K-Shell Cabin Creek 81(1)A

CABIN CREEK

COAL EXPLORATION

1981

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

Held by: Shell Canada Resources Limited

Operated by: Crows Nest Resources Limited

Kootenay Land District, Southeast British Columbia

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

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

Consultant and Author: Dennis E. Bell, P. Geol. (Alberta)
Max Air Exploration Limited
P.O.Box 878
Jasper, Alberta
TOE 1EO

Field Work: September, 1981

Submission Date: Feb. 28, 1982

Crows Nest Resources LIMITED

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

February 28, 1982

Ministry of Energy, Mines and Petroleum Resources
British Columbia

Dear Sirs;

Enclosed please find our report on the Cabin Creek Project

Mr. Dennis E. Bell planned and supervised the 1981 geological field program on Cabin Creek B.C. Coal Licences held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited. Gary Cox assisted with the field work, and the preparation of this report.

Mr. Dennis E. Bell, B.Sc., graduated in Geology from Dalhousie University in 1965. Since 1968 he has specialized in mapping, structural interpretation, and exploration supervision in the coking coal belt of British Columbia and Alberta. He has worked on projects similar to this property for this company and a number of other major coal companies. Mr. Bell is registered as a Professional Geologist in the Association of Professional Engineers, Geologists, and Geophysicists of Alberta.

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

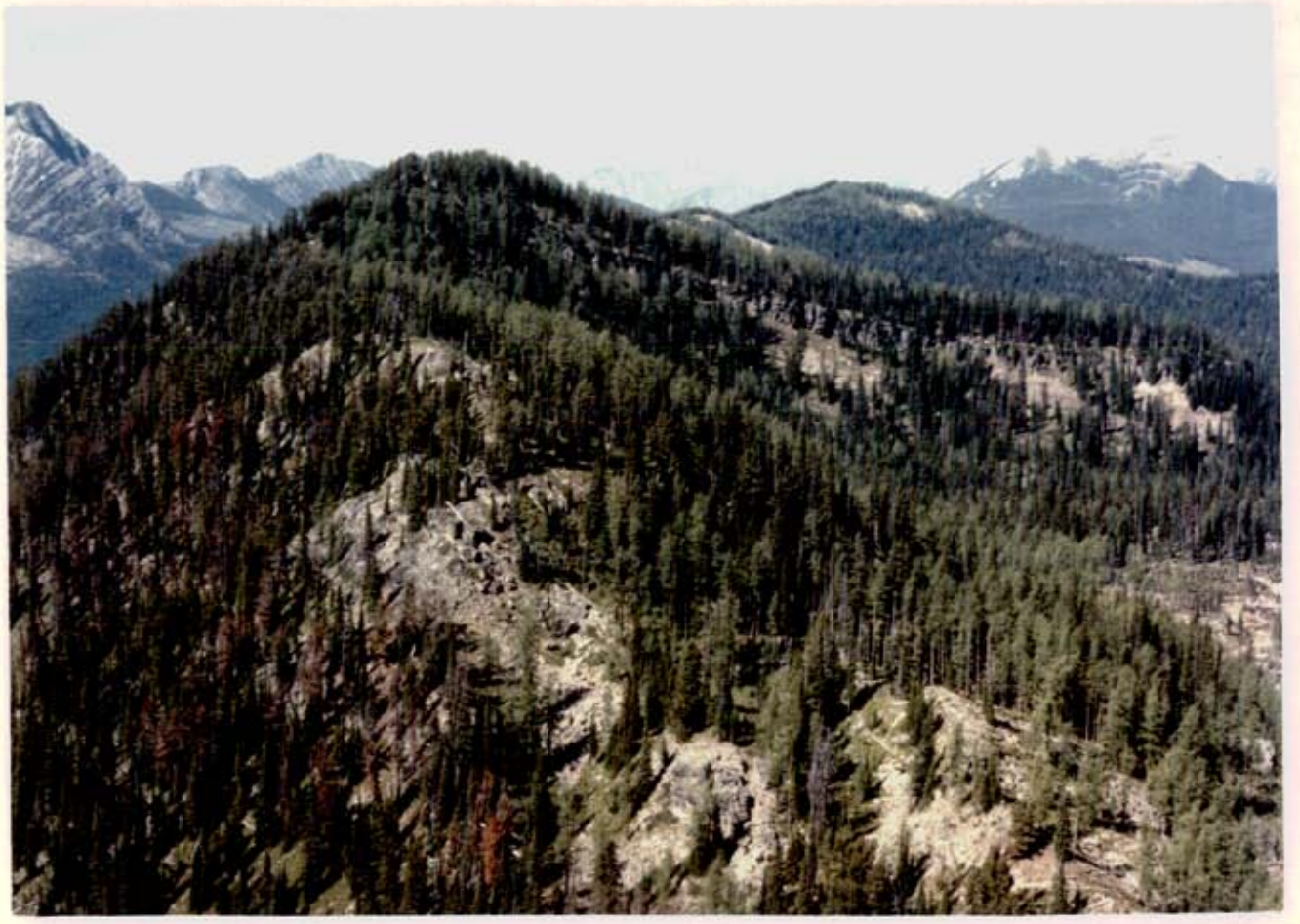
Their work was carried out under the supervision of our District Manager, British Columbia, Mr. Frank Martonhegyi.

Yours truly,

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

/ld

Enc.



1981

CABIN CREEK

S.E. B.C.

VIEW NORTHWEST

The cliff of Top Sandstone overlying Seam 4 dips gently to the north from the ridge's peak. The two 1978 Crows Nest Resources' adits are in the light-brown clearings under the right half of the Sandstone.

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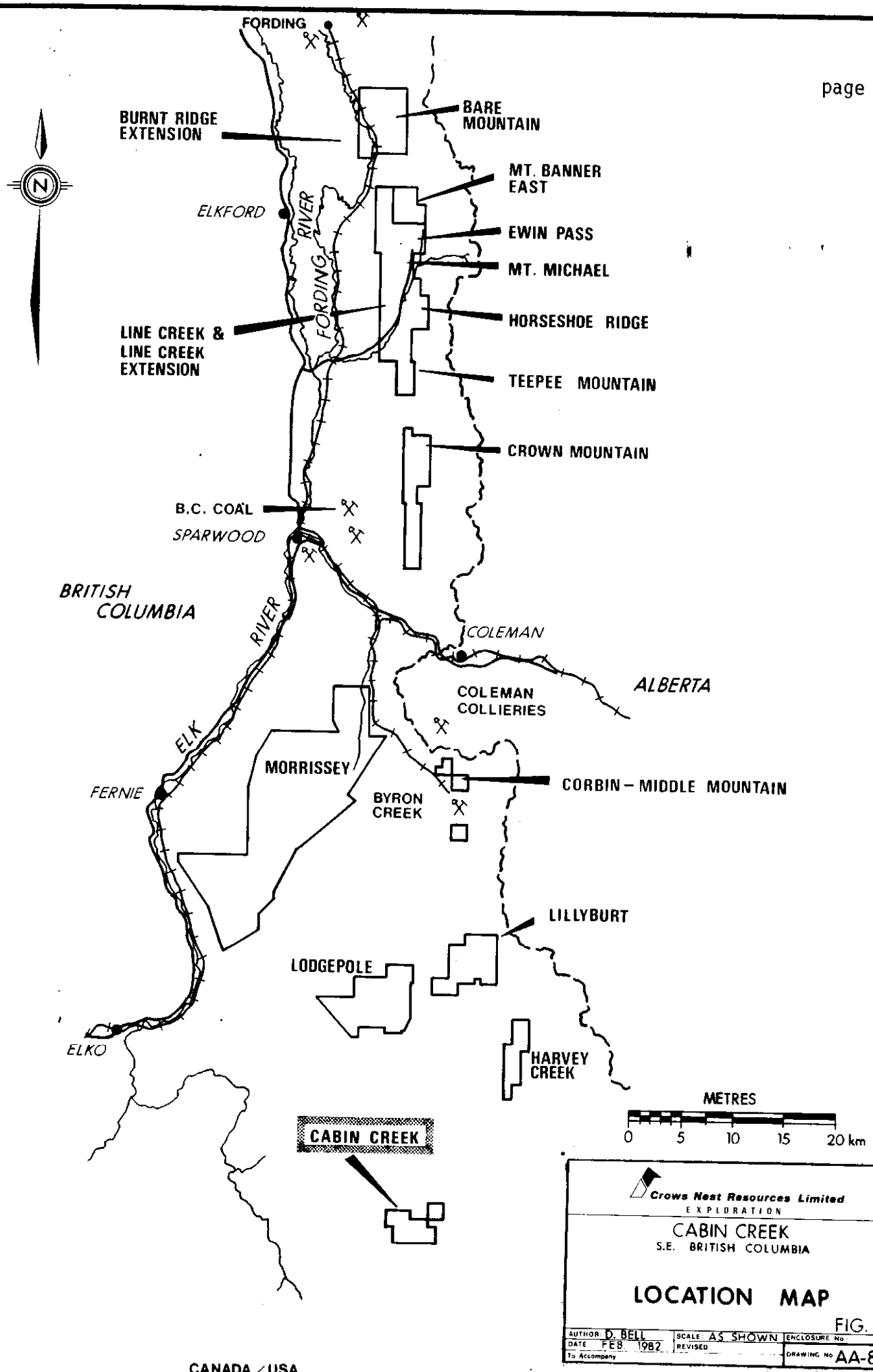


Crows Nest Resources Limited
EXPLORATION

CABIN CREEK
S.E. BRITISH COLUMBIA

LOCATION MAP

FIG. 1

AUTHOR D. BELL	SCALE AS SHOWN	ENCLOSURE No
DATE FEB 1982	REVISED	
To Accompany		DRAWING No AA-823

1.0 SUMMARY

Through a two week period in September, 1981, the author conducted a two-part exploration program in southeastern British Columbia on the Cabin Creek coal licences held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited. The work was based from Fernie and Sparwood. Cost has been $21,578.00.

The first part consisted of detail hand-held plane table geologic mapping of 1:2,000 scale on a enlarged 1:5,000 topographic base. This was a direct continuation of the 1979 mapping done on the same base by the author.

The second part consisted of hand-trenching of six locations. The first two are part of the main reserve outlined by the mapping, and the other four were discovered during the 1980 mapping by the author in licence 595, which covers a separate area from the main area and which was the subject of the 1980 report. The hand-trenching was supervised and recorded by a Crows Nest Geologist; Gary Cox.

No equipment work was done in 1981. Analysis of the trench coal samples is not yet complete and will be reported in the next Cabin Creek report. All other trench data are contained in this report.

The mapping of 1979, 1980 and 1981 has been planned and executed by the author as one linked whole. During 1978 Crows Nest Resources successfully completed and sampled two adits in the two known thick seams, but no

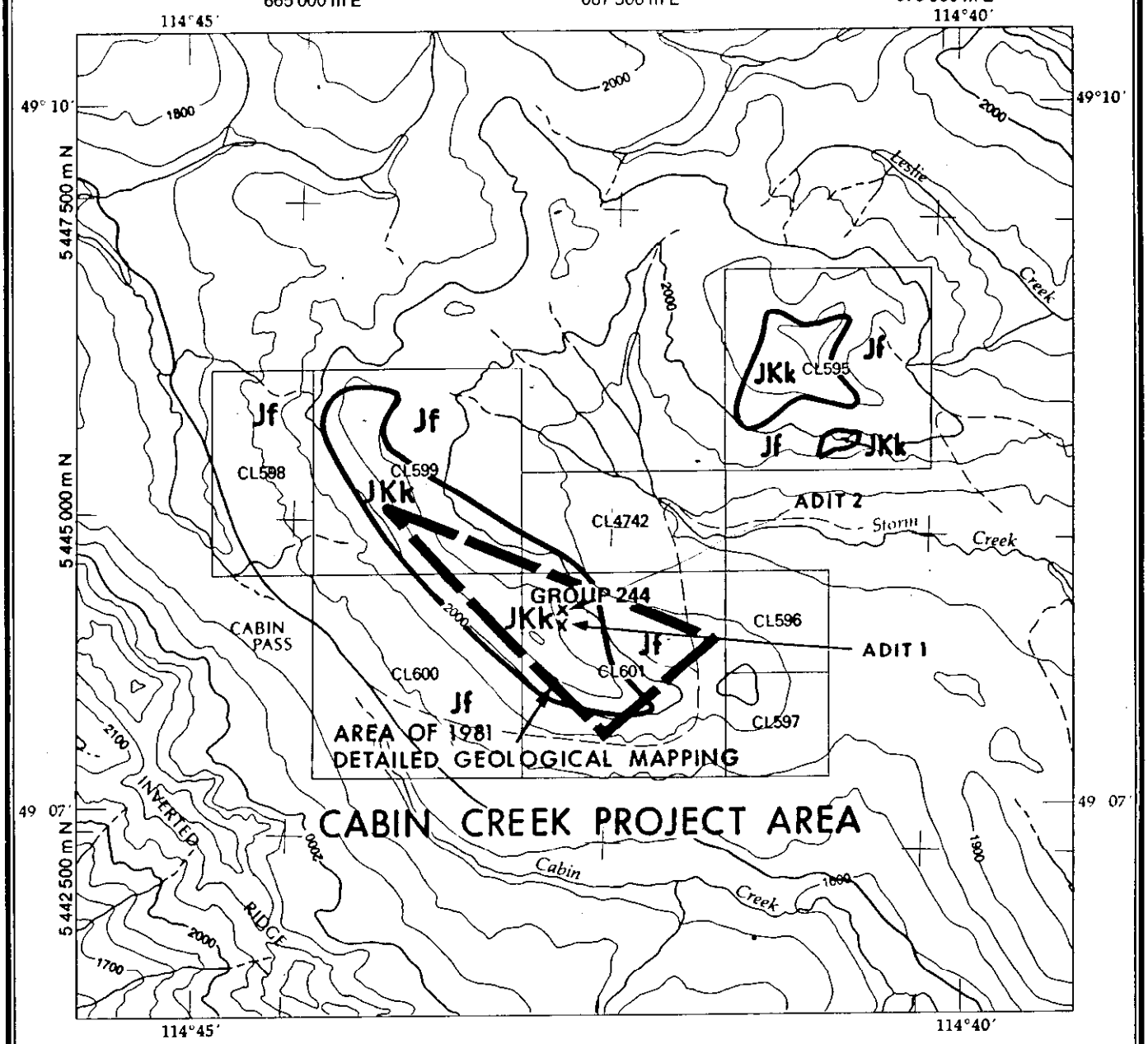
1.0 Summary continued. ..

mapping was done. This work is recorded in very complete detail in the 1978 report by J. Horachek, now located in the Calgary Head Office.

The mapping by the author has been aimed at outlining the extent and structural orientation of the Kootenay Group section of interest, to complement the adit work. All mapping to date on the main reserve has been done by careful chain measurement from either the adits or the peak, with altitude corrections included. As the main reserve consists of a structurally-simple tilted erosional remnant of Kootenay sediments, the attempt has been to bettter define its extent. Mapping is not yet completed, and further work requires one or two helicopter landing sites to be cut, as the distance to traverse further northwest along the main ridge has become prohibitive in time.

Eight million tonnes of geological in place coal resources were estimated in the 1978 Cabin Creek Geological Report (Horachek, 1978). This volume was calculated considering the seams with their thickness at the adit sites.

Cabin Creek area is outlined on the following "Index, Geologic Compilation, and Coal Disposition Map" of 1:50,000 scale.



Reference map produced by the Surveys and Mapping Branch, Department of Energy, Mines and Resources in 1973 and updated from 1979 Province of British Columbia 1:100 000 mapping. Metric contours were manually interpolated.

Km. 0.5 0 0.5 1.0 1.5 2.0 Km.

Mi. 0.5 0 0.5 1.0 1.5 Mi.

Contour Interval 100m
Transverse Mercator Projection
Universal Transverse Mercator Grid Zone 11

JKk **Kootenay Group**

Jf **Fernie Formation**

Legend

- Road; Highway, Main road
- Road; Loose surface, Dry weather
- Track or trail
- Railway
- River
- Stream
- Contours (2000 / 1500)
- Licence boundary

T.N
1°43'
Grid North

Crows Nest Resources Limited
EXPLORATION

S.E. B.C.
CABIN CREEK

INDEX GEOLOGIC COMPILATION AND COAL LAND DISPOSITION

FIG. 2.

AUTHOR D. BELL	SCALE 1:50 000	ENCLOSURE No.
DATE FEB, 1982	REVISED	AA-831
To Accompany		

2.0 INTRODUCTION

2.1 Coal Land Tenure

Eight licences (595-601 inclusive and 4742) compose Group 244, 1426 hectares.

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

CROWS NEST RESOURCES LIMITED (Exploration)

B.C. COAL LICENCES — BLOCK: CABIN CREEK — PROJECT: — YEAR: 1981-82

TENURE STANDING — GROUP: #244 — CABIN CREEK — DATE: FEBRUARY, 1982

LICENCE			ACQ/ADM		RENTALS		REQUIREMENT WORK						BUDGET		EXP	POTL	REMARKS
NO.	LEGAL DESCRIPTION	AREA TOTAL AC/HA.	FEES YEAR	FEES $	ANNUAL $	TOTAL TO NEXT ANN. $ 10^3	EXPIRED $ 10^3	CURRENT YEAR LIC YEAR	CURRENT YEAR $	PRE-FULFILMENT YEAR	PRE-FULFILMENT $	ANNIVERSARY DATE	CURRENT YEAR AFE	CURRENT YEAR $ 10^3	TOTAL $ 10^3	SHELL CLASS.	
8 LIC.		1426		101	7130	41.1	259.4		17,625			FEBRUARY 28	-	-	540	Y	LICENCE NO'S:
595	LOT 5926	259	75				256.8	7	16,000	8+	154,464						595-601 ARE IN GOOD
596	SW¼ 5923	65															STANDING UNTIL
597	NW¼ 11930	65															FEB.28, 1990, UNDER
598	UNSURVEYED	65															THE 74 COAL ACT
599	UNSURVEYED	130															PLUS $20.42 PER HA
600	UNSURVEYED	259															CREDIT. LICENCE NO
601	UNSURVEYED	259															4742 IS IN GOOD
																	STANDING UNTIL
4742	UNSURVEYED	130	79				2.6	3	1,625	5+	21,632						FEB.28, 1987 PLUS
																	$3.90 PER HA
																	CREDIT.
				WORK DONE	PRIOR TO 1978	1978	1979		1980		1981						
				$	-	221,144	19,134		9,986		21,758						

BA - 312

2.2 Location, Geography, and Physiography

The Cabin Creek Prospect is the most southerly of Crows Nest Resources' areas in southeast British Columbia. It is located on the north side of the upper Cabin Creek drainage, which empties southeast into the Flathead River. It is separated by several massive lines of mountains from the licences of Lodgepole, Harvey Creek, and Lillyburt.

The topography is steep, but less than on some other Crows Nest properties. The geography and physiography is typically southern Rocky Mountain in aspect. Forest is of medium density. The overall character is similar to that of Lodgepole or the workings of B.C. Coal's operations.

The peak of the ridge over the main reserve is a relatively high 2,170 m (7,120 ft.). Forest cover is mainly of medium-density, and no part of the property is above treeline.

Snow may be expected on the ground in May and in October. Mining would be entirely above 1,900 m (6,200 ft.).

2.3 Access

At present, road access is from Fernie south 15 km on Highway 3 to the Morrissey turn-off, then 55 km southeast along the Lodgepole and Ram Creek logging roads to the Storm Creek turn-off. A further 7 km of four-wheel-drive trail leads to the impassable water-bar constructed on the trail to the adits. Alternately, the property is 15 minutes by helicopter southeast from Fernie, and 20 minutes from Sparwood. As the drainage faces southeasterly, away from Fernie and Sparwood, the area tends to be isolated. Mapping lends itself to a blend of road and helicopter access, as the driving time is 1½ hours one way.

A longer road route to the Storm Creek turn-off exists south from Lillyburt along the Flathead Road and northeast up Cabin Creek.

3.0 WORK DONE

3.1 Summary of Previous Work

The 1978 program included geodetic ground control and location surveys, photogrammetric mapping as well as driving and bulk sampling two adits for analysis and tests.

The 1979 program of geologic mapping was done by the author in the vicinity of the adits, to determine the attitude of the beds and the extent of the reserve.

Work in 1980 consisted of detail mapping on a 1:5,000 scale by the author on the geologically isolated northeast licence 595, containing a separate and smaller erosional remnant of Kootenay section.

3.2 Scope and Objective of 1981 Exploration

Considering that adits have been completed and sampled in the main reserve of two seams, and that even a casual aerial inspection shows the reserve to consist of a simple, tilted erosional block, 1981 mapping was intended to continue a plot of bedding attitudes on measured outcrop lines.

Careful measurement of outcrop position and attitude is required, as the reserve is small in extent and mining decisions will have a correspondingly small error allowance.

At the same time, mapping was intended to describe the thickness and character of the stratigraphic section in order to guide future mapping, drilling, and trenching.

3.3 Work Done in 1981

1981 work cost $21,578.00. Mapping was continued from the 1979 start on the main reserve, on the same scale and base. Sufficient has been done to outline most of the extent of reserve of the upper seam, but approximately half of the extent of the lower seam remains to be done. Bedding attitudes have been stereographically analyzed to determine the orientation of the reserve. Thickness measurements of the stratigraphic units have been done. Hand trenches were dug on each of the two major seams, and on three coal occurences in 1980's northeast licence.

A stereographically-oriented grid has been established, to which further work may be referenced. This will ensure that the least possible apparentness in thickness and aspect will occur on cross sections.

All geologic data has been plotted on the base and the geologic map presented in the enclosures of this report is complete to date. One 1:2,000 structural cross section has been prepared and it is also included in the enclosures. This cross section is section 100 West on the grid and supersedes the similar, sketched cross section presented in the 1978 report.

3.3 Work Done in 1981 continued. ..

The hand-trenching has provided coal thicknesses and samples to complement the data from the adits and, as the measured thickness of the upper major seam (Seam 4) is significantly thinner than that from the adit, the need for further trenching is apparent.

3.4 Costs of Work Done in 1981

Detailed costs of the 1981 Cabin Creek geologic program are contained in the Application To Extend Term of Licence on the following pages.

Total cost of the 1981 program is calculated to be $21,578.00.

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

APPLICATION TO EXTEND TERM OF LICENCE

I, Leslie Gramantik (Name) agent for Shell Canada Resources Limited (Name)

P.O. Box 100 (Address) Calgary (Address)

Alberta T2P 2H5

Valid FMC No. 244642

hereby apply to the Minister to extend the term of Coal Licence(s) No(s). 595-601 & 4742

8 Coal Licences, Group #244, 1426 Hectares

for a further period of one year.

2. Property name Cabin Creek, 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 27th 1981 to February 28, 19 82, work to the value of at least $ 21,578.00

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

CATEGORY OF WORK	Licence(s) No(s).	Apportioned Cost
Geological mapping	601, 600, 599, 4742	17,770
Surveys: Geophysical	-	-
Geochemical	-	-
Other	-	-
Road construction	-	-
Surface work	595, 601	1,100
Underground work	-	-
Drilling	-	-
Logging, sampling, and testing	595, 601	292
Reclamation	595, 601	531
Other work (specify)		
Off-property costs Geological Report		1,885

5. I wish to apply $ 21,578.00 of this value of work on Coal Licence(s) No(s). 4742.

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

7. The work performed on the location(s) is detailed in the attached report entitled The Geological Report will be submitted in ninety days.

Feb 25, 82 (Date)

(Signature)

Assistant Landman (Position)

(FORMS AND REPORT TO BE SUBMITTED IN DUPLICATE)

GEOLOGICAL MAPPING Yes ☒ No ☐

	Area (Hectares)	Scale	Duration
Reconnaissance			
Detail: Surface	285	1:2,000	19 man days
Underground			
Other* (specify)			

Total Cost $ 12,770

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	9.0 m	1.5	1.5	
Seam Tracing				
Crosscutting				
Other* (specify)	31.0 m of old trenches cleaned out			

Total Cost $ 1,100

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) 6 trench samples taken

Testing: Proximate analysis ☐ FSI ☐ Washability ☐
Carbonization ☐ Petrographic ☐ Plasticity ☐

Other* (specify)

Total Cost $ 292

RECLAMATION Yes ☒ No ☐

Details Filled in trenches Total Cost $ 531

OTHER WORK (Specify details) Yes ☐ No ☒ Cost

Total Cost $

OFF-PROPERTY COSTS Yes ☒ No ☐

Details Geological Report Total Cost $ 1,885

Total Expenditures $ 21,578

Feb 23/82
(Date)

W. T. Kowalishin
(Signature)

Manager - Account, CNRL
(Position)

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

4.0 GEOLOGY

4.1 Regional Geology

Regional Geology of the coal belt of southeastern British Columbia has become fairly well known in the last several years, mostly as a result of Geological Survey of Canada work. The author has compiled a biblography of the ten most relevant papers, dating back to 1953. This is included in this report.

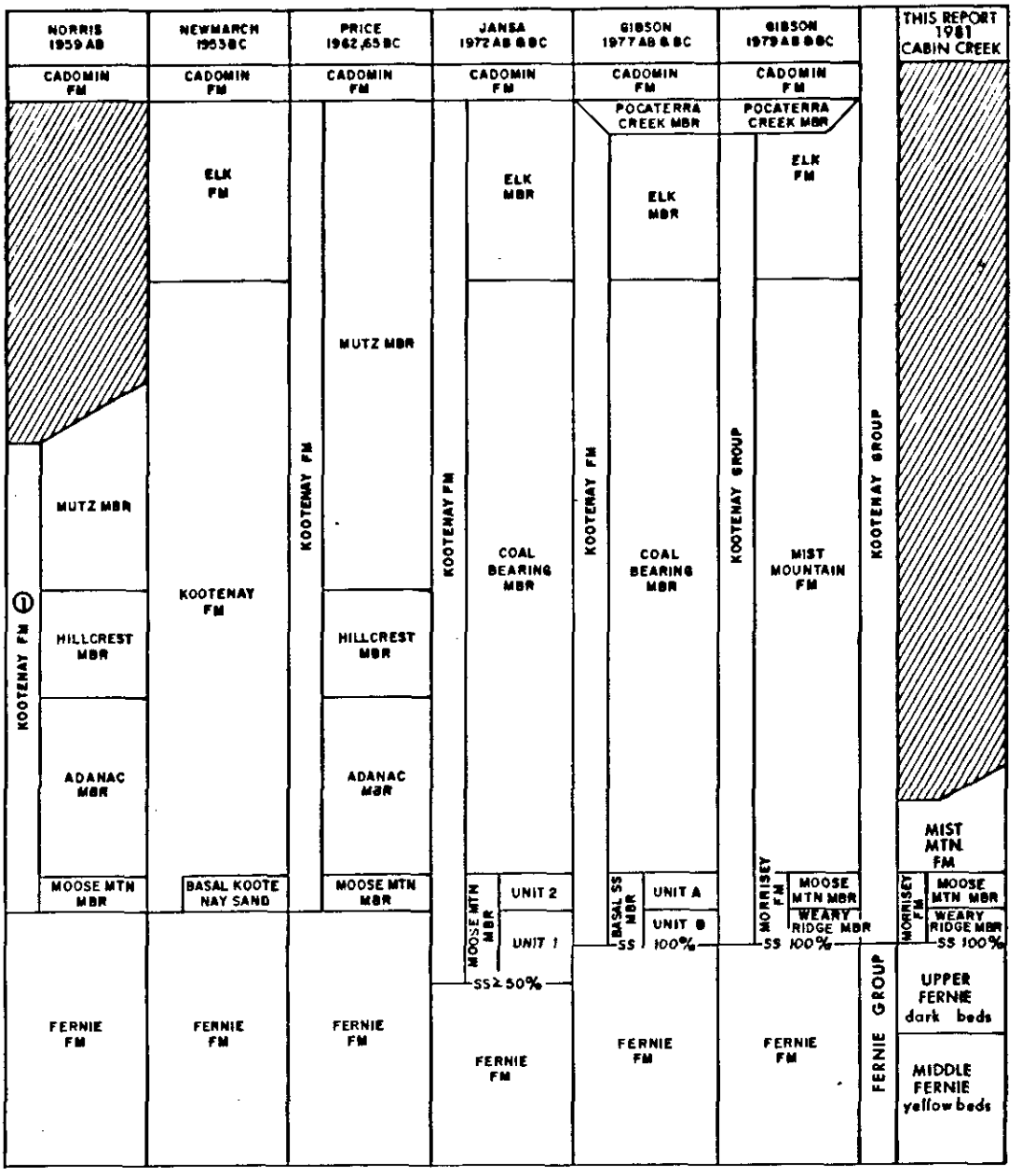
In 1979, D.W. Gibson of the Survey published his paper outlining new lithostratigraphic units named the Mist Mountain and Morrissey Formations of the Kootenay Group. This work was meant by the Survey to be a synthesis of all individually studied and published areas done in the past. This terminology is followed in this report.

Erosional remnants in the southeastern part of the East Kootenay coal area (Cabin Creek, Sage Creek, Harvey Creek), isolated from the Fernie Coal Basin, are commonly referred to as the Flathead Coalfield.

Cabin Creek is close to and appears to have similar geology to the nearby "Flathead Map Area" mapped and published upon by the Survey's Price in 1962. Crows Nest work has been done in the framework of this report.

4.1 Regional Geology continued. ..

The following page, "Formational Diagram, Cabin Creek," shows the nomenclature used in this report, as well as six others used in the past. Gibson and Price are included.



(1) Name 'Kootenay' from Dawson, 1886

Crows Nest Resources Limited
EXPLORATION

S.E. BRITISH COLUMBIA

FORMATIONAL DIAGRAM
CABIN CREEK

FIG. 4

AUTHOR: D.E. BELL	SCALE: N.T.S.	ENCLOSURE No:
DATE: FEB. 1982	REVISED:	DRAWING No: AA-601
To Accompany		

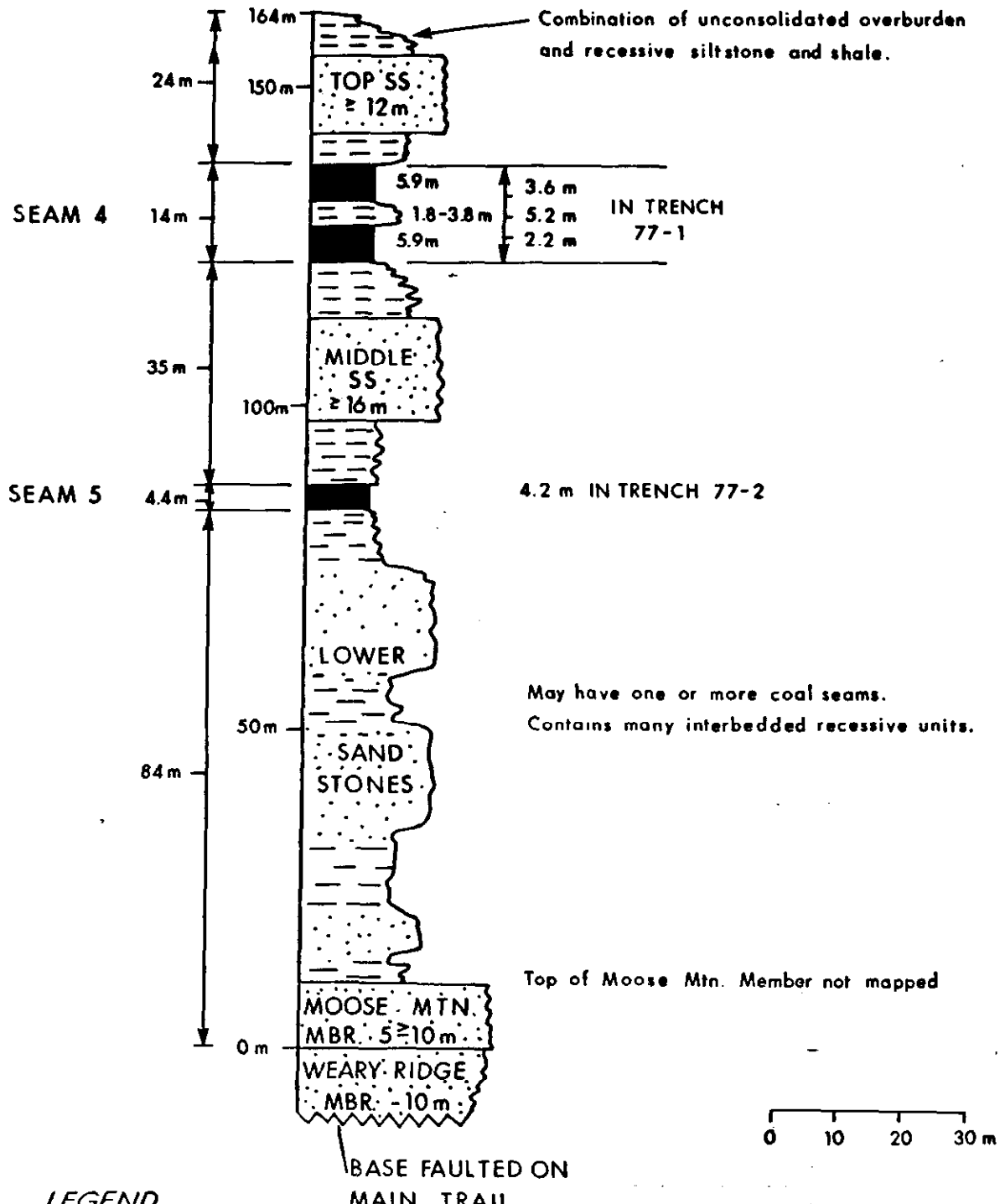
4.2 Stratigraphy

Geological work until 1981 has not included, beyond an estimate basis only, a measurement of the amount of coal-bearing sediments (Mist Mountain Formation) left behind by erosion in Cabin Creek area.

This figure has a bearing on all further exploration, particularly in drill planning and the search for seams in addition to the two mineable seams already known.

During the limited amount of mapping 1981, which was directed mainly at outlining on the ground the main reserve, the author found one outcrop exposing the Weary Ridge - Moose Mountain contact, within the Morrissey Formation, underlying the Mist Mountain. This location is on the main trail leading up to the adits. Construction of this 1978 trail exposed considerable outcrop along its route up from Storm Creek drainage to the east. This has been mapped in detail, and is presented on the geological map in the enclosures.

The "Stratigraphic Diagram, Cabin Creek" on the following page incorporates thicknesses based on outcrop along this trail. The position of the contact has been projected onto the plane of the section using the average strike of the bedding attitudes analyzed in the stereographic work, giving a result of 164 m (538 ft.) of Kootenay section remaining above the Weary Ridge - Moose Mountain contact.



Crows Nest Resources Limited
EXPLORATION

CABIN CREEK
S.E. B.C.

STRATIGRAPHIC SECTION

FIG. 5

AUTHOR: D. BELL	SCALE: 1:1000	ENCLOSURE No.:
DATE: FEB. 82	REVISED:	DRAWING No: AA832
To Accompany		

4.2 Stratigraphy continued. ..

The plane table mapping, incorporating elevation corrections based on hand-held clinometer readings, shows that the upper thick seam (No. 4) is separated from the lower thick seam (No. 5), by 35 m. Average strike and dip used in this calculation is that shown by the sterographic work. This figure agrees closely with the 38 m estimated by J. Horachek in the 1978 work.

J. Horachek also estimated that Mist Mountain thickness was 80 m. The author has not definitely established the top of the Moose Mountain, but the measurements show (as drawn on the cross section) that 84 m of section remains between the base of the Moose Mountain and the lower seam.

The problem is that the lower Mist Mountain in this southern-most portion of the coal field is known to contain unusually thick sandstones which appear at even close range as similar to the traditional Moose Mountain or Basal Sandstone. The situation is similar to that at Lodgepole.

Above the Weary Ridge - Moose Mountain contact outcropping on the main trail there is a covered interval in the bulldozer-opened section of 1978, and so the top of the Moose Mountain is not exposed. Further outcrop, however, exposes recessive coaly siltstones and shales, and the author estimates that the Moose Mountain cannot be thicker than 10 m as a result. This would mean a Mist Mountain

4.2 Stratigraphy continued. ..

remnant thickness of 74 m, or 79 m if a Moose Mountain thickness of 5 m (which is the minimum that can be seen).

The sterographic study shows, however, that the average strike along the trail differs substantially (by 49 degrees) from the average strike in the area of the adits and so there is still considerable room for change in this figure, depending upon the projection used to put the contact onto the plane of the section.

A conclusion is that drill holes of maximum depth 150 m may be expected over most of the area to penetrate into the Fernie beds lying beneath the Kootenay coal-bearing units, and these will discover any further thick seams present. As most work to date has been targeted at the two known thick seams, which are in the upper part of the section, it is desirable to investigate this unprospected lower 84 m. This may be done by drilling holes which are positioned to penetrate the two thick seams, to a greater depth.

The author has continued to use the 1978 designation of "Top, Middle, and Lower Sandstone" for the three thick sandstone units sandwiching the two major seams. They are easy to follow in the area and allow precise mapping. The name "Lower Sandstone" is left at this time to include all section between the base of the lower thick seam and the Moose Mountain, as it appears to consist mostly of thick, inter-lensing massive sandstone units, usually fine-grained

4.2 Stratigraphy continued. ..

but very tough erosionally, with unexposed interbedded recessive units composing less than half of the total section. At one point along the trail coal bloom is exposed, but a backhoe is needed to trench it. Therefore the Lower Sandstone remains prospective for the time being.

4.3 Structural Geology

Present Cabin Creek coal reserves are contained in a tilted erosional remnant; it is possible to traverse completely around the three massive cliff-forming sandstone units sandwiching the two known thick seams. This was started in 1979 by the author, continued by him in 1981, but much remains to be done.

As the Top Sandstone, overlying the most-important Seam 4, is more followable than the Middle Sandstone underneath it, a circular traverse, starting in either direction from the peak, was done in order to outline as precisely as possible the extent of the reserve on 1:2,000 scale. The method used was a hand-held plane-tabling procedure, wherein the traverse line is plotted directly onto the geologic base map in the field. Altitudinal corrections were made at the time. Closure on this traverse was 3 m. This position is drafted on the 1:2,000 map. There is yet one unmapped area on the northwest side of the circle probably underlain by the seam, as noted on the map.

The Sandstone's bedding attitudes measured on this traverse were run through Golder Associates' computer program STEREO to plot scatter and contour stereographs. The program, in this case of monoclinally-dipping beds, computes also the average attitude. The average attitude should approximate closely what will be found in actual mining; the program was also used by Golder in planning the Line Creek pit.

4.3 Structural Geology continued. ..

Average attitude is: strike 287 degrees true, dip 16 degrees north. This strike was used as the baseline for the grid, originating at the peak. By orienting cross sections at 90 degrees to this baseline, in the average dip direction (017 degrees), most apparentness in thickness will disappear. The section included in this report is 100 m West on this grid, and it was chosen as it shows the maximum "length" downdip of the reserve.

Three other sets of bedding attitudes were run stereographically:

TABLE NO. 1

BEDDING ATTITUDE STEREOGRAPHIC RESULTS

		NUMBER OF ATTITUDES	STRIKE	DIP
(1)	TOPSS81	37	287	16
(2)	ALLSS81	60	299	20
(3)	ACCTR81	25	238	11
(4)	ACCTR81 + ALLSS81	85	289	16

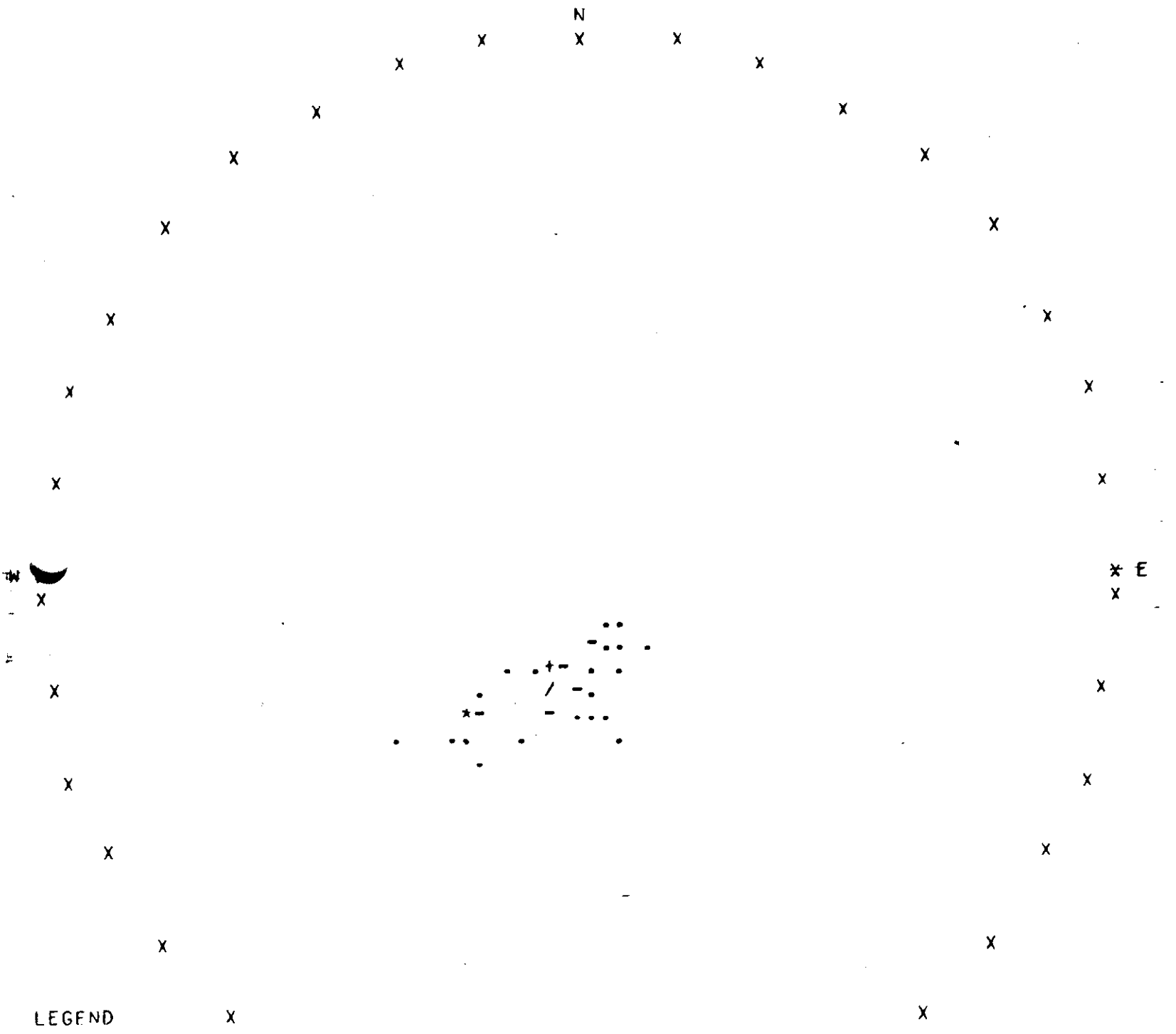
The individual scatter and contour diagrams are reproduced on following pages.

TOPSS81, Top Sandstone 1981, is the set of attitudes from the circular, closed traverse around the Top Sandstone.

STEREO*** 8121587 -- CROWSNEST RESOURCES LTD -- STRUCTURAL MAPPING DATA.

TRAVERSE - TOPSS81

37 ORIGINAL POLES



LEGEND

.	1 POLE
-	2
+	3
*	4
5-9	5,6,7,8,9
A-Z	10,11,...

/ MEAN VECTOR = 16.16/ 376.66

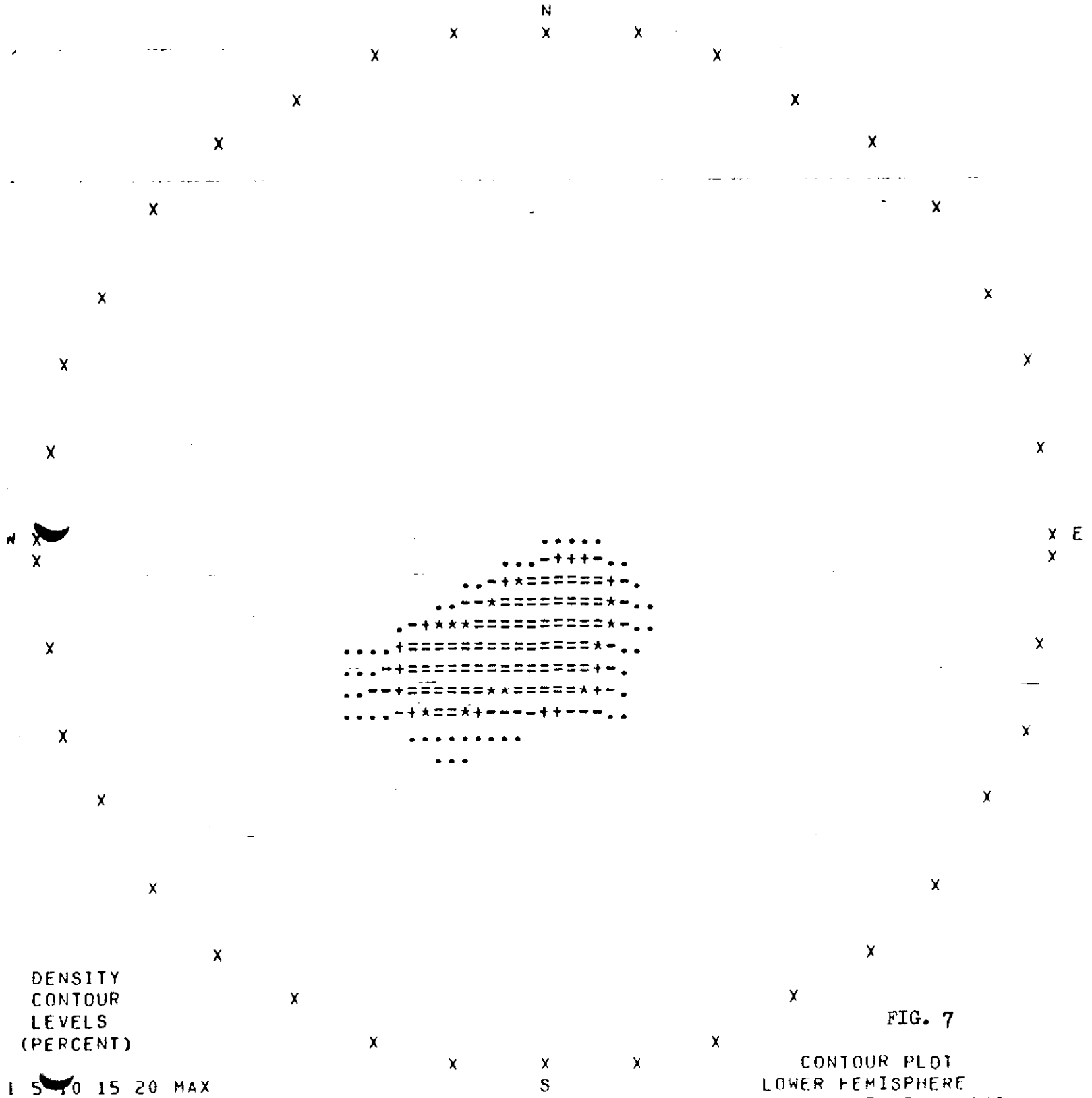
FIG. 6

SCATTER DIAGRAM
LOWER HEMISPHERE
EQUAL AREA PROJECTION

STEREO 8121587 -- CROWSNEST RESOURCES LTD -- STRUCTURAL MAPPING DATA.

TRAVERSE - TOPSS8I

37 ORIGINAL POLES



DENSITY CONTOUR LEVELS (PERCENT)

1 5 10 15 20 MAX

. - + * =

MAXIMUM DENSITY = 55.62 PERCENT

FIG. 7

CONTOUR PLOT
LOWER HEMISPHERE
EQUAL AREA PROJECTION

4.3 Structural Geology continued. ..

ALLSS81, All Sandstone Attitudes 1981, adds all other attitudes measured northwest along the main ridge from TOPSS81 to this latter set. This new set includes, structurally, Middle and Lower Sandstone attitudes in this direction, and adds the lower, Seam 5 unmapped reserve in this direction. The strike swing northerly is evident (12 degrees), but the dip increase to 20 degrees is actually a reflection of the fact that the southerly side of the tilted block which was traversed is steeper than the northerly, downdip untraversed side.

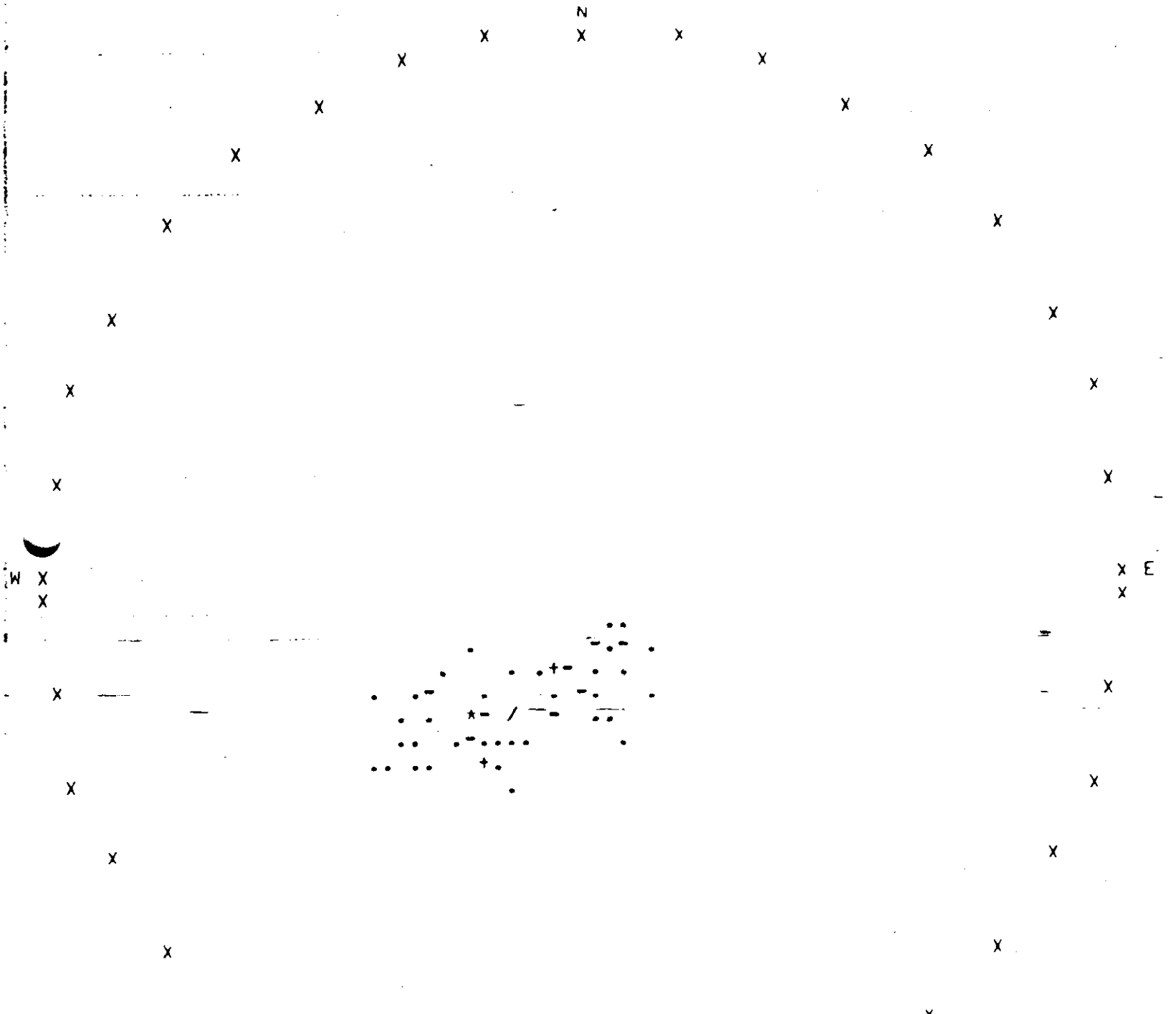
ACCTR81, Access Trail 1981, is a set of all attitudes collected below Seam 5 down the main trail to the base of the Weary Ridge outcrop where it is faulted. It shows a southwest swing in strike of 49 degrees. This set is, in effect, as average strike and dip for the Lower Sandstone in this easterly direction from the block of main reserve.

The final set, ACCTR81 + ALLSS81, is a "summary" set of all attitudes measured in the mapping, except those below the Weary Ridge. It differs in strike from TOPSS81 by only two degrees, and so the figure for TOPSS81 was used as the grid baseline.

STEREO 8121587 -- CROWSNEST RESOURCES LTD -- STRUCTURAL MAPPING DATA.

TRAVERSE - ALLSS81

60 ORIGINAL POLES



LEGEND

1 POLE
2
3
4
5-9 5,6,7,8,9
A-Z 10,11,....

/ MEAN VECTOR = 20.077 389.21

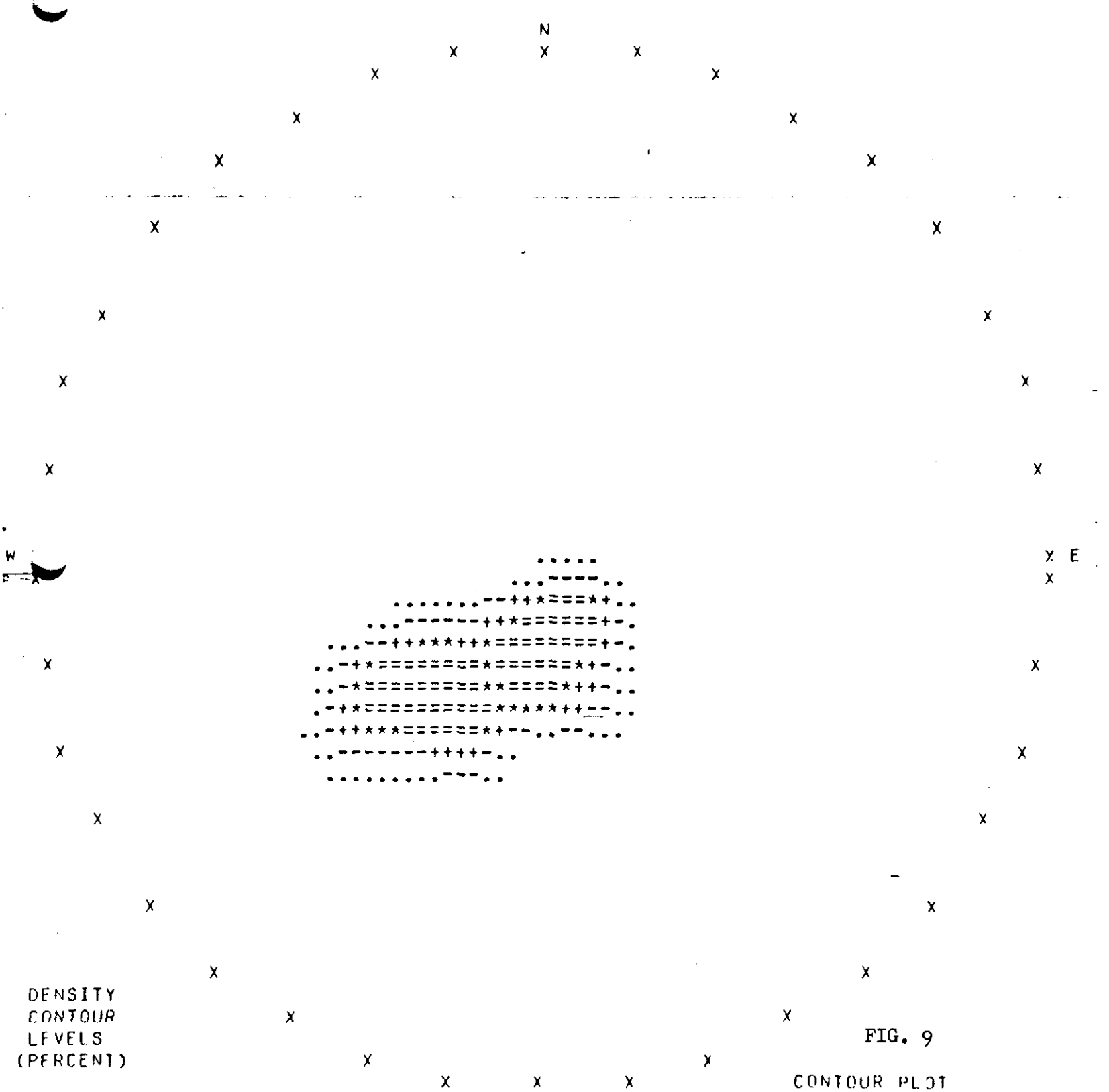
FIG. 8

SCATTER DIAGRAM
LOWER HEMISPHERE
EQUAL AREA PROJECTION

STEREO 8121587 -- CROWSNEST RESOURCES LTD -- STRUCTURAL MAPPING DATA.

TRAVERSE - ALLSS81

60 ORIGINAL POLES



DENSITY CONTOUR LEVELS (PERCENT)

1 [illegible] 0 15 20 MAX

. + * =

MAXIMUM DENSITY = 47.25 PERCENT

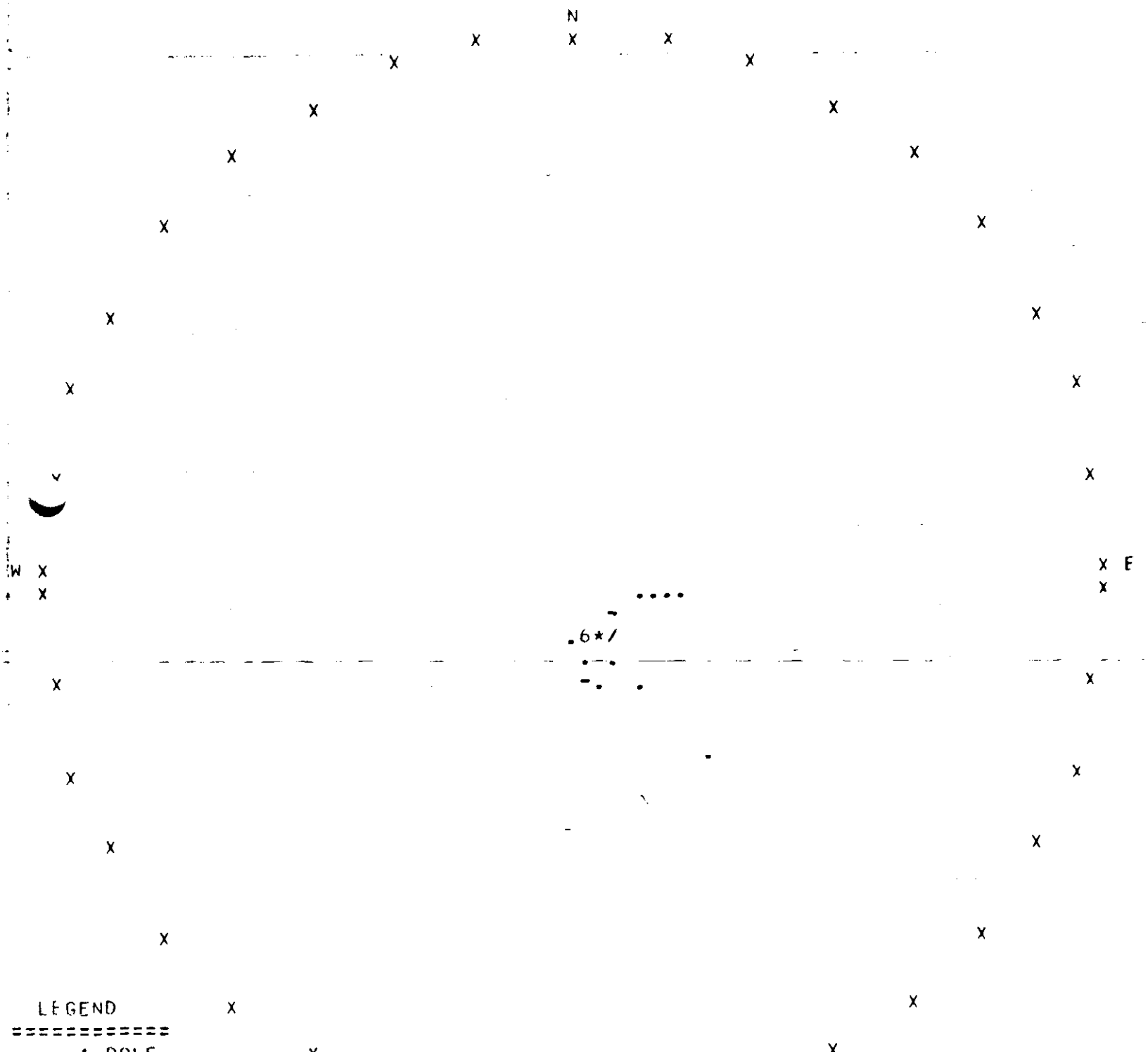
FIG. 9

CONTOUR PLOT
LOWER HEMISPHERE
EQUAL AREA PROJECTION

STEREO 8121587 -- CROWSNEST RESOURCES LTD -- STRUCTURAL MAPPING DATA.

TRAVERSE - ACCTR81

25 ORIGINAL POLES



LEGEND

.	1 POLE
)	2
+	3
*	4
5-9	5,6,7,8,9
A-Z	10,11,...

S

FIG. 10

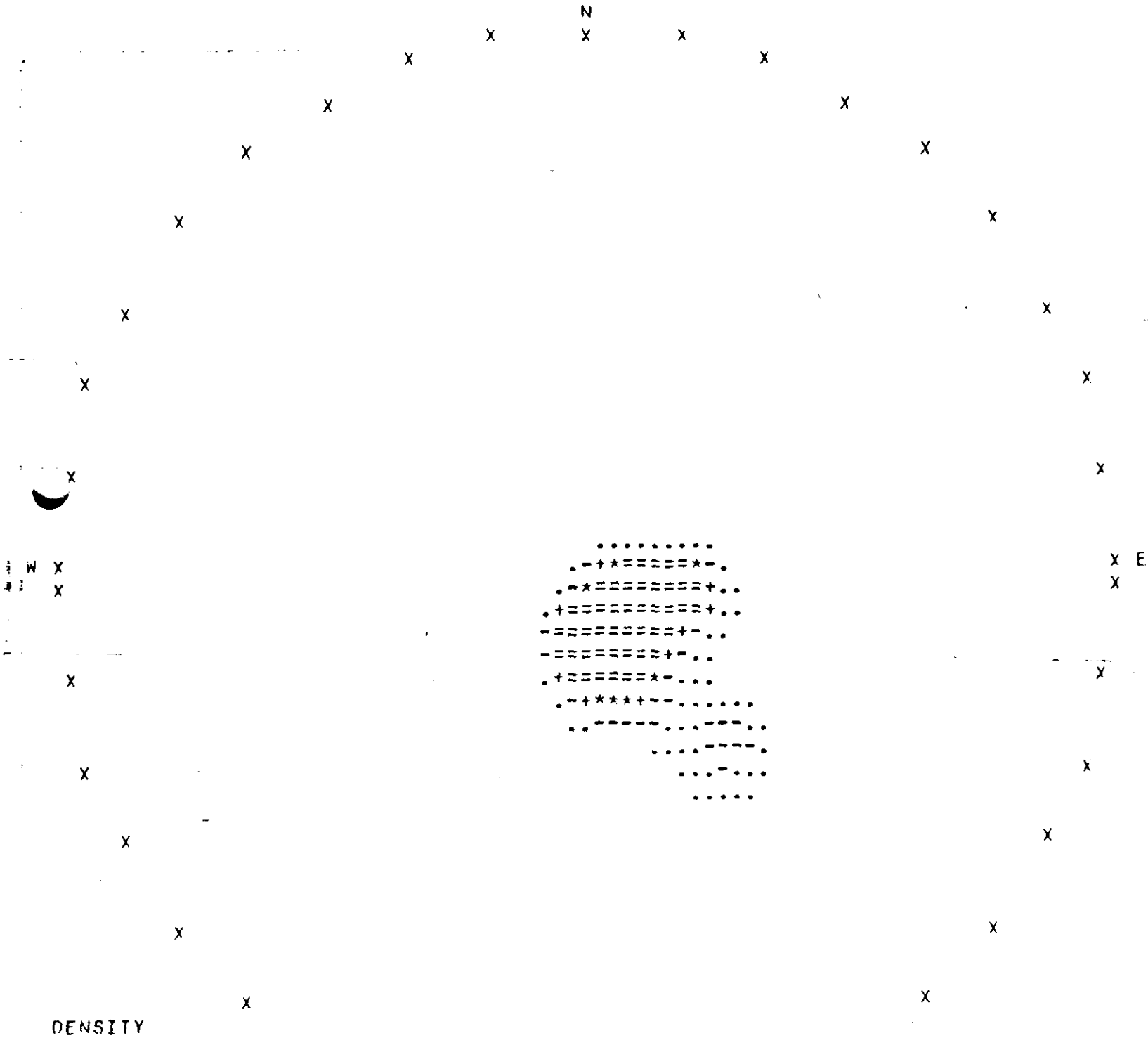
SCATTER DIAGRAM
LOWER HEMISPHERE
EQUAL AREA PROJECTION

*/ MEAN VECTOR = 11.11/ 328.12

STEREO 8121587 -- CROWSNEST RESOURCES LTD -- STRUCTURAL MAPPING DATA.

TRAVERSE - ACCTR81

25 ORIGINAL POLES



DENSITY
CONTOUR
LEVELS
(PERCENT)

1 5 10 15 20 MAX
. - + * =

MAXIMUM DENSITY =130.39 PERCENT

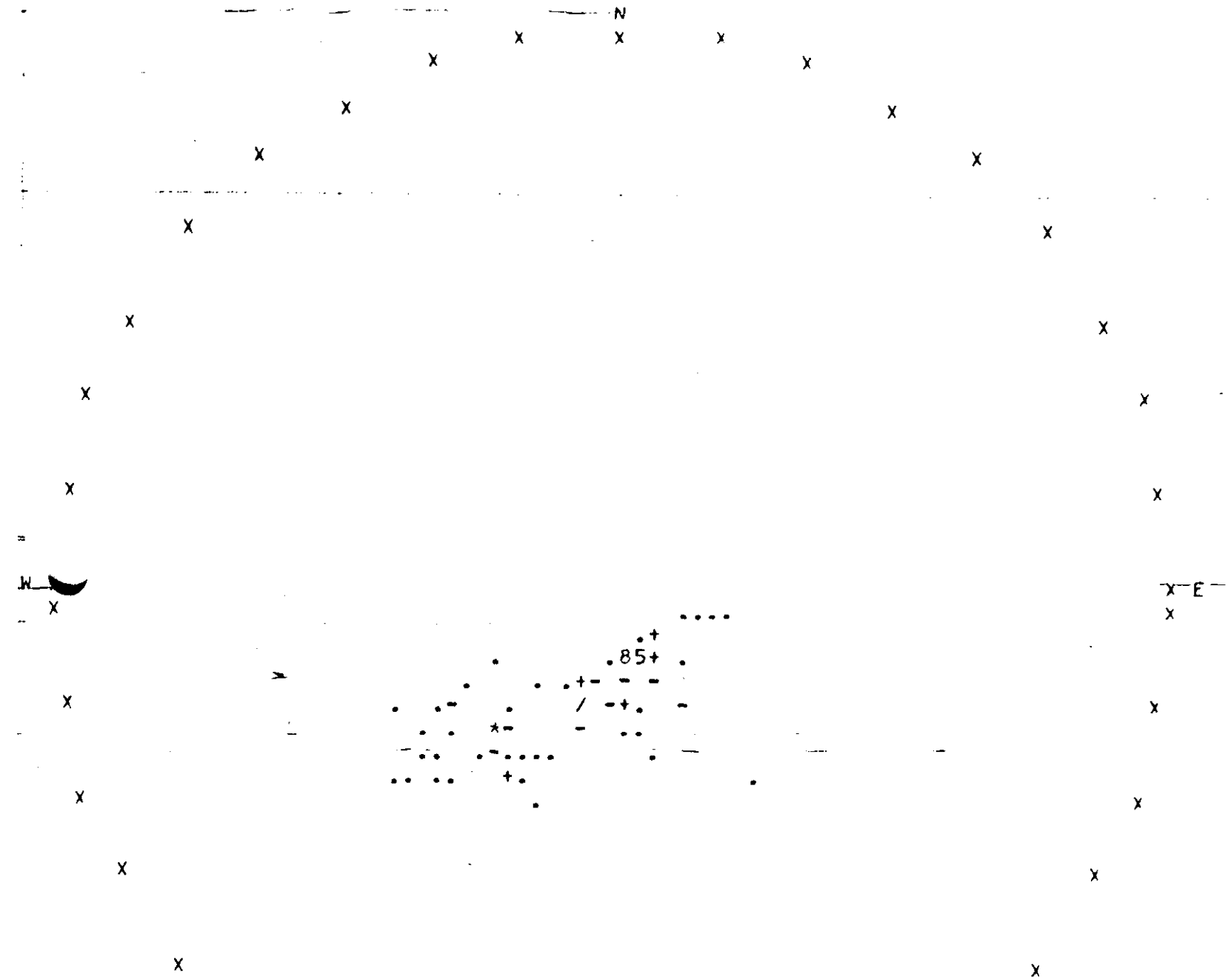
FIG. 11

CONTOUR PLOT
LOWER HEMISPHERE
EQUAL AREA PROJECTION

STEREO 8121587 -- CROWSNEST RESOURCES LTD -- STRUCTURAL MAPPING DATA.

TRAVERSES - ACCTR81 AND ALLSS81

85 ORIGINAL POLES



LEGEND

. 1 POLE
- 2
+ 3
* 4
5-9 5,6,7,8,9
A-Z 10,11,...

/ MEAN VECTOR = 16.03/ 378.63

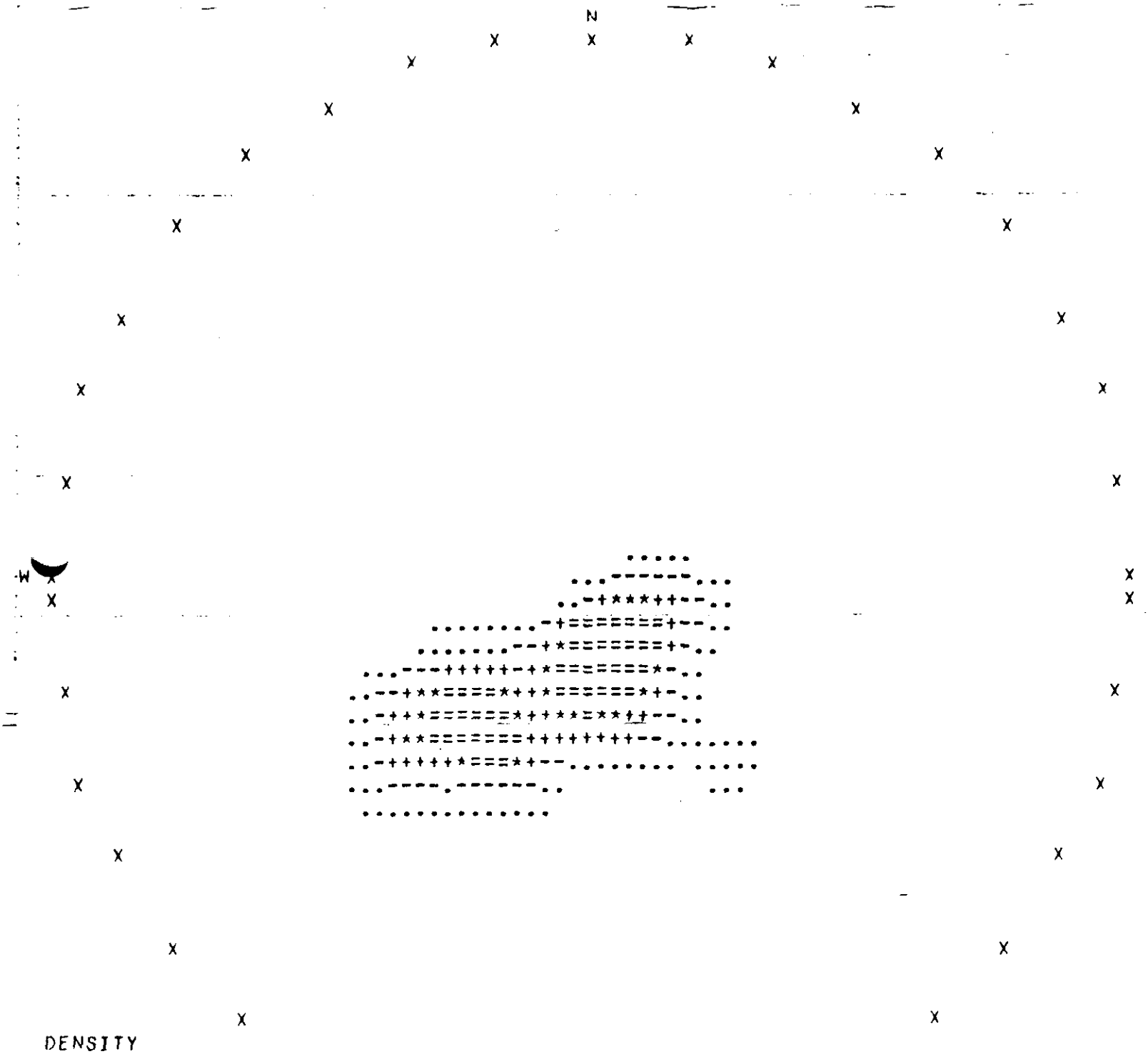
FIG. 12

SCATTER DIAGRAM
LOWER HEMISPHERE
EQUAL AREA PROJECTION

STEREO 8121587 -- CROWSNEST RESOURCES LTD -- STRUCTURAL MAPPING DATA.

TRAVERSES - ACCTR81 AND ALLSS81

85 ORIGINAL POLES



DENSITY CONTOUR LEVELS (PERCENT)

1 5 10 15 20 MAX

. - + * =

MAXIMUM DENSITY = 62.60 PERCENT

FIG. 13

CONTOUR PLOT
LOWER HEMISPHERE
EQUAL AREA PROJECTION

4.4 Hand-Trenching

One pair of hand-trenchers, supervised by Crows Nest Geologist Gary Cox, trenched six locations in 1981 on Cabin Creek licences. The Crows Nest-contracted helicopter stationed at Sparwood was used for transportation.

Four of the locations are on licence 595, which covers the smaller separate Kootenay erosional remnant investigated in 1980 by the author. These locations were noted as coal bloom in 1980 mapping, and their trenching fulfills one of 1980's recommendations.

The other two locations are in the vicinity of the adits on the main block of reserve, and re-exposed pre-1977 trenching of the two main seams where they cross the main ridge.

Gary Cox measured the results, and they are presented in the diagrams of the following pages on a scale of 1:50. Thicknesses presented are true. Trench bearings and inclinations were recorded, as well as strike and dip, in order that the trenches may be constructed.

Sample analyses are not yet available at the time of writing. They will be included in the next report.

4.4.1 B.C. CL 595: Trench 81-1 N 5446130 E668200 (approx)

This hand trench is located 300 m west of the helicopter landing site drafted on the 1980 geologic map HA-78 in an outcrop labelled "massive sandstone, interbedded siltstone-mudstone and chippy shale."

The trench exposed the footwall, but not the hanging wall, of a clean 2.18 m (7.2 ft) coal bed. Overburden became too deep on the hanging wall side to uncover the seam's top, but there is room for considerable thickness.

The footwall bed is 22 cm of slightly coaly mudstone. Underlying is a dirtier 95-cm coal bed, containing two partings, thickest is 10 cm.

Dip is steeply northeast at 56 degrees.

4.4.2 B.C. CL 595: Trench 81-2 N 5445760 E669010 (approx)

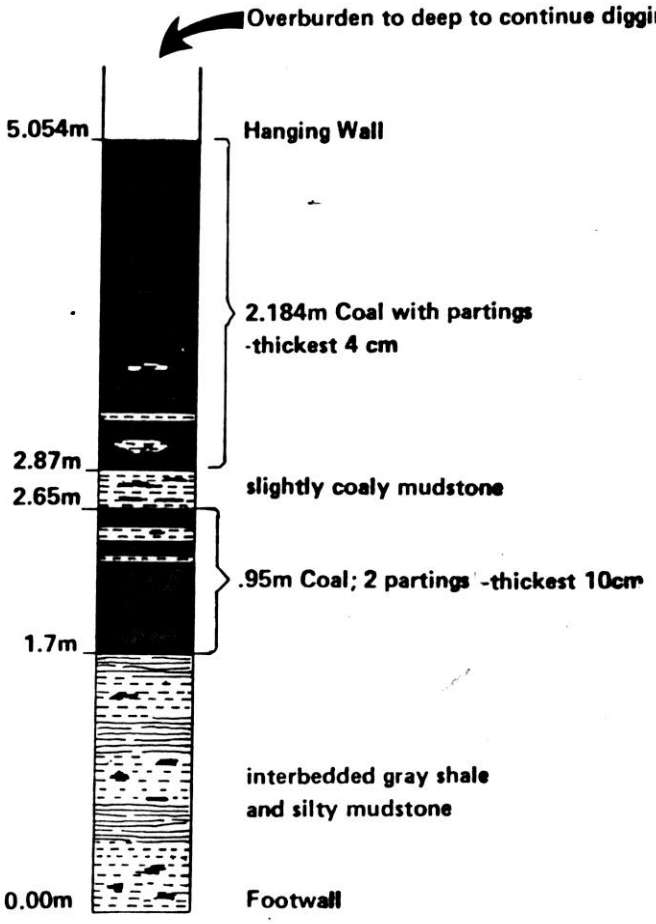
This trench is located also on 1980 geologic map HA-78, in the lower, southerly area bounded by faults and marked "JKmm", at an outcrop labelled, "10 m micaceous massive sandstone, coal bloom from above". The location is in steep, tangled brush and trees, and very difficult to trench.

A coal bed of 1.39 m was trenched, with only 11 cm of shale hanging wall exposable above. Dip is 30 degrees north-easterly. Difficult terrain prevented further trenching in the time available.

FIG. 14

TRUE THICKNESS CROSS SECTION ALONG TRENCH CC-81-1

TRENCH BEARING ; 097°
TRENCH INCLINATION ; FROM 0m to 4.95m ; 0° VERTICALLY
FROM 4.95m to 8.05m ; -18° VERTICALLY
STRIKE AND DIP OF STRATA ; 331° 56° N.E.



0 0.5 1 2 METRES

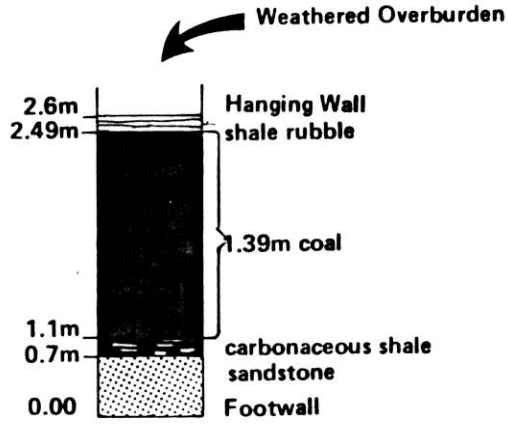
SCALE 1 : 50

Crows Nest Resources Limited
EXPLORATION

CABIN CREEK
S.E. B.C.
TRENCH DIAGRAM
CC-81-1

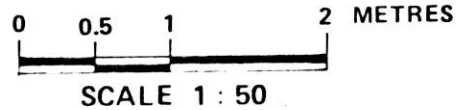
AUTHOR G. COX	SCALE AS SHOWN	ENCLOSURE No.
DATE FEB. 1982	REVISED	DRAWING No AA-834
To Accompany		

FIG. 15



TRUE THICKNESS CROSS SECTION ALONG TRENCH CC-81-2

TRENCH BEARING ; 297°
TRENCH INCLINATION ; 0° VERTICALLY
STRIKE AND DIP OF STRATA ; 320° - 30° N.E.



SCALE 1 : 50

Crows Nest Resources Limited
EXPLORATION

CABIN CREEK
S. E. B. C.

TRENCH DIAGRAM
CC-81-2

AUTHOR G. COX	SCALE AS SHOWN	ENCLOSURE No
DATE FEB 1982	REVISED	DRAWING No AA-835
To Accompany		

4.4.3 B.C. CL 595: Other Trenches

The other two licence 595 hand trenches exposed no measureable coal and may be further disregarded. The first is marked on HA-78 as a bloom occurrence 150 m west of 81-1, against the edge of the map sheet, in an outcrop labelled, "2 m massive fine and medium sandstone underlain by coal bloom". The second is located 150 m west from the peak, to the north of 81-1, and marked on HA-78 with the label "Coal bloom in patchy trees and rubble; would be difficult to trench."

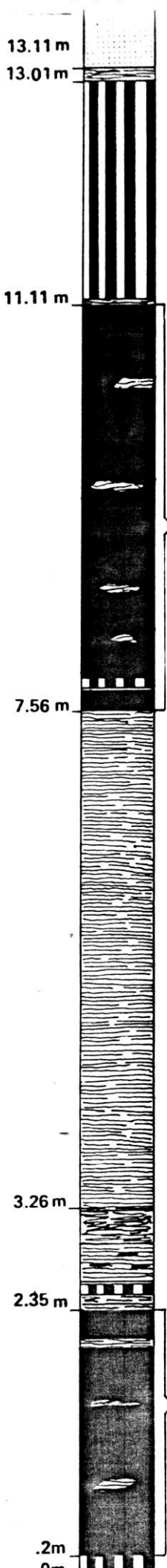
4.4.4. B.C. CL 601: Trench 77-1 E667050 N5449710

This trench is a re-exposure of the pre-1977 trench placed on the main ridge southeast from the adits, and its position is plotted to an accuracy of 5 m on the geologic map included in the enclosure of this report.

The coal is Seam 4, measured and sampled in Adit No. 2 in 1978. J. Horachek, in the 1978 report, lists the thickness of the "upper bench", this is, of the upper part of this split seam, as 5.9 m; the thickness in the trench is 3.55 m. The thickness of the "main parting", or split, in the adit is 2.3 m; in the trench it is 5.2 m. The thickness of the "lower bench", or lower part of the seam, is 5.9 m; in the trench it is 2.15 m.

Total thickness in the adit is 11.8 m coal in 14.1 m; in the trench it is 5.7 m coal in 10.9 m. There are further, thinner partings in both adit and trench.

FIG. 16



light grey thick bedded sandstone — Hanging Wall

light brown shale

1.9m shaley Coal

TRUE THICKNESS CROSS SECTION ALONG TRENCH CC-77-1

TRENCH BEARING ; 337°
TRENCH INCLINATION ; FROM 0m to 8.8m IS 0° VERTICALLY
FROM 8.8m to 24m IS + 14° VERTICALLY
STRIKE AND DIP OF STRATA ; 305° 25° N

3.55m Coal; 2 shale partings
thickest 8 cm

brown to dark grey
weathered shale

Carbonaceous Shale with thin interbeds of shale and Coaly Shale.

2.152m Coal; 1 parting
9cm thick

shaley coal — Footwall

0 0.5 1 2 METRES

SCALE 1 : 50

Crows Nest Resources Limited
EXPLORATION

CABIN CREEK
S.E. B.C.
TRENCH DIAGRAM
CC-77-1

AUTHOR G. COX.	SCALE AS SHOWN	ENCLOSURE No
DATE FEB 1982	REVISED	DRAWING No AA-836
To Accompany		

4.4.4. B.C. CL 601: Trench 77-1 continued. ..

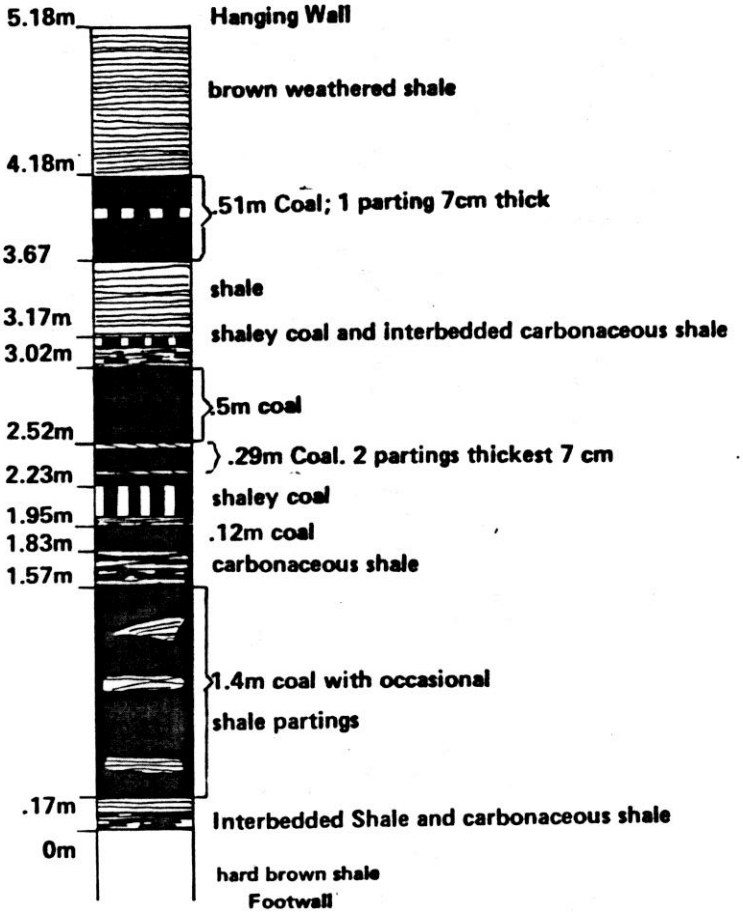
A conclusion is that much more work is needed on this seam, as, should the thinning of the seam prove to be the rule rather than the exception, the 1978 reserve estimate is far too high.

4.4.5 B.C. CL 601: Trench 77-2 E667190 N5443840

This trench is a re-exposure of the pre-1977 trench placed also on the main ridge southeast from the adits, and its position is plotted to an accuracy of 5 m on the geologic map included in the enclosures of this report.

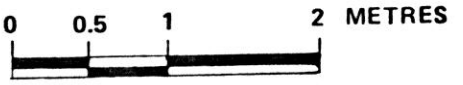
The coal is Seam 5, the lower of the two adited seams. In Adit No. 1 it is 4.40 m thick, including 1.32 m shale parting. At the trench it is 4.18 m, including at least 1.2 m of partings. The remainder of the coal appears quite high-ash.

FIG. 17



TRUE THICKNESS CROSS SECTION ALONG TRENCH CC-77-2

TRENCH BEARING ; 343°
TRENCH INCLINATION ; -19° VERTICALLY
STRIKE AND DIP OF STRATA ; 303° 21° N.



SCALE 1 : 50

Crows Nest Resources Limited
EXPLORATION

CABIN CREEK
S.E. B.C.
TRENCH DIAGRAM
CC-77-2

AUTHOR G. COX	SCALE AS SHOWN	ENCLOSURE No
DATE FEB 1982	REVISED	DRAWING No AA-837
To Accompany		

5.0 RECOMMENDATIONS

Geologic exploration on Cabin Creek licences by Crows Nest Resources in the four years of 1978-81 has been conducted in the months of September and October only, by staff engaged on other properties elsewhere during the earlier part of the field season. A great amount of work was not done in any year, therefore, but the total is now considerable.

With two adits in hand from 1978, approximately 90 per cent of the extent of reserve of Seam 4 has been outlined in mapping and its structural tilt has been determined. A much smaller portion of the extent of Seam 5, the lower of the two seams, has been mapped. There is, or could be, considerable extent of this seam northwest from its known position; the furthest distance possible in this direction may be easily seen from a helicopter, but the eye loses the seam's subcrop, amongst the boulder patches and overlapping cliff lines exposed around the erosional block. Mapping in this direction along the ridge will require one or two helicopter landing sites to be cut, as the distance to hike has become prohibitive.

As the 1981 re-exposure of trench 77-2 shows the thick Seam 4 to have thinned by half, further trenching around the erosional edge of the reserve is especially called for, but most of this would have to be done by backhoe, which requires trail building. There are several sites, however, which may be hand-trenched. Both seams may yet be hand-trenched where they cross the main ridge on the west side of the main block. These positions are drawn on the geological map.

5.0 Recommendations continued. ..

One or more 100 - to 150-m drill holes may be planned on the main block. The first of these should be drilled deep enough to reach the Fernie shales; if no thick coal beds are found in the Lower Sandstones, further holes may be less than 100 m in depth, deep enough to penetrate Seam 5.

The hand trenching on the isolated northeast licence 595 has found two seams greater than 1 m in thickness. Recommendations for this block remain as outlined in the 1980 report; mapping (and now hand trenching) is complete and shallow drilling or backhoe trenching is in order for the future.

6.0 SELECTED BIBLIOGRAPHY

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

APPENDIX A

49° 10' 00" 114° 45' 00"

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

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

49° 07' 30" 114° 45' 00"

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

78-37

MAP INDEX AND AERIAL PHOTO INDEX

82G/2
1 : 50 000

115°00'00" | 52'30" | 45'00" | 37'30" | 114°30'00"
49°15'00" | 10'00" | 05'00" | 49°00'00"

N

REFERENCE

MAIN ROAD		RIVER, LAKE	
SECONDARY ROAD		INTERMITTENT RIVER	
TRACK OR TRAIL		TREED AREA	
RAILWAY		LINE OF TREES	
HEDGE FENCE	H K	INDIVIDUAL TREES	
BRIDGE CULVERT		VERTICAL INTERVAL	1512 1810 1808
CUT FILL		DEPRESSION	PEAK
SWAMP		SPOT HEIGHT	• 1597.5
DRILL HOLE	△	CONTROL POINT	

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

PREPARED BY :

NORTH WEST SURVEY CORPORATION (YUKON) LTD.

JOB NO 78-109

LEGEND

JURASSIC - CRETACTOUS

KOOTENAY GROUP

- JKmm — Moose Mountain Member of the Morrisey Formation, also known as "Basal Sandstone", with possibly lowermost Mist Mountain beds.
- JKwr — Weary Ridge Member of the Morrisey Formation, also known as the "Orange Passage Beds" of the Fernie.

FERNIE GROUP

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

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

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

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

METRES 100 50 0 100 200 300 400 500 METRES

SCALE 1 : 5 000

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

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

C.L. 598 | C.L. 599 | C.L. 600 | C.L. 601 | C.L. 595 (LOT 5926) | C.L. 4742

Contact between yellow & dark F.sh
Dark Fernie sh
Yellow Fernie sh
Dark Fernie sh bank (possible only)
Dark Fernie sh bank (possible only)
Yellow Fernie sh banks & outcrop
Small patch Weary Ridge float
Basal ss boulder patch
Scattered ss boulders
Basal ss boulder patch no outcrop
Grid 1
SCRUB BUSH
NO OUTCROP VISIBLE FROM HELICOPTER
STORM
TRAIL
MAIN
1980 impassable stream crossings
CREEK

Jfy | Jfd | JKwr | JKmm

1899·0 | ·2064·0 | 2044·0 | 2026·0 | ·2003·0 | ·1864·0 | ·1856·0 | ·1846·0 | ·1767·0 | 2064·0 | 2079 | 1967·0 | 2005·0

78-37

REFERENCE

MAIN ROAD		RIVER, LAKE	
SECONDARY ROAD		INTERMITTENT RIVER	
TRACK OR TRAIL		TREED AREA	
RAILWAY		LINE OF TREES	
HEDGE FENCE		INDIVIDUAL TREES	
BRIDGE CULVERT		VERTICAL INTERVAL	1812 1810 1808
CUT FILL		DEPRESSION	PEAT
SWAMP		SPOT HEIGHT	· 1507 S
DRILL HOLE		CONTROL POINT	

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

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

LEGEND

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- Patchy, indeterminate outcrop or exposure of identifiable boulders or rubble.
- Outcrop with exposed contact. (JKwr / Jfd)
- Contact surface trace, approximate only. (JKmm / JKwr)
- Contact surfact trace, assumed only. (Jfd / Jfy)

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

METRES 100 50 0 100 200 300 400 500 METRES

SCALE 1 : 5 000

114°42'30" | 49°07'30"

Crows Nest Resources Limited
EXPLORATION

CABIN CREEK
S.E. B.C.

381

1981
GEOLOGIC MAP

1 of 2

K-Cabin Creek B1(2)A *(1)

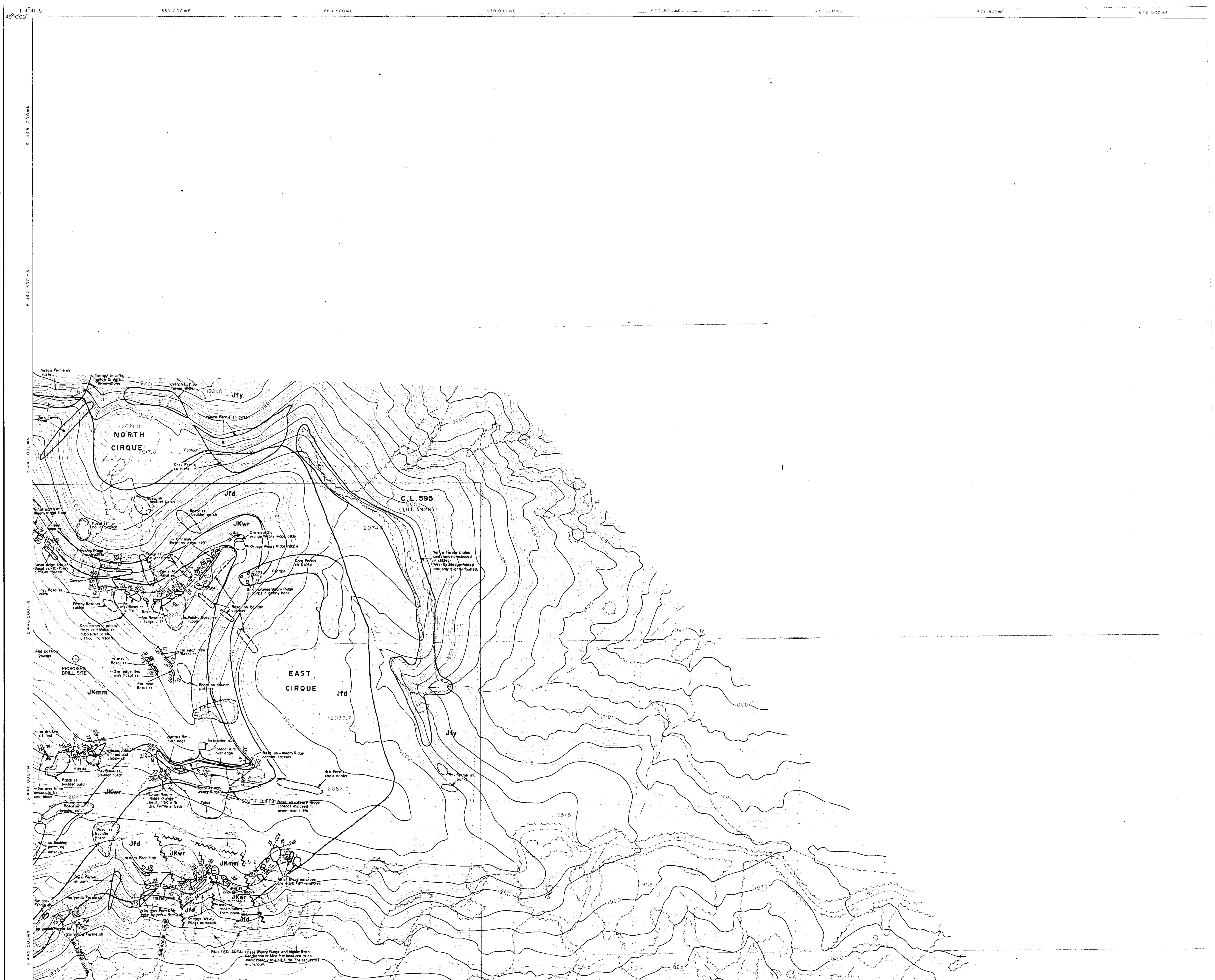
AUTHOR: D.E. BELL	SCALE: 1:5000	ENCLOSURE No: APPENDIX A
DATE: FEB 1982	REVISED:	DRAWING No: HA-78A
To Accompany		

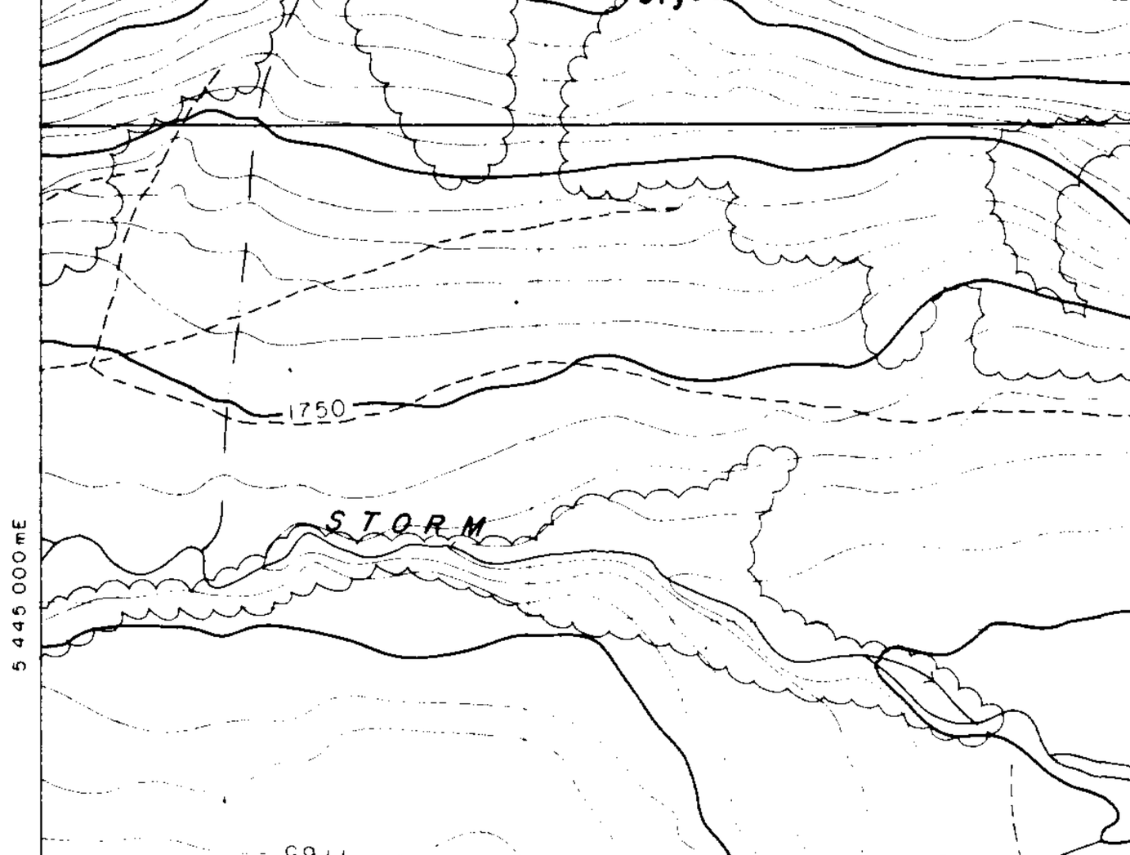
APPENDIX A

82 G 2 NORTH WEST ZONE G

M1

HA-78A





REFERENCE

MAIN ROAD		RIVER, LAKE	
SECONDARY ROAD		INTERMITTENT RIVER	
TRACK OR TRAIL		TREED AREA	
RAILWAY		LINE OF TREES	
HEDGE FENCE		INDIVIDUAL TREES	
BRIDGE CULVERT		VERTICAL INTERVAL	
CUT FILL		DEPRESSION	
SWAMP		SPOT HEIGHT	1507.5
DRILL HOLE		CONTROL POINT	

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

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

LEGEND

JURASSIC - CRETACTOUS

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Thrust fault, position approximate

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

Fault other than thrust, position approximate.

Anticline

Syncline

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

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

Outcrop with exposed contact.

Contact surface trace, approximate only.

Contact surfact trace, assumed only.

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

METRES 100 50 0 100 200 300 400 500 METRES

SCALE 1 : 5 000

670 000mE 670 500mE 671 000mE 671 500mE 672 000mE 672 500mE 673 000mE 114°37'30" 49°10'00"

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

49°07'30"

C.L.595
00002
(LOT 5926)

Yellow Fernie shales continuously exposed in cliffs. Well-bedded, unfolded and only slightly faulted.

Jfy

Fernie sh bands

CREEK

670 000mE 670 500mE 671 000mE 671 500mE 672 000mE 672 500mE 673 000mE 114°37'30"

LEGEND

REFERENCE

MAIN ROAD		RIVER, LAKE	
SECONDARY ROAD		INTERMITTENT RIVER	
TRACK OR TRAIL		TREED AREA	
RAILWAY		LINE OF TREES	
HEDGE FENCE	M K	INDIVIDUAL TREES	
BRIDGE CULVERT		VERTICAL INTERVAL	1812 1810 1808
CUT FILL		DEPRESSION	
SWAMP		SPOT HEIGHT	PELL + 1507.5
DRILL HOLE		CONTROL POINT	

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

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

JURASSIC - CRETACTOUS

KOOTENAY GROUP

- JKmm — Moose Mountain Member of the Morrisey Formation, also known as "Basal Sandstone", with possibly lowermost Mist Mountain beds.
- JKwr — Weary Ridge Member of the Morrisey Formation, also known as the "Orange Passage Beds" of the Fernie.

FERNIE GROUP

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

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

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

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

METRES 100 50 0 100 200 300 400 500 METRES

SCALE 1 : 5 000

Crows Nest Resources Limited

EXPLORATION

CABIN CREEK
S.E. B.C.

381

1981
GEOLOGIC MAP

2 of 2

K - Cabin Creek B1(2)A *(1)

AUTHOR: D.E. BELL	SCALE: 1:5000	ENCLOSURE No : APPENDIX A
DATE: FEB 1982	REVISED:	DRAWING No: HA-78
To Accompany		

82 G 2 NORTH EAST ZONE G

M2

666 000 mE

666 500 mE

667 000 mE

114°43'15"

5 445 000 mN

5 444 500 mN

5 444 000 mN

49°08'00"

49°07'30"

1000 m W

500 m W

500 m S

000 m N/S

END OF TRAVERSE LINE

CLIFF on UNIT, 7-8m, BASE IS BOTTOM OF LOWER SANDSTONE

LOWER SANDSTONE OUTCROP AND BOULDER PATCH

CLIFF on CREST SANDSTONE

CLIFF on CROSSING RIDGE

CLIFF SANDSTONE

CHIPPY grv sh BANK

BOULDER PATCH (SEAM 5)

SEAM 5, IF PRESENT, SHOULD BE HERE SITE COVERED WITH MOSS AND BRUSH, NO BLOOM APPARENT NEEDS TRENCHING

CLIFF-LINE CROSSES RIDGE

DIP-SLOPE mwr ss, hd, lt-grn, wth

3m OF CLIFF ss, fg, COALY BANDS, BLOCKY, hd, lt-grn

1m LEDGE fg

2m LEDGE fg PLATEY

SMALL OUTCROP LINES OF ss AND fg BEDS 10 cm-0.5m

APPROXIMATE TOP OF SEAM 4 CROSSING RIDGE

MAIN RIDGE

APPROXIMATE POSITION SEAM 4

UNMAPPED IN 1981

UNMAPPED TOP ss CLIFFY

LARGE AREA OF DIP-SLOPE TOP ss MEDIUM FOREST AND BRUSH

LEDGE LINE

3m LEDGE TOP ss

2m TOP ss

2-5m TOP ss CLIFF

DIP-SLOPE TOP ss; 5-10m TOTAL SECTION

PATCHY COAL BLOOM

TOP ss BOULDER PATCH

NO OUTCROP

MEDIUM FOREST

GRASSY, TAMARACK (SNOW BANK AREA)

APPROXIMATE

APPROXIMATE POSITION CLIFF BOTTOM

SEAM 5

vari-COLOURED SHALES CROSS RIDGE

10 to 15 (1m - 5m) CLIFFS

VARI-COLOURED CHIPPY sh BANKS, THIS IS RECESSIVE UNIT ABOVE TOP ss

RIDGE

ESTIMATED POSITION OF THE "PEAK"

ss CLIFF TOP ss, mwr BLOCKY, hd ms

HAND TRENCH 77

TOP SS BOULDER PATCH

5m CLIFF TOP ss

CLIFF DISAPPEARS

SEAM 4

CLIFF EDGE 15-20m TOP ss

CLIFF EDGE 20M TOP

FAULTED OR FOLDED otc, PATCHY, DIFFICULT TO SEE

3m CLOSURE ON CHAINED TRAVERSE LINE IN CIRCLE AROUND TOP SS STARTING IN EITHER DIRECTION FROM PEAK

CLIFF EDGE 15m TOP ss

CLIFF CHUTE ACCESS

LEDGE 0.5m ss OTCS, EACH

61cm CONGLOMERATIC SS AT CLIFF BASE BOULDERS TO 15cm

CLIFF CHUTE ACCESS

AS FAR AS PEAK, THE CHAINED LINE IS TOP BED OF "CAP SANDSTONE" A HARD, MASSIVE, GREY, WEATHERING CLIFF SS OVERLYING COAL OF ADIT 2

CLIFF BOTTOM

TOP SEAM 4

MIDDLE SANDSTONE

BASE OF UPPER BENCH MARK PARTING LOWER BENCH

TOP OF SANDS MASSI

HAND TRENCH 77

SEAM 4 (UPPER SEAM) OVERLAIN BY 15cm sh, THEN THE BASE OF THE SANDSTONE: MED-GRAINED MED-DARK, HARD, MASSIVE ss, WEATHERS LIGHT GREY. FIGURES ARE NOT TRUE THICKNESS; THEY ARE CHAINED ALONG TRENCH (i.e. PLAN VIEW ONLY).

BASE OF MIDDLE SANDSTON HAS BECOME PLATEY, IN LOW HALF, SOFTER, AND NOT SO MASSIVE, SOMEWHAT CARBO AND WEATHERS BROWNISH

JKk

C.L. 599 C.L. 600 C.L. 601

1950 2000 2025 1875 1925 1975 2100 2150 2000 1800 1850

•1864·0 •1856·0 •1846·0

MAP INDEX AND AERIAL PHOTO INDEX

82G/2

L K J I E F G H D C B A

49°15'00" 10'00" 05'00" 49°00'00"

115°00'00" 52'30" 45'00" 37'30" 114°30'00"

T.N. Grid North

REFERENCE

MAIN ROAD		RIVER, LAKE	
SECONDARY ROAD		INTERMITTENT RIVER	
TRACK OR TRAIL		TREE AREA	
RAILWAY		LINE OF TREES	
HEDGE FENCE	—H—X—	INDIVIDUAL TREES	
BRIDGE CULVERT		VERTICAL INTERVAL	1920 1925 1930
CUT FILL		DEPRESSION	1741
SWAMP		SPOT HEIGHT	• 1739.4
DRILL HOLE	⊙	CONTROL POINT	△

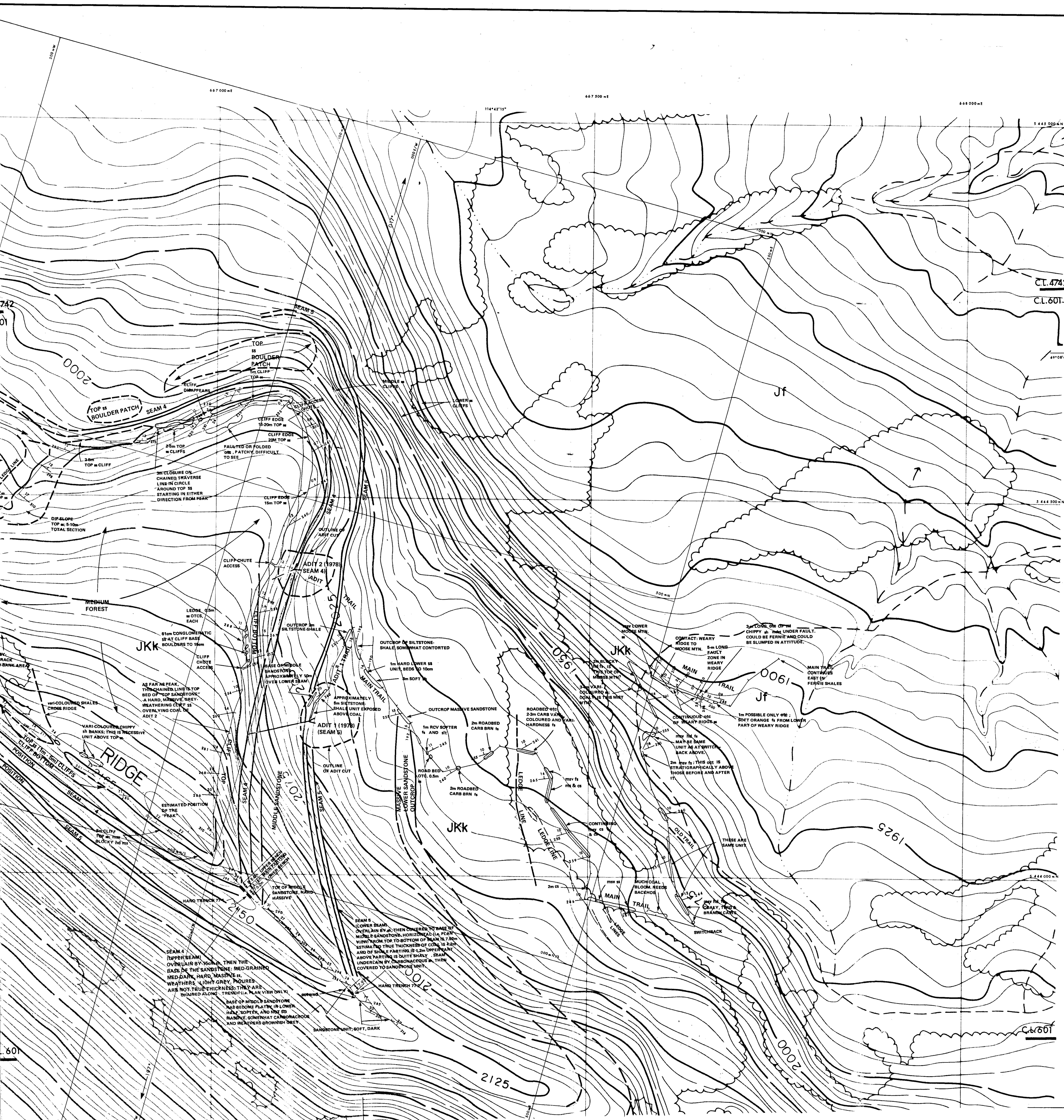
MAP PROJECTION : UNIVERSAL TRANSVERSE MERCATOR
CENTRAL MERIDIAN REFERENCE 117°W.

PREPARED BY :

NORTH WEST SURVEY CORPORATION (YUKON) LTD.

40 20 0 40 80 120 METRES

SCALE 1 : 2 000


667 000 mE
667 500 mE
668 000 mE
114°42'15"
5 445 000 mN
5 444 500 mN
5 444 000 mN
49°08'00"
49°07'30"
C.L. 4742
C.L. 601
2000
1950
1900
1925
2025
2125
2150
2100
Jf
JKk
RIDGE
MEDIUM FOREST
SEAM 4
SEAM 5
TOP ss BOULDER PATCH
5m CLIFF TOP ss
CLIFF DISAPPEARS
CLIFF ACCESS CHUTE
CLIFF EDGE 15-20m TOP ss
CLIFF EDGE 20M TOP ss
2.5m TOP ss CLIFFS
FAULTED OR FOLDED otc, PATCHY, DIFFICULT TO SEE
2.5m TOP ss CLIFF
3m CLOSURE ON CHAINED TRAVERSE LINE IN CIRCLE AROUND TOP SS STARTING IN EITHER DIRECTION FROM PEAK
CLIFF EDGE 15m TOP ss
DIP SLOPE TOP ss; 5-10m TOTAL SECTION
MIDDLE ss CLIFFS
LOWER ss CLIFFS
OUTLINE OF ADIT CUT
CLIFF CHUTE ACCESS
ADIT 2 (1978) SEAM 4)
ADIT
TRAIL
LEDGE 0.5m ss OTCS, EACH
CLIFF BOTTOM
61cm CONGLOMERATIC ss AT CLIFF BASE BOULDERS TO 15cm
OUTCROP 2m SILTSTONE-SHALE
OUTCROP OF SILTSTONE-SHALE, SOMEWHAT CONTORTED
CLIFF CHUTE ACCESS
BASE OF MIDDLE SANDSTONE APPROXIMATELY 10m OVER LOWER SEAM
1m HARD LOWER SS UNIT, BEDS TO 10cm
3m SOFT sh
MAIN TRAIL
ADIT # 1 TRAIL
AS FAR AS PEAK, THIS CHAINED LINE IS TOP BED OF "TOP SANDSTONE" -A HARD, MASSIVE, GREY-WEATHERING CLIFF SS OVERLYING COAL OF ADIT 2
APPROXIMATELY 5m SILTSTONE-SHALE UNIT EXPOSED ABOVE COAL
ADIT 1 (1978) (SEAM 5)
OUTCROP MASSIVE SANDSTONE
vari-COLOURED SHALES CROSS RIDGE
VARI-COLOURED CHIPPY sh BANKS; THIS IS RECESSIVE UNIT ABOVE TOP ss.
TOP ss (1m - 5m) CLIFFS
CLIFF BOTTOM POSITION
POSITION
1m RCV SOFTER fs AND slt
2m ROADBED CARB BRN fs
ROADBED otc 2-3m CARB VARI-COLOURED AND VARI-HARDNESS fs
ROAD BED OTC. 0.5m ss
2m ROADBED CARB BRN fs
OUTLINE OF ADIT CUT
CLIFF TOP
MIDDLE SANDSTONE
MASSIVE LOWER SANDSTONE OUTCROP
LEDGE LINE
msv fs ms & cs
ESTIMATED POSITION OF THE "PEAK"
5m CLIFF TOP sh; msv BLOCKY hd ms
8.84m UPPER BENCH
.15m MAIN PARTING
.76m LOWER BENCH
TOP OF MIDDLE SANDSTONE, HARD MASSIVE
HAND TRENCH 77-1
SEAM 5 (LOWER SEAM) OVERLAIN BY sh, THEN COVERED TO BASE OF MIDDLE SANDSTONE. HORIZONTAL (i.e. PLAN VIEW) FROM TOP TO BOTTOM OF SEAM IS 7.92m ESTIMATED TRUE THICKNESS OF COAL IS 4.2m AND OF SHALE PARTING IS 1.2m UPPER PART ABOVE PARTING IS QUITE SHALY. SEAM UNDERLAIN BY CARBONACEOUS sh, THEN COVERED TO SANDSTONE UNIT.
SEAM 4 (UPPER SEAM) OVERLAIN BY 15cm sh, THEN THE BASE OF THE SANDSTONE: MED-GRAINED MED-DARK, HARD, MASSIVE ss, WEATHERS LIGHT GREY. FIGURES ARE NOT TRUE THICKNESS; THEY ARE CHAINED ALONG TRENCH (i.e. PLAN VIEW ONLY)
covered
7.92m
HAND TRENCH 77-2
BASE OF MIDDLE SANDSTONE HAS BECOME PLATEY IN LOWER HALF, SOFTER, AND NOT SO MASSIVE, SOMEWHAT CARBONACEOUS AND WEATHERS BROWNISH GREY
SANDSTONE UNIT, SOFT, DARK
msv LOWER MOOSE MTN. ss
CONTACT: WEARY RIDGE TO MOOSE MTN.
5-m LONG FAULT ZONE IN WEARY RIDGE
3-m LONG otc OF 1M CHIPPY sh mdst UNDER FAULT. COULD BE FERNIE AND COULD BE SLUMPED IN ATTITUDE.
MAIN TRAIL CONTINUES EAST IN FERNIE SHALES
2m BLOCKY hd fs IS THIS TOP OF MOOSE MTN?
3-m VARI-COLOURED ss; COALY, IS THIS MIST MTN?
CONTINUOUS otc OF WEARY RIDGE ss
1m POSSIBLE ONLY otc; SOFT ORANGE fs FROM LOWER PART OF WEARY RIDGE
msv hd fs MAY BE SAME UNIT AS AT SWITCH-BACK ABOVE.
2m msv fs; THIS oct IS STRATIGRAPHICALLY ABOVE THOSE BEFORE AND AFTER IT.
CONTINUING msv cs & cs
OLD TRAIL
THESE ARE SAME UNIT
2m cs
msv ss
MUCH COAL BLOOM. NEEDS BACKHOE
LEDGE LINES
msv hd fs COALY, TWIG & BRANCH CASTS
SWITCHBACK
40 20 0 40 80 120 METRES
SCALE 1: 2 000

ABBREVIATIONS LEGEND, MAPS AND CROSS SECTIONS

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

GEOLOGICAL LEGEND

PLANE-TABLE TRAVERSE LINE TICKS INDICATE STATION. BEDDING ATTITUDE WHERE STRIKE LINE OF SYMBOL TOUCHES CHAIN LINE.

OUTCROP; BEDDING ATTITUDE WHERE STRIKE LINE OF SYMBOL TOUCHES OUTCROP OUTLINE.

COAL SEAMS EXPOSED IN HAND-TRENCHING. SEAM INTERCEPTS ON CHAIN LINE ACCURATE TO + - 10m

ADIT; LENGTH AND ORIENTATION PLOTTED.

FAULT

CLIFF CHUTE — CHUTE IN CLIFF: ACCESS ON FOOT.

JKk — KOOTENAY GROUP MIST MTN. AND MORRISSEY FORMATIONS

Jf — FERNIE GROUP

M3

DOC. NO. 82088

Crows Nest Resources Limited
EXPLORATION

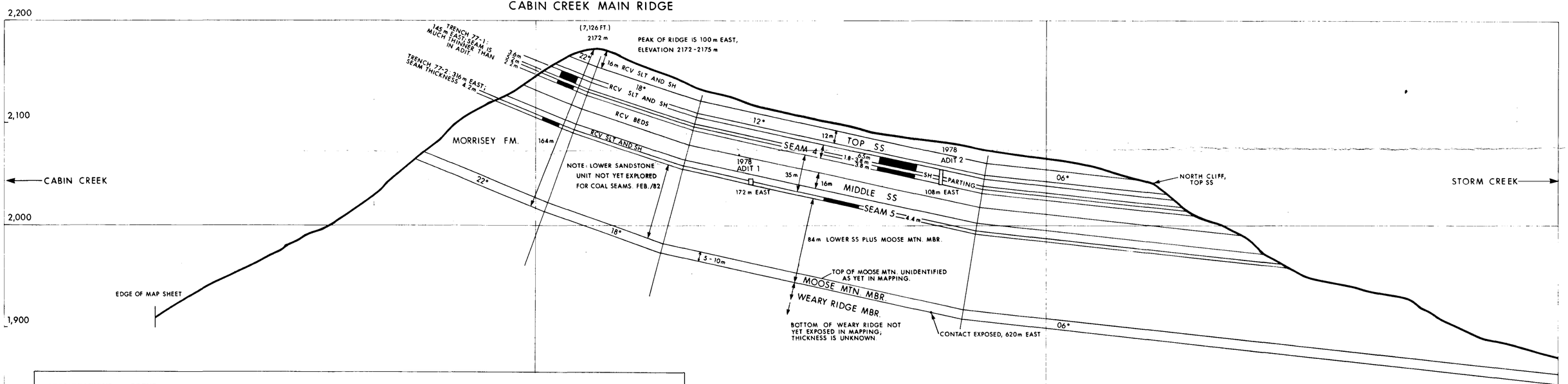
CABIN CREEK
S.E. B.C.

GEOLOGICAL MAP

N.T.S. 82G2 | U.T.M. ZONE 11

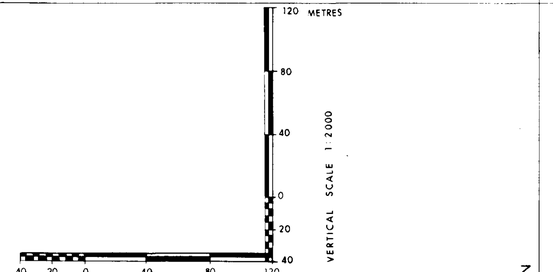
AUTHOR: D. BELL	SCALE: 1:2000	APPENDIX A ENCLOSURE No:
DATE: FEB. 1982	REVISED:	DRAWING No: HC-97
To Accompany		

CABIN CREEK MAIN RIDGE



ABBREVIATIONS LEGEND, MAPS AND CROSS SECTIONS

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



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K-Shell Cabin Creek 8 1/2"x11" (1*)

Crows Nest Resources Limited
EXPLORATION

CABIN CREEK
S.E. B.C.

STRUCTURAL CROSS SECTION
100 WEST

AUTHOR: D. BELL	SCALE: 1:2000	APPENDIX B
DATE: FEB./82	REVISED:	DRAWING No. HC-97A
To Accompany		