K-SHELL HARVEY CREEK 75(1)A.

PRELIMINARY REPORT
COAL LICENCES Nos 585 - 601 INCL.
KOOTENAY DISTRICT.

J.J. CRABB

MAY 28TH 1976

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Fernie, British Columbia
Telephone: (604) 423-4464

CROWS NEST INDUSTRIES LIMITED

May 31, 1976

J. J. CRABB
VICE PRESIDENT - EXPLORATION

Dr. James T. Fyles
Deputy Minister of Mines
Department of Mines
and Petroleum Resources
Victoria, B. C.

Dear Sir:

RE: Coal Licences 588 - 601

We are pleased to submit the enclosed report entitled "Preliminary Report Coal Licences 588 - 601 Inclusive, Kootenay District" dated May 28, 1976, in support of Application to Extend Term of Licence of the same date, pursuant to Sections 19 and 21 of the Coal Act 1974.

The report is in two parts: Part A concerns coal licences 588 to 594 in the Flathead Valley north of Harvey Creek, and Part B reports on coal licences 595 to 601 inclusive located 12 miles to the southwest between Cabin and Storm Creeks.

Insufficient work was done on these licences to fulfill the Act requirements and we have therefore made payment of cash in lieu for the difference.

We intend to undertake reclamation work at Harvey Creek and do further hand trenching, stratigraphic measurements, and geologic mapping at Cabin - Storm Creek this forthcoming field season.

Yours very truly,

J. J. Crabb

JJC/kl

Encls.

GENERAL OFFICES
FERNIE, B. C.

MINERALS DIVISION
FERNIE, B. C.

FOREST PRODUCTS DIVISION
MAIN OFFICE
FERNIE, B. C.

ELKO OPERATIONS
ELKO, B. C.

K-SHELL HARVEY CREEK ... A

OPEN FILE

PRELIMINARY REPORT COAL LICENCES
NOS. 588 TO 601 INCLUSIVE
KOOTENAY DISTRICT

CROWS NEST INDUSTRIES LIMITED
FERNIE, B. C.

MAY 28, 1976

INTRODUCTION

Crows Nest Industries Limited (C.N.I.) of Fernie, British Columbia holds, through its wholly owned subsidiary, The Crow's Nest Pass Oil and Gas Company, Limited, coal licences 588 to 601 inclusive. These are located in two separate areas, both of which lie in the Flathead valley area of southeastern B. C:

1) Harvey Creek coal licences 588 to 594 inclusive and
2) Cabin Creek coal licences 595 to 601 inclusive.

The former seven licences contain 2032 acres and the latter seven total 3200 acres.

During the 1975 field season, hand trenching and topographic mapping were undertaken at Cabin Creek. At Harvey Creek, a backhoe was used to expose coal and a report of exploration pursuant to section 8, Coal Mines Regulation Act was filed January 19, 1976.

Part A of this report describes exploration and results thereof for the Harvey Creek Licences while Part B concerns work done at Cabin Creek.

PART A

HARVEY CREEK AREA

Coal Licence Data:

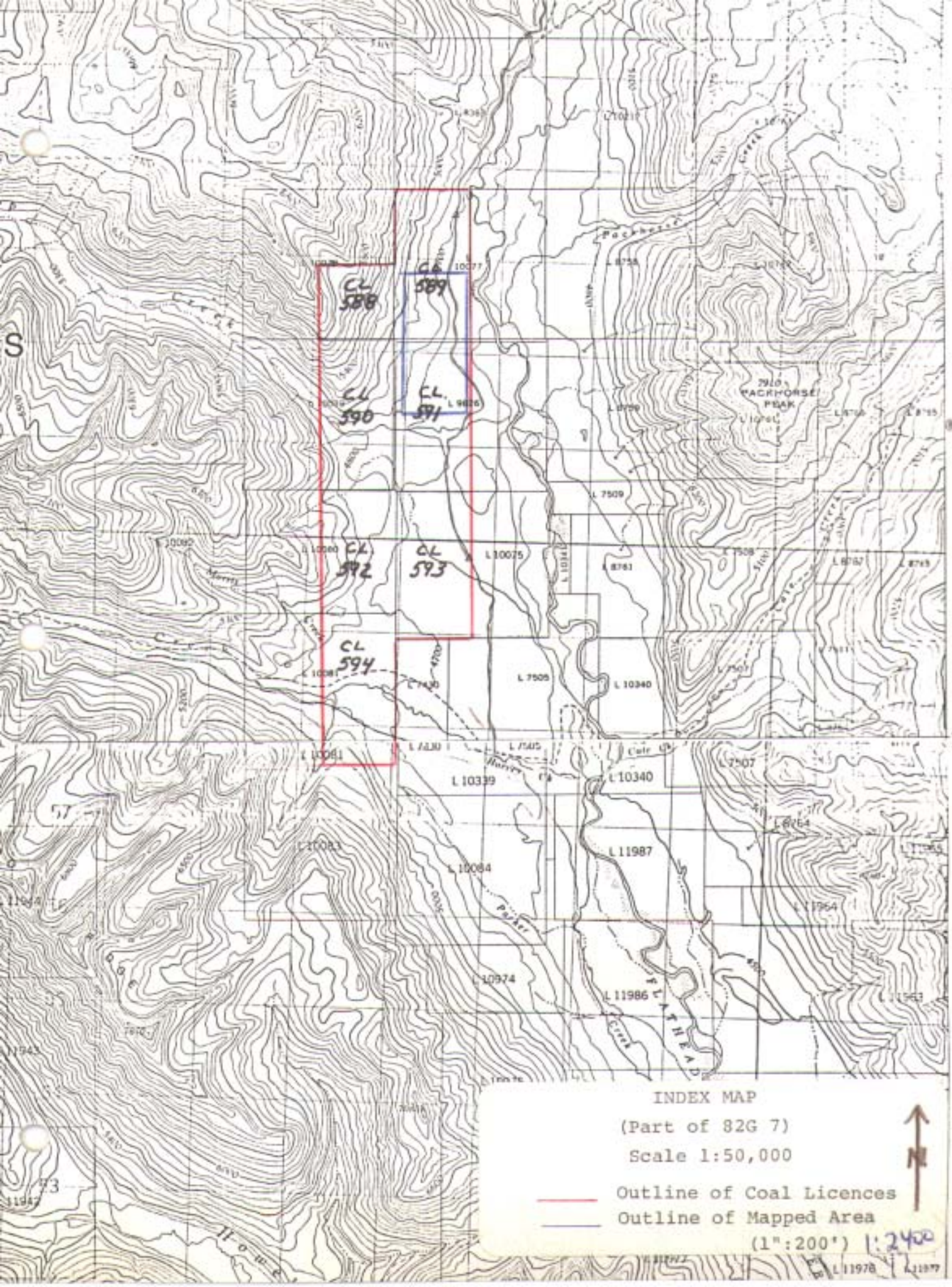
Licence No.	Date	Description	Acreage
588	June 3, 1975	SE¼ Lot 10078	160±
589	"	W½ Lot 10077	320±
590	"	E½ Lot 10079	320±
591	"	W½ Lot 9826 & Lot 10076	333±
592	"	E½ Lot 10080	265±
593	"	W½ Lot 10075	314±
594	"	E½ Lot 10081	320±
			2032

The above licences were first issued to Crows Nest Industries Limited and later assigned (Jan. 1976) to The Crow's Nest Pass Oil and Gas Company, Limited pursuant to section 9 of the Coal Act.

LOCATION

Harvey Creek coal licences are located approximate Latitude 49°17' and longitude 114°34' some 26 air miles southeast of Fernie, B. C. A portion of map 82G 7 scale 1:50,000 showing the licence area, follows this page.

Licences 588 to 594 inclusive lie along the west side of Flathead valley, extending about three and one-half miles north of Harvey Creek.


CL 588
CL 589
CL 590
CL 591
CL 592
CL 593
CL 594
INDEX MAP
(Part of 82G 7)
Scale 1:50,000
Outline of Coal Licences
Outline of Mapped Area
(1":200') 1:2400
5557000m. N.
5559000m. N.
L 10339
L 10340
L 10084
L 11987
L 10974
L 11986
L 10075
L 7509
L 7505
L 7507
PACKHORSE PEAK
7910
Packhorse Creek
Flathead Creek

ACCESS

The area is accessible from two directions:

1) From Morrissey station adjacent to Southern Trans-Provincial Highway No. 3 via Lodgepole and Flathead Forest development roads, a distance of some 32 miles.

2) From Corbin, about 19 miles south via Flathead Forest Development Road. In the licence area this road runs mainly along the east side of the outcrop belt.

These roads are normally snowed in during the winter months. A bridge over the Flathead river a few miles north of the coal licence area was washed out in the spring of 1975 and the river can only be forded during low-water.

PREVIOUS WORK

Only traces could be found of prospect tunnels and hand trenches which were emplaced during the early part of this century. These lie along the north slope of a low rounded hill, about 3/4 miles north of Shepp Creek and some 200 yards west of the Flathead Forestry Road. The existing road follows approximately the same route as the old wagon road which also extended from Corbin south to the U.S.A. border. A forest fire during the early 1930's destroyed most of the mature timber in the valley which is

now cloaked in a dense cover of second growth Jackpine. The combination of windfalls and heavy new growth makes foot travel very difficult.

TOPOGRAPHIC MAPPING

A base map, scale 1:2400 with 20' contours covering 264 acres was compiled by Kenting Earth Sciences Limited of Ottawa. (See back of this report) All surface features are shown in their approximate location.

FIELD WORK

An 1,800 foot "cat" road, designed to intersect the old prospects along the north side and, at the same time, provide access for possible drilling or other work was built from the Flathead Forestry Road to the hill summit. A 250 foot branch road was also made at right angles to the apparent regional strike which was then used for trenching with a backhoe (See Figure 1). A trench 140 feet long and about 12 feet deep was subsequently sampled, measured and backfilled.

Four "potholes" were later dug, sampled and backfilled near the south end of the main access road.

Except for basic prospecting, all work was confined to Coal Licence No. 589.

GEOLOGY

Two low elongate hills lying west of and parallel to the Flathead road north of Shepp Creek, appear to be underlain by coal measures.

Outcrops of Cretaceous rocks are very scarce. Other than the strata exposed by backhoe, the only indication of rock type and attitude is a linear sandstone talus zone trending almost north-south near the hill summit. Those exposures which appear to be in place consist of massive bedded medium grained sandstone, seemingly dipping steeply eastward toward the Flathead river.

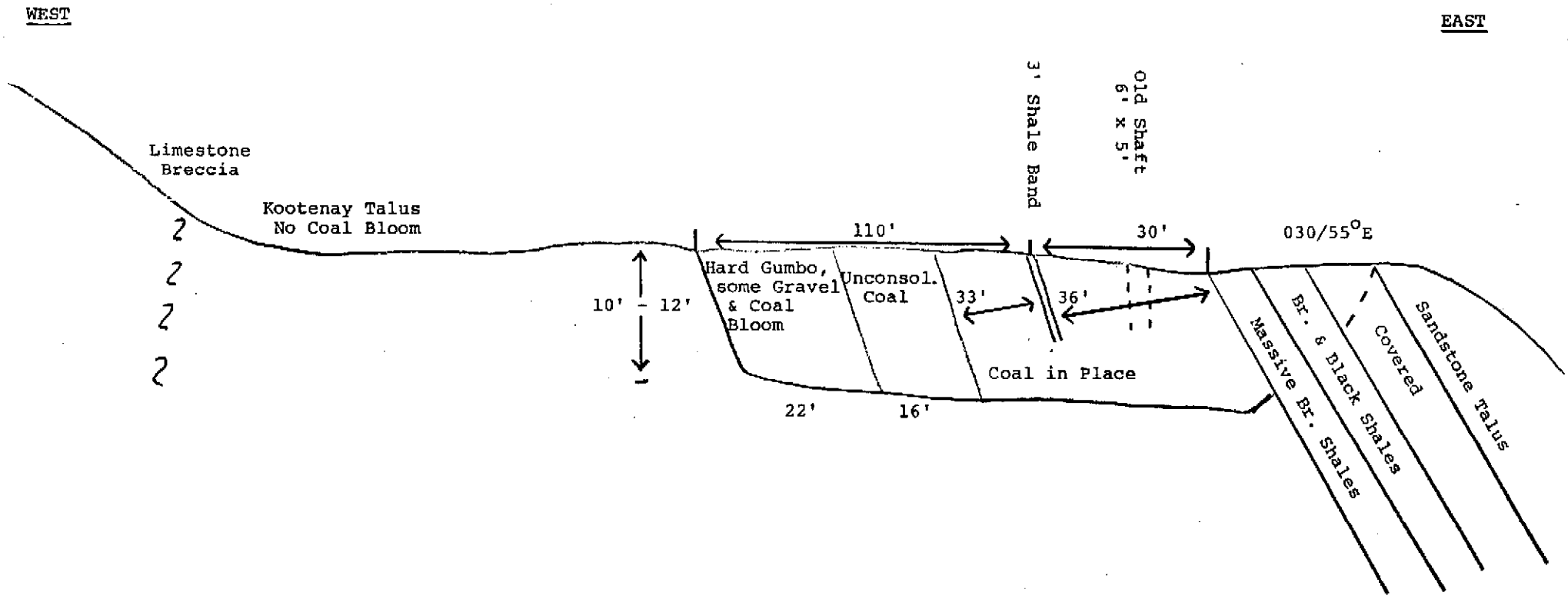
The closest outcrops to the west consist of Paleozoic limestone breccia. Absence of Jurassic, Triassic and Rocky Mountain formations further indicate a fault contact of significant magnitude.

Contrary to old reports*, only one thick seam of coal was uncovered by backhoe. The sketch profile and measured section which follows, best describes the sequence.

* DOWLING D. B. Coalfields of British Columbia Memoir 69, 1915

EAST - WEST SKETCH PROFILE ACROSS SUMMIT OF HILL

3 MILES NORTH OF HARVEY CREEK



STRATIGRAPHIC SECTION AS MEASURED IN BACKHOE TRENCH FROM EAST TO WEST

Thickness (Feet)		Lithology
10.0		Brown and Black Shales
3.0		Massive Brown Shale
5.5		Coal
3.0	16.8	Coal (Part in old shaft)
7.0		Coal with 1 or 2 Shale Bands
0.2		Sulpur Band
1.1		Coal
0.8		Shale Parting
4.5		Coal
2.0	18.5	Coal and Gumbo
12.0		Coal with 3" Gumbo Band
3.0		Shale and Gumbo - Dip 75° East
18.0	30.0	Coal with Several Shale Partings
12.0		Coal - Broken Up - Not in Situ
16.0		Coal, Bloom and Gumbo
22.0		Gumbo, Gravel and Some Bloom

NOTES

1. The divergence of dip suggests thickening of coal.
2. The coal was wet, stained and probably heavily oxidized.

3. Clay bands, representing decomposed shale partings are common.
4. Potholes on the south end showed a similar gradation to the west from coal to gumbo.

ASSAY RESULTS HARVEY CREEK

Sample Location	Moist.	Raw Ash	Float (1.5) Ash	F.S.I.	Yield
Backhoe Trench	8.2	35.3	9.0	0	34.3
Pothole #1(south)	8.9	67.1	8.7	0	39.0
Pothole #2	1.6	23.5	7.5	0	39.6
Pothole #3	13.0	48.3	9.3	0	9.9
Pothole #4	9.1	46.0	10.2	0	35.1

CONCLUSIONS

The Harvey Creek coal area appears to be confined to a relatively small, down-dropped linear segment of Kootenay strata. This factor, plus the observed discordance in dips would indicate that coal bed(s) are deformed at depth, thereby making underground mining more speculative than in other coal areas of the district.

Amounts of coal above valley elevation which might be considered for open pit mining is quite limited, relative to others now under investigation. This leads to the assumption that the Harvey Creek deposits would, in order to make economic sense, have to be developed in conjunction with other nearby mines.

PART B

CABIN CREEK AREA

Coal Licence Data:

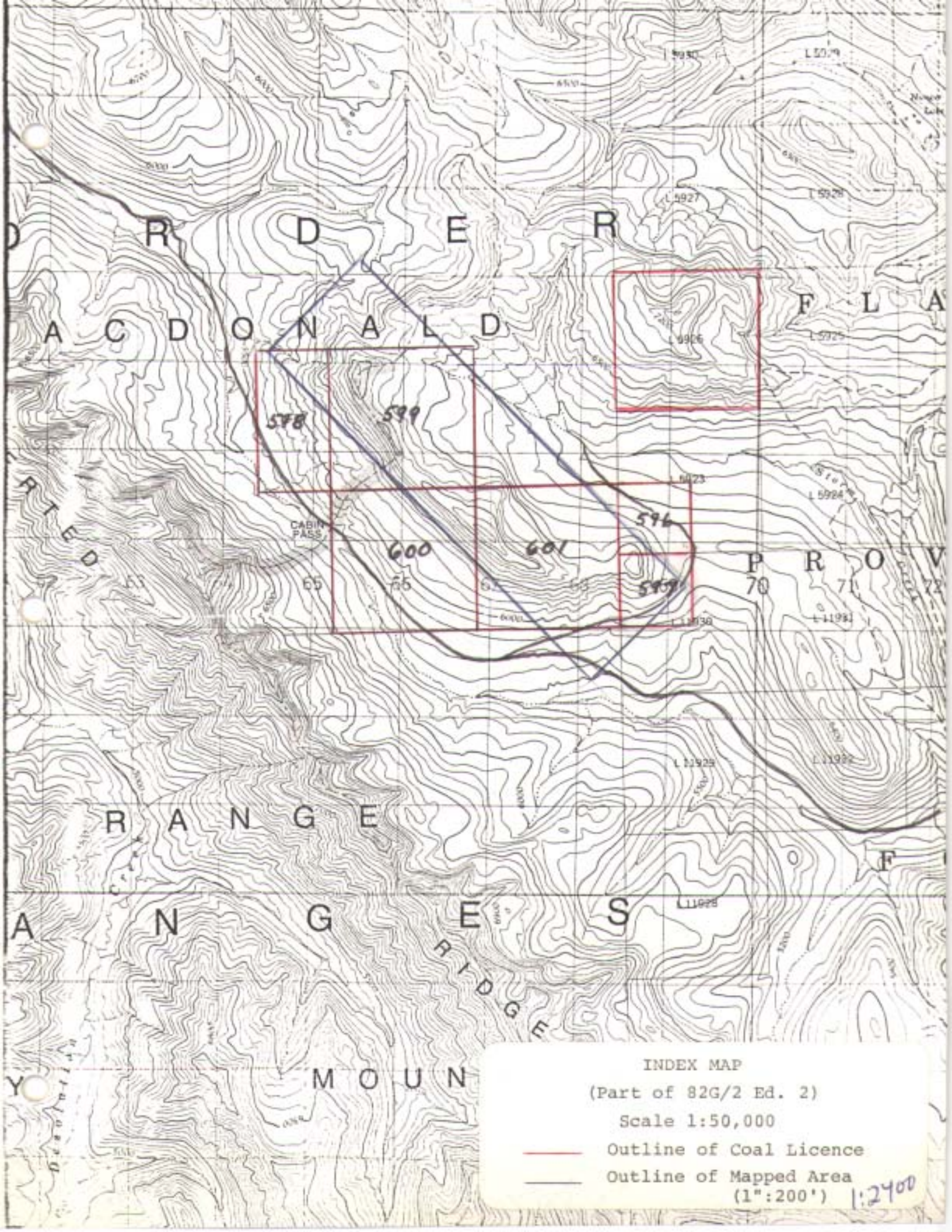
Licence No.	Date	Description	Acreage
595	June 3, 1975	Lot 5926	640
596	"	SW¼ 5923	160±
597	"	NW¼ 11930	160±
598	"	Unsurveyed	340
599	"	"	640
600	"	"	640
601	"	"	640
			3200

The above licences were first issued to Crows Nest Industries Limited and later assigned (Jan. 1976) to The Crow's Nest Pass Oil and Gas Company, Limited pursuant to section 9 of the Coal Act.

LOCATION

Cabin Creek coal licences are located approximate latitude 49°08' and longitude 114°43', some 30.5 air miles southeast of Fernie, B. C. A portion of map 82G/2 Ed. 2 scale 1:50,000 showing the licence area follows this page.

Licences 596 to 601 inclusive lie between the watersheds of Cabin Creek and Storm Creek and licences 595 is located along the height of land between Storm Creek and Leslie Creek.


R D E R
A C D O N A L D
F L A
598
599
600
601
594
597
CABIN PASS
P R O V
70
71
R A N G E
A N G E S
F
RIDGE
M O U N
INDEX MAP
(Part of 82G/2 Ed. 2)
Scale 1:50,000
Outline of Coal Licence
Outline of Mapped Area
(1":200')
1:2400

ACCESS

From Morrissey station adjacent to Southern Trans-provincial highway No. 3, the shortest distance to the prospect area via Lodgepole, Ram Creek and Storm Creek Forest access roads is about 38 miles. Access may also be gained via the Lodgepole, Flathead and Cabin Creek roads, a total distance of about 52 miles from Morrissey station. Unless logging operations are underway, these roads are not open during the winter months. From a point about one mile over the Cabin - Storm Creek summit, an abanded subsidiary logging road trends westerly toward the coal outrop area. From the end of this latter road, the walking distance to nearest ridgetop trench is about one mile.

TOPOGRAPHIC MAPPING

A base map, scale 1:2,400 (1":200') with 20 foot contours covering about 1,803 acres was compiled by Kenting Earth Sciences Limited, of Ottawa. (See back of this report) All surface features are shown in the approximate location.

FIELD WORK

All prospecting was done by local high school students. No mechanical equipment was used (other than for transportation). Seams were first trenched on the southeast end and were later traced by potholing along the east and west sides of the outcrop area. Large slump blocks of the overlying sandstone cover the seam outcrops on the north end of the mountain.

GEOLOGY

An erosional remnant of the lower Kootenay formation containing two seams of coal cap the ridge between Cabin and Storm Creeks. These measures, found at elevations up to 7,100 feet, dip-slope northeast toward Storm Creek at angles of 20^{o} or less. The area underlain by the lower seam is approximately 160 acres; the upper seam area is considerably smaller.

A stratigraphic section was measured down the southwest slope where best exposures occur.

Aug. 20-21 1975

Thickness (feet)		Description
50' +		Medium grained, dark grey sandstone, rusty weathering. Forms a distinctive cliff almost entirely around the perimeter of the ridge.
0.3		Carbonaceous friable shale, shiny
1.8		Carbonaceous friable shale, dull - ROOF
2.5		Coal hard clean
1.4		Coal with shale lenses.
0.05	FIGURE 4	Shale parting, very hard
0.9		Coal, hard, clean
0.05		Shale parting, very hard
1.3		Coal, soft, clean
0.7		Coal, some oolitic iron stringers
0.05		Gumbo

Thickness (Feet)		Description
0.8		Coal medium hard
3.0		Coal iron stained
1.0		Coal appears good quality
0.1		Shale parting
0.3		Coal iron stained
0.1		Shale parting, soft, black
0.5		Coal brown stained
1.0		Coal clean, brittle
0.2		Shale hard, brittle
0.6	FIGURE 4	Shale hard, grey with coal stringers
0.65		Coal fairly clean
1.8		Coal good quality, iron stained
0.1		Shale hard, grey
0.5		Gumbo, black, carbonaceous
0.05		Gumbo, red
0.15		Gumbo, black, carbonaceous
0.05		Gumbo, red
0.55		Coal, brittle, some staining
		Total seam thickness 18.4
		Total coal thickness 16.4

Thickness (Feet)		Description
7.3		Shale floor carbonaceous 293/24°N
0.6		Coal and shale
4.1		Shale
0.8		Coal iron stained
0.2		Shale, grey blocky
0.6	FIGURE 4	Coal appears dirty, iron stained
0.5		Gumbo, black carbonaceous
0.5		Coal with shale stringers
0.2		Shale carbonaceous
6.0		Coal soft, few small shale stringers, iron stained
1.7		Coal with shale stringers
0.4		Shale
0.9		Coal soft, dirty
		Total seam thickness 11.8
		Total coal thickness 10.5
		Floor - shale 302/23°N
104.0		Shale and sandstone - forms prominent
	FIGURE 5	topographic break between upper and
		lower seams.
22.0		Shale blocky
1.5		Shale with coal stringers
0.9		Coal, very hard

Thickness (Feet)		Description
0.2		Shale
0.7		Coal dirty
1.7		Shale blocky
1.0		Coal and shale 50% coal
0.7		Coal with shale partings 90% coal
0.6		Coal
0.5		Coal iron stained
1.4		Coal fairly soft
0.2	FIGURE 5	Shale
1.5		Coal with shale stringers 90% coal
1.5		Coal clean, soft
0.1		Iron band
1.4		Coal clean, brittle
0.6		Coal with iron stringers
1.6		Coal
0.2		Shale blocky
0.4		Coal with shale stringers 75% coal
25.0		Shale footwall, grades into siltstone that forms prominent ridge below trench. 095/19°N

Total seam thickness 15.2'

Total coal thickness 12.8'

ASSAY RESULTS FOR CABIN CREEK

Sample Location	Moist.	Raw Ash	Float Ash (1.5)	F.S.I.	Yield
Top of Upper Seam	3.9	14.1	7.4	0	59.9
Bottom of Upper Seam	6.8	13.3	7.1	0	71.5
Lower Seam	4.2	18.5	8.4	0	67.7

CONCLUSIONS

Assuming continuity of seam thickness' throughout the coal bearing area, the volume of coal in situ would be about 7,347,000 short tons. An apparent low ratio of rock to coal (probably less than 5.5:1) in a dip-slope condition would allow open-pit methods of mining. Since the area has low pitch, good roof, and appears to be relatively simple geologically, underground mining could be an alternative method.

Figure 1

Backhoe starting to dig Trench across strike of coal measures. Looking west towar Paleozic limestones.

Figure 2

Completed Backhoe Trench

Figure 3

"Potholes" near south end of main access road. Looking northwest.

Figure 4

Upper Seam Cabin Creek

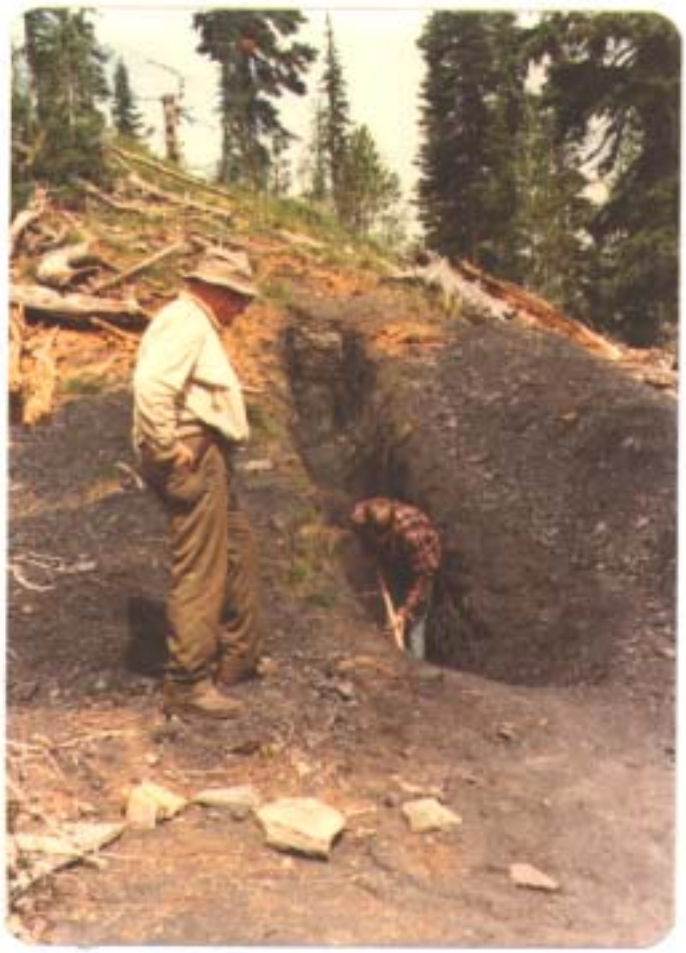


Figure 5

Lower Seam Cabin Creek

CROWS NEST INDUSTRIES LIMITED

TOPOGRAPHIC MAP OF

CABIN CREEK COAL AREA

BRITISH COLUMBIA

PREPARED FOR

SCALE 1"= 200' or 1:2,400

FEET 200 100 0 200 400 600 800 1000 FEET

Contour Interval 20 feet

Contours in wooded areas are approximate only

Elevations in feet above Mean Sea Level

LEGEND

- BUILDING
- ROADS — PAVED — LOOSE
- WAGON ROAD
- TRAIL
- TREE LINE
- SINGLE TREE
- STREAM
- RIVER — SAND
- CONTOURS — 6000
- SPOT ELEVATION — 6292
- MINING AREA BOUNDARY
- HORIZONTAL CONTROL POINT — △ T-2
- PHOTO CENTRE — +54

NOTE: Horizontal and Vertical Information Derived From N.T.S. 1:50,000 Maps

GRID : Based on 6° U.T.M. Grid, Zone 11 Derived From N.T.S. Sheet No. 82 G2 East

DATE: November 1975

Seam Outcrop

Approx. Location

Assumed Location

Hand Trench

UPPER SEAM

LOWER SEAM

K-HARVEY CREEK 00400 (1) 75(1)A.

17,864,000 N 2,186,000 E

17,865,000 N 2,187,000 E

2,188,000 E 17,866,000 N

17,863,000 N

2,186,000 E

2,187,000 E

17,860,000 N

2,188,000 E

2,189,000 E

17,859,000 N

2,190,000 E

17,865,000 N

2,189,000 E

17,864,000 N

2,191,000 E

17,858,000 N

2,192,000 E

17,859,000 N

2,193,000 E

17,860,000 N

2,194,000 E

17,862,000 N

2,163,000 E

17,862,000 N

2,194,000 E

17,861,000 N

00400

310,000 E 311,000 E 344,000 N 312,000 E

309,000 E 344,000 N 343,000 N

343,000 N 342,000 N

342,000 N 341,000 N

341,000 N 340,000 N

340,000 N 339,000 N

308,000 E 309,000 E 310,000 E 339,000 N 311,000 E

SAND

SAND

4649

4636

4644

4636

4636

4634

4626

4674

4631

4709

4727

4691

4714

4709

4726

4744

4685

4640

4640

4640

4680

4700

4720

4800

4900

4960

4900

4800

4800

4700

4800

4960

4900

4800

4700

4680

Forest

Forest

Forest

Forest

LIMESTONE BRECCIA

SANDSTONE

1800'

250'

4905

4917

4893

4900

5462200 N
676100 E
U.T.M.

Access Road

Drill Site

Backhoe Trench

Backhoe Pothole

Approx. Geologic Boundary

Assumed Geologic Boundary

Assumed Fault

N

LEGEND

BUILDING

ROADS — PAVED — LOOSE

WAGON ROAD

TRAIL

TREE LINE

SINGLE TREE

STREAM

RIVER — SAND

CONTOURS — 6000

SPOT ELEVATION ·6292

MINING AREA BOUNDARY

HORIZONTAL CONTROL POINT △ T-2

PHOTO CENTRE +54

NOTE: Horizontal and Vertical Information
Derived From N.T.S. 1:50,000 Maps
ARBITRARY GRID: No Fixed Origin

DATE: November 1975.

PREPARED FOR

CROWS NEST INDUSTRIES LIMITED

TOPOGRAPHIC MAP OF

HARVEY CREEK COAL AREA

BRITISH COLUMBIA

SCALE 1"= 200' or 1:2,400

FEET 200 100 0 200 400 600 800 1000 FEET

Contour Interval 20 feet
Contours in wooded areas are approximate only
Elevations in feet above Mean Sea Level

K-SHELL-HARVEY CREEK 75(1)A.

Produced by
KENTING EARTH SCIENCES LIMITED
Ottawa, Ontario Canada

00400 (2)