K-SHELL-HARVEY CR. 78(1)A

APPENDIX I AND II INCL.

GEOLOGICAL ASSESSMENT
OF THE
HARVEY CREEK PROJECT

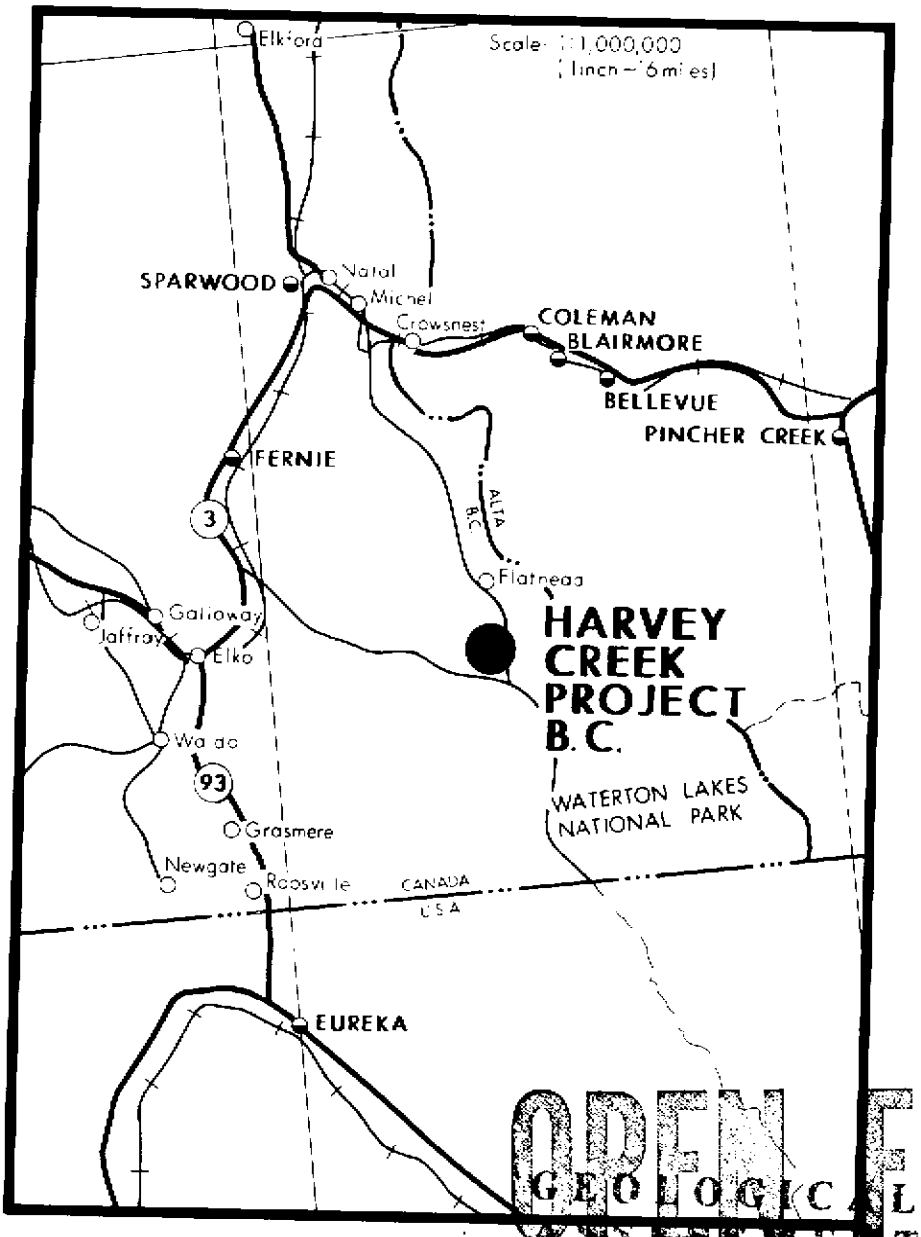
by J. HARKONEN
D. FIETZ

CROWS NEST RESOURCES LIMITED
SHELL CANADA RESOURCES LIMITED

Report on Coal Licences
588 to 594 Inclusive

and

4090 to 4103 Inclusive



HARVEY CREEK PROJECT

KOOTENAY DISTRICT B.C.

PROFESSIONAL VERIFICATION OF REPORT

Entitled: Geological Assesment of the
Harvey Creek Project
Coal Licences Nos. 588 to 594
inclusive and 4090 to 4103 inclusive

SOUTHEASTERN BRITISH COLUMBIA, 1978

Mr. Jaro Horachek planned and carried out the geological field program of Shell Canada Resources Ltd. and Crows Nest Resources Ltd. - 1978 Harvey Creek Project, and prepared this report under the general supervision of the undersigned.

Jaro Horachek, M.Sc., graduated in Geological Engineering from the Mining University of Ostrava, Cechoslovakia in 1969. Mr. Horachek is a member, as a Professional Engineer, of the Association of Professional Engineers, Geologists and Geophysicists of Alberta. His experience in Western Canada coal exploration since 1970 includes positions with:

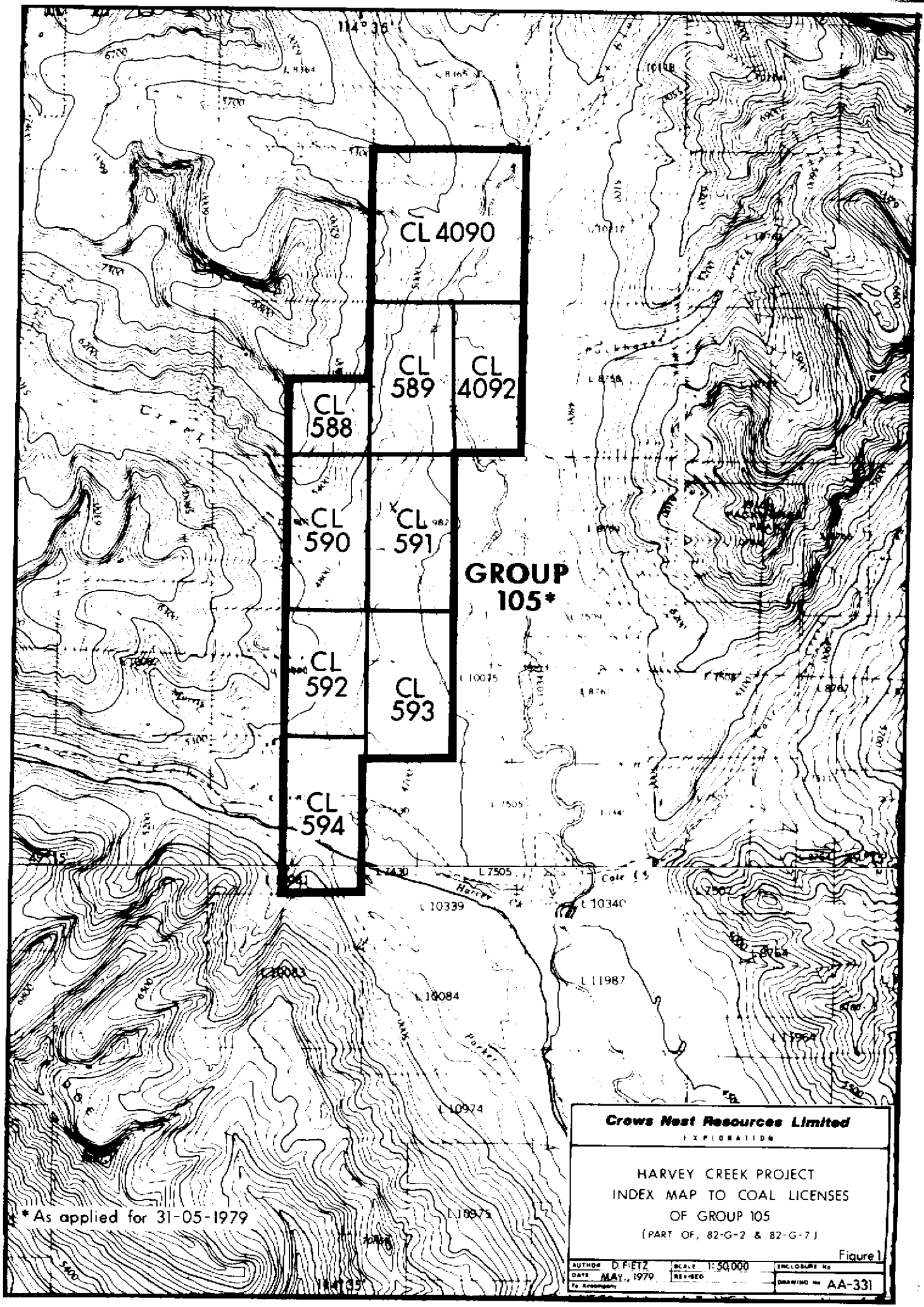
- Scurry Rainbow Oil Ltd., Calgary, Alberta
- Energy Resources Conservation Board, Calgary, Alberta
- Shell Canada Resources Ltd., Calgary, Alberta
- Crows Nest Resources Ltd., Calgary, Alberta

He currently holds the position of Staff Geologist for Crows Nest Resources Ltd.

I consider Jaro Horachek to be well qualified to undertake the responsibilities he was assigned on this project. I am satisfied that the attached report dated May, 1979 has been competently prepared and justly represents the information obtained from this project.

June 18, 1979

J. J. Crabb, P.Eng.


CL 4090
CL 589
CL 4092
CL 588
CL 590
CL 591
CL 592
CL 593
CL 594
GROUP 105*
114° 36'
49° 15'
L 7505
L 10339
L 10340
L 10084
L 10974
L 10975
L 11987
Harvey Ck
Cole Ck
Parker Ck
* As applied for 31-05-1979
Crows Nest Resources Limited
EXPLORATION
HARVEY CREEK PROJECT
INDEX MAP TO COAL LICENSES
OF GROUP 105
(PART OF, 82-G-2 & 82-G-7)
Figure 1
AUTHOR D. FIETZ
DATE MAY., 1979
SCALE 1:50,000
REVISED
ENCLOSURE No.
DRAWING No. AA-331

ADDENDUM

LAND TENURE

REF: GEOLOGICAL ASSESSMENT OF THE HARVEY CREEK PROJECT;
SECTION 11: CONCLUSIONS AND RECOMMENDATIONS.

Licences originally issued 03-06-1975 form Group 105 and are to be retained. Of the licenses issued 04-07-1978, only Coal License Nos. 4090 and 4092 will be kept. Application has been made (31-05-1979) to include Coal License Nos. 4090 and 4092 into Group 105.

Group 105, as revamped, includes nine (9) licenses encompassing 1215 hectares or 3004 acres (See Table 1 and Figure 1).

04-06-79 DWF

TABLE 1

SUBJECT: COAL LICENSES

AREA: HARVEY CREEK, B.C.

GROUP: 105

LICENSEE: SHELL CANADA RESOURCES LIMITED

DATE: 31-05-1979

LICENCE NO.	DATE	DESCRIPTION	HECTARES ±	ACRES ±
588	June 3, 1975	SE 1/4 LOT 10078	65	161
589	June 3, 1975	W 1/2 LOT 10077	130	321
590	June 3, 1975	E 1/2 LOT 10079	130	321
591	June 3, 1975	W 1/2 LOT 9876	135	334
592	June 3, 1975	E 1/2 LOT 10080	108	269
593	June 3, 1975	W 1/2 LOT 10075	128	316
594	June 3, 1975	E 1/2 LOT 10081	130	321
4090	August 4, 1978	LOT 8363	259	640
4092	August 4, 1978	E 1/2 LOT 10077	130	321
9 licences			1215 ± hectares	3004 ± acres

GEOLOGICAL ASSESSMENT OF THE HARVEY CREEK PROJECT

COAL LICENSES NO.'S 588 to 594 INCLUSIVE
and 4090 to 4103 INCLUSIVE

KOOTENAY DISTRICT
MAP REFERENCE: 82G2 & 82G7

49^{o} 15' to 49^{o} 19' NORTHERN LATITUDE
114^{o} 32' to 114^{o} 36' WESTERN LONGITUDE

CROWS NEST RESOURCES LIMITED

SHELL CANADA RESOURCES LIMITED

CALGARY, ALBERTA

AUTHORS: J. Horachek, P. Eng
D. Fietz, C.E.T.

EXPLORATION PERIOD: August and September, 1978

REPORT DATE: MAY, 1979

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LIST OF ENCLOSURES

* contained in accompanying map tube

SUMMARY

The Harvey Creek Project, covering some 2965 hectares, encompasses coal licences 588 to 594 and 4090 to 4103 inclusive. The "500 - series" licenses have been held by Crows Nest Industries Limited (C.N.I.) since 1975 and were subsequently transferred to Shell Canada Resources Limited; the "4000 - series" licenses were issued to Shell Canada Resources Limited in August, 1978. Crows Nest Resources Limited, a Shell Canada Resources Limited subsidiary, executed a small exploration program during the summer of 1978. One core hole was drilled; coal seams were sampled. In addition one backhoe trench was excavated in the vicinity of Shepp Creek.

Interpreted exploration data indicate that the Coal-Bearing Member of the Kootenay Formation is 160 meters thick and contains eight coal seams. Four seams range in thickness from 2.2 to 13.7 m, their aggregate thickness is 23.0 m.

The overall dip of coal measures is 55° to the east. Because of the steep dip of the strata and relatively low topographic relief along the subcrop of the Kootenay Formation potential coal reserves are mainly underground. Raw, in-place reserves have been calculated to be 110 million tonnes. Surface mineable reserves of clean coal, at a 2:1 stripping ratio, total 6.2 million tonnes.

Of the coal seams sampled, one is a high volatile bituminous coal; the balance are medium volatile bituminous coals. Overall quality of clean coal follows:

Ash = 8.9%, VM = 26.7%, FSI = 2.5; the average yield, at a 1.5 Float, is 52%.

The total 1978 exploration expenditure including geodetic survey was $82,132.

No further exploration is recommended on the property until a townsite and railway line are constructed for the development of the major coal reserve of the Flathead Basin, the Sage Creek Project currently held by Rio Tinto Exploration Limited and Pan Ocean Oil Ltd. The Sage Creek property is located some 15 km south of the Harvey Creek Project area.

1 INTRODUCTION

1.1 LICENSES

During June of 1975, coal licenses, numbered 588 to 594 inclusive, were issued to Crows Nest Industries Limited (C.N.I.) of Fernie, British Columbia. In January, 1976, these licenses were assigned to C.N.I.'s wholly owned subsidiary, The Crows Nest Pass Oil and Gas Company Limited.

Shell Canada Resources Limited, in February, 1978, acquired C.N.I. The noted licenses have since been transferred to Shell Canada Resources Limited.

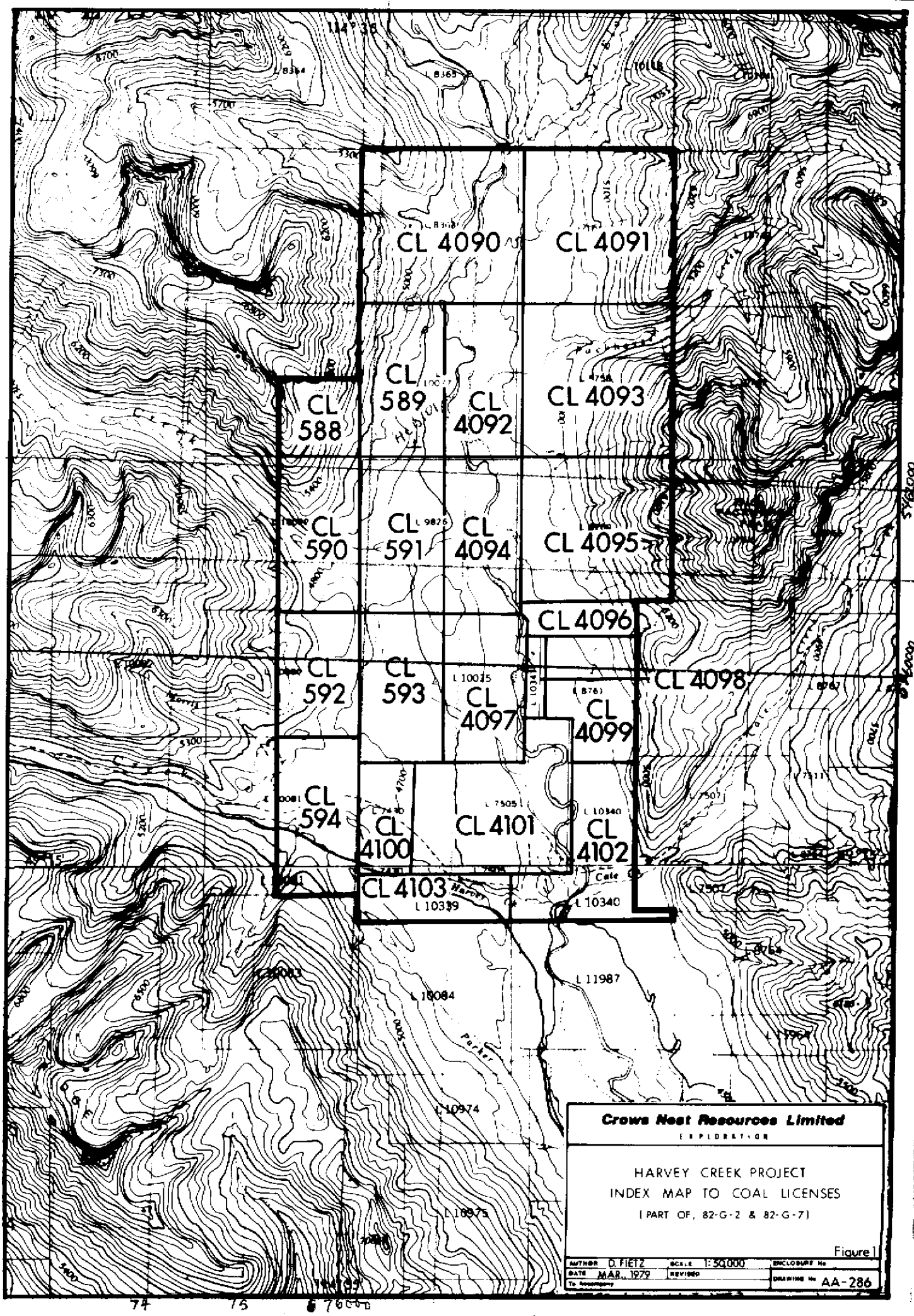
Shell Canada Resources Limited applied for additional coal lands primarily to the east from the original C.N.I. licenses. These licenses, numbered 4090 to 4103 inclusive, were issued in August, 1978.

The licenses, lying on and in close proximity to the Flathead River Valley of southeastern British Columbia, encompass an approximate area of 2965 ± hectares or 7327 ± acres. (APPENDIX One) The block of licenses has been designated as the HARVEY CREEK PROJECT (FIGURE 1).

1.2 PREVIOUS WORK

Prospect tunnels and hand trenches were constructed in the license area in the early 1900's.

In 1975, a 550 meter (1800 feet) "cat" road was built to intersect the old prospects. In addition, a 76 meter (250 feet) branch road was excavated perpendicular to the strike; a 43


CL 4090
CL 4091
CL 588
CL 589
CL 4092
CL 4093
CL 590
CL 591
CL 4094
CL 4095
CL 4096
CL 592
CL 593
CL 4097
CL 4098
CL 4099
CL 594
CL 4100
CL 4101
CL 4102
CL 4103
L 10339
L 10340
L 11987
L 10974
Crows Nest Resources Limited
EXPLORATION
HARVEY CREEK PROJECT
INDEX MAP TO COAL LICENSES
(PART OF, 82-G-2 & 82-G-7)
Figure 1
AUTHOR D. FIETZ
SCALE 1:50,000
DATE MAR., 1979
REVISED
ENCLOSURE No.
DRAWING No. AA-286

meter - long (140 feet) trench was subsequently sampled, measured and backfilled. Minor "potholing" was also conducted near the south end of the main access road. Details of the 1975 program are more fully described in the C.N.I. report "Preliminary Report, Coal Licenses Nos. 588 to 601 Inclusive, Kootenay District"; the report is dated 28-05-1976.

1.3 OBJECTIVE OF EXPLORATION PROJECT: 1978

Exploration activities, in 1978, were designed to:

- locate and map any additional geological data points
- establish stratigraphic positions and seam thicknesses of the coal measures
- establish the general structural setting of the coal measures
- determine the potential for coal mine development

1.4 ACCOMPLISHMENTS: 1978

Field operations, conducted during the summer, entailed diamond drilling, mechanical trenching, road construction and geodetic surveying. One core hole was drilled within the license area; coal seams were sampled and analysed at the CNRL lab facilities in Fernie, British Columbia.

A backhoe trench, 150 meters (500 feet) in length, was excavated approximately one kilometer south-west of the drill site. To gain access to the drill and trench sites, some 980 meters (3200

feet) of road construction was required.

Using the data compiled from the 1978 trenching - drilling activities, as well as information presented in the '76 progress report, a complete stratigraphic section of coal measures was determined. General structural conditions, in the vicinity of the hole and trenches, were also established.

2 REGIONAL SETTING

2.1 LOCATION

The Harvey Creek project area is located in the Flathead River Valley. The block of licenses lie 40 air-kilometers (25 air-miles) south-east of Fernie, British Columbia (FIGURE 2).

Geographically the licenses extend between:

- $49^{o}15'$ and $49^{o}19'$ of northern latitude, and
- $114^{o}32'$ and $114^{o}36'$ of western longitude

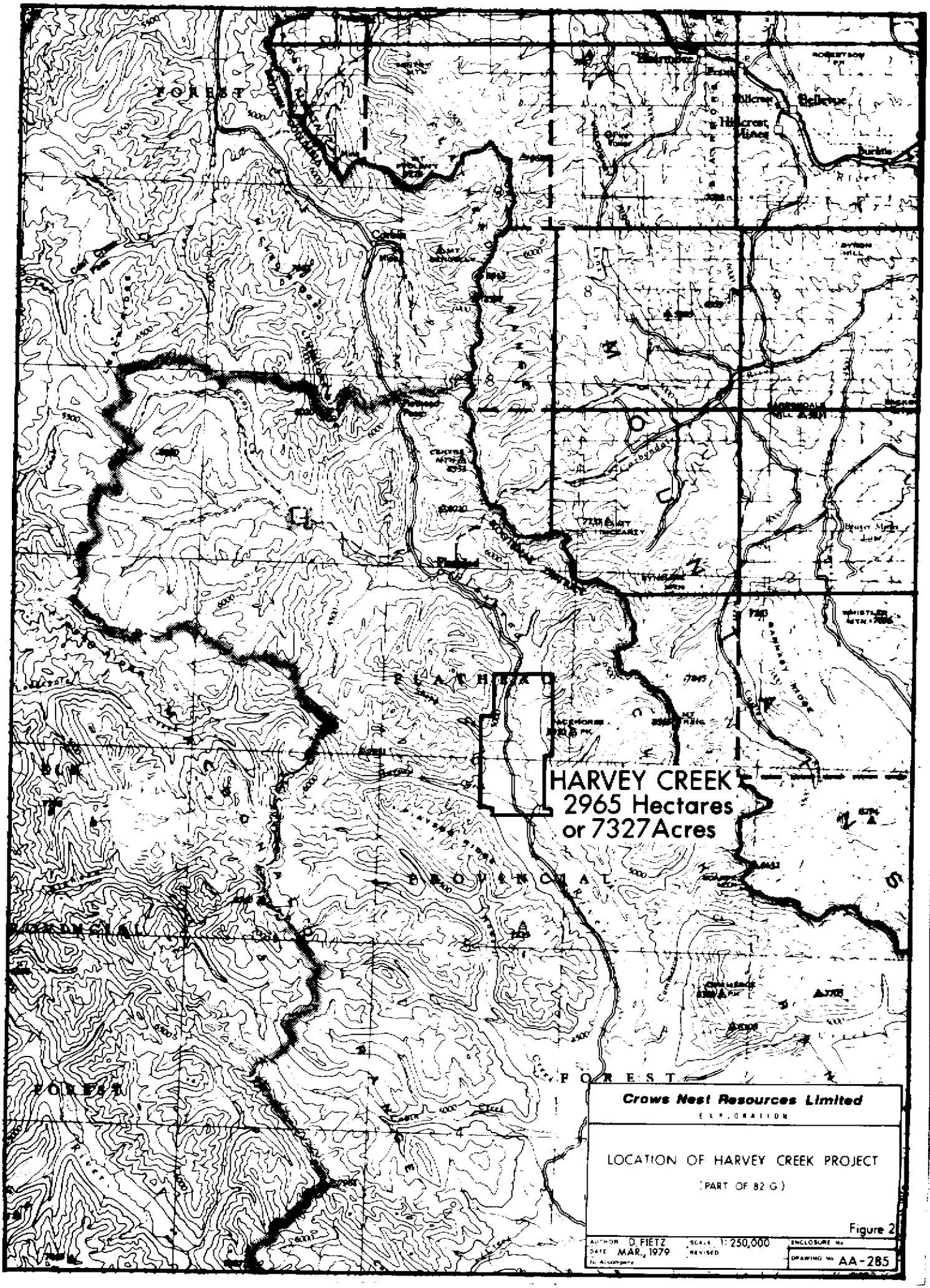
The licenses are approximately bounded to the north where Pollock Creek flows into the Flathead River; to the east by the west slope of Packhorse Peak; to the south where Harvey Creek flows into the Flathead River; and to the west by the topographical break of the alluvial terraces of the Flathead River Valley (FIGURE 3).

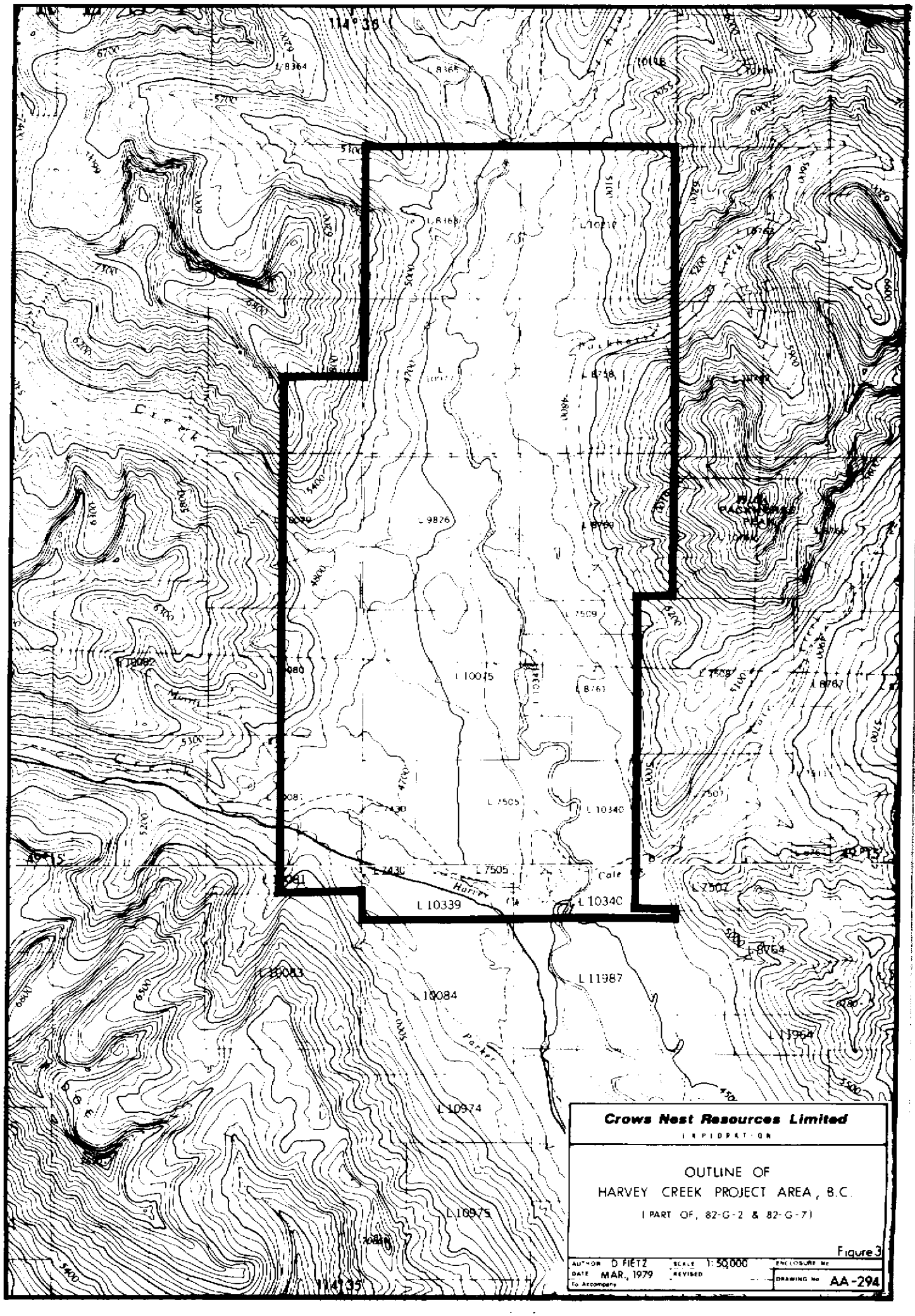
2.2 ACCESS AND INFRASTRUCTURE (FIGURE 4)

2.2.1 ROADS

The license area is located 65 road-kilometers (40 miles) south-east of Fernie, B. C. From Morrissey station, located 13 kilometers (8 miles) south of Fernie via Provincial Highway No. 3, the Lodgepole and Harvey Creek Forest Development Roads provide access to the project.

One "cat" trail was cut in 1975 within the license area. Upon completion of the program, the trail was "log-corduroyed" to make it impassable.


HARVEY CREEK
2965 Hectares
or 7327 Acres
Crows Nest Resources Limited
EXPLORATION
LOCATION OF HARVEY CREEK PROJECT
(PART OF 82 G)
Figure 2
AUTHOR D. PIETZ
DATE MAR., 1979
SCALE 1:250,000
REVISED
To Accompany
ENCLOSURE No.
DRAWING No. AA-285



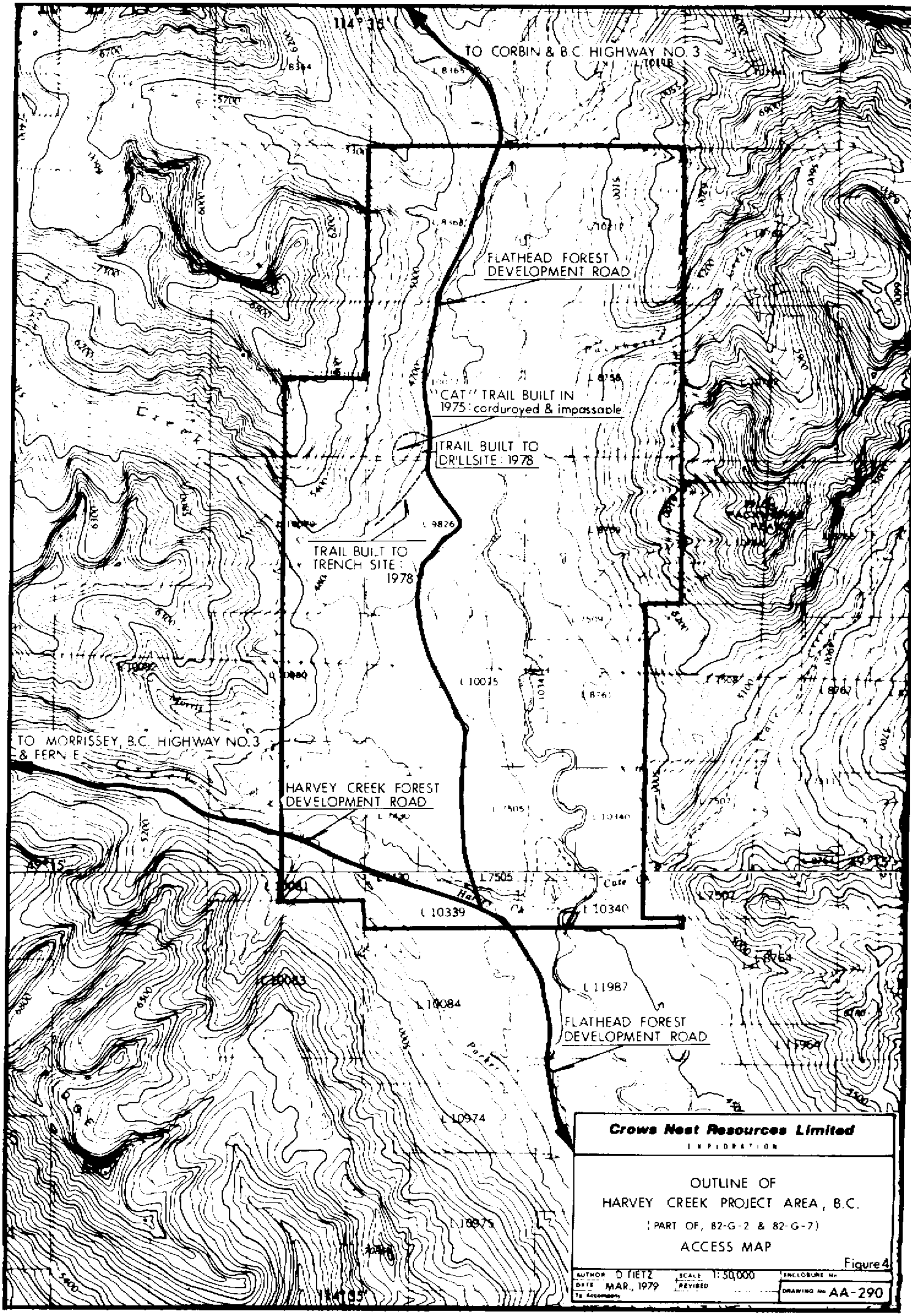
Crows Nest Resources Limited

EXPLORATION

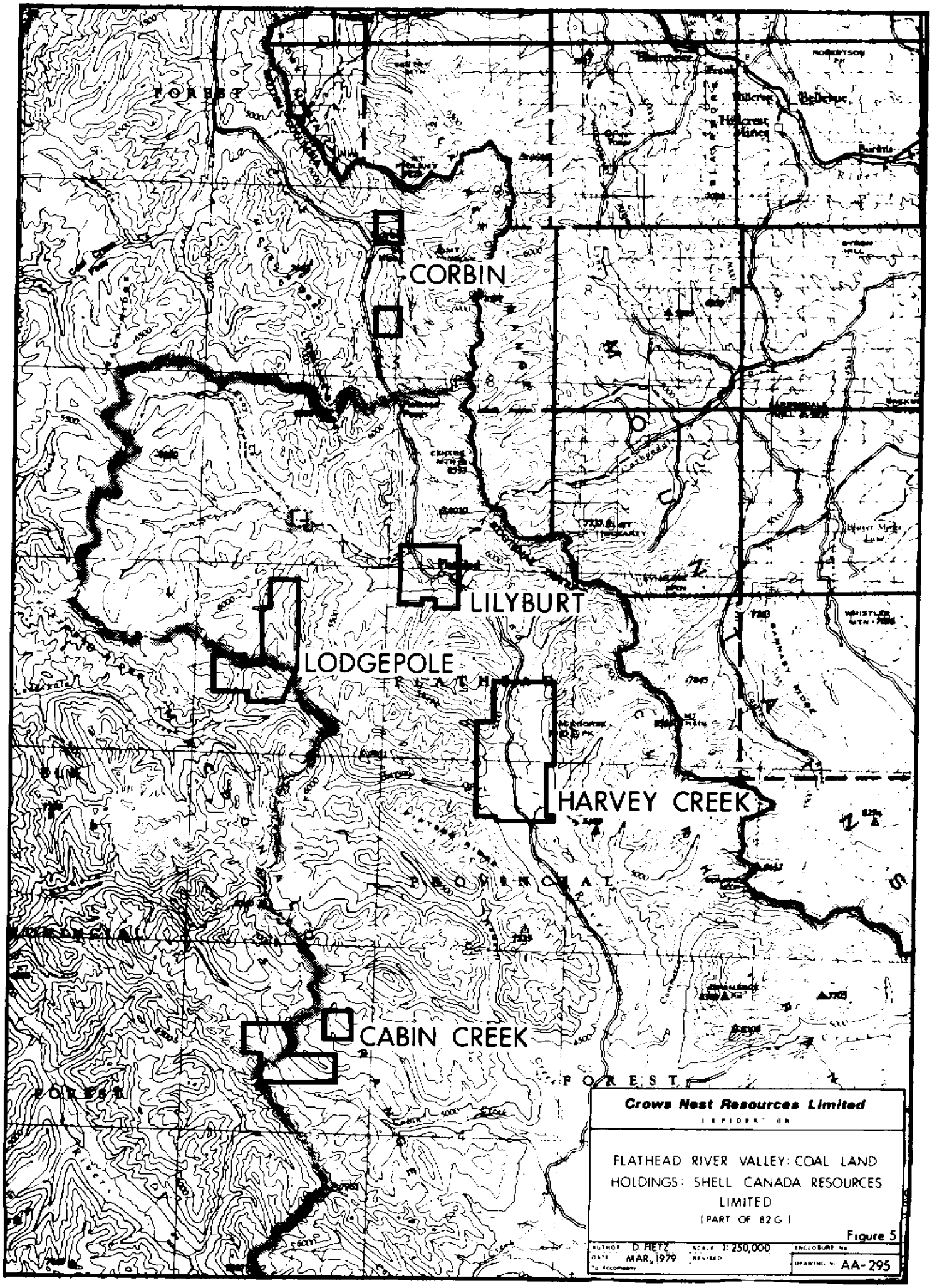
OUTLINE OF
HARVEY CREEK PROJECT AREA, B.C.
(PART OF, 82-G-2 & 82-G-7)

Figure 3

AUTHOR D FIETZ	SCALE 1: 50,000	ENCLOSURE No	
DATE MAR., 1979	REVISED	DRAWING No	AA-294
To Accompany			



TO CORBIN & B.C. HIGHWAY NO. 3
FLATHEAD FOREST DEVELOPMENT ROAD
"CAT" TRAIL BUILT IN 1975: corduroyed & impassable
TRAIL BUILT TO DRILLSITE: 1978
TRAIL BUILT TO TRENCH SITE: 1978
TO MORRISSEY, B.C. HIGHWAY NO. 3 & FERNIE
HARVEY CREEK FOREST DEVELOPMENT ROAD
L 10339
L 10340
L 7505
L 11987
L 10084
L 10974
L 10975
FLATHEAD FOREST DEVELOPMENT ROAD
Crows Nest Resources Limited
EXPLORATION
OUTLINE OF
HARVEY CREEK PROJECT AREA, B.C.
(PART OF, 82-G-2 & 82-G-7)
ACCESS MAP
Figure 4
AUTHOR D. TIETZ
SCALE 1:50,000
DATE MAR., 1979
DRAWING No AA-290


CORBIN
LILYBURT
LODGEPOLE
HARVEY CREEK
CABIN CREEK
FOREST
PROVINCIAL
FOREST
Crows Nest Resources Limited
FLATHEAD RIVER VALLEY: COAL LAND HOLDINGS: SHELL CANADA RESOURCES LIMITED
(PART OF 82 G)
Figure 5
AUTHOR D. HETZ
DATE MAR., 1979
SCALE 1:250,000
DRAWING No. AA-295

Two trails, both originating from the main Forest Development Road, were cut during 1978. One, less than 60 meters (200 feet) in length, provided access to the drill site; the second, about 900 meters (3000 feet) long, terminated at the trench site.

At the conclusion of the '78 field season, the trails were re-seeded and fertilized.

2.2.2 RAILWAYS

The existing C.P.R. Crows Nest line parallels Provincial Highway No. 3 at Morrissey Station; the distance between Morrissey Station and the license area is 50 kilometers (32 miles).

3 PROPERTY DESCRIPTION AND OWNERSHIP (FIGURE 5)

The coal licenses (no's 588 to 594 and 4909 to 4103, inclusive) are located in the Flathead River valley of southeastern British Columbia. The project area, because of its structural setting, is an isolated block. Shell Canada Resources Limited do, however, hold other coal licences in the Flathead area:

- LODGEPOLE AREA ... located 12 air-kilometers (8 miles) to the N.W.
- CABIN CREEK AREA ... located 20 air-kilometers (13 miles) to the S.W.
- LILYBURT ... located 10 air-kilometers (6 miles) to the N.W.
- CORBIN ... located 25 air-kilometers (16 miles) to the N.W.

4 GEOLOGICAL SETTING

4.1 GENERAL STATEMENT

The Harvey Creek Project is part of the Flathead Basin. Coal measures are confined to the Upper Jurassic - Lower Cretaceous Kootenay Formation and occur as scattered erosional remnants. Locally, the license block encompasses a steeply-dipping, down-faulted segment of the Kootenay Formation.

4.2 TABLE OF FORMATION (SEE FIGURE 6)

See the table on following page.

4.3 KOOTENAY FORMATION

"The formation consists predominantly of a nonmarine, interstratified sequence of dark grey to greyish brown weathering siltstone, sandstone, shale, conglomerate and coal. The Kootenay ranges in age from Late Jurassic to Early Cretaceous. The Kootenay conformably but abruptly overlies interbedded sandstone, siltstone and shale of the Jurassic "Passage Beds" of the Fernie Formation."+ The formation is subdivided into the Moose Mountain Member, the Coal-Bearing Member and the Elk Member. In the Harvey Creek Area, the Elk Member is not present.

In the Harvey Creek Project area, the Coal-Bearing Member is some 160 meters thick. Considering only those seams greater than 1.0 meter (3.3 feet) thick, the area contains 4 seams ranging

---

+ after GIBSON '77

Figure 6

TABLE OF FORMATIONS

PERIOD OR EPOCH	FORMATION	LITHOLOGY	THICKNESS (m)
LOWER CRETACEOUS	CADOMIN FORMATION (Blairmore Group)	non-marine: sandstone, conglomerate and shale	360 - 1980
	Pocaterra Creek Member	non-marine: sandstones, conglomerate siltstone & shale	
LOWER CRETACEOUS AND JURASSIC	KOOTENAY FORMATION — ELK MEMBER	non-marine interbedded medium to coarse grain sandstone, chert-pebble conglomerate with minor siltstone, shale and coal	30 - 490
	KOOTENAY FORMATION — COAL BEARING MEMBER	non-marine & brackish: interbedded coal, siltstones, shales and sandstones	70 - 610
	KOOTENAY FORMATION — BASAL SANDSTONE UNIT OR MOOSE MOUNTAIN MEMBER (MMM)	non-marine: massive, cliff, forming sandstone	20 - 60
JURASSIC	FERNIE FORMATION	marine: shale, siltstone, sandstone and limestone	180 - 380

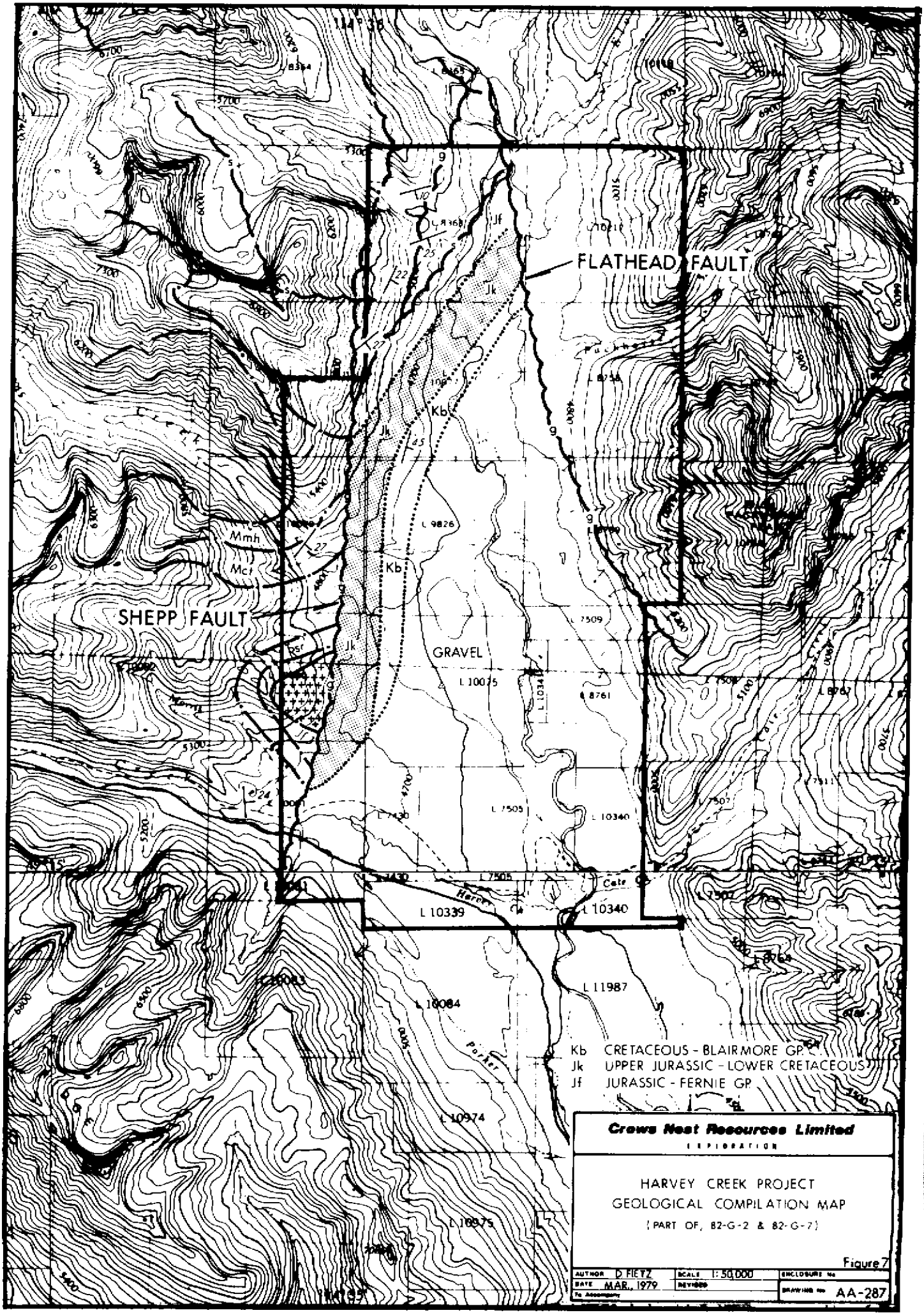
... after GIBSON 1977
PRICE 1961, 1965

in thickness from 2.2 to 13.7 m (7 to 45 feet) thick. Total aggregate thickness of coal is 23.0 m (75 feet).

4.4 REGIONAL STRUCTURAL GEOLOGY (FIGURE 7)

Bounded to the northeast by the Flathead normal fault and by the Shepp normal fault to the southwest, the Harvey Creek licence block lies within an asymmetrical graben.

Earlier field examinations (GSC Memoir 336 ... Price, 1965) concluded that the strata within the graben area "are cut by a series of smaller gravity faults that produce a complex of small fault blocks." Within the license area, the Kootenay Formation generally strikes N20^{o}E. The strata dip steeply to the east; dip angles vary between 45^{o} and 75^{o}.


FLATHEAD FAULT
SHEPP FAULT
GRAVEL
Kb
Jk
Jf
Mmh
Mcr
Rsr
Kb CRETACEOUS - BLAIRMORE GP.
Jk UPPER JURASSIC - LOWER CRETACEOUS
Jf JURASSIC - FERNIE GP
Crows Nest Resources Limited
EXPLORATION
HARVEY CREEK PROJECT
GEOLOGICAL COMPILATION MAP
(PART OF, 82-G-2 & 82-G-7)
Figure 7
AUTHOR D FIETZ
SCALE 1:50,000
DATE MAR. 1979
REVISED
To Accompany
ENCLOSURE No.
DRAWING No. AA-287

5 EXPLORATION PROJECT 1978

5.1 GENERAL STATEMENT

Exploration conducted on the Harvey Creek Project area consisted of:

- an angle diamond core hole drilled to a total depth of 247 meters (810 feet)
- a 150 meter long (500 feet) backhoe trench

Using the combined data of the 1975 and 1978 programs, a surface mineable reserves estimate was derived.

5.1.1 PLANNING, EXECUTION AND COMPILATION

In-office scheduling of the program commenced in mid-May, 1978. Exploration activities, on the Harvey Creek Project area were conducted during September, 1978, and were run concurrent with the Lodgepole Project.

Interpretation of the amassed data, leading to the compilation of the technical report, including required drafting and typing commenced in January, 1979. Due to changing priorities, time spend on the report was discontinuous; the report was not completed until May, 1979.

5.1.2 RESPONSIBILITY

J. J. Crabb, Manager of Exploration, CNRL was responsible for all exploration activities conducted in 1978. Frank Martonhegyi, Staff Geologist, reported to J. J. Crabb and directed

all exploration projects in southeast B. C.

For the Harvey Creek Project, Jaro Horachek, P. Eng. Senior Geologist was designated overall authority. The report was compiled by Dale Fietz, C.E.T. Drafting services were provided by Shell Canada Resources Limited, more specifically, by Gerald Babiuk. Linda Anderson and Bette Olsen capably assumed typing responsibilities.

5.1.3 MANPOWER

The geological field staff, assigned to the Harvey Creek area, consisted of the following personnel:

- Jaro Horachek, P. Eng., Senior Geologist (Project Geologist)
- Dale Fietz, Senior Geological Technologist
- John Fisher, Senior Geological Technologist
- Andy Newson, Geological Consultant
- Jim Loader, field assistant

Considering only the geological staff, 78 man-days were spent on the Harvey Creek Project. A breakdown of the total follows:

• Field Mapping, including flagging of drill site, trench and required access ...	12
• Description and Sampling of Core ...	36
• Office Compilation (post-field season) ...	30
TOTAL MAN-DAYS	78

5.2 FIELD OPERATION: 1978

The Harvey Creek Project was carried out in the following chronological order:

DATE	ACTION
August 13	• begin flagging access road to trench site
September 6	• flag access road to drill site • flag drill site

September 13	• bulldozer on site to construct:
	  • access to drill site
	  • drill site

September 15 & 16	• complete flagging of access road to trench site • locate trench site
September 17	• begin drilling HC-D 101
September 21 & 22	• HC-D 101 TD'ed and logged
September 22	• backhoe (for trench) arrives on site
September 23 - 26	• excavation of trench
September 26	• description of trench and backfilling of same
post-September	• seeding and fertilizing of access roads and trenches by "INTERIOR RE-FORESTATION CO. LTD."

5.2.1 AERIAL PHOTOGRAPHY AND TOPOGRAPHIC MAPS

North West Survey Corp. (Yukon) Ltd. from Edmonton, Alberta was contracted to produce a new series of air photographs and topographic maps (1:5000) of the Project area.

High altitude air photographs (1:40000) are now available for the Harvey Creek Project. The photos, applicable to the area are

identified as NW 55678: No. 168 to 171 (inclusive)

Line: 8 - N

Date: 28-06-78

The 1:40000 photographs, combined with ground survey control*, were used to produce the 1:5000 topographic map. The new topographic base, due to its late arrival, was not incorporated into the contents of this report.

In 1975, a base map (Scale: 1:2400) with a 20 foot (6 meter) contour interval was compiled by Kenting Earth Sciences of Ottawa. The area of coverage, relative to the total project block, is illustrated in FIGURE 8. For this report, the Kenting document has been utilized as the key base map.

5.2.2 GEOLOGICAL MAPPING (ENCLOSURE 1)

Other than the strata exposed by backhoe, outcrops of Jurassic - Cretaceous strata are absent. Geological mapping was confined to sub-surface data derived from the 1975 and 1978 trenching - drilling programs.

5.2.3 TRENCHING (APPENDIX Two)

The backhoe trench, HC-T1, was located approximately perpendicular to the strike of the strata. It was hoped that HC-T1 would intersect:

- the top of the basal Kootenay sandstone (MMM)
- the first major coal seam above the basal Kootenay sandstone

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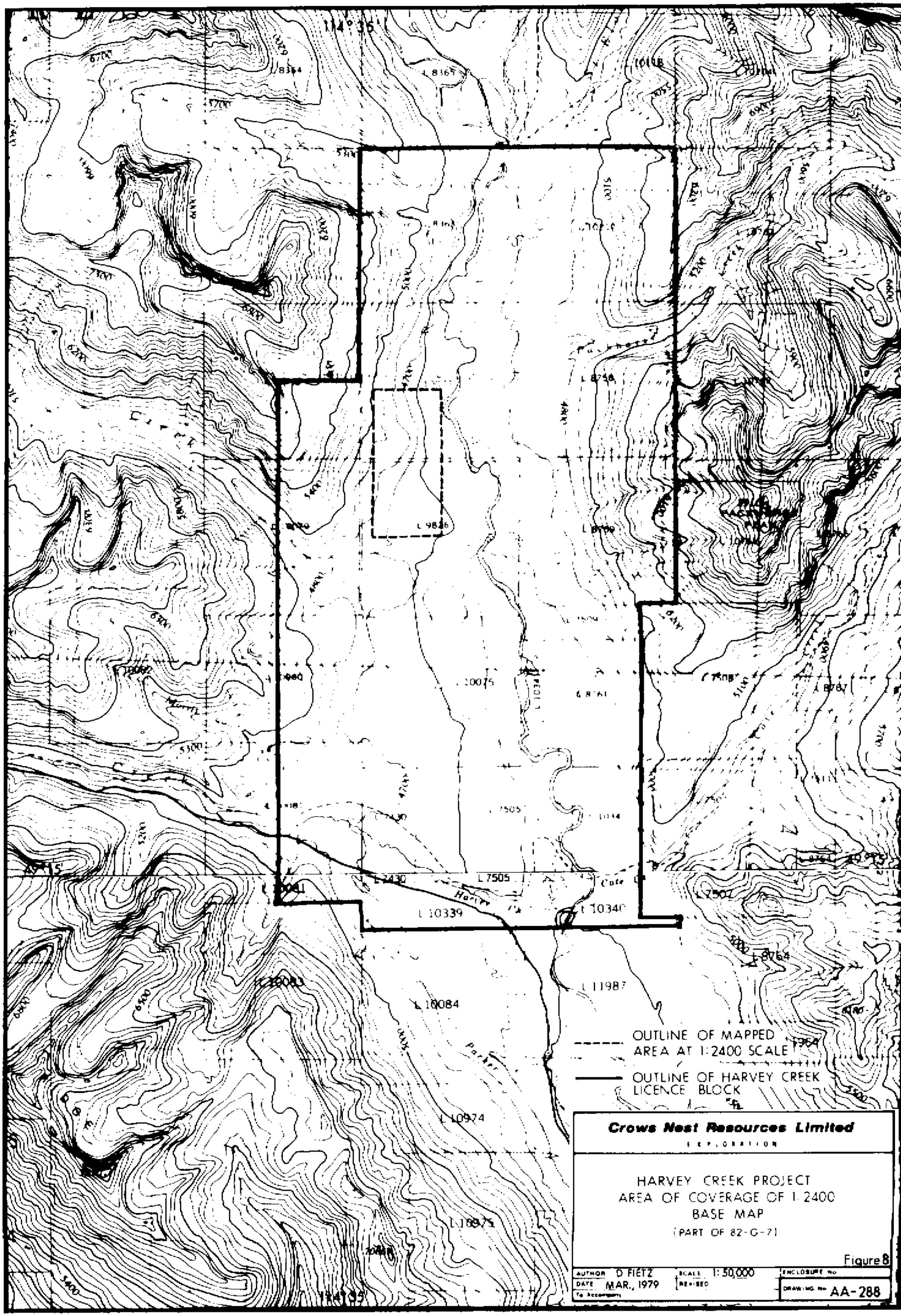
* contracted to the Survey Department: Shell Canada Resources Limited


OUTLINE OF MAPPED AREA AT 1:2400 SCALE
OUTLINE OF HARVEY CREEK LICENCE BLOCK
Crows Nest Resources Limited
EXPLORATION
HARVEY CREEK PROJECT
AREA OF COVERAGE OF 1:2400
BASE MAP
(PART OF 82-G-7)
Figure 8
AUTHOR D FIETZ
SCALE 1:50,000
DATE MAR., 1979
DRAWING No AA-288
L 10339
L 10340
L 7505
L 10084
L 10974
L 11987
L 8764
L 10083
L 9826
L 10075
L 10081

In this regard, HC-T1 was only partially successful; only the top of the basal Kootenay sandstone was located.

The trench, in magnitude, was some 150 meters (500 feet) in length; 0.8 - 0.9 meters (3 feet) wide; the depth, due to thick gravel cover, was up to 3 meters (10 feet). HC-T1, after being measured and mapped, was backfilled, seeded and fertilized.

5.2.4 DRILLING

The diamond core hole, HC-D 101, was contracted to TONTO DRILLING LTD. The hole, drilled during September 17 to 21 of 1978, attained a TD of 247 meters (810 feet). The hole azimuth averaged 296°; the angle of the hole, measured from the horizontal plane, was 58°.

The core hole had a drill designation of HQ:

- Hole Diameter ... 100 mm
- Core Diameter ... 75 mm

Core recovery, in coal, averaged 82% and was considered adequate. In rock, the recovery was substantially higher.

5.2.5 SURVEYING

Ground survey control was contracted to Shell Canada Resources Limited. Control points used included:

- B. C. topographic stations
- Federal Government geodetic control stations

Controlled traverses and conventional surveys were run to determine locations, elevations and coordinates* of drill hole HC-D 101 and the access to the backhoe trench HC-T1. See Appendix Four and Enclosure 2.

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* based on the Universal Transverse Mercator Grid system.

5.2.6 LOGGING

When drilling of HC-D 101 had been completed, BPB ran a suite of geophysical logs which included:

- COAL LITHOLOGY LOG+
  - Gamma Ray
  - L.S. Density
  - Caliper
- NEUTRON-NEUTRON LOG+ & VERTICALITY PRINTOUT
- SEAM THICKNESS LOG*
  - Caliper
  - B.R. Density
- COAL QUALITY LOG*
  - Gamma Ray
  - L.S. Density

A full suite of logs is included in ENCLOSURE 3.

5.2.7 LOGISTICS

The Black Nugget Inn, Sparwood, B. C. was the base of 1978 field operations. Mr. A.P. Sampietro, Field Foreman for CNRL, was responsible for control of manpower, costs and safety; in addition, all in-field expediting was authorized through Mr. Sampietro.

Travel distance, from Sparwood to the license block, was long. For this reason, some members of the geological staff re-located to the ANCO MOTEL, Fernie, B. C. In mid-September, the majority of the personnel were accomodated at the CNRL exploration camp at Howell Creek[x]. Management of the camp was assigned to Mr. Barry Kaser, a Shell Canada Resources Limited employee.

+ GENERAL SCALE LOG: 1:100 scale
* DETAIL SCALE LOG: 1: 50 scale
x the camp was initially established to provide lodging for personnel involved in the 1978 adit work on the CNRL : CABIN CREEK PROJECT.

A four-wheel drive Chevrolet Blazer was used to transport the geological staff to and from the license area.

Core, from HC-D 101, was transported from the drill site to the camp. At the Howell Creek site, the core was washed, logged and sampled. Laboratory analyses of the coal core was conducted by staff of the CNRL lab in Fernie, B. C.

Field schedules, for the geological field staff, were based on a "10 day-on, 4 day-off" cycle. Time off was accrued for any scheduled holidays or extra days worked.

Rigid safety policies and procedures, as outlined at the outset of the field season, were generally adhered to by field personnel; on the Harvey Creek Project, no serious injuries occurred.

6 EXPENDITURES

6.1 SUMMARY STATEMENT

The 1978 expenditure, totalled $ 82,132.

The majority of the expenses were affiliated with

- contractor's costs; 75%
- salaries for mapping, sampling and report preparation; 12%

6.2 COST BREAKDOWN

ITEM	$ SPENT					
	Mapping	Trenching	Drilling	Survey	Sampling	Total
WAGES*						6000
• 12 man-days @ $125/day	1500					
• 36 man-days @ $125/day					4500	
ACCOMODATION & FUEL*						3792
• 38 man-days @ $34/day			1292			
• 10 man-days @ $34/day		340				
• 40 man-days @ $34/day					1360	
• fuel	200				600	
TRANSPORTATION*						3450
• 1 truck-month @ $1200/mth					1200	
• 3 helicopter-hour @ 375/hr	1125					
• 3 helicopter-hours @ 375/hr			1125			
MATERIALS*					2100	2100
CNRL LAB COSTS*					1190	1190
CONTRACTORS*						61850
• road & trench construction		8686				
• drilling & assoc.			25554			
• trucking			2250			
• geophysical					1921	
• survey				22689		
• reclamation		750				
TOTAL ON-PROPERTY COSTS:						78382
REPORT+						3750
• 30 man-days @ $125/day					3750	
TOTAL OFF-PROPERTY COSTS:						3750
TOTAL	2825	9776	30221	22689	16621	82132

* on-property cost
\+ off-property cost

7 PROJECT GEOLOGY

7.1 GEOLOGICAL MAP (ENCLOSURE 1) & TYPE SECTION

Results of the 1975 and 1978 exploration programs have been plotted on the Kenting topo (1:2400).

The basal Kootenay sandstone or Moose Mountain Member (MMM), has been identified in the 1978 trench site (details of HC-T1 are noted in APPENDIX Two) and, at depth, in drill hole HC-D 101. Based on the number of known data points, it is a relatively well-controlled litho unit; for this reason, a structure contour map, drawn at the top of the basal Kootenay sandstone, has been compiled. Known coal occurrances have also been indicated on the map. Data presented is in Imperial Units to coincide with the base units of the map.

A type section, emphasizing the coal measures, was established. The section was derived from the evaluated drill data of HC-D 101. The stratigraphic section of the Harvey Creek area correlates to stratigraphic sections measured in the Cabin Creek area* (FIGURE 9).

7.2 STRATIGRAPHY

7.2.1 STRATIGRAPHIC SETTING

West of the Shepp Fault, Paleozoic strata outcrops. East

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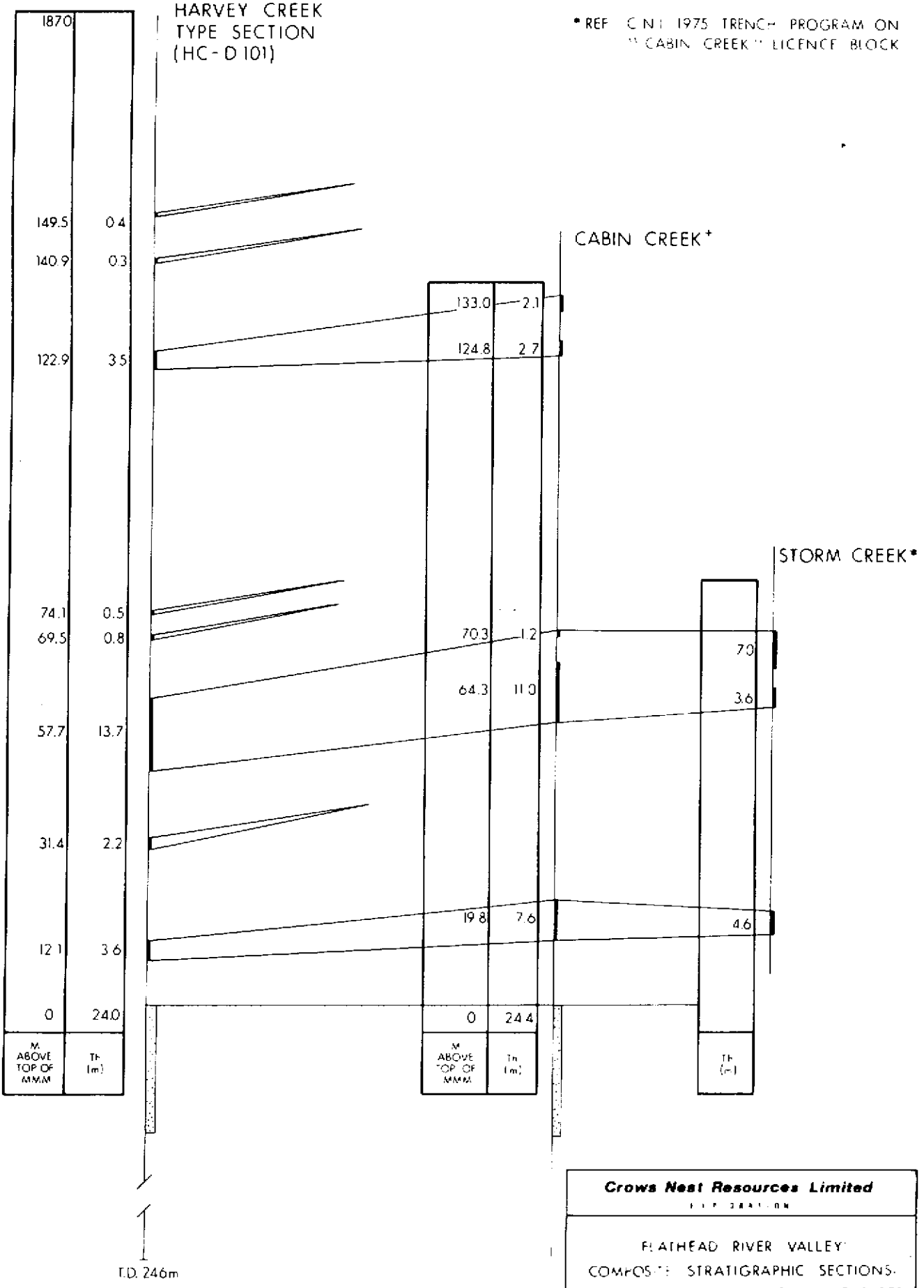
* GSC Memoir 87; J.D. MacKenzie, "Geology of a Portion of the Flathead Coal Area, British Columbia", 1916 (p 41); license currently held by SAGE CREEK COAL LIMITED.



*GSC MEMOIR 87;
J.D. MacKENZIE, "GEOLOGY OF A PORTION OF THE FLATHEAD COAL AREA, BRITISH COLUMBIA", 1916. (P41);
LICENCES CURRENTLY HELD - SAGE CREEK COAL LIMITED.

Crows Nest Resources Limited

FLATHEAD RIVER VALLEY
COMPOSITE STRATIGRAPHIC SECTIONS.
KOOTENAY FORMATION: COAL MEASURES

Figure 9

AUTHOR D. FIETZ SCALE 1:100
DATE MAR., 1979
DRAWING AA-289

of the fault and comprising the majority of the project area, the following geological formations are present:

- Jurassic : Fernie Formation
- Upper Jurassic - Lower Cretaceous : Kootenay Formation
- Lower Cretaceous : Blairmore Formation

The Kootenay Formation is economically important due to the presence of coal seams which may exceed 10 meters in thickness.

7.2.2 LITHOSTRATIGRAPHY

As encountered in HC-D 101, the Kootenay Formation is 180+ meters thick; the Coal Bearing Member is 160 meters thick. The basal Kootenay sandstone or Moose Mountain Member (MMM), some 25 meters thick, underlies the Coal-Bearing strata. The Cadomin Formation conglomerate overlies the Kootenay and was partially drilled in HC-D 101; the Elk Member of the Kootenay Formation is not present.

HC-D 101 can be summarized as follows:

GEOLOGICAL FM	INTERVAL IN HOLE (m)	TRUE THICKNESS* (m)
NO CORE ... CASING	0 - 15	-
BLAIRMORE CONGL.	15 - 28	13
KOOTENAY - COAL BRG MBR	28 - 187	159
- BASAL SS	187 - 211	24
FERNIE	211 - 247	36

NOTE: APPENDIX THREE, to further expand on data derived from HC-D 101, contains a:

- copy of the core description
- BPB : COAL LITHOLOGY LOG with interpretation of lithology
- tabulation of geophysical tops vs logged tops

7.3 GEOLOGICAL STRUCTURE

The Harvey Creek Project area, bound to the northeast by the Flathead normal fault and to the southwest by the Shepp normal fault, lies within an asymmetrical graben.

Paleozoic strata outcrop west of the Shepp Fault. East of the Shepp Fault, coal bearing strata dip steeply to the east. The eastern extent of the coal bearing strata is delineated by the Flathead Fault plane.

---

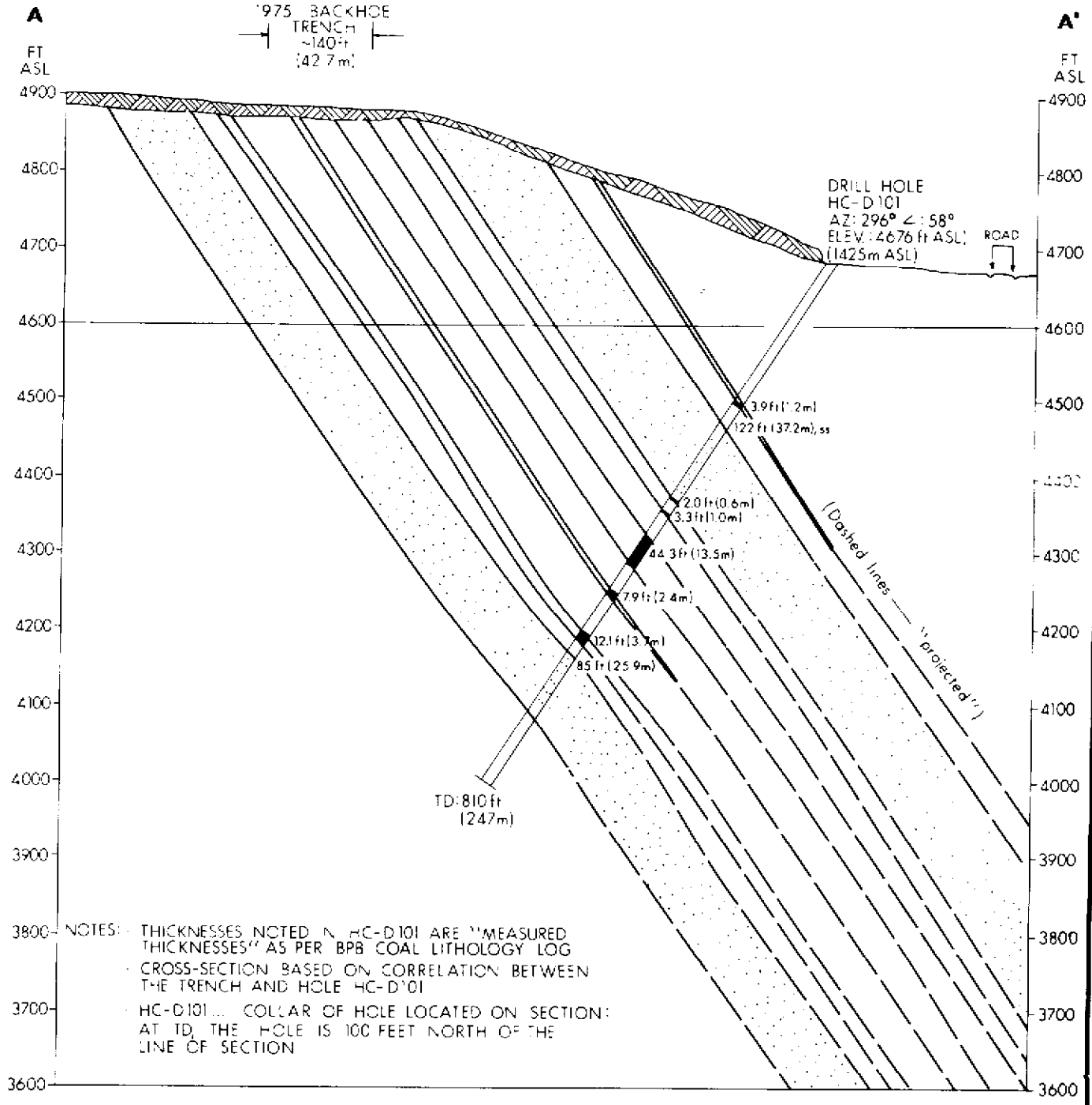
* in an attempt to obtain true thicknesses (intersecting the bedding planes at 90^{o}), HC-D 101 was drilled at an angle of 58^{o} from the horizontal plane; bedding angles; measured from the core axis, averaged 69^{o} ... "TRUE THICKNESS" intervals noted are exaggerated by approximately 10%.

Dip of the Kootenay Formation ranges from 45^{o} - 75^{o}; the average easterly dip has been assumed to be 55^{o}. Potential coal resources, above drainage, are very limited. Because of steep structure and flat terrain the depth of cover increases rapidly (FIGURE 10).

7.4 COAL SEAMS

In HC-D 101, eight coal seams were intersected. Four seams were less than one meter thick. The remaining four ranged in thickness from 2.2 to 13.7 meters.

A type section of the area, emphasizing the coal measures, was established. Stratigraphically it correlates with the coal measures of the Cabin Creek and Storm Creek areas (FIGURE 9).



Crows Nest Resources Limited
EXPLORATION

HARVEY CREEK PROJECT

CROSS-SECTION A-A'

Figure 10

AUTHOR D. FIETZ
DATE APRIL, 1979
To Accompany
SCALE
REVISED
ENCLOSURE NO.
DRAWING NO. AA-291

8 COAL QUALITY

Six of the eight seams drilled in HC-D 101 were sampled. Only the upper two, 0.4 and 0.3 meters thick, were not. All seams sampled, with one exception, are medium volatile bituminous coal. The 3.5 meter seam, at 64 meters depth, is a high volatile bituminous coal.

Weighted average analyses for the sampled seams follow:

SPECIFIC GRAVITY	% RESIDUAL MOISTURE	% ASH a.d.b.	% V.M. a.d.b.	FSI	% YIELD
RAW	0.88	31.01	-	1.4	-
1.5 Float	-	8.88	26.74	2.5	52

Analytical results per sampled unit have been matched to the interpreted COAL LITHOLOGY geophysical log (APPENDIX THREE).

9 COAL RESERVES

The in-place coal resources of the 4 seams greater than 1 meter thick, calculated to a maximum depth of 460 m (1500 feet), total some 110 million tonnes.

Strippable coal resources, for the thick seam, calculated to a depth of 60 m or 200 feet, total 10.6 million tonnes. Because of the steep dip, open pit mining conditions would comprise long, narrow, trench-like excavation.

A breakdown of the calculated in-place resources follows:

- TOTAL RESERVES (calculated to a maximum depth of cover : 460 m (1500 ft).
  - assumed dip : 55°

	Th(m)	Tonnes (10^6)
	3.5	16.6
	13.7	65.0
	2.2	10.4
STRATIGRAPHICALLY LOWER	3.6	17.1
TOTAL :		109.1

- SURFACE RESERVES
  - assumed dip : 55°
  - max. depth of cover : 61 m (200 feet)
  - includes only the main, thick coal seam

Th(m)	Tonnes (10^6)
13.7	10.6

Assuming 60% overall recovery, the reserves are reduced to 6.2 million tonnes at 2 : 1 stripping ratio.

10 DEVELOPMENT POTENTIAL

Proximity to the Flathead River make this license area environmentally sensitive; distance from existing rail lines, coupled with no existing, nearby infrastructure further impede development of the project.

Surface reserves are minimal; underground mining is highly speculative.

The Sage Creek Coal Limited property, currently held by Pan Ocean Oil Ltd. and Rio Tinto Exploration Limited, lies further to the south. Of the coal prospects in the Flathead River valley, the Sage Creek property will likely be the first to be developed. Infrastructure and rail lines would have to be built and would, therefore, enhance the development potential of the Harvey Creek property.

11 CONCLUSIONS & RECOMMENDATIONS

Development of the Harvey Creek area is not likely in the forseeable future.

Because of the steeply dipping strata, very deep geological coal resources underly the eastern license blocks. Only those licenses containing potential mineable resources* should be retained; the following parcels are therefore recommended to be dropped:

LICENCE NO.	DESCRIPTION	HECTARES ±	ACRES ±
4091	LOT 10217	259	640
4093	LOT 8758	259	640
4094	E ½ LOT 9876	134	331
4095	LOT 8759	259	640
4096	LOT 7509	53	131
4097	E ½ LOT 10075	130	321
4098	LOT 10341	23	57
4099	LOT 8761	122	301
4100	LOT 7430	65	161
4101	LOT 7505	223	551
4102	LOT 10340	146	360
4103	LOT 10339	77	190
12 licences		1750 ± hectares	4323 ± acres

To conduct further exploration work, at this time, would only be academic. Until development of the Sage Creek property is assured, further expenditures, at Harvey Creek, are difficult to justify.

---

* assumed maximum depth of cover : 460 m or 1500 ft.

APPENDIX ONE

COAL LICENSES HELD BY SHELL CANADA RESOURCES LIMITED
IN THE HARVEY CREEK PROJECT AREA

LICENCE NO.	DATE	DESCRIPTION	HECTARES ±	ACRES ±
588	June 3, 1975	SE 1/4 LOT 10078	65	161
589	June 3, 1975	W 1/2 LOT 10077	130	321
590	June 3, 1975	E 1/2 LOT 10079	130	321
591	June 3, 1975	W 1/2 LOT 9876	135	334
592	June 3, 1975	E 1/2 LOT 10080	108	269
593	June 3, 1975	W 1/2 LOT 10075	128	316
594	June 3, 1975	E 1/2 LOT 10081	130	321
4090	August 4, 1978	LOT 8363	259	640
4091	August 4, 1978	LOT 10217	259	640
4092	August 4, 1978	E 1/2 LOT 10077	130	321
4093	August 4, 1978	LOT 8758	259	640
4094	August 4, 1978	E 1/2 LOT 9876	134	331
4095	August 4, 1978	LOT 8759	259	640
4096	August 4, 1978	LOT 7509	53	131
4097	August 4, 1978	E 1/2 LOT 10075	130	321
4098	August 4, 1978	LOT 10341	23	57
4099	August 4, 1978	LOT 8761	122	301
4100	August 4, 1978	LOT 7430	65	161
4101	August 4, 1978	LOT 7505	223	551
4102	August 4, 1978	LOT 10340	146	360
4103	August 4, 1978	LOT 10339	77	190
21 licences			2965 ± hectares	7327 ± acres

APPENDIX TWO

1978

HARVEY CREEK PROJECT

Trench HC-T1

- trench survey started at west end of road cut and proceeded in an easterly direction
- trench particulars: ave. depth: 3.0 m
  ave. width: 0.8 - 0.9 m
- distances, determined in the field, by pacing+ have been adjusted to fit the surveyed data:

STATION 0 to 1:
- 25 paces (17.5 m) at AZ: 94°
- true strat. thickness: 15.1 m
- Lithology • gravel and soil; sandstone and limestone float

STATION 1 to 2:
- 63 paces (52.6 m) at AZ: 86°
- true strat. thickness: 42.4 m
- 4.5 m (true strat. interval: 3.6 m) west of STATION 2 ... basal Moose Mountain Sandstone
  • medium grain to coarse grain; dark grey; minor carbonaceous steaks along bedding; N20°E/62°E

STATION 2 to 3:
- 50 paces (35.0 m) at AZ: 52°
- true strat. thickness: 16.4 m
- Lithology • Moose Mountain Sandstone

STATION 3 to 4:
- 20.0 m at AZ: 52°
- true strat. thickness: 9.4 m
- strat. section measured lower to higher (west to east)

+ 1 pace has been assumed to be 0.7 m in length

MEASURED TH(m)	TRUE TH(m)	LITHO DESCRIPTION
10.8	4.4	Sandstone; rubble
5.0	2.3	Sandstone; fine grain grading to coarse grain
0.5	0.2	Siltstone; soft; weathered
5.0	2.4	Shale; brown-grey; grading to siltstone
0.3	0.1	Coal
STATION 4		
0.2	0.1	Shale
1.4	0.7	Sandstone
0.7	0.3	Shale
0.2	0.1	Shale; coaly
7.4	3.5	Shale with minor siltstone interbeds; top 0.2 m "clayey-shale"; "coal/shale" contact is poor; floor of coal seam is soft
1.0	0.5	Coal; soft; sheared near base; coal breaks into small fragments $\leq$0.02 m in diameter
0.4	0.2	Shale
0.9	0.4	Coal; cleat visible; breaks to 0.05 m fragments; mainly bright-banded coal
NOTE: Coal zone thickness: net/gross: 1.3 m/1.7 m		
3.5	1.6	Sandstone; roof of coal seam....very good separation with coal seam; medium grain; blocky

End of measured section.....Covered Interval

HARVEY CRK.

DEPARTMENT OF MINES AND PETROLEUM RESOURCES

Coal Act (Sec. 19)

APPLICATION TO EXTEND TERM OF LICENCE

1. I Gordon A. Schwartz (Name) agent for Shell Canada Resources Limited (Name)
P.O. Box 100 (Address) P.O. Box 100 (Address)
Calgary, Alberta T2P 2H5 Calgary, Alberta T2P 2H5
Valid FMC No. 171929
hereby apply to the Minister to extend the term of Coal Licences No(s). 588, 589, 590, 591, 592, 593 594, 4090, 4092, 9 licences, 2992 acres = 1215 hectares for a further period of one year.

2. I have performed, or caused to be performed, during the period August 5, 1978 to May 11, 19 79, work to the value of at least $ 82,132 on the location of coal licences as follows:

CATEGORY OF WORK	Licence No(s).	Apportioned Cost
Geological mapping	589	$ 2,825
Surveys: Geophysical	Nil	-
Geochemical	Nil	-
Other - Geodetic	-588-594 incl., 4090, 4092	22,689
Road construction	589, 591	5,040
Surface work - Trenching	589, 591	3,986
Underground work	Nil	-
Drilling	591	30,221
Logging, sampling, and testing	589, 591	16,621
Reclamation	589, 591	750
Other work (specify)	Nil	-

3. I wish to apply $ 77,532 of this value of work on Coal Licence(s)* 588-594 incl., 4090, 4092, application filed concurrently to add licences 4090 and 4092 to existing group #105 (licences 588 to 594 incl.).

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

5. I wish to apply $ 10,160 of this value of work to claim a refund of cash in lieu of work in the amount of $ 10,160 which was paid to extend the term of Coal Licence(s) No(s) 588-594 incl. from June 4, 1978 to June 3, 19 79, Mining Receipt No. 122781E for prior payment of cash in lieu of work *is attached* for adjustment.

6. The work performed on the location(s) is detailed in the attached report entitled Geological assessment of the Harvey Creek Project; Geodetic Ground control survey, photogrammetric mapping and location survey, Harvey Creek Project

May 28, 1979 (Date) H.A. Schwartz (Signature and position) Landman

* Applications to group licences may be filed to apportion costs on a maximum of 10 licences.

(FORMS TO BE SUBMITTED IN DUPLICATE)

FOR DEPARTMENTAL USE ONLY

Value of work reported $ _____ Value of work applied on licences $ _____

Value of work approved $ _____ Value of credit remaining $ _____

Work performed. Yes ☒ No ☐

The program of operations detailed hereunder was carried out during the period from August 5, 1979 to May 11, 1979. Total costs are $ 77,532, an average of $ 27.45 per acre.

GEOLOGICAL MAPPING Yes ☒ No ☐ Cost $ 2825

	Area (Acres)	Scale	Time
Reconnaissance	5	1:5000	12 man-days @ $125 + support cost
Detail: Surface			
Underground			
Other (specify)			

GEOPHYSICAL OR GEOCHEMICAL SURVEYS Yes ☐ No ☒ Cost $ Nil

Method ____ Line miles ____

OTHER SURVEYS Yes ☒ No ☐ Cost $ 22,689 geodetic ground control and location survey

Grid ____ Topographic photogrammetric mapping Other ____

ROAD CONSTRUCTION Yes ☒ No ☐ Cost $ 5040

Length: On Licences 3200 Access (off licences) -

SURFACE WORK Yes ☒ No ☐ Cost $ 3986

	Length	Licence Number(s)
Trenching	500 feet	589, 591
Seam tracing		
Crosscutting		
Other		

UNDERGROUND WORK Yes ☐ No ☒ Cost $ Nil

Test adits: Number ____ Average length ____ Total footage ____

Other workings: Area ____ Total footage ____

DRILLING Yes ☒ No ☐ Cost $ 30,221

	Hole Size	Number of Holes	Total Footage
Core: Diamond ☒ Wireline ☐	HQ	1	813
Rotary: Conventional ☐			
Reverse circulation ☐			
Other			

Contractor Tonto Drilling Where core stored CNRL Lab, Fernie, B.C.

LOGGING, SAMPLING, AND TESTING (check) Yes ☒ No ☐ Cost $ 16,621

Lithology: Drill samples ☐ Core samples ☒ Bulk samples ☐

Logs: Gamma-Neutron ☒ Density ☒ Other ☐

Testing: Prox. analysis ☒ FSI ☒ Washability ☒

Carbonization ☐ Petrographic ☐ Plasticity ☐ Other ☐

OTHER WORK (specify details) None Cost $ Nil

REPORTS:

Reclamation work (Permit No. 54) Detail of work* Harrowing, seeding and fertilizing five acres (drill site, trench and access road).

Cost $ 750

OPERATIONS:

Work was supervised by Jaro Horachek Position Senior Geologist

Is this person a registered or licensed Professional Engineer in British Columbia? Yes ☐ No ☒

NOTE—Where the licensee intends to perform, during the extended term of his licence, work not set out in the plan of operations filed under section 15 (2) (c), a supplemental plan of operations is to be attached.

* If reclamation work reported in separate report give details of report identification

VALUATION OF WORK: COST STATEMENT
(Sec. 27, B.C. Reg. 436/75)

ON-PROPERTY COSTS: For period from August 5, 1978 to May 11, 1979

1. OPERATOR'S FEES, SALARIES, AND WAGES:

	Average Number of Employees	Average Rate	Average Number of Days	Amount
Professional and technical	4	$125	12	6000
Machine operators and support				
Miners				
Other				

Total operator's costs $ 6000

2. CONTRACTORS AND CONSULTANTS:

Name	Service	Contract Amount
Tonto Drilling	Diamond Drilling	22,334
Drain Brothers Construction	Bulldozer and Backhoe	7,686
Galant Trucking	Water Trucking	2,300
Pathfinder Consultants	Surface Work Supervision	1,000
BBR Drilling	Drilling Supervision	920
SCRL Survey Dept. (including subcontractor Northwest Survey)	Geodetic Ground Control and location survey, photogram. mapping	22,689

Total contractor and consultant costs $ 56,929

3. EQUIPMENT AND INSTRUMENTS USED: Owned Rented

Type	Rented From	Amount

Total equipment and instrument rentals $ Nil

4. FIELD CAMP COSTS:

		Amount
Food	$16/88 man-days	1,408
Accommodation	$18/88 man-days	1,584
Fuel		800
Other		

Total field camp costs $ 3,792

5. SAMPLING, ANALYSIS, AND TESTING:

Service	Performed by	Amount
Downhole Geophysical Logging	BPB Industries	1,921
Analysis, Tests	CNRL Lab, Fernie, B.C.	1,190

Totals, samplings, analysis, and testing $ 3,111

6. SUPPLIES AND MATERIALS COSTS:

	Amount
Process supplies	
Operating and maintenance supplies	1,500
Office and technical supplies	
Other supplies and materials	600

Total, supplies and materials $ 2,100

7. TRANSPORTATION COSTS (Ground transportation details):

Vehicles	Owner	Rental Rate	Amount
1-4 x 4	Rentway	$1200/mo. 1 mo.	1,200
1	Kikt Trucking	$25/hr. 90 hrs.	2,250

Air support details:

Aircraft Type	Owner	Charges	
Helicopter 206 B	Kenting	$365/hr. 6 hrs.	2,250

Total transportation costs $ 5,700

8. RECLAMATION WORK:

Interior Reforestation Co. Ltd. $ 750

9. TRAVEL EXPENDITURES (operator's costs only):

Number of Personnel	Number of Trips	Amount
Included in man-days @ $125		

Total travel expenditures $ N/A

Total costs $ 78,382

(Secs. 28 and 29, B.C. Reg. 436/75)

OFF-PROPERTY COSTS: Period from August 5, 1978 to May 11, 1979

		Amount ($)
(a)	Logistics and field support	
(b)	Technical and feasibility studies	
(c)	Preparation of reports — 30 man-days @ $125/day	3,750
(d)	Supplies and services	
(e)	Mobilization and demobilization of equipment	
(f)	Travelling expenses (Itemize)	

Total $ 3,750

Supporting Cost Statements Attached	Amount
All supporting cost is included in the $125 per man-day	N/A

Total supporting costs $ N/A

SUMMARY

On-property costs	$ 78,382
Off-property costs	$ 3,750
Total costs	$ 82,132

Statement of costs verified by Accounting Division, Finance & Administration, SCRL

(Date) (Signature and position)

Analyst, Administration & Planning - CNRL

EM-675-8196

ENCLOSURE 1

HARVEY CREEK PROJECT: STRUCTURE

CONTOUR ON TOP OF BASAL KOOTENAY

SANDSTONE (1:2 400)

SEE ACCOMPANYING MAP TUBE

K-SHEET - HARVEY CR 76(2)A

ENCLOSURE

OFFICIAL FILE COPY

401

2 of 4

K - SHELL - HARVEY CR. 78 (2) A

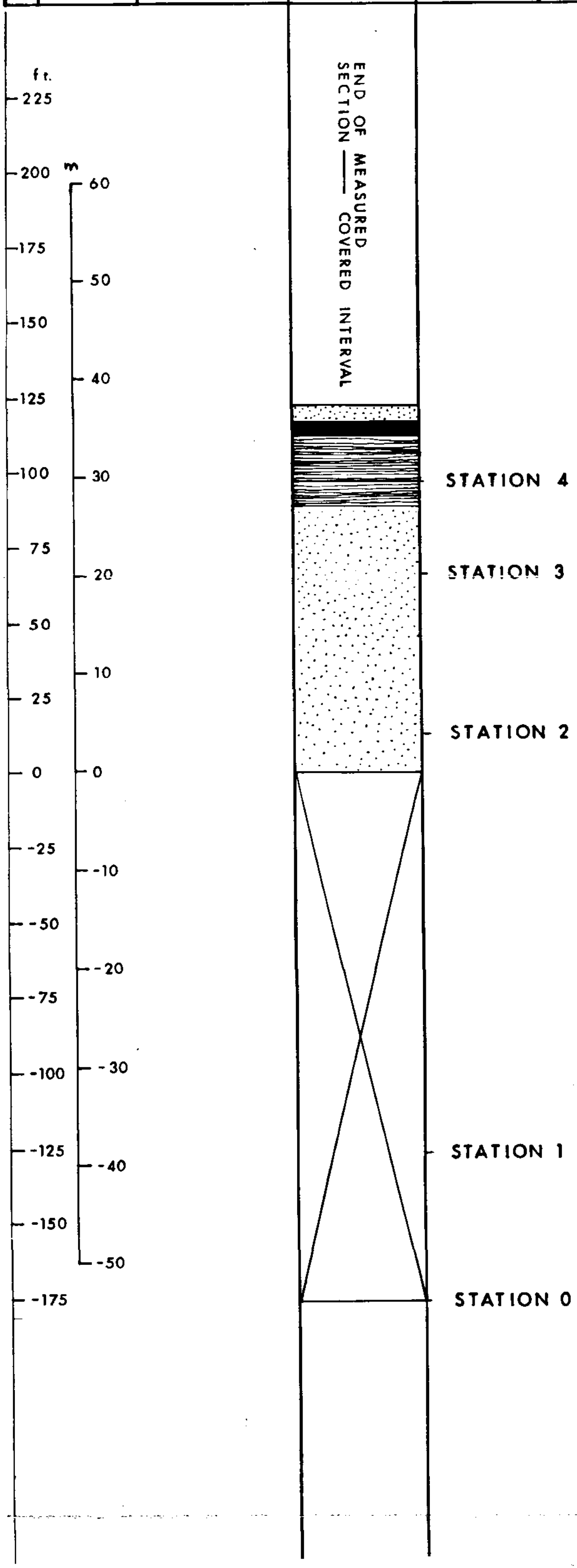
STRATIGRAPHIC SECTION

DESIGNATION:	TRENCH HC-T1	PART —	OF —
PROJECT: HARVEY CREEK	AUTHOR: J. Horachek, P. Gilmar	DATE: 1978 Sept. 26	
AREA: UPPER FLATHEAD	SOURCE OF DATA: Trench Description, Field Notes.		
LOCATION: South East B.C.			

SCALE	CONTROL POINT	INTERVAL	LITHOLOGY	STRIKE & DIP	DESCRIPTION	SAMPLE

401 2/4

①

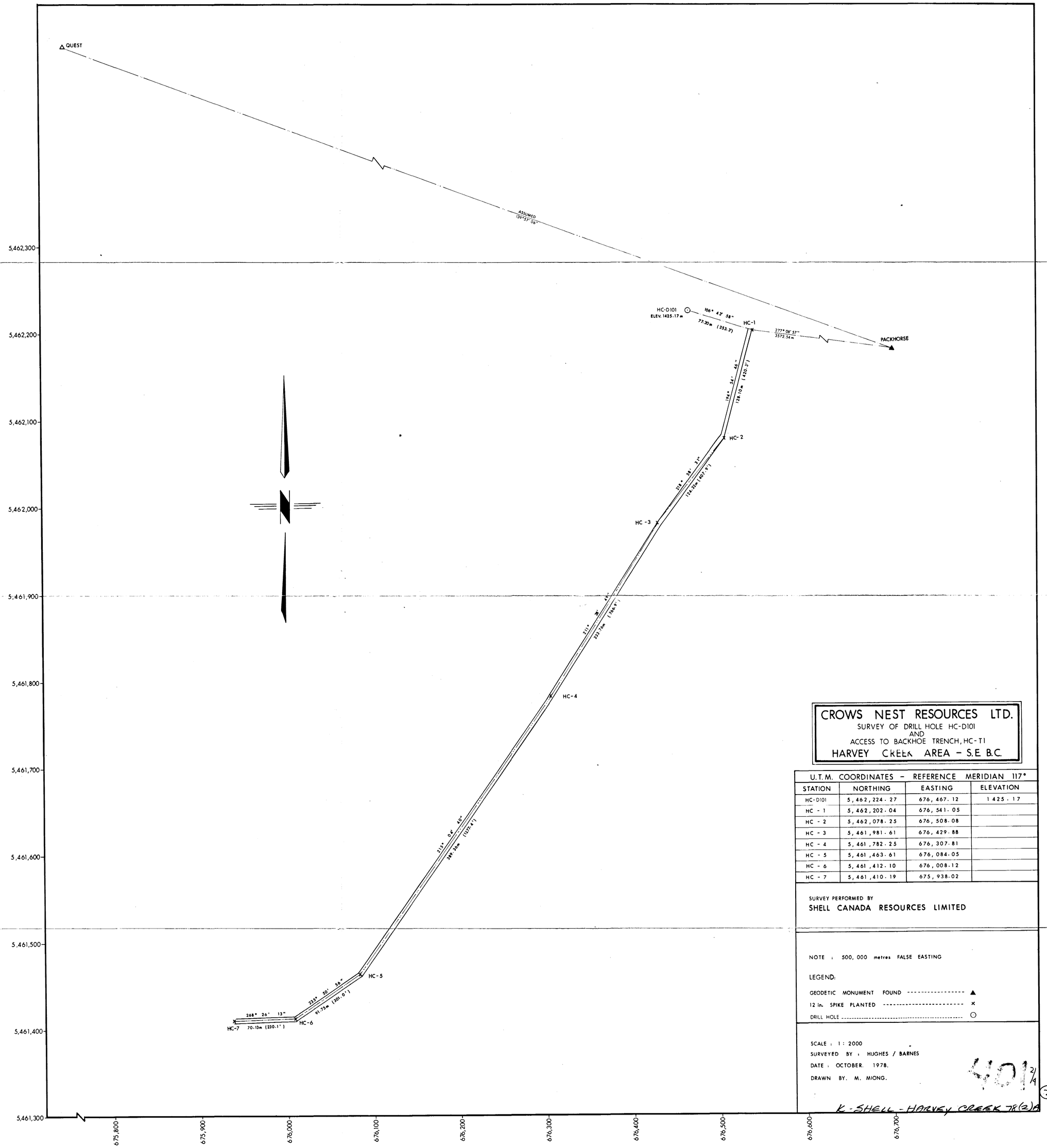


Measured by
J. HORACHEK &
P. GILMAR.
Sept. 26 / 78

1.6 m Ss.
1.7 m Coal, net Coal zone 1.3 m
4.7 m Sh. with minor Ss. interbed
0.1 m Coal
2.4 m Sh.

26.7m Ss; mg. to cg.; Dk. Gy.
N 20°E / 60° W
(MMM)

Start of HC - T-1



CROWS NEST RESOURCES LTD.

SURVEY OF DRILL HOLE HC-D101
AND
ACCESS TO BACKHOE TRENCH, HC-T1
HARVEY CREEK AREA - S.E. B.C.

U.T.M. COORDINATES - REFERENCE MERIDIAN 117°

STATION	NORTHING	EASTING	ELEVATION
HC-D101	5,462,224.27	676,467.12	1425.17
HC - 1	5,462,202.04	676,541.05	
HC - 2	5,462,078.25	676,508.08	
HC - 3	5,461,981.61	676,429.88	
HC - 4	5,461,782.25	676,307.81	
HC - 5	5,461,463.61	676,084.05	
HC - 6	5,461,412.10	676,008.12	
HC - 7	5,461,410.19	675,938.02	

SURVEY PERFORMED BY
SHELL CANADA RESOURCES LIMITED

NOTE : 500,000 metres FALSE EASTING

LEGEND:

GEODETIC MONUMENT FOUND ▲
12 in. SPIKE PLANTED ×
DRILL HOLE ○

SCALE : 1 : 2000
SURVEYED BY : HUGHES / BARNES
DATE : OCTOBER. 1978.
DRAWN BY. M. MIONG.

401 2/4 (2)

K - SHELL - HARVEY CREEK 78(2)A

HK 1/

FIG 2