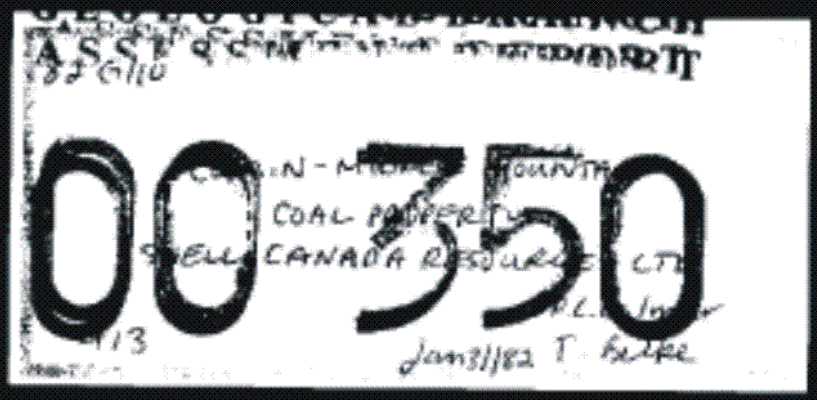
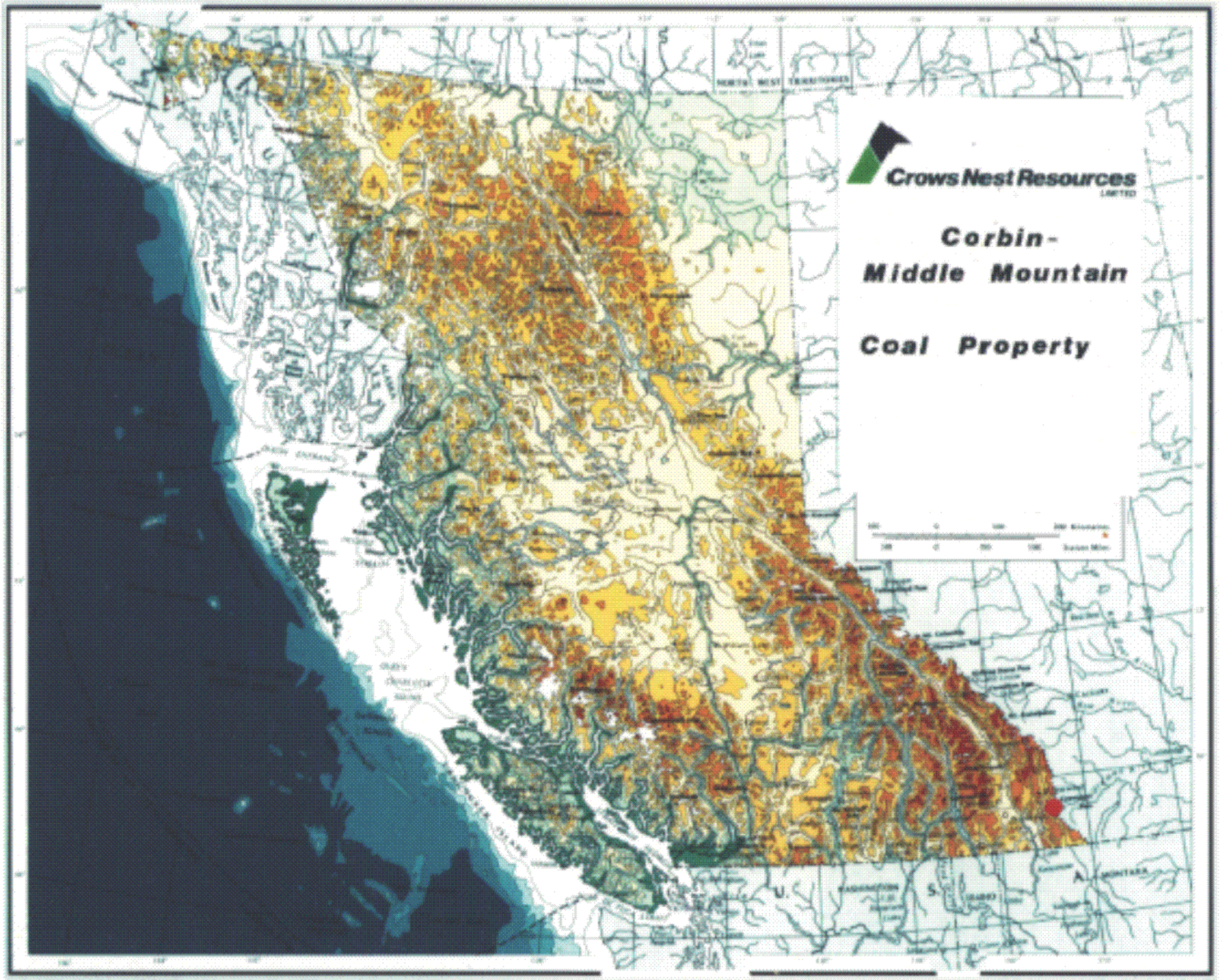
K - SHELL CARBIN MINE MT 82/G/10



350

Note: covers the same property as

This report ~~xx~~ last years 1980 Shell-Tent Mtn. see K-Shell-Tent Mt: 80(1)A


Crows Nest Resources
LIMITED
Corbin-
Middle Mountain
Coal Property

K-SHELL-CORBIN-Middle Mtn. 81(1)A

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

January 31, 1982

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

Dear Sirs:

Enclosed please find our report on the Corbin-Middle Mountain Project

Mr. Patrick C. Gilmar planned and supervised the 1981 geological field program on Corbin-Middle Mountain B.C. Coal Licences held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited. Terry Belke did the field work and compiled the geological information for this report.

Pat Gilmar, B.Sc., graduated in Geology from the University of Calgary in 1978. Prior to his graduation Mr. Gilmar worked as a field assistant for a number of major mining companies in British Columbia and Alberta. Pat Gilmar has been employed with the company as a geologist since 1978.

Terry Belke, B.Sc., graduated in Geology from the University of Alberta in 1980.

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

In my opinion, all of these personnel are fully qualified, by training and experience to prepare this report and this account of work done under their direct supervision.

Yours very truly,

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

1A/CQd.2

CORBIN - MIDDLE MOUNTAIN

COAL PROPERTY

Report on Coal Licence 413 Group 6

Kootenay Land District, British Columbia

Held by: SHELL CANADA RESOURCES LIMITED

Operated by: CROWS NEST RESOURCES LIMITED

on work done June 8 to September 11, 1981

Lat: 49° 31' to 49° 33'

Long: 114° 39' to 114° 42'

NTS 82 G/10

Authors:

Patrick C. Gilmar

Terry Belke

Geologists

Crows Nest Resources Limited

January 31, 1982

TABLE OF CONTENTS

ENCLOSURES

APPENDICES

1.0 SUMMARY

The Corbin-Middle Mountain property (Coal Licence No. 413) covers approximately 259 hectares of Crown Land north of Coal Mountain and south of Tent Mountain. Coal mining activities have taken place in the Corbin area since 1908.

The property lies 4 km directly west of the Alberta-British Columbia boundary, 56 km directly north of the United States border, and 28 km east of Fernie, B.C. Byron Creek Collieries Limited's mine access road runs along the west and south sides 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 which is presently producing coal from the northern end of Coal Mountain.

In 1980-81 CNRL has done 1:5000 scale mapping, hand trenching, road construction (3.4 km), and drilling of 4 rotary drill holes (685 m).

The property lies within the Rocky Mountains and is an outlier of the Fernie coal basin. Strata of the lower Kootenay Group (Gibson, 1979), along strike with those mined at Coal Mountain and Tent Mountain, outcrop on Middle Mountain ridge.

The strata along the ridge are repeated by a series of west dipping thrust faults. Over the western extension only repeats of Fernie shales and Morrissey sandstones occur. In the southeast corner of the licence the Morrissey and Mammoth seam have been thrust repeated and folded into a steeply south plunging structure. This is the only in-place coal occurrence found on the property.

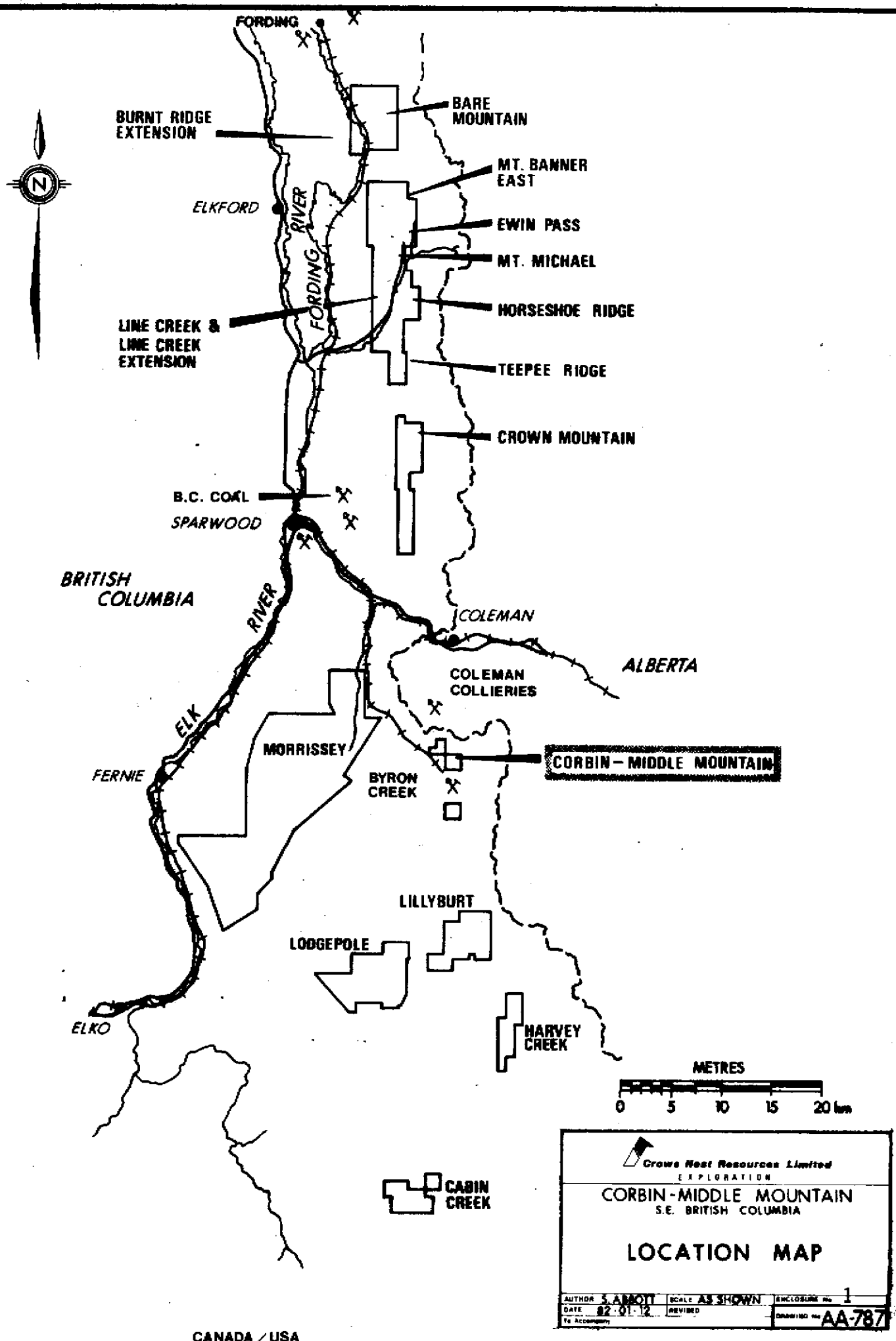
Open pit potential is confined to this southeast corner, therefore only a small coal tonnage can exist. No quality analysis has been done but an oxidized Medium Volatile Bituminous coal is expected.

2.0 LOCATION

Enclosure 1 - Location Map

The Corbin-Middle Mountain property is located on B.C. Coal Licence No. 413 covering 259 hectares. It is in southeastern British Columbia and lies 4 km directly west of the Alberta-British Columbia boundary, 56 km directly north of the United States border, and 28 km east of Fernie, B.C. (Enclosure 1).

The licence lies south of Andy Good Creek and north of Corbin Creek (Enclosure 2). Immediately south, Byron Creek Collieries is presently producing thermal coal from a surface mine on the northern end of Coal Mountain. Loadout facilities are adjacent to the Middle Mountain licence.

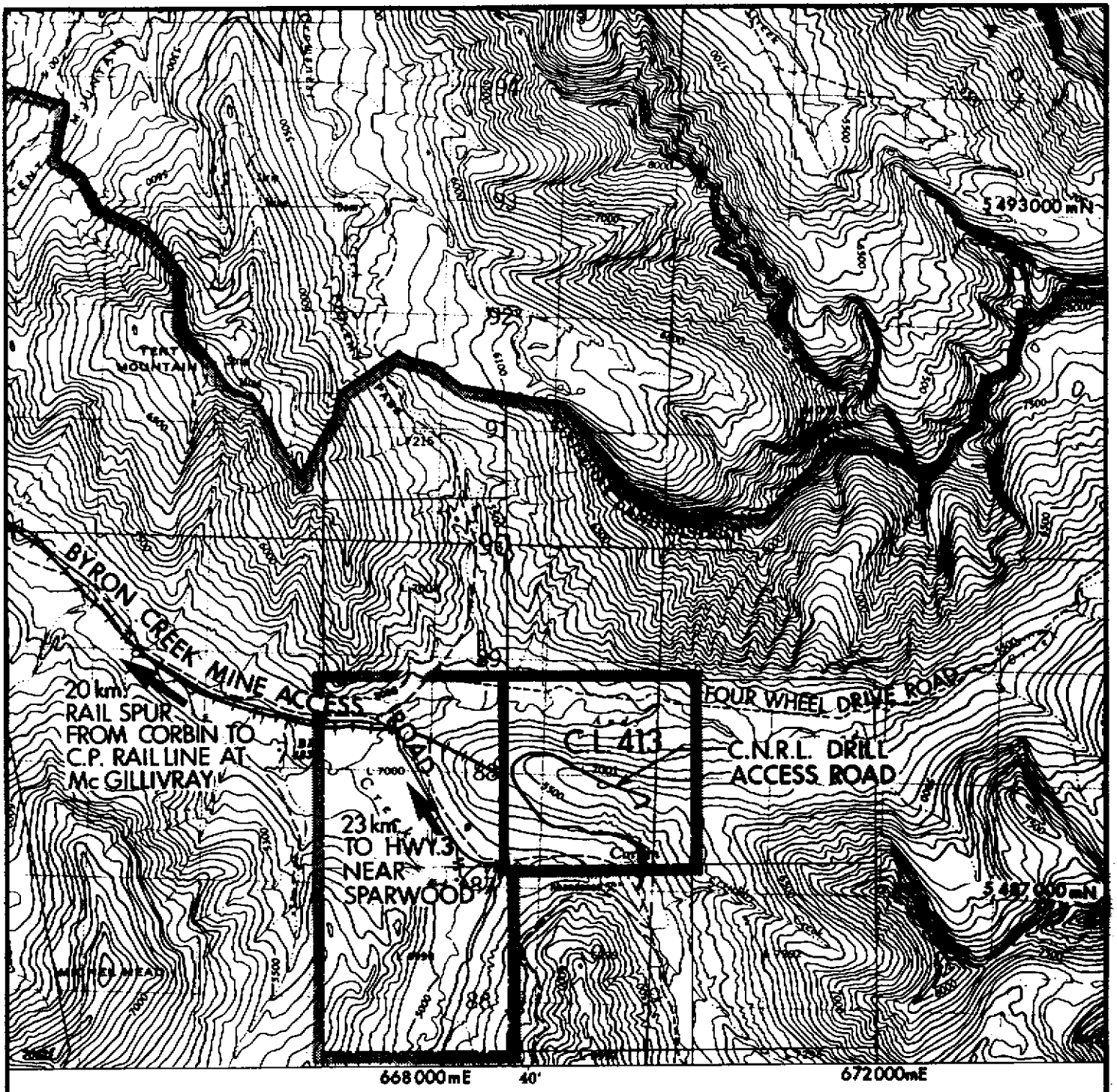

FORDING
BURNT RIDGE EXTENSION
BARE MOUNTAIN
MT. BANNER EAST
ELKFORD
FORDING RIVER
EWIN PASS
MT. MICHAEL
LINE CREEK & LINE CREEK EXTENSION
HORSESHOE RIDGE
TEEPEE RIDGE
CROWN MOUNTAIN
B.C. COAL
SPARWOOD
BRITISH COLUMBIA
ELK RIVER
COLEMAN
ALBERTA
COLEMAN COLLIERIES
MORRISSEY
FERNIE
BYRON CREEK
CORBIN – MIDDLE MOUNTAIN
LILLYBURT
LODGEPOLE
ELKO
HARVEY CREEK
METRES
0 5 10 15 20 km
CABIN CREEK
CANADA / USA
Crows Nest Resources Limited
EXPLORATION
CORBIN-MIDDLE MOUNTAIN
S.E. BRITISH COLUMBIA
LOCATION MAP
AUTHOR S. ABBOTT
DATE 82-01-12
SCALE AS SHOWN
REVISED
ENCLOSURE No. 1
DRAWING No. AA-787

3.0 ACCESS

Enclosure 2 - Access Map

Byron Creek Collieries Limited's mine access road runs along the west and south boundaries of the property, providing access to Highway 3 near Sparwood, B.C., a distance of 23 km by road from the Corbin townsite. From this main road a four-wheel drive road branches eastward through the north end of the coal licence along Andy Good Creek. In 1981 a 3.4 kilometre drill access road was constructed on the licence block from the southern boundary.

A rail spur from Corbin townsite to the CP Rail Line at McGillivray, B.C. has been constructed by Byron Creek (Enclosure 3). 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.



Crows Nest Resources Limited
EXPLORATION

CORBIN – MIDDLE MOUNTAIN
S.E. BRITISH COLUMBIA

ACCESS MAP

N.T.S. - 82 G/10

AUTHOR: S. ABBOTT	SCALE: 1:50 000	ENCLOSURE No.: 2
DATE: 82-01-20	REVISED:	DRAWING No.: AA-799
To Accompany		

4.0 TENURE

Appendix A - B.C. Coal Licences Tenure Standing

Appendix B - Coal Land Disposition Map

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, 413 and 414, Group No. 6, cover 713 ha. of Crown land.

The Corbin-Middle Mountain property is on C.L. No. 413, covering 259 hectares.

5.0 WORK DONE

5.1 Prior to 1981

No work was done on Middle Mountain by Crows Nest Resources Ltd. prior to the 1980 exploration program. However, a sizeable pile of coal spoil was found downhill from one of the coal outcrops, indicating excavation in the past. The date of this excavation is not known.

Field work on the Middle Mountain property in 1980 consisted of reconnaissance and detailed geological mapping, hand trenching of coal exposures, and flagging of a route for a proposed access road.

Sheltech Canada set up eight geological control stations in the area using control stations set up for Corbin-Coal Mountain.

5.2 1981 Exploration Program

Appendix C - Application to Extend Term of Licence

Appendix D - Downhole Geophysical Logs

Appendix E - (Part 1) Drill Hole Summaries (4)

Appendix E - (Part 2) Drill Hole Stratigraphic Sections (4)

Appendix F - Hand Trenching Summaries

Appendix G - Traverse Survey Map

Field work on the Middle Mountain property in 1981 consisted of reconnaissance and detailed geological mapping, hand trenching of

coal exposures, building a 3.4 kilometre road for drill access, machine trenching for outcrop exposure along the road and drilling four rotary drill holes.

Sheltech Canada surveyed in the road and set up two additional geological control stations.

Overburden, consisting mainly of glacial till, is very thick (up to 15 m) on Middle Mountain ridge and the roadcut exposed only 600 metres of nearly continuous outcrop along the southern face of the ridge. A Bantam C260 backhoe and a rubber-tired backhoe were brought in to dig trenches along the road to expose additional outcrop. The overburden was too thick along most of the road and outcrops occurred in only six trenches on the northwest face of the ridge. This thick overburden accounts for the low percentage of outcrop exposure (less than 5 percent) on the Middle Mountain property.

Four reverse circulation rotary drill holes were drilled on the Middle Mountain property on sites located along the road. The principle aim of the drilling program was to prove or disprove the occurrence of coal bearing strata in the western half of the coal licence. Outcrop exposure on the western half is very sparse.

Hand trenching of coal exposures was continued in the area of the ridgetop outcrop on the east side of the property. Attempts at hand trenching in other areas met with failure primarily due to thick overburden.

6.0 GEOLOGY

Enclosure 3 - Geology Compilation Map

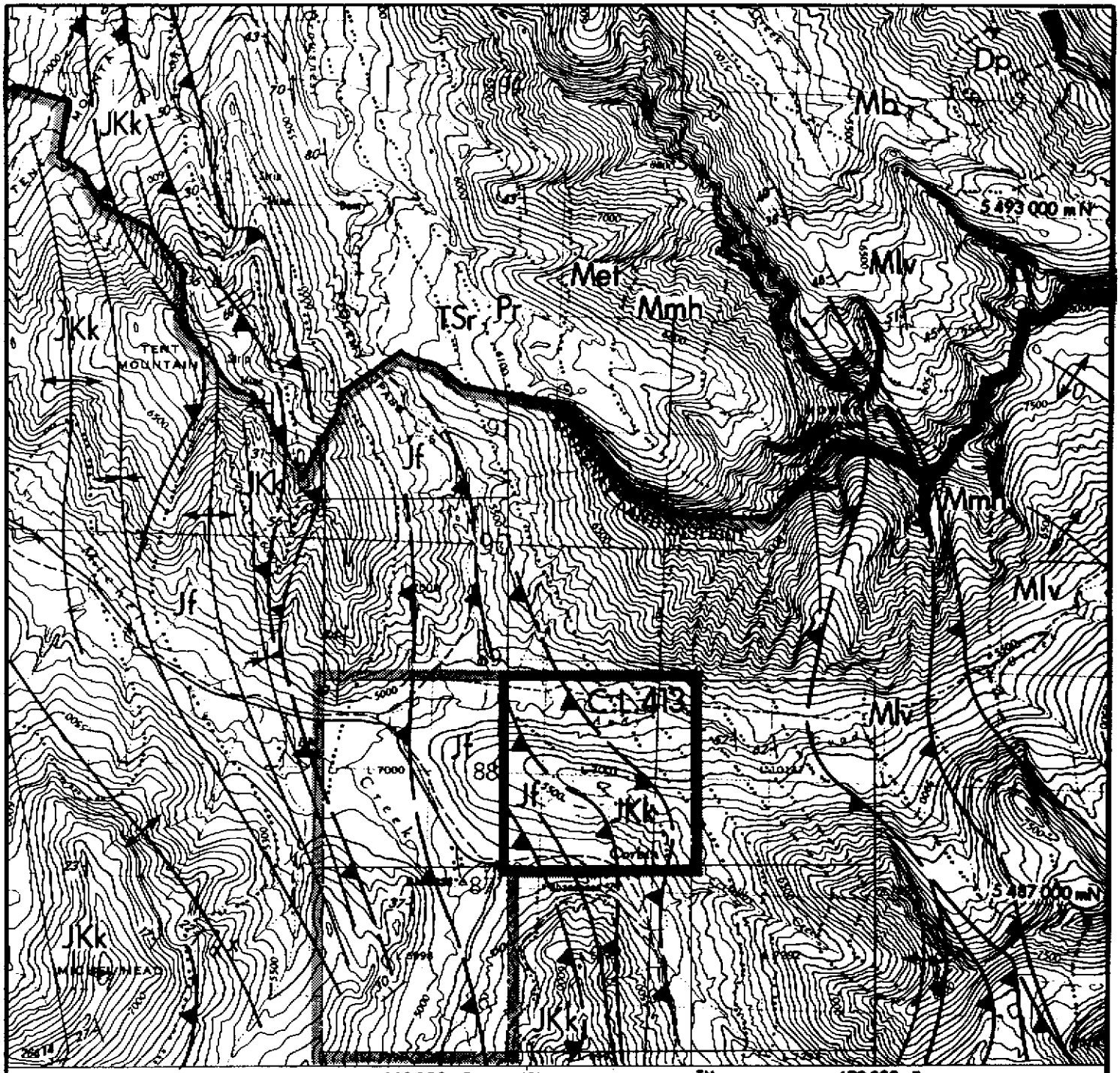
6.1 Regional

Coal deposits of the Corbin area occur within the Kootenay Group of Jurassic-Cretaceous age. These have been mined at Tent Mountain, 4 km NW of Middle Mountain, and have been mined since 1908 at Coal Mountain, 1 km to the south. The Kootenay Group is underlain by shales, siltstones, and fine sandstones of the Fernie Formation.

Structurally, the area is within the Front Ranges of the Rocky Mountains. Numerous closely spaced thrust faults and tight folds have been observed on Coal Mountain and Tent Mountain. These structures have caused intense deformation of the coal seams, in some cases resulting in structural thickening.

6.2 Regional Stratigraphy

The Corbin area is underlain by strata of the upper portion of the Fernie Formation and the lower portion of the Kootenay Group (Table 1). The Fernie Formation is Jurassic in age. The Kootenay Group spans the Jurassic-Cretaceous boundary but the portion of



SYMBOL LEGEND

- STRIKE & DIP OF BEDDING
- PLUNGING SYNCLINE (symmetrical, overturned)
- PLUNGING ANTICLINE (symmetrical, overturned)
- THRUST FAULT (teeth on upper plate)
- NORMAL FAULT (lines on downthrown plate)
- FAULT OF UNKNOWN RELATIVE MOVEMENT
- GEOLOGICAL BOUNDARY (certain, assumed)
- X SHELL MEASURED OUTCROP SECTION

500 0 1000 2000 Metres

GEOLOGICAL LEGEND

JURASSIC - CRETACEOUS
- JKk — Kootenay Group

JURASSIC
- Jf — Fernie Formation

TRIASSIC
- TSr — Spray River Group

PERMIAN AND (?) PENNSYLVANIAN
- Pr — Rocky Mountain Formation

MISSISSIPIAN
- M
- Mr — Rundle Group
- Met — Etherington Formation
- Mmh — Mount Head Formation
- Mlv — Livingstone Formation
- Mb — Banff Formation

DEVONIAN
- Dp — Palliser Formation

TN GN

- Road: Highway, Main road
- Road: Loose surface, Dry weather
- Track or trail
- Railway
- River
- Stream
- 5700 Contours
- Licence boundary

Crows Nest Resources Limited
EXPLORATION

CORBIN – MIDDLE MOUNTAIN
S.E. BRITISH COLUMBIA

GEOLOGY COMPILATION MAP

AUTHOR: S. ABBOTT | SCALE: 1:50 000 | ENCLOSURE No.: 3
DATE: 82-01-20 | REVISED: | DRAWING No.: AA-798
To Accompany

(Gibson, 1979), which in ascending order are Morrissey, Mist Mountain, and Elk (not present). In this report the coal-bearing Mist Mountain Formation is subdivided into the Lower Mammoth Seam and the Upper Sandstone and Shale Series.

Fernie Formation

The Fernie Formation consists of a thick sequence of marine sediments. This formation is recessive in nature and is very poorly exposed on the Corbin coal licences.

In the Corbin area the base of the Fernie Formation is marked by a few feet of phosphatic shale and oolitic phosphate rock. This is overlain by grey and black shales containing abundant spherical sideritic concretions and some glauconitic beds. Interbeds of siltstone and mudstone become increasingly common in the upper portion of the formation as the gradational contact with the basal sandstone of the Kootenay Group is approached. The transition from the Fernie Formation to the Kootenay Group is called the Passage Beds. The Fernie Formation is estimated to be in the order of 200 meters thick in the Corbin area.

Morrissey Formation

The Morrissey Formation of the Kootenay Group is a cliff-forming quartz-chert sandstone which conformably overlies the Fernie Formation. The lower portion, the Weary Ridge Member, consists of slightly ferruginous, fine to coarse grained sandstone, commonly argillaceous and carbonaceous. The upper portion, the Moose Mountain Member, is medium to coarse grained and is more resistant.

The Morrissey Formation is approximately 70 to 80 meters thick in the Corbin Area. Its exact thickness has not been determined due to structural complexity and poor exposure of the lower contact.

Mist Mountain Formation

In the Corbin area only the lower part of the Mist Mountain Formation is present. It has been divided into the coal-bearing Mammoth Seam and the Upper Sandstone and Shale Series.

The Mammoth Seam is comprised of coal with discontinuous lenses and interbeds of shale. Because of structural complexity, the thickness of this unit is hard to establish.

The Upper Sandstone and Shale Series consist of interbedded sandstone, silstone, and shale. While this unit occurs on Coal Mountain, it has not been found on the Tent Mountain property.

6.3 Detailed Stratigraphy

Enclosure 4 - Stratigraphic Table

Outcrops of Fernie Formation and Kootenay Group rocks have been found on Middle Mountain. Due to forest cover on most of the property, outcrop is poor. The main area of outcrop is along the ridgetop on the east side of the property, and on the SW facing slopes below the ridge. The section exposed here starts in brown shales of the Fernie Group and passes upward through interbedded sandstones, siltstones, and shales of the Passage Beds. Overlying this is orange-brown weathering sandstone of the Weary Ridge Member of the Morrissey Formation. On top of this is light grey, medium grained massive sandstone of the Moose Mountain Member of the Morrissey Formation. It is overlain by a coal seam at least 7.5 meters thick. The upper contact of the seam was not found.

On the west end of Middle Mountain, a cut into the hillside above Byron Creek Collieries Ltd.'s loadout exposes fine greenish to purplish sandstones of the Fernie Formation.

Enclosure 4 - STRATIGRAPHY OF THE CORBIN COAL LICENCES

PERIOD	FORMATION		MEMBER	BEDS	LITHOLOGY	THICKNESS
JURASSIC-CRETACEOUS	KOOTENAY GROUP	MIST MOUNTAIN FORMATION		Upper Sandstone and Shale Series	Interbedded sandstone, silty sandstone and mudstone; minor carbonaceous horizons	Greater than 190 m
				Upper Mammoth Seam	Coal, with discontinuous lenses and interbeds of claystone	Up to 35 m
				Lower Mammoth Seam	Claystone, with thin discontinuous lenses and interbeds of coal and stoney coal	Up to 58 m
		MORRISSEY FORMATION	Moose Mountain Member		Sandstone, medium to coarse-grained, highly resistant	70 - 80 m
			Weary Ridge Member		Sandstone, very fine to coarse-grained, slightly ferruginous, commonly argillaceous - carbonaceous	
JURASSIC		FERNIE FORMATION			Gray and black marine shales with sideritic concretions and glauconitic beds; abundant interbeds of siltstone and sandstone at top; base marked by a thin phosphatic unit	200 m (approximate)

A section similiar to that described above, except for the coal occurrence, was exposed in the 1981 roadcut on the southern face of Middle Mountain ridge. No indications of the Mammoth coal seam or the Upper Sandstone and Shale series of the Mist Mountain formation have been found in roadcut exposures or drill holes on the western extension of the ridge.

6.4 Detailed Structure

APPENDIX F - Geology Map

APPENDIX G - Cross Sections

The main fold structure on the property is a north - south trending anticline-syncline pair outcropping near the eastern boundary. These folds plunge steeply S at about 35°. Their shape is defined by nearly continuous outcrops of the Moose Mountain Member. To the SW of these folds are two other panels of Moose Mountain Member which have been thrust over them in an imbricate fashion.

Two separate bodies of coal were found. The first sits directly on the Moose Mountain Member, and wraps around the folds. It is cut out to the NW by the thrust at the base of the middle panel of Moose Mountain Member. The second body sits on top of the middle Moose Mountain Member panel, and is bounded to the SW by the thrust at the base of the westernmost Moose Mountain Member panel. Since both coal occurrences are in the same stratigraphic position, it seems likely that they are the same seam.

The seam that wraps around the south-plunging folds should be found at depth in the SE part of the property, since the 35° plunge of the folds is greater than the angle of the slope.

The structure on the west side of the Middle Mountain property is a series of westward dipping high angle reverse faults thrusting the Fernie Formation over the Morrissey Formation. These imbricate thrusts produce two repeats of the Morrissey Formation; however the Lower Mammoth coal seam generally found overlying the Moose Mountain member of the Morrissey Formation is absent. This was seen in RDH-MM-1 where the Fernie Formation is directly overlying the Moose Mountain Member.

6.5 Coal Reserves and Quality

1981 work indicates limited, if any, open pit potential for the Middle Mountain coal licence. Exploration on the western portion of the ridge has revealed only repeats of Fernie shales thrust directly over the Moose Mountain Member. The only in-place coal found was in the fold structures and accompanying thrust panels on the extreme southeast corner of the licence. These structures apparently continue plunging steeply southward onto Byron Creek Collieries property and possibly under Corbin Creek. Raw coal potential on CNRL's licence could be in the one million tonne range.

To properly evaluate this corner of the property, an information exchange with Byron Creek would be necessary. If conditions look favorable a short spur road off the 1981 Drill Access road would provide good drill access to test down the plunge of the outcropping folds.

No coal quality testing has been done on the property. A Coal Mountain or Tent Mountain type coal quality (Medium Volatile Bituminous) is expected. Due to the structural complexity and near-surface orientation of the reserve area, an oxidized coal is probable.

7.0 BIBLIOGRAPHY

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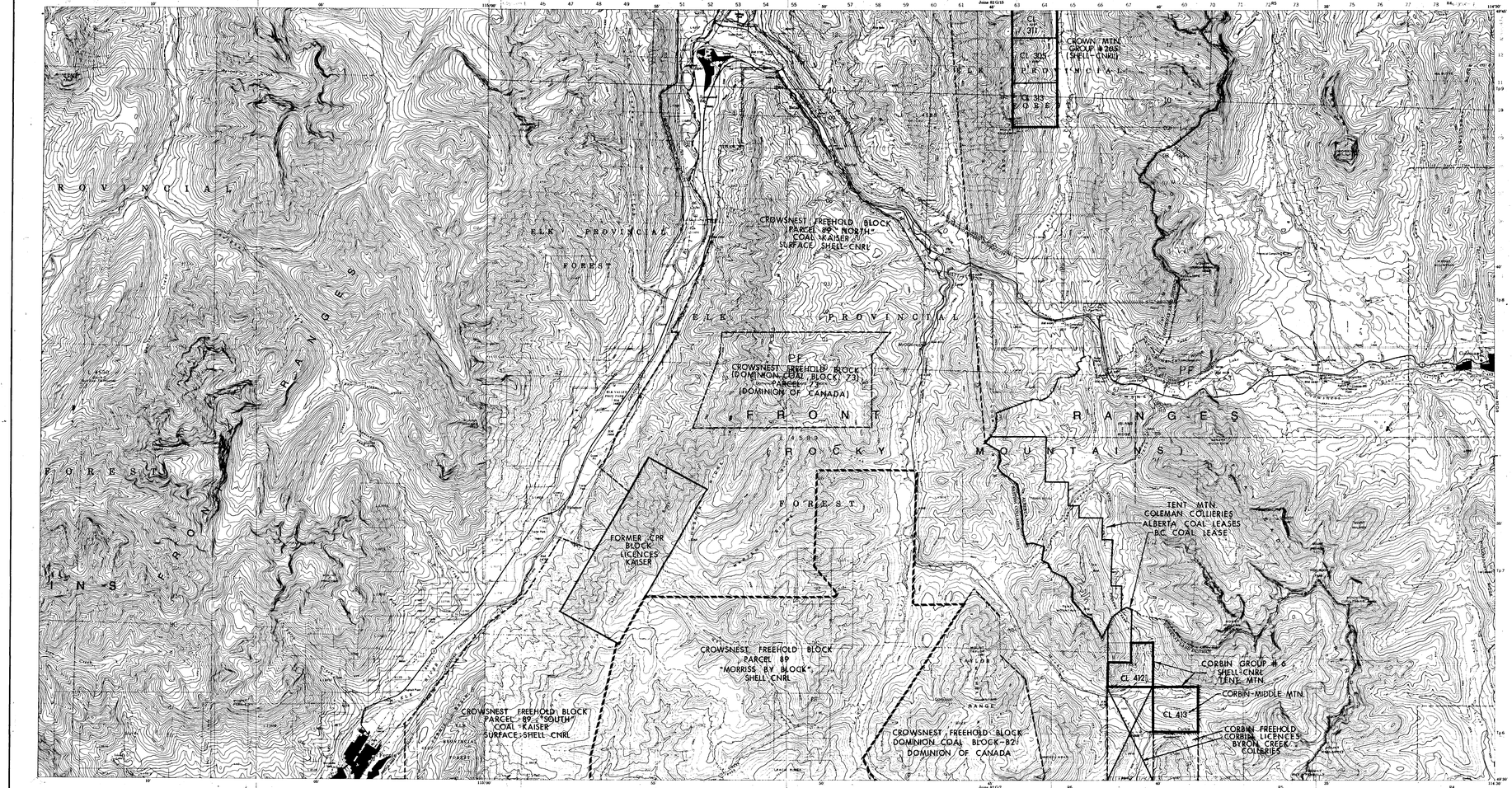
CROWS NEST RESOURCES LIMITED (Exploration)

B.C. COAL LICENCES — BLOCK: CORBIN — PROJECT: — YEAR: 1981

TENURE STANDING — GROUP: #6 — CORBIN — DATE: JANUARY 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 CURRENT YEAR $ 10^3	LIC. YEAR	$	PRE-FULFILMENT YEAR	$	ANNIVERSARY DATE	CURRENT YEAR AFE	$ 10^3	TOTAL $ 10^3	SHELL CLASS.	
3 LIC		713	74	1,600	3,565	21.3	1,033.3	8	8,800	10	141,700	JANUARY 31			2,794.4	Y	THE LICENCES ARE
412	S ½ & NE ¼ LOT 7002	195															IN GOOD STANDING
413	LOT 7001	259															UNTIL JAN 31st
414	LOT 6995	259															1990 UNDER THE
																	'74 COAL ACT AND
																	UNTIL JAN 31st 1992
																	UNDER THE '78
																	COAL ACT
				WORK DONE	PRIOR TO '78	1978	1979		1980		1981						
				$	153,305	407,348	30,409		516,206		150,220						

BA - 312



COMPANY COLOR CODE

SHELL - CNRL

SAGE CREEK COAL LTD.

KAISER RESOURCES LTD.

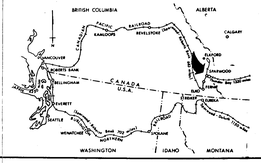
DOMINION OF CANADA

BYRON CREEK COLLIERIES LTD.

COLEMAN COLLIERIES LTD.

FORDING COAL LTD AND OTHER CP COMPANIES

ELCO MINING LTD.



COAL LAND TENURE

FREEHOLD LICENCES

BORDER OF SHELL-CNRL GROUPS BLOCK ETC.

APPLICATION FOR ABOVE

OUTLINE OF HOLDINGS BY OTHER THAN SHELL-CNRL

APPLICATION FOR B.C. COAL LICENCE BY OTHER THAN SHELL-CNRL

B.C. COAL LICENCE BORDER SHELL-CNRL ONLY

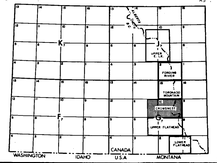
NOTE

B.C. COAL LICENCES WERE ISSUED AND REVOKED COVERING MOST PARTS OF THE DOMINION COAL BLOCK PARCEL 82 AND ALL OF PARCEL 72. THESE OLD LICENCES ARE NOT SHOWN ON THE MAP.

SCALE 1:50,000

MILES 1 0 1000 2000 3000

METRES 1000 0 1000 2000 3000



SHELL CANADA RESOURCES LIMITED

COAL DEVELOPMENT

SHELL-CNRL LEASE GROUPS
KAISER RESOURCES
TENURES
CROWN MTN.
CORBIN TENT MTN.
CORBIN-MIDDLE MTN.

CROWSNEST

KOOTENAY LAND DISTRICT

SOUTHEASTERN B.C.

LAND MAP

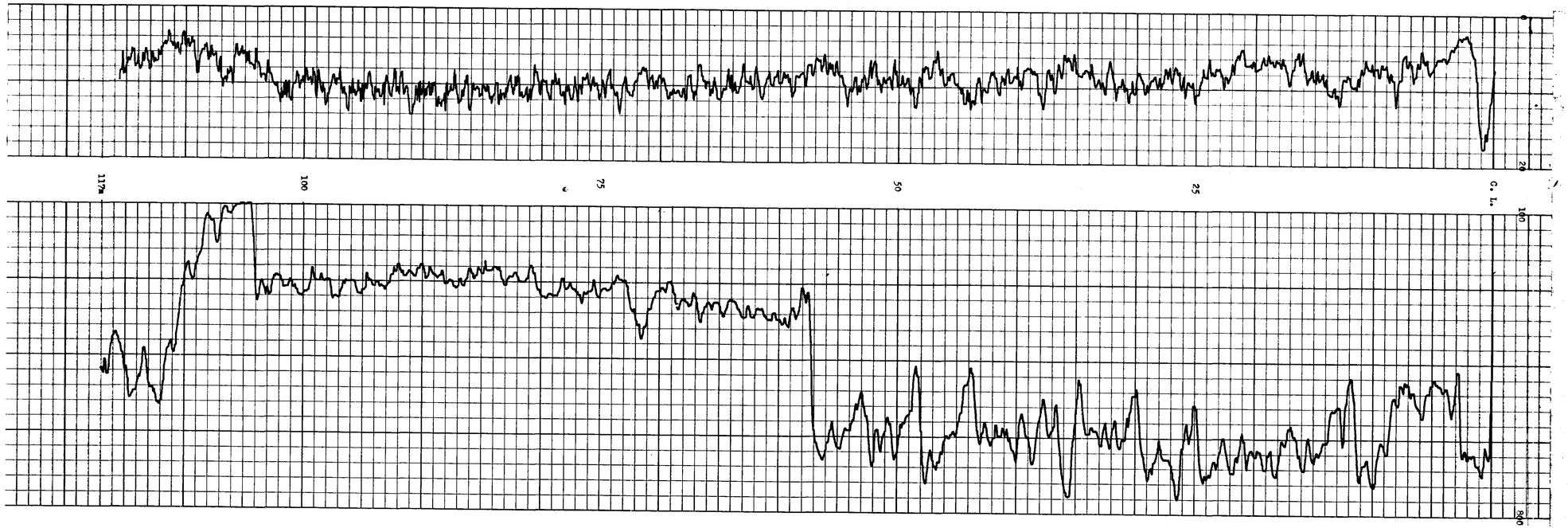
NTS 82 G/10, G/15

AUTHOR: F. Marienhagen	SCALE: 1:50 000	DRAWING No. NW 30E
DATE: Sept. 1977	REVISED: March 1980	APPENDIX B

To Accompany

R. SHELL Courtesy Middle Arm BLSTR

K-SHELL-CORBIN Middle Mtn. 31C/3/A #1



DAVIES EXPLORATION LOGGING LTD.

COMPANY	CROWSNEST RESOURCES LIMITED
HOLE NUMBER	RDH - MM - 1
LOCATION	Middle Mountain
PROVINCE	B. C.
ELEVATION	
LOG TYPE:	Natural Gamma & Neutron
DATE	Aug. 18, 1981
DRILLED DEPTH	118m
LOGGED DEPTH	117m
ZERO DATUM	G. L.
HOLE DIAMETER	5" 1/8"
CASING LENGTH	25' - T.D. - Double wall pipe

REMARKS: SCALE: 1:200

350

APPENDIX D

(2)

K-SHELL-COMBIN Middle Mtn 81(3)A * 1

APPENDIX D

(3)

DAVIES EXPLORATION LOGGING LTD.

COMPANY	CROMSWEST RESOURCES LIMITED
HOLE NUMBER	BDH - MM - 1
LOCATION	Middle Mountain
PROVINCE	B. C.
ELEVATION	
LOG TYPE:	CALIPER, NATURAL GAMMA, RESISTIVITY, DENSITY
DATE	Aug. 18, 1981
DRILLED DEPTH	118m
LOGGED DEPTH	117m
ZERO DATUM	G. L.
HOLE DIAMETER	5" ⅛
CASING LENGTH	7.5m
REMARKS:	SCALE: 1:200

350

CALIPER | NATURAL GAMMA | RESISTIVITY | DENSITY

3 | 20

G. L.

25

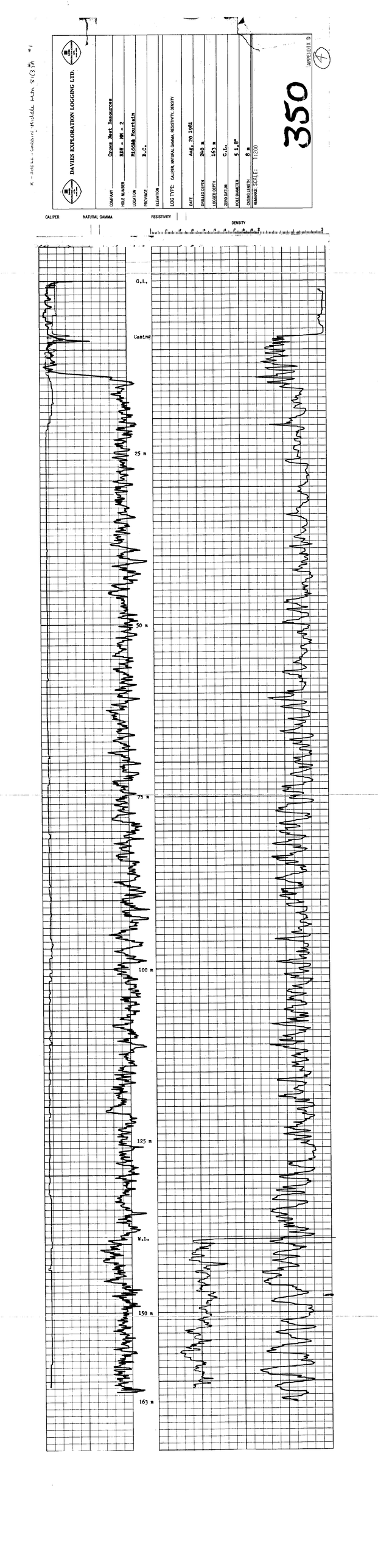
50

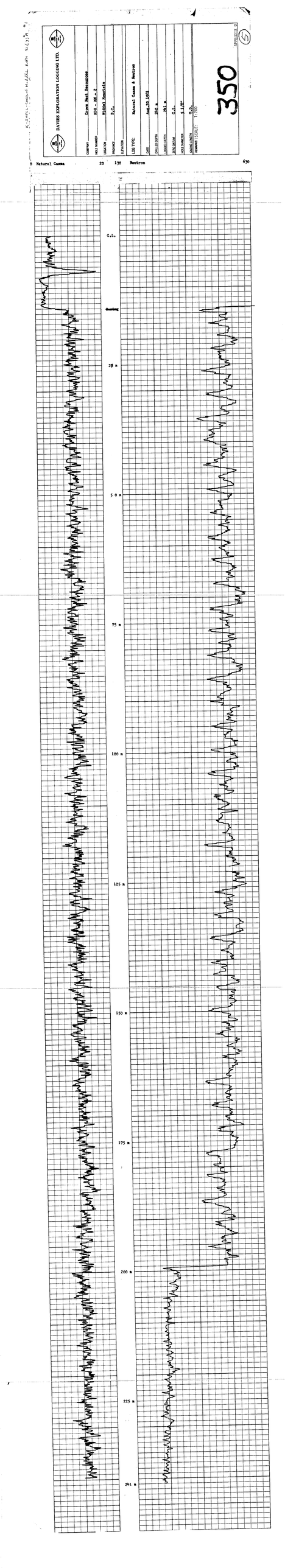
fluid level

75

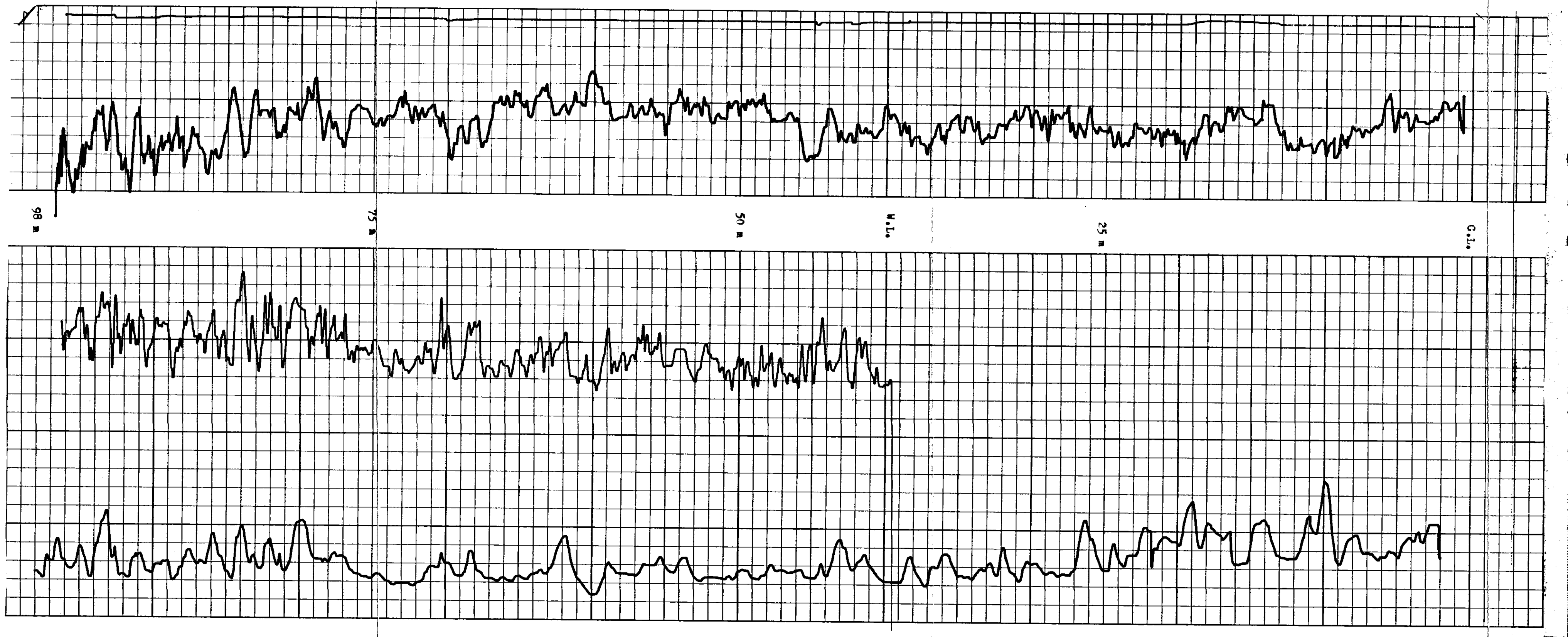
100

117m


DAVIES EXPLORATION LOGGING LTD.
COMPANY Ocean Mist Resources
HOLE NUMBER RDH - MM - 2
LOCATION Middag Mountain
PROVINCE B.C.
ELEVATION
LOG TYPE: CALIPER, NATURAL GAMMA, RESISTIVITY, DENSITY
DATE Aug. 20 1981
DRILLED DEPTH 240 m
LOGGED DEPTH 163 m
ZERO DATUM G.L.
HOLE DIAMETER 5 1/8"
CASING LENGTH 8 m
REMARKS SCALE: 1:200
350
APPENDIX D
4
CALIPER
NATURAL GAMMA
RESISTIVITY
DENSITY
G.L.
Casing
25 m
50 m
75 m
100 m
125 m
W.L.
150 m
163 m


DAVIES EXPLORATION LOGGING LTD.
COMPANY Crows Nest Resources
WELL NUMBER DDH - RM - 2
LOCATION Middy Mountain
PROVINCE B.C.
ELEVATION
LOG TYPE Natural Gamma & Neutron
DATE Aug.25 1981
DRILLED DEPTH 290 m
LOGGED DEPTH 281 m
ZERO DATUM G.L.
CASE DIAMETER 5 1/2"
CASING LENGTH 20
REMARKS SCALE: 1:500
350
APPENDIX D
5
0 Natural Gamma 20 150 Neutron 630
G.L.
Casing
25 m
50 m
75 m
100 m
125 m
150 m
175 m
200 m
225 m
281 m

K-SHELL - CORBIN - Middle Mtn. 81(3)A *1



CALIPER

NATURAL GAMMA

RESISTIVITY

DENSITY

DAVIES EXPLORATION LOGGING LTD.

COMPANY	Crows Nest Resources
HOLE NUMBER	RDH - MM - 3
LOCATION	Middle Mountain
PROVINCE	B.C.
ELEVATION	
LOG TYPE:	CALIPER, NATURAL GAMMA, RESISTIVITY, DENSITY
DATE	Aug. 22 1981
DRILLED DEPTH	100 m
LOGGED DEPTH	98 m
ZERO DATUM	G.L.
HOLE DIAMETER	5 1/8"
CASING LENGTH	nil
REMARKS:	SCALE: 1:200

350

APPENDIX D

6

DAVIES EXPLORATION LOGGING LTD.
COMPANY Crane Mtn. Resources
WELL NUMBER 3DH - 4 & 4A
LOCATION Middle Mountain
PROVINCE B.C.
ELEVATION
LOG TYPE CALIPER, NATURAL GAMMA, RESISTIVITY, DENSITY
DATE Aug. 22 1981
LOGGER DEPTH 227 m
LOGGED DEPTH 227 m
CASE DIAMETER 6¼"
CASE DEPTH 5 1/2"
DRAWING SCALE 1:200
350
CALIPER
NATURAL GAMMA
RESISTIVITY
DENSITY
G.L.
Casing
25 m
50 m
75 m
100 m
125 m
W.L.
150 m
175 m
200 m
227 m

K. Shell Canada Middle Keg River "A" 1

DAVIES EXPLORATION LOGGING LTD.

COMPANY Ocean Port Resources
WELL NUMBER HPR No. 4
LOCATION Middle Fontain
PROVINCE B.C.
ELEVATION

LOG TYPE: Natural Gamma & Neutron
DATE Dec. 23 1981
LOGGED DEPTH 227 m
LOGGED DEPTH 227 m
PROJECTION Grid
GRID LOCATION S. 1/8"
GRID LOCATION E. 2"
MARKER CYCLE = 1000

350

APPROVED

0 Natural Gamma 25 130 Neutron 650

0.0.

25 m

Mah.

50 m

75 m

100 m

125 m

150 m

175 m

200 m

227 m

APPENDIX E (PART 1)

1981 DRILL HOLE SUMMARIES

RDH-MM-1

DATE:	AUGUST 18/81
LOCATION:	MIDDLE MOUNTAIN, S.E. B.C.
DRILL COMPANY:	SPECIALIZED DRILLING SERVICES
DRILL TYPE:	IR-1700
HOLE DIAMETER:	13 cms (5 1/8")
ELEVATION (m):	1685.1 grd.; 1685.5 cas.
NORTHING:	5488139.55
EASTING:	669037.47
TOTAL DEPTH (m):	118
LOGS RUN:	CALIPER, NAT.GAM.,RES.,DENS.;NAT.GAM. AND NEUT.
DEPTH LOGGED (m):	117
LOGGER:	DAVIES EXPLORATION
COMMENTS:	

NO COAL INTERSECTIONS

APPENDIX E (PART 1)

1981 DRILL HOLE SUMMARIES

RDH-MM-2

DATE:	AUGUST 20/81
LOCATION:	MIDDLE MOUNTAIN, S.E. B.C.
DRILL COMPANY:	SPECIALIZED DRILLING SERVICES
DRILL TYPE:	IR-1700
ELEVATION (m):	1660.9 grd.; 1661.4 cas.
NORTHING:	5488058.22
EASTING:	668692.07
TOTAL DEPTH (m):	240
LOGS RUN:	CALIPER, NAT.GAM., RES.,DENS.;NAT.GAM. AND NEUT.
DEPTH LOGGED (m):	241
LOGGER:	DAVIES EXPLORATION
COMMENTS:	

NO COAL INTERSECTIONS

APPENDIX E (PART 1)

1981 DRILL HOLE SUMMARIES

RDH-MM-3

DATE:	AUGUST 22, 1981
LOCATION:	MIDDLE MOUNTAIN, S.E. B.C.
DRILL COMPANY:	SPECIALIZED DRILLING SERVICES
DRILL TYPE:	IR-1700
HOLE DIAMETER:	13 cms. (5 1/8")
ELEVATION (m):	1746.6 grd.
NORTHING:	5487799.41
EASTING:	669816.76
TOTAL DEPTH (m):	100
LOGS RUN:	CALIPER, NAT. GAM., RES., DENS.
DEPTH LOGGED (m):	98
LOGGER:	DAVIES EXPLORATION
COMMENTS:	

NO COAL INTERSECTIONS

APPENDIX E (PART 1)

1981 DRILL HOLE SUMMARIES

RDH-MM-4

DATE:	AUGUST 22, 1981
LOCATION:	MIDDLE MOUNTAIN, S.E. B.C.
DRILL COMPANY:	SPECIALIZED DRILLING SERVICES
DRILL TYPE:	IR-1700
HOLE DIAMETER:	13 cms (5 1/8")
ELEVATION (m):	1631.9 grd.
NORTHING:	5487701.34
EASTING:	668950.09
TOTAL DEPTH (m):	227
LOGS RUN:	CALIPER, NAT.GAM.,RES.,DENS.;NAT. GAM. AND NEUT.
DEPTH LOGGED (m):	227
LOGGER:	DAVIES EXPLORATION
COMMENTS:	

NO COAL INTERSECTIONS

350 K-SHELL - CORBIN - Middle Mtn 81C38A *1 (9)

Crows Nest Resources Limited

EXPLORATION

CORBIN-MIDDLE MOUNTAIN

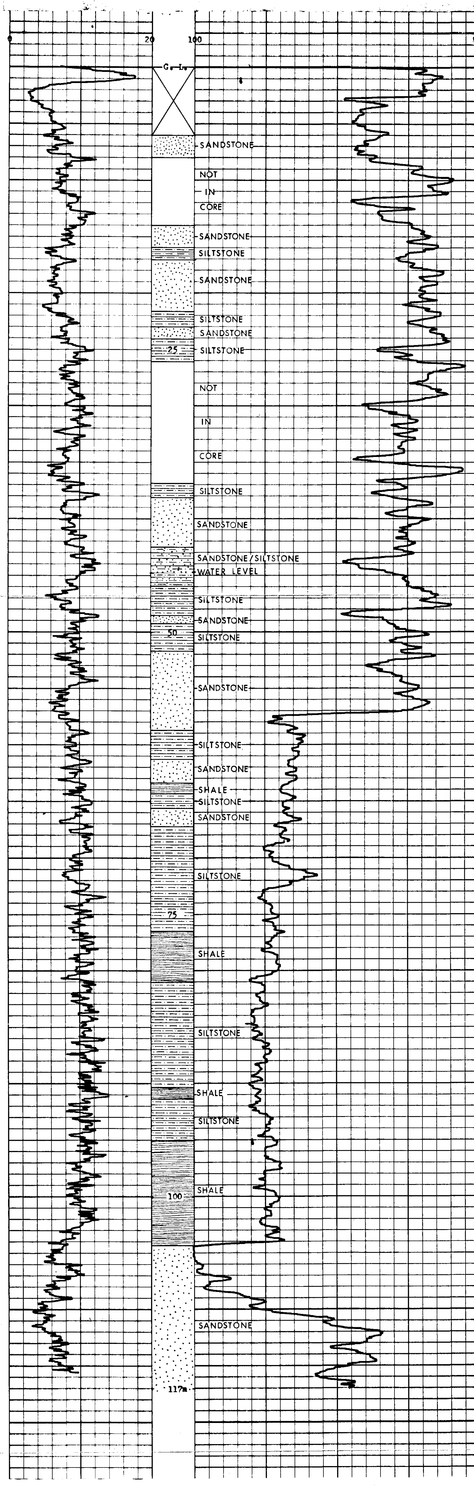
S.E. BRITISH COLUMBIA

DRILL HOLE STRATIGRAPHIC SECTION

AUTHOR: TERRY BELKE	SCALE: 1: 200	APPENDIX E (Part 2)
DATE: JANUARY, 1982	REVISED:	DRAWING No: HB-94A
To Accompany		

DAVIES EXPLORATION LOGGING LTD.

COMPANY	CROWSNEST RESOURCES LIMITED
HOLE NUMBER	BSH - MM - 1
LOCATION	Middle Mountain
PROVINCE	B. C.
ELEVATION	
LOG TYPE:	Natural Gamma & Neutron
DATE	Aug. 18, 1981
DRILLED DEPTH	216m
LOGGED DEPTH	117m
ZERO DATUM	G. L.
HOLE DIAMETER	5"
CASING LENGTH	25' - T.D. - Double wall pipe
REMARKS	



350

(10)

K-Middle Mtn 81(3)A *1

Crows Nest Resources Limited

EXPLORATION

CORBIN-MIDDLE MOUNTAIN

S.E. BRITISH COLUMBIA

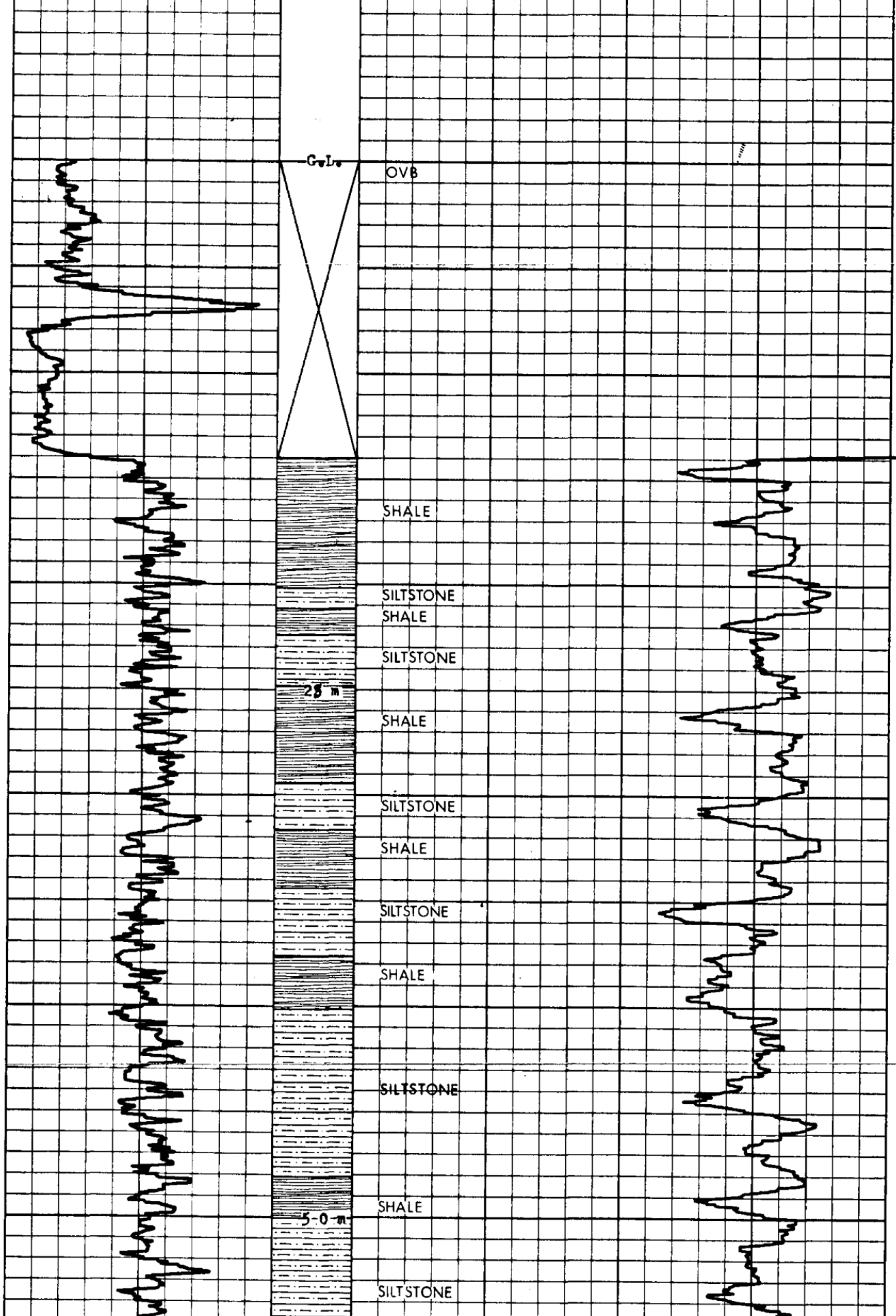
DRILL HOLE STRATIGRAPHIC SECTION

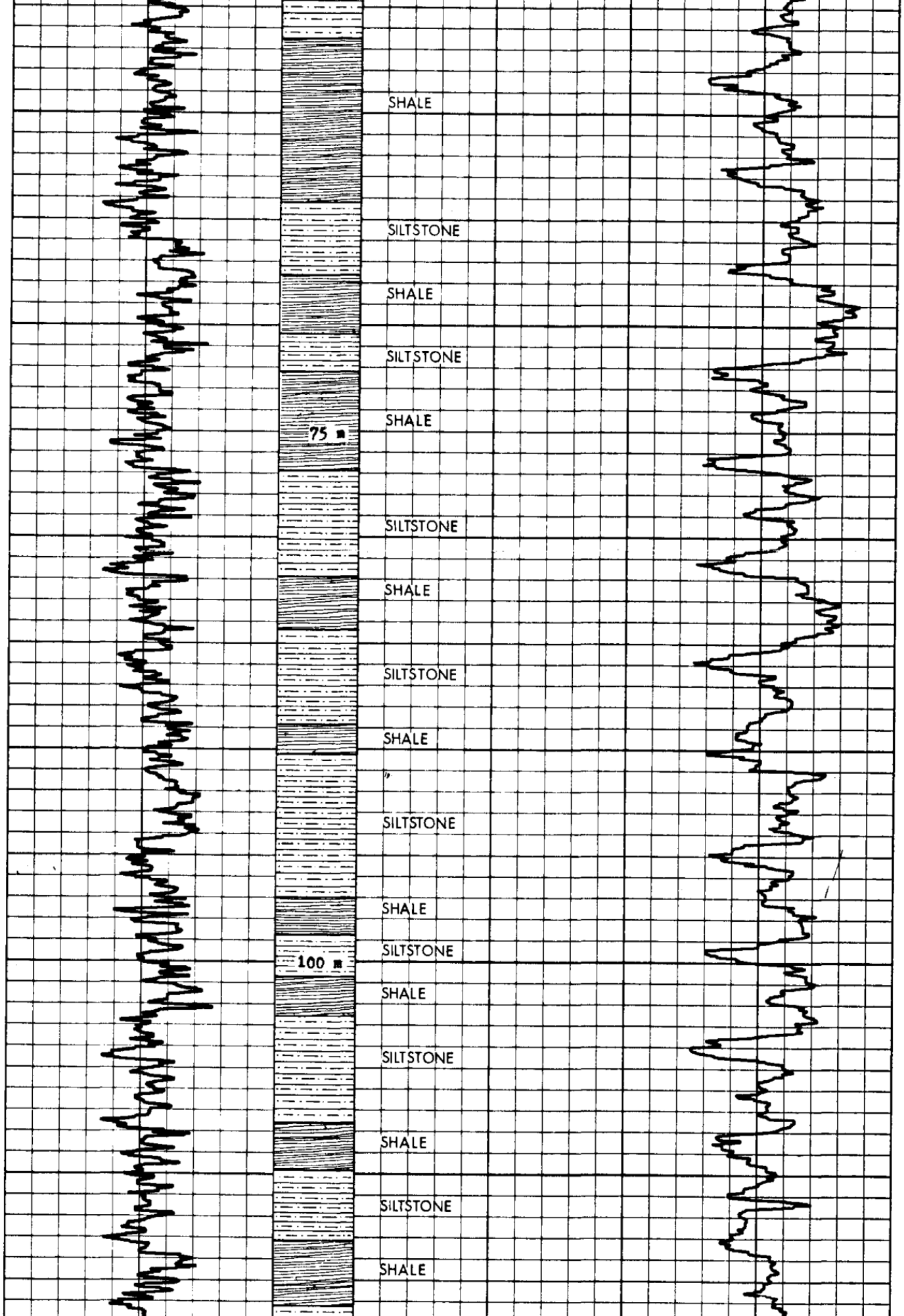
AUTHOR: TERRY BELKE	SCALE: 1: 200	APPENDIX E (Part 2)
DATE: JANUARY, 1982	REVISED:	DRAWING No: HB-94B
To Accompany		

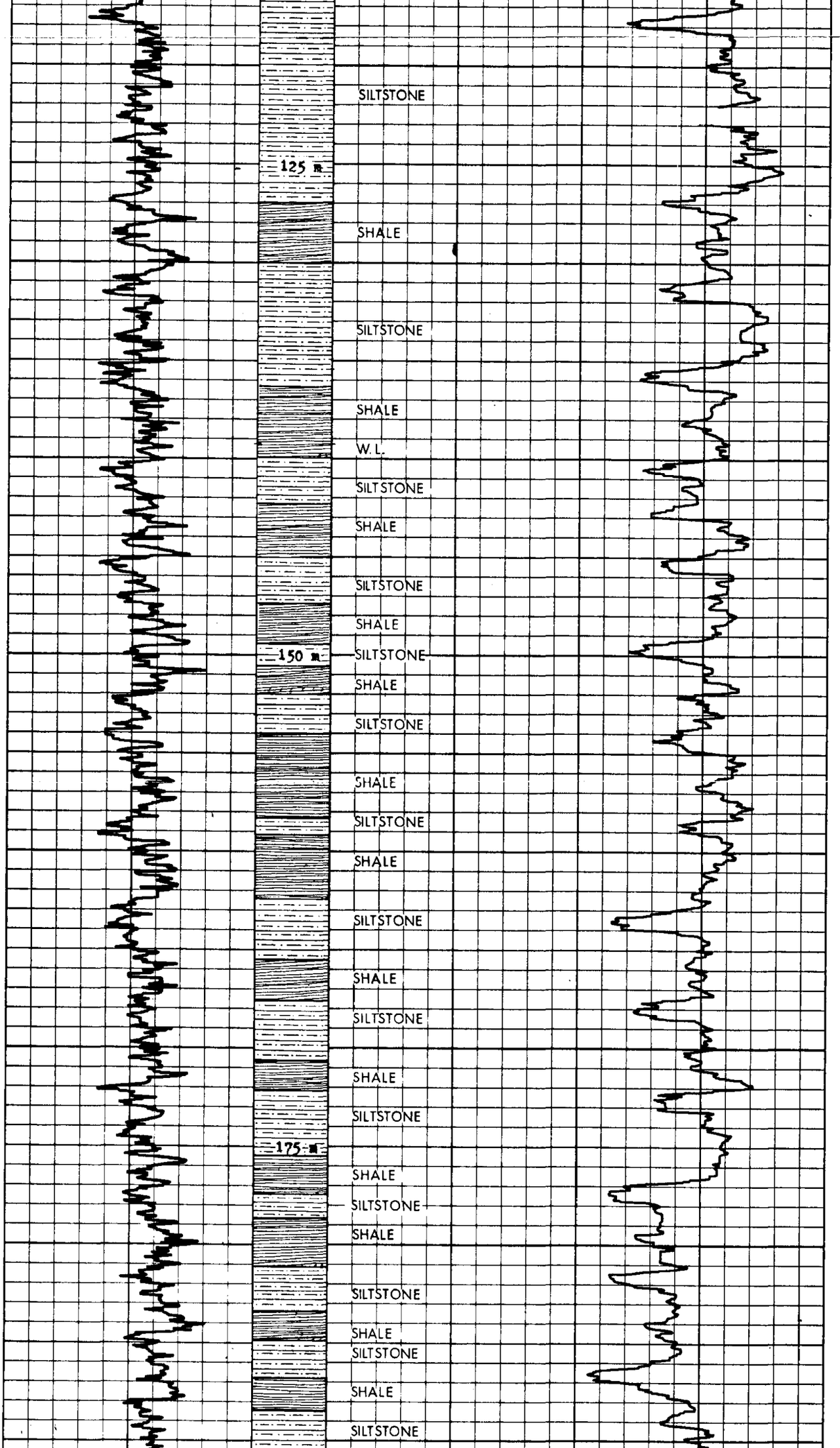
DAVIES EXPLORATION LOGGING LTD.

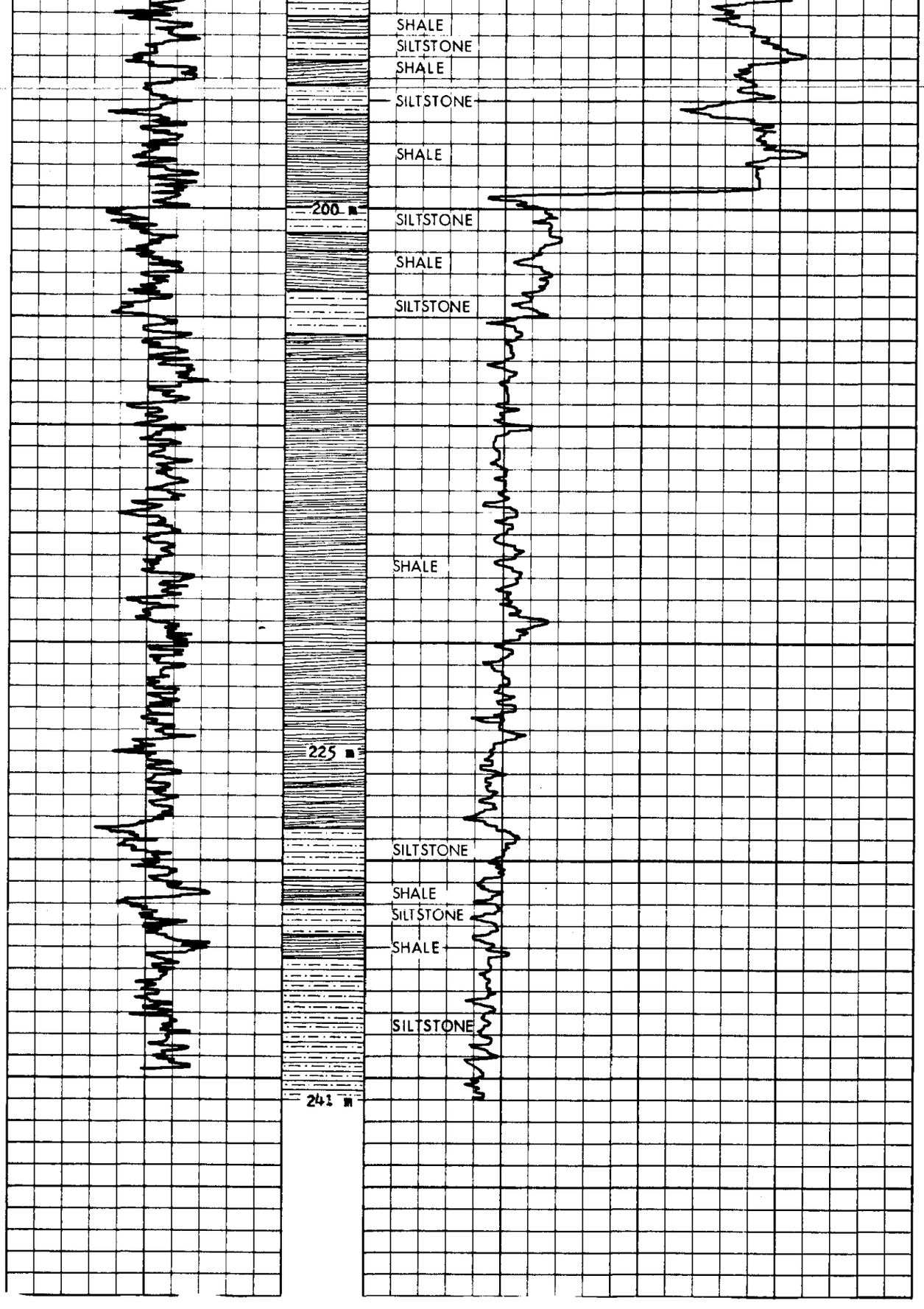
COMPANY	Crows Nest Resources
HOLE NUMBER	RDH - MM - 2
LOCATION	Middel Mountain
PROVINCE	B.C.
ELEVATION	
LOG TYPE:	Natural Gamma & Neutron
DATE	Aug.20 1981
DRILLED DEPTH	240 m
LOGGED DEPTH	241 m
ZERO DATUM	G.L.
HOLE DIAMETER	5 1/8"
CASING LENGTH	T.D.
REMARKS:	

0 Natural Gamma 20 130 Neutron 630


GeLe
OVB
SHALE
SILTSTONE
SHALE
SILTSTONE
28 m
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
50 m
SILTSTONE


SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
75 m
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
100 m
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE


SILTSTONE
125 m
SHALE
SILTSTONE
SHALE
W.L.
SILTSTONE
SHALE
SILTSTONE
SHALE
150 m
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
175 m
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE


SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
200 m
SILTSTONE
SHALE
SILTSTONE
SHALE
225 m
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
241 m

350

K - SHELL - CORBIN - Middle Mtn 81C/3E *1

(11)

Crows Nest Resources Limited

EXPLORATION

CORBIN-MIDDLE MOUNTAIN

S.E. BRITISH COLUMBIA

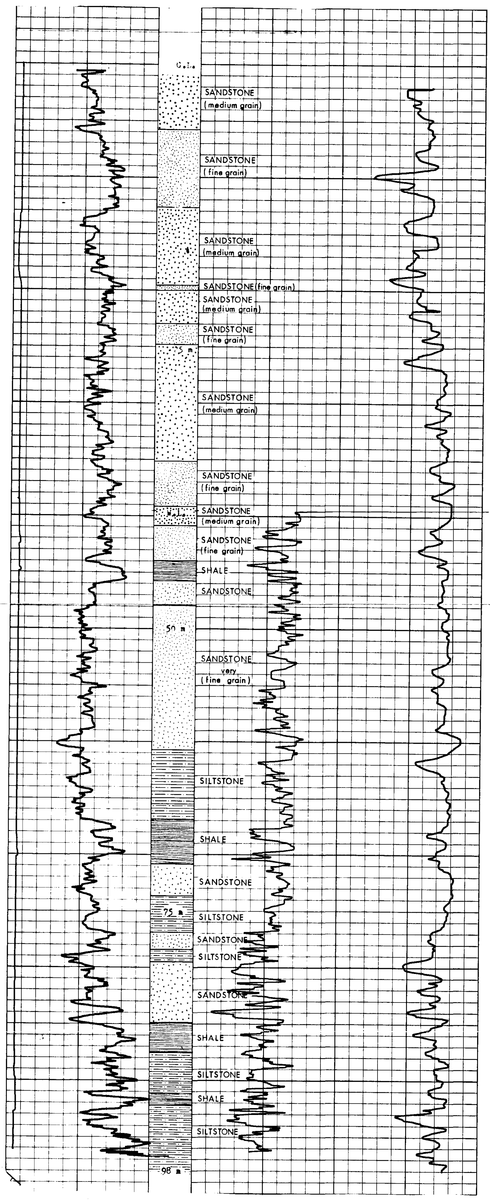
DRILL HOLE STRATIGRAPHIC SECTION

AUTHOR: TERRY BELKE	SCALE: 1: 200	APPENDIX E (Part 2)
DATE: JANUARY 1982	REVISED:	DRAWING No. HB-94C
To Accompany		

DAVIES EXPLORATION LOGGING LTD.

COMPANY: Crows Nest Resources
HOLE NUMBER: BDH - MM - 3
LOCATION: Middle Mountain
PROVINCE: B.C.
ELEVATION:
LOG TYPE: CALIPER, NATURAL GAMMA, RESISTIVITY, DENSITY
DATE: Aug. 22, 1981
DRILLED DEPTH: 100 m
LOGGED DEPTH: 98 m
ZERO DATUM: G.L.
HOLE DIAMETER: 5 1/8"
CASING LENGTH: Nil
REMARKS:

CALIPER | NATURAL GAMMA | RESISTIVITY | DENSITY



350

(12)

K-Middle Mtn 8(C3)A *1

Crows Nest Resources Limited

EXPLORATION

CORBIN-MIDDLE MOUNTAIN

S.E. BRITISH COLUMBIA

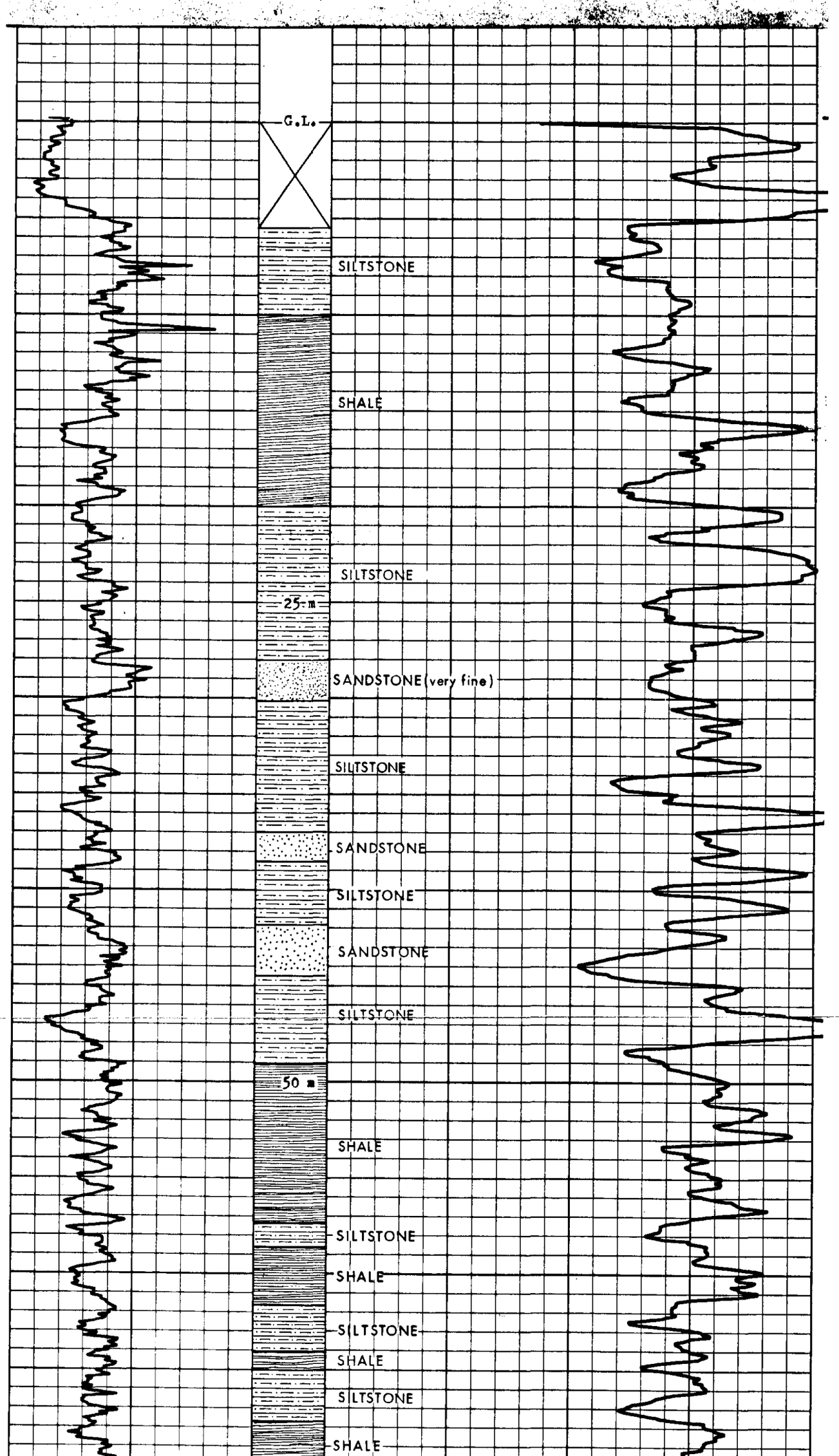
DRILL HOLE STRATIGRAPHIC SECTION

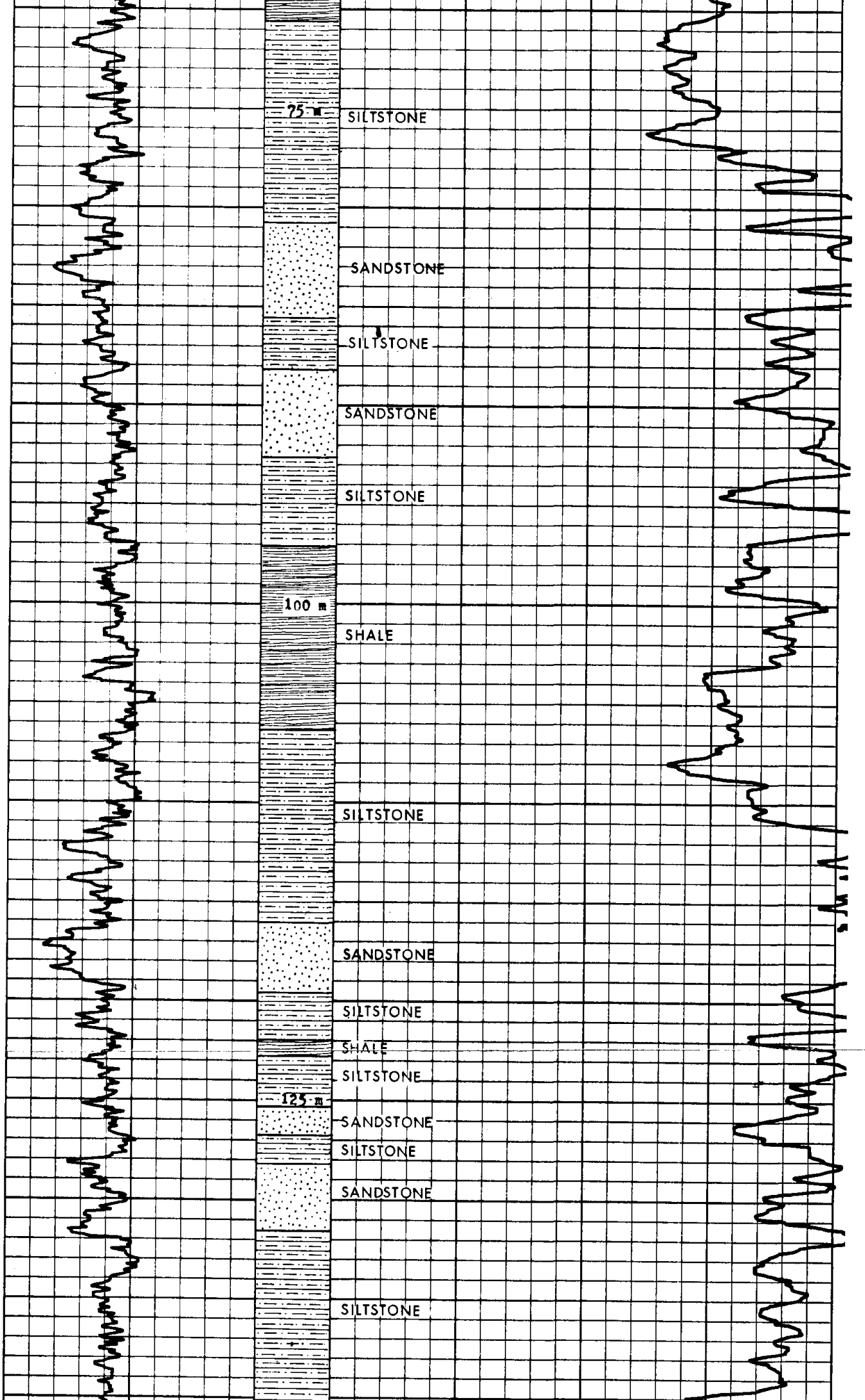
AUTHOR: TERRY BELKE	SCALE: 1:200	APPENDIX E (Part 2)
DATE: JANUARY 1982	REVISED:	DRAWING No: HB-94D
To Accompany		

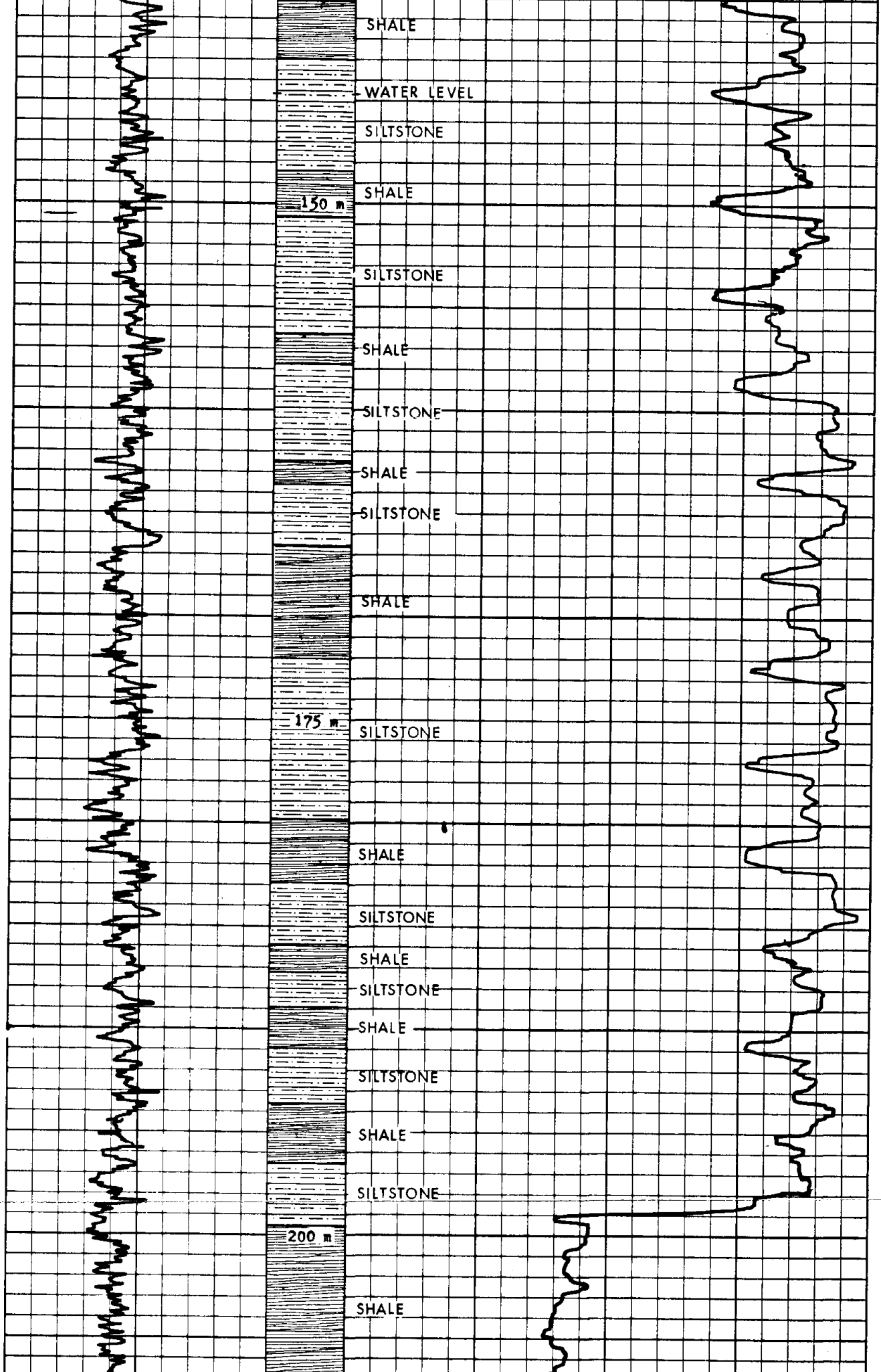
DAVIES EXPLORATION LOGGING LTD.

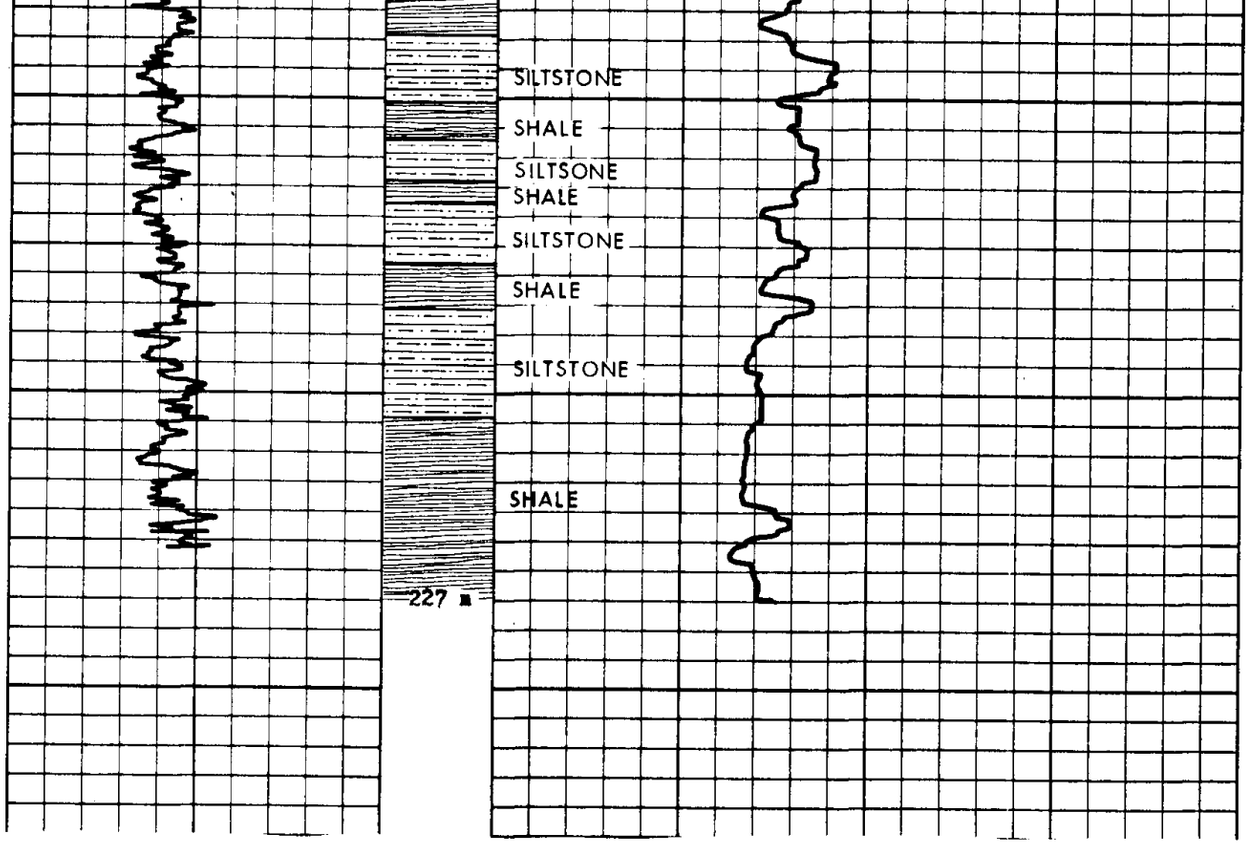
COMPANY	Crows Nest Resources
HOLE NUMBER	EDH - Mm - 4
LOCATION	Middle Mountain
PROVINCE	B.C.
ELEVATION	
LOG TYPE:	Natural Gamma & Neutron
DATE	Aug. 23 1981
DRILLED DEPTH	227 m
LOGGED DEPTH	227 m
ZERO DATUM	G.L.
HOLE DIAMETER	5 1/8"
CASING LENGTH	T.D.
REMARKS:	

0 Natural Gamma 25 130 Neutron 630


G.L.
SILTSTONE
SHALE
SILTSTONE
25 m
SANDSTONE (very fine)
SILTSTONE
SANDSTONE
SILTSTONE
SANDSTONE
SILTSTONE
50 m
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE


75 m
SILTSTONE
SANDSTONE
SILTSTONE
SANDSTONE
SILTSTONE
100 m
SHALE
SILTSTONE
SANDSTONE
SILTSTONE
SHALE
SILTSTONE
125 m
SANDSTONE
SILTSTONE
SANDSTONE
SILTSTONE


SHALE
WATER LEVEL
SILTSTONE
SHALE
150 m
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
175 m
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
SILTSTONE
200 m
SHALE


SILTSTONE
SHALE
SILTSONE
SHALE
SILTSTONE
SHALE
SILTSTONE
SHALE
227 m

APPENDIX F

1981 HAND TRENCHING SUMMARIES

Trench

Tm-80-4

Thickness (Metres)		Description	
2.4	-	Footwall black, carbonaceous, medium gr Ss (Moose Mountain)	094/35° S
1.5	-	COAL soft, dull, dirty, traces of claro-vitrain	
0.12	-	Shale, dark grey, carbonaceous	
0.44	-	COAL soft, dull	094/34° S
0.60	-	Shale, dark grey, carbonaceous	
0.61	-	COAL soft, dull	
0.33	-	Shale dark grey, carbonaceous	
3.87	-	COAL dull, vitrain bands, claro-vitrain, clean	090/36° S
1.02	-	COAL dull, crumbly	
1.25	-	COAL dull, dark grey carbonaceous shale lenses, shaly in places	
2.0	-	COAL dull, dirty, shaly in places, vitrain bands	

APPENDIX F - CONTINUED

1981 HAND TRENCHING SUMMARIES

Trench

TM-80-4 (continued)

Thickness (Metres)		Description	
1.86	-	Shaly COAL soft, dirty	095/35° S
5.45	-	COAL dull, soft, crumbly dirty, minor shale bands	
5.30	-	COAL dull, dirty, crumbly	
5.90	-	Shaly COAL dull, dirty, oxidized surfaces, thin shale beds	
0.30	-	Shale dark grey, carbonaceous	108/37° S
3.5	-	Coaly Shale	117/39° S
3.7	-	Shale, dark grey,	124/38° SW
4.50	-	Shaly COAL dull, dirty, soft, some vitrain bands	
3.90	-	Shaly COAL dull, dirty, soft, thin mudstone beds	
1.95	-	Shale dark grey, carbonaceous	
2.0	-	Shaly COAL, dull, soft	
2.6	-	Shale dark grey, carbonaceous, thin coal bands	
2.35	-	COAL, dull, dirty, soft	
0.7	-	Shale, medium grey, some deformation	137/45° SW
		lose exposure after this shale outcrop - take as hanging-wall	

APPENDIX F - CONTINUED

1981 HAND TRENCHING SUMMARIES

Trench

MM-81-1

Thickness (Metres)		Description
		footwall - medium grey, medium grained SS
		(Moose Mountain)
1.0	-	COAL, dull, soft, dirty
1.6	-	COAL, shiny, blocky, clean
1.85	-	COAL, shiny, blocky, dirty in places, claro-durain
	-	trench ends in coal
	-	no good surfaces for strike and dip were found
	-	bedding appears to be dipping steeply west

K-SHELL-CCKBIN - Middle Mtn 81(a)A *1

350

MEMORANDUM

DATE : JANUARY 26, 1982

T O : CROWS NEST RESOURCES LIMITED (C.N.R.L.)

FROM : SHELTECH CANADA

SUBJECT: MIDDLE MOUNTAIN (4151-L) - S.E. BRITISH COLUMBIA

All surveying done in the Middle Mountain area is based on the 1979 Doppler Satellite Control Stations "Quest" and "Pin".

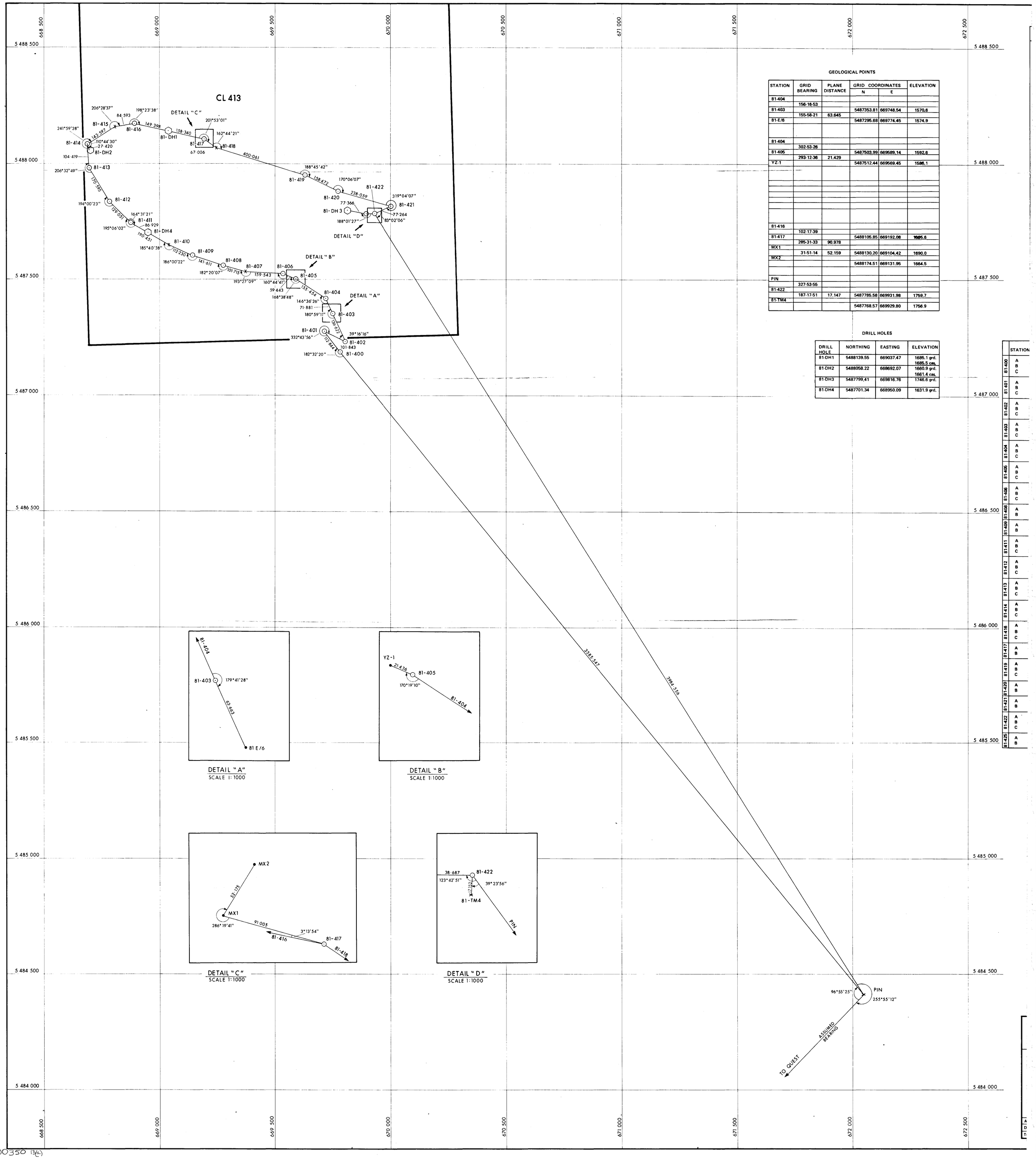
From these two stations a road traverse about 3.2 km. long and consisting of 23 traverse points was surveyed, including references at most of the points. Also 4 geological points were surveyed.

Conventional survey methods using both a 1" and 20" theodolites and electronic distance measuring equipment were used to obtain survey data. All calculations were done in the UTM system with distances being reduced to plane and bearings referenced to 117°W. The relative accuracy of the road traverse was better than 1/20,000. The results were given to C.N.R.L. personnel in both tabular and map form.

A. L. Melton

RB/cm

s665



DETAIL "A"
SCALE 1:1000

DETAIL "B"
SCALE 1:1000

DETAIL "C"
SCALE 1:1000

DETAIL "D"
SCALE 1:1000

GEOLOGICAL POINTS

STATION	GRID BEARING	PLANE DISTANCE	GRID COORDINATES N	GRID COORDINATES E	ELEVATION
81-404					
	156-16-53				
81-403			5487353.81	669748.54	1570.6
	155-58-21	63.645			
81-E/6			5487295.68	669774.45	1574.9
81-404					
	302-53-26				
81-405			5487503.99	669589.14	1592.6
	293-12-36	21.429			
YZ-1			5487512.44	669569.45	1586.1
81-416					
	102-17-39				
81-417			5488105.85	669192.08	1685.6
	285-31-33	90.978			
MX1					
	31-51-14	52.159	5488130.20	669104.42	1690.0
MX2					
			5488174.51	669131.95	1684.5
PIN					
	327-53-56				
81-422					
	187-17-51	17.147	5487785.58	669931.98	1759.7
81-TM4					
			5487768.57	669929.80	1756.9

DRILL HOLES

DRILL HOLE	NORTHING	EASTING	ELEVATION
81-DH1	5488139.55	669037.47	1685.1 grd. 1685.5 cas.
81-DH2	5488058.22	668692.07	1660.9 grd. 1661.4 cas.
81-DH3	5487799.41	669816.76	1746.6 grd.
81-DH4	5487701.34	668950.09	1631.9 grd.

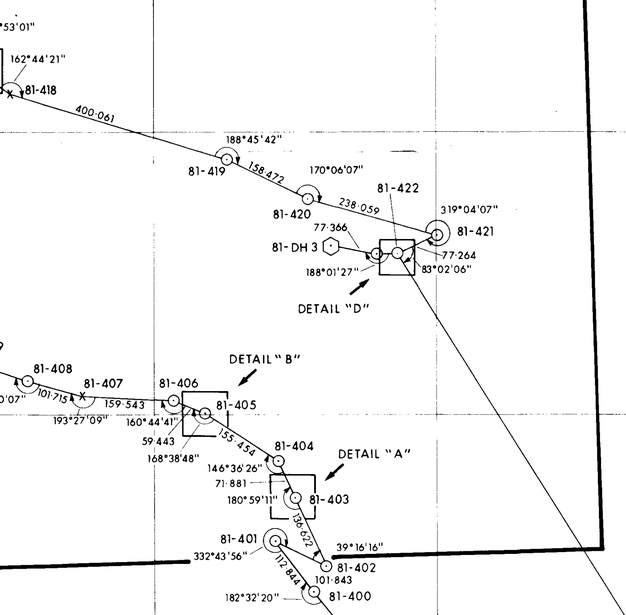
STATION	
81-400	A B C
81-401	A B C
81-402	A B C
81-403	A B C
81-404	A B C
81-405	A B C
81-406	A B C
81-408	A B
81-409	A B
81-411	A B C
81-412	A B C
81-413	A B C
81-414	A B C
81-416	A B C
81-417	A B
81-419	A B C
81-420	A B
81-421	A B
81-422	A B C
81-425	A B

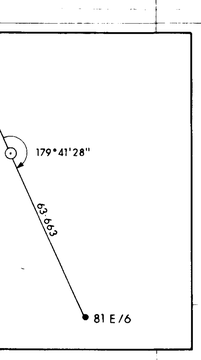
00350 13(c)

669 500 | 670 000 | 670 500 | 671 000 | 671 500 | 672 000 | 672 500

5 488 500 | 5 488 000 | 5 487 500 | 5 487 000 | 5 486 500 | 5 486 000 | 5 485 500 | 5 485 000 | 5 484 500 | 5 484 000

CL 413





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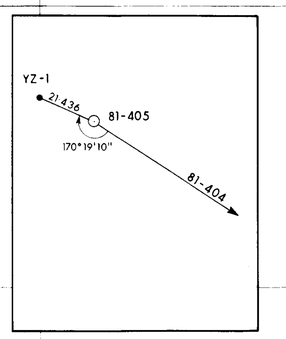
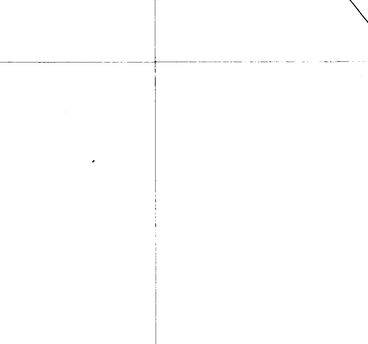
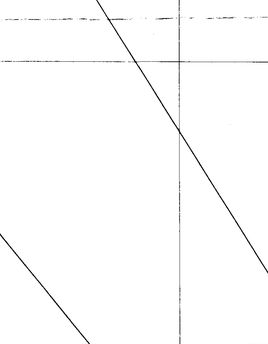
SCALE 1: 1000



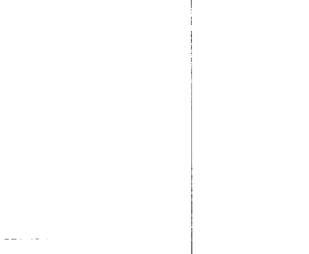
DETAIL "B"
SCALE 1:1000



DETAIL "C"
SCALE 1:1000



DETAIL "D"
SCALE 1:1000



GEOLOGICAL POINTS

STATION	GRID BEARING	PLANE DISTANCE	GRID COORDINATES N	GRID COORDINATES E	ELEVATION
81-404					
	156-16-53				
81-403			5487353.81	669748.54	1570.6
	155-58-21	63.645			
81-E/6			5487295.68	669774.45	1574.9
81-404					
	302-53-26				
81-405			5487503.99	669589.14	1592.6
	293-12-36	21.429			
YZ-1			5487512.44	669569.45	1586.1
81-416					
	102-17-39				
81-417			5488105.85	669192.08	1685.6
	285-31-33	90.978			
MX1					
	31-51-14	52.159	5488130.20	669104.42	1690.0
MX2					
			5488174.51	669131.95	1664.5
PIN					
	327-53-55				
81-422					
	187-17-51	17.147	5487785.58	669931.98	1759.7
81-TM4					
			5487768.57	669929.80	1756.9

DRILL HOLES

DRILL HOLE	NORTHING	EASTING	ELEVATION
81-DH1	5488139.55	669037.47	1685.1 grd. 1685.5 cas.
81-DH2	5488058.22	668692.07	1660.9 grd. 1661.4 cas.
81-DH3	5487799.41	669816.76	1746.6 grd.
81-DH4	5487701.34	668950.09	1631.9 grd.

ROAD TRAVERSE

STATION	GRID BEARING	PLANE DISTANCE	GRID COORDINATES N	GRID COORDINATES E	ELEVATION
QUEST					
	43-49-07				
PIN			5484411.23	672048.42	2272.91
	320-44-40	3584.327			
81-400			5487186.89	669780.33	1547.0
	323-17-07	112.810			
81-401			5487277.12	669712.89	1551.6
	116-01-11	101.812			
81-402			5487232.46	669804.38	1556.4
	335-17-34	133.582			
81-403			5487363.81	669748.54	1570.6
	336-16-53	71.859			
81-404			5487419.60	669719.64	1577.8
	302-53-26	155.408			
81-405			5487503.99	669589.14	1592.6
	291-32-22	59.425			
81-406			5487525.81	669533.87	1596.7
	272-17-10	159.496			
81-407			5487532.17	669374.50	1601.8
	285-44-27	101.684			
81-408			5487559.75	669276.63	1611.4
	288-04-41	141.569			
81-409			5487603.68	669142.05	1618.4
	294-05-11	112.196			
81-410			5487649.47	669039.82	1626.3
	299-45-56	190.394			
81-411			5487744.00	668874.35	1636.7
	314-52-06	129.012			
81-412			5487835.01	668782.91	1644.7
	328-52-37	170.544			
81-413			5487981.01	668694.76	1655.8
	355-25-33	104.388			
81-414			5488085.06	668686.44	1661.6
	57-25-09	143.554			
81-415			5488162.36	668807.40	1670.1
	83-53-53	84.567			
81-416			5488171.35	668891.49	1674.9
	102-17-39	307.645			
81-417			5488105.85	669192.08	1695.6
	124-10-47	66.986			
81-418			5488068.21	669247.49	1703.4
	106-55-16	399.941			
81-419			5487951.81	669630.12	1730.5
	115-41-05	158.425			
81-420			5487883.15	669772.89	1741.3
	105-47-20	237.988			
81-421			5487818.39	670001.90	1758.0
	244-51-34	77.241			
81-422			5487785.58	669931.98	1759.7

REFERENCES

	STATION	BEARING	DISTANCE	ELEVATION	DESCRIPTION	GRID COORDINATES N	GRID COORDINATES E
81-400	A	341-44-40	7.48		12" SPIKE IN GROUND	5487193.8	669778.0
	B	79-59-30	8.45		"	5487188.2	669788.7
	C	111-25-30	7.23	1547.1	"	5487184.1	669787.1
81-401	A	220-58-20	5.27		12" SPIKE IN GROUND	5487273.1	669709.4
	B	323-45-20	4.29		"	5487280.8	669710.4
	C	60-11-10	4.62	1552.4	"	5487279.4	669716.9
81-402	A	82-59-30	10.91		6" NAIL IN 5" POPLAR	5487233.8	669815.2
	B	118-13-40	9.31	1557.8	6" NAIL IN 8" POPLAR	5487228.1	669812.6
	C	199-08-10	8.85		6" NAIL IN 5" POPLAR	5487224.1	669801.5
81-403	A	338-24-34	8.57		6" NAIL IN 7" POPLAR	5487381.8	669745.4
	B	65-25-00	3.72	1572.3	6" NAIL IN 9" PINE	5487355.4	669751.9
	C	155-55-40	12.77		6" NAIL IN 8" POPLAR	5487342.2	669753.8
81-404	A	317-16-50	9.60	1579.1	6" NAIL IN 5" PINE	5487426.7	669713.1
	B	50-52-50	0.79		6" NAIL IN 7" PINE	5487420.1	669720.3
	C	131-30-10	4.47		6" NAIL IN 8" PINE	5487416.6	669723.0
81-405	A	137-17-30	1.89		12" SPIKE IN GROUND	5487502.6	669590.4
	B	329-30-00	3.08		"	5487506.6	669587.6
	C	31-28-20	2.60	1593.6	"	5487506.2	669590.5
81-406	A	297-44-40	3.49		12" SPIKE IN GROUND	5487526.7	669532.2
	B	18-31-20	2.68		"	5487528.4	669534.7
	C	78-30-00	3.91	1597.3	6" NAIL IN 7" PINE	5487526.6	669537.7
81-408	A	300-50-10	8.30		6" NAIL IN 10" PINE	5487564.0	669269.5
	B	7-55-50	7.90	1616.3	"	5487567.6	669277.7
81-409	A	125-53-15	10.805		6" NAIL IN 8" PINE	5487597.4	669150.8
	B	321-51-00	9.81	1620.1	6" NAIL IN 6" PINE	5487611.4	669136.0
81-411	A	121-08-30	12.19	1637.4	6" NAIL IN 6" PINE	5487737.7	668884.8
	B	305-41-40	14.19		6" NAIL IN 8" SPRUCE	5487752.3	668862.8
	C	40-21-35	9.92		6" NAIL IN 12" PINE	5487751.6	668880.8
81-412	A	320-10-00	5.82	1646.1	6" NAIL IN 8" PINE	5487839.5	668779.2
	B	39-35-40	12.02		6" NAIL IN 15" PINE	5487844.3	668790.6
	C	103-06-30	18.01		6" NAIL IN 12" PINE	5487830.9	668800.5
81-413	A	175-51-30	8.11		6" NAIL IN 6" FIR	5487972.9	668695.4
	B	59-29-50	8.37	1667.5	6" NAIL IN 14" PINE	5487985.3	668702.0
	C	124-31-38	14.43		6" NAIL IN 6" FIR	5487972.8	668706.7
81-414	A	179-08-30	17.02		6" NAIL IN 10" FIR	5388068.0	668686.7
	B	345-02-30	6.31		6" NAIL IN 10" FIR	5388091.2	668684.8
	C	41-37-20	6.26	1662.8	6" NAIL IN 10" FIR	5388089.7	668690.6
81-416	A	287-42-00	15.07	1675.3	6" NAIL IN 8" FIR	5488175.9	668877.1
	B	66-28-20	5.47		6" NAIL IN 10" FIR	5488173.5	668896.5
	C	167-39-20	11.67		6" NAIL IN 8" FIR	5488160.0	668894.0
81-417	A	264-42-00	15.95		6" NAIL IN 8" FIR	5488104.4	669176.2
	B	310-09-10	14.10	1694.7	6" NAIL IN 6" FIR	5488114.9	669181.3
81-419	A	341-03-20	5.61	1730.9	6" NAIL IN FIR	5487957.1	669628.3
	B	152-58-30	20.88		6" NAIL IN FIR	5487933.2	669639.6
	C	247-18-10	14.34		6" NAIL IN FIR	5487945.3	669616.9
81-420	A	24-53-45	14.08		6" NAIL IN 6" FIR	5487895.9	669778.8
	B	148-14-30	2.84	1742.5	6" NAIL IN 6" POPLAR	5487880.7	669774.4
81-421	A	139-29-00	11.66	1759.6	6" NAIL IN 10" FIR	5487809.5	670009.5
	B	173-56-30	14.08		6" NAIL IN 10" FIR	5387804.4	670003.4
81-422	A	247-54-50	2.29	1760.8	6" NAIL IN 8" SPRUCE	5487785.1	669929.7
	B	347-44-50	9.10	1760.7	6" NAIL IN 8" SPRUCE	5487794.5	669930.1
	C	53-56-00	6.49		6" NAIL IN 8" SPRUCE	5487789.4	669937.2
81-425	A	143-09-10	9.20		6" NAIL IN 8" SPRUCE	5487779.1	669898.8
	B	196-47-30	11.52	1755.9	6" NAIL IN 6" SPRUCE	5487775.4	669889.7

LEGEND

- 6" NAIL
- X 12" SPIKE
- ⊙ 3' IRON REBAR WITH CAP
- CNRL CONTROL POINT
- DRILL HOLE
- COAL LICENCE BOUNDARY (approximate)

ALL ANGLES AND HORIZONTAL DISTANCES SHOWN ON MAP ARE ACTUAL FIELD MEASUREMENTS

UNLESS OTHERWISE NOTED ALL DISTANCES SHOWN IN TABULAR FORM HAVE BEEN REDUCED TO THE UTM PLANE AND ARE IN METRES AND DECIMALS THEREOF

ALL BEARINGS SHOWN IN TABULAR FORM ARE GRID AND REFERRED TO 117° W MERIDIAN

SURVEY PERFORMED BY Sheltech Canada, 1981

GN

100 50 0 100 200 300 400 500

SCALE 1 : 5000

350

13(b)

Crows Nest Resources Limited
EXPLORATION

CORBIN-MIDDLE MOUNTAIN
S.E B.C.

TRAVERSE SURVEY MAP

K - SHELL - CORBIN - Middle Mtn 81(2)A *1

AUTHOR: SHELTECH	SCALE: 1:5000	APPENDIX G
DATE: 81 07 22	REVISED:	DRAWING No: HI-93E
To Accompany		

114° 40' 15"

114° 39' 00"

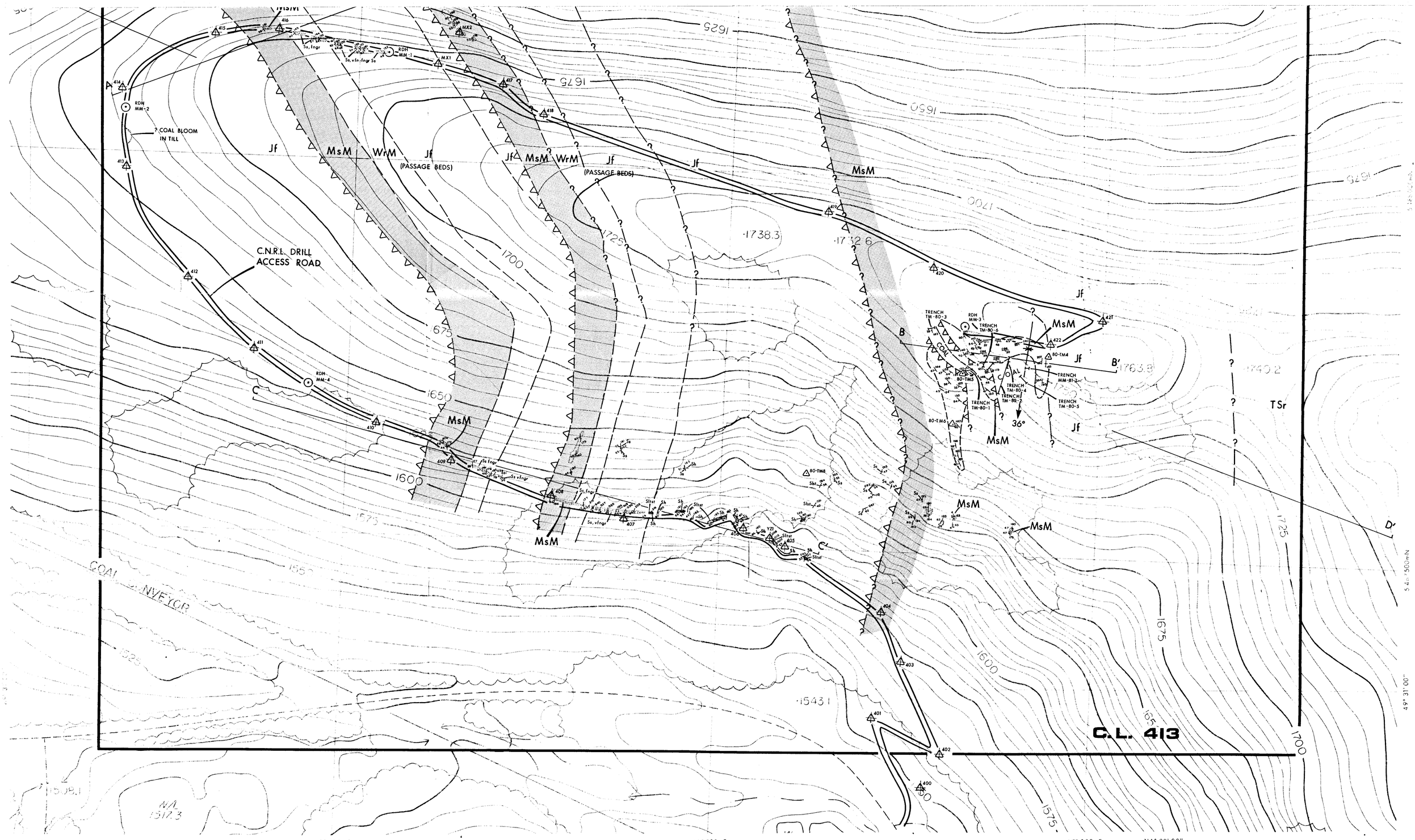
49° 31' 45"

5 426 500 mN

1550
1625
1650
1675
1575
1525
1500
1600
1700
1725
1750
1775
1800
1825

W
965
1501.8
1508.3
1738.3
1732.6

MsM
WrM
Jf
(PASSAGE BEDS)
MX1
MX2
RDH MM-1
RDH MM-2
Ss, fngr
Ss, v fn fngr Ss
? COAL BLOOM IN TILL
C.N.R.L. DRILL ACCESS ROAD
A
A'
D
412
413
414
415
416
417
418
419
420



MAP INDEX AND AERIAL PHOTO INDEX

82 G/10

L K J I
E F G H
D C B A
NW NE SW SE

G.N.
T.N.

REFERENCE

MAIN ROAD	RIVER, LAKE
SECONDARY ROAD	INTERMITTENT RIVER
TRACK OR TRAIL	TREED AREA
RAILWAY	LIP OF CUT
HEDGE FENCE	INCH WIDE TRACES
BRIDGE CULVERT	CONTOUR INTERVAL
CUT FILE	DEPRESSION
SWAMP	SPOT HEIGHT
DRILL HOLE	CONTROL POINT

MAP PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
CENTRAL MERIDIAN REFERENCE 117 W

0 10 20 30 40 50 100 150 200 Metres

SCALE 1:2000

CONTOUR INTERVAL : 5 METRES

GEOLOGICAL LEGEND

Lithology

- Shale (Sh)
- Siltstone (Slst)
- Sandstone (ss)
- Coal

Structure

- Syncline, Anticline
- Strike and Dip (Right Hand Rule)
- Jointing
- Cz Confused Zone
- Fault (approximate)
- Fault (inferred)

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

- Geological boundary (approximate)
- Geological boundary (inferred)

350
14(a)

Crows Nest Resources Limited
EXPLORATION

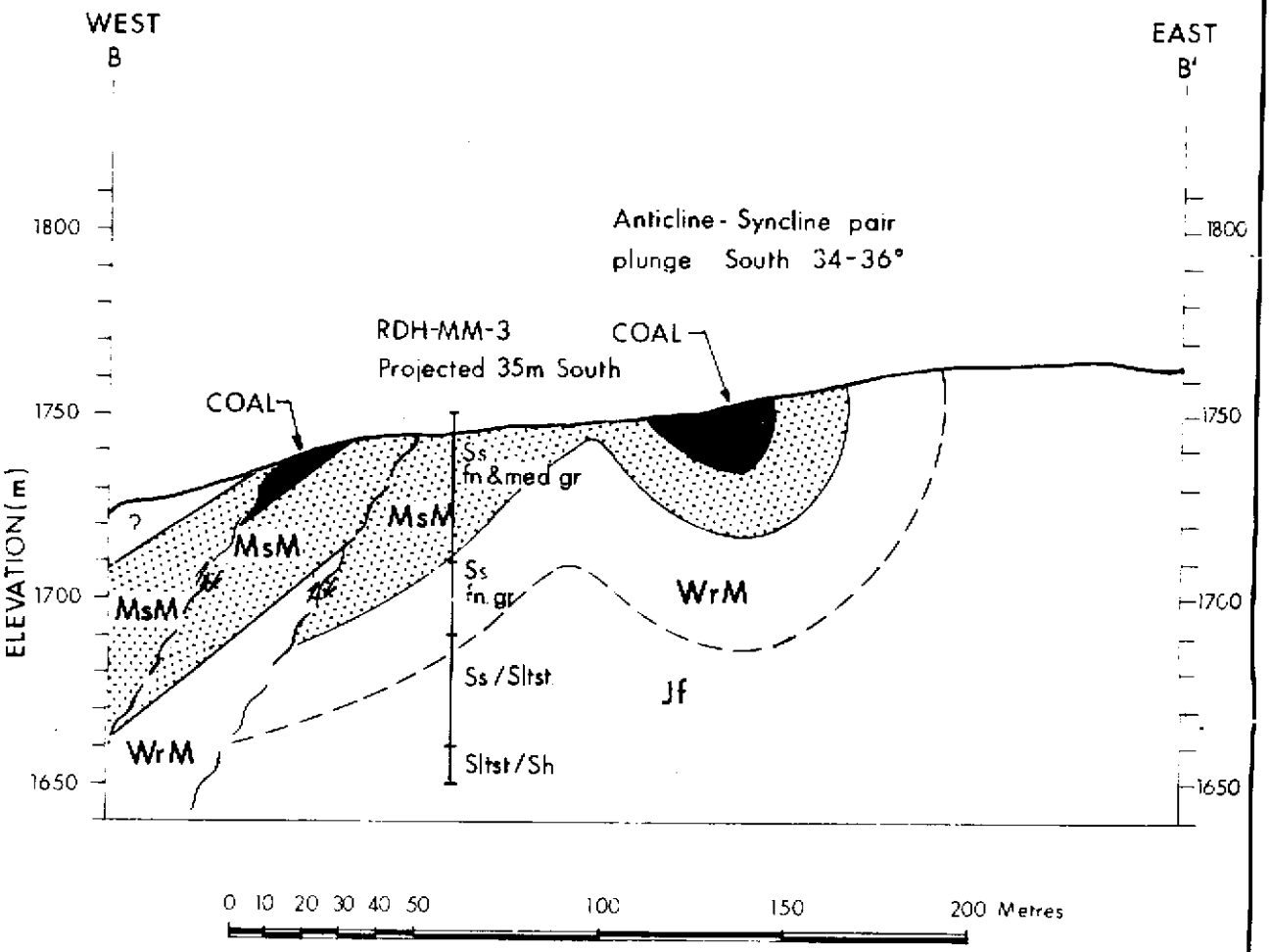
CORBIN - MIDDLE MOUNTAIN
S.E. BRITISH COLUMBIA

1981 GEOLOGICAL MAP

N.T.S. 82/G/10 ZONE 11

AUTHOR: BELKE-GILMAR	SCALE: 1:2 000	APPENDIX H
DATE: JAN. 1982	REVISED:	DRAWING No: HI-93F
To Accompany		

K-SHELL-CORBIN-Middle Mtn 81G2/8 #1



SCALE 1:2000

CONTOUR INTERVAL : 5 METRES

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

Coal

Geological Contact - defined, approx., inferred

Thrust Fault (arrow represents direction of thrusting)

K-SHELL-CORBIN-Middle Mtn 81(2)*A *1

Crows Nest Resources Limited
EXPLORATION

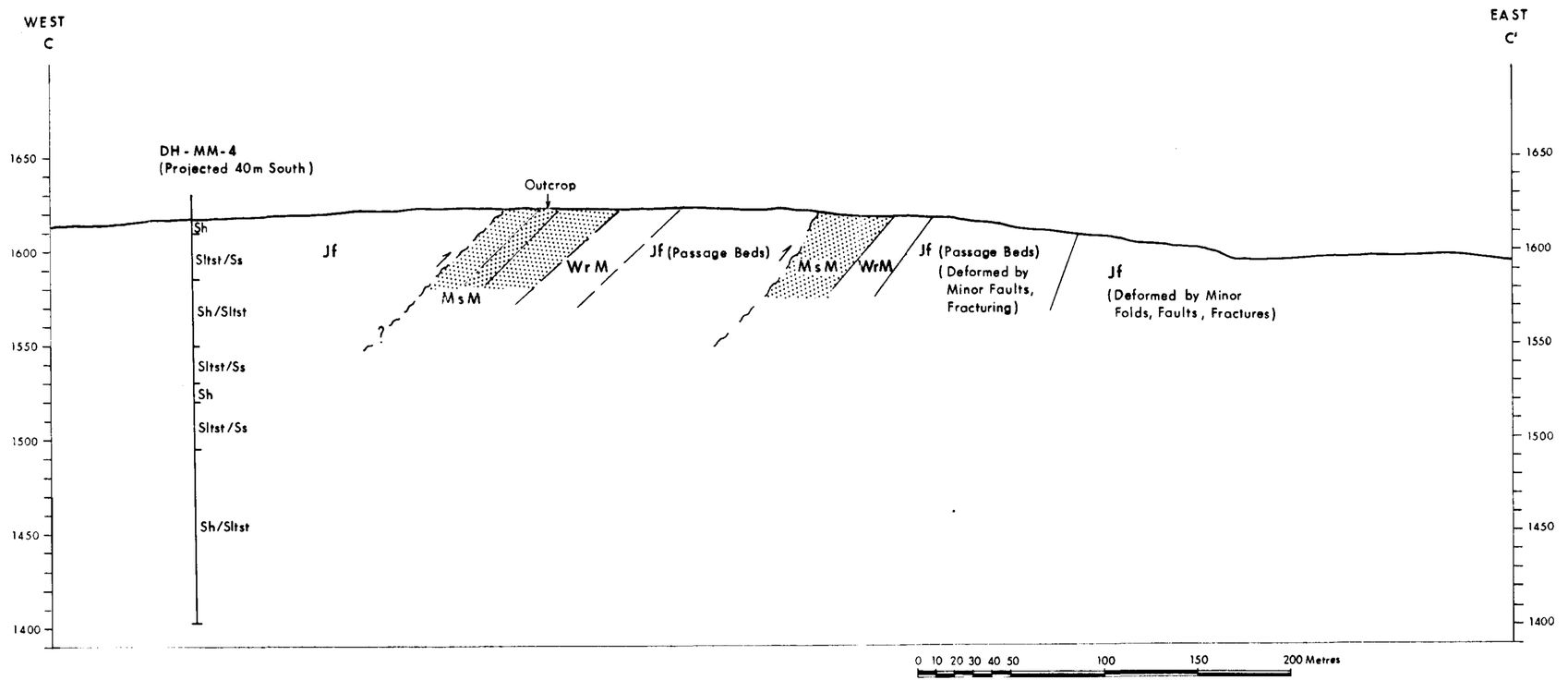
CORBIN – MIDDLE MOUNTAIN
S.E. BRITISH COLUMBIA

CROSS SECTION B–B'

APPENDIX I

FIGURE 11-93B

350



SCALE 1:2000

CONTOUR INTERVAL : 5 METRES

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 (arrow represents direction of thrusting)

K-SHELL CORBIN-Middle 81(2)A #1

Crows Nest Resources Limited
EXPLORATION

CORBIN-MIDDLE MOUNTAIN
S.E. BRITISH COLUMBIA

CROSS SECTION C-C'

(15)

APPENDIX I

AUTHOR: BELKE-GILMAR	SCALE: 1:2000	DRAWING No: HI-93C
DATE: JAN. 1982	REVISED:	
To Accompany		

350

SW
A

NE
A'

RDH-MM-2
Projected North 20m

Thrust trace
(Assumed)

RDH-MM-1
Projected North 72m
along strike 160°

Thrust Trace
(Assumed)

1700
1650
1600
1550
1500
1450
1400

Sh
Sltst/Sh
Sltst
Sltst/Sh
Sltst/Sh
Sltst/Sh
Sltst /Sh
Sh
Sltst/Sh

Jf
Sltst/Sh

MsM
WrM

Jf
(Passage Beds)
Ss/Sltst

Ss/Sltst Sltst/Sh
SHALE
MsM
WrM
Jf
(Passage Beds)

1700
1750
1600
1650
1500
1550
1400

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 (arrow represents direction of thrusting)

0 10 20 30 40 50 100 150 200 Metres

SCALE 1:2000

CONTOUR INTERVAL : 5 METRES

350

R-SHELL-CORBIN-Middle Mtn 81(2)A 1

Crows Nest Resources Limited
EXPLORATION

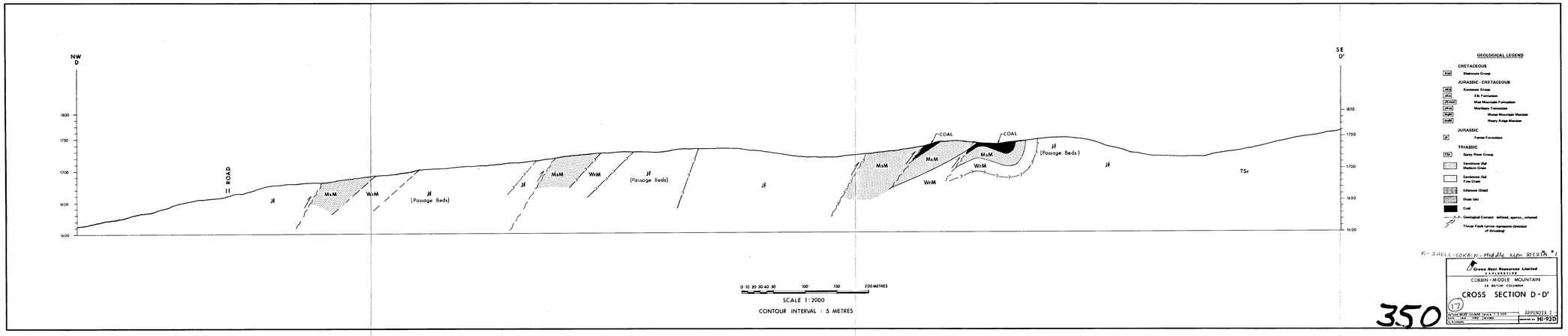
CORBIN - MIDDLE MOUNTAIN
SE. BRITISH COLUMBIA

CROSS SECTION A-A'

(16)

APPENDIX I

AUTHOR: BELKE-GILMAR		SCALE: 1:2 000	
DATE: JAN 1982	REVISED:		DRAWING No. HI-93A
To Accompany			



K-SHELL-COAL-FI-Middle Mtn SILSTN *1

Crows Nest Resources Limited
EXPLORATION
CORBIN - MIDDLE MOUNTAIN
SE BRITISH COLUMBIA
CROSS SECTION D - D'
(17)
APPENDIX I
Figure No. NI-920

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