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MOUNT BANNER EAST PROSPECT

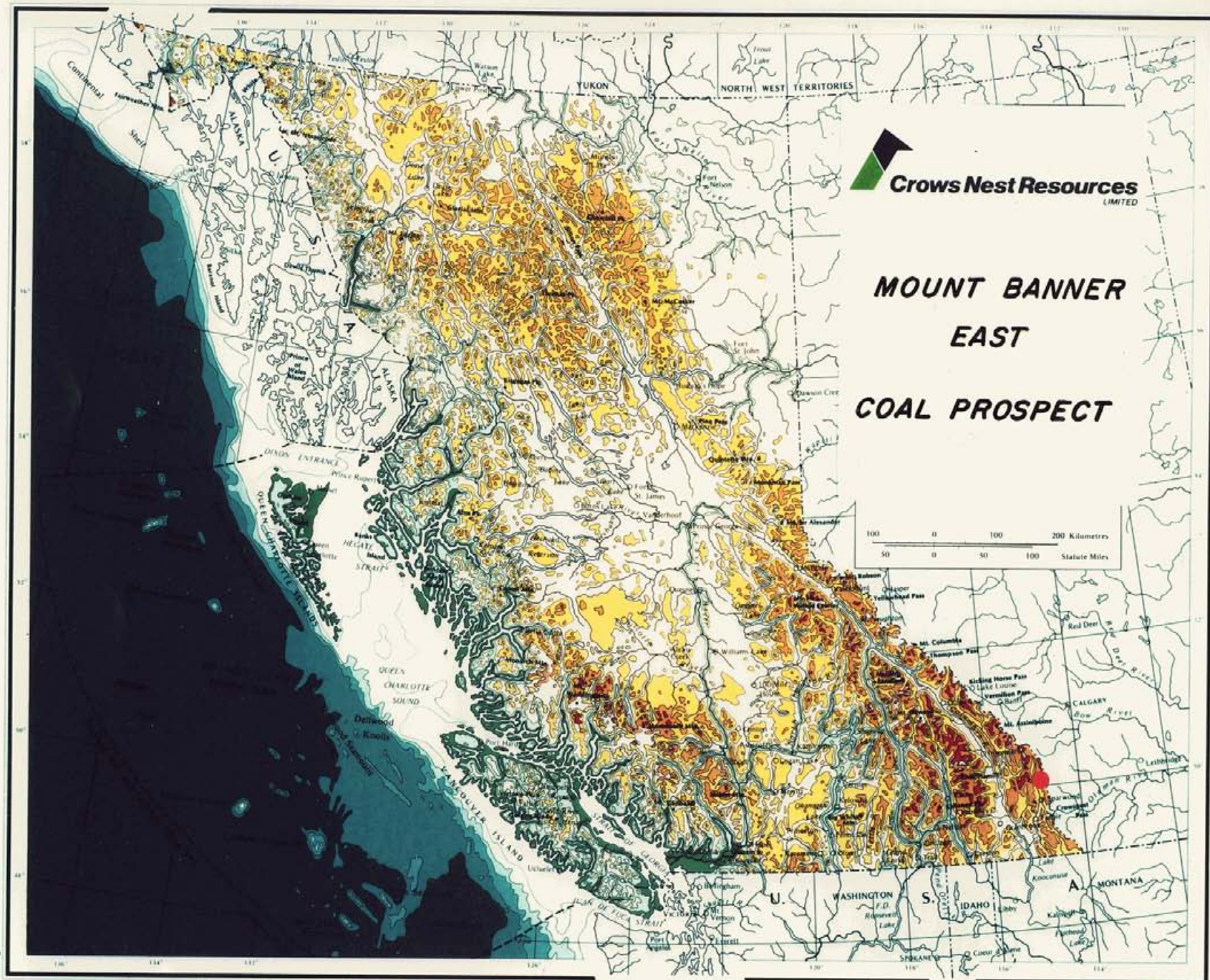
GEOLOGICAL REPORT ON COAL LICENCES
277, 280, 281, 1299 and 1302

GROUP NO. 329

1981

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 433



**MOUNT BANNER
EAST
COAL PROSPECT**





Crows Nest Resources

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P.O. Box 2699, Station M, Calgary, Alberta T2P 2M7 Telex 03-822505

LIMITED

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January 31, 1982

Ministry of Energy, Mines and Petroleum Resources
British Columbia

Enclosed please find our report on the Mount Banner East Prospect

Dr. Barry D. Ryan planned and supervised the 1981 geological field program on Mount Banner East B.C. Coal Licences held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited. Tara Sloan and Mike Sherwin assisted with the field work. Mike Sherwin and Gary Cox assisted with the preparation of this report.

Dr. Barry D. Ryan received his B.Sc. Honours Degree in Geology from the University of British Columbia in 1967 and his Ph.D. from the same University in 1973. He has worked for a number of mining companies before accepting a post with CNRL in April 1981.

Mike Sherwin, B.Sc., graduated in Geology from the University of Manitoba in 1981.

Gary Cox, B.Sc., graduated in Geology from the University of Alberta in 1981.

Tara Sloan is currently attending the University of Calgary specializing in Geology.

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

Yours very truly,

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

MOUNT BANNER EAST PROSPECT
GEOLOGICAL REPORT ON COAL LICENCES 277, 280, 281, 1299 and 1302
GROUP NO. 329

HELD BY: SHELL CANADA RESOURCES LIMITED
OPERATED BY: CROWS NEST RESOURCES LIMITED

KOOTENAY LAND DISTRICT
BRITISH COLUMBIA

FOR WORK DONE IN PERIOD
JUNE, 1981 to OCTOBER, 1981, INCLUSIVE

LATITUDE 50°01'30" WEST
LONGITUDE 114°45'30" WEST
MAP REFERENCE N.T.S. 82J/2

JANUARY 31, 1982

PROJECT GEOLOGIST: BARRY D. RYAN

ASSISTANT GEOLOGISTS: G.F. COX
M. SHERWIN
T. SLOAN

(i)

MOUNT BANNER EAST

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MOUNT BANNER EAST

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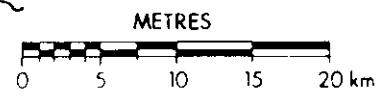
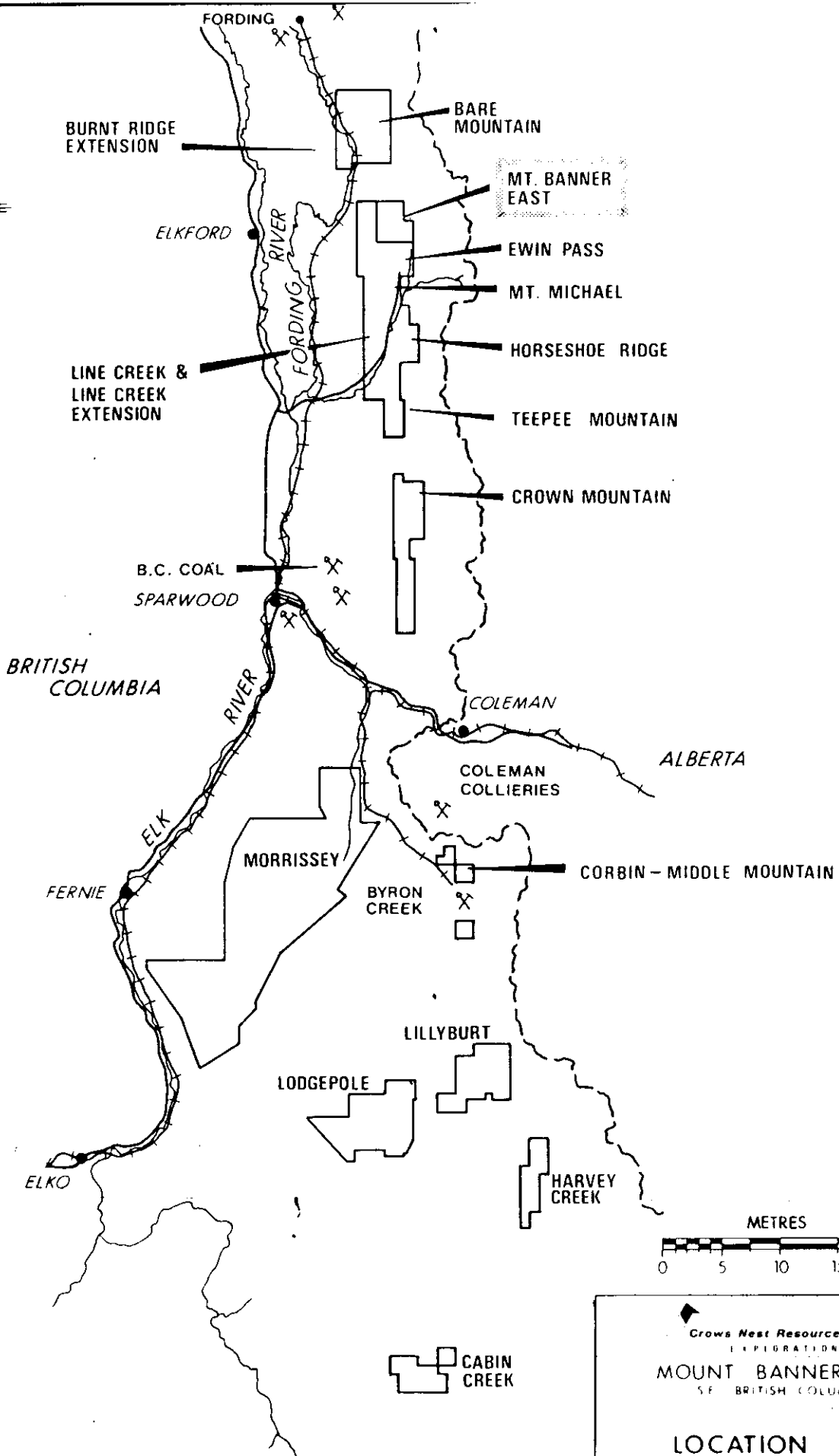
1.0 SUMMARY

The Mount Banner East Prospect is part of the Elk Valley Coalfield in the Rocky Mountains of Southeastern British Columbia. It is located at Latitude 50°01'30" North and Longitude 114°45'30" West 12 kilometres from the town of Elkford. The prospect is 2.5 kilometres from the nearest existing railway (FIGURE 1), on which it is approximately 1,180 kilometres to the Vancouver area coal ports. Exploration on the prospect is still in the grass roots stage.

The coal bearing Jura-Cretaceous Kootenay Group crops out on the prospect where it is 435 metres thick and includes over 50 metres of coal in at least thirteen seams which are identified in the southeast part of the map area (Sloan, 1981). Analysis of core samples indicate a low to medium volatile bituminous coal quality (TABLE 2 included in this report).

The prospect is located east of Mount Banner; it is traversed by a syncline which plunges southward under Mount Banner East. The prospect has limited open pit potential. Reserve of eight million tonnes of low overburden ratio coal have been identified (Sloan, 1981). There are four seams greater than 5 metres thick (Sloan, 1981). These also have an underground mining potential, particularly in the area where dips are less than 20 degrees.

The Mount Banner East Prospect is located in the northeastern corner of the Central Block, Group No. 329, B.C. Coal Licences held by Shell Canada Resources Limited, operated by its wholly-owned subsidiary, Crows Nest Resources Limited (Appendix A).



Crows Nest Resources Limited
EXPLORATION
MOUNT BANNER EAST
SE BRITISH COLUMBIA,
LOCATION MAP

APPROX. COX
DATE: APR. 1982

ENCLOSURE NO. AA 804

2.0 INTRODUCTION

2.1 Coal Land Tenure

Five B.C. Coal Licences (No's: 277, 280, 281, 1299 and 1302) comprise Group No. 329 covering approximately 908 hectares in southeastern British Columbia's Kootenay Land District. These Licences are held by Shell Canada Resources Limited and operated by it wholly-owned subsidiary, Crows Nest Resources Limited.

Appendix A locates these licences which make up Group No. 329. TABLE 1 is a summary of the coal land tenure standing. This report accounts for work performed in 1981 on Licences 277, 280, 281, 1299 and 1302, the Mount Banner East Prospect.

CROWS NEST RESOURCES LIMITED (Exploration)

B.C. COAL LICENCES
TENURE STANDING

BLOCK: CENTRAL BLOCK

PROJECT: _____ YEAR: 1981

GROUP: #329

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	\$ 10 ³	TOTAL \$ 10 ³		SHELL CLASS.
5 LIC		908		1,882.8	4,540	32.3	74.8	7 & 8	11,200	9+	139,845	JANUARY 31	-	-	2,129.8	Y	THE LICENCES ARE IN GOOD STANDING UNTIL JAN 31ST 1990 UNDER THE '78 COAL ACT AND UNTIL JANUARY 31ST 1990 UNDER THE '78 COAL ACT WITH \$46.08 PER HECTARES CRI FOR THE SUBSEQUENT TERM
277	LOT 6748	259	75														
280	LOT 6751	259	75														
281	W 1/2 6752	130	75														
1299	W 1/2 6782	130	74														
1302	E 1/2 6752	130	74														
				WORK DONE	1980	1981											
				\$	247,050	41,845											

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. It is on the east side of the Fording River Valley, 12 kilometres by air from the town of Elkford. It is centered approximately on the intersection of 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 northeast by Ewin Creek and on the west by a small tributary of Ewin Creek (APPENDIX A).

The main ridge of Mount Banner East is rugged with a 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 generally heavily forested, in sharp contrast to the more open grassy slopes of Mount Banner.

2.3 Access

Rail and road transport routes are located within 2.5 kilometres of the prospect. It is 11.4 kilometres by road to B.C. Coal Resources' Greenhills Plant construction site. The Canadian Pacific Railway Fording spur line roughly parallels a paved highway owned by Fording Coal Limited, which connects Elkford to the Fording mine site (Appendix A). Access to the base of the prospect from the Fording highway is by 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 (Sloan, 1981). It was a four-wheel drive road, but the lower portion has since been reclaimed by recontouring.

3.0 WORK DONE

3.1 Summary of Previous Work

A report filed by Crows Nest Resources Limited in 1979 entitled North Central Block Project (Group No. 266 was a part of Shell-CNRL's Central Block of B.C. Coal Licences) accounts for the initial reconnaissance mapping. It was prepared by Crows Nest Resources Limited Geologist, John Fisher.

A report filed by Crows Nest Resources Limited in 1981 entitled Mount Banner East Prospect prepared by G.R. Sloan, a Geological Technologist, employed by Crows Nest Resources Limited accounts for the following: continued reconnaissance mapping, detailed mapping of outcrops in an area of prospective open pit for coal mining: hand trenching, sampling and analysis of the coal occurrences: construction of 3.6 kilometres of exploration road and 127 metres of backhoe trenching of coal occurrences along the road: continuous diamond core drilling of 319 metres in a vertical hole and its downhole geophysical logging: examination of the core: sampling and analysis of the coal intersections. TABLE 2 provides the results of proximate analyses of core samples from Mount Banner East. In summary the Mount Banner East coal is low to medium volatile bituminous by rank, according to A.S.T.M. standards. Appendix D shows the surveyed location of the road, drill hole, coal occurrences and control points.

TABLE 2

COAL QUALITY (From Previous Work)

		<u>Raw Coal</u>	<u>Clean Coal</u>
			Washed at 1.6 S.G.
			<u>Air Dry Basis</u>
<u>Proximate Analyses</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

3.2 Objectives of the 1981 Exploration

The objectives of the 1981 field program were:

- to continue compilation of a detailed geological map of the prospect area.

3.3 Work Done in 1981

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

- continued detailed geological mapping on a 1:5,000 scale of the prospect area for coal outcrops.
- hand trenching of coal bloom and coal subcrops.

This report includes a 1:5,000 geological map as APPENDIX A updated with 1981 mapping results. Also included is a summary of the hand trenches as TABLE 3. The location of the upslope end of each trench is plotted to within 50 metres on the 1:5,000 geological map, APPENDIX C.

TABLE 3

SUMMARY OF HAND TRENCHES - MOUNT BANNER EAST - 1981

- Notes:
- No samples taken from any of these trenches.
 - Trench location accurate to 50 m.
 - U.T.M. coordinates of up-slope end of trench.

Trench	U.T.M. Coordinates		Elevation	Apparent Coal Thickness	Average Attitude of Strata	True Coal Thickness	Trench Azimuth	Trench Plunge
	Northing	Easting						
1	5 544 847	659 903		10.0 m	182°/79°	6.3 m	305°	+ 30°
2	5 544 848	659 874		1.5 m	281°/12°	.62 m	305°	+ 30°
3	5 544 803	659 756		23.0 m	95°/7°	14.64 m	315°	+ 35°
				9.4 m	95°/7°	6.7 m	325°	+ 40°
				32.4 m		21.34 m		
4	5 544 793	659 649		6.7 m	190°/50°	6.0 m	135°	+ 40°

3.4 1981 Exploration Expenditure

The total 1981 exploration expenditure for the Mount Banner East prospect was \$41,845.00. Details of the 1981 exploration expenditure are contained in the Application to Extend Term of Licence on the following pages.



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

APPLICATION TO EXTEND TERM OF LICENCE

I, LESLIE GRAMANTIK agent for SHELL CANADA RESOURCES LIMITED
(Name) (Name)
P.O. BOX 100 CALGARY
(Address) (Address)
ALBERTA T2P 2M7
Valid FMC No. 244642

hereby apply to the Minister to extend the term of Coal Licence(s) No(s). 277, 280, 281, 1299,
1302, 5 LICENCES, GROUP NO: 329, 908 HECTARES
for a further period of one year.

2. Property name MOUNT BANNER EAST, 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 \$ 41,845.00

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

CATEGORY OF WORK

CATEGORY OF WORK	Licence(s) No(s).	Apportioned Cost
Geological mapping	277, 280, 281, 1299	33,009
Surveys: Geophysical	-	-
Geochemical	-	-
Other (TOPOGRAPHIC)	-	1,533
Road construction	-	-
Surface work	277	2,510
Underground work	-	-
Drilling	-	-
Logging, sampling, and testing	-	-
Reclamation	281, 1302	588
Other work (specify)	-	-
Off-property costs	GEOLOGICAL REPORT	4,205

5. I wish to apply \$ 41,845.00 of this value of work on Coal Licence(s) No(s). 277, 280, 281,
1299, 1302.

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 MOUNT BANNER EAST
GEOLOGICAL REPORT WILL BE SUBMITTED IN 90 DAYS.

JANUARY 27, 1982
(Date)

(Signature)

ASSISTANT LANDMAN
(Position)

GEOLOGICAL MAPPING

Yes No

Area (Hectares)

Scale

Duration

Reconnaissance
Detail: Surface 475 1:5,000 48 MAN-DAYS
Underground
Other* (specify)
Total Cost \$ 33,009

GEOPHYSICAL/GEOCHEMICAL SURVEYS

Yes No

Method
Grid
Topographic 1,533
Other* (specify)
Total Cost \$ 1,533

ROAD CONSTRUCTION

Yes No

Length Width
On Licence(s) No.(s)
Access to
Total Cost \$

SURFACE WORK

Yes No

Length Width Depth Cost
Trenching (HAND) 50-6M 0.5M 0.5M 2,510
Seam Tracing
Crosscutting
Other* (specify)
Total Cost \$ 2,510

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: Proximate analysis FSI Washability
Carbonization Petrographic Plasticity
Other* (specify)
Total Cost \$

RECLAMATION

Yes No

Details Total Cost \$ 588

OTHER WORK (Specify details)

Yes No

Cost
Total Cost \$

OFF-PROPERTY COSTS

Yes No

Details GEOLOGICAL REPORT Total Cost \$ 4,205

Total Expenditures \$ 41,845

Jan. 28/82
(Date)

L. J. Kowalski
(Signature)

MANAGER - ACCOUNTING CNRL

(Position)

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

4.0 GEOLOGY

4.1 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 Mist Mountain Formation of the Kootenay Group.

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. The syncline is on the east limb of the Fording Syncline (Alexander Creek Syncline) under the Fording (Ewin Pass) Thrust (Appendix B).

4.2 Stratigraphy

Jurassic-Cretaceous sediments (TABLE 4) grading from marine shales (Fernie Formation) to fully alluvial conglomerates and sandstones (Blairmore Group) represent the regression to the northeast of the Jurassic "Fernie Sea" from this area. This regression occurred through various epineritic and deltaic environments the latter being favourable to coal deposition.

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 Group

This report adheres to the stratigraphic nomenclature established Gibson (1979) of the Geological Survey of Canada. He divides the Kootenay Group into three formations: the Morrissey, Mist Mountain and Elk in ascending order (TABLE 4).

Morrissey Formation

This Formation represents the transition from marine to deltaic depositional environment. It is divided into the Moose Mountain and Weary Ridge Members.

The Weary Ridge Member is 27.8 metres thick on Mount Banner East. It consists of medium to thick bedded, fine to medium grained sandstone with minor

iron-stained concretions and silty as well as shaley interbeds. The member is grey but weathers orange-brown. The Moose Mountain Member is generally massive, well indurated, medium to coarse-grained gray sandstone with a few thin chert pebble or silty bands. It weathers light to medium gray and is a distinct cliff-former. An 18.7 metre section of this member was measured on Mount Banner East. Coal seams have been found in this member on other CNRL properties, but on Mount Banner East only one thin coaly stringer was observed in outcrop and in the diamond drill core (Sloan, 1981).

Mist Mountain Formation

This Formation 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 Formation, and often makes up more than 10% of the Formation.

On Mount Banner East the Mist Mountain Formation is approximately 435 metres thick and contains 13 coal seams with an aggregate thickness of over 50 metres (Sloan, 1981).

Elk Formation

This Formation consists of cliff-forming, buff weathering, gray sandstones, a few conglomerate bands, siltstones, shales, and of a few thin seams of hard coal. More than 200 metres lower Elk Formation caps the south end of the main ridge of Mount Banner East.

TABLE OF FORMATIONS TABLE 4 (Adapted from Gibson, 1979)

ERA	PERIOD	FORMATION	LITHOLOGY	THICKNESS (M)	
MESOZOIC	Lower Cretaceous	Cadamin Fm.	non-marine: sandstone, conglomerate and shale	360 - 1980	
	LOWER CRETACEOUS AND JURASSIC	Pocaterra Creek	non-marine: sandstones, conglomerate, siltstones and shales		
		ELK FORMATION	non-marine: interbedded medium to coarse grain sandstone, chert-pebble conglomerate with minor siltstone shale and uneconomic coals	150 - 490	
		KOOTENAY GROUP	MIST MTN. FORMATION	non-marine and brackish: interbedded coal, siltstones, shales, and sandstones	380 - 480
			MORRISSEY FORMATION	Moose mtn. ----- Weary Ridge	non-marine: massive cliff-forming sandstone
	Jurassic	Fernie Fm.	marine: shales, siltstone, sandstone, limestone	180 - 380	

4.3 Geological Structure

The prospect is located on the east limb of the Alexander Creek Syncline. Much of the prospect is a scarp slope of west dipping beds cropping out on the east side of a north trending ridge. In the south a northeast trending secondary ridge produces an extended area of Mist Mountain Formation outcrop. A northwest trending syncline trends across this ridge producing a small area favourable to open pit mining.

The Northwest trending syncline is located in the basal plate of the Ewin Pass Thrust which crops out near the Elk - Mist Mountain formation contact west of the syncline trace. The syncline should trend northwards along the lower part of the ridge but bedding measurements indicate that it is replaced to the north by thrusts associated with the Ewin Pass Thrust.

Outcrop of the Mist Mountain Formation in the northern part of the prospect is poor. Mapping of the overlying Elk Formation and limited Mist Mountain Formation outcrop indicates that in this region the basal plate of the Ewin Pass Thrust is disturbed by a number of small drag folds and thrusts.

4.4 Coal Geology

Mapping of the southern part of the prospect (Sloan, 1980) outlined 13 major coal seams, the lower 8 were observed in

outcrop and drill core, the upper 5 in outcrop. The 1981 mapping located coal outcrops in the upper part of the Mist Mountain Formation in the northern part of the prospect. These could not be correlated with the seams mapped in the south. Trenches dug in 1981 are located on the 1981 Mount Banner Geology Map (Appendix C) and the relevant data is in Table 3.

Some of the seams in the south can be correlated with seams at Line Creek, these seams have been given the same number designation, other seams have been given a letter designation unique to the Mount Banner prospect.

The No. 10 seam directly overlies the Moose Mountain member. It is 15.05 metres thick in the diamond drill core, consisting of 7.61 metres of coal in six splits and 7.44 metres of rock (Sloan, 1981). The seam is similar at Ewin Pass. Only the base of No. 10 seam was exposed in hand trenches due to the usually thick overburden which cover it.

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 traced by trenching.

A sandstone unit approximately 13 metres thick, overlain by a thin coal seam, occurs above No. 9 seam (Sloan, 1981). No. 9 seam is believed to be equivalent to the so-called "Marker Seam" at Line Creek and was named accordingly.

Seams E, G, H, I, and J are thicker in outcrop (in an up-dip direction) than in the drill hole. Seams C, D, and F occur in outcrop only. Minor bedding slippage thrust faulting was observed on the outcrops of some seams (Sloan, 1981).

The two uppermost seams, K and L, were not intersected by the drill hole and stratigraphic correlation in hand trenches was made very difficult by the extreme depth of overburden (Sloan, 1981).

5.0 MINEABILITY AND COAL RESERVES/RESOURCES

5.1 Open Pit

There is not enough information for measured reserve calculations. Preliminary Reserve Estimates were made by Sloan (1981).

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 km². 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 3.5:1m³ rock/tonne of coal. (Sloan, 1981)

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. (Sloan, 1981)

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. (Sloan, 1981).

6.0 RECOMMENDATIONS

Continued detailed mapping of the prospect area is advisable.

Drilling will be needed for a thorough evaluation of the coal resources and mining potential.

7.0 SELECTED BIBLIOGRAPHY

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SLOAN, G. - Geological Report: Mount Banner East Prospect; Internal Crows Nest Resources Limited filed with B.C. Ministry of Energy, Mines and Petroleum Resources, 1981.

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: MOUNT BANNER (4152-S) - S.E. BRITISH COLUMBIA

All survey control in the Mount Banner area is based on the Crows Nest Control Network using results established from the fall of 1980. The stations used were 'North' and '79-401'.

From these two stations 3 geological control points were established, 'SR1-TS81', '81TS 5+1', and 'LE8TS81'.

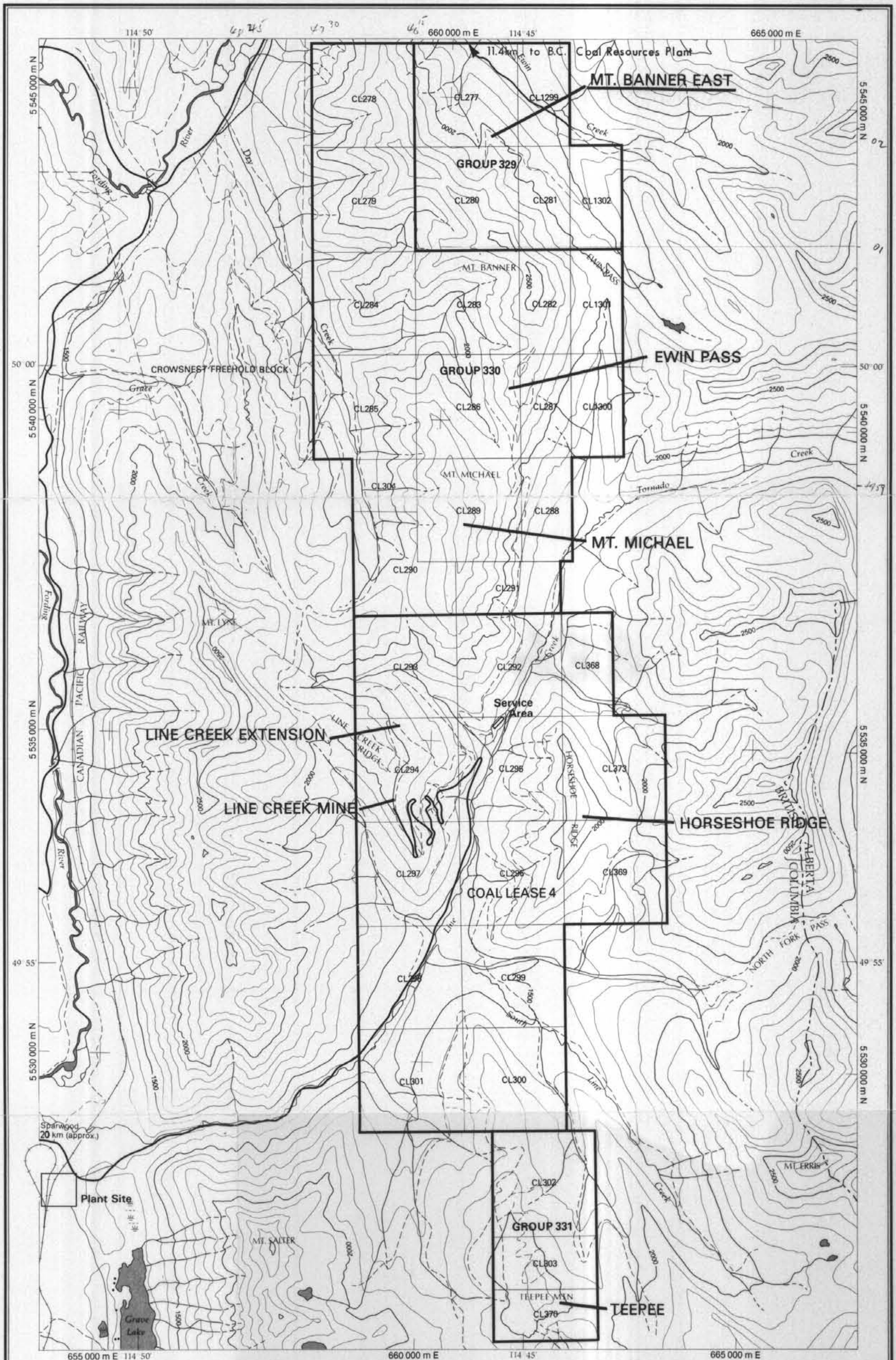
Conventional survey methods using a 1" theodolite and electronic distance measuring equipment were used to obtain survey data. All calculations were done in the UTM system with distances being reduced to plane and bearings referenced to 117°W. The results were given to C.N.R.L. personnel in both tabular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



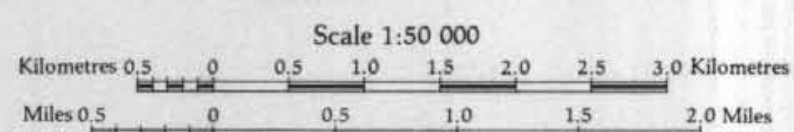
A. L. Melton

RB/cm

s729



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 1:100,000 mapping. Metric contours were manually interpolated.



Scale 1:50 000
 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



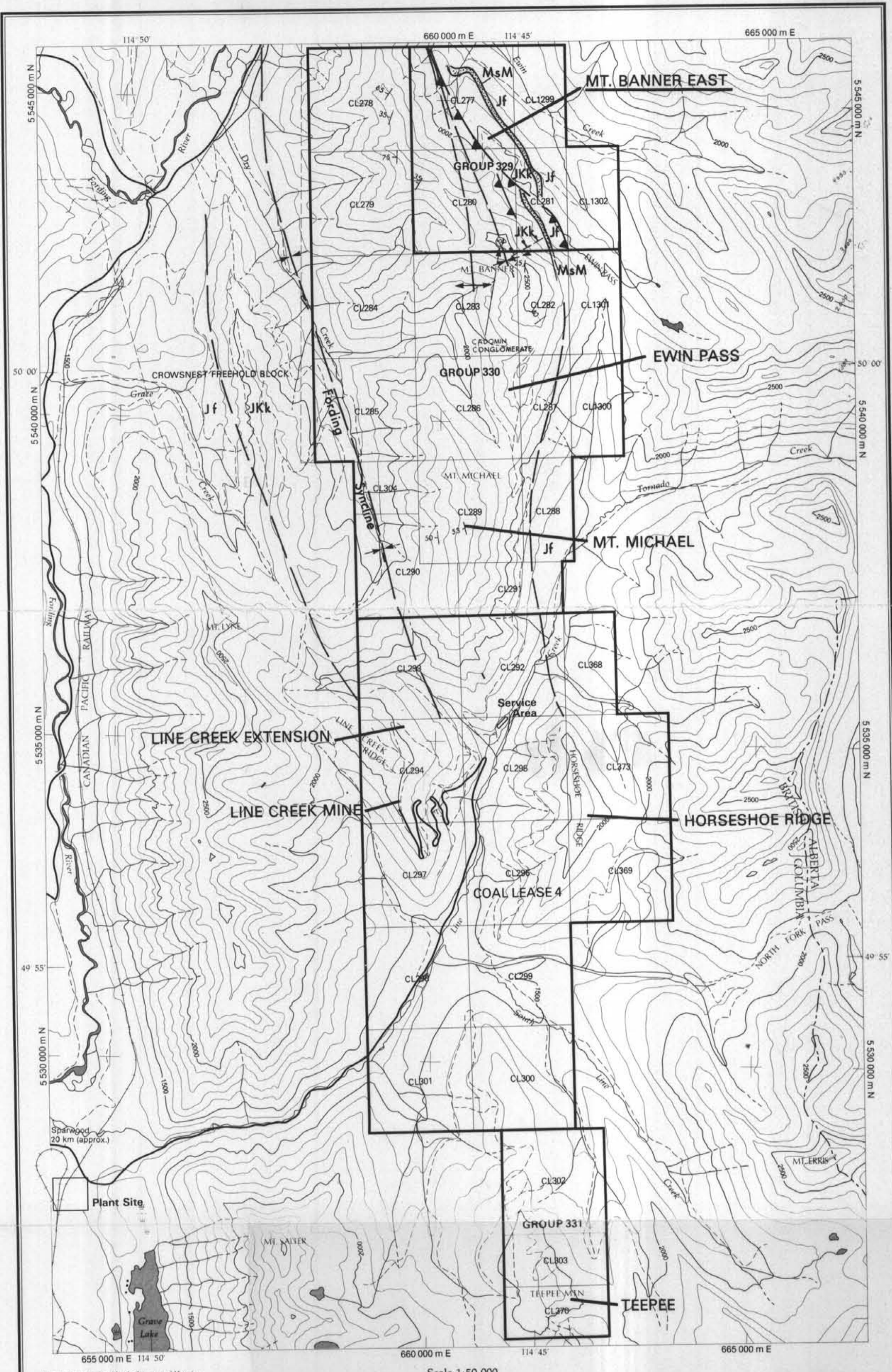
Crows Nest Resources Limited
 EXPLORATION

MOUNT BANNER EAST
 S.E. BRITISH COLUMBIA
INDEX TO COAL LICENCES AND ACCESS MAP

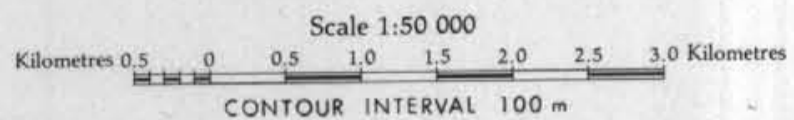
N.T.S. 82 G/15 & 82 J/2	Appendix A
AUTHOR: G. COX	SCALE: 1:50 000
DATE: JAN 1982	REVISED:
ENCLOSURE NO.	CA 273

433

K-SHELL - Mt Banner East 81(2*)A *(1)



Reference map produced by the Surveys and Mapping Branch, Department of Energy, Mines and Resources in 1975 and updated from 1979 Province of British Columbia 1:100,000 map. Metric contours were manually interpolated.



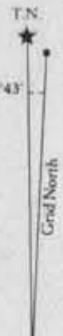
GEOLOGICAL SYMBOLS

- ▲ Thrust Fault
- I I Normal Fault
- ∕ Bedding Altitude
- ↔ Syndine
- ⬆ Anticline
- ▨ Sandstone
- ▩ Cadomin Conglomerate

GEOLOGICAL LEGEND

- JURASSIC - CRETACEOUS**
- JKk Kootenay Group
 - JKe Elk Formation
 - JKmm Mist Mountain Formation
 - JKm Moorissy Formation
 - MsM Moose Mountain Member
 - Wm Weary Ridge Member
- JURASSIC**
- Jf Fernie Formation

- 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

S.E.B.C.
MOUNT BANNER EAST
GEOLOGIC COMPILATION MAP

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

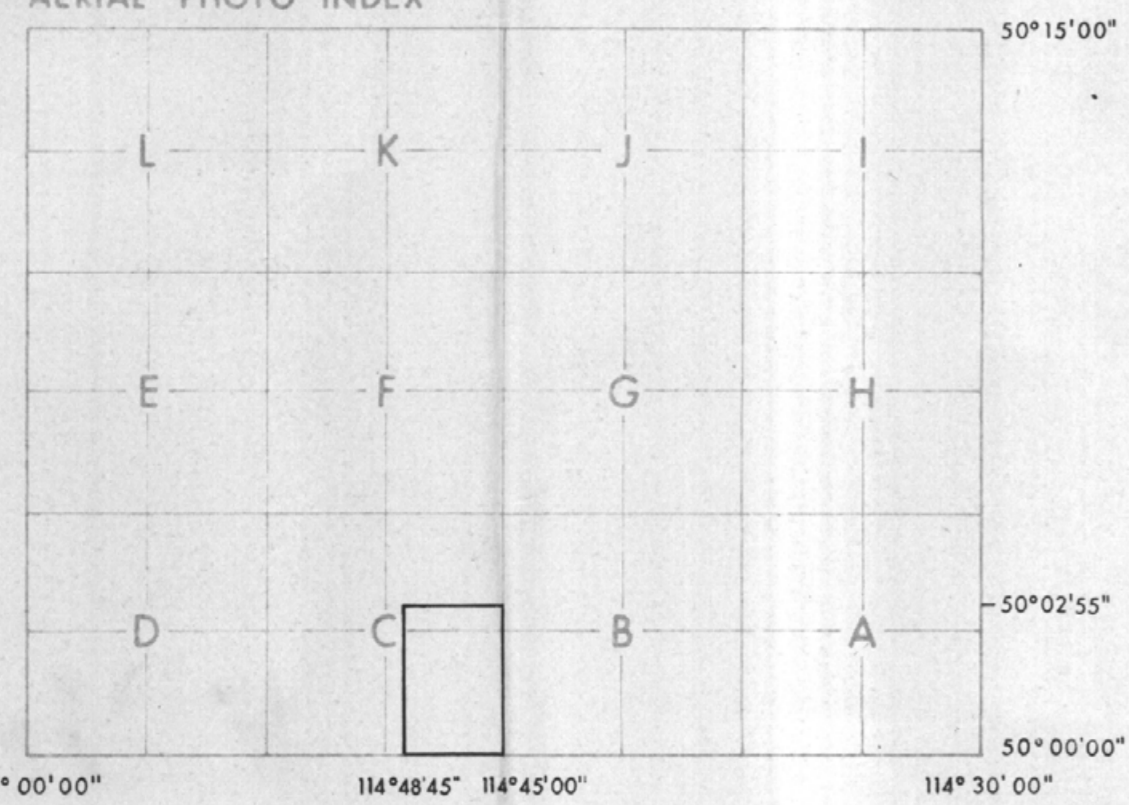
Author: G. COX
Date: JAN 1982
Scale: 1:50,000
Revised: _____
To Accompany: _____
Enclosure No: CA-274

433

K-SHELL Mt Banner East 81 (2*)A *(1)



MAP INDEX AND AERIAL PHOTO INDEX



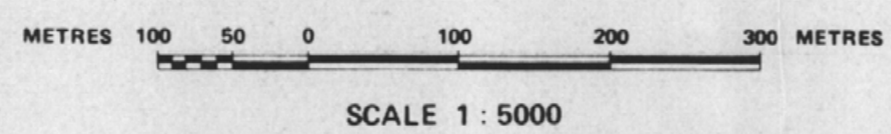
REFERENCE

- MAIN ROAD
- SECONDARY ROAD
- TRACK OR TRAIL
- RAILWAY
- RIDGE FENCE
- BRIDGE CULVERT
- CUT FILL
- SWAMP
- DRILL HOLE
- MAP PROJECTION: UNIVERSAL TRANSVERSE MERCATOR CENTRAL MERIDIAN REFERENCE 117° W.

PREPARED BY NORTH WEST SURVEY CORPORATION (YUKON) LTD.

GEOLOGICAL LEGEND

- CRETACEOUS**
 - Blairmore Group
- JURASSIC-CRETACEOUS**
 - Kootenay Group
 - Elk Formation
 - Mat Mountain Formation
 - Morrissy Formation
 - Moose Mountain Member
 - Wary Ridge Member
- JURASSIC**
 - Famie Formation
- TRIASSIC**
 - Spray River Group
- Sandstone (Ss)
 - Medium Grain
 - Fine Grain
- Shale (sl)
- Cadomian Conglomerate
- Coal
- Geological Contact - defined, approx., inferred
- Thrust Fault
- Normal Fault
- Bedding Strike & Dip
- Uplapse End of Trench - Location Approximate
- Axial Trace: Syncline, Anticline
- (Coal Licence Boundary) Approximate Location
- Complexly folded strata



K-SHEET: H. Banner East 81(20)A (1)

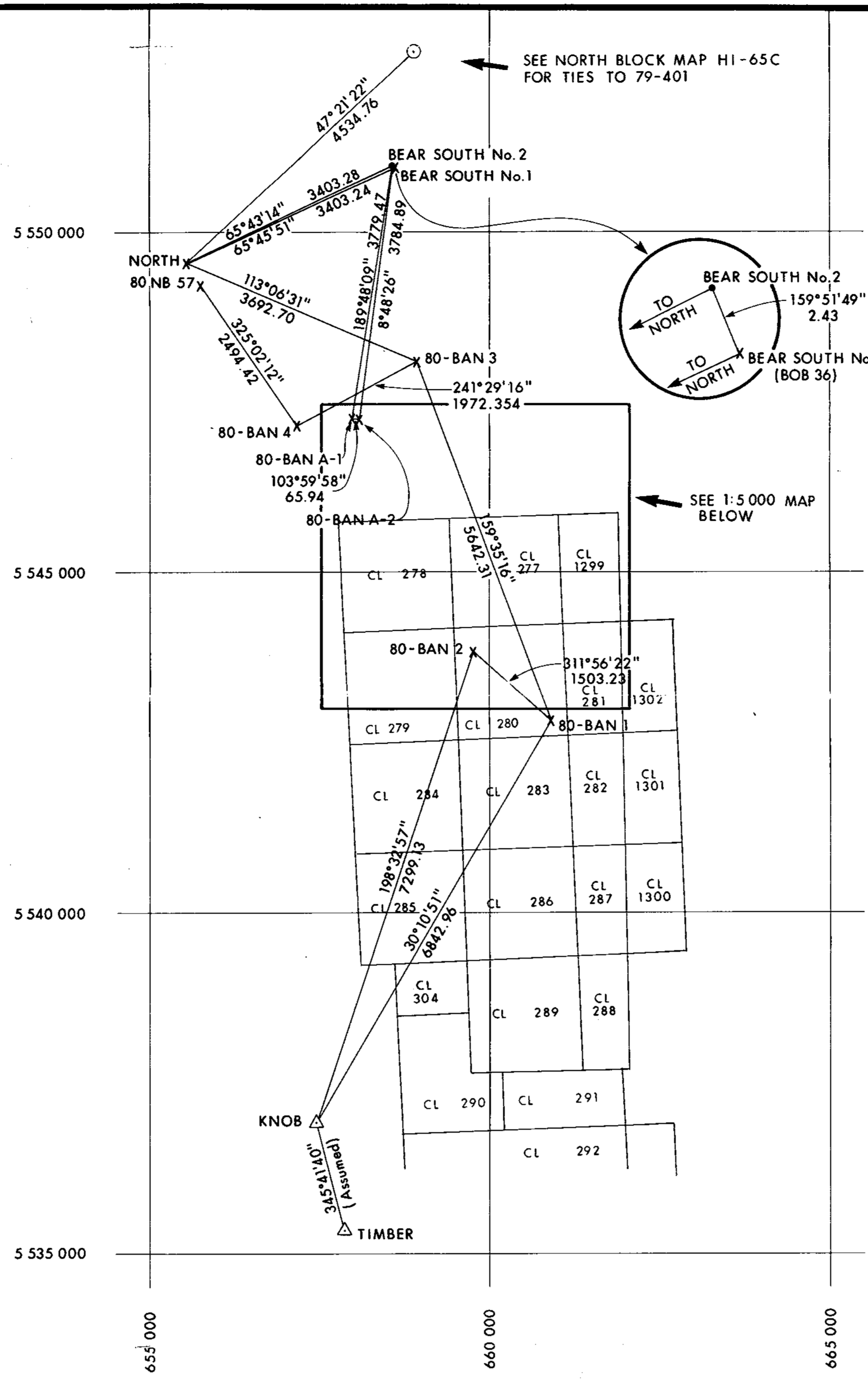
Crows Nest Resources Limited
EXPLORATION

MOUNT BANNER EAST
S.E. BRITISH COLUMBIA

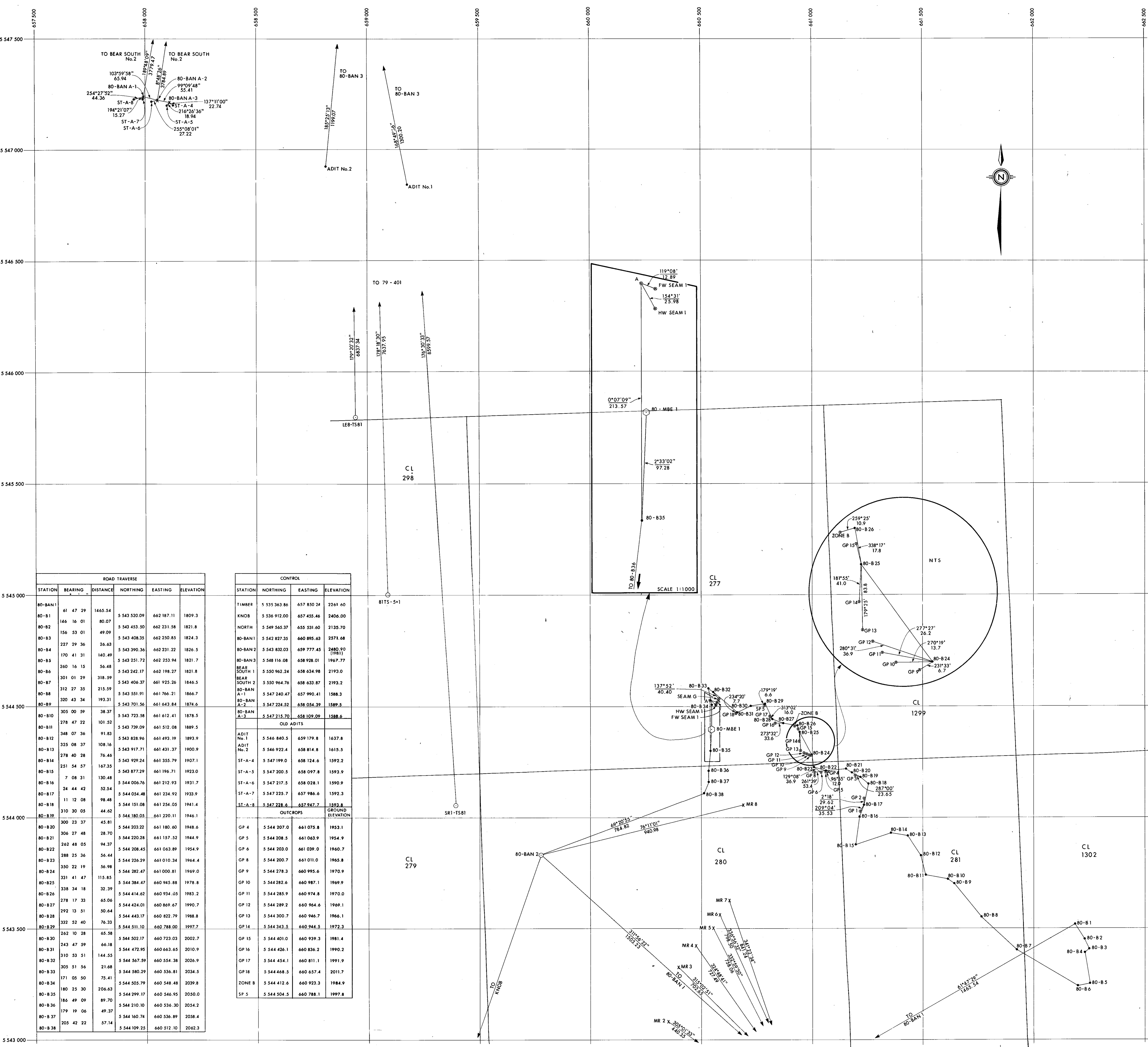
433

GEOLOGICAL MAP

NTS. 82J/2		UTM. ZONE 11	
AUTHOR: GARY COX	SCALE: 1:5000	ENCLOSURE No: Appendix C	
DATE: FEBRUARY, 1982	REVISED:	DRAWING No: HI-95	
To Accompany			



CONTROL FOR BANNER
SCALE 1:50 000



ROAD TRAVERSE					
STATION	BEARING	DISTANCE	NORTHING	EASTING	ELEVATION
80-BAN 1	61 47 29	1465.54	5 543 520.09	662 187.11	1809.3
80-B1	146 16 01	80.07	5 543 453.50	662 231.58	1821.8
80-B2	156 53 01	49.09	5 543 408.35	662 250.85	1824.3
80-B3	227 29 36	26.63	5 543 390.36	662 231.22	1826.5
80-B4	170 41 31	140.49	5 543 251.72	662 253.94	1821.7
80-B5	260 16 15	56.48	5 543 242.17	662 198.27	1821.8
80-B6	301 01 29	318.59	5 543 406.37	661 925.26	1846.5
80-B7	312 27 35	215.59	5 543 551.91	661 766.21	1866.7
80-B8	320 43 34	193.31	5 543 701.56	661 643.84	1876.6
80-B9	305 00 59	38.37	5 543 723.58	661 612.41	1878.5
80-B10	278 47 22	101.52	5 543 739.09	661 512.08	1889.5
80-B11	348 07 36	91.83	5 543 828.96	661 493.19	1893.9
80-B12	325 08 37	108.16	5 543 917.71	661 431.37	1900.9
80-B13	278 40 28	76.46	5 543 929.24	661 355.79	1907.1
80-B14	251 54 57	167.35	5 543 877.29	661 196.71	1923.0
80-B15	7 08 31	130.48	5 544 006.76	661 212.93	1931.7
80-B16	24 44 42	52.54	5 544 054.48	661 234.92	1933.9
80-B17	11 12 08	98.48	5 544 151.08	661 254.05	1941.4
80-B18	310 30 05	44.62	5 544 180.05	661 220.11	1946.1
80-B19	300 23 37	45.81	5 544 203.22	661 180.60	1948.6
80-B20	306 27 48	28.70	5 544 220.28	661 157.52	1944.9
80-B21	262 48 05	94.37	5 544 208.45	661 063.89	1954.9
80-B22	288 25 36	56.44	5 544 226.29	661 010.34	1964.4
80-B23	350 22 19	56.98	5 544 282.47	661 000.81	1969.0
80-B24	331 41 47	115.85	5 544 384.47	660 945.88	1978.8
80-B25	338 34 18	32.39	5 544 414.62	660 934.05	1983.2
80-B26	278 17 33	65.06	5 544 424.01	660 869.67	1990.7
80-B27	292 13 51	50.64	5 544 443.17	660 822.79	1988.8
80-B28	332 52 40	76.33	5 544 511.10	660 788.00	1997.7
80-B29	262 10 28	65.58	5 544 502.17	660 723.03	2002.7
80-B30	243 47 59	66.18	5 544 472.95	660 663.65	2010.9
80-B31	310 53 51	144.55	5 544 367.59	660 554.38	2026.9
80-B32	305 51 56	21.68	5 544 380.29	660 536.81	2034.5
80-B33	171 05 50	75.41	5 544 505.79	660 548.48	2039.8
80-B34	180 25 30	206.63	5 544 299.17	660 546.95	2050.0
80-B35	186 49 09	89.70	5 544 210.10	660 536.30	2054.2
80-B36	179 19 06	49.37	5 544 160.74	660 536.89	2058.4
80-B37	205 42 22	57.14	5 544 109.25	660 512.10	2062.3
80-B38					

CONTROL			
STATION	NORTHING	EASTING	ELEVATION
TIMBER	5 535 363.86	657 850.24	2261.60
KNOB	5 536 912.00	657 455.46	2406.00
NORTH	5 549 565.37	655 531.60	2135.70
80-BAN 1	5 542 827.33	660 895.63	2371.68
80-BAN 2	5 543 832.03	659 777.45	2480.90 (1981)
80-BAN 3	5 548 116.08	658 928.01	1967.77
BEAR SOUTH 1	5 550 962.24	658 634.98	2193.0
BEAR SOUTH 2	5 550 964.76	658 633.87	2193.2
80-BAN A-1	5 547 240.47	657 990.41	1588.3
80-BAN A-2	5 547 224.52	658 054.39	1589.5
80-BAN A-3	5 547 215.70	658 109.02	1588.6
OLD ADITS			
ADIT No. 1	5 546 840.5	659 179.8	1637.8
ADIT No. 2	5 546 922.4	658 814.8	1615.5
ST-A-4	5 547 199.0	658 124.6	1592.2
ST-A-5	5 547 200.5	658 097.8	1593.9
ST-A-6	5 547 217.5	658 028.1	1590.9
ST-A-7	5 547 225.7	657 986.6	1592.3
ST-A-8	5 547 228.6	657 947.7	1593.8
OUTCROPS			
GP 4	5 544 207.0	661 075.8	1953.1
GP 5	5 544 208.5	661 063.9	1954.9
GP 6	5 544 203.0	661 039.0	1960.7
GP 7	5 544 200.7	661 011.0	1965.8
GP 8	5 544 278.3	660 995.6	1970.9
GP 9	5 544 282.6	660 987.1	1969.9
GP 10	5 544 285.9	660 974.8	1970.0
GP 11	5 544 289.2	660 964.6	1969.1
GP 12	5 544 300.7	660 946.7	1966.1
GP 13	5 544 343.5	660 944.3	1972.3
GP 14	5 544 401.0	660 939.3	1981.4
GP 15	5 544 426.1	660 836.2	1990.2
GP 16	5 544 454.1	660 811.1	1991.9
GP 17	5 544 468.5	660 657.4	2011.7
GP 18	5 544 412.6	660 923.3	1984.9
SP 5	5 544 504.5	660 788.1	1997.8

OUTCROPS			
STATION	NORTHING	EASTING	GROUND ELEVATION
A	5 544 512.7	660 547.4	2038.8
GP 1	5 544 023.4	661 217.1	1933.3
GP 2	5 544 084.0	661 236.1	1935.1
GP 3	5 544 187.0	661 197.5	1948.6
FW SEAM 1	5 544 506.5	660 558.7	2040.2
HW SEAM 1	5 544 489.3	660 558.6	2041.1
HW SEAM G	5 544 537.6	660 581.5	2021.5

DRILL HOLE			
STATION	NORTHING	EASTING	GROUND ELEVATION
80-MBE 1	5 544 396.35	660 551.28	2044.1

SURVEY STATIONS 1981			
STATION	NORTHING	EASTING	ELEVATION
81-T581	5 544 053.28	659 330.54	2434.26
81-T581	5 545 002.27	659 092.40	2367.38
LEB-T581	5 545 800.00	658 945.41	2237.81

LEGEND
 ○ PLANTED 3" REBAR WITH CAP AND MARKER POST
 △ FOUND CNR CONTROL MONUMENT
 X PLANT 12" SPIKE
 • PLANT 6" NAIL
 ● OUTCROP
 ○ DRILL HOLE
 ALL DISTANCES ARE IN METRES AND DECIMALS THEREOF AND HAVE BEEN REDUCED TO PLANE
 ALL BEARINGS ARE GRID AND REFERRED TO 117°W
 SURVEY PERFORMED BY Sheltech Canada, 1980, 1981
 ALL ELEVATIONS ARE TO THE TOP OF SPIKE OR IRON BAR UNLESS OTHERWISE NOTED.

Sheltech Canada
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 Crows Nest Resources Limited
 ENGINEERING
 CENTRAL BLOCK
 S.L.C.
 MT. BANNER EAST
 TRAVERSE SURVEY MAP
 AUTHOR: SHELTECH SCALE: 1:5000 (1:50000) ENCLOSURE No. Appendix D
 DATE: 80.12.17 REVISED: 81 NOV DRAWING No. HI-65