

GEOLOGICAL REPORT

- on -

COAL LICENSES #6131 to #6136
Groundhog Coal Field
British Columbia

CONFIDENTIAL
OPEN FILE

- for -

L. G. SCOTT,
KITIMAT, B.C.

Work Completed: June 2- 7, 15 & 16, 1980
October 6 - 9, 1980

OPEN FILE

Location: NTS 104A/16W 05E
56°50'N; 128°15'W.
180 km. north of Hazelton, B. C.

PREPARED BY:
KERR, DAWSON & ASSOCIATES LTD.,
#1-219 Victoria Street,
KAMLOOPS, B. C.

John R. Kerr, P. Eng.,
February 9, 1981.

00 104

JOHN R. KERR, P. ENG.

Geological Engineer

#1-219 VICTORIA STREET • KAMLOOPS, B.C. V2C 2A1 • TELEPHONE (604) 374-0544

January 4, 1982

**MINISTRY OF ENERGY, MINES
AND PETROLEUM RESOURCES**

Mr. Paul Hagen, Coal Administrator,
Ministry of Energy, Mines & Petroleum Resources,
Parliament Buildings,
Victoria, B. C. V8V 1X4

JAN 8 1982

103

Dear Mr. Hagen:

MINERAL TITLES FILE ROOM

Re: Coal Licenses 6131 - 6136.
Report dated December 20, 1981

I enclose two copies of all maps pertinent to the above mentioned report. I have made additions to all maps regarding Sections 8-3, 8-9 & 8-10. I have also made an addition to Figure #189-6, as to the location of sample B-01, as per regulation in Section 10-2.

With regards to the regulation under Section 8-12, I assume this applies to Figure #189-5, the legend being located in the left hand corner. As you can note, the lower right hand corner is cluttered with data on this particular map, making it impossible to fit the legend in this area.

Enclosed please find two copies of proximate analysis of 4 coal samples as completed by Commercial Testing & Engineering Co. in Vancouver, as per Sections 10-1, 10-3 & 10-4. I have added to these reports location of each sample with reference to plan number, as per Section 10-2.

* With regards to method of determining moisture content, as per Section 10-3, the samples were initially weighed as received. The samples were dried under low heat, and were then weighed, the difference in weight being the moisture content.

I trust that the enclosed and this letter can be appended to my report dated February 9, 1981, with regards to your requests.

Yours Very Truly,

KERR, DAWSON AND ASSOCIATES LTD.,

John R. Kerr
John R. Kerr, P. Eng.

REFERRED TO	DATE	INITIALS
C.G.C.		
D.C.C.C.		
G.C.		
F.M.C.		
M.T.D.R.		
P.L.C.R.		
COAL		
D.G.C.		
FILE NO.		
FILING CLERK		

cc. B. Mountford
Enclosures

KERR, DAWSON AND ASSOCIATES LTD.
Consulting Geologists and Engineers

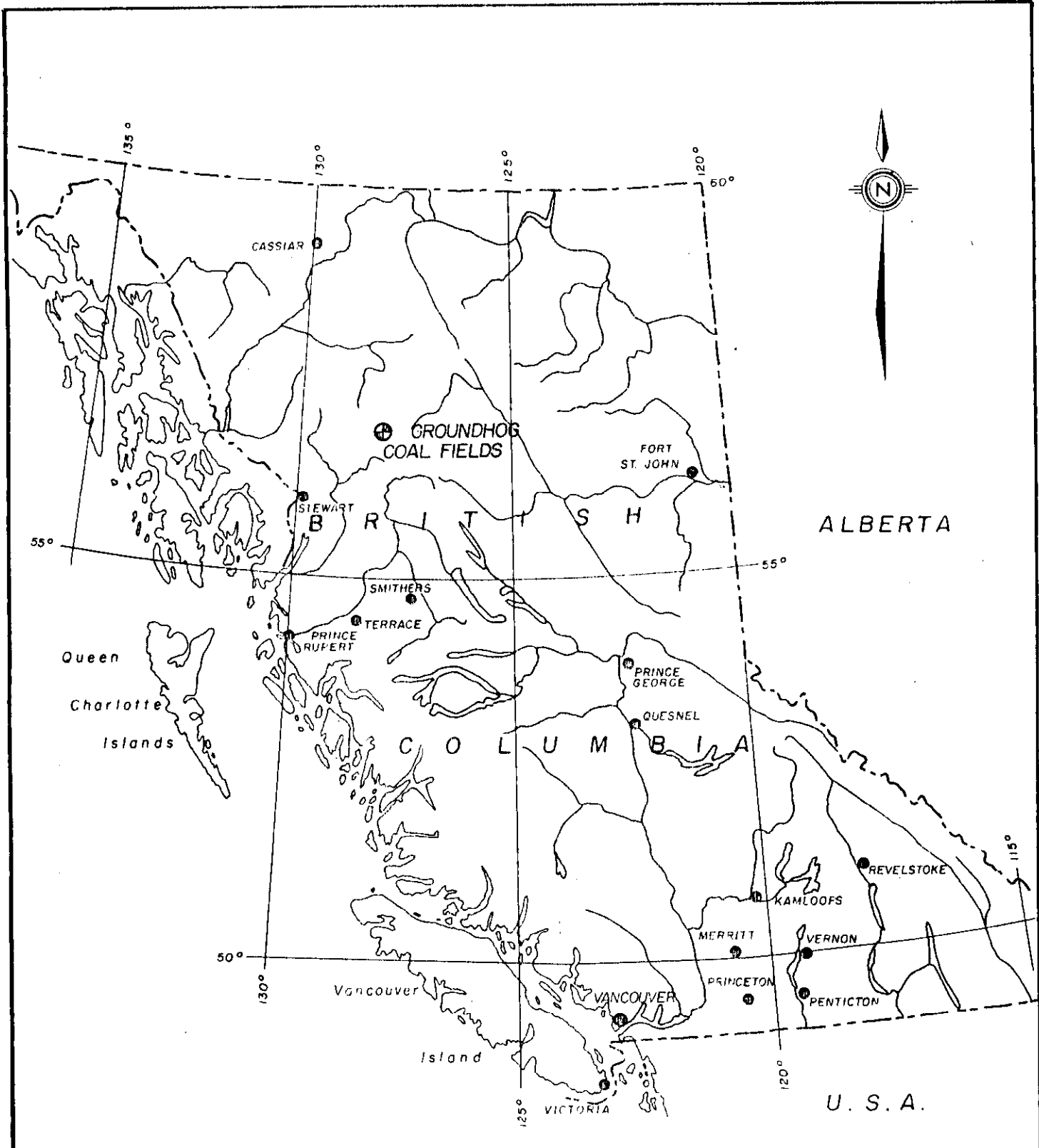
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SUMMARY

Mr. L. G. Scott requested that a preliminary geological programme be completed on six coal licenses in the Groundhog Coal Field, located approximately 180 km. north of Hazelton, B. C. The programme was completed by a four man crew during the period June 2-7, 15 & 16, 1980, and by a two man crew during the period October 6-9, 1980. The programme consisted of establishing 31 km. of grid over the licenses, tying all outcrops into grid stations. Major creeks were mapped and prospected. Located coal seams were sampled.

The licenses were located to cover three separate areas where coal is known to exist. Licenses 6131, 6132, and 6133 cover known coal outcroppings on Telfer Creek, and the projection of these seams to the northwest. License #6134 covers the southern projection of known coal seams on Beirnes Creek. Licenses #6135 and #6136 cover known coal seams at the head of Currier Creek. Seams range in thickness from 0.3 m to possibly 5 m. Thermal content of collected samples range 9,497 - 12,637 BTU/lb, with ash content ranging 11.71 - 33.41%. It is estimated that clean coal (< 5% ash) would have a thermal content > 14,000 BTU/lb.



PREPARED FOR L.G. SCOTT	
LOCATION MAP	
GROUNDHOG COAL FIELDS	
Technical Work by: Kerr, Dawson & Assoc. Ltd.	Date : Dec. 1980.
Scale : 1cm. = 87 km.	Dwg No. 189-1

Coal occurs in sandstone and shale of the Jurassic /Cretaceous Bowser Group. The sediments and carbonaceous material derive from deltaic deposition in the southeastern margin of the Bowser Basin. Regionally the Bowser Group of rocks have undergone varying degrees of deformation. Within the license areas, there is no evidence of major structural disturbances. Measured strikes of the sediments range from 110° to 150° , dips varying from 0° - 30° to both the NE and SW.

If the projection of the known coal seams are continuous over the entire license areas, potential geological reserves of coal amount to 48,000,000 tonnes, of which 4,200,000 tonnes could be mined by strip mining methods. In addition, other coal seams may exist in the strata, which are not obviously exposed on surface. Diamond drilling at 400-500 meter centers is required to substantiate these reserves.

INTRODUCTION

General Statement:

L. G. Scott of Kitimat, B. C. acquired six coal licenses in the Groundhog Coalfields during 1980. The six licenses form three separate blocks, and cover what is considered Key areas for relatively undisturbed coal seams. At the request of Mr. Scott, a preliminary exploration programme was completed during the periods June 2 - 7, 15, 16, and October 6-9, 1980. The writer, in accompaniment of Mr. Brian Mountford, P. Eng. and two field assistants completed a geological mapping and sampling programme on the six licenses. This report summarizes the results of these programmes.

Location and Access:

The Groundhog coal field is located in north-western British Columbia, approximately 150 km. northeast of Stewart, and 180 km. due north of Hazelton. Geographic coordinates of the three blocks of licenses are as follows:

Licenses 6131, 6132 & 6133	56°53'N; 128°14 1/2'W.
License 6134	56°56'N; 128°22'W.
Licenses 6135 & 6236	56°50'N; 128°30'W.
NTS 104A 16W and 15E.	

Access to the licenses on the ground is difficult. The B. C. R. right-of-way has been cleared along the eastern bank of the Skeena River. A construction road follows the clearing. Several bridge wash-outs and slides block this road to rail-end at Chipmunk, ~ 35 km. to the southeast. Access to the licenses is best gained by helicopter. Several swampy areas provide easy landing sites. An airstrip is situated at the Kluatantan River, approximately 20 km. to the southeast. This airstrip is suitable for small fixed-wing aircraft.

Future development of the Groundhog coal fields would depend on completion of the B.C.R. rail line. Distance to Prince George is 495 km. Alternative access, providing direct routes to tidewater, are along the Skeena River to Hazelton, and along the Nass River to Greenville, distances of 200 - 250 km.

Topography and Vegetation:

The Groundhog coal fields lies at the headwaters of three major river systems. The Stikine River drains the northern portion; the Nass River drains the southwestern portion; and the Skeena River drains the southeastern portion. General terrain in the coal field is mountainous, with broad, relatively flat basins in the major river systems.

Licenses #6131, 6132, 6133 are located on the eastern valley slopes of the Skeena River. Relief is flat to moderate, elevations ranging from 1,060 m (a.s.l.) to over 1,500 m (a.s.l.) in the eastern portion of the licenses. Small creeks form local steep escarpments. License #6134 is in the flat valley of the Skeena River, with little relief ranging from 1,060 m (a.s.l.) to 1,200 m (a.s.l.). Licenses #6135 and 6136 are located on the divide between the Skeena and Nass Rivers, at the headwaters of Currier Creek. Relief is moderate to locally steep, elevations ranging from 1,310 m (a.s.l.) in the Currier Creek valley to 1,650 m (a.s.l.) in the west central portion of the licenses.

Licenses #6131, 6132, 6133, and 6134 are generally forest covered, with stands of spruce, balsam, and occasional poplar trees. Underbrush is light in the lower areas; however, in the higher elevations, thick, dense, low-lying alpine spruce occurs. There are numerous swamps within these licenses, vegetation being swamp grass and alder.

Licenses #6135 and 6136 are generally above timberline, vegetation consisting of alpine grasses and flowers. At lower elevations, thick groves of alpine spruce occur.

Coal Licenses:

<u>License No.</u>	<u>Lot No.</u>	<u>Expiry Date</u>
License 6131	2182	April 10, 1981
License 6132	2184	April 10, 1981
License 6133	2185	April 10, 1981
License 6134	- -	April 10, 1981
License 6135	- -	April 10, 1981
License 6136	- -	April 10, 1981

All licenses are owned by L. G. Scott of
Kitimat, B. C.

History:

The history of the Groundhog coal fields is well documented in "Geology of the Groundhog Coal Field" by Willard D. Tompson, March, 1977. The following summarizes Mr. Tompson's account.

The earliest recorded discovery of coal in the area was made in 1900, in the Spatsizi River area, some 30 km. northwest of the Groundhog. James McEvoy discovered coal on Discovery Creek in 1903. Subsequent discoveries were on Abraham Creek, Trail Creek, Telfer Creek and Beirnes Creek. During the period 1904-1913, development work was completed on all seams. Commercial production was never achieved.

Work in the coal field was idle until 1948, when the G.S.C. sent a crew into the area to evaluate and map the coal bearing lithologies. Due to mobilization problems, very little was accomplished during the programme.

Coastal Coal Ltd. acquired 24 licenses in 1966. Under the supervision of R.V. Best and J. M. Black, a party

of eight geologists, assistants and prospectors geologically mapped a 1,500 square mile area. In 1969 and 1970, Placer Development Ltd., Quintaina Minerals Corporation and National Coal Corporation, geologically mapped 200 square miles in the Skeena River valley area. Six diamond drill holes were completed in late 1970. The licenses were permitted to lapse in the early 1970's.

Although coal licenses currently exist over most of the favourable coal bearing lithosome, there is no documented work in the area during the period 1970-1980.

FIELD PROGRAMME - 1980

A four-man crew headed by the writer and Mr. Brian Mountford, P. Eng. commenced work in the Groundhog on June 2, 1980, mobilizing out of Smithers, B. C. Supplies were shipped to the Kluatantan airstrip by Smithers Air Services Ltd. Northern Mountain Helicopters Ltd. provided mobilization of crews and supplies to the various fly camps. A fly camp was initially established on C.L. #6132.

During the period June 3 - 7, 1980, a 19 km. grid was established over approximately 2/3 of Licenses #6131, 6132, and 6133, with lines spaced at 250 meter intervals. All grid lines were geologically mapped, tying in all outcrop, and float to grid stations. In addition, Langlois Creek, Telfer Creek, the B.C.R. right-of-way, and Skeena River were prospected and geologically mapped.

On June 15 and 16, 1980, a 7 km. grid was established on License #6134. Outcrops were tied into grid stations. Anthracite Creek, to the south, and Beirnes Creek, to the north, were geologically mapped. A coal seam located on Beirnes Creek was sampled.

Due to snow, the licenses at the headwaters of Currier Creek (Licenses #6135 and 6136) could not be worked on during June. A two-man crew returned during the period October 6-9, 1980, to complete work on these licenses. Mobilization was on a daily basis by Northern Mountain Helicopters from Smithers, B. C. A 5 km. grid was established over a portion of the license area, tying in all outcrop and float to grid stations. Helicopter reconnaissance of the remainder of the license area, and at the headwaters of Currier Creek tied in several outcrops to topographic features. Three coal seams were located and sampled in the license area.

The four collected samples were sent to the laboratories of Commercial Testing and Engineering Co. in Vancouver for normal proximate analyses. This analysis includes:

- Moisture Content (as received)
- Ash Content
- Volatile Content
- Fixed Carbon Content
- Thermal Content (BTU/lb.)
- Sulphur Content

As samples were collected in very wet conditions (snow and rain), moisture content largely derives from

external sources, and does not reflect the true moisture of natural coal. Sample locations, results, and outcrop areas are plotted on Figures #189-5,6, & 7.

GEOLOGY

General Geology:

The Groundhog coalfields are located in the southeastern portion of the Bowser Basin. The Bowser Basin is an assemblage of deltaic and basin sedimentary rocks of Upper Jurassic and Lower Cretaceous Age. The Groundhog area is mainly deltaic deposits, the coal seams deriving from thick peat bogs, common to most deltas.

Various lithologies within the Bowser Assemblage in the Groundhog area have been recognized since early development of the coal seams. The most recent attempt to classify these lithologies was made by Tompson, et al, from work completed during the 1969/70 field seasons. As the writer confined the 1980 programme to detail in the coal-bearing strata, very little can be added to Tompson's interpretation, and the following description of each "Lithosome" (stratigraphic unit), is summarized from Tompson's 1977 report.

I. McEVOY RIDGE LITHOSOME

Probably the oldest stratigraphic unit of the Groundhog area, this lithosome is characterized by

well indurated, dark coloured, poorly sorted, fine to coarse grained clastic rocks. Mudstone and fine to coarse grained sandstone, occasionally grading to a chert pebble conglomerate, are the predominant rock. Bedding thicknesses vary from thin to medium.

II. COAL BEARING LITHOSOME

The Coal Bearing Lithosome conformably overlies the McEvoy Ridge Lithosome. The contact is exposed at the head of Anthracite Creek, and according to Tompson, is a well-defined conformable contact.

Poorly indurated rocks of this lithosome are defined as carbonaceous shales and mudstones (85-90%) and fine-coarse grained clastic sandstones. It is within the carbonaceous shales that seams of dense, hard coal occur. Bedding thicknesses vary from medium to thick.

III. DEVIL'S CLAW CONGLOMERATE

The Devil's Claw Conglomerate conformably overlies the Coal Bearing Lithosome, the contact exposed on Table Mountain. Tompson defines the contact as well-defined and conformable.

The dominant rock type of this lithosome is a medium-coarse chert pebble conglomerate, occurring as irregular beds 10-60 meters thick. Pebbles are commonly 2-4 cm. in diameter; however, range as large as 10-15 cm. in diameter. Common pebble colours are black, green and cream. The matrix is generally a fine-medium grained, siliceous sandstone.

Intertongued with the conglomerate are mudstone and shale, similar to the dominant rock type of the Coal Bearing Lithosome.

IV. LONESOME MTN. LITHOSOME

The Lonesome Mtn. Lithosome conformably overlies the Devil's Claw Conglomerate, and is the youngest rock in the Groundhog area. Exposures of the contact area difficult to recognize; however, Tompson interprets one on Table Mtn. The contact is described as very gradational.

The dominant rock-type of this lithosome is a tan to dark brown, well indurated sandstone, occasionally

grading into conglomerate. Mudstone and shale are interbedded with the sandstone, beds ranging in thickness from 4-9 meters. Irregular carbonaceous and coal lenses occur within the shale. Conglomerate beds and lenses are found in the lower portion of the Lonestome Mtn. Lithosome.

Structure:

The structural features of the Groundhog area are very complex, marked by areas of intense disturbance and irregularities, and areas where the strata is relatively undisturbed and predictable. Several relatively flat-lying thrust faults have been interpreted, the most prominent being the Groundhog thrust, which lies approximately 3 km. SW of the Skeena River.

Several normal and reverse faults have been observed and interpreted within the Groundhog area. These have caused local disturbances to the strata. Drag folding development of cleavage, fracturing, and secondary alteration are associated with these faults.

Rocks in the upper plate of the Groundhog thrust are observed to be highly disturbed and contorted. This feature is easily observed, as rocks of the upper plate form mountainous terrain (Devil's Claw Mtn.) where outcrops are plentiful. Rocks of all lithosomes of the Bowser Assemblage have been identified in the upper plate. Rocks of the lower plate are located in the broad, relatively flat Skeena River valley. Outcrops are not plentiful; however, all mapped outcrops have been identified as belonging to the coal bearing lithosome. Seventy to eighty percent of the outcrops mapped in the Skeena River valley indicate a north to northwest strike and a gentle dip (5° - 20°) generally to the northeast.

Along the Skeena River, outcrops were examined in detail at two locations, where strata is highly disturbed and contorted. 2.2 km. northwest of Currier Creek, one outcrop showed a moderately dipping normal fault, with drag folding apparent in the upper plate. Detailed examination of the rock indicates that a secondary cleavage has developed in the shale, with bedding features crossing the cleavage planes. At Langlois Creek, apparent bedding attains a very steep dip ($> 70^{\circ}$). Detailed examination revealed that secondary cleavage had developed; however,

appears conformable to the bedding. The fault plane was not positively identified at this location.

At both locations, the disruptions appear very local, and are probably confined to the plane of the fault. At Langlois Creek, an outcrop 50 - 75 meters east of the disturbed rock, shows very flat-lying undisturbed bedding.

It is within this lower plate of the Groundhog thrust that the potential for developing coal reserves exists, and the six subject coal licenses of this report are located.

Property Geology:

All license areas were mapped at a scale of 1:10,000 using a reconnaissance grid as control (see figures 189, 5,6, & 7). Outcrops are scarce on Licenses 6131, 6132, 6133, and 6134, being confined to main creek and river valleys. Outcrop areas are abundant on Licenses 6135 and 6136.

In general, outcrops mapped were mainly a fine-medium grained, gritty, well bedded sandstone, and black, fine-grained, occasionally carbonaceous, fissile shale or mudstone. At three locations at the head of Currier Creek, and at one location on Beirnes Creek, coal seams were located in outcrop. All rock outcrops examined in all license areas were identified as belonging to the Coal Bearing Lithosome. Scarcity of outcrop made interpretation of various lithologies impossible.

In License 6131, 6132, and 6133 area, outcrops providing good bedding attitudes were located along Langlois Creek to the north, and along Telfer Creek to the south. In general, all measured strikes ranged from 135° - 150° , dips varying from flat-lying to 30° SW in the western portion of the licenses to 35° NE in the eastern portion. It can be assumed from this that a gentle anticlinal feature passes through the center of the license area.

There were no outcrops on License 6134 indicating bedding attitudes. A traverse up Anthracite Creek indicated relatively flat-lying beds to the east, gradually dipping steeper upstream to a point of an interpreted fault zone. Rocks near the interpreted fault zone are sheared, brecciated and altered. Outcrops on Beirnes Creek indicate a consistent strike of 135° , and dip of 20° NE.

Outcrops on Licenses 6135 and 6136 show a generally consistent strike of 110° - 135° , with erratic dips ranging from 20° SW to 60° NE. Most outcrops indicate relatively flat-lying dips. The measured steep dips may be due to slumped blocks or possibly local structural irregularities.

Four outcroppings of coal were mapped and sampled in two of the license areas. At Beirnes Creek, an old development adit was located. The adit and seam were badly caved in providing unreliable measurements of seam thickness. At the headwaters of Currier Creek, three apparently different coal seams were located. C-01 is a large slumped suboutcrop of coal, indicating a possible thickness of up to 5 meters. Coal in general was badly broken and crushed; however, blocks of clean hard coal exist within the outcrop. Two other coal seams (.3 and 1 meter thick) exist in this area.

ECONOMIC POTENTIAL

LICENSES #6131, 6132, and 6133.

The only coal located in place in the license area are outcroppings along Telfer Creek. At the time of our examination, all outcrops were badly sloughed, with no clean exposures of good coal. Drill logs of DDH70-5, located on Telfer Creek within License 6131, indicate eight different seams ranging in thickness from 0.4 to 2.0 meters thick. Proximate analysis of the drill core indicate the following range of results:

Moisture Content	- 0.52 - 0.90%
Ash Content	- 4.50 - 11.38%
Volatile Content	- 4.50 - 5.28%
Fixed Carbon Content	- 82.82 - 90.42%
Thermal Content	- 13,448 - 14,596 BTU/lb.
Sulphur Content	- 0.31 - 0.74%

Coal float is located along Langlois Creek. If this coal is from the same seams as found on Langlois Creek, it would be normal to project coal seams through the three licenses. Geological potential reserves of coal from seams > 1 m thickness on the license area would therefore be in excess of 40,000,000 tonnes; however, because

of apparent moderate-steep dips of the sediments (25-35°), much of this coal may be at excessive depths for economic mining. Of this potential reserve, only 2,500,000 tonnes could be mined by strip mining methods.

LICENSE #6134.

Coal was not located within this license. The only evidence of coal existing on the license is the coal found on Beirnes Creek, 1,800 meters to the northwest. One outcrop of coal located and sampled by the writer indicates coal over a width of ~ 2.1 meters, with the following laboratory results.

	<u>As Received</u>	<u>Dry Basis</u>
Moisture Content	6.85%	- - - -
Ash Content	12.55%	13.47%
Volatile Content	6.73%	7.23%
Fixed Carbon Content	73.87%	79.30%
Thermal Content	11,771 BTU/lb.	12,637 BTU/lb.
Sulphur Content	0.92%	0.99%

Diamond drill hole #70-1, located at Beirnes Creek indicates a total thickness of coal of 7.8 meters. If these seams were continuous through the license area, potential geological reserves of the license area may range

3,000,000 to 10,000,000 tonnes, of which 500,000 to 1,500,000 tonnes could be mined by strip mining methods.

LICENSE #6135 and 6136.

Three coal seams were located in the area of the licenses, two of which definitely exist within the licenses. Proximate analyses of these samples range as follows:

	<u>Dry Basis</u>
Moisture Content	- - - -
Ash Content	11.75 - 33.41%
Volatile Content	8.69 - 11.71%
Fixed Carbon Content	57.90 - 76.54%
Thermal Content	9,497 - 12,602 BTU/lb.
Sulphur Content	.59 - 5.84%

Although exposures of the seams did not provide adequate measurements of seam thickness, it is estimated that each seam has a minimum thickness of 1 meter. If these thicknesses are true, potential geological reserves of the license area would be approximately 3,000,000 tonnes, of which 700,000 tonnes could be mined by strip mining methods.

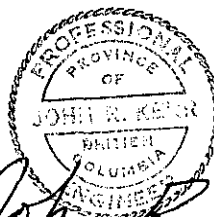
In summary, all six licenses offer geological potential reserves from coal seams > 1.0 meters thick of 48,000,000 tonnes, of which 4,200,000 tonnes could be mined by strip mining methods. The quality indicates a high rank bituminous coal or meta-anthracite acceptable to all thermal generating plants. In addition, other coal seams may exist that are not exposed in outcrop. Diamond drilling at 400-500 meter centers is required to substantiate these reserves.

RECOMMENDATIONS

Continued work on the coal licenses is justified, and should be oriented at developing coal reserves. The programme is to allow for approximately 5,000 meters of diamond drilling, consisting of 25 diamond drill holes ranging 100-300 meters deep (average -200m). Specific emphasis is placed on developing a stratigraphic section of the sediments, and interpretation of any structural disturbances or irregularities.

Respectfully Submitted By:

KERR, DAWSON AND ASSOCIATES LTD.,



John R. Kerr

John R. Kerr, P. Eng.,
GEOLOGIST

Kamloops, B. C.,
February 9, 1981.

APPENDIX A

COST STATEMENTS

COSTS

NOTE:

The costs shown for each particular licence area have been developed by pro-rating the overall cost of the 1980 programme. In the case of Salaries and Wages the total amount consisted of 2 Engineers and 2 Assistants for 63½ days @ \$207.65 per day on average i.e. \$13,253.35.

L.G. SCOTT
SUPPORT STATEMENT FOR EXPLORATION
DURING THE 1980 SEASON ON COAL
LICENCES: #6131, #6132, #6133

SALARIES & WAGES

2 Engineers and 2 Assistants: 6,626.67

FOOD & ACCOMMODATION

Field Work 493.71

SUPPORT AIRCRAFT

Helicopter and fixed wing 4,659.84

FIELD SUPPLIES

Survey instruments, protection
safety equipment, radio telephone
from various suppliers 643.30

REPORT COMPILATION

998.10

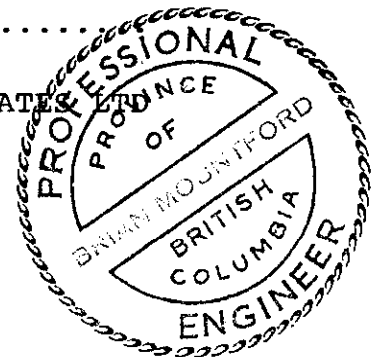
MISC.

Workers Compensation payments
for field work 71.70

\$13,493.32

Signed *B Mountford*

B. Mountford
for BRIAN MOUNTFORD & ASSOCIATES



L.G. SCOTT
SUPPORT STATEMENT FOR EXPLORATION
DURING THE 1980 SEASON ON COAL
LICENCE: #6134

SALARIES & WAGES

2 Engineers and 2 Assistants: 2,208.90

FOOD & ACCOMMODATION

Field Work 164.57

SUPPORT AIRCRAFT

Helicopter and fixed wing 1,553.29

FIELD SUPPLIES

Survey instruments, protection
safety equipment, radio telephone
from various suppliers 214.43

REPORT COMPILATION

332.70

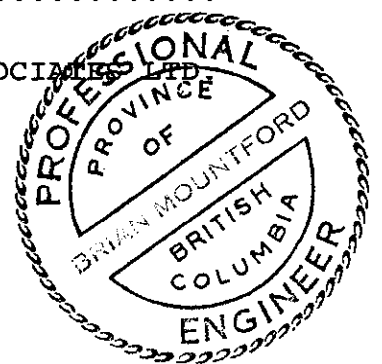
MISC.

Workers Compensation payments
for field work 23.90

\$4,497.79

Signed B. Mountford

B. Mountford
for BRIAN MOUNTFORD & ASSOCIATES LTD



L.G. SCOTT
SUPPORT STATEMENT FOR EXPLORATION
DURING THE 1980 SEASON ON COAL
LICENCES: #6135 and #6136

SALARIES & WAGES

2 Engineers and 2 Assistants: 4,417.78

FOOD & ACCOMMODATION

Field Work 329.12

SUPPORT AIRCRAFT

Helicopter and fixed wing 3,106.56

FIELD SUPPLIES

Survey instruments, protection
safety equipment, radio telephone
from various suppliers 428.88

REPORT COMPILATION 665.42

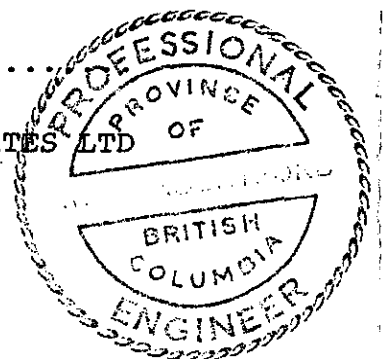
MISC.

Workers Compensation payments
for field work 47.80

\$8,995.56

Signed *B Mountford*

B. Mountford
for BRIAN MOUNTFORD & ASSOCIATES LTD



APPENDIX B

LABORATORY REPORTS

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434

FEB 9 RECD



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

BRIAN MOUNTFORD & ASSOCIATES LTD.
701 - 744 West Hastings St.
VANCOUVER, BC, CANADA

February 6, 1981

Sample identification
by Brian Mountford & Associates

Kind of sample
reported to us

Coal Sample - C-01

Sample taken at

----- Located on CL # 1136, 200 meters south of north boundary.
Located on Figure 189-7

Sample taken by

----- J. R. Kerr, P. Eng.

Date sampled

Date received

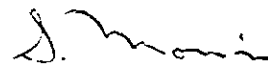
February 3, 1981

Analysis report no. 64-19934

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	7.83	xxxx
% Ash	10.83	11.75
% Volatile	10.79	11.71
% Fixed Carbon	<u>70.55</u>	<u>76.54</u>
	100.00	100.00
BTU	11615	12602
% Sulphur	0.67	0.73

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING
Division of Peabody International Corporation (Canada) Ltd.


S. Morrin
Regional Manager



Charter Member

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COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

BRIAN MOUNTFORD & ASSOCIATES LTD.
701 - 744 West Hastings St.
VANCOUVER, BC, CANADA

February 6, 1981

Sample identification
by

Brian Mountford & Associates

Kind of sample
reported to us

Coal Sample - C-04

Sample taken at

----- on Coal License #6136, 100m south of north boundary,
at headwaters of Currier Crk. Located on Fig. 139-7

Sample taken by

----- John R. Kerr, P. Eng.

Date sampled

Date received


February 3, 1981

Analysis report no. 64-19935

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	16.93	xxxx
% Ash	26.19	31.53
% Volatile	7.69	9.26
% Fixed Carbon	<u>49.19</u>	<u>59.21</u>
	100.00	100.00
BTU	8197	9867
% Sulphur	0.49	0.59

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING
Division of Peabody International Corporation (Canada) Ltd.


S. Morrin
Regional Manager



Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434

RESIDENT MANAGER
WESTERN CANADA OPERATIONS



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

BRIAN MOUNTFORD & ASSOCIATES LTD.
811 - 675 West Hastings Street
VANCOUVER, BC
V6B 1N2

July 22, 1980

Sample identification

Brian Mountford & Associates

Kind of sample reported to us

Coal Sample - B-01

Sample taken at

----- 1.9km NW of northwest corner of
C.L. # 6134 on Beirnes CK. Located on Fig 189-6

Sample taken by

----- J.R. Kerr, P Eng.

Date sampled

----- :

Date received

June 30, 1980

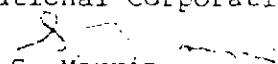
Analysis report no. 64-19562

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	6.85	xxxx
% Ash	12.55	13.47
% Volatile	6.73	7.23
% Fixed Carbon	<u>73.87</u>	<u>79.30</u>
	100.00	100.00
BTU	11771	12637
% Sulphur	0.92	0.99

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Division of Peabody International Corporation (Canada) Ltd.


S. Morrin
Regional Manager

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434

RESIDENT MANAGER
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
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OFFICE TEL. (604) 929-2228

BRIAN MOUNTFORD & ASSOCIATES LTD.
811 - 675 West Hastings Street
VANCOUVER, BC
V6B 1N2

July 22, 1980

Sample identification
by

Brian Mountford & Associates

Kind of sample reported to us Coal Sample - B-01
Sample taken at -----
Sample taken by -----
Date sampled -----
Date received June 30, 1980

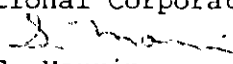
Analysis report no. 64-19562

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	6.85	xxxx
% Ash	12.55	13.47
% Volatile	6.73	7.23
% Fixed Carbon	<u>73.87</u>	<u>79.30</u>
	100.00	100.00
BTU	11771	12637
% Sulphur	0.92	0.99

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Division of Peabody International Corporation (Canada) Ltd.


S. Morrin
Regional Manager



Charter Member

APPENDIX C

WRITER'S CERTIFICATE

JOHN R. KERR, P. ENG.
Geological Engineer

#1-219 VICTORIA STREET • KAMLOOPS, B.C. V2C 2A1 • TELEPHONE (604) 374-0544

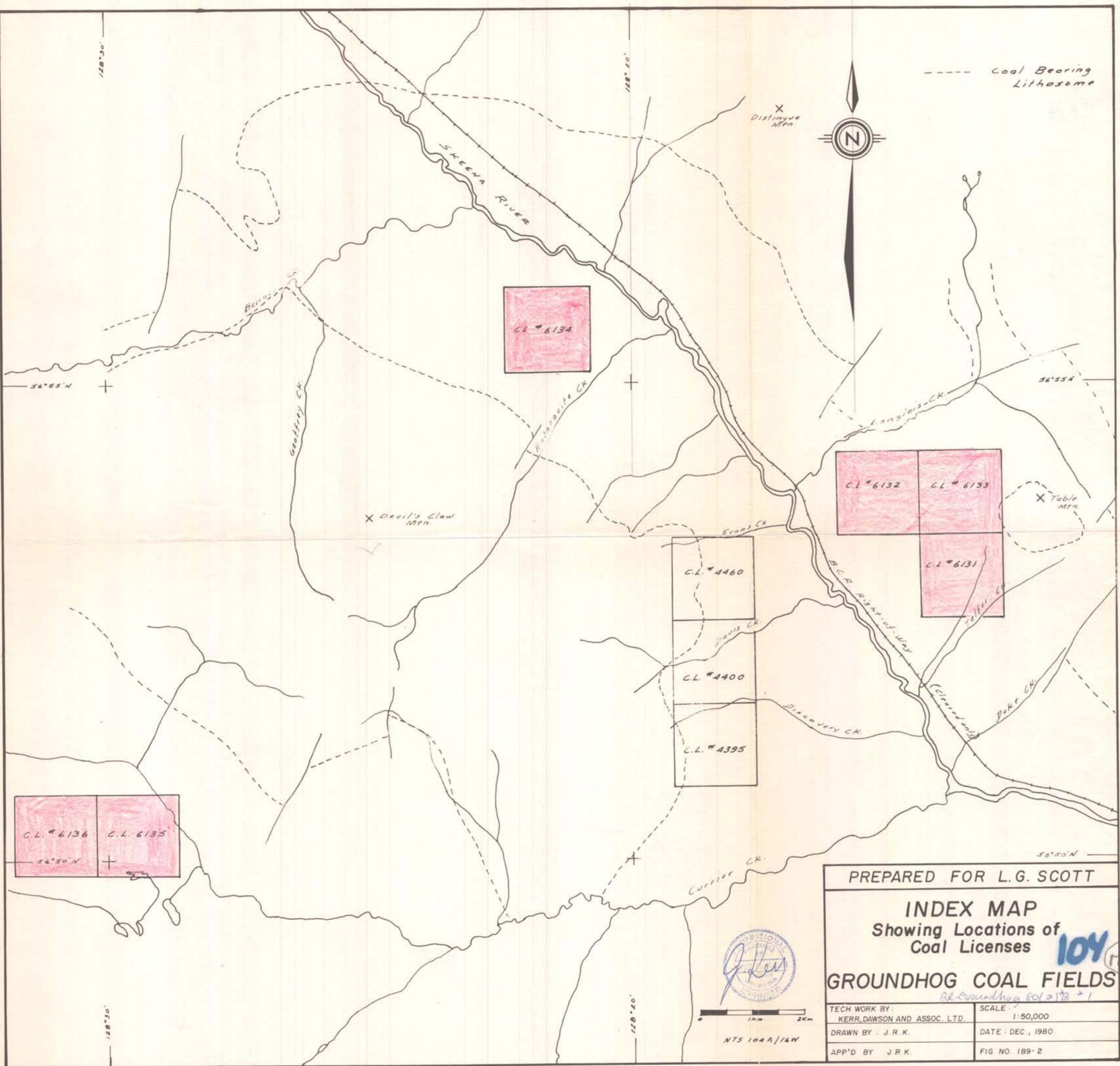
CERTIFICATE

I, JOHN R. KERR, OF KAMLOOPS, BRITISH COLUMBIA, DO HEREBY CERTIFY THAT:

- (1). I am a member of the Association of Professional Engineers of British Columbia, and a Fellow of the Geological Association of Canada.
- (2). I am a geologist employed by Kerr, Dawson and Associates Ltd. of #1-219 Victoria Street, Kamloops, B. C.
- (3). I am a graduate of the University of British Columbia (1964), with a B.A. Sc. degree in Geological Engineering.
- (4). I have practised my profession continuously since graduation.
- (5). I supervised and assisted in the collection of data as compiled in this report. I am the author of this report which is based on the aforementioned data.


John R. Kerr
John R. Kerr, P. Eng.,
GEOLOGIST

Kamloops, B. C.
February 9, 1981.



PREPARED FOR L.G. SCOTT

INDEX MAP
 Showing Locations of
 Coal Licenses

GROUNDHOG COAL FIELDS

GR-Groundhog 501 2178 + 1

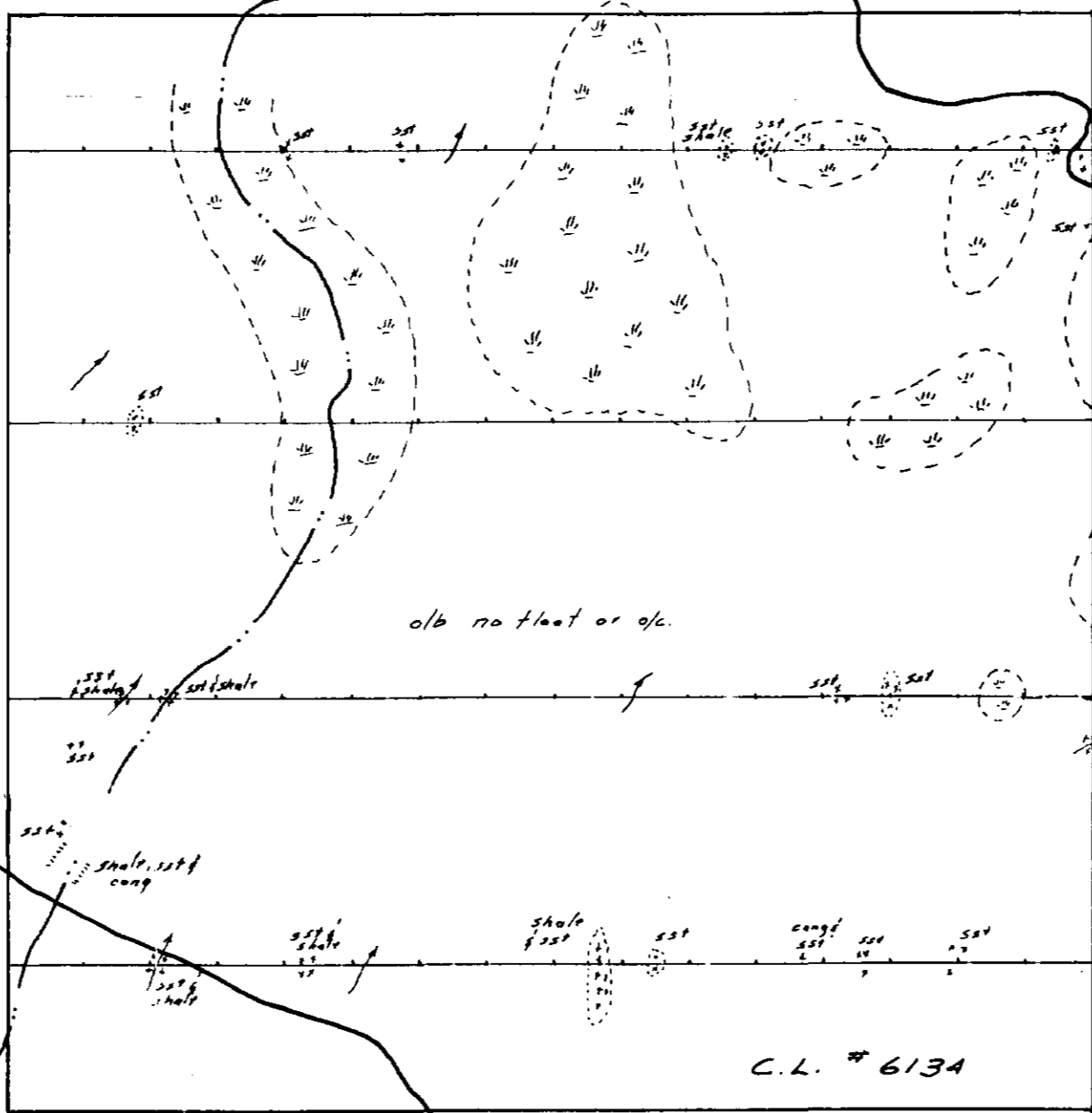
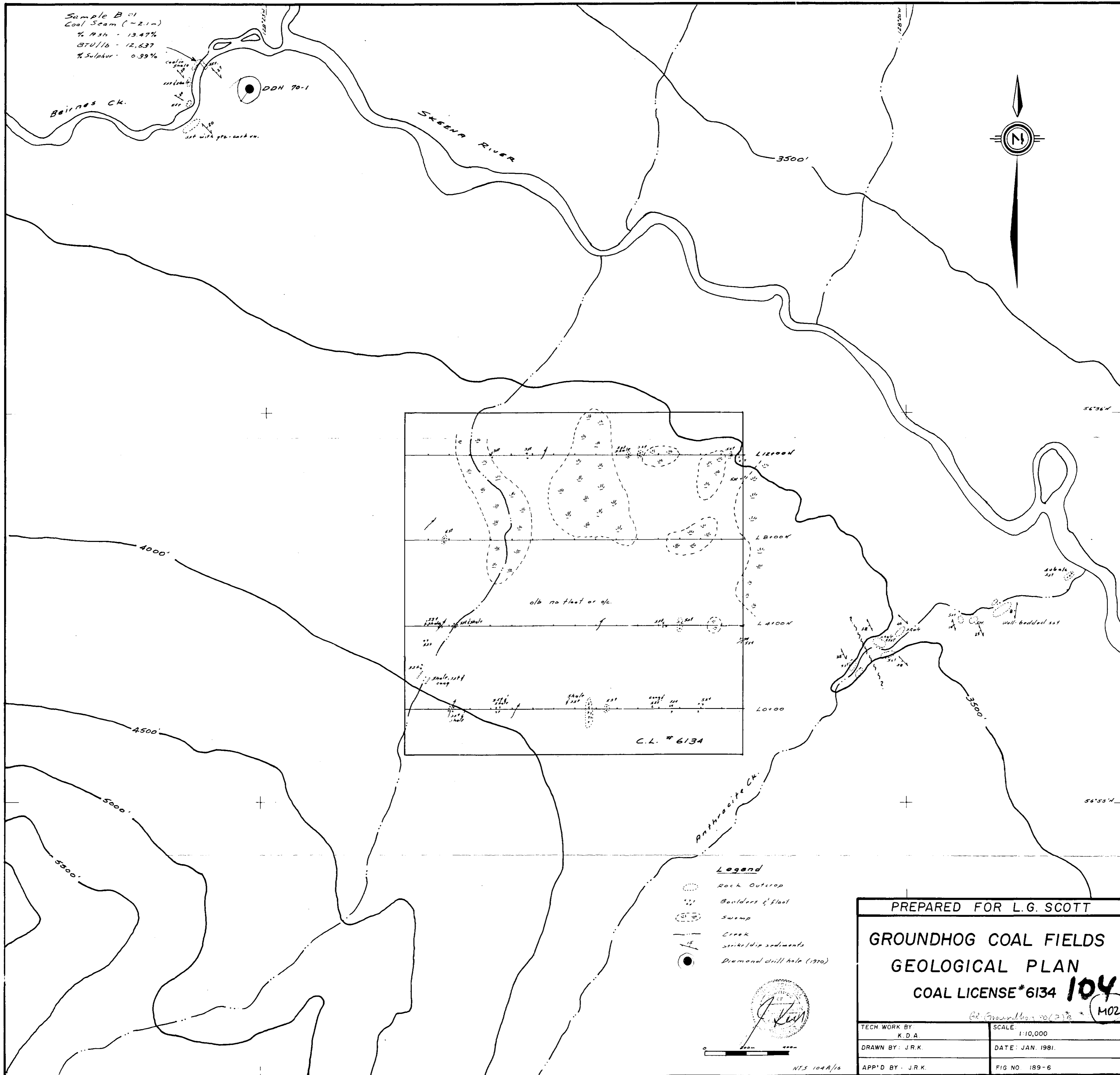
TECH WORK BY: KERR, DAWSON AND ASSOC. LTD.	SCALE: 1:50,000
DRAWN BY: J.R.K.	DATE: DEC., 1980
APP'D BY: J.R.K.	FIG NO. 189-2



NTS 1049/16W

104916W

Sample B-01
 Coal Seam (~2.1m)
 % Ash - 13.47%
 BTU/lb - 12,637
 % Sulphur - 0.99%

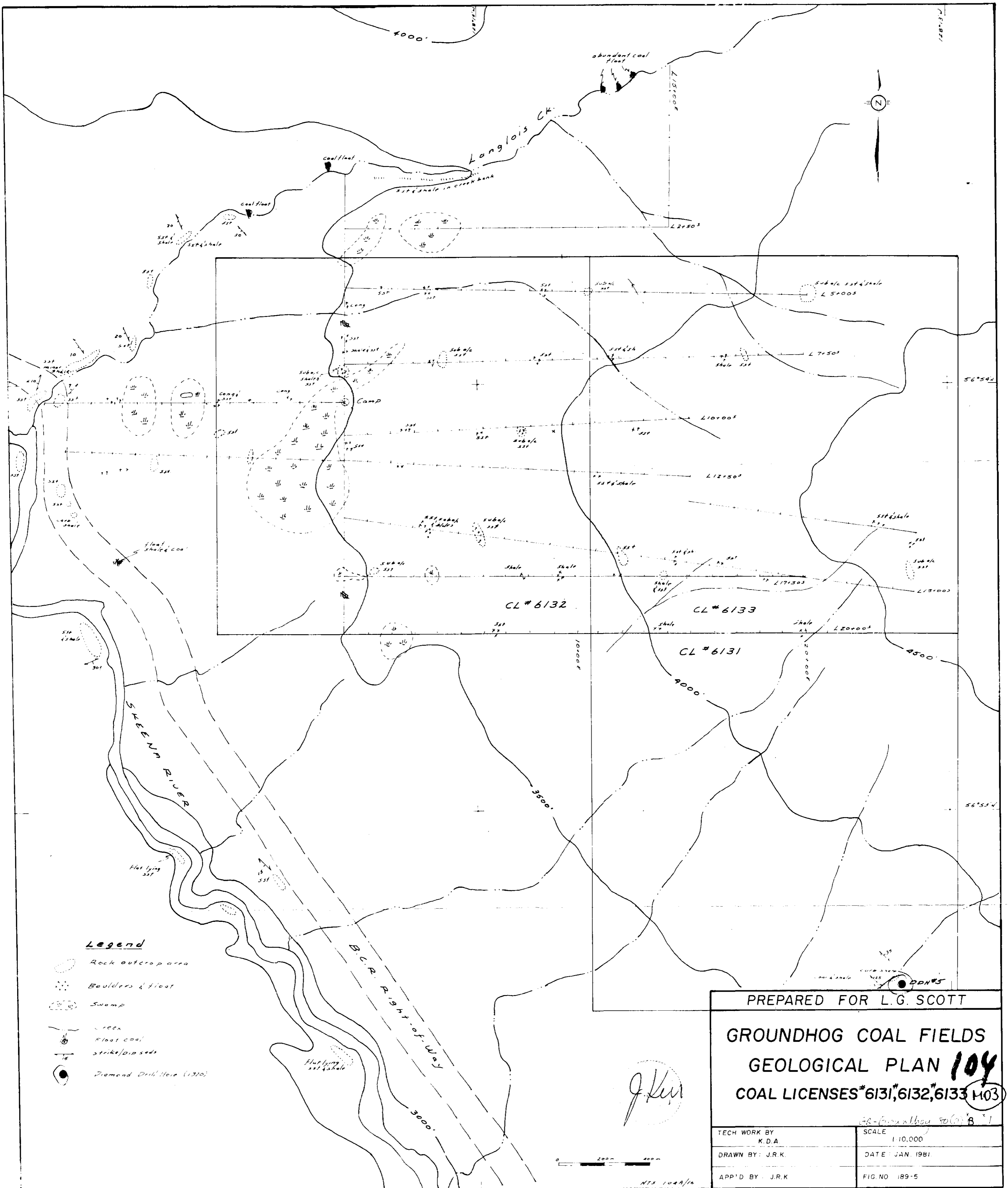


- Legend**
- Rock Outcrop
 - Boulders & float
 - Swamp
 - Creek
 - strike/dip sediments
 - Diamond drill hole (1970)



PREPARED FOR L.G. SCOTT	
GROUNDHOG COAL FIELDS GEOLOGICAL PLAN	
COAL LICENSE # 6134 104	
<i>Ed. Groundhog 10(2)8</i> M02	
TECH WORK BY K. D. A.	SCALE 1:10,000
DRAWN BY: J.R.K.	DATE: JAN. 1981.
APP'D BY: J.R.K.	FIG NO 189-6

NTS 104A/16

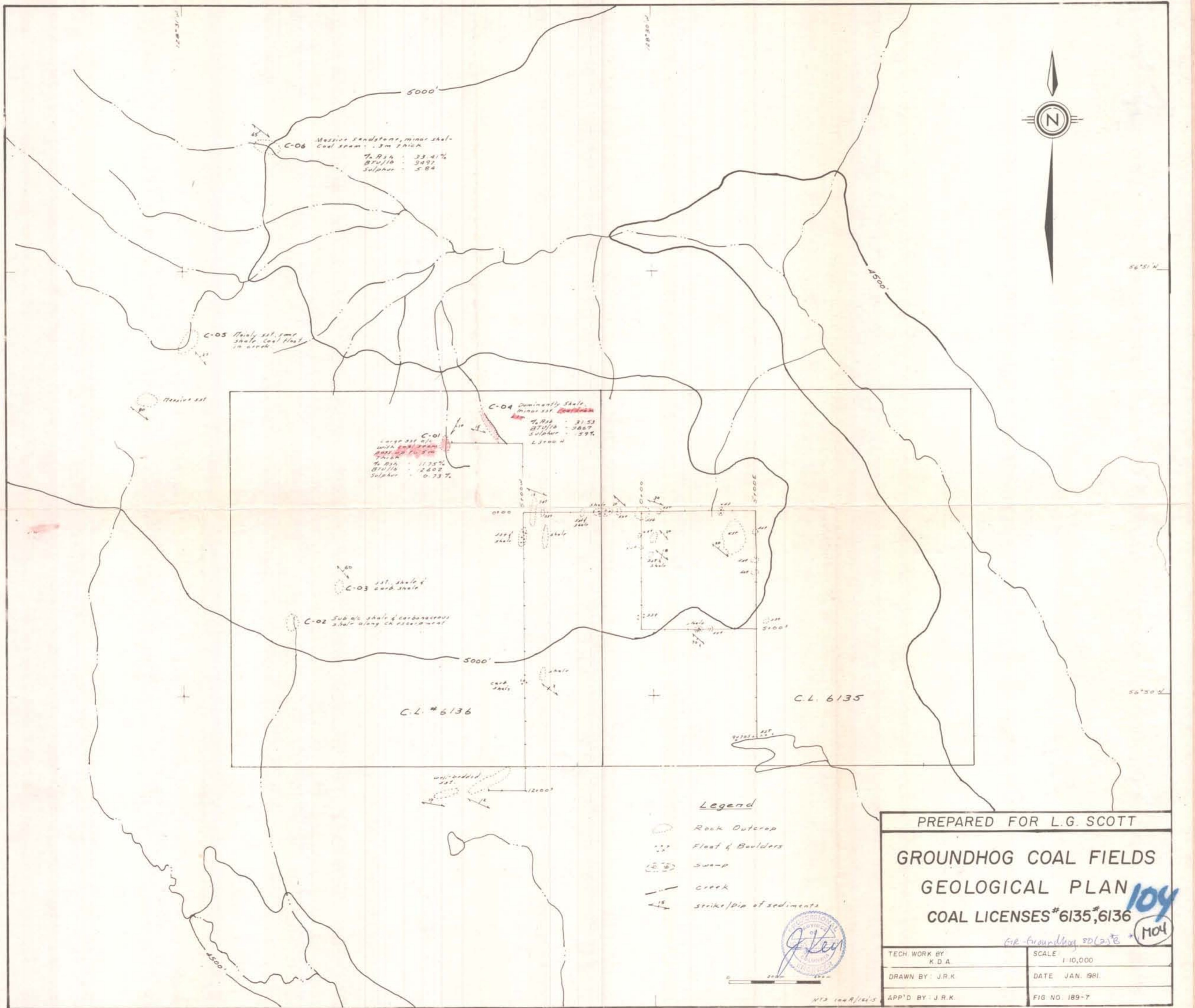


Legend

- Rock outcrop area
- Boulders & float
- Swamp
- Creek
- Float coal
- strike/dip beds
- Diamond Drill Hole (1370)

PREPARED FOR L.G. SCOTT	
GROUNDHOG COAL FIELDS	
GEOLOGICAL PLAN 104	
COAL LICENSES #6131, #6132, #6133, #6133 M03	
<i>GR-Formal copy 5060 B 1</i>	
TECH WORK BY K.D.A.	SCALE 1:10,000
DRAWN BY: J.R.K.	DATE: JAN. 1981
APP'D BY: J.R.K.	FIG. NO. 189-5

NTS 104A/10



C-06 Massive Sandstone, minor shal-
Coal seam: .3m thick
% Ash : 23.41%
BTU/lb : 9497
Sulphur : 5.84

C-05 Thinly sat. sand
shale. Coal float
in creek

C-04 Dominantly shale,
minor sat. ~~carbonaceous~~
shale
% Ash : 31.53
BTU/lb : 3867
Sulphur : 5.9%

C-01 Large sat. sh.
with coal seam
about 1/2 to 5/8
thick
% Ash : 11.75%
BTU/lb : 2402
Sulphur : 0.73%

C-03 sat. shale &
carb. shale

C-02 Sub-sat. shale & carbonaceous
shale along creek escarpment

C.L. #6136

C.L. 6135

Legend

- Rock Outcrop
- Flint & Boulders
- Swamp
- Creek
- Strike/Dip of sediments



PREPARED FOR L.G. SCOTT	
GROUNDHOG COAL FIELDS GEOLOGICAL PLAN	
COAL LICENSES #6135, #6136	
TECH WORK BY K.D.A.	
SCALE 1"=10,000'	
DRAWN BY: J.R.K.	
DATE JAN. 1981.	
APP'D BY: J.R.K.	
FIG NO. 189-7	

104
104