

CONFIDENTIAL
OPEN FILE

CORBIN COAL MOUNTAIN PROPERTY

SOUTH EAST BRITISH COLUMBIA

GEOLOGICAL REPORT ON THE 1982 BULK SAMPLING PROGRAM

CORBIN COAL MOUNTAIN PROPERTY

KOOTENAY LAND DISTRICT BRITISH COLUMBIA

COAL LICENCE 414: GROUP 6

HELD BY: SHELL CANADA RESOURCES LIMITED

OPERATED BY: CROWS NEST RESOURCES LIMITED

NTS MAP 82 G/7

LONGITUDE: 114° 39' TO 114° 40'

LATITUDE: 49° 28' 49° 29'

EXPLORATION PERIOD SEPTEMBER OCTOBER 1982

REPORT PREPARED BY:

PATRICK C. GILMAR

BARRY D. RYAN

FEBRUARY 1983



Crows Nest Resources

Esau Claire Place, 525 - 3rd Avenue S.W., Calgary, Alberta (403) 232-4355 **LIMITED**
P.O. Box 2699, Station M, Calgary, Alberta T2P 2M7 Telex 03-822505

March 21, 1983

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

Dear Sirs:

Enclosed please find our report on the Corbin Coal Mountain Property. Dr. Barry Ryan was in charge of the 1982 bulk sampling program on Corbin Coal Mountain Licences held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited. He also prepared this report.

Dr. Ryan received his BSc Honours degree in Geology from the University of B.C. in 1967 and his PhD from the same University in 1973. He has worked for a number of mining companies before accepting a post with CNRL in April 1981.

I consider Dr. Ryan to be well qualified to expedite the geological field work and report preparation involved in this project. I am satisfied that the attached report dated January 1983 has been competently prepared and contains all pertinent information.

Yours very truly,

**H.G. Rushton
Vice President, Development**

Enclosure

BDR/md

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ENCLOSURES

	SCALE
1 LOCATION MAP	1:5x10 ⁵ filed at back
2 BULK SAMPLING LOCATION MAP	1:2,000 filed at back
3 LAND MAP	1:50,000 filed at back

1.0 SUMMARY

The Corbin-Coal Mountain property (Coal Licence No. 414) covers approximately 259 hectares of the southern end of Coal Mountain in southeastern British Columbia. Coal mining activities have taken place in the Corbin area since 1908. The unusually thick coal in this area is well suited to recovery by surface mining methods.

The Corbin property lies 4 km directly west of the Alberta - British Columbia boundary, 53 km directly north of the United States border, and 28 km directly east of Fernie, B.C. A forestry road runs along the west side of the property providing access to Highway 3 near Sparwood, B.C., a distance of 23 km by road from Corbin townsite. A 20 km rail spur to Corbin townsite from the CP Rail line at McGillivray has been constructed by Byron Creek Collieries Limited which is presently producing coal from the northern end of Coal Mountain.

Coal Mountain lies within the Rocky Mountains and is an outlier of the Fernie coal basin. The property contains strata of the Mist Mountain Formation including one coal seam, the Mammoth Seam, which consists of an upper coal zone and lower high ash zone. The coal is oxidized bituminous coal suitable for use in electrical power generation.

The strata on Coal Mountain have been subjected to an unusually high degree of folding and thrust faulting which have greatly thickened the Mammoth Seam. The upper coal zone achieves thickness of up to 35 metres. Seventeen rotary holes had been drilled on the property prior to 1978, eight full-cored holes were drilled during the 1978 exploration program and 11 cored holes and 1 rotary hole drilled during the 1980 exploration program. This drilling has resolved much of the structural complexity.

2.0 LOCATION

The Corbin-Coal Mountain property consists of one coal licence, Coal Licence No. 414, part of Group #6, which covers an area of 259 hectares. It is located in southeastern British Columbia and lies 4 km directly west of the Alberta-British Columbia boundary, 53 km directly north of the United States border, and 28 km directly east of Fernie, B.C. (Enclosure 1).

The Corbin-Coal Mountain coal licence covers the southern end of Coal Mountain near the former coal mining town of Corbin. Byron Creek Collieries is presently producing thermal coal from a surface mine on the northern end of the mountain.

The relief of the property is great, with the high point of 2090 m at the summit of Coal Mountain and the low point of 1550 m lying on Michel Creek to the west (Enclosure 2). The major portion of coal reserves lie high on the western flank of Coal Mountain.

3.0 ACCESS

A forestry road runs along the western edge of coal licence No. 414 and follows Michel Creek north to Highway 3 near Sparwood, B.C., a distance of 23 km from Corbin townsite. Access to the interior of the licence is from the south on an exploration road constructed by CNRL in 1978-1979. Previously access was through the Byron Creek minesite.

A rail spur from Corbin townsite to the CP Rail line at McGillivray, B.C. has been constructed by Byron Creek Collieries Limited (Enclosure 1). It is 20 km long and follows Michel Creek, paralleling a newly built public road which extends south, from Highway No. 3. Unit trains are presently hauling coal from Corbin to Thunder Bay, Ontario, a distance of 2125 km. The rail distance from Corbin to Vancouver is 1140 km.

4.0 TENURE

The B.C. Coal Licences granted to Crows Nest Industries Limited on September 19, 1974, are now held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited. These three coal licences, Nos. 412, and 414, Group No. 6, cover 713 ha. of Crown land.

The Corbin-Coal Mountain property is on C.L. No. 414, covering 259 hectares, (Enclosure 3). The present legal standing of this licence is described in Table 1 (Land Tenure Standing Sheet).

5.0 WORK DONE

5.1 Prior to 1982

Prior to 1978 Crows Nest Industries Limited carried out several exploration programs on the Corbin coal licence. This work included geological mapping and drilling and geophysical logging of 17 rotary drill holes.

The 1978 exploration program done by Crows Nest Resources involved drilling eight fully cored diamond drill holes. Geological mapping, aerial photography, surveying and road construction were also carried out. A compilation of all work done to 1978 was submitted in June, 1979 in the four-volume Crows Nest Resources Limited 1979 Corbin Geological Report.

During 1979 2.1 km of road designed to provide southern access to the coal licence was completed and upgraded. This work was reported in the Crows Nest Resources Limited 1980 Corbin-Coal Mountain Property report.

The 1980 exploration program involved upgrading the southern access road. Eleven drill holes totalling 1778 metres were cored and geophysically logged. All coal intersections were

sampled and sent to CNRL lab for analysis. One rotary hole was attempted but was abandoned at 52 metres due to caving problems. Trenching and detailed mapping were done throughout the exploration program. Backhoe trenches totalling 1.34 km were dug on existing roads and 1.55 km of new drill hole access roads. This work was reported in the Crows Nest Resources Limited 1981 Corbin-Coal Mountain property report.

5.2 1982 Bulk Sampling Program

A small bulk sampling program was undertaken in late September early October. In three locations existing roads were slightly widened into the bank and backhoe trenches cut adjacent to the bank. A total of 11 tonnes of raw coal were collected from the three trenches. The trenches are located on Enclosure 2.

The southern trench (1) was 22 m long, the northwestern trench (3) was 60 m and the northeastern trench (2) was 44 m long. Details of the trenches are provided in a table (Table 2).

Samples were taken using a John Deer 410 Backhoe. The thickness of cover over the trench tops varied from 1 - 3

metres. The trenches were then dug down an additional 1.5 metres at a width of 1.2 metres which is twice the bucket width. Samples were taken from a cut down the center of the trenches thus preventing side wall contamination.

TABLE 2

Trench Particulars

TRENCH	LENGTH	WIDTH	DEPTH	SAMPLE WIDTH	AVERAGE SAMPLE DEPTH	APPROX TONNES	NO. OF BARRELS
1	22m	1.2m	1.5m	0.6m	0.15m	2	11
2	44m	1.2m	1.5m	0.6m	0.2m	5	27
3	60m	1.2m	1.5m	0.6m	0.12m	4	23

N+E "guess" estimated from map enclosure 2

1 669478 5483084
2 609430 5483478
3 609410 5483494

Samples were dumped directly into 45 gallon drums which were labelled and sealed on site before shipment to Calgary.

The costs of the 1982 bulk sampling program were 11,861.13. Details of previous years expenditures are provided in Table 3 (The Application to Extend Term of Licence).



TABLE 3

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

APPLICATION TO EXTEND TERM OF LICENCE

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

Valid FMC No. 257 6777

hereby apply to the Minister to extend the term of Coal Licence(s) No(s). 412, 413, 414, 3 LICENCES
GROUPE .6, .713 HECTARES,
for a further period of one year.

2. Property name CORBIN, 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, 1982 to
JANUARY 31, 1983 work to the value of at least \$
on the location of coal licence(s) as follows:

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

5. I wish to apply \$ of this value of work on Coal Licence(s) No(s).
N/A

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

7. The work performed on the location(s) is detailed in the attached report entitled PLEASE APPLY
EXCESS CREDIT ON THESE LICENCES

JANUARY 24, 1983
(Date)

[Signature]
(Signature)
ASSISTANT LANDMAN
(Position)

GEOLOGICAL MAPPING Yes No

	Area (Hectares)	Scale	Duration
Reconnaissance
Detail: Surface
Underground
Other* (specify)
			Total Cost \$

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
Scam 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	<input type="checkbox"/>	Core samples	<input type="checkbox"/>	Bulk samples	<input type="checkbox"/>
Logs: Gamma-neutron	<input type="checkbox"/>	Density	<input type="checkbox"/>		
Other* (specify)				
Testing: Proximate analysis	<input type="checkbox"/>	FSI	<input type="checkbox"/>	Washability	<input type="checkbox"/>
Carbonization	<input type="checkbox"/>	Petrographic	<input type="checkbox"/>	Plasticity	<input type="checkbox"/>
Other* (specify)				
					Total Cost \$

RECLAMATION Yes No

Details

Total Cost \$

OTHER WORK (Specify details) Yes No Cost

.....

.....

Total Cost \$

OFF-PROPERTY COSTS Yes No

Details

Total Cost \$

Total Expenditures \$

..... (Date) (Signature)

..... (Position)

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

6.0 COAL QUALITY

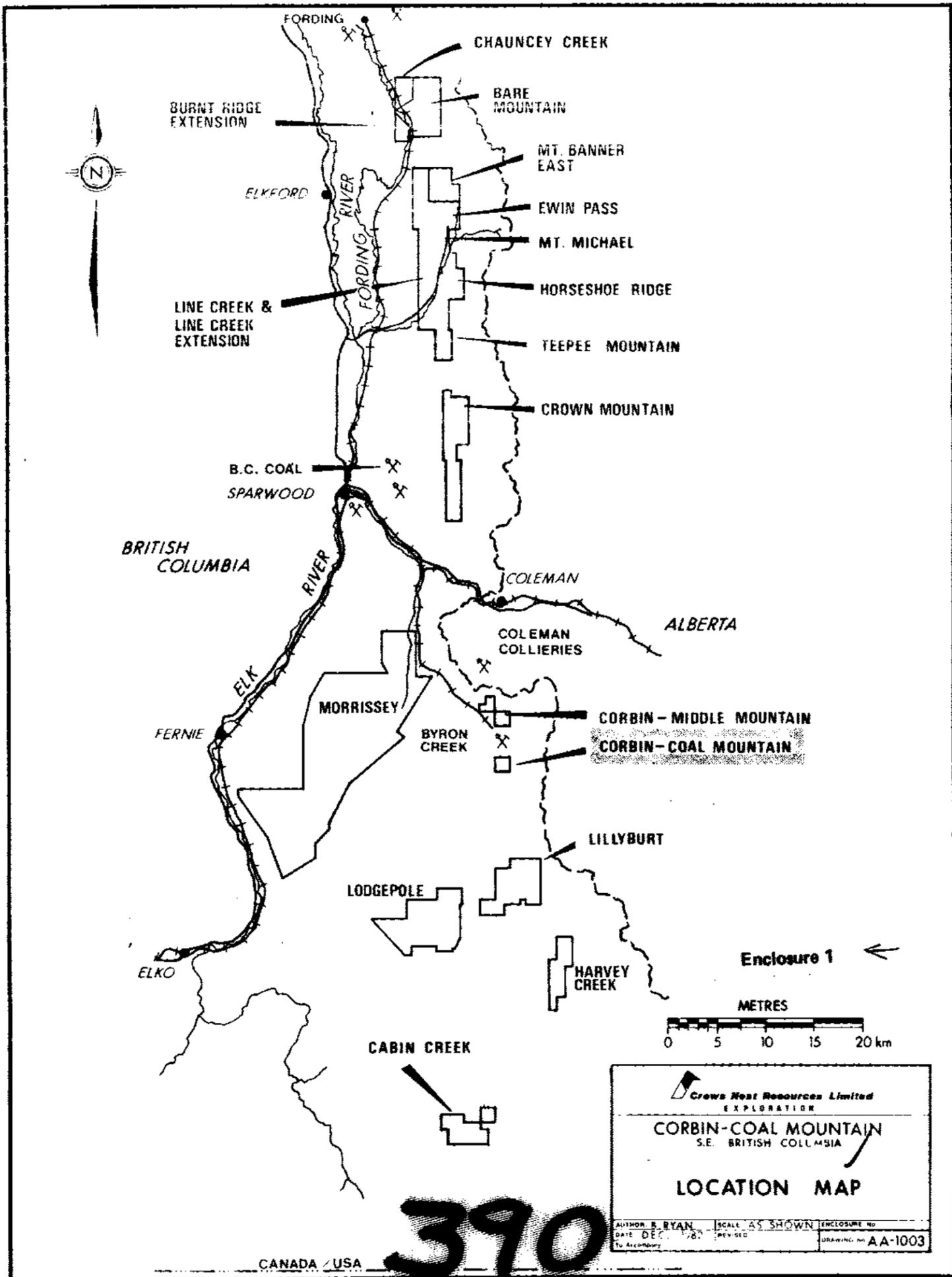
Trench 2 was a very good site, the coal although oxidized was relatively fresh with very little evidence of any brown staining usually accompanying badly oxidized surface coal. Trench 1 was also relatively fresh although there was brown staining on some of the coal sampled. Sample 3 was a more difficult sampling situation as it had a good depth of cover to the south but gradually lost cover as it advanced to the north. In this area we dug down in the order of 2.5 metres but the coal was still badly oxidized in the last 3 to 4 metres of the trench. The effects of this oxidization showed up in the test results in the form of increased fines and poor calorific value.

Samples were sent to Birtley for sizing and washability studies. The results are reported in (Table 4). Average ash values for the three samples are 1, 22.14%, 2, 18.2% and 3, 19.66%. The 50 to 6mm size fractions for the three samples wash to a 16% ash product with an average yield of 85% and the 6 - 2mm fractions wash to a 16% ash product with an average yield of 92%. In all cases the 2mm - 0 material is less than 16% ash.

7.0 BIBLIOGRAPHY

Gilmar, P. 1980 Geological Report Corbin Coal Mountain
Crows Nest Resources Limited, 1980.

Hoffman, G. 1979 Corbin Geological Report Crows Nest Resources
Limited, 1980



390

Enclosure 1 ←

0 5 10 15 20 km

Crows Nest Resources Limited
EXPLORATION

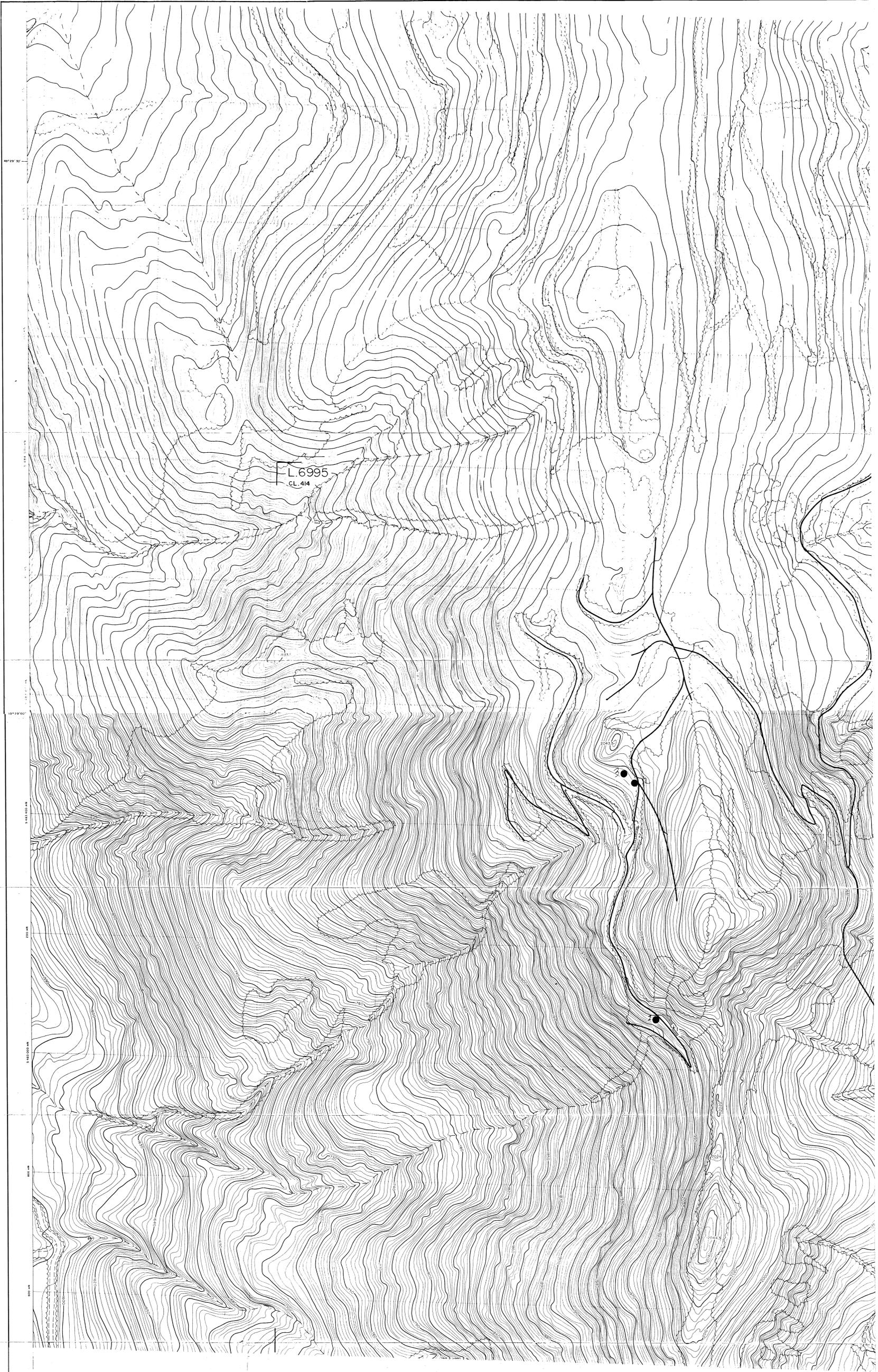
CORBIN-COAL MOUNTAIN
S.E. BRITISH COLUMBIA

LOCATION MAP

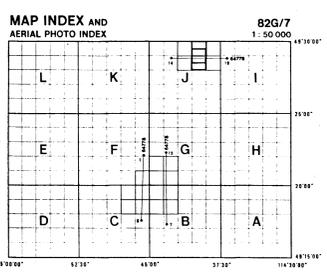
AUTHOR: E. RYAN	SCALE: AS SHOWN	ENCLOSURE NO.
DATE: DEC. 1980	REVISED:	DRAWING NO. AA-1003
BY: [unclear]		

CANADA / USA

K-Shell-Corbin 82(2*)A *(1)

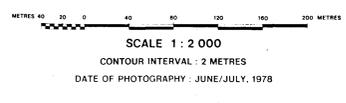


L.6995
CL. 414



REFERENCE

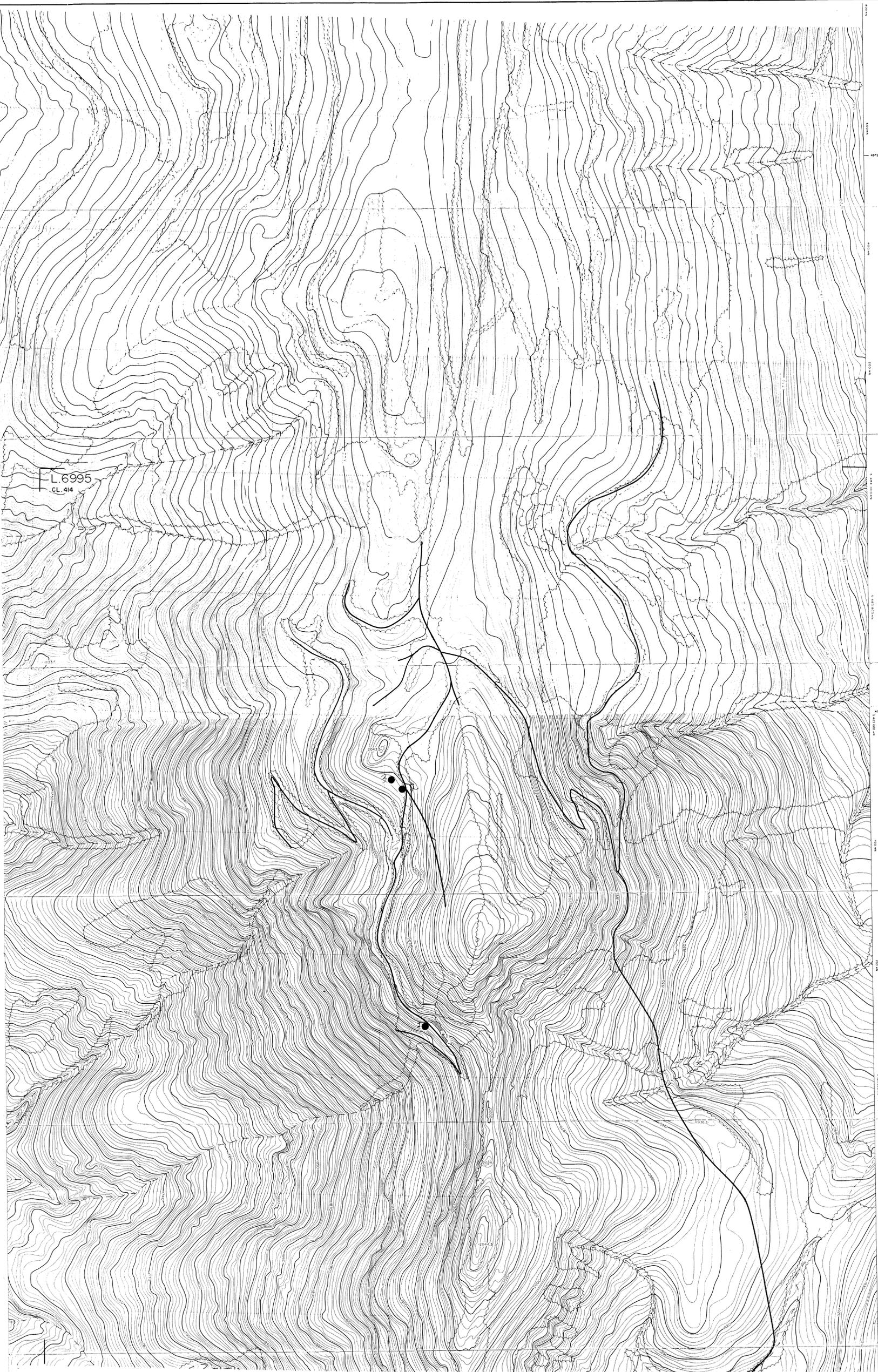
MAIN ROAD	RIVER, LAKE	INTERMITTENT RIVER
TRACE OF TRAIL	TREED AREA	LINE OF TREES
RAILWAY	INDIVIDUAL TREES	VERTICAL INTERVAL
HEDGE FENCE	DEPRESSION	SPOT HEIGHT
BRIDGE CULVERT	CONTROL POINT	
CUT FILL		
SWAMP		
DRILL HOLE		



LEGEND

—	EXISTING ACCESS ROADS			
●	BULK SAMPLE SITE PROPOSED 1982			
x	BULK SAMPLE SITE 1982			
		Northing	Easting	Elevations
	SITE 1 NE CORNER	5483070.0	669506.0	2004.0
	SITE 2 NE CORNER	5483404.0	669439.0	2020.0
	SITE 3 NE CORNER	5483462.0	669314.0	2006.0

390 1/2 (a)



L 6995
CL 414

REFERENCE

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

SCALE 1:2 000
CONTOUR INTERVAL: 2 METRES
DATE OF PHOTOGRAPHY: JUNE/JULY, 1978

LEGEND

—	EXISTING ACCESS ROADS	Northings	Eastings	Elevations	
●	BULK SAMPLE SITE PROPOSED 1982				
○	BULK SAMPLE SITE 1982				
		SITE 1 NE CORNER	5483070.0	669508.0	2004.0
		SITE 2 NE CORNER	5483464.0	669439.0	2020.0
		SITE 3 NE CORNER	5483462.0	669314.0	2000.0

390
K Shell Corbin 8a (a)A 40

Crows Nest Resources Limited
EXPLORATION
CORBIN-COAL MOUNTAIN
S.E. BRITISH COLUMBIA

1982 BULK SAMPLING PROGRAM

Enclosure 2

82G7
AUTHOR: SA
DATE: 12, 1982
To: Accompany

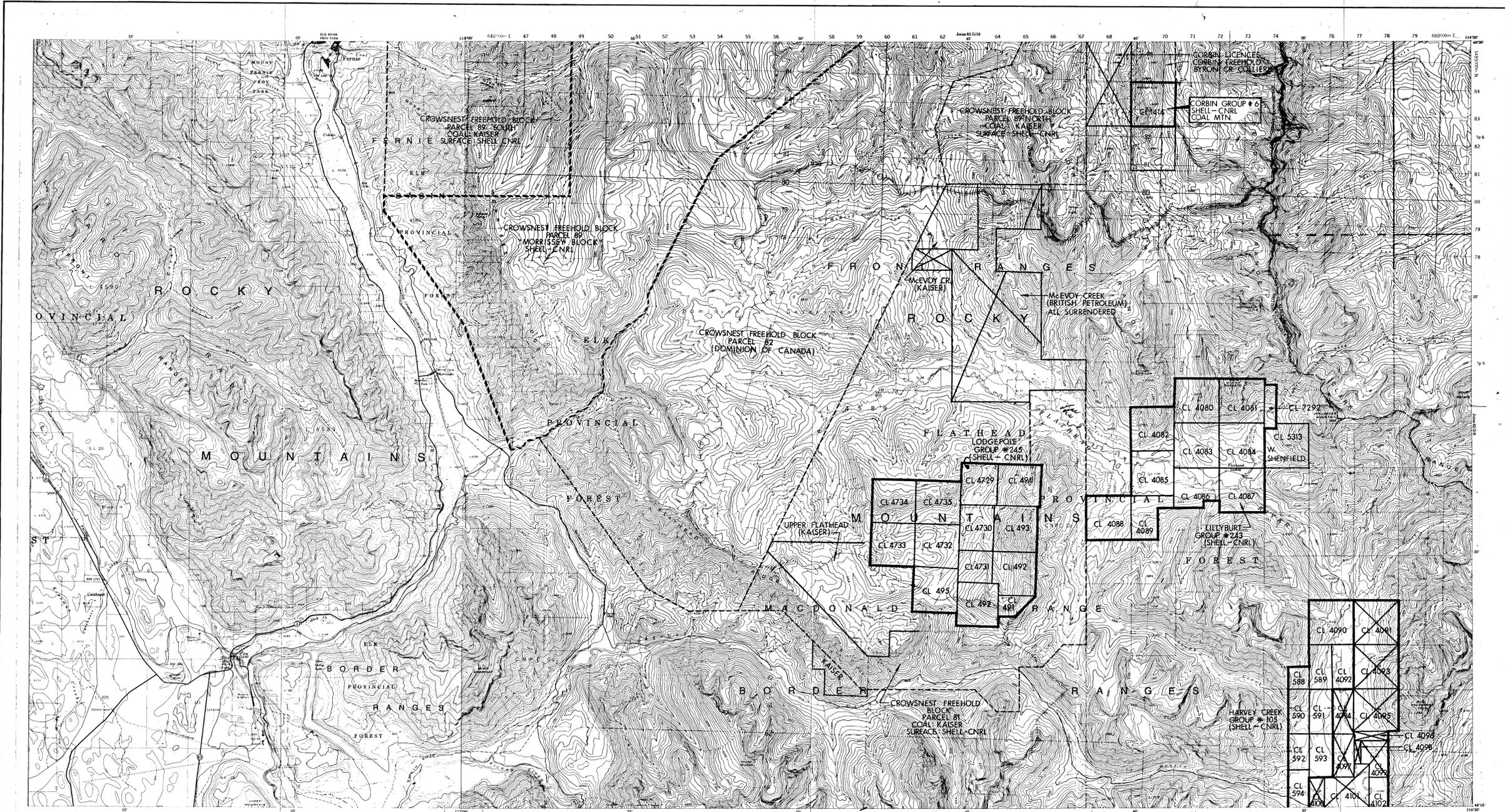
SCALE: 1:2000
REVISED:

DRAWN BY:
DRAWING No: CM1D1

UTM Zone 11

390 1/2 (a)

00390 1/2
①(b)



COMPANY COLOR CODE

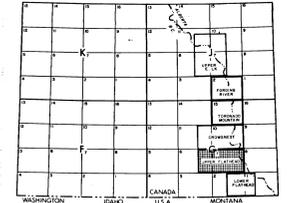
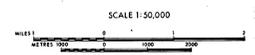
[White box]	SHELL - CNRL
[Light Gray box]	SAGE CREEK COAL LTD.
[Medium Gray box]	KAISER RESOURCES LTD.
[Dark Gray box]	DOMINION OF CANADA
[Black box]	BYRON CREEK COLLIERIES LTD.
[White box]	COLEMAN COLLIERIES LTD.
[White box]	FORDING COAL LTD. AND OTHER C.P. COMPANIES
[White box]	ELCO MINING LTD.



COAL LAND TENURE

[Dashed line]	FREEHOLD LICENCES
[Solid line]	BORDER OF SHELL-CNRL GROUPS BLOCK ETC APPLICATION FOR ABOVE
[Dotted line]	OUTLINE OF HOLDINGS BY OTHER THAN SHELL-CNRL
[Dash-dot line]	APPLICATION FOR B.C. COAL LICENCE BY OTHER THAN SHELL-CNRL
[Thick solid line]	B.C. COAL LICENCE BORDER SHELL-CNRL ONLY

NOTE
B.C. COAL LICENCES WERE ISSUED AND REVOKED COVERING MOST PART OF THE DOMINION COAL BLOCK PARCEL 82. THESE OLD LICENCES ARE NOT SHOWN ON THE MAP.



SHELL CANADA RESOURCES LIMITED
COAL DEVELOPMENT

UPPER FLATHEAD
KOOTENAY LAND DISTRICT
SOUTHEASTERN B.C.
LAND MAP

NTS 82-077 & 086
SCALE: 1:50,000
DRAWING NO.: 114 - 35

Enclosure 3

② 390 1/2