OPEN FILE

TEEPEE MOUNTAIN
1989 GEOLOGICAL REPORT

B.C. Coal Licence Numbers: 302, 303, 370

held by Shell Canada Resources Limited

operated by Crows Nest Resources Limited

Kootenay Land District, British Columbia

N.T.S. 82 G/1[illegible]

Longitude: 114° 4[illegible]' West

Latitude: 49° 53' North

Exploration Period: May - September, 1989

CONFIDENTIAL

751

ANIL SHARMA,
PROJECT GEOLOGIST
JANUARY, 1990

FS1 FC2
900115(AS/jb)

Crows Nest Resources
LIMITED
P.O. Box 2003, Sparwood, British Columbia V0B 2G0
(604) 425-2555 Fax (604) 425-2779

February 13, 1990

Ministry of Energy, Mines and
Petroleum Resources
525 Superior Street
Victoria, B.C.
V8V 1X4

Dear Sirs:

Enclosed please find our report on the TeePee Mountain Project.

This report has been prepared by Mr. A. Sharma and Mr. T. Hannah, both of whom are employed by Crows Nest Resources Limited as geologists.

Mr. A Sharma, B.Sc., graduated in Geophysics from the University of Calgary in 1989. Prior to his graduation, Mr. Sharma worked as an assistant for a major coal company in the Crows Nest coalfields. Mr. Sharma has been employed by Crows Nest Resources Limited as a Project Geologist since May 1989.

Mr. T. Hannah, B.Sc. P.Geol., graduated in Geology from the University of New Brunswick in 1973. Since graduation, Mr. Hannah has spent 17 years working for Shell Canada Ltd. and Crows Nest Resources on a wide variety of coal exploration projects in B.C. and Alberta. His present position is that of Senior Geologist, Development Engineering Group, Line Creek Mine.

In my opinion, these personnel are fully qualified, by training and experience to prepare this report.

Yours truly,

CROWS NEST RESOURCES LTD.

R. Williams

R. Williams, P. Eng
Chief Engineer

GE1 GQ14.1
900213(RW/lv)

TABLE OF CONTENTS

LIST OF ENCLOSURES

NUMBER

1.0 SUMMARY

The Teepee Mountain Project is contained partially within four British Columbia coal licences, CL302, 303, 370 and 300. In addition a portion of the project lies on Freehold Land Lot 2 Plan 9330. The licences are held by Shell Canada Resources Limited and operated by its wholly owned subsidiary Crows Nest Resources Limited.

The property is located in the Crowsnest Pass area of the Rocky Mountains in southeastern British Columbia, 1150 kilometres east of Vancouver and 25 kilometres northeast of Sparwood. Teepee Mountain lies directly south of Horseshoe Ridge and is approximately 17 kilometres from the Line Creek preparation plant and rail loop.

The coal bearing strata of the Kootenay Group has been eroded from most of Teepee except at the southern and western parts of the property, where it is preserved over an area of approximately 1.2 square kilometres. Here roughly 55 metres of coal bearing section exist with up to four mappable seams averaging approximately nine metres in aggregate thickness.

The 1989 exploration program entailed geological mapping on a 1:5000 scale. Coal showings were backhoe trenched on existing roads. Three sections of new road were constructed to provide access to four proposed drillsites. Two rotary holes were completed; one is located in Group 331.

From cross sections that were drawn in 1982, geological in place reserves were calculated to be four million tonnes at an overburden ratio of 4.39 bank cubic metres waste per tonne of coal. Drilling in 1989 discovered an additional 400,000 tonnes of coal at an overburden ratio of 3.74 bank cubic metres waste per tonne of coal. Total in place reserves now stand at 4.4 million tonnes with an overburden ratio of 4.06 bank cubic metres waste per tonne of coal. 2.4 million tonnes at an overburden ratio of 2.20 bank cubic metres waste per tonne of coal can be placed into a probable category, the rest is possible reserves. 1980 analysis of drill hole samples indicate the coal to be medium volatile bituminous, of thermal rank (ASTM).

The total field expenditures in 1989 for the Teepee Mountain Project was $34,081.00, of which $30,712.00 was spent on Group 331.

2.0 INTRODUCTION

2.1 Location and Access

Enclosure 1: Index Map
Enclosure 2: Location Map
Enclosure 3: Access Map

The Teepee Mountain Project is located in the front ranges of the Rocky Mountains in southeastern British Columbia. Teepee Mountain is centred at approximately:

Longitude 114° 41' West
Latitude 49° 53' North

The licences lie immediately south of the Horseshoe Ridge Property, 17 kilometres from the Line Creek preparation plant and rail loop.

Vehicular access is via the Line Creek haul road or via the Grave Lake road from the south.

2.2 Tenure

Enclosure 4: Coal Licence Map

Group 331 consists of three British Columbia Coal Licences (numbers 302, 303 and 370) and covers an area of 519 hectares. These licences are held by Shell Canada Resources Limited and operated by its wholly owned subsidiary Crows Nest Resources Limited.

Group 331 covers the south and east section of Teepee Mountain. In addition the north end of Teepee Mountain is contained within Coal Lease #4 and the west side of Teepee Mountain lies within Freehold Land, Tree Farm, Lot 2 Plan 9330.

3.0 WORK DONE

3.1 Summary of Previous Work

Prior to 1978 work was conducted by Crows Nest Industries and consisted of road construction and bulldozer trenching.

In 1980 work was conducted by Crows Nest Resources Ltd. and included:

- reconnaissance geological mapping (1:5000)

- detailed geological mapping (1:2000)
- construction of four road spurs
- backhoe trenching
- seven rotary and one diamond drill hole

In 1981 field operations were supervised by Dave Handy and Steve Cameron of Crows Nest Resources Ltd. Exploration included:

- geological mapping (1:5000)
- construction of two road spurs
- backhoe trenching
- 10 rotary drill holes
- bulk sampling
- reclamation

In 1988 field operations were supervised by Barry Ryan of Crows Nest Resources Ltd. Exploration included:

- geological mapping (1:5000)
- four rotary drill holes

In 1989 field operations were supervised by Anil Sharma of Crows Nest Resources Ltd. Exploration included:

- geological mapping (1:5000)
- two rotary drill holes
- backhoe trenching
- construction of three road spurs
- computer modelling

Prior to the 1989 exploration program, field mapping and extensive drilling had been conducted over most of Teepee Mountain. On the eastern and southern portions of the mountain the contact between the coal bearing Mist Mountain Formation and the sandstone of the Morrissey Formation had been defined. 1620 metres of drilling had delineated a north plunging syncline in the southern part of the mountain covering an area of 0.6 square kilometres.

In 1989 the northern extent of the Mist Mountain Formation had been determined. A drill hole placed on the western slope intersected 13.2 metres of coal in 71 metres of section. Cross sections have been made correlating this drill hole with the eight previous drill holes in the area. Geological in place reserves now stand at 4.4 million tonnes and the areal extent of the coal bearing area at 1.2 square kilometres. Coal blooms that were backhoe trenched on the northern part of the mountain showed no continuity.

Lithology and survey data from all the drill holes plus topography data have been entered into the MINER2 database. A geological model and several cross sections have been constructed using the MINER2 software.

4.0 GEOLOGY

4.1 Regional Stratigraphy

Figure 1: Table of Formations

FIGURE 1

TABLE OF FORMATIONS (S.E. B.C.)						
ERA	**PERIOD**	**FORMATION**			**LITHOLOGY**	**THICKNESS (M)**
MESOZOIC	LOWER CRETACEOUS	CADOMIN FM.			NON-MARINE: SANDSTONE, CONGLOMERATE AND SHALE	
		POCATERRA CREEK			NON-MARINE: SANDSTONES, CONGLOMERATE SILTSTONES AND SHALES	360 - 1980
	LOWER CRETACEOUS AND JURASSIC	KOOTENAY GROUP	ELK FORMATION		NON-MARINE: INTERBEDDED MEDIUM TO COARSE GRAIN SANDSTONE, CHERT-PEBBLE CONGLOMERATE WITH MINOR SILTSTONE SHALE AND UNECONOMIC COALS	28-488
			MIST MTN. FORMATION		NON-MARINE AND BRACKISH: INTERBEDDED COAL, SILTSTONES, SHALES AND SANDSTONES	74-665
			MORRISSEY FORMATION	MOOSE MTN. WEARY RIDGE	NON-MARINE: MASSIVE CLIFF-FORMING SANDSTONE	4-36 5-55
	JURASSIC	FERNIE FM.			MARINE: SHALES, SILTSTONE, SANDSTONE, LIMESTONE	180-380

LA2.WK1

(AFTER GIBSON, 1981)

The Mist Mountain Formation of the Kootenay Group of Upper Jurassic - Lower Cretaceous age is the coal bearing sequence in southeastern British Columbia. It is a thick sequence of clastic sediments representing delta progradation over marine shales, siltstones and sandstones of the Jurassic Fernie Formation.

Deposition was initiated by an epeirogenic uplift of the source area in early phases of the Columbia Orogeny in Late Jurassic time. The Mist Mountain section thickens from east to west; the source of sediments being southwest and the shoreline on the east and northeast. Its thickness within the Upper Elk Coalfield ranges up to 1100 metres.

The Kootenay Group has been subdivided into three formations. The lower, Morrissey Formation is composed predominantly of sandstones with minor siltstones and shales. It is a prograding sequence of delta front sheet sands, barrier bars and tidal channel deposits.

The cliff-forming Moose Mountain Member serves as a useful marker horizon between the Weary Ridge Member and the main coal bearing strata of the Mist Mountain Formation.

The middle Mist Mountain Formation is generally in sharp contact with the underlying Morrissey Formation (sandstone-coal, or sandstone-bioturbated silty shale). It consists of alternating beds of sandstone, shale, siltstone and coal representing prograding delta plain environments. The Mist Mountain Formation is 74 - 665 metres thick, including 6 - 61 metres of coal in the south contained within two to eight seams, and up to 90 metres of coal in 23 seams in the north.

The upper portion of the Kootenay Group, the Elk Formation consists of alternating sandstone, siltstone, shale and conglomerates with minor lenticular coal beds. It represents progradation of the alluvial plain over the delta plain coal forming environments.

4.2 Regional Structure

Coal bearing Mist Mountain Formation occurrences in the front ranges of southeastern British Columbia are preserved in north-south trending synclines referred to as the Crowsnest Coalfields. The structure within the synclines is complicated to varying degrees, mostly by thrust faults and folds, but also by normal faults. This structural complexity increases towards the thinner, east side of the coalfields where they have been thrust against underlying Paleozoics.

The Crowsnest Coalfields can be subdivided into three coal bearing areas. From south to north they are the Flathead Coalfield, the Fernie Coalfield and the Upper Elk Coalfield. Since they are all part of the same depositional complex, their subdivision is based on erosional and structural boundaries.

Upper Elk Coalfield

The Upper Elk Coalfield is an elongate basin composed of two major synclines (Greenhills and Fording) separated by an anticline and the northern extension of the Erickson normal fault. The eastern, Fording Syncline, can be traced northward from Alexander Creek to the Kananaskis Lakes. Only erosional remnants of the Kootenay Group are preserved in the southern portion of the Fording Syncline where the Teepee Mountain Project is located.

4.3 Teepee Mountain Stratigraphy - General

Kootenay Group strata occur along most of Teepee Mountain. Recessive shales (Fernie Formation) underlie the Kootenay Group and form most of the eastern slope of the mountain and lie in the valley to the west. Sandstone of the Basal or Moose Mountain Member comprise most of the mountain.

The Mist Mountain Formation has been eroded from a large part of the mountain. Approximately 55 metres of lower coal bearing strata have been preserved near the southern end of the mountain and cover an area of roughly 1.2 square kilometres. Four mappable coal seams have been identified with an aggregate thickness averaging 9.0 metres. The Teepee Mountain coal seams have been designated Basal Sandstone Seam, #10A, #10B, and #9 Seam in ascending order, using Line Creek correlatable seam numbers. The upper section of the Mist Mountain Formation and the Elk Formation of the Kootenay Group are not present at Teepee Mountain.

Coal Stratigraphy

Basal Sandstone Seam -	measures 1.82 metres in outcrop but varies to 1.17 metres in drill holes;

- continuity of this seam is questionable over the pit area.

Seam 10A
- lies directly above the Basal Sandstone;
- measures 1.35 metres in outcrop, but varies from 1.15 metres to 1.80 metres in drill holes;
- appears to thin and become separated from the Basal Sandstone toward the south.

Seam 10B
- separated from 10A by a predominantly shaley unit;
- varies from less than 1.0 metre to 1.6 metres in drill holes.

Seam 9
- the stratigraphic interval between 10B and Seam 9 is approximately 15 to 20 metres;
- measures 4.65 metres in outcrop and varies from 5.60 to 1.60 in drill holes;
- appears to thin towards the south;
- contains the bulk of the surface mineable reserves at Teepee Mountain.

An additional seam of 1.25 metres was measured stratigraphically above Seam 9 in outcrop. It is not intersected by any drill hole and appears to have insignificant areal extent in the proposed pit area.

4.4 Teepee Mountain Structure

Teepee Mountain is located on the axis of the Fording River Syncline.

The mountain shows evidence of intense thrust faulting and to a lesser degree, normal faulting. An air photo interpretation of the Teepee structure was compiled by Walley Drew (Sproule and Associates Ltd.) in 1980. This served as a base for the Teepee Geology Map (Enclosure 6). A cross section has been constructed (Enclosure 7) showing the general imbricate structure that has been interpreted for Teepee Mountain.

In the proposed pit area (the main syncline) an east-west trending normal fault displaces the coal bearing strata a few metres. A fairly major thrust fault defines the western limit of the syncline.

The west slope of Teepee Mountain contains rock of the Mist Mountain Formation. Holes drilled in 1980/81 intersected seams which seemed to be discontinuous and uncorrelatable. DH8 which was drilled in this same area in 1989 intersected 13.2 metres of coal in 71 metres of stratigraphic section. Cross sections of this area have been constructed correlating DH8 to the 1980/81 drill holes on the west slope (Enclosure 7). Lack of outcrops make it difficult to determine the orientation of the strata but drill hole correlation would suggest west dipping strata, and a thickening of seams to the north.

Coal bloom that had been backhoe trenched on the northern part of the mountain showed no continuity. If the source for this bloom was located at a higher elevation, it is suspected that this source has now been eroded away. Therefore, the Mist Mountain Formation has a northern limit approximately at TP7.

5.0 MINEABILITY AND COAL RESERVES

Using 1989 data, geological in place reserves stand at 4.4 million tonnes at an overburden ratio 4.05:1 bank cubic metres waste per tonne of coal. 2.4 million tonnes at an overburden ratio 2.20:1 bank cubic metres waste per tonne of coal can be placed into a probable category. The other two million tonnes can be listed as possible reserves or resources.

A Teepee Mountain Mining Study of nine seam was completed by Bill Moir of Crows Nest Resources Ltd. in 1989.

6.0 COAL QUALITY

In 1981, Teepee Mountain coal samples were obtained from rotary drill cuttings and a bulk sample taken from nine seam.

The nine seam bulk sample washability tests data are in Appendix 1.

Teepee Mountain coal is medium volatile bituminous by ASTM rank, of thermal grade and of low (0.5%) sulphur content. The following is a weighted average of the analytical (proximate) results:

CLEAN COAL, AIR DRIED BASIS

WASHED AT S.G. 1.6

Moisture	1.62%
Ash	10.19%
V.M.	21.10%
F.C.	67.10:
K. Cal./Kg.	6717

7.0 RECOMMENDATIONS FOR FUTURE WORK

- A minimum of three drill holes should be placed on the west slope to better define the thickening of seams that occur here.

- Further backhoe trenching up slope from bloom zones.

- Drilling and backhoe trenching to better define bedding attitudes and coal quality.

8.0 BIBLIOGRAPHY

Gibson, D.W.

1979 "The Morrissey and Mist Mountain Formations; Newly Defined Litho-stratigraphic Units of the Jura-Cretaceous Kootenay Group, Alberta and British Columbia"; Bull. Canadian Petroleum Geol. V.27, No. 2, pp. 183-208

Gibson, D.W. and Hughes, J.D.

1981 "Structure, Stratigraphy, Sedimentary Environments and Coal Deposits of the Jura-Cretaceous Kootenay Group, Crowsnest Pass Area, Alberta and British Columbia"; Field Guides to Geology and Mineral Deposits, Calgary '81 GAC, MAC, CGU 1981. pp. 1-39

Handy, D

1980 Geological Report - Teepee Mountain Project - Crows Nest Resources Limited.

Hannah, T.

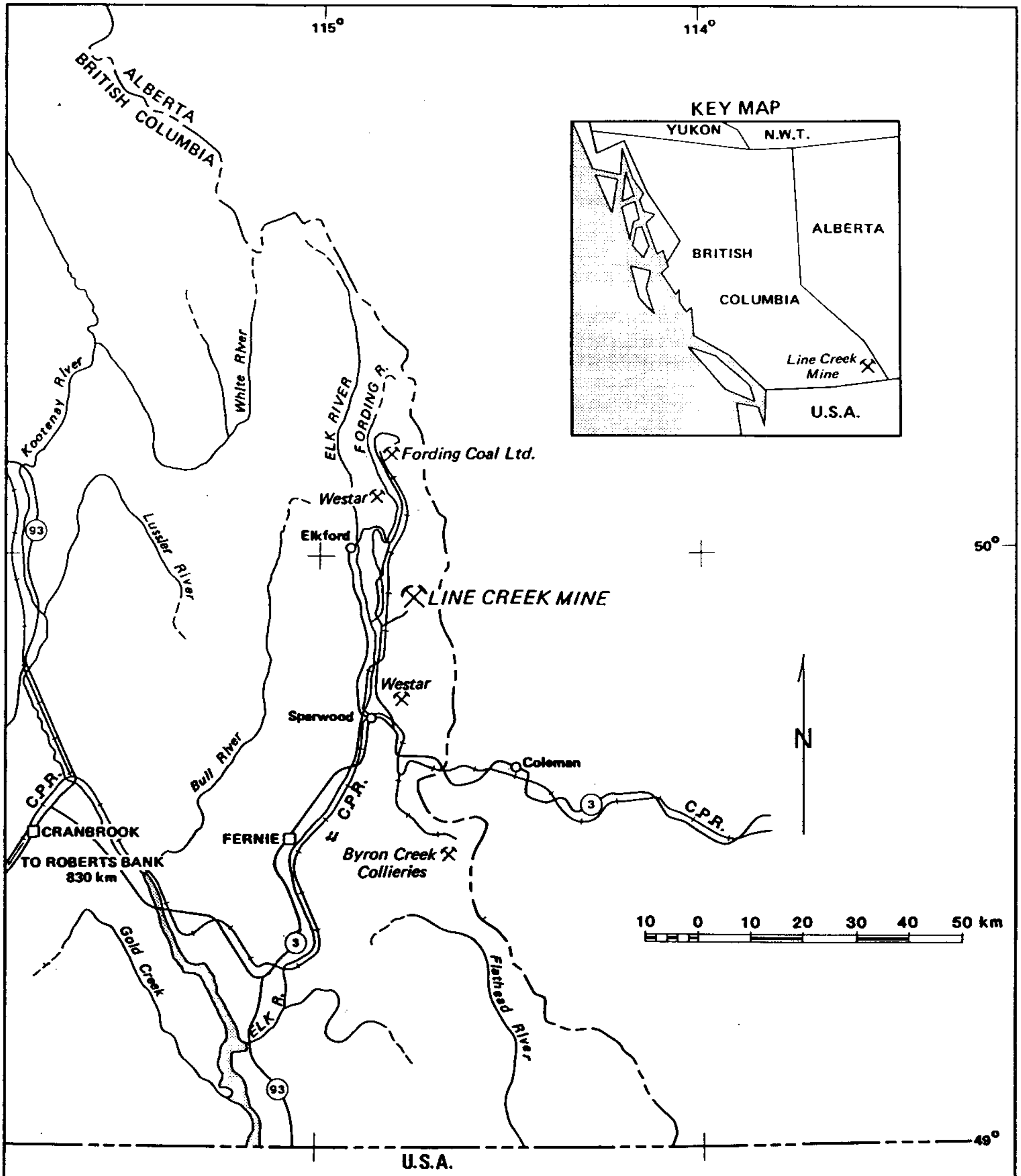
1979 Geological Report - Line Creek Coal Project - Crows Nest Resources Limited

Moir, B.

1989 Mining Study - Teepee Mountain Nine Seam Mining Study - Crows Nest Resources Limited

Schlender, J.

1979 Geological Report - Horseshoe Ridge Coal Project - Crows Nest Resources Limited



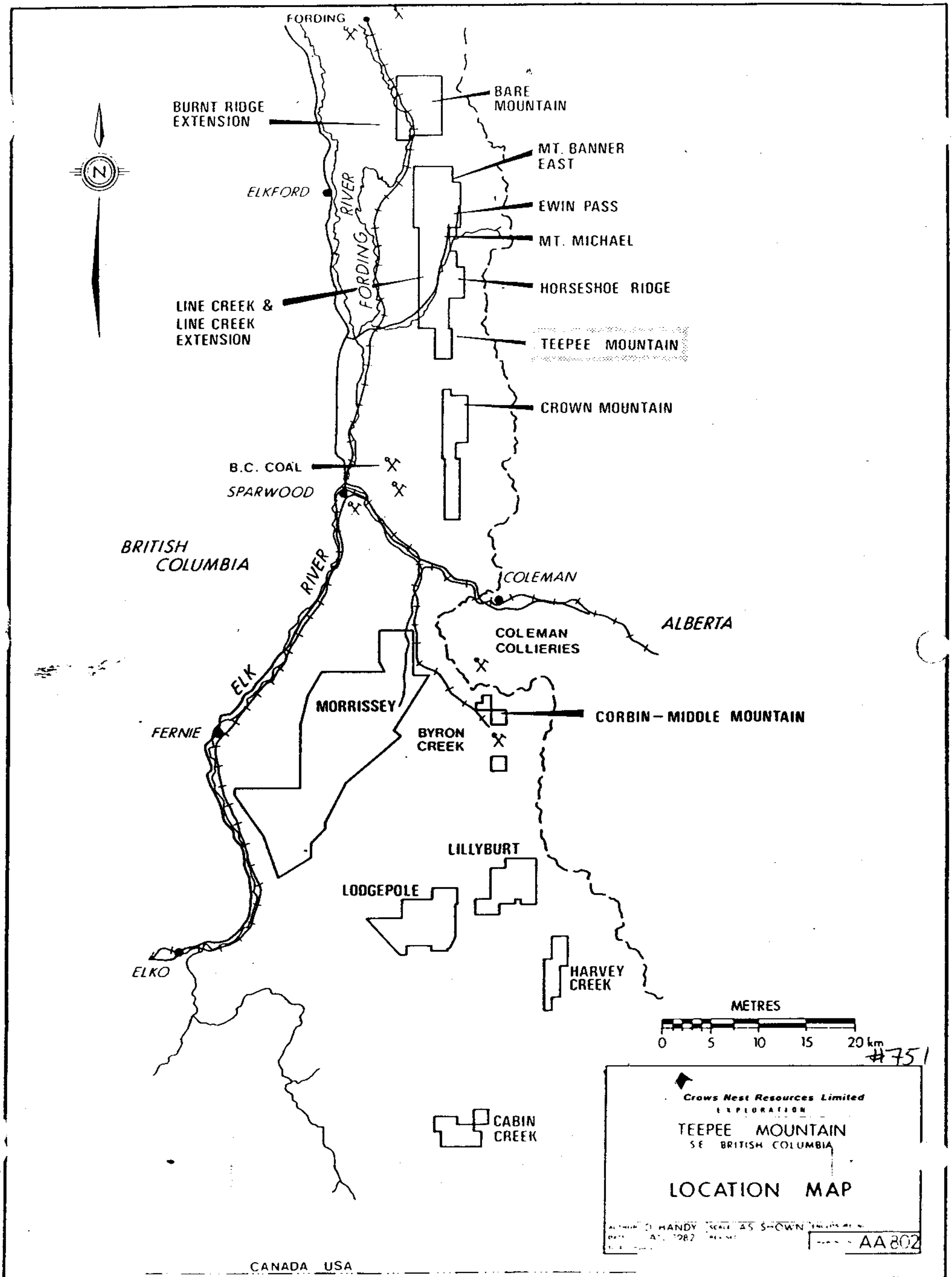
#751

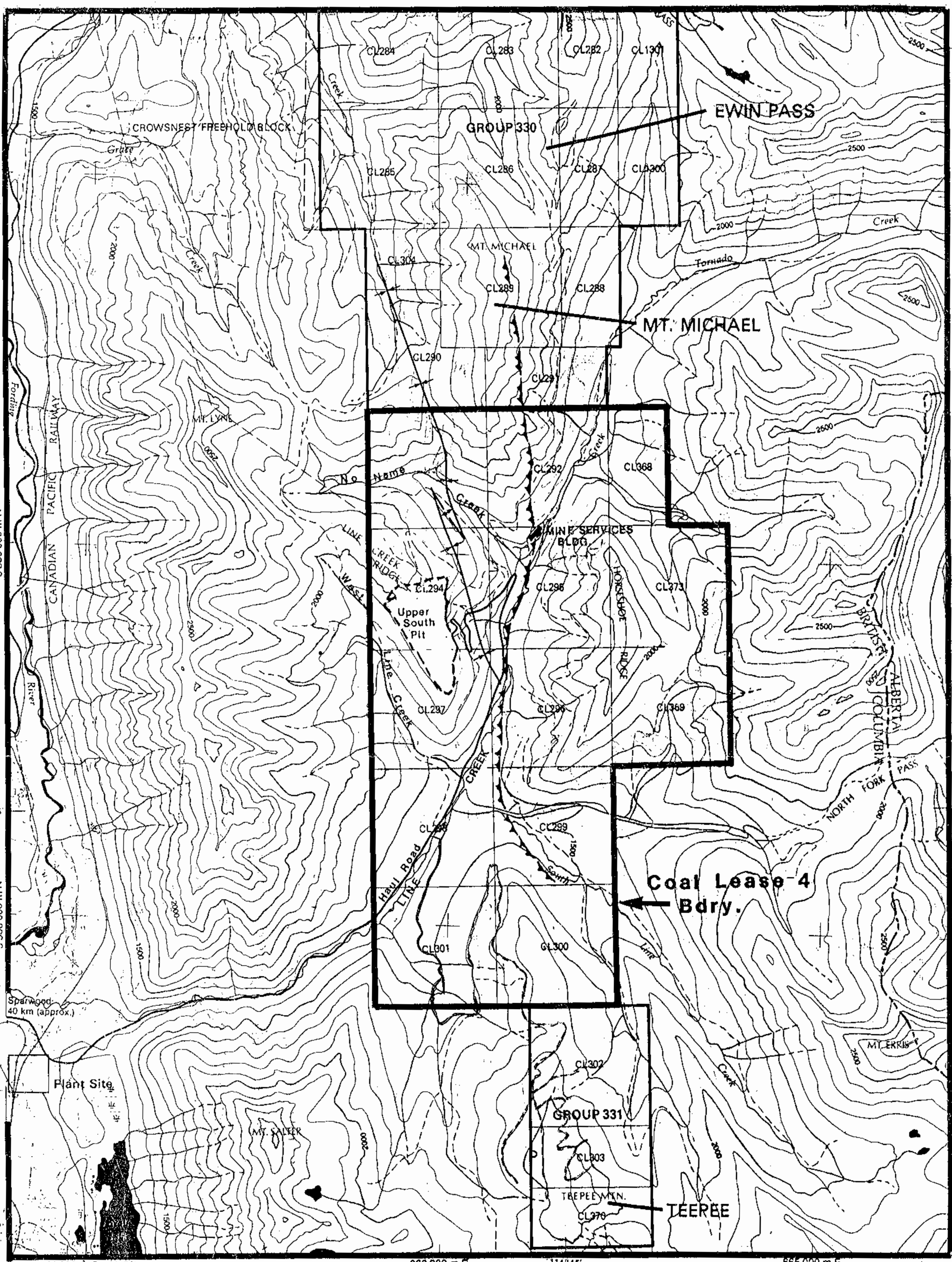
Crows Nest Resources Limited

LINE CREEK EXPANSION

INDEX MAP

Fig. 1.1


FORDING
BARE MOUNTAIN
BURNT RIDGE EXTENSION
MT. BANNER EAST
ELKFORD
FORDING RIVER
EWIN PASS
MT. MICHAEL
HORSESHOE RIDGE
LINE CREEK & LINE CREEK EXTENSION
TEEPEE MOUNTAIN
CROWN MOUNTAIN
B.C. COAL
SPARWOOD
BRITISH COLUMBIA
ELK RIVER
COLEMAN
ALBERTA
COLEMAN COLLIERIES
MORRISSEY
CORBIN – MIDDLE MOUNTAIN
BYRON CREEK
FERNIE
LILLYBURT
LODGEPOLE
ELKO
HARVEY CREEK
METRES
0 5 10 15 20 km
#751
Crows Nest Resources Limited
EXPLORATION
TEEPEE MOUNTAIN
SE BRITISH COLUMBIA
LOCATION MAP
HANDY
AS SHOWN
1982
AA 802
CABIN CREEK
CANADA USA



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 mapping. Metric contours were manually interpolated.

Scale 1:50 000

Kilometres 0.5 0 0.5 1.0 1.5 2.0 2.5 3.0 Kilometres

Miles 0.5 0 0.5 1.0 1.5 2.0 Miles

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 (2000, 1500)
- Licence boundary
- Licence group boundary
- Alexander Creek Syncline
- Ewin Pass Thrust

T.N.

1°43'

Grid North

Crows Nest Resources Limited

TEEPEE MOUNTAIN

ACCESS MAP

AUTHOR: BR	SCALE: 1:50 000	ENCLOSURE No.:
DATE: FEB 88	REVISED:	
To Accompany		

Reference map produced by Map Surveys 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

Kilometres 0.5 0 0.5 1.0 1.5 2.0 2.5 3.0 Kilometres

Miles 0.5 0 0.5 1.0 1.5 2.0 Miles

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	2000 1500
Licence boundary	
Licence group boundary	

HARDY ASSOCIATES (1978) LTD.

TN

Grid North

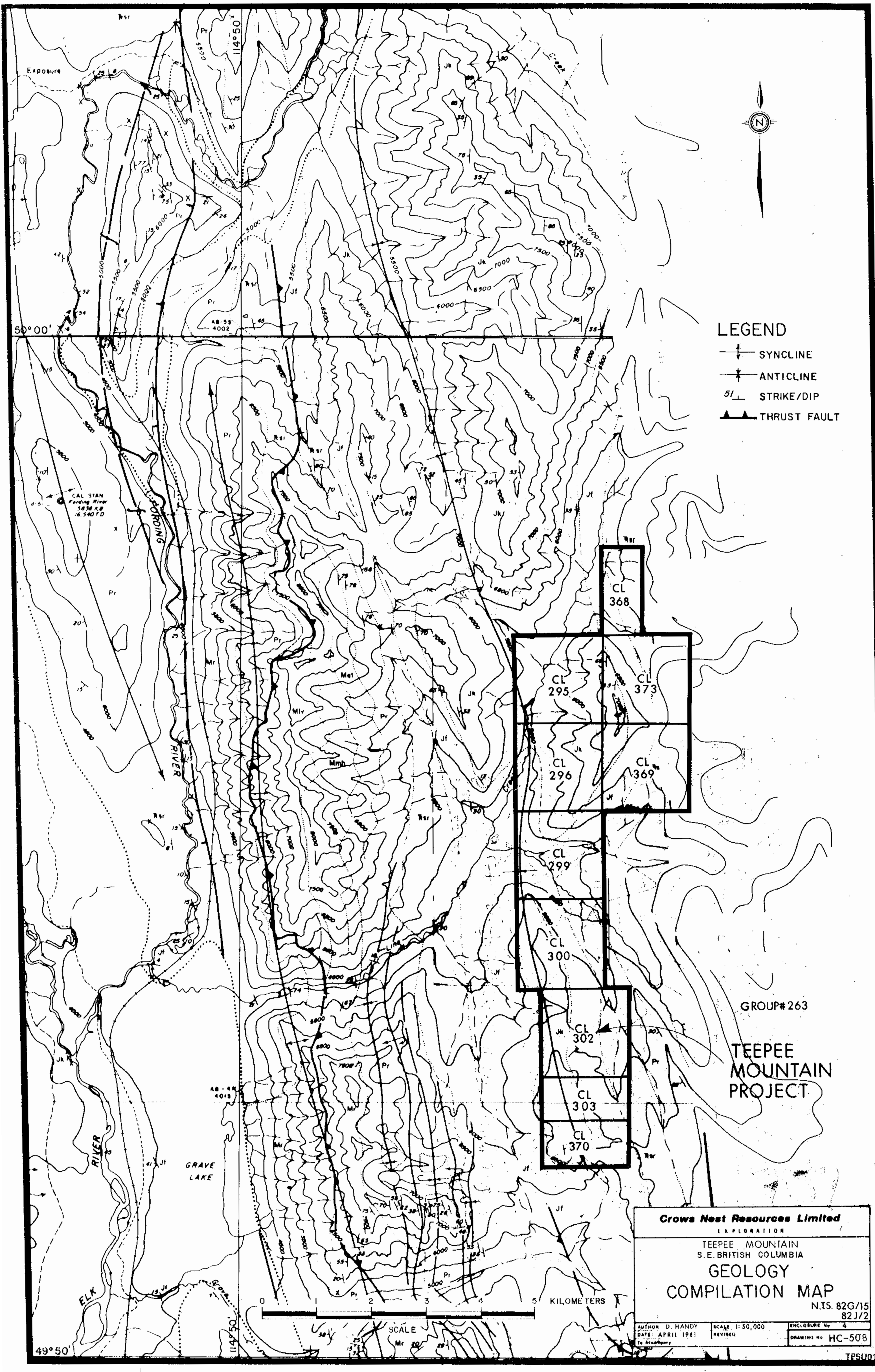
Crows Nest Resources Limited
EXPLORATION

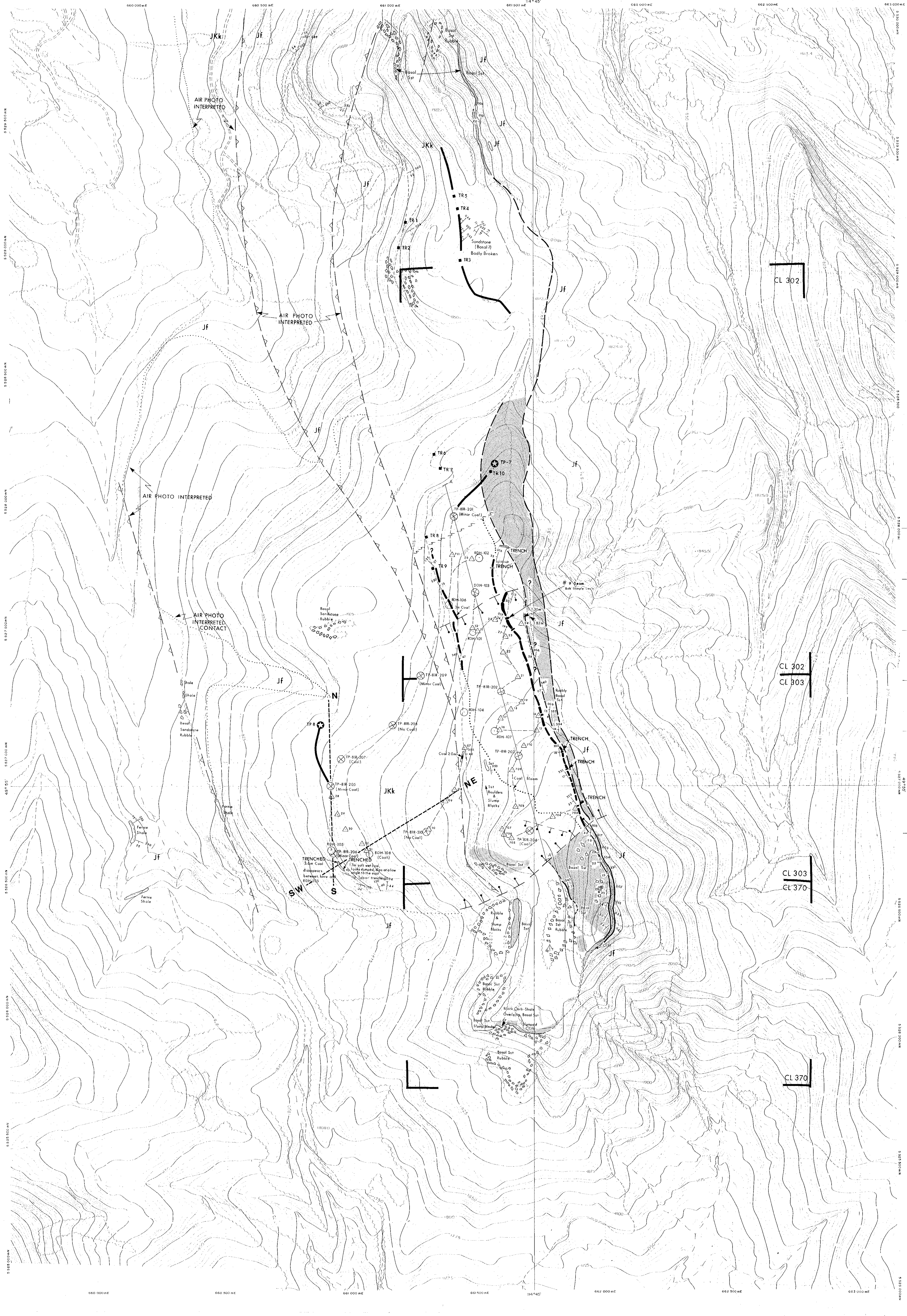
TEEPEE MOUNTAIN
S.E. BRITISH COLUMBIA

COAL LICENCES

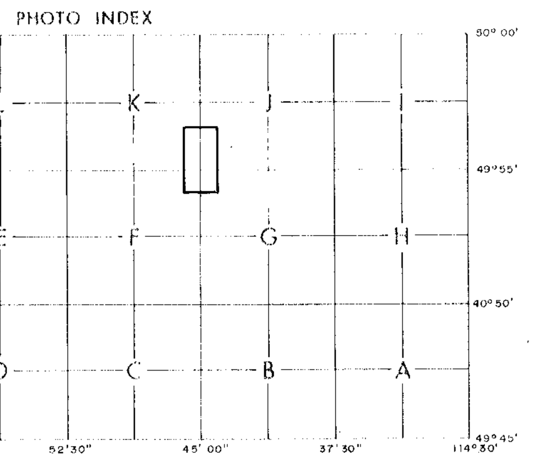
NTS 82G/15 & 82J/2

AUTHOR D. HANDY	SCALE 1:50 000	ENCLOSURE No.	
DATE JAN. 1982	REVISED	DRAWING No. CA-269	
TO ACCOMPANY 1982 GEOLOGICAL REPORT			


LEGEND
SYNCLINE
ANTICLINE
STRIKE/DIP
THRUST FAULT
CL 368
CL 295
CL 373
CL 296
CL 369
CL 299
CL 300
CL 302
CL 303
CL 370
GROUP#263
TEEPEE MOUNTAIN PROJECT
FORDING RIVER
ELK RIVER
GRAVE LAKE
CAL STAN Fording River
50°00'
49°50'
114°50'
0 1 2 3 4 5 KILOMETERS
SCALE
Crows Nest Resources Limited
EXPLORATION
TEEPEE MOUNTAIN
S.E. BRITISH COLUMBIA
GEOLOGY
COMPILATION MAP
N.T.S. 82G/15
82J/2
AUTHOR D. HANDY
DATE: APRIL 1981
To Accompany
SCALE 1:50,000
REVISED
ENCLOSURE No 4
DRAWING No HC-508
TP5U01



MAP INDEX AND
AERIAL PHOTO INDEX



REFERENCE

MAIN ROAD
SECONDARY ROAD
TRACK OR TRAIL
RAILWAY
HEDGE FENCE
BRIDGE CULVERT
CUT FILL
SWAMP
DRILL HOLE — LOCATION APPROXIMATELY, SURVEYED
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.

1989 WORK

TP8 DRILL HOLE
NEW ROAD
TR3 TRENCH

METRES 100 50 0 100 200 300 METRES
SCALE 1 : 5000

GEOLOGICAL LEGEND

CRETACEOUS
Kbl Blairmore Group
JURASSIC - CRETACEOUS
JKk Kootenay Group
JKe Elk Formation
JKmm Mist Mountain Formation
JKm Morrissey Formation
MsM Moose Mountain Member
WrM Weary Ridge Member
JURASSIC
Jf Fernie Formation
TRIASSIC
TSr Spray River Group

Sandstone (Ss) Medium Grain
Sandstone (Ss) Fine Grain
Siltstone (Sltst)
Shale (sh)
Coal
Geological Contact - defined, approx., inferred
Thrust Fault
Down Thrown Side — Normal Fault
25/220 Bedding Strike & Dip
Hand Trench
Axial Trace: Syncline, Anticline
Coal Licence Boundary

751

Crows Nest Resources Limited
EXPLORATION

TEEPEE MOUNTAIN
S.E. BRITISH COLUMBIA

GEOLOGICAL MAP

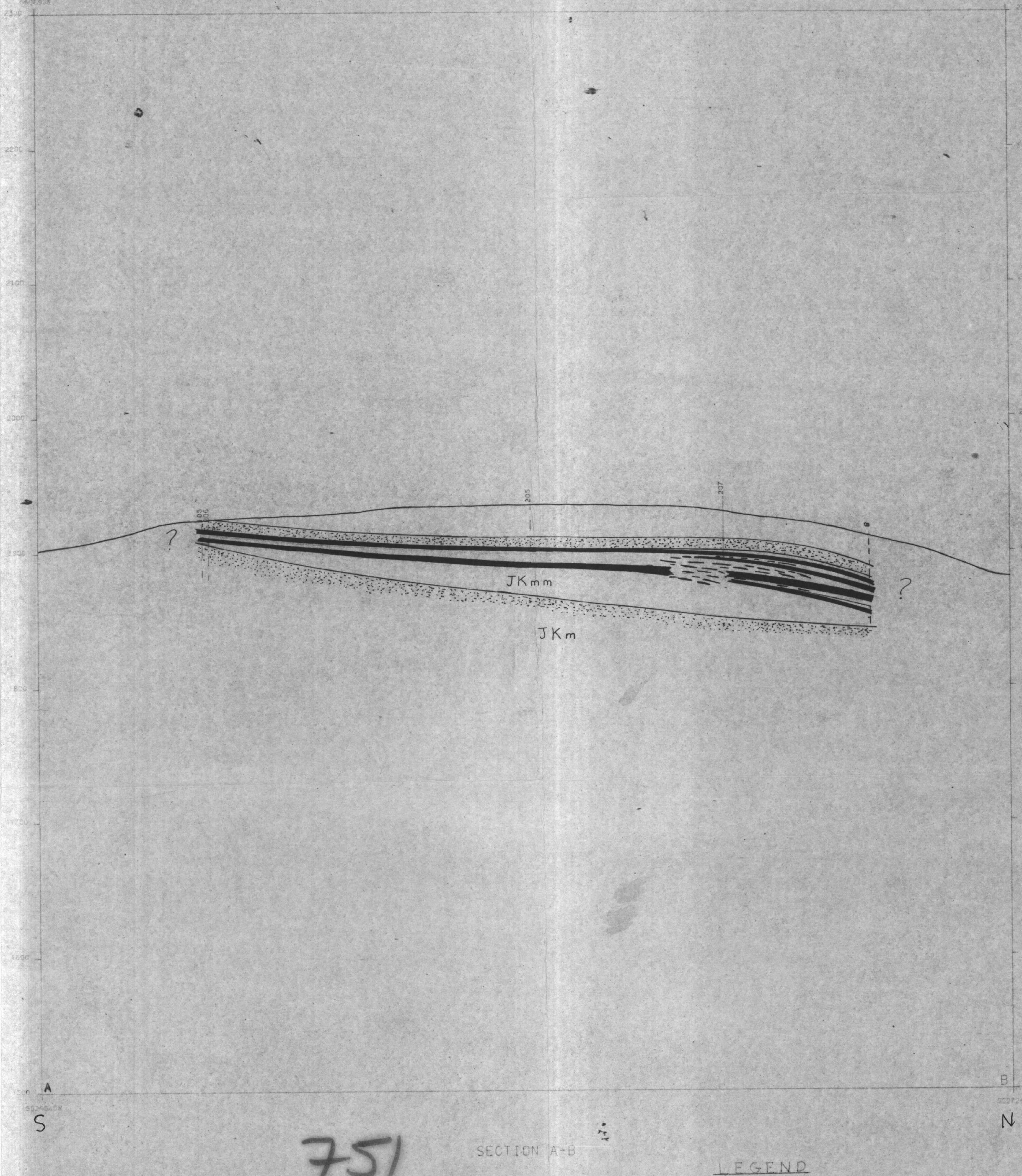
NTS. 82 J2 ZONE II

AUTHOR: S. CAMERON / D. HANDY	SCALE: 1:5000	ENCLOSURE No: 6
DATE: JANUARY, 1982	REVISED:	DRAWING No: HI-94
To Accompany 1981 GEOLOGICAL REPORT		

REV. FEB 1990 A-SHARMA

TP2U1

TPM PROJECT



SECTION A-B

751

LEGEND

- COAL
- SANDSTONE
- CARBONACEUS MUDSTONE

JKmm - Mist Mountain fmn.

JKm - Moose Mountain fmn.

Crows Nest Resources Limited

EXPLORATION

TEEPEE MOUNTAIN

S.E. B.C.

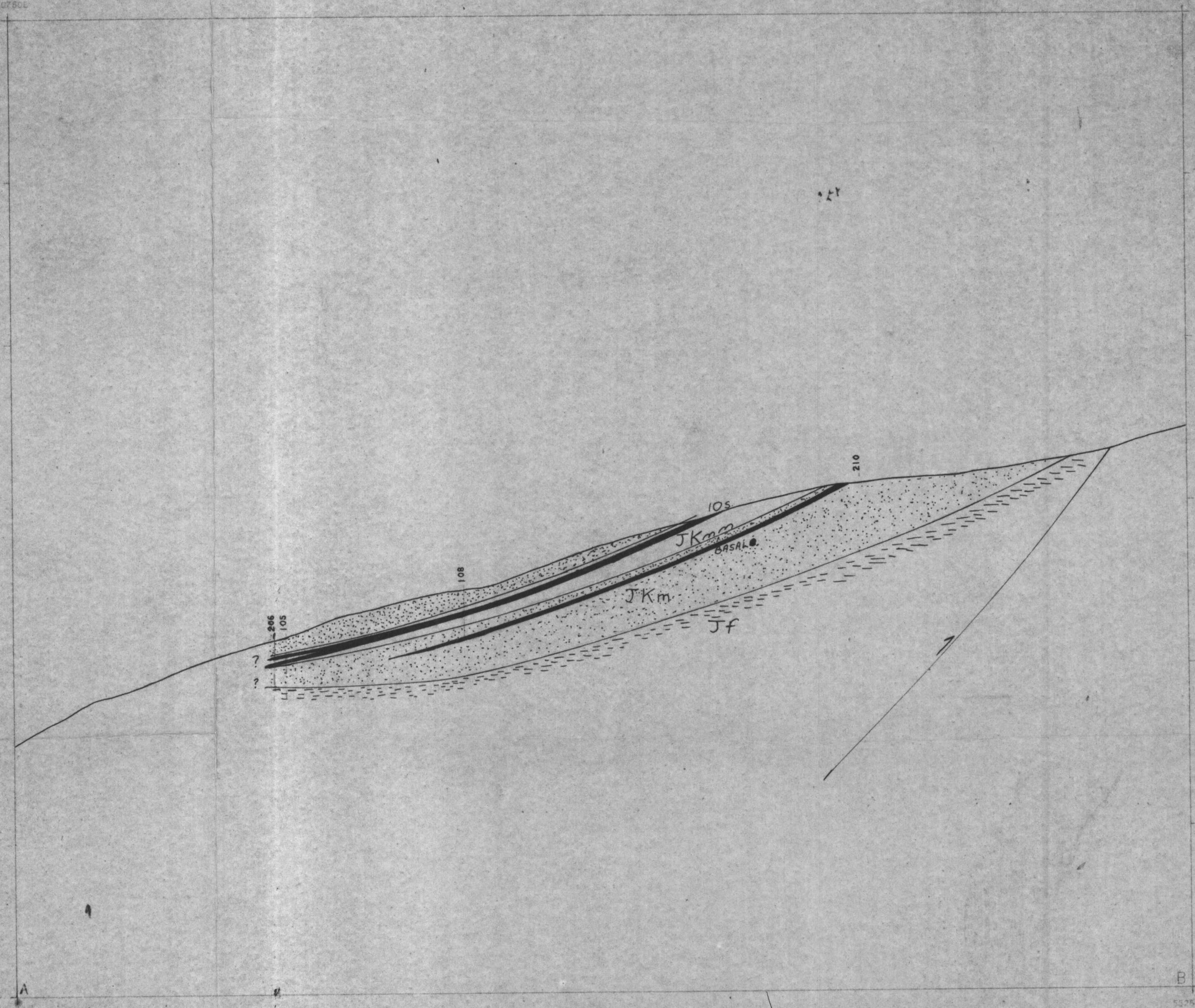
WEST SLOPE

N - S

AUTHOR: A. SHARMA	SCALE: 1: 2000	ENCLOSURE No: 7
DATE: 89/11/28	REVISED:	DRAWING No: WS2
To Accompany		

TPM PROJECT

BARRY (SCALE 1 : 2,000) 24-Oct-89



SECTION A-B

LEGEND

COAL SEAM	JKmm	- Mist Mountain fmn.
SANDSTONE	JKm	- Moose Mountain fmn.
SHALE	Jf	- Fernie fmn.
THRUST FAULT		

751

Crows Nest Resources Limited

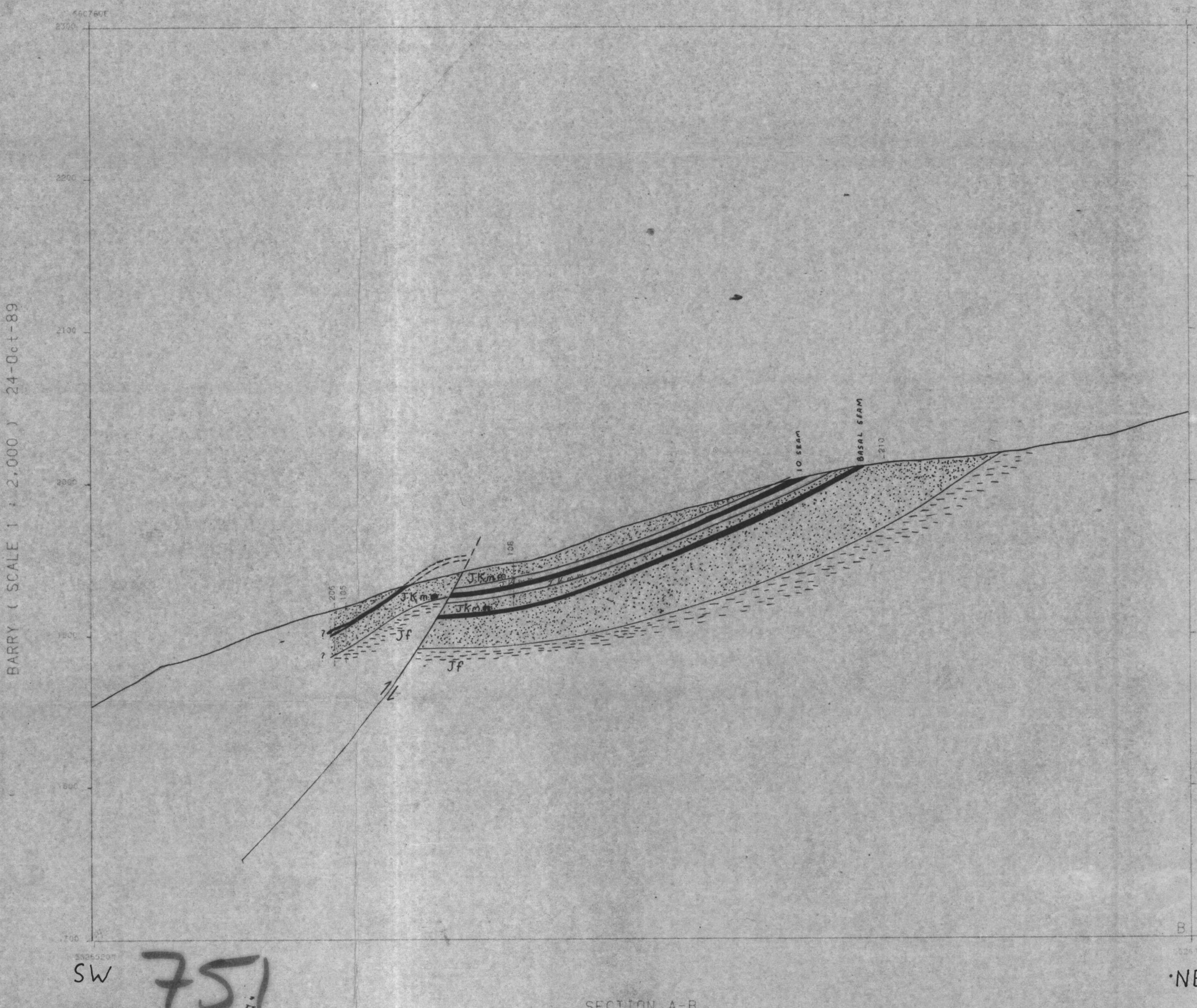
EXPLORATION

TEEPEE MOUNTAIN

S.E. B.C.

WEST SLOPE
NE - SW

AUTHOR: A. SHARMA	SCALE: 1:2000	ENCLOSURE No: 7
DATE: 89/11/13	REVISED:	DRAWING No: WS18
To Accompany		



SECTION A-B

LEGEND

- COAL SEAM
- SANDSTONE
- SHALE
- THRUST FAULT

JKmm - Mist Mountain fmn
JKm - Moose Mountain fmn
Jf - Fernie fmn

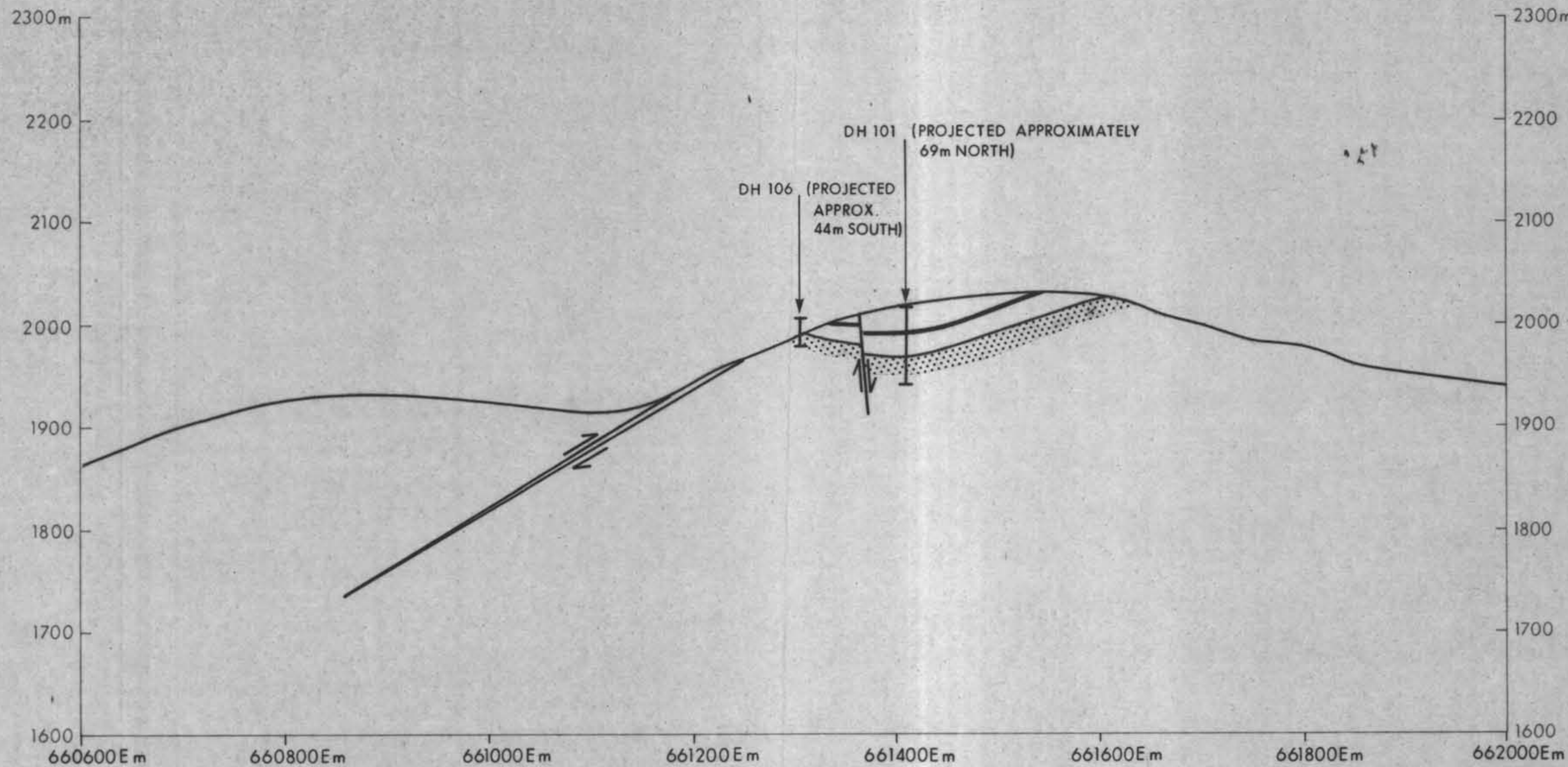
Crows Nest Resources Limited
EXPLORATION

TEEPEE MOUNTAIN
S.E. B.C.

WEST SLOPE
NE - SW

AUTHOR: A. SHARMA	SCALE: 1:2000	ENCLOSURE No: 7
DATE: 89/10/24	REVISED:	DRAWING No: WS1A
To Accompany		

SECTION 5 527 600 NORTH



751

SCALE 1:5000

100 0 100 200 metres

NO VERTICAL EXAGGERATION

GEOLOGICAL LEGEND

FAULT

COAL SEAM

BASAL SANDSTONE

DRILL HOLE

Crows Nest Resources Limited
EXPLORATION

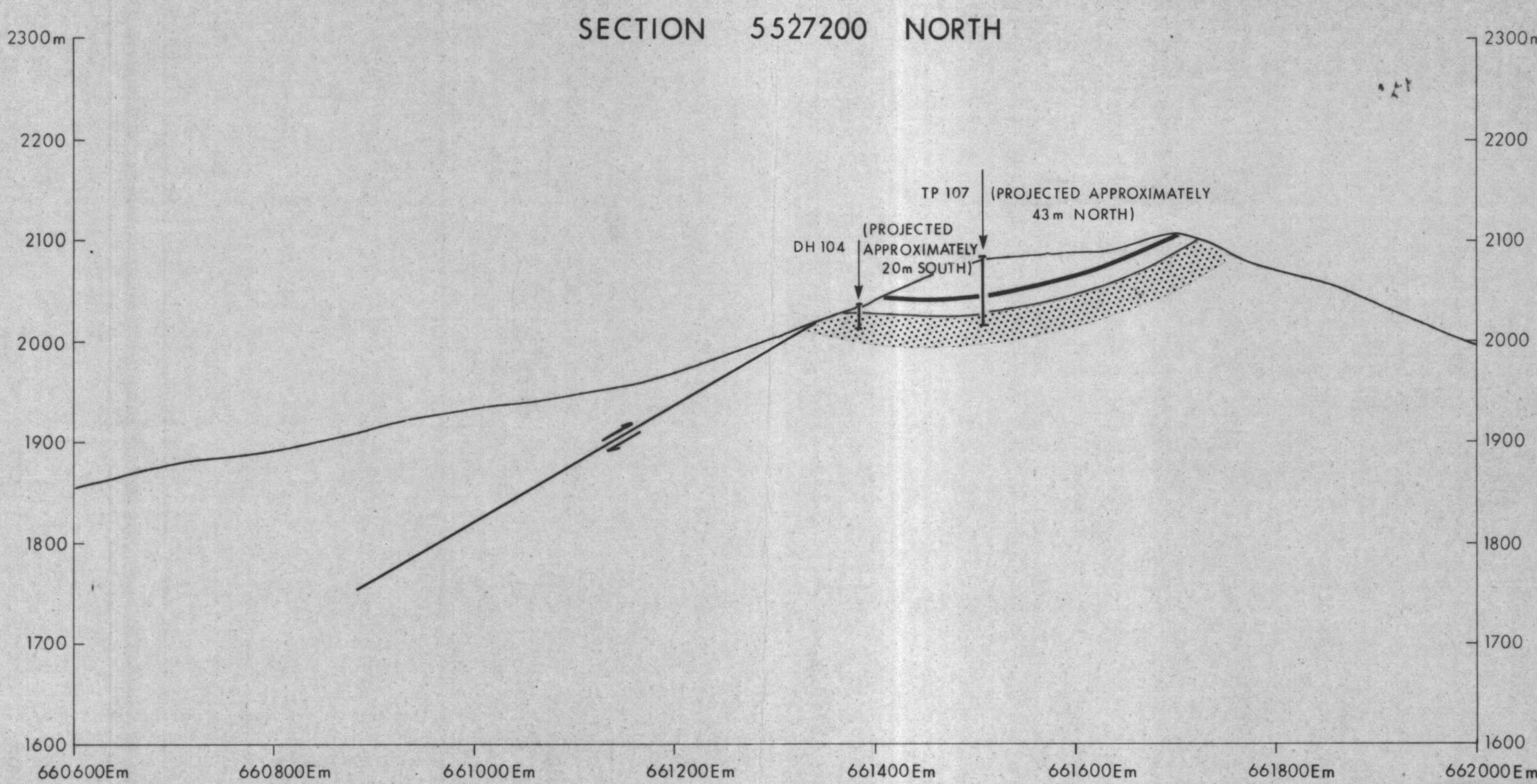
TEEPEE MOUNTAIN
S.E. BRITISH COLUMBIA

CROSS SECTION
SECTION 5 527 600 NORTH

AUTHOR S. CAMERON SCALE 1:5000
DATE JAN, 1982 REVISED
DRAWING No. HI-94A

TP2X1

SECTION 5527200 NORTH



751

SCALE 1:5000

100 0 100 200 metres

NO VERTICAL EXAGGERATION

GEOLOGICAL LEGEND

FAULT

COAL SEAM

BASAL SANDSTONE

DRILL HOLE

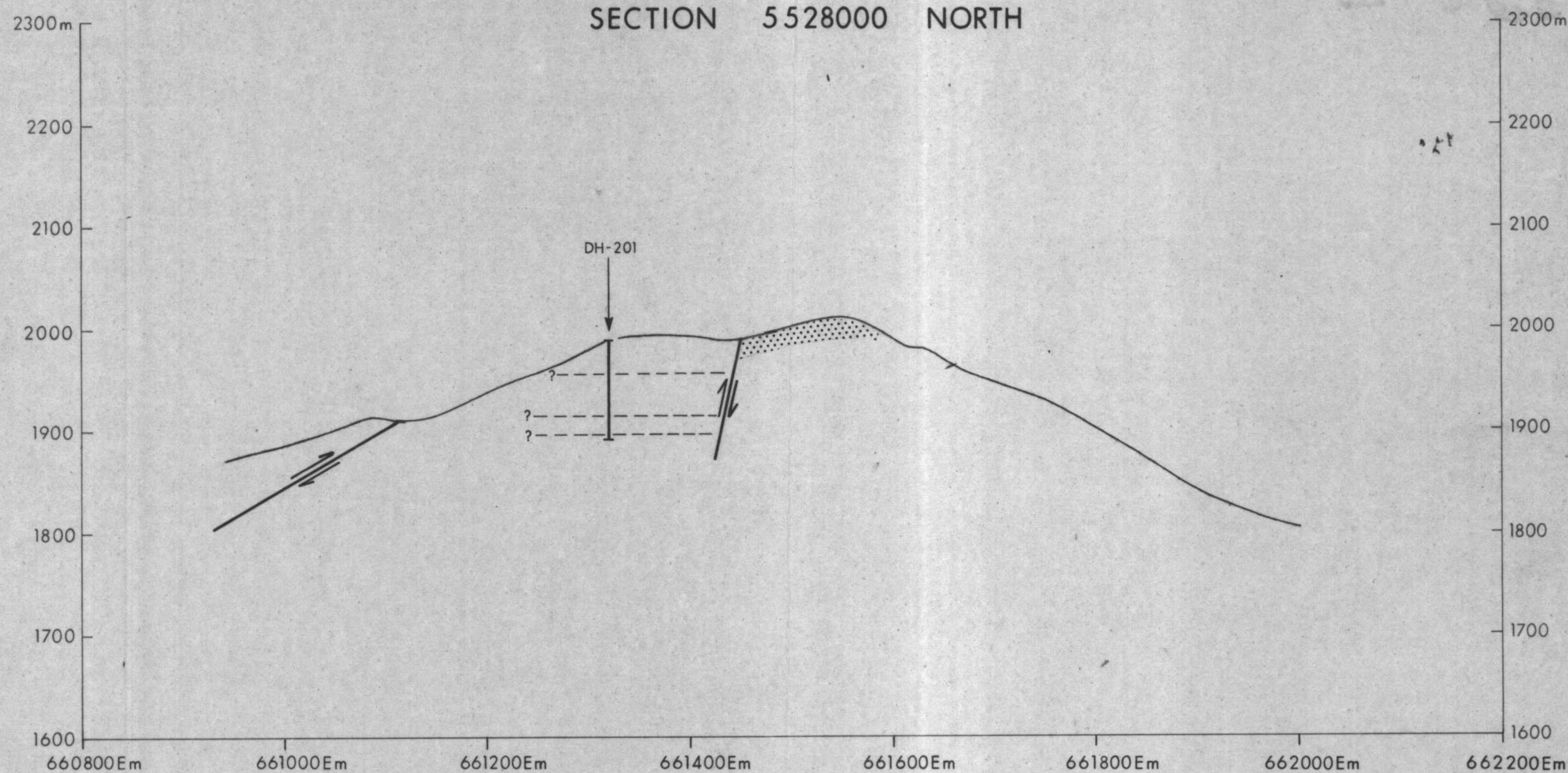
Crows Nest Resources Limited
EXPLORATION

TEEPEE MOUNTAIN
S.E. BRITISH COLUMBIA

CROSS SECTION
SECTION 5 527200 NORTH

AUTHOR S. CAMERON	SCALE 1:5000	ENCLOSURE No.	
DATE JAN, 1982.	REVISED	DRAWING No. HI-94B	
To Accompany			

SECTION 5528000 NORTH



751

SCALE 1:5000

100 0 100 200 metres

NO VERTICAL EXAGGERATION

GEOLOGICAL LEGEND

- FAULT
- COAL SEAM
- BASAL SANDSTONE
- DRILL HOLE

Crows Nest Resources Limited
EXPLORATION

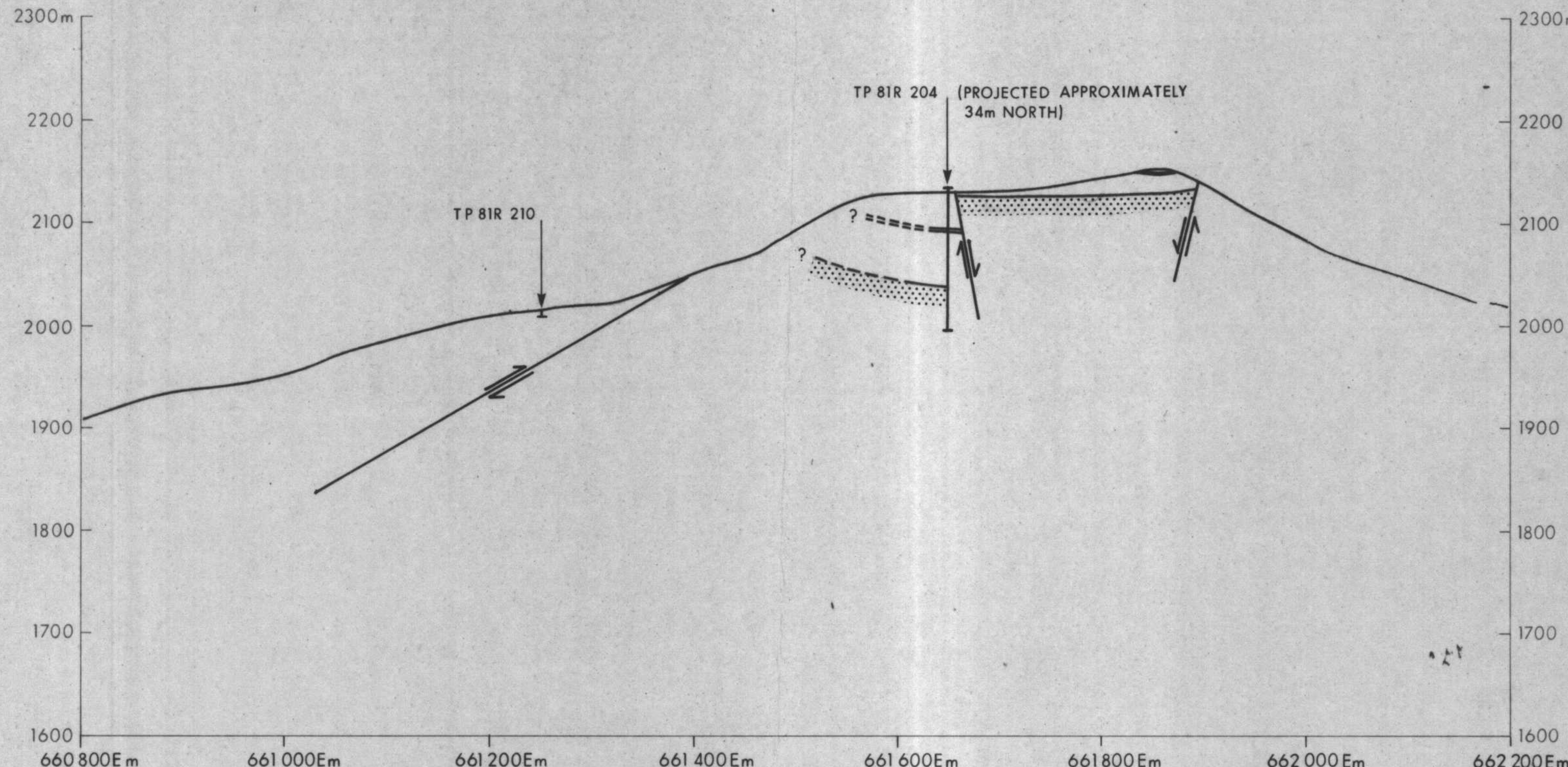
TEEPEE MOUNTAIN
S.E. BRITISH COLUMBIA

CROSS SECTION

SECTION 5528000 NORTH

AUTHOR S. CAMERON	SCALE 1:5000	ENCLOSURE No
DATE JAN. 1982	REVISED	DRAWING No HI-94C
To Accompany		

SECTION 5 526 800 NORTH



SCALE 1:5000

100 0 100 200 metres

NO VERTICAL EXAGGERATION

GEOLOGICAL LEGEND

FAULT

COAL SEAM

BASAL SANDSTONE

DRILL HOLE

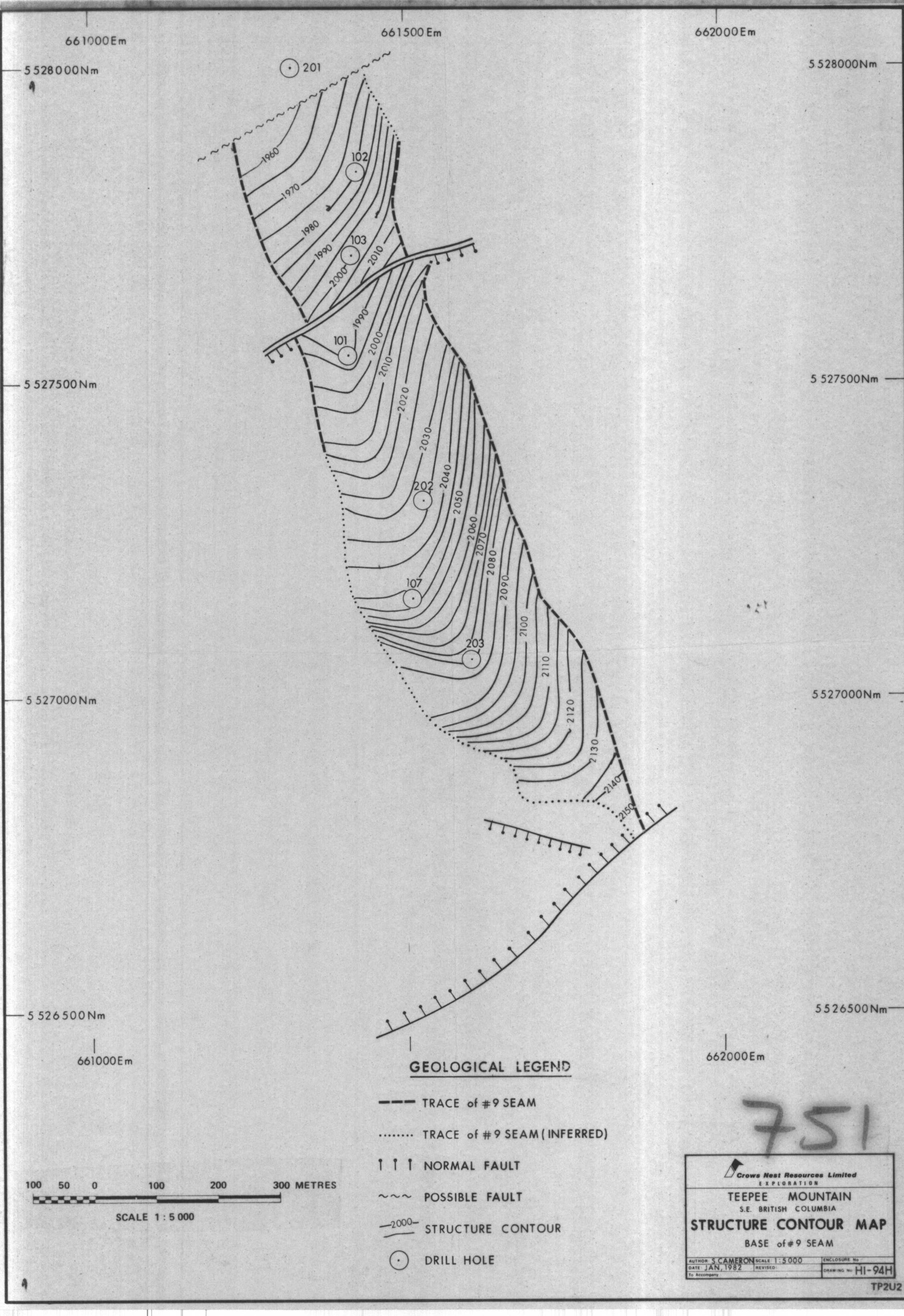
751

Crows Nest Resources Limited
EXPLORATION

TEEPEE MOUNTAIN
S.E. BRITISH COLUMBIA

CROSS SECTION
SECTION 5 526 800 NORTH

AUTHOR: S. CAMERON | SCALE: 1:5000 | ENCLOSURE No.
DATE: JAN, 1982 | REVISED: | DRAWING No. HI-94D
To Accompany:



661000Em
661500Em
662000Em
5528000Nm
5527500Nm
5527000Nm
5526500Nm
201
102
103
101
202
107
203
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
2120
2130
2140
2150
GEOLOGICAL LEGEND
TRACE of #9 SEAM
TRACE of #9 SEAM (INFERRED)
NORMAL FAULT
POSSIBLE FAULT
2000
STRUCTURE CONTOUR
DRILL HOLE
100 50 0 100 200 300 METRES
SCALE 1 : 5 000
751
Crows Nest Resources Limited
EXPLORATION
TEEPEE MOUNTAIN
S.E. BRITISH COLUMBIA
STRUCTURE CONTOUR MAP
BASE of #9 SEAM
AUTHOR S.CAMERON
SCALE 1:5000
ENCLOSURE No.
DATE JAN, 1982
REVISED
DRAWING No. HI-94H
To Accompany
TP2U2

DRILL HOLE SUMMARY

DEVIATION LOG

HOLE NO: TEEPEE DH # 7

TYPE: CSR

WATER LEVEL:

LOCATION: 5528150 N, 661542 E

GROUND ELEVATION: 1937 m

HOLE DIRECTION: VERTICAL

LOGS RUN: GAMMA, DEVIATION

SEAM NO.	GEOPHYSICAL TOP	GEOPHYSICAL BOTTOM	DRILLED THICKNESS	TRUE THICKNESS	REC. %	S
N/C						
TD	152					

DEPTH	INCLN	DIR
50	2.4	110
100	1.7	71
150	2.3	31
200	2.3	285
250	2.3	297
300	1.5	19
350	1.8	63
400	2.4	116
450	1.8	26
500	0.7	132
550	0.6	350
600	0.3	162
650	0.2	353
700	0.4	250
750	0.5	162
800	0.7	115
850	0.9	121
900	1.7	47
950	2.3	112
1000	3.0	49
1050	3.6	345
1100	4.0	301
1150	4.6	133
1200	5.9	46
1250	6.9	229
1300	7.8	352
1350	8.8	158
1400	9.6	13
1450	9.9	04
1500	11.3	202
1511.3	11.4	172
6	0.7	241

DECLINATION E 18.0
PRESET DEPTH 6.0

DRILL HOLE SUMMARY

DEVIATION LOG

HOLE NO: TEEPEE DH # 8

TYPE: CSR

WATER LEVEL:

LOCATION: 5527155 N, 660803 E.

GROUND ELEVATION: 1913 m.

HOLE DIRECTION: VERTICAL

LOGS RUN: GAMMA, DEVIATION

SEAM NO.	GEOPHYSICAL TOP	GEOPHYSICAL BOTTOM	DRILLED THICKNESS	TRUE THICKNESS	REC. %
COAL	40.0	43.6	3.6		
COAL	~~44~~ 45.0	48.3	3.3		
COAL	57.0	59.7	2.7		
COAL	71.5	72.5	1.0		
TD	94				

DEPTH	INCLN	DIR
0	0.6	207
50	0.3	169
100	0.7	313
150	0.9	256
200	1.0	138
250	1.4	100
300	1.8	74
350	1.9	179
400	1.9	85
450	2.0	236
500	1.6	351
550	0.3	319
600	0.6	145
650	4.2	211
700	1.7	238
750	0.7	85
800	1.0	295
850	0.1	257
900	1.0	143
926	2.0	258

DECLINATION E 18.0
PRESET DEPTH 6 0

751

Crows Nest Resources LIMITED

HOLE NO. TEEPEE DH # 7

AREA TEEPEE

DATE JULY 12, 1989

GROUND LEVEL	
TOTAL DEPTH	152
CASING	
BIT SIZES 1	
2	
CASING SIZE	
WATER LEVEL	

LOG TYPE

LOG	GAMMA
PROBE NO.	
CHART RATIO	100 : 1
CPS	10
FIRST READING	152
LAST READING	0
INTERVAL LOGGED	
ENGINEER	

SEAM DEPTHS

DEPTHS FROM	DEPTHS TO	SEAM NO.

751

Crows Nest Resources LIMITED

HOLE NO.	TEEPEE DH #8

AREA	TEEPEE MTN.
DATE	JULY 11, 1989

GROUND LEVEL	
TOTAL DEPTH	96.5
CASING	
BIT SIZES 1	
2	
CASING SIZE	
WATER LEVEL	

LOG TYPE

LOG	GAMMA
PROBE NO.	
CHART RATIO	100:1
CPS	
FIRST READING	92
LAST READING	0 m
INTERVAL LOGGED	92 m
ENGINEER	

SEAM DEPTHS

DEPTHS FROM	DEPTHS TO	SEAM NO.

TEEPEE PIT ROTARY SAMPLES

890821

FIELD#	LAB #	SEAM	TOP	BASE	ASH(ADB)	FSI
441	7373		14.5	15	79.0	0.0
442	7374		36	37	72.1	0.0
	7375		37	38	63.7	0.0
	7376		38	38.5	71.9	0.0
443	7377		40	41	29.5	0.0
	7378		41	42	34.7	0.0
	7379		42	43	35.6	0.0
	7380		43	44	29.7	0.0
444	7381		45	46	27.5	0.0
	7382		46	47	15.8	0.0
	7383		47	48	24.4	0.0
	7384		48	48.5	62.8	0.0
445	7385		57	58	31.4	0.0
	7386		58	59	43.5	0.0
	7387		59	60	47.5	0.0
446	7388		71.5	72	28.6	0.0
	7389		72	72.5	34.8	0.0

CLIENT: CROWS NEST RESOURCES LTD.

PROJECT: TEEPEE MOUNTAIN BULK SAMPLE

LAB NO.: 906

SINK-FLOAT ANALYSIS:adb: 50mm x 6mm (Attrited					
SG FRACTION	WT%	RM%	ASH%	CUMULATIVE WT%	CUMULATIVE ASH%
- 1.30	nil	-	–	-	-
1.30- 1.35	0.1	2.6	4.5	0.1	4.5
1.35- 1.40	0.4	2.3	6.6	0.5	6.2
1.40- 1.45	1.3	2.2	9.0	1.8	8.2
1.45- 1.50	5.6	3.3	10.6	7.4	10.0
1.50- 1.55	6.0	3.4	15.3	13.4	12.4
1.55- 1.60	3.1	3.2	20.6	16.5	13.9
1.60- 1.70	6.3	2.7	33.6	22.8	19.4
1.70- 1.80	5.3	2.6	41.1	28.1	23.5
+1.80-	71.9	2.1	70.2	100.0	57.1

SINK -FLOAT ANALYSIS,adb: 6mm x 0.6mm (Attrited)					
SG FRACTION	WT%	RM%	ASH%	CUMULATIVE WT%	CUMULATIVE ASH%
- 1.30	0.1	2.0	1.6	0.1	1.6
1.30 - 1.35	2.9	5.0	1.5	3.0	1.5
1.35 - 1.40	2.2	3.0	3.9	5.2	2.5
1.40 - 1.45	5.0	4.5	6.3	10.2	4.4
1.45 - 1.50	12.0	6.0	8.7	22.2	6.7
1.50 - 1.55	18.6	6.2	13.0	40.8	9.6
1.55 - 1.60	11.4	5.2	18.5	52.2	11.5
1.60 - 1.70	10.6	4.8	25.6	62.8	13.9
1.70 - 1.80	8.5	3.9	36.6	71.3	16.6
+1.80	28.7	3.2	63.9	100.0	30.2

copy pg
c̄ table of
raw analysis -
rest is confi-
dential.

CLIENT ; CROWS NEST RESOURCES LIMITED

PROJECT: TEEPEE MOUNTAIN BULK SAMPLE

LAB NO.: 906

HEAD RAW ANALYSIS

ADM%	MOIST%	ASH%	VOL%	F.C.%	S%	C.V. Cal/gm	CALC BASIS
16.6	2.6	28.7	24.7	44.0	0.58	4658	a.d.b.
	18.8	23.9	20.6	36.7	0.52	3885	a.r.b.
		29.5	25.4	45.1	0.59	4782	d.b.

SIZE CONSIST ,a.d.b.; BEFORE ATTRITION

SIZE FRACTION	WT%	CUM WT%
50 mm x 25 mm	4.2	4.2
25 mm x 12	12.2	16.4
12 x 6	5.4	21.8
6 x 0.6	49.3	71.1
0.6 x 0.3	10.5	81.6
0.3 x 0.15	8.2	89.8
0.15 x 0.075	5.9	95.7
0.075 x 0	4.3	100.0

WT% + 50 mm = 0.2 crushed to pass 50 mm

SIZE AND RAW ANALYSIS, a.d.b.				AFTER ATTRITION	
				CUMULATIVE	
SIZE FRACTION	WT%	RM%	ASH%	WT%	ASH%
50 mmx 25mm	0.2	1.6	76.7	0.2	76.7
25 x 12	1.1	2.1	69.2	1.3	70.4
12 x 6	6.1	3.3	54.0	7.4	56.9
6 x 0.6	52.6	5.8	30.7	60.0	33.9
0.6 x 0.3	10.5	6.3	18.9	70.5	31.7
0.3 x 0.15	9.5	6.7	16.9	80.0	29.9
0.15 x 0.075	10.0	7.3	16.8	90.0	28.5
0.075x 0	10.0	7.9	18.4	100.0	27.5

CLIENT : CROWS NEST RESOURCES LIMITED

PROJECT: TEEPEE MOUNTAIN BULK SAMPLE

LAB NO.: 906

SINK-FLOAT ANALYSIS,adb: 0.6mmx0.3 mm(Attrited)

S.G. FRACTION	WT%	RM%	ASH%	CUMULATIVE WT%	CUMULATIVE ASH%
- 1.30	0.2	1.7	1.5	0.2	1.5
1.30 - 1.35	4.5	2.1	1.7	4.7	1.7
1.35 - 1.40	9.1	2.6	2.9	13.8	2.5
1.40 - 1.45	9.8	3.7	5.1	23.6	3.6
1.45 - 1.50	17.0	3.8	7.6	40.6	5.3
1.50 - 1.55	18.3	4.6	11.4	58.9	7.2
1.55 - 1.60	11.5	4.7	15.7	70.4	8.6
1.60 - 1.70	10.6	4.6	23.5	81.0	10.5
1.70 - 1.80	4.2	4.2	33.6	85.2	11.7
+ 1.80	14.8	2.8	61.1	100.0	19.0

FROTH FLOTATION TEST,adb:0.3mmx0 (Attrited)

PRODUCT	WT%	RM%	ASH%	CUMULATIVE WT%	CUMULATIVE ASH%
STAGE 1	4.5	6.6	18.0	4.5	18.0
STAGE 11	4.2	6.6	18.2	8.7	18.1
TAILINGS	91.3	7.2	17.6	100.0	17.6

F.F. Parameters- Pulp Density = 10%
Reagent = 4:1=Ker:MIBC
Dosage = 0.48 lb/Ton
Conditioning Time= 60 seconds
Stage 1 = 1st minute froth
Stage 11 = 2nd minute froth

Birtley Coal
& Minerals Testing