LILLYBURT

SOUTHEAST
B.C.

1985
GEOLOGICAL
REPORT

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

December 20, 1985

Ministry of Energy, Mines and
Petroleum Resources
525 Superior Street
Victoria, B.C.
V8V 1T7

Dear Sirs:

Enclosed please find our report on the Lillyburt Project.

This report has been prepared by Mr. B. McKinstry, an employee of Crows Nest Resources Limited.

Mr. B. McKinstry, M.Sc., graduated in Geology from Carleton University, Ottawa in 1971. Prior to graduation, Mr. McKinstry worked as an assistant for a major mining firm and after graduation as a geologist with a mining firm, a research assistant at Carleton University and a a geologist with a consulting firm. Mr. McKinstry has been employed by Crows Nest Resources Limited as a Staff Geologist, since 1981.

I consider the aforementioned geologist to be well qualified to undertake the responsibilities assigned on this project. I am satisfied that the attached report has been competently prepared and justly represents the information obtained from this project.

Yours very truly,

B.D. Ryan, P. Geol.
Manager, Geology

A12/u.2

LILLYBURT PROJECT

Kootenay Land District, British Columbia

B.C. Coal Licence Numbers: 4080-4089 Inclusive; 5313, 7292

Group Number : 243

Owner: Shell Canada Resources Limited

Operator: Crows Nest Resources Limited

NTS: 82G/7

Longitude: 114° 37' West

Latitude: 49° 22' North

Report Prepared By: B. McKinstry
Staff Geologist
December, 1985

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LIST OF ENCLOSURES

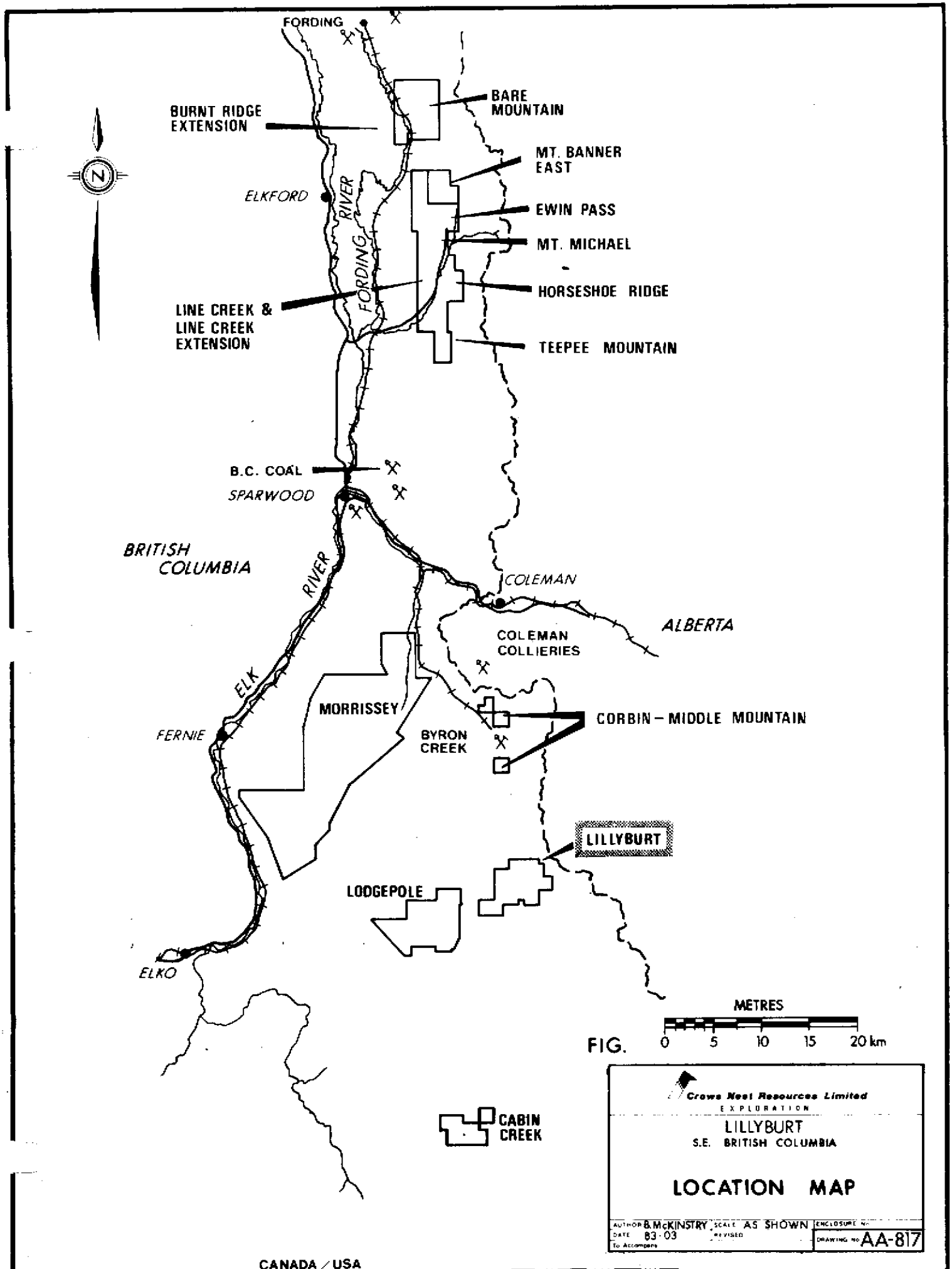


FIG.

ENCLOSURE 1

SUMMARY

The Lillyburt coal property is located within British Columbia coal licences 4082 through 4087 inclusive, and licences 5313 and 7292 covering some 1865 hectares of land. The licences are located in the northeast end of the Flathead River Valley in southeastern B.C. (Enclosure 1). Access to the property is obtained via the Corbin Valley forestry access road from the Corbin coal loading facilities (15 kilometers) or via the Lodgepole forestry access road from Morrissey Station on the main C.P.R. railway line (45 kilometers). Total rail distance to Roberts Bank, Vancouver, is approximately 1150 kilometers.

Coal licences, 4080-4089 (Group #243), have been held since 1978 by Shell Canada Resources Limited with operations carried out by its wholly-owned subsidiary, Crows Nest Resources Limited. Exploration to date has included 26 rotary holes, 4 diamond drill holes, numerous backhoe trenches, geological mapping, ground control and location surveys and photogrammetric mapping. In 1982, Shell Canada Resources Limited obtained coal licences 5313 and 7292 immediately to the east of the above mentioned licences. However, corporate evaluation of the Lillyburt project has required the forfeiture of licences 4080, 4081, 4088 and 4089 inclusive this year.

Geology within the area of interest is dominated by normal faults to the northeast and south, and by a thrust fault to the west. Drilling and mapping data indicate Jurassic-Cretaceous Fernie, Kootenay and Cretaceous Blairmore stratigraphy have been folded into an open doubly plunging asymmetric syncline with axial plane trending east-west. This structure is bounded on all sides by high angle normal faulting exhibiting considerable movement.

Thickness of the coal-bearing member of the Kootenay Formation is 300 meters on the south limb of this syncline but reduced to 140 meters on the north limb. Within the coal-bearing member, there are five seams of economic interest totalling 21 meters in aggregate thickness. All seams exceed 1 meter; with the thickest averaging 10 meters, being the third seam in an ascending order from the Fernie-Kootenay contact.

Total indicated resources of coal underlying group #243 within the property are estimated to be some 130 million tonnes. Geological in place "reserves" are calculated to be 24.9 million tonnes with an overburden ratio of 3.8 cubic meters rock per tonne coal. These figures may increase with the added coal potential underlying licence #5313.

Analysis from rotary cuttings and drill core indicate coal at Lillyburt to be medium volatile bituminous.

1.0 INTRODUCTION

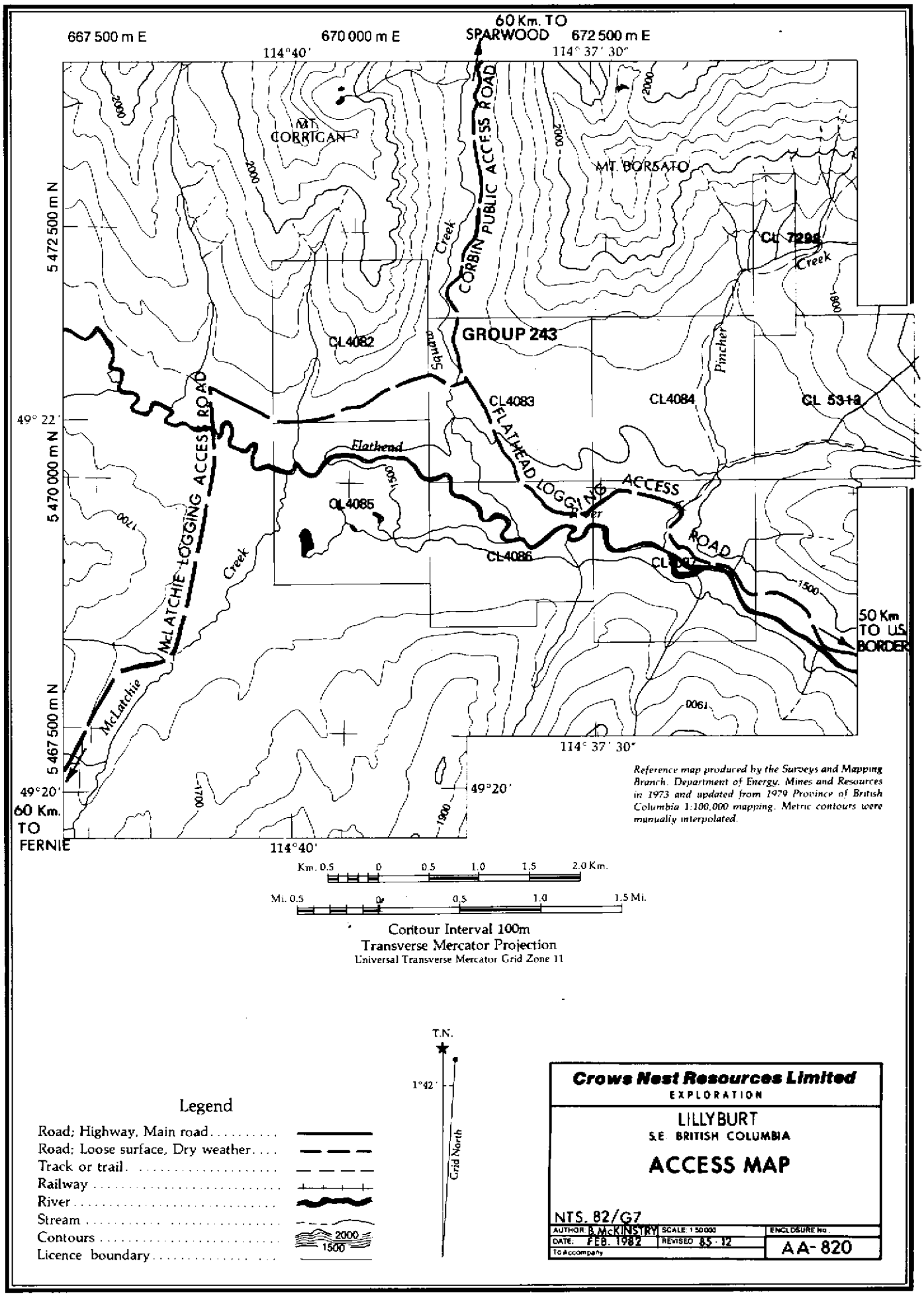
1.1 Location and Access NTS 82G/7

The Lillyburt Coal Prospect is located in and near the Flathead River Valley in the Front Range of the Rocky Mountains of southeastern British Columbia.

The prospect is 40 and 15 kilometers from the nearest railway points at Morrissey Station and the Corbin Mine Loop respectively. In addition, it is 60 kilometers by logging and forestry access roads from the towns of Sparwood and Fernie. (Enclosure #2). The port of Vancouver is approximately 1150 kilometers by rail from the property. Most of the project area has been extensively logged providing a dense network of roads throughout the property. These roads have been utilized for drilling access, backhoe trenching and geological mapping.

1.2 Geography and Physiography

Topography in the area is of relatively moderate relief ranging from 1480 meters near the Flathead River increasing to 1720 meters at the northern boundary. The Flathead River forms a natural boundary to the south while Squaw Creek bisects the property into east and west halves. Extensive logging operations have removed a substantial percentage of forest vegetation. The abandoned townsite of Flathead is located on Coal Licence #4087 within the property.



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

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

T.N.
1°42'
Grid North

Legend

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

Crows Nest Resources Limited
EXPLORATION

LILLY BURT
S.E. BRITISH COLUMBIA

ACCESS MAP

NTS. 82/G7

AUTHOR: B. McKINSTRY	SCALE: 1:50 000	ENCLOSURE No.
DATE: FEB. 1982	REVISED 85 - 12	AA- 820
To Accompany		

ENCLOSURE 2

1.3 Tenure of Land and Coal Rights

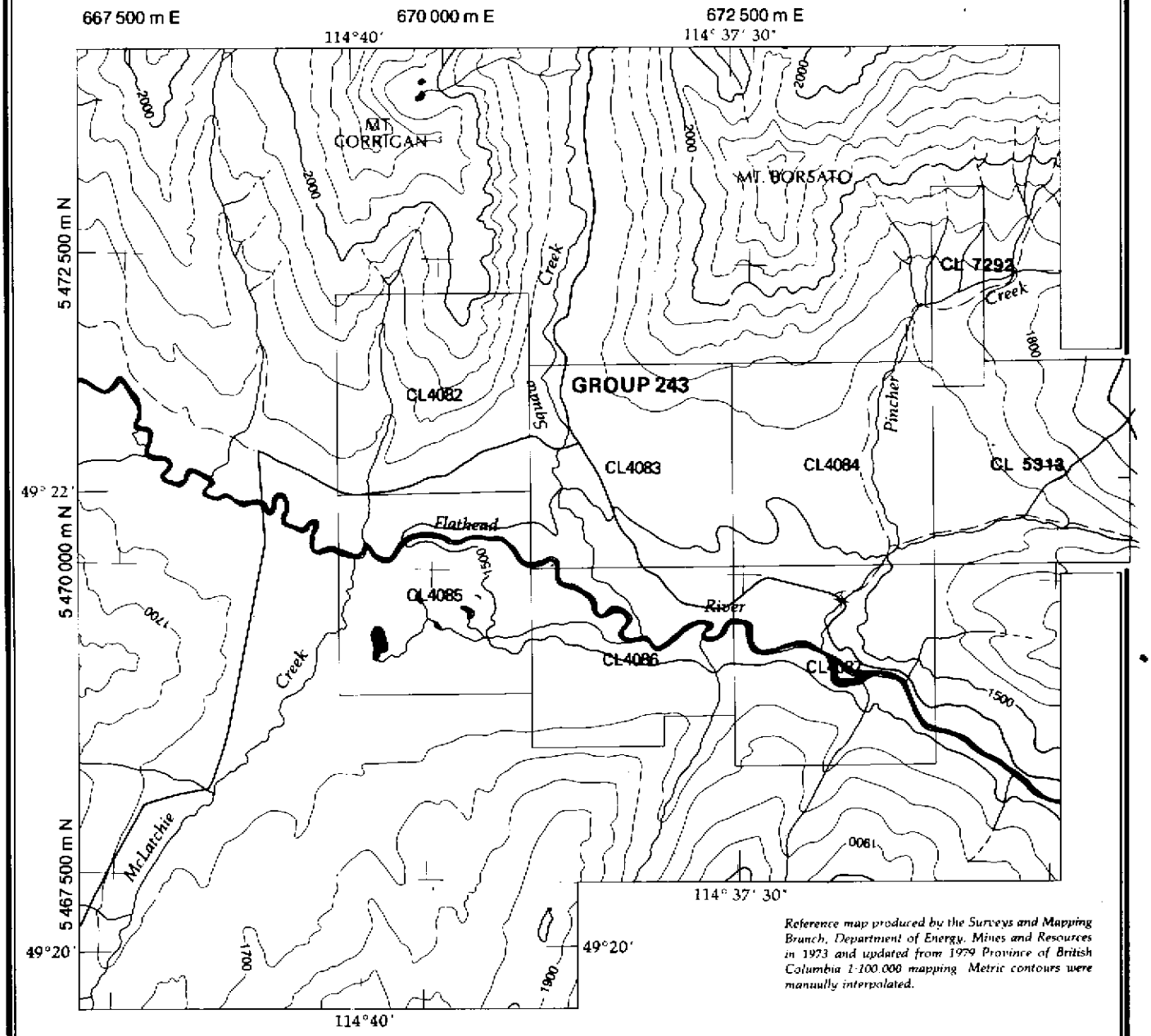
The Lillyburt Coal Property consists of 9 B.C. Coal Licences, held by Shell Canada Resources Limited, a wholly-owned subsidiary of SCRL. The licences, #4080-4089, were acquired by SCRL in 1978 and were grouped (#243) in 1981. Licences 5313 and 7292 were purchased in 1982 from William Schenfield of Fernie, B.C. and have been included in group 243. A re-evaluation of geology and economic considerations has necessitated a decision to forfeit licences 4080, 4081, 4088 and 4089 inclusive this year. The licences now total some 1865 hectares of land. Enclosure #3 details the position of licence boundaries with respect to topographic features.

2.0 WORK DONE

2.1 Summary of Previous Work

In 1978, aerial photography and ground control surveys were done on photogrammetric topographic maps which were constructed at a scale of 1:5000 with five-meter contour intervals.

Reconnaissance geological mapping at a scale of 1:5000 was initiated in 1979. Preliminary rotary drilling was carried out on the property in three localities totalling 571 meters. In addition, three backhoe trenches and six hand trenches were dug for a total length of 30 meters.



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

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

T.N.
1°42'
Grid North

Legend

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

FIG.

Crows Nest Resources Limited
EXPLORATION

LILLYBURT
S.E. BRITISH COLUMBIA

INDEX MAP TO COAL LICENSES

NTS 82/G7

AUTHOR: B. McKINSTRY	SCALE: 1:50 000	ENCLOSURE No.:
DATE: FEB 1982	REVISED: 85-12	AA-821
To Accompany		

ENCLOSURE 3

During the 1980 field season, an additional nineteen vertical rotary holes were drilled throughout the property totalling 3388 meters. Three backhoe trenches were excavated along the north limb of the syncline for a total distance of 275 meters. Reconnaissance geological mapping continued at the scale of 1:5000. In 1981, 4 diamond holes and 3 rotary holes were drilled along with some road construction and detailed mapping at 1:5000 scale. This mapping encompassed all relevant outcrops on and around the licences. Upon acquisition of Licences 5313 and 7292 in 1982, a report was filed (McKinstry, 1983) detailing the results of the off-licence mapping.

2.2 Work Accomplished, 1985 (Licence 5313)

Extensive logging operations on and to the east of licence #5313 in the past seven years has exposed sufficient outcrop to extrapolate geological contacts. W. Schenfield's trenching and prospecting activities in 1981 exposed coal showings close to the presumed trace of the Flathead normal fault. It was decided to test the validity of the coal showings with a shallow rotary hole in 1985. Subsequently, Western Hydro-Air of Calgary was contracted and mobilized to the site in September and proceeded to drill 110 meters of strata. High water pressures encountered in the hole at this depth prevented further penetration and the hole was cemented off with casing left in the ground. Fall weather conditions required a postponement of reclamation of the site until drier conditions prevail in 1986. The hole was

geophysically logged at a scale of 1:200 by Century Geophysics of Calgary, Alberta. Open hole conditions enabled the following suite of logs to be run; Gamma ray, Neutron-Neutron, Verticality, Caliper, Resistivity and Density (Enclosure 8). A detail scale of 1:20 was used over the two coal seams encountered. Chip samples were taken every 5 meters and several representative intervals were thin sectioned for detailed analysis. Descriptions of rotary cuttings, thin sections and binocular microscopic samples are included with this report (Enclosure 9). Location of the borehole was interpolated from airphoto coverage and the 1:5000 topographic map. Accuracy for the UTM coordinates is to within ±5.0 meters and ±2.0 meters for the elevation estimate.

BH85-1 COORDINATE DATA

Northing (m):	5471050
Easting (m):	674190
Elevation (m):	1565

2.3 Cost of Work Done, 1985

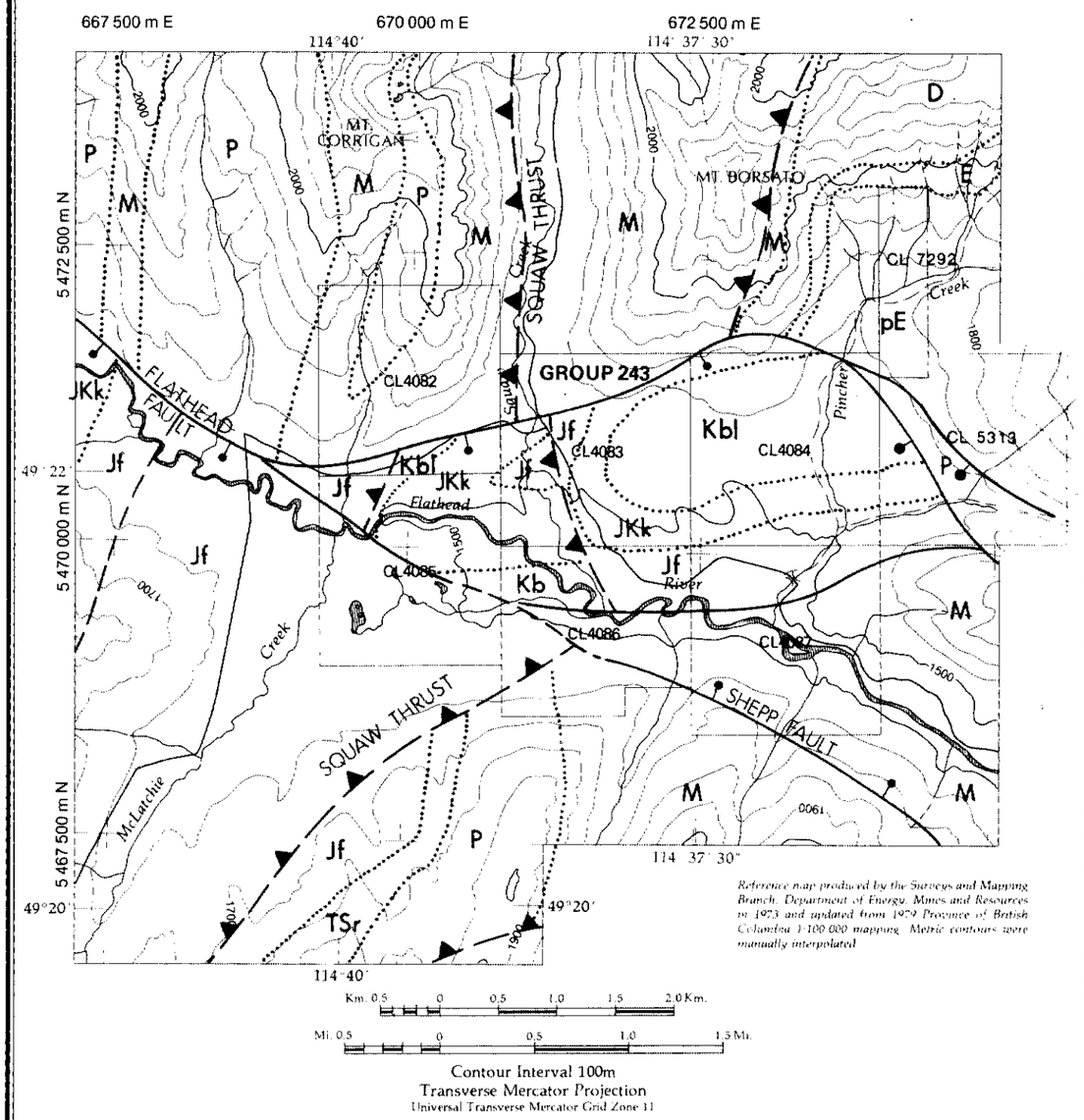
Total expenditure for 1985 work and report generation are $20,497. A detailed summary of expenditures can be found in Enclosure 11.

3.0 GEOLOGY

3.1 Regional Geology

The Lillyburt Coal Prospect is located in the Flathead Valley graben structure as outlined in Price (1965). The property is bounded by the south-dipping Flathead normal fault to the north and east, and a north-dipping normal fault located in the Flathead River to the south (Enclosure 4). Westward, coal-bearing strata are confined by the Squaw Thrust. Strata to the north and south of the property consist of Cambrian to Pennsylvanian carbonates. Shales of the Jurassic Fernie Formation are dominant west of the Squaw Thrust. To the east, the Flathead normal fault separates the Kootenay strata from Precambrian Purcell lavas. However, this year's drilling results suggest a splay off the Flathead fault has interjected possible Pennsylvanian Rocky Mountain Formation strata between the above mentioned units.

Thrusting and associated folding are dominant structural features within the strata surrounding the Lillyburt prospect but are of minimum importance within the property. However, due to the influence of the Flathead normal fault, high angle normal faulting and strikeslip faulting at a local scale dominate the geology within the property (Enclosure 7).



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

GEOLOGICAL LEGEND

CRETACEOUS

Kbl — Blairmore Group

JURASSIC - CRETACEOUS

JKk — Kootenay Group

JURASSIC

Jf — Fernie Formation

TRIASSIC

TSr — Spray River Group

PENNSYLVANIAN

P — Rocky Mountain Formation

MISSISSIPPIAN

M — Rundle Group + Banff Formation

DEVONIAN

D — Palliser + Alexo Formations
Fairholme Group

CAMBRIAN

E — Elko + Flathead Formations

PRECAMBRIAN

pE — Purcell Group

..... geological contact (approximate)

thrust fault (approximate)
teeth on upthrust side

gravity fault (approximate)
solid circle on downthrown side

Legend

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

FIG.

Crows Nest Resources Limited
EXPLORATION

LILLYBURT
S.E. BRITISH COLUMBIA
GEOLOGICAL COMPILATION MAP

82 G/7

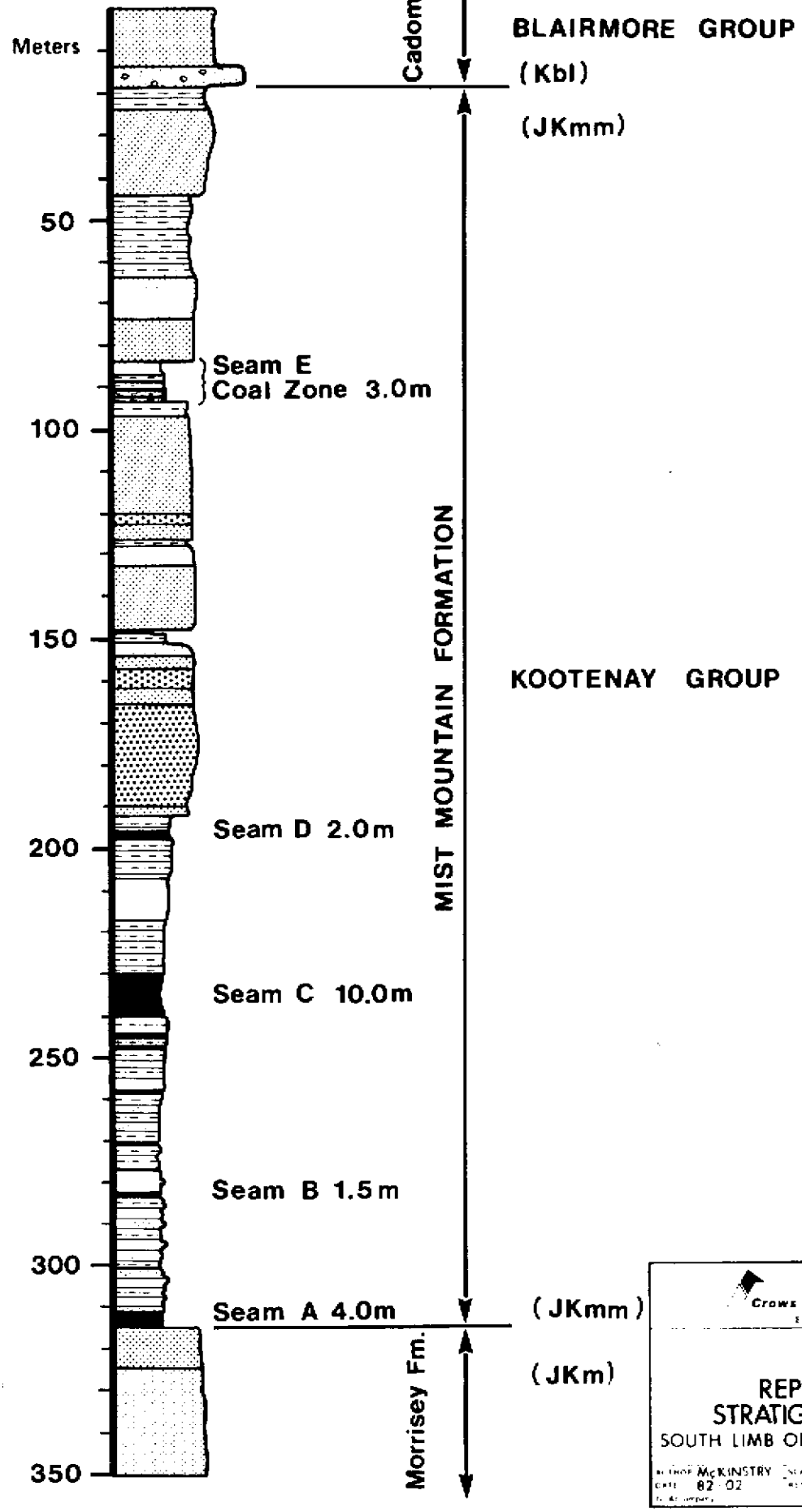
AUTHOR MCKINSTRY	SCALE 1:50 000	ENCLOSURE No.
DATE 82-02	REVISED 85-12	DRAWING No. AA-822
To Accompany		

ENCLOSURE 4

3.2 Geology of Coal Licence 5313

The stratigraphy of the Lillyburt Project has been extensively outlined by McKinstry (1981). Enclosure 5 details the main lithologic units which occur within the Jurassic - Cretaceous Kootenay Mist Mountain Formation. It was considered by McKinstry (1983) that the lower seams of this section could be traced eastward to the trenching sites of W. Schenfield on licence #5313.

Examination of the geophysical log profiles of borehole 85-1 suggest that correlation of 'B' seam, 'A' seam and a 5 meter sandstone unit between A and B can be achieved with log profiles from boreholes 301, 302, 212 and 213. This would strengthen the argument for extrapolation of Lillyburt geology along the south limb of the syncline eastward. However, evidence from chip samples and thin section material below A seam (Enclosure 9) (at approximately 72m in the hole) indicate a radical deviation in lithology from Kootenay strata. These chips have been very tentatively identified as representing Pennsylvanian Rocky Mountain dolomitic sandstones and dolomites based upon lithologic descriptions of Price (1965). It is suggested that a west dipping normal fault separates this strata from the overlying A seam and may be a splay from the Flathead normal fault system. Figure 6 reflects these revisions to previous geological interpretations. Figure 7, a cross-section through borehole 85-1 illustrates this interpretation. Dips for Kootenay strata were extrapolated from attitude information on the south limb of the syncline while dips for the Rocky Mountain Formation were interpolated from nearby surface mapping data.



Crows Nest Resources Limited
EXPLORATION

LILLYBURT
S.E. B.C.

REPRESENTATIVE STRATIGRAPHIC COLUMN

SOUTH LIMB OF THE LILLYBURT SYNCLINE

AUTHOR McKINSTRY SCALE AS SHOWN ENCLOSURE NO.
DATE 82 02 REVISED DRAWING NO. AA-828

ENCLOSURE 5

3.3 Structural Geology

McKinstry (1981) has indicated that Jurassic - Cretaceous Kootenay Group stratigraphy has been folded into a doubly plunging syncline at Lillyburt. Evidence from field mapping in 1981 and drilling in 1985 suggest the syncline is constrained on the east by the Flathead normal fault. Price (1965) suggested that the Flathead fault is dipping steeply west in this vicinity. In addition, Dowling (1914, p.51), Price (1965) and McKinstry (1981) have shown that the east-west extension of the Flathead fault at the south end of the Flathead and Taylor ranges dips approximately 60 degrees south. With this in mind, section A - A was constructed with the Flathead fault dipping west at 60 degrees. As previously discussed, evidence from borehole 85-1 suggests a fault beneath 'A' seam in the Mist Mountain Formation separating Kootenay Formation strata from possible Rocky Mountain Formation rocks. For lack of additional data, the orientation of this fault was constructed in the section to mimic the Flathead normal fault.

4.0 RESERVES

McKinstry (1980) outlined 24.8 million tonnes of 'in-situ' coal amenable to open pit mining methods with an overburden ratio of 3.8 cubic meters of rock per tonne of coal. This calculation did not reflect potential coal reserves east of licence 4084. Coal intersections in borehole 85-1 and seam correlation to borehole intersections to the west indicate further open-pit reserve potential within licences 7292 and 5313. However, it is felt further drilling is required to attain a reasonable estimate of this potential.

5.0 COAL QUALITY (BOREHOLE 85-1)

Two coal seams were intersected in borehole 85-1. The first seam (31.16-31.89m) is considered to be B seam in the Lillyburt section (see Enclosure 5). Examination of the rotary sample and subsequent analysis suggest considerable contamination of this seam during sampling. The 47.0% raw ash does not reflect the 'clean' pattern indicated on the density log. Dry mineral matter-free volatile matter content of 29.26% is somewhat higher than values for this seam further to the west. Results of the analyses for the sample from this seam are included with enclosure 8. CONFIDENTIAL — HAS BEEN REMOVED FROM REPORT

The second coal intersection (from 69.38 - 71.34m) is thought to be 'A' seam, at the base of the Mist Mountain Formation. Water pressures in the hole prevented sampling of this seam. In addition, caving conditions at both coal intersections almost certainly have enhanced apparent thicknesses of the seams on the density geophysical log.

6.0 RECOMMENDATIONS FOR FURTHER WORK

Further exploration work on these licences should consider the following: -

a) Core drilling to further evaluate coal potential on licences 5313 and 7292.

b) Hydrology studies throughout the property including installation of piezometers.

7.0 BIBLIOGRAPHY

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GEOLOGICAL LEGEND

CRETACEOUS
- Kbl — Blairmore Group

JURASSIC-CRETACEOUS
- JKk — Kootenay Group
  - JKmm — Mist Mountain Formation
  - JKm — Morrissey Formation

JURASSIC
- Jf — Fernie Formation

TRIASSIC
- TSr — Spray River Group

PENNSYLVANIAN
- P — Rocky Mountain Formation

MISSISSIPIAN
- M — includes Rundle Group and Banff Formation

DEVONIAN
- D — includes Fairholme Group and Palliser and Alexo Formations

CAMBRIAN
- Є — includes Elko and Flathead Formations

PRECAMBRIAN
- pE — Purcell Group

ABBREVIATION	ROCK TYPE
CONG.	CONGLOMERATE
c.Ss.	SANDSTONE (coarse grained)
m.Ss.	SANDSTONE (medium grained)
f.Ss.	SANDSTONE (fine grained)
SLST.	SILTSTONE
VOLC.	VOLCANICS
MDST, CLST.	MUDSTONE, CLAYSTONE
COAL	COAL
LS.	LIMESTONE
SH	SHALE

- GEOLOGICAL CONTACT (defined, approximate)
- THRUST FAULT (approximate) TEETH ON UPTHRUST SIDE
- GRAVITY FAULT (defined, approximate) SOLID CIRCLE ON DOWNTHROWN SIDE, ARROWS INDICATE RELATIVE MOVEMENT
- SYNCLINE (approximate; dip unknown; plunge indicated)
- COAL SEAM TRACE
- CROSS SECTION LINE
- DRILLHOLE
- ROCK OUTCROP, AREAL EXTENT OF OUTCROP
- TRENCH
- BEDDING (inclined, vertical)

MAP INDEX AND AERIAL PHOTO INDEX

REFERENCE

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

PREPARED BY: THE ORTHOSHOP

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Crows Nest Resources Limited
EXPLORATION

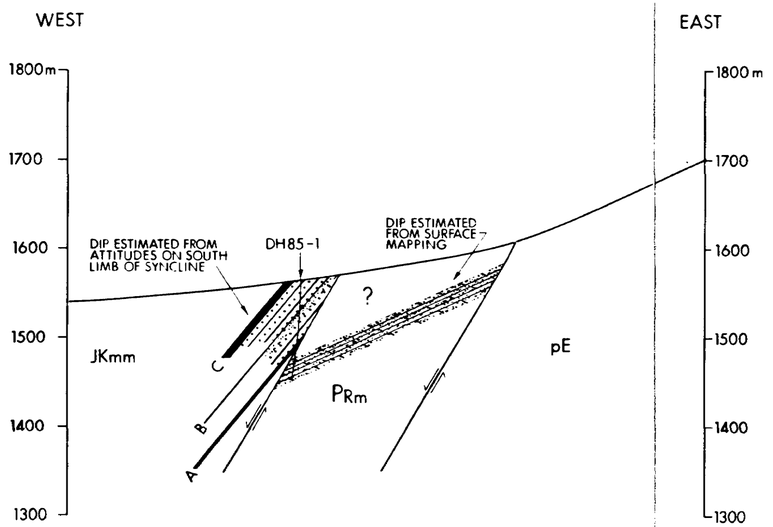
LILLYBURT
S.E. B.C.

GEOLOGY MAP

N.T.S.-82G/7 UT.M. ZONE 11

AUTHOR: B. McKINSTRY	SCALE: 1:5000	ENCLOSURE No:
DATE: 83 - 03	REVISED: 85-11	DRAWING No. LB2U03
To Accompany		

SECTION A-A'



GEOLOGICAL LEGEND

JURASSIC–CRETACEOUS

JKmm — Mist Mountain Formation (Kootenay Group)

PENNSYLVANIAN–PERMIAN?

PRm — Rocky Mountain Formation

PRE–CAMBRIAN

pE — Purcell Lava

FAULT

SILTSTONE

COAL

SANDSTONE (fine grain)

DOLOMITIC SANDSTONE

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Crows Nest Resources Limited
EXPLORATION
LILLYBURT
S.E. B.C.

CROSS SECTION A – A'

AUTHOR: B. MACKINSTRY	SCALE: 1:5000	DRAWN BY: R.G.P.
DATE: Feb. 11	REVISED:	DRAWING No: LB2X52
To Accompany		

ENCLOSURE 7

CENTURY GEOPHYSICAL CORPORATION

Tulsa, Oklahoma

697

COMPANY	CROWSNEST RES.
BOREHOLE	85-1 (IN PIPE)
AREA	LILLYBURT
ELEVATION	
COUNTY	
~~STATE~~ PROV.	B.C.
SECTION	
TOWNSHIP	
RANGE	

HOLE DATA

TOTAL DEPTH — DRILLER	115 M	BIT SIZE	16.8 cm
TOTAL DEPTH — LOGGER	119.1 M	CASING — TYPE & SIZE	
TOTAL FOOTAGE LOGGED	119.1 M	CASING DEPTH	6 M
LOGGING SPEED	12 M/MIN	BOREHOLE FLUID	H_2O
REFERENCE LEVEL	GROUND	FLUID RESISTIVITY	@ °F
PROBE NO.	9055A-054	SOFTWARE LEVEL	8.2 *A
		SCALE SELECTION	☒ OPERATOR ☐ CLIENT

REMARKS:

BOREHOLE	85-1 (IN PIPE)
DATE	9-12-85
UNIT/OPERATOR	7920/M. STEACY
FIELD OFFICE	CALGARY

EQUIPMENT DATA

PROBE MODEL		9010	9030	9050/55	9060	
PROBE DIAMETER		1.87"	2.0"	1.87"	1.4"	
NATURAL GAMMA	DETECTOR TYPE	NaI	NaI	NaI	NaI	
	DETECTOR SIZE	.875" x 1.25"	1.125" x 4.5"	.875" x 4.0"	.5" x 3.0"	
	STD. K-FACTOR	1.58×10^{-4}	—	$.598 \times 10^{-4}$	1.62×10^{-4}	
	STD. DEADTIME	1 μsec	—	1.18 μsec	1 μsec	
	CALIB. MODEL LOC.		—			
	CALIB DATE		—			
	K-FACTOR $\times 10^{-4}$		—			
	DEADTIME μsec		—			
	TEST READING		—			
	WATER FACTOR		—			
	CASING FACTOR		—			
DENSITY	DETECTOR TYPE	—	NaI	—	NaI	
	DETECTOR SIZE	—	.5" x 1.5"	—	.5" x 3.0"	
	SOURCE TYPE	—	Cs^{137}	—	Cs^{137}	
	SOURCE NO.	—		—		
	SOURCE STRENGTH	—		—		
	SOURCE SPACING	—		—		
NEUTRON	DETECTOR TYPE	—	—	He^3	—	
	DETECTOR SIZE	—	—	1.0" x 6.0"	—	
	SOURCE TYPE	—	—	AmBe	—	
	SOURCE NO.	—	—	1 Ci	—	
	SOURCE STRENGTH	—	—	71-1-244	—	
	SOURCE SPACING	—	—	45.7 CM	—	
	CAL STD			152		
	CAL RUN			140		
SNGL. PT RESISTANCE		1.4"D x 2.5"L	—	1.4"D x 2.5"L	1.1"D x 2.5"L	
RESISTIVITY		—	8" FOCUSED	—	—	
SELF POTENTIAL		YES	—	YES	YES	
TEMPERATURE		—	—	YES	—	
DEVIATION		—	—	NO / YES	—	
CALIPER		—	YES	—	—	

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CENTURY GEOPHYSICAL CORPORATION

* * * * * * * * VERTICAL DEVIATION * * * * * * * *

COMPU LOG VOL3 DEVIATION

CLIENT : CROWSNEST RES.

HOLE ID : CS-1 (OPEN HOLE)

LOCATION : LILLYBURT

DATE OF LOG : [illegible]

DATA FROM : VOL2*A

PROBE : 9055A 0094

TD = TOTAL DEPTH
T = TOP OF ZONE
B = BOTTOM OF ZONE

DEPTH	TRUE DEPTH	NORTH DEV	EAST DEV	DISTANCE	AZIMUTH	SA	SAB
.00	.00	.00	.00	.00	.0	.0	.0
5.00	4.99	.00	.16	.16	92.3	1.0	[illegible]
10.00	9.99	.01	.33	.33	92.3	1.0	[illegible]
15.00	14.99	.02	.49	.49	92.4	1.0	[illegible]
20.00	19.98	.03	.65	.65	92.0	1.0	[illegible]
25.00	24.98	.01	.81	.81	88.9	1.5	78.6
30.00	29.98	.03	.95	.95	87.8	1.6	[illegible]
35.00	34.98	.05	1.10	1.10	87.2	[illegible]	85.1
40.00	39.97	.06	1.21	1.23	[illegible]	1.4	[illegible]
45.00	44.97	.08	1.35	1.35	86.6	1.3	[illegible]
50.00	49.97	.08	1.47	1.47	86.8	1.6	89.5
55.00	54.97	.12	1.62	1.63	85.8	1.6	74.2
60.00	59.97	.10	1.72	1.73	86.4	1.1	96.1
65.00	64.96	.14	1.85	1.85	85.4	1.4	72.3
70.00	69.96	.17	2.00	2.01	85.2	1.9	[illegible]
75.00	74.96	.16	2.12	2.12	85.5	1.3	92.3
80.00	79.96	.12	2.29	2.29	86.9	1.9	101.1
85.00	84.95	.07	2.54	2.54	88.5	2.9	[illegible]
90.00	89.94	.01	2.78	2.78	[illegible]	2.6	104.2
95.00	94.93	.13	3.01	3.01	92.5	3.1	[illegible]
100.00	99.92	.37	3.21	3.23	96.6	3.5	140.4
105.00	104.91	.63	3.40	3.46	100.5	[illegible]	[illegible]
110.00	109.90	.87	3.65	3.75	103.4	3.9	[illegible]
TD 110.50	110.40	.90	3.67	3.78	103.8	4.2	151.4

VERTICAL DEVIATION

697

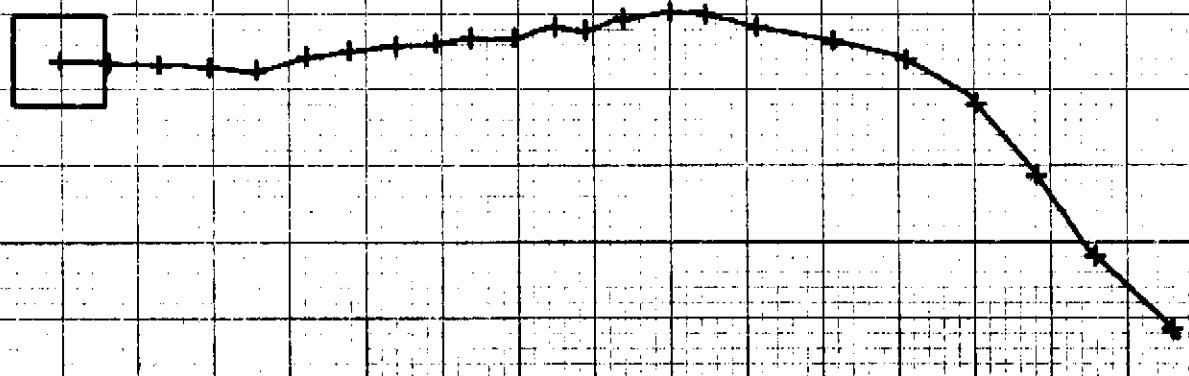
COMPU-LOG V8L1 DEVIATION
DATA FROM : V8L2*A

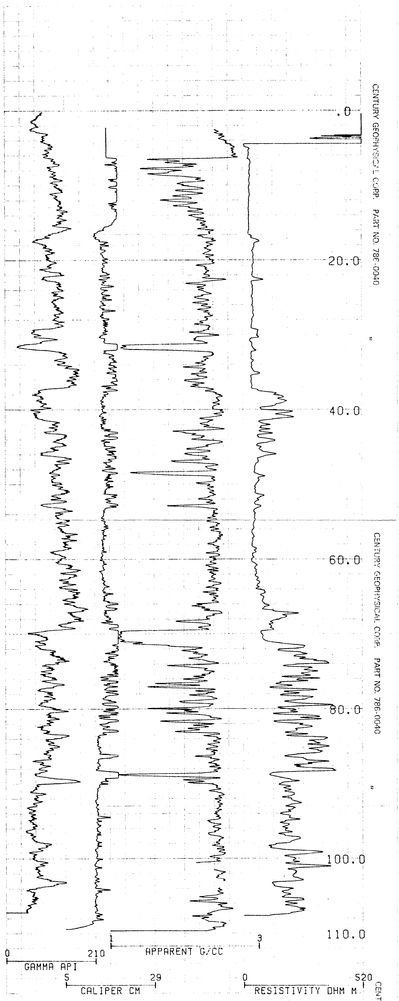
CLIENT : CROWSNEST RES.
LOCATION : LILLYBURT
HOLE ID : 85-1 (OPEN HOLE)
DATE OF LOG : 09-12-85
PROBE : 9055A 0054

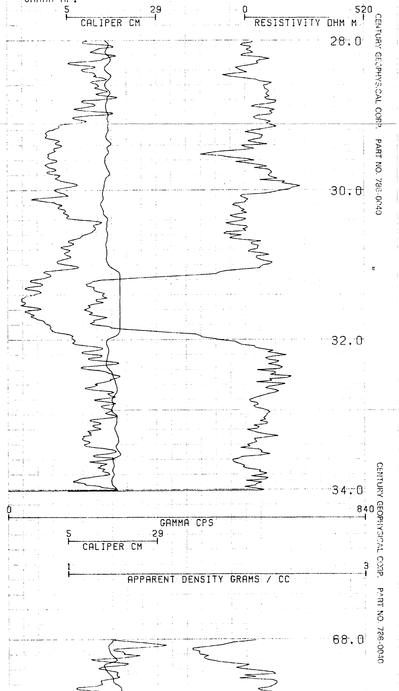
SCALE: .25 M/DIV
MAG DECL: .0
TRUE DEPTH: 110.4 M
AZIMUTH: 103.8
DISTANCE: 3.78 M

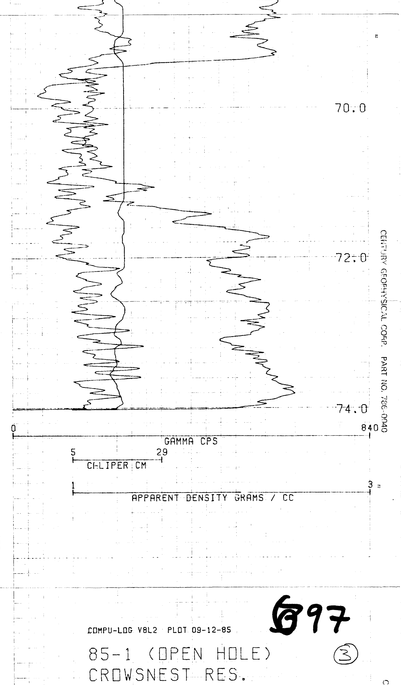
+ = 5.0 M INCR
Δ = TOP OF ZONE
◇ = BOTTOM OF ZONE

TRUE NORTH ↑









6897

COMPU-LOG V8L2 PLOT 09-12-85

85-1 (OPEN HOLE)
CROWSNEST RES.
LILLYBURT

HOLE DIAMETER : 16.8"
PROBE # 9030A - 444
SENSOR #4 CAL STD CPS = 6598
SENSOR #4 CAL RUN CPS = 4090
SENSOR #4 CAL BIAS = 17
DATA V8L2#A TRUCK # 7920
MARK STERCY RPPL.#3711L1

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

NO. 786-0040

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

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4

COMPU-LOG V8L2 PLOT 09-12-85

85-1 (OPEN HOLE)
CROWSNEST RES.
LILLYBURT

HOLE DIAMETER : 16.8
PROBE # 9055A - 054
SENSOR #4 CAL STD CPS = 152
SENSOR #4 CAL RUN CPS = 140
SENSOR #4 CAL BIAS = 0
DATA V8L2*A TRUCK # 7920
MARK STEACY APPL.#7 L1

CENTURY GEO

ENCLOSURE 10

Report on the Sealing of drillholes

Inspection District FERNIE B.C. Date of Report 04/10/85

Company CROWS NEST RESOURCES Land District Kootenay

Coal Mine Number _____ Licence Number 5313

1. Number of Drillhole. LB 85-1
2. Surface elevation. 1565 m.
3. Type (Vertical, diamond, rotary, size etc. ROTARY - VERTICAL
4. Drilled by: Name of Contractor WESTERN HYDRO-AIR
   Name of Exploration Company CROWS NEST RESOURCES
5. Date of completion. 12/09/85
6. Date of Sealing 12/09/85 + 04/10/85
7. Sealed by: Name of Contractor WESTERN HYDRO-AIR & G&B SHOTHOLE CEMENTERS
   Name of Exploration Company CROWS NEST RES.
8. (a) Has any casing, drill pipe, drill bits, core barrel, etc. been left in the hole? YES
   (b) If so, give details and location. 3M OF CASING AT TOP OF HOLE
9. (a) Was the drillhole sealed in the manner outlined in the Chief Inspectors Instructions? YES
   (b) If No, give reasons and details of variation. _____
10. (a) Was the sealing effective? YES
    (b) Details of any tests carried out. NO
11. I certify that the above drillhole has been effectively sealed in accordance with the instructions of the Chief Inspector of Mines.

Signature Brian McGinty

Designation CROWS NEST RESOURCES

Date 04/10/85

Countersignature _____

Designation _____

Date _____

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

APPLICATION TO EXTEND TERM OF LICENCE

I, Glenn C. Proudfoot (Name) agent for Shell Canada Resources Limited (Name)
(same) (Address) P.O. Box 100 (Address)
Calgary, Alberta
Valid FMC No. 207 568

hereby apply to the Minister to extend the term of Coal Licence(s) No(s). 4082 - 4087, ~~and~~ 5313 and 7292.

for a further period of one year.

2. Property name Lillyburt Project (Group No. 243)

3. I am allowing the following Coal Licence(s) No(s). to forfeit 4080, 4081, 4088 & 4089

4. I have performed, or caused to be performed, during the period September 9 to October 5, 1985, work to the value of at least $ 20,497.00 on the location of coal licence(s) as follows:

CATEGORY OF WORK	Licence(s) No(s).	Apportioned Cost
Geological mapping		
Surveys: Geophysical		
Geochemical		
Other		
Road construction	5313	848.00
Surface work		
Underground work		
Drilling	5313	12,006.25
Logging, sampling, and testing	5313	5,100.25
Reclamation		
Other work (specify)		
Off-property costs		#2,542.50

5. I wish to apply $ 16,542.00 of this value of work on Coal Licence(s) No(s). 5313 and #3955 of this value of work on Coal licence No. 7292

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

7. The work performed on the location(s) is detailed in the attached report entitled Lillyburt Project, 1985 Report to Ministry of Energy, Mines & Petroleum Resources

December 9, 1985 (Date)

(Signature)

Supervisor, Land (Position)

(FORMS AND REPORT TO BE SUBMITTED IN DUPLICATE)

GEOLOGICAL MAPPING Yes ☐ No ☑

	Area (Hectares)	Scale	Duration
Reconnaissance			
Detail: Surface			
Underground			
Other* (specify)			

Total Cost $ .....

GEOPHYSICAL/GEOCHEMICAL SURVEYS Yes ☐ No ☑

Method .....
Grid .....
Topographic .....
Other* (specify) .....

Total Cost $ .....

ROAD CONSTRUCTION Yes ☑ No ☐

Length 30 metres Width 10 metres
On Licence(s) No.(s) 5313
Access to DRILL HOLE LB-85-1

Total Cost $ 840.00

SURFACE WORK Yes ☐ No ☑

	Length	Width	Depth	Cost
Trenching				
Seam Tracing				
Crosscutting				
Other* (specify)				

Total Cost $ .....

UNDERGROUND WORK Yes ☐ No ☑

	No. of Adits	Maximum Length	No. of Holes	Total Metres	Cost
Test Adits					
Other workings*					

Total Cost $ .....

DRILLING Yes ☑ No ☐

	Hole Size	No. of Holes	Total Metres	Cost
Core: Diamond				
Wireline				
Rotary: Conventional				
Reverse circulation	5 inch	1	110	$12,006.25
Other* (specify)				

Contractor WESTERN HYDRO AIR (CALGARY)
Where is the core stored? N/A

Total Cost $ 12,006.25

LOGGING, SAMPLING, AND TESTING Yes ☑ No ☐

Lithology:	Drill samples	☑	Core samples	☐	Bulk samples	☐
Logs:	Gamma-neutron	☑	Density	☑		

Other* (specify) .....

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

Other* (specify) .....

Total Cost $ 5100.25

RECLAMATION Yes ☐ No ☐

Details To be reclaimed in 1986 as per discussion with R. Booth & A. O'Brien Total Cost $ .....

OTHER WORK (Specify details) Yes ☐ No ☑ Cost

.....
.....

Total Cost $ .....

OFF-PROPERTY COSTS Yes ☑ No ☐

Details MAP & REPORT PREPARATION Total Cost $ 2542.50

Total Expenditures $ 20,497.00

December 9, 1985
(Date)

(Signature)

MANAGER GEOLOGY
(Position)

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

K-SHELL LILLYBURT
85A
CONFIDENTIAL
COAL ANALYSIS

697 2/2

LORING LABORATORIES LTD.

CERTIFICATE OF COAL TESTING

COMPANY	CROWSNEST RESOURCES LTD.
ATTENTION	B. McKinstry
PROJECT	
FILE NO.	27926
DATE	October 7, 1985
PAGE	1 of 1

SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY SINK	% RECOVERY FLOAT	BASIS OF ANALYSIS	REC'D % H_2O	% H_2O	% V.M.	% ASH	% F.C.	% S	Kcal/kg	F.S.I	NOTES
85-1 # 1 32.0-32.5	Raw Coal			As Received	7.88	-		47.04				1	
				Air Dried	-	.92		50.59					
				Dry Basis	-	-		51.06					
	-1.60 Flt	-	47.13	Air Dried	-	.98	25.66	14.79	58.57	.72	6,897	3	
				Dry Bais	-	-	25.91	14.94	59.15	.73	6,965		

COAL DETAIL

PURCHASE ORDER NUMBER: CN 24019

ANALYST: D. Enders

FILE NO. AA-447