West.

The prospect area is the broken slope of a ridge which extends northeasterly from Mount Banner. It is bounded on the east and west by small tributaries of Ewin Creek to the northeast (Figure 3).

The main ridge of Mount Banner East has a rugged topographic relief of up to 825 metres from the crest to the valley floor to the east. Average surface gradients range from 45% on the western slopes to 55% on the eastern slopes.

The prospect area is heavily forested in general, in sharp contrast with the more open grassy slopes of Mount Banner.

2.3 Access

Two major transportation routes exist 2.5 kilometres west of the Mount Banner East Prospect. Canadian Pacific Railway's Fording spur line roughly parallels a paved highway owned by Fording Coal Limited, which runs from Elkford to the Fording minesite. Access to the base of the prospect from the Fording highway is along a gravel logging road which parallels the highway then turns southeast up Ewin Creek. During 1980, Crows Nest Resources extended this road by 3.6 kilometres from its southern end, to wind northwest up Mount Banner East at an 8% grade (Figure 4). It was a four-wheel drive road, but access has since been closed by recontouring of the lower portion of the road during reclamation.

3.0 WORK DONE

The total cost of exploration on the Mount Banner East prospect in 1980 was \$247,051. Figure 5 details the nature and cost of the work performed with reference to the licences involved.

3.1 Previous Work

In summary no machinery and very little "on foot" work was done previously on the prospect area. A report filed by Crows Nest Resources Limited in 1979 entitled North Central Block Project (Group No. 266 is a part of Shell-CNRL's Central Block of B.C. Coal Licences) accounts for the initial reconnaissance mapping. It was authored by Crows Nest Resources Limited's Geologist, John Fisher.

3.2 Objectives of 1980 Exploration

The objectives of the 1980 field program were:

- to compile a detailed geological map of the prospect area;
- to examine the stratigraphy of the underlying strata with emphasis on the coal beds; and
- to obtain initial information concerning coal quality.

3.3 Work Done in 1980

In order to achieve the aforementioned goals, the following work was done:

- orientation mapping of the entire area;
- detailed mapping of the area prospective for coal where outcrops allowed it;
- hand trenching and some sampling and analysis of the coal occurrences found;
- construction of 3.6 kilometres of exploration road and 127 metres of backhoe trenching of the coal occurrences along the road; and
- continuous core (diamond) drilling of 319 metres in one vertical hole and its downhole geophysical logging, examination of the core, sampling and analysis of the coal intersections.

Special care was taken in protection of the environment and in reclamation. The road was pre-slashed and all commercial timber was recovered. At the completion of the field season the road was recontoured at the lower and the far ends, and seeded and fertilized throughout.

4.0

GEOLOGY4.1 Regional Geology

The Mount Banner East Prospect is within the Elk Valley Coalfield, the northernmost of three major coalfields in southeastern British Columbia. The coalfield is an elongate basin, composed of sediments of Upper Jurassic to Lower Cretaceous Age. Coal seams of economic interest are found in the Coal Bearing Member of the Kootenay Formation.

A south plunging major syncline is the main structural element in the prospect area. Dips are steep on the west limb, moderate on the east limb. It is separated from the Fording Syncline to the west by heavily folded and faulted strata believed to be associated with the Fording Thrust (Figure 6).

4.2 Stratigraphy

Jurassic-Cretaceous sediments (Figure 7) grading from marine shales (Fernie Formation) to fully alluvial conglomerates and sandstones (Blairmore Group) represent the regression of the Jurassic "Fernie Sea" from this area to the northeast. This regression occurred through various epineritic and deltaic environments favourable to coal deposition.

4.2 Stratigraphy (continued)

Fernie Formation

Interbedded marine shales, siltstones, sandstones and limestones comprise the Fernie Formation. These strata are usually recessive in outcrop and weather dark brown. Fernie shales occur at the foot of the eastern side of Mount Banner East.

Kootenay Formation

This report follows a stratigraphic nomenclature postulated and slightly modified by various authors (Figure 8) and commonly used in the past. It subdivides the Kootenay Formation into three members, namely Moose Mountain, Coal Bearing and Elk, in ascending order. Strictly speaking the latest of these previous ones (Jansa, 1972) was followed. The new nomenclature (Gibson, 1979) has not been adapted as it is not yet used commonly in the area.

4.2 Stratigraphy (continued)

Moose Mountain Member

This member, also called "Moose Mountain Sandstone" represents the transition from marine to deltaic depositional environment.

The Moose Mountain Sandstone occurs in two distinct lithologic units on Mount Banner East. The lower unit was measured to be 27.8 metres. It is comprised of medium to thick bedded, fine to medium grained quartzose sandstone with minor iron-stained concretions and silty as well as shaley interbeds, all occurring in shades of gray weathering orange-brown. The upper unit of the Moose Mountain Sandstone is mainly massive, well indurated, medium to coarse-grained gray quartzose sandstone with few thin chert pebble and occasional silty bands. It weathers light to medium gray and is a distinct cliff-former. An 18.7 metre part of this unit was measured on Mount Banner East. Although coal seams have been found in this unit on other CNRL properties, only one thin coaly stringer was observed on Mount Banner East in outcrop and in the diamond drill hole.

4.2 Stratigraphy (continued)

Coal Bearing Member

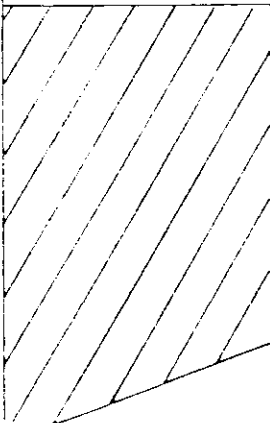
This member is an interstratified succession of siltstones, silty shales, mudstones, sandstones and coal seams. All coal of economic interest in southeastern British Columbia occurs in this unit, comprising often more than 10% of the section.

On Mount Banner East 13 coal seams were found, with an aggregate thickness of over 50 metres. The Coal Bearing member is estimated to be 435 metres.

Elk Member

This member consists of cliff-forming, buff weathering, gray sandstones with minor conglomerates, siltstones and shales, and with a few thin seams of very hard coal. An over 200 metre lower Elk succession caps the south end of the main ridge of Mount Banner East.

KOOTENAY FORMATION. NOMENCLATURE USED

Norris 1959 ALBERTA		Newmarch 1953 BRITISH COLUMBIA		Jansa 1972 ALBERTA – B.C.		Gibson 1977 ALBERTA – B.C.			
CADOMIN FM.		CADOMIN FM.		CADOMIN FM.		CADOMIN FM.			
		ELK FORMATION		Elk Member		Pocaterra Creek Mbr.	Elk Member		
						KOOTENAY FORMATION		Coal Bearing Member	
KOOTENAY FORMATION		KOOTENAY FORMATION		KOOTENAY FORMATION		KOOTENAY FORMATION			
						Mutz Member		Coal Bearing Member	
						Hillcrest Member		Coal Bearing Member	
Adanac Member		Basal Kootenay Sand		Moose Mountain Mbr.		Basal Sandstone Member			
Moose Mountain Mbr.		FERNIE FM		FERNIE FM		Unit A			
FERNIE FM		FERNIE FM		FERNIE FM		Unit B			
FERNIE FM		FERNIE FM		FERNIE FM		FERNIE FM			

... after GIBSON '77

TABLE OF FORMATIONS

	PERIOD OR EPOCH	FORMATION	LITHOLOGY	THICKNESS (m)
ERA	Lower Cretaceous	Cadomin Fm.	non-marine: sandstone, conglomerate and shale	360 - 1980
MESOZOIC	LOWER CRETACEOUS AND JURASSIC	Pocaterra Creek Member	non-marine: sandstones, conglomerate siltstone & shale	
		ELK MEMBER	non-marine: interbedded medium to coarse grain sandstone, chert-pebble conglomerate with minor siltstone, shale and coal	30 - 490
		COAL BEARING MEMBER	non-marine & brackish: interbedded coal, siltstones, shales and sandstones	70 - 610
		BASAL SANDSTONE UNIT OR MOOSE MOUNTAIN MEMBER (MMM)	non-marine: massive, cliff-forming sandstone	20 - 60
	JURASSIC	FERNIE FM.	marine: shale, siltstone, sandstone & limestone	180 - 380

... after GIBSON 1977; PRICE 1961, 1965

4.3 Geological Structure

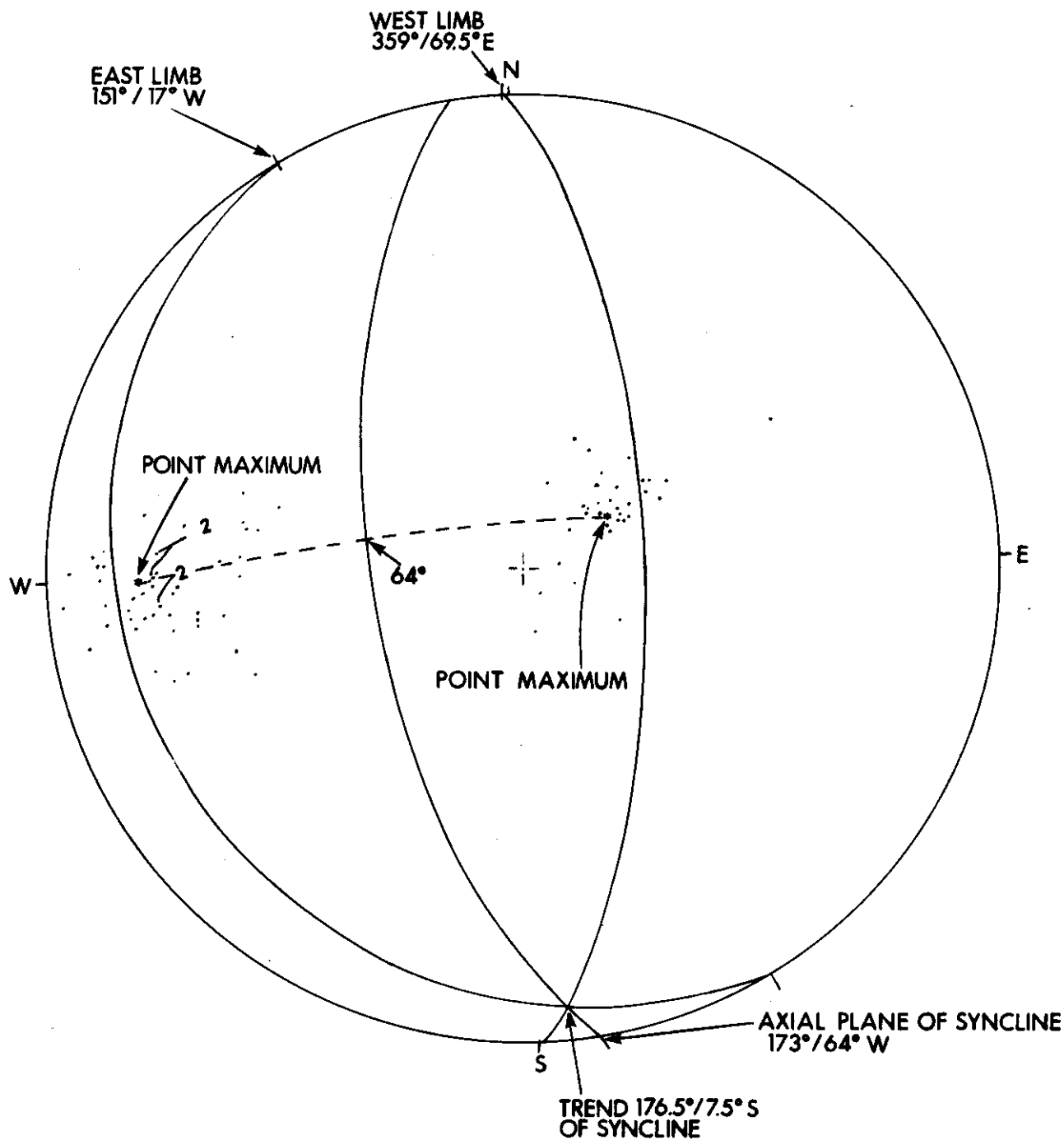
The area of interest on Mount Banner East is a major asymmetric syncline (Figure 9). The surface reflects this synclinal structure in the study area. The steep slopes of Mount Banner to the west and the more gentle western slopes of Mount Banner East are the surface expression of the limbs. The valley between them roughly follows the axis. The creek, however, flows in a direction opposite to the plunge of the syncline. As a result of this, the coal bearing sequences are preserved and capped by the Elk Member to the south but gradually eroded to the north.

The major syncline was first noted through the use of air photo interpretation in 1978. During the 1980 field program, a total of 84 bedding attitudes were taken on both limbs of the syncline. These attitudes were all measured in the Elk Member. A subsequent measuring of 37 bedding attitudes on the road cutting the Coal Bearing Member below confirmed that the coal measures were part of the east limb of the syncline (Figures 10, 11, 12).

A lower hemisphere equal area projection of poles to bedding (Figure 13) was used to determine the attitude of the fold axis (176.5° plunging 7.5° south), and axial plane ($173^\circ/64^\circ$ west) of the syncline.

Fig. 13

TOTAL OF 84 POLES



Crows Nest Resources Limited		
EXPLORATION		
MOUNT BANNER EAST S.E. B.C.		
S POLE PLOT OF BEDDING ATTITUDES FROM MAIN RIDGE TRAVERSES 1 THROUGH 24		
AUTHOR: G SLOAN	SCALE:	ENCLOSURE No: 13
DATE: 81-04-02	REVISED:	DRAWING No: AA-547
To Accompany		

4.4 Coal Geology

The Coal Bearing Member on Mount Banner East crops out on the gently dipping east limb of the major syncline which trends through the property. A total of 13 major coal seams have been found on the prospect. Most of the lower eight seams were observed both in outcrop and in the diamond drill hole (Appendix B), and the other five were found in outcrop only (Figure 14, Appendix C).

The coal seams were originally denoted by letters. Then Crows Nest Resources Limited's seam numbers used further south in the Central Block, were assigned to the seams which could be correlated without doubt to other projects.

The No. 10 Coal Zone lies directly on the Moose Mountain Sandstone. It was 15.05 metres thick in the diamond drill core (Figure 15), comprised of 7.61 metres of coal in six splits and 7.44 metres of rock in between. This coal horizon occurs very similarly at Ewin Pass. Only the base of this zone could be exposed in hand trenches due to usually thick overburden covering this stratigraphic horizon.

4.4 Coal Geology (continued)

No. 9 seam was identified in the drill hole, but it appears to be in a faulted zone at its outcrop on the road and was not traceable by trenching.

An approximately 13-metre sandstone unit occurs above No. 9 seam and a thin coal seam further up. It is believed to be equivalent to the so-called "Marker Seam" at Line Creek and was named accordingly.

Seams E, G, H, I, J all occurred thicker in outcrop (in an up-dip direction) than in the drill hole. Seams C, D, and F occurred in outcrop only. The same or similar depositional or tectonic circumstances may be responsible for the thicker developments of these seams - being relatively close to each other. Minor bedding slippage thrust faulting was observed on the outcrops but there were not enough occurrences to study this matter further.

The two uppermost seams, K and L, were not intersected by the drill hole and stratigraphic correlation in hand trenches was made very difficult due to the extreme depth of overburden.

FIGURE 18/4

TABLE OF COAL SEAM THICKNESSES

<u>SEAM #</u>	TRUE THICKNESS (m)			
	Drill Hole MBE-101	Main Road	Trenches (Thickest Intersection Only)	Interburden (Drill Hole)
L	-	-	4.94	
K	-	-	5.50	
J	1.47	1.57	-	9.40
I	5.55	6.37	5.30	4.97
H	1.73	2.46	2.65	22.28
G	7.69	11.17	12.69	
F	Pinched Out	1.19	-	69.52
E	7.55	12.39	11.41	
D	Pinched Out	2.60	-	
C	Pinched Out	0.60	-	32.88
"Marker"	0.31	-	-	
9	1.23	-	-	35.24
10-1	1.94	-	-	47.93
10-2	1.25	-	-	1.09
10-3	2.54	-	-	1.47
10-4	0.79	-	-	1.76
10-5	0.62	-	-	1.26
10-6	0.47	-	-	1.86

5.0 MINEABILITY AND COAL RESERVES/RESOURCES

5.1 Open Pit

There is not enough information on which reserve computations can be based. The following is more speculation than calculation - to indicate reserve potential for further planning and decision-making. Reserves quoted below are of Possible (Inferred) Category.

A stratigraphic interval of approximately 130 metres (Seams from J to E) includes 24 to 36 metres of coal. This "target horizon" occurs without significant cover over an area of approximately $.25 \text{ km}^2$. Therefore, potential exists for approximately eight million tonnes of geological in place reserves, amenable for open pit mining at a corresponding overburden ratio of approximately $3.5:1 \text{ m}^3$ rock/tonne of coal.

Including the next seam both up (Seam K) and downwards (Seam D) adds 8.0 metres of coal to the target horizon but also 80 metres of rock. Neither the target horizon nor the area can be extended further without incurring prohibitive ratios.

5.2 Underground

Coal seams described above dip under Elk strata to the south at approximately 20 degrees. There are four seams greater than 5.0 metres which may be amenable for underground hydraulic mining.

6.0 COAL QUALITY

Mt. Banner East

Figure 16 and Appendix D account for all coal analyses and tests. In summary the Mount Banner East coal is low to medium volatile bituminous by rank, according to ASTM standards. It can be characterized by the following parameters based on analysis of the core samples:

		<u>Raw Coal</u>	<u>Clean Coal</u> Washed at 1.6 S.G.
		<u>Air Dry Basis</u>	
<u>Proximate Analysis</u>			
Moisture	%	0.30- 4.54	0.30- 2.41
Ash	%	12.05-45.64	5.87-12.54
Volatile Matter	%		17.42-23.94
Fixed Carbon	%		58.30-71.85
FSI	-	0-8	0-8.50
Sulphur	%		0.32- 0.90
Calorific Value	Kcal/Kg		7,533-8,124
Yield at 1.6 S.G.	%		34-86

FIGURE 16

MT. BANNER EAST

COAL QUALITY SUMMARY

Based on analysis of core samples
unless otherwise stated

SEAM	MOIST %	ASH %	F.S.I.	MOIST %	ASH %	V.M. %	F.C. %	F.S.I.	% YIELD	Kcal/Kg.
J	2.57	41.21	0	2.07	10.91	23.94	63.08	0.5	37	6886
I Upper 78%	.65	12.05	7.5	.68	6.49	21.44	71.39	8	86	8005
I Lower 22%	.49	18.46	8	.57	5.87	23.03	70.53	8.5	81	8124
H	.60	49.7	1	.59	11.93	19.88	67.60	5	34	7502
G	.62	24.55	3	.51	8.93	20.08	70.48	4	71	7741
E	.41	22.41	3.5	.61	10.47	19.28	69.64	6	73	7639
"MARKER"	.48	15.6	1	.48	10.0	17.67	71.85	1	85	7656
10-1	.40	28.38	4.5	.48	10.02	18.59	70.91	8	62	7737
10-2	.40	19.74	7	.37	10.22	18.27	71.14	7.5	73	7773
10-3	.44	38.61	3.5	.37	10.79	17.88	70.96	8	47	7619
10-4	.30	16.35	3	.36	10.82	17.59	71.23	4.5	81	7708
10-5	.35	25.04	4.5	.30	11.82	17.42	70.47	7.5	71	7609
10-6	.32	22.55	7	.31	12.54	18.85	68.3	8	78	7533
D (Trench)	3.38	30.92	0	2.41	11.34	27.95	58.3	0	36	5860
F (Trench)	1.25	45.64	0	2.61	9.54	23.48	64.82	0.5	29	6905
<u>I Lower</u> 22%	.49	18.46	8	.57	5.87	23.03	70.53	8.5	81	8124
K Upper (Trench)	4.54	22.49	0	2.61	4.84	27.72	64.83	0	44	
K Lower (Trench)	4.06	21.44	0	2.08	7.06	27.36	63.50	0	45	

Raw Coal (Air Dry Basis)

Clean Coal (Air Dry Basis) Washed At 1.50 S.G.

7.0 RECOMMENDATIONS

Drilling will be needed for a thorough evaluation of both the open pit and underground potential when warranted.

Detailed mapping of the area is advisable, however, before further drilling and it is recommended for 1981. It has to include a systematic search for the extensions of the coal seams by hand trenching.

8.0 SELECTED BIBLIOGRAPHY

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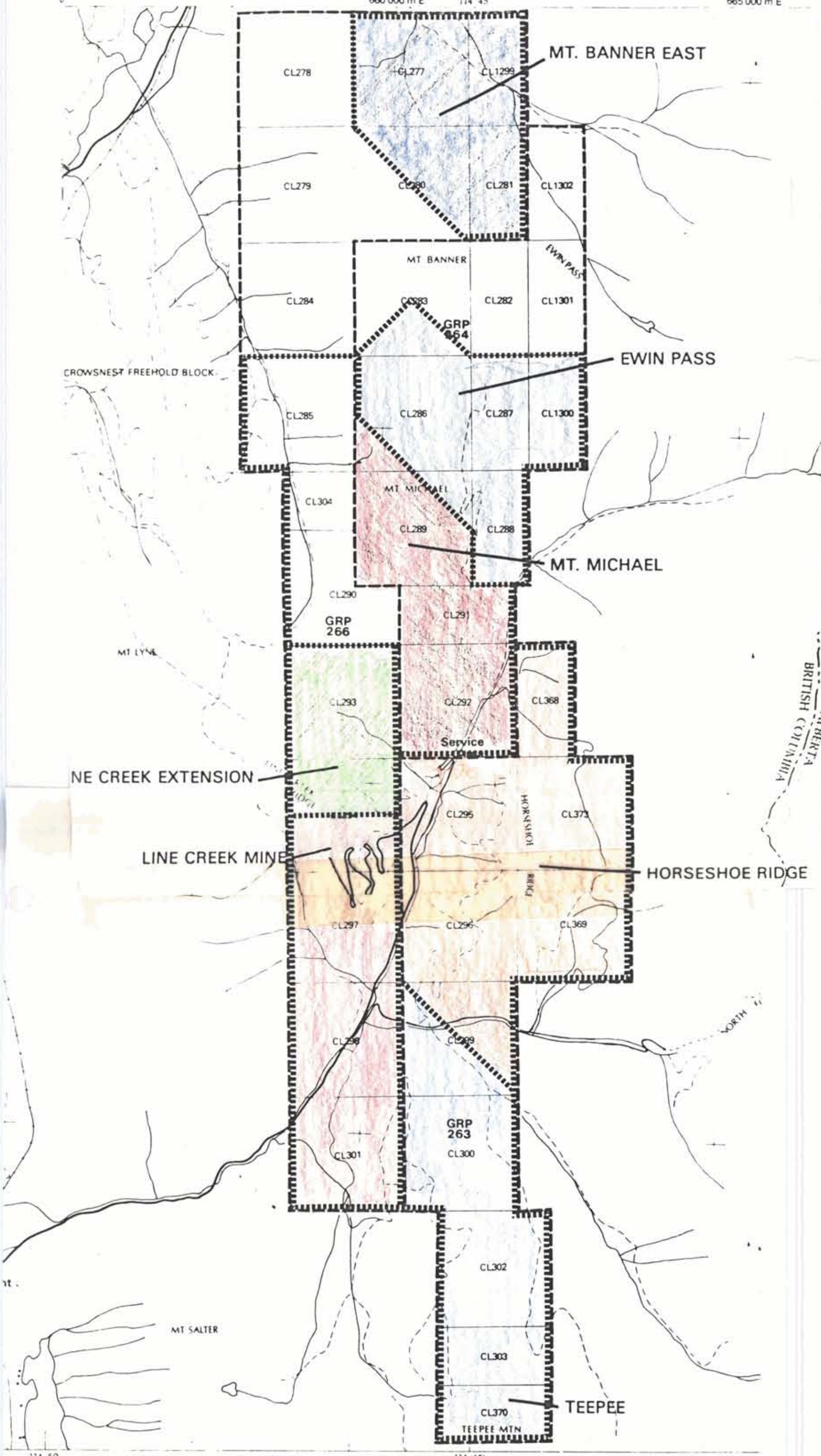
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HANNAH, T.W. - Line Creek Ridge Coal Project, Geological Report for work done during 1979, Crows Nest Resources Limited, 1980

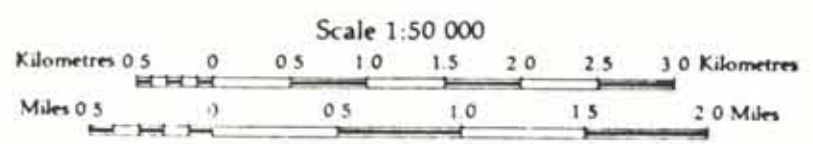
JANSA, L. - Depositional History of Coal Bearing Upper Jurassic-Lower Cretaceous Kootenay Formation, Southern Rocky Mountains, Canada - G.S.A. Bull. Vol. 83, pp. 3199-3222, 1972.

660 000 m E 114 45 665 000 m E



ALBERTA
BRITISH COLUMBIA

114 50
By the Survey and Mapping
Agency, Mines and Technical
Surveys, British Columbia
and 1990 Crown Survey
Drawing (1:50 000)



FACT PROSPECT
BOUNDARY

IP BOUNDARY

Grid North
Magnetic North

Annual Change in magnetic declination
APPROXIMATE MEAN DECLINATION 1275
Annual Change in declination 1.4

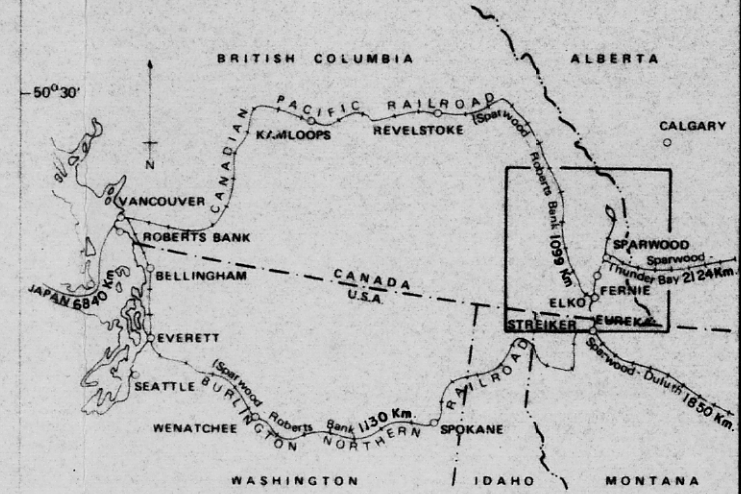
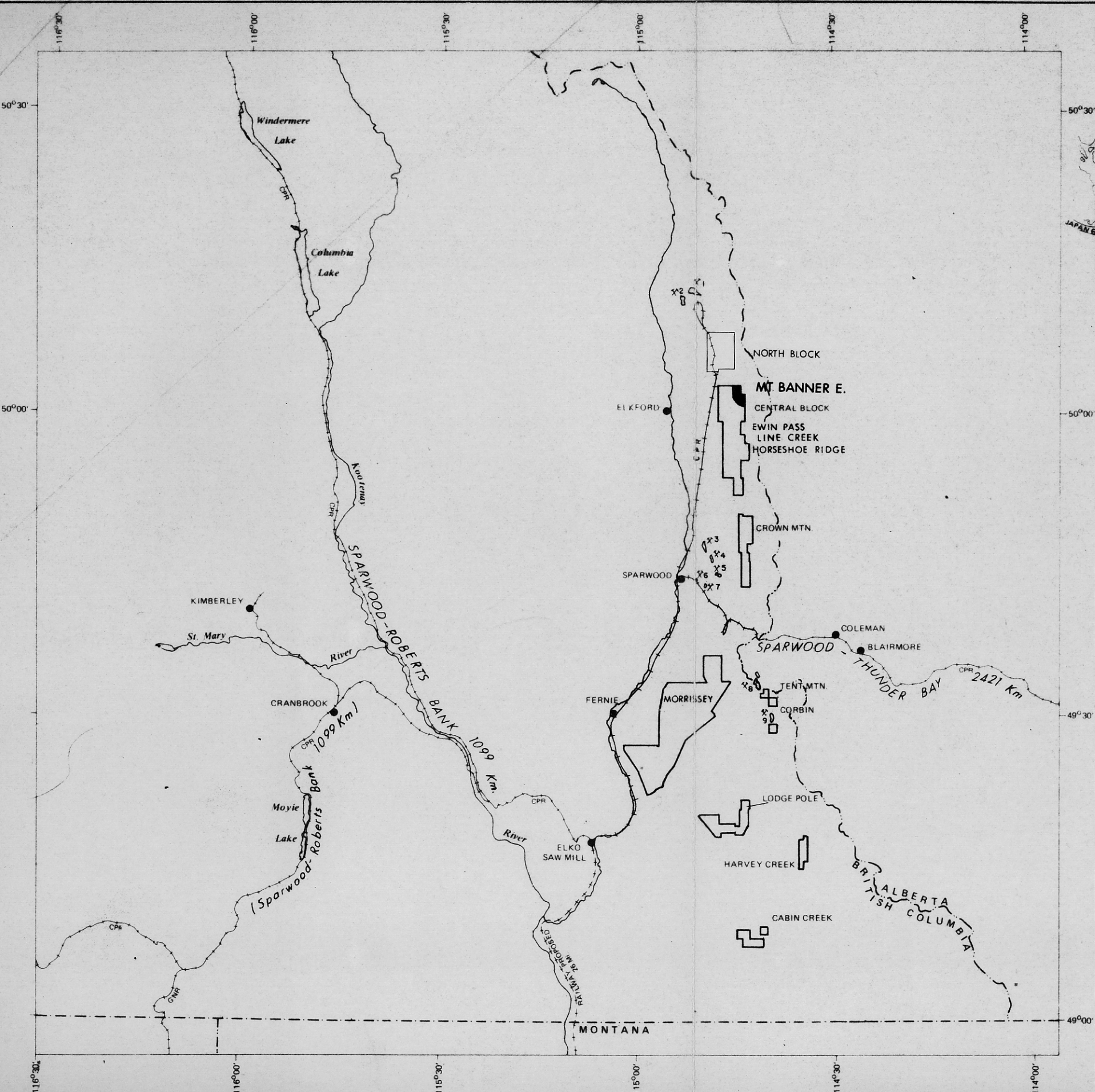
Transverse Mercator Projection
Universal Transverse Mercator Grid Zone II

Crows Nest Resource
EXPIRABLE

CENTRAL BLO
SE BLO

**PROJECT LC
MAP**

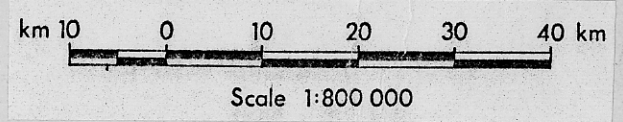
AUTHOR R. BARRY SCALE 1:50 000
DATE 81/07/30 BY [signature]



LEGEND

- OPERATING MINES**
- FORDING COAL LTD.
 - 1 CLODE PIT
 - 2 GREENHILLS PIT
 - KAISER RESOURCES LTD.
 - 3 HARMER PITS 1 & 2
 - 4 ADIT 29 PIT
 - 5 CAMP 8 & ADIT 40A PITS
 - 6 BALMER SOUTH HYDRAULIC UNDERGROUND MINE
 - 7 BALMER NORTH CONVENTIONAL UNDERGROUND MINE
 - COLEMAN COLLIERIES LTD.
 - 8 TENT MOUNTAIN PITS
 - BYRON CREEK COLLIERIES LTD.
 - 9 CORBIN PIT
- COAL RIGHT OWNED/LICENCED BY**
- SHELL CNRL

K-SHELL MT. BANNER EAST 80/2A



Crows Nest Resources Limited		
EXPLORATION		
SOUTHEAST B.C. LOCATION MAPS		
AUTHOR: Martonhegyi	SCALE: 1:800 000	ENCLOSURE No: 1
DATE: 81-04-03	REVISED:	DRAWING No: BA-292
To: Accompany		

COST STATEMENT



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

APPLICATION TO EXTEND TERM OF LICENCE

1. Bolton Agnew agent for Shell Canada Resources Limited
(Name) (Name)
 P.O. Box 100
(Address) (Address)
 Calgary, Alberta, T2P 2H5

Valid FMC No. 207568

hereby apply to the Minister to extend the term of Coal Licence(s) No(s). 277 - 281 Incl., 284, 285, 290, 293, 294, 297, 298, 301, 304, 1299; 15 Licences, 3402 Hectares
 for a further period of one year.

2. Property name . Line Creek North & Mt. Banner East; Group #266, Kootenay Land District

3. I am allowing the following Coal Licence(s) No(s). to forfeit ... None

4. I have performed, or caused to be performed, during the period . January 30, 1980 to
 January 31 19 81, work to the value of at least \$ 822,728.20

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

CATEGORY OF WORK


	Licence(s) No(s).	Apportioned Cost
Geological mapping	277, 280, 281, 293, 294, 1299	\$120,635.50
Surveys: Geophysical		
Geochemical		
Other (Location)	277, 280, 281, 293, 294, 1299	33,636.93
Road construction	277, 280, 281, 293, 294, 1299	104,583.78
Surface work (Trenching)	277, 281, 293, 294	31,843.52
Underground work (Adits)	293, 294, 297	42,742.58
Drilling	293, 294, 297	353,728.28
Logging, sampling, and testing	277, 293, 294, 297	49,968.13
Reclamation	277, 280, 281, 293, 294, 1299	49,338.13
Other work (specify)		
Off-property costs		36,251.35

5. I wish to apply \$ 822,728.20 of this value of work on Coal Licence(s) No(s). 277 - 281 Incl., 284, 285, 290, 293, 294, 297, 298, 301, 304, 1299

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 Line Creek North Geological Report '80, Mount Banner East Geological Report '80, will be submitted in ninety days

1981.01.28
(Date)


(Signature)

..... Land Supervisor
(Position)

Application to extend term of licence for the entire group was submitted January 28th, 1981

CATEGORY OF WORK

GEOLOGICAL MAPPING

Yes No

Area (Hectares) 778 Scale 1:5000 Duration 211 man-days
 Reconnaissance Surface
 Detail: Underground
 *Other (specify)
 Total Cost \$ 64,407.00

GEOPHYSICAL/GEOCHEMICAL SURVEYS

Yes No

Method
 Grid
 Topographic Location Surveys
 *Other (specify)
 Total Cost \$ 15,212.93

ROAD CONSTRUCTION

Yes No

Length 3.6 km Width 5 m
 On Licence(s) No(s) 277, 280, 281, 1299, 1302
 Access to Diamond Drill Site
 Total Cost \$ 68,826.78

SURFACE WORK

Yes No

Length Width Depth Cost
 Trenching 227 m 1 m 1 m
 Seam Tracing
 Crosscutting
 *Other (specify)
 Total Cost \$ 11,784.66

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 HQ 1 318.82
 Rotary: Conventional
 Reverse circulation
 *Other (specify)
 Contractor Tonto Drilling
 Where is the core stored? Logging landing - UTM 5544, 250 mN, 661, 870 mE
 Total Cost \$ 59,015.25

LOGGING, SAMPLING AND TESTING

Yes No

Lithology: Drill samples Core samples Bulk samples
 Logs: Gamma-neutron Density
 *Other (specify) Caliper
 Testing: Proximate analysis FSI Washability
 Carbonization Petrographic Plasticity
 *Other (specify) BTU, Sulpher
 Total Cost \$ 2,665.00

OTHER WORK (specify details)

Reclamation
 Total Cost \$ 16,070.00
 On-property costs 237,961.62
 Off-property costs 9,088.98
 Total Expenditures \$ 247,050.60

Original dated 1981.01.28
 (Date)

ORIGINAL SIGNED BY
 W. S. KOWALSKI
 (Signature)

Manager- Accounting CNRL
 (Position)

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

CATEGORY OF WORK

GEOLOGICAL MAPPING

Yes No

	Area (Hectares)	Scale	Duration
Reconnaissance	778	1:5,000	211 Man-Days
Detail: Surface	500	1:2,000	90 Man-Days
Underground			

*Other (specify)

Total Cost \$ 120,635.50

GEOPHYSICAL/GEOCHEMICAL SURVEYS

Yes No

Method

Grid

Topographic Location Surveys

*Other (specify)

Total Cost \$ 33,636.93

ROAD CONSTRUCTION

Yes No

Length 4,760 m Width 5 m

On Licence(s) No(s) 293, 294, 277, 280, 281, 1299, 1302

Access to

Total Cost \$ 104,583.78

SURFACE WORK

Yes No

	Length	Width	Depth	Cost
Trenching	5,852	1 m	1 m	
Seam Tracing				
Crosscutting				

*Other (specify)

Total Cost \$ 31,843.52

UNDERGROUND WORK

Yes No

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

*Other workings

Total Cost \$ 42,742.58

DRILLING

Yes No

	Hole Size	No. of Holes	Total Metres	Cost
Core: Diamond				
Wireline	HQ-96 mm	3	761.82 m	
Rotary: Conventional				
Reverse circulation	124 mm	13	2,658 m	

*Other (specify)

Contractor Acadia, Tont (Diamond), SDS (Rotary), Drilling Companies.

Where is the core stored? CNRI Lab, Fernie, and on Mt. Banner East Prop.

(UTM 5,544,250 m N; 661,870 m E) Total Cost \$ 353,728.28

LOGGING, SAMPLING AND TESTING

Yes No

Lithology: Drill samples	<input checked="" type="checkbox"/>	Core samples	<input checked="" type="checkbox"/>	Bulk samples	<input checked="" type="checkbox"/>
Logs: Gamma-neutron	<input checked="" type="checkbox"/>	Density	<input checked="" type="checkbox"/>		
*Other (specify) Caliper					
Testing: Proximity analysis	<input checked="" type="checkbox"/>	FSI	<input checked="" type="checkbox"/>	Washability	<input checked="" type="checkbox"/>
Carbonization	<input checked="" type="checkbox"/>	Petrographic	<input checked="" type="checkbox"/>	Plasticity	<input checked="" type="checkbox"/>

*Other (specify)

To Date Total Cost \$ 49,968.13

OTHER WORK (specify details)

Reclamation (charring, seeding, fertilizing) roads, adit and

drill sites, re-contouring parts of Mt. Banner East road as

requested by the Advisory Committee on Coal

Exploration, BC Ministry of Energy, Mines and

Petroleum Resources

Total Cost \$ 49,338.13

On-property costs 786,476.85

Off-property costs 36,251.35

Total Expenditures \$ 822,728.20

1981.01.28
(Date)

W. K. Karulsh
(Signature)

Manager - Accounting, CNRI
(Position)

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