

82-6-20

REPORT ON GEOLOGICAL MAPPING
AND DRILLING OF CORE HOLES

19,600 Acres Flathead Area, B. C.
Coal Permits Nos. 374 to 407, 409 to 411

Field Supervisor:
Pickands Mather & Co.
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Cleveland, Ohio 44115

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F. D. Effinger

For

The Steel Company of Canada Limited

October 31, 1969

Registered Holder of Properties:
Royal Canadian Ventures, Ltd.

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FLATHEAD EXPLORATION PROGRAM - COAL
CABIN CREEK PROSPECT, BRITISH COLUMBIA

Summary

At the request of The Steel Company of Canada, a coal exploration program has been conducted by Pickands Mather & Co. during the period October 4 to November 8, 1968 and June 15 to August 3, 1969, at the Cabin Creek prospect of the Flathead area, southeastern British Columbia. The exploration was conducted on a 19,600-acre coal property controlled by Royal Canadian Ventures Ltd., Calgary, Alberta, and optioned in August 1968 to The Steel Company of Canada. Work consisted of geologic mapping, construction of access roads, and the drilling of seven core holes for an aggregate total of 3,911 feet with resulting coal sample analyses. Based on the results of this work, it has been concluded that the Cabin Creek coal seams generally dip at about 30° and are extremely faulted and discontinuous, irregular in thickness (6 to 60 foot thicknesses encountered), of impure quality and of limited reserves. Based on these conclusions it is herein recommended that the subject property be abandoned as a potential long-term coal reserve.

Introduction

In August 1968, the Steel Company of Canada entered into an option agreement with Royal Canadian Ventures, Ltd. (R.C.V.) whereby Stelco agreed to spend a minimum of \$125,000 prior to January 1970 on exploration of a 19,594-acre coal prospect on Cabin Creek, in the Flathead River area of southeastern British Columbia, which is under license to R.C.V. (Figure 1).

Stelco engaged Pickands Mather to conduct this exploration program, which was conducted in two phases: Phase One from October 4 to November 8, 1968, and Phase Two from June 15 to August 3, 1969.

Purpose

The purpose of this report is to describe the recently completed exploration program on the Cabin Creek prospect.

Description of Prospect

A. Location

The coal lands under license to R.C.V. total 19,594 acres and are located west of the Flathead River in southeastern British Columbia. The main area of interest consists of two hills which are separated by easterly-flowing Cabin Creek, near where it joins the Flathead River (Figure 1). This prospect is located approximately 40 miles, by road, south of the town of Fernie, British Columbia, and 12 miles, by road, north of the U.S.-Canada border.

B. Geological Description

The ages of the rock in this immediate area vary from Jurassic to Recent. The stratigraphic column is as follows:

Pleistocene and Recent - glacial till, gravel and sand
Upper Cretaceous - Blairmore Formation
Lower Cretaceous - Kootenay Formation
Jurassic - Fernie Formation

1. Fernie Group

The Fernie Group are the oldest rocks in the immediate area. It is Jurassic in age, and consists of evenly laminated brownish and grayish shales and siltstones with numerous calcite veins. Exposures in the immediate vicinity of the prospect are limited.

2. Kootenay Formation

The Kootenay Formation contains the coal measures. It is Lower Cretaceous in age. It consists largely of sandstones with shale and conglomerates. Its sandstones are described as

thick-bedded, massive, well-laminated and cross-bedded. Their color varies from light brown to dark gray.

The Kootenay Formation in the Cabin Creek area outcrops irregularly along a strip which is approximately two and one-half miles in length. It is bounded on the north by a major fault along Howell Creek and on the south by an unconformable thick cover of Kishenehn Formation. Generally the Kootenay strata strike a few degrees east of north and dip eastward at approximately 30 degrees (figures 2 and 3). There are a number of local departures from this trend which drilling and mapping has indicated are due to faulting.

3. Blairmore Group

The Blairmore Group is represented, in this area, by a resistant conglomerate, up to 85 feet in thickness, which caps the Kootenay Formation on the two hills. It is Upper Cretaceous in age. This conglomerate consists of well-rounded chert fragments from 1/8 to 3 inches in diameter, in a sandy matrix, cemented by silica. Its resistant nature and persistence make it an excellent "marker horizon".

C. Previous Work

These lands, called the Cabin Creek prospect, were first described in 1909, by W. F. Robertson, Provincial Mineralogist. At that time E. W. Butts, a prospector, had constructed several short adits into the north side of the northern hill. These adits were the basis of Robertson's report.

In 1914 and 1916, this prospect was described by J. D. MacKenzie. At that time there were a number of trenches and adits in both hills and MacKenzie was able to describe a crude stratigraphic sequence which indicated the various coal seams (Figure 3).

Since MacKenzie's reports there have been several other reports which included descriptions of the Cabin Creek area. However, since the trenches and adits no longer existed, these reports were largely based on MacKenzie's descriptions.

In October, 1967 R.C.V. had their geologist Paul Dyson conduct a search of the literature and an extremely brief field examination which formed the basis for his report on the prospect.

A small amount of coal was extracted from an open pit on the north side of the southern hill, Dally Hill. This coal was used as fuel for steam engines on drilling rigs which were exploring for oil in the immediate vicinity.

Incidentally one of these early drill holes, Canadian Kootenay Oils #1, located on D. L. 11951 (Figure 1), encountered coal seams, which were not described, below a depth of 3,500 feet.

Exploration Program

A. Description of Program

The recently completed exploration program consisted of geologic mapping, construction of access roads and diamond drilling.

This exploration program was conducted in two phases: the first from October 4 to November 8, 1968, and the second from June 15 to August 3, 1969.

The diamond drilling was done by Canadian Longyear, Ltd., using HQ size ($2\frac{1}{8}$ " diameter) wire-line equipment and various types of drilling muds. A total of 3,911 feet were drilled in the two phases of the exploration program.

The two phases, designated Phase One and Phase Two, are described as follows:

1. Phase One

This phase was begun late in the season with the objective being to complete a limited amount of drilling to provide coal samples for test work, and some information concerning the dimensions and attitude of the coal seams.

Three holes were drilled totaling 1,485 feet. Two of the holes, 1 and 2, were drilled on the northern hill. The third hole, No. 3, was drilled on the north side of Dally Hill, near the base of the hill (Figure 2).

In addition to construction of access roads to the three drill sites, an access road was completed to the site of drill hole 4, which was scheduled to be drilled in Phase Two. This access road work was done using a D-7 and a D-8 Caterpillar tractor. The contractor was Clare Drain of Blairmore, Alberta.

Due to snow cover, a very limited amount of geologic mapping was done by the writer.

2. Phase Two

This phase was begun as soon as possible after the spring thaws. The objective of this phase of the program was to obtain samples and information from the Dally Hill area to compare with the results of the Phase One program.

This phase consisted of geologic mapping of outcrops, additional access road construction and maintenance of existing roads, and drilling of four additional holes totaling 2,426 feet.

A major factor in cost which was not anticipated was the fact that a bulldozer was needed almost continually to repair the access roads which were in extremely bad condition due to meltwater and heavy rainfall.

The bulldozer used in this phase of the program was a D-7E Caterpillar. The contractor was the Nohels Logging Co. of Fernie, B. C.

This phase of the program was conducted by two geologists employed for the summer; Jonathan Berg and John Winston, under the direction of the writer.

Descriptions of the individual drill holes and their objectives and results are appended to this report.

The drill core from all reasonably wide intersections of coal seams has been sent to Commercial Testing and Engineering Co., South Holland, Illinois, for test work under the direction of Paul Weir & Co.

B. Results of Program

The exploration program has resulted in the following observations:

1. The coal seams are extremely faulted and discontinuous (Figure 4).
2. The coal seams are irregular in thickness
3. The coal generally appears to be impure.
4. The dip of the coal measures is generally near 30 degrees.
5. Areas of increased outcrop width, originally thought to be the result of flattening of dip, are due to duplication by faulting.
6. The reserves are limited and no extensions of the coal measures were indicated to the north or south.

Conclusions

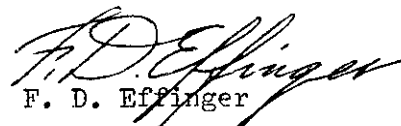
Because of the observations resulting from the exploration program it is concluded that this prospect would not be economically feasible as an underground or an open pit operation.

The discontinuity and irregularity of the coal seams would result in high development costs in an underground operation. The steep dips would result in higher mining costs.

The discontinuous nature of the coal seams, steep dips and limited area would indicate very limited reserves available, at a reasonable all material ratio, for an open pit operation.

Recommendation

It is recommended that this property be dropped from consideration as a long-term coal reserve for Stelco.

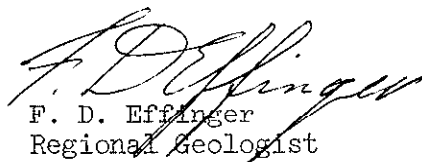

F. D. Effinger
October 31, 1969

CERTIFICATE OF QUALIFICATION

I, Frederick D. Effinger, of Cleveland, Ohio, hereby certify:

- (1) That I am a graduate of the University of Wisconsin and hold a Bachelor of Science degree in geology.
- (2) That I have been practicing my profession as a geologist since 1956.
- (3) That the accompanying report is based on personal supervision of the exploration work carried out on the property.

Dated at Cleveland, Ohio
this 31st day of October, 1969


F. D. Effinger
Regional Geologist

FDE:jab

CABIN CREEK DRILLING

Hole No. 1

Objective: To intersect the entire Kootenay Formation.

Anticipated Depth: 1,100 feet.

*abandoned
at 386'*

Results: The hole was started at the base of the overlying Blairmore conglomerate. Drilling was unable to continue below a depth of 386 feet due to jamming caused by extreme water pressure.

Hole No. 2

Objective: To continue the intersection of the Kootenay Formation from a starting point approximately 250 feet, stratigraphically, below the Blairmore-Kootenay contact.

Anticipated Depth: 850 feet

*stopped short
of objective
(743')*

Results: The hole was halted at a depth of 743 feet because of artesian water pressure. At that depth the drill had reached a fine-grained sandstone felt to be the lowest unit of the Kootenay Formation. A total of 94 feet of coal was intersected in nine seams.

Hole No. 3

Objective: To obtain coal samples from the lower portion of the Kootenay Formation.

Anticipated Depth: 300 feet.

*Stopped short
of objective
(156')*

Results: The hole was stopped at a depth of 156 feet due to broken material seizing the rods and since it was apparent that the thick coal seams which were the objective had been offset or eliminated by faulting. One 6.8-foot coal seam was encountered at a depth of 94 feet.

Hole No. 4

Objective: To intersect the entire Kootenay Formation.

Anticipated Depth: 1,100 feet.

*stopped short
at 262'*

Results: Although this hole was collared near an outcrop of the overlying Blairmore Conglomerate, it encountered 99 feet of surface material before entering the underlying Fernie Formation. A fault was present between the outcrop and the drill hole which had an apparent vertical displacement of more than 1,000 feet. The hole was stopped at a depth of 262 feet.

Hole No. 5

Objective: To intersect the major coal seams in the lower portion of the Kootenay Formation.

Anticipated Depth: 500 feet

COMPLETED!

Results: This hole intersected the lower portion of the Kootenay Formation and was stopped in the underlying Fernie Formation at a depth of 827 feet. A thick coal seam was encountered from 424 feet to 484 feet. *60' of coal - faulting?*

Hole No. 6

Objective: To intersect the entire Kootenay Formation.

Anticipated Depth: 1,000 feet.

COMPLETED

Results: The objective of this hole was reached. The hole collared in the overlying Blairmore Conglomerate and was stopped at a depth of 737 feet in the Fernie Formation. A number of thin coal seams were intersected, but the two major seams were encountered from 398 feet to 461½ feet, and from 601½ feet to 631½ feet. *631½'* *301½'*

Hole No. 7

Objective: To intersect the two major coal seams near the bottom of the Kootenay Formation.

Anticipated Depth: 400 feet

Results: Faulting had offset the coal seams which outcropped near the collar of the hole. Only two thin coal seams were intersected before the Fernie Formation was encountered at a depth of approximately 165 feet. The drillers were told to stop at a depth of 600 feet; however, drilling continued to a depth of 800 feet. No charge was made for drilling beyond 650 feet.

COMPLETED

FLATHEAD PROJECT

DRILL HOLE CLASSIFICATION

| | |
|----------------------------|--|
| Drill Hole No. 1 | Location: 525'N, 200'E of SW corner of Lot 9385 |
| Started: October 17, 1968 | Elevation: (Approx.) 5100' |
| Finished: October 24, 1968 | Logged By: F. D. Effinger |

Note: This hole was located on Kootenay sandstone bedrock directly below the contact with the Blairmore conglomerate. At this location there is approximately one foot of surface.

| <u>Footage</u> | <u>Description</u> |
|----------------|--|
| 0-8½ | No core (sandstone in bank). |
| 8½-28 | Sandstone. Medium-grained, hard, extremely broken. Generally massive. Occasional dark argillaceous zones which are very soft due to surface weathering. |
| 28-47½ | Siltstone with occasional thin stringers of coal at 34-37', 41' and 45'. The siltstone is soft, brown to black in color, extremely broken and weathered. Bedding is indistinct. |
| 47½-62 | Sandstone. Fine-grained, weathered, soft, dark greyish-brown, badly broken. Vague bedding, \triangle = approx. 60°. |
| 62-95 | Siltstone with thin coal seams. Massive, dark grey, hard. Moderately broken, exc. extremely broken at 62-75', 80-81', 87-88' and 92-93'. <u>Six-inch coal seams</u> at 69½-70' and 71'. <u>A ten-inch seam</u> (only 60% recovery) at 62-63', containing minor pyrite. \triangle = approx. 55°. |
| 95-107 | Shale and sandstone. Very finely and distinctly laminated. Alternating layers of dark grey shale and fine-grained brownish sandstone. Hard. Fissile, moderately broken, exc. extremely broken at 101-102', and 105-107. Fractures are generally cemented by calcite or quartz. \triangle = 60°. |
| 107-130 | Sandstone with irregular blebs and stringers of coal. Sandstone is medium-grained, with vague granular layering, hard, fairly clean. Bedding granules are limonitic and argillaceous. Irregular blebs and stringers of coal up to 3/8-inch thick from 124-130'. Very broken at 107-110' and 115-117'. \triangle = approx. 78°. |

| Footage | Description |
|------------------------|---|
| 130-162 $\frac{1}{2}$ | Sandstone. Massive, hard, medium-grained, fairly clean with a "salt and pepper" appearance. Generally moderately broken, except badly broken at 136-138', 141-142 $\frac{1}{2}$ ', 146-147', 151 $\frac{1}{2}$ -152', 154 $\frac{1}{2}$ -156' (limonitic), 159 $\frac{1}{2}$ -160'. |
| 162 $\frac{1}{2}$ -167 | Shale. Laminated, dark grey, hard. Coal seam 6 inches thick at 163'. Very fine distinct laminations from 162 $\frac{1}{2}$ -163. Quite badly broken from 165-167. \triangle = approx. 70°. |
| 167-202 | Sandstone with occasional irregular stringers of coal. The sandstone has a silty matrix, and is fine- to medium-grained. It is occasionally vaguely layered. The sandstone is very fine-grained and clean from 167-171'. It is fine-grained from 171-173'. Below 180' it has a distinct limonitic cast and limonite coating fractures. There are abundant, irregular, thin (to $\frac{1}{2}$ ") coal stringers from 184-186' and 193-202'. The core is moderately broken. \triangle = approx. 65°. |
| 202-247 | Siltstone with occasional thin coal seams. The siltstone is massive, black and hard. From 232-233 $\frac{1}{2}$ ' there are a few 2- to 3-inch zones of quartzite with a silty matrix. From <u>211 to 215'</u> is a seam of fairly clean soft coal containing minor pyrite. From <u>203-205'</u> and from <u>237$\frac{1}{2}$-238'</u> there are badly broken mixtures of <u>al and siltstone</u> . \triangle = 60°-65°. |
| 247-314 | Sandstone with a few zones containing thin stringers of coal. The sandstone is massive to 302' with vague layering below this. It is moderately hard, with a silty matrix. It is medium- to coarse-grained. It is moderately broken, except badly broken from 302-307'. There are scattered, irregular, thin (to $\frac{1}{4}$ ") stringers of coal from 302-305' and 310-312'. There is a massive siltstone zone from 305-307'. \triangle = approx. 60°. |
| 314-323 | Shale with a few thin coal seams. The shale is dark grey, finely-laminated and very broken. It contains occasional thin sandstone seams. There are several thin coal seams a few inches thick at 315'. The bedding is quite disturbed, especially at 322'. |

| Footage | Description |
|----------------|--|
| 323-345 | Sandstone. Hard, medium-grained, vague layering. Limonitic spots and fracture filling. "Salt and pepper" appearance. Moderately broken, except badly broken from 323-339. Vugs at 337'. Δ approx. 40° . Two sets of fractures are found throughout the hole. One set has a north-south strike and a dip which is normal to the bedding. The other set has an east-west strike and a dip which has a Δ of approx. 23° . |
| 345-355 | Siltstone. Hard, dark grey and dense. Moderately fractured. Not fissile. Soft carbonaceous seam at $345\frac{1}{2}$ -346'. Δ = approx. 65° . |
| <u>355-367</u> | <u>COAL</u> . Generally clean. Contains approx. 1% euhedral crystals of pyrite. Bands of broken siltstone from 356-357' and 365-366'. |
| 367-377' | Siltstone. Hard, dense and black. Generally massive with occasional vague laminations. Very broken, largest pieces one foot long. Δ = 21° at 374'. |
| 377-386 | Siltstone. Similar to above but extremely broken with numerous coal fragments which could be from this footage or could have caved from 355-367'. |

E. O. H.

Note: This hole was stopped in badly broken rock having considerable water pressure. The broken rock caused the drill rods to jam. The water pressure evidently prevented cement from having any effect. The rod size was reduced to N; however, these rods also jammed. Thirty-eight feet of casing left in hole.

FLATHEAD PROJECT

DRILL HOLE CLASSIFICATION

| | |
|----------------------------|--|
| Drill Hole No. 2 | Location: 685'S, 525'E of NW corner of Lot 8727 |
| Started: October 26, 1968 | Elevation: (approx.) 4600' |
| Finished: November 1, 1968 | Logged By: F. D. Effinger |
| Depth: 743' | |

| <u>Footage</u> | <u>Description</u> |
|----------------|---|
| 0-19 | Surface. |
| 19-137 | Sandstone. Varies from massive to finely laminated and from medium- to coarse-grained. Hard, argillaceous matrix. Badly broken 22-94', 100-101', and 127-137'. Moderately broken from 101-127'. Shaly sandstone zone from 40-46'. Badly weathered from 83-85' and 87-89'. $\triangle = 50^{\circ}-60^{\circ}$. |
| 137-170 | Siltstone with occasional coal seams. The siltstone is generally massive, becomes sandy gradationally at each boundary. The coal seams are from 146-153' (except for a shaly zone from 148 $\frac{1}{2}$ -149') and from 159-160 $\frac{1}{2}$ '. The core is badly broken from 142-162' with slickensides at 162'. |
| 170-224 | Sandstone. Hard. Fine- to medium-grained. Grey. Generally moderately broken, except badly broken below 208'. |
| 224-238 | Siltstone with scattered thin coal stringers. Generally massive with some vague bedding having extremely variable dips. $\triangle = 50^{\circ}-55^{\circ}$. |
| 238-273 | Siltstone. Dark grey, massive. Vague irregular banding from 243-253' caused by interlayered sandy beds. Moderately broken, except badly broken below 268'. $\triangle = \text{approx. } 55^{\circ}$. |
| 273-304 | Sandstone. Hard, grey with a slight brownish cast. Fine-grained to 280', medium-grained below 280'. Argillaceous matrix. Shaly from 273-282'. Granular layering. Quite broken. $\triangle = 70^{\circ}$. |
| 304-364 | Shale. Varies from finely laminated and fissile to massive. Bedding is irregular with some "cross-bedding". Generally badly broken, especially 304-307', 318-319', 321-331' and 359-364'. $\triangle = 65^{\circ}-70^{\circ}$. |

| Footage | Description |
|----------------|--|
| <u>364-396</u> | <u>Coal</u> . Quite broken with occasional shaly zones. Scattered pyrite. |
| 396-406 | Shale. Dark grey, indistinct laminations, some evidence of plant remains. A few scattered, thin, coal stringers. Moderately broken with slickensides scattered throughout. \triangle is unreliable. |
| <u>406-427</u> | <u>Coal with occasional thin shaly seams</u> . Scattered pyrite. Quite broken. \triangle = approx. 65° . |
| 427-446 | Shale. Dark grey to black with a few coal stringers. |
| 446-459 | Sandstone with shale zones. The sandstone is fine-grained with an argillaceous matrix. The shale is interlayered with the sandstone and occurs as dark grey to black, finely laminated to massive zones. The core is generally quite broken, but it is badly broken with well-developed slickensides from 446-447'. \triangle = 60° . |
| <u>459-535</u> | Siltstone with occasional coal seams and stringers. Dark grey to black in color. Massive. <u>Seams of mixed coal and shale occur at $528\frac{1}{2}$-$531\frac{1}{2}$', $523\frac{1}{2}$-$525\frac{1}{2}$', and $494\frac{1}{2}$-$495\frac{1}{2}$' (\triangle = 52°)</u> . The thin coal stringers generally occur below 483'. The core is moderately broken. |
| 535-561 | Sandstone with widely scattered shaly zones. The sandstone is medium-grained, light grey, generally hard, with an argillaceous matrix. The shaly zones are nearly black varying from massive to finely laminated. \triangle = 70° - 75° . |
| 561-586 | Mixed sandstone and shale. The bedding is very irregular and disturbed, possibly during lithification. 568-569' contains a zone of brecciated shale having a sandstone matrix and cross bedding. At 568', $\frac{1}{4}$ " coal stringer. Core is badly fractured. |
| 586-634 | Siltstone. Generally massive with some vague layering near the upper contact. Some cross bedding. A thin coal stringer six inches thick is located between 631' and $631\frac{1}{2}$ '. The siltstone becomes quite soft toward the bottom. The core is moderately broken, except badly broken from 611-612', 622-623' and 627-628. Some fracturing parallel to the axis of the core. \triangle = approx. 65° . |

| <u>Footage</u> | <u>Description</u> |
|----------------|--|
| <u>634-673</u> | <u>Coal</u> . Shaly. Generally hard with scattered shale seams. |
| 673-681 | Sandstone. Medium-grained, grey, hard, argillaceous matrix. Abundant granular layering. Badly broken. |
| <u>681-683</u> | <u>Coal</u> . Fairly hard. Minor pyrite. |
| 683-715 | Sandstone. Similar to 673-681'. Moderately broken, except badly broken from 683-692' and 702-703'. Occasional fractures along bedding planes with some fractures parallel to axis of core. Numerous carbonaceous stringers along bedding planes below 705'. \triangle = approx. 65°. |
| 715-743 | Sandstone. Hard, light grey, fine-grained and completely massive. Generally moderately broken, except badly broken below 741'. |

E. O. H.

Note: This hole was stopped due to caving caused by extreme artesian water pressure.

According to the drillers, the rock from 715-743' is typical of the basement rock at C.P.O.G.

FDE:jab

November 14, 1968

FLATHEAD PROJECT

DRILL HOLE CLASSIFICATION

| | |
|----------------------------|---|
| Drill Hole No. 3 | Location: 2950'S, 150'E of NW corner of Lot 8727. |
| Started: November 3, 1968 | Elevation: (approx.) 4500' |
| Finished: November 6, 1968 | Logged By: F. D. Effinger |

| <u>Footage</u> | <u>Description</u> |
|----------------|---|
| 0-42 | Surface. (Ledge is difficult to determine due to talus.) |
| 42-91 | Sandstone. Hard, medium-grained. Generally massive, except for 81-91' which shows finely laminated granular layering. Slightly carbonaceous at 62'. Core is very badly broken with numerous steep fractures. = approx. 70°. |
| 91-93 | Carbonaceous shale. Badly broken. |
| <u>93-102</u> | <u>Coal with shale.</u> Minor associated pyrite. |
| 102-156 | Sandstone. Hard. Light grey in color. Finely laminated granular layering. Extremely broken below 106'. Core is generally in $\frac{1}{2}$ " to 1" pieces. Δ = approx. 60°. |

E. O. H.

Note: This hole was located directly east of a coal occurrence crossed by the access road. The purpose of the hole was to intersect a sizeable thickness of coal near the old adits. Evidently an offsetting fault occurs west of the hole. The hole was stopped due to extremely broken ground, after cementing proved impractical.

FDE:jab

November 14, 1968

CABIN CREEK, BRITISH COLUMBIA

Drill Hole No. 4

Location: 600' S., 1700' E. of
NW corner of L 3508

Started: June 23, 1969

Elevation: 5,650' (approx.)

Finished: July 1, 1969

Logged By: J. H. Berg
J. G. Winston

| <u>Footage</u> | <u>Description</u> |
|----------------|---|
| 0-101 | Overburden |
| 101-250 | Black siltstone. Occasional interbedding of dark grey, extremely fine-grained, cross-bedded sandstone near top and gradually grading to shale near bottom. Moderately to extremely broken. Vague bedding, $\Delta =$ (approx.) 72° , dips E. Fracture system (apparently oriented normal to bedding) has $\Delta =$ (approx.) 20° . |
| 250-272 | Apparent fault zone (?). Shale and siltstone "gravel". Extremely broken to 258', then broken into $\frac{1}{4}$ - $\frac{1}{2}$ inch, angular particles with rounded edges, giving a gravel appearance. |

E. O. H.

Note: This hole was terminated in a zone of unconsolidated siltstone and shale "gravel". Jamming of the rods resulted, and cementing proved ineffective.

CABIN CREEK, BRITISH COLUMBIA

Drill Hole No. 5

Location: 1300' N., 1200' W.
of SE corner of L 3506

Started: July 4, 1969

Elevation: 5,250' (approx.)

Finished: July 16, 1969

Logged By: Jonathan Berg and
John G. Winston

| <u>Footage</u> | <u>Description</u> |
|----------------|---|
| 0-8' | No Core. |
| 8-19 | Sandstone. Coarse-grained. Interbedded with conglomerate. Some bedding apparent: $\Delta = 65^\circ$. |
| 19-50 | Sandstone. Medium- to coarse-grained, greyish brown. Numerous <u>coal</u> stringers. Distinct bedding: $\Delta = 70^\circ$. |
| 50-120 | Siltstone. Massive dark grey siltstone. Contains several small <u>coal</u> stringers. (106-113') sandstone similar to the one described just above. |
| 120-177 | Shale. Dark grey, interbedded with siltstone. Badly broken from (124-126'). |
| 177-221 | Sandstone. Medium-grained, light to dark grey. Distinct bedding and occasional <u>coal</u> stringers. $\Delta = 45^\circ$. |
| 221-296 | Siltstone. Massive, dark grey, argillaceous. Contains interbedded, extremely fine-grained sandstone. <u>Coal</u> at 224-225½' and 227-228' with abundant pyrite. |
| 296-332 | Sandstone. Medium-grained, light grey. Numerous <u>coal</u> stringers at 306-309' and 329-332'. Distinctive bedding: $\Delta = 50^\circ$. |
| 332-424 | Siltstone. Massive, dark grey to black. <u>Coal</u> at 413-414' and numerous <u>coal</u> stringers thereafter. |
| 424-484 | Coal. Occasionally shaly. Scattered pyrite. Shale at 478-481'. |
| 484-490½ | Carbonaceous shale. Light to dark grey, soft. Bedding indistinct. |
| 490½-503 | Sandstone. Fine-grained, brown-grey, friable, massive. Badly broken at 495½-503'. Numerous pyrite veinlets. |
| 503-755 | Siltstone. Dark grey to black. Interbedded with grey, fine-grained, cross-bedded sandstone. Numerous fractures and slickensides normal to bedding. Numerous calcite and pyrite veinlets. Bedding variable $\Delta = 45^\circ$ to 55° . |

| <u>Footage</u> | <u>Description</u> |
|----------------|---|
| 755-815 | Siltstone. Black, massive. Numerous calcite veinlets. Brecciated from 766-772'. Badly broken at 785-787'. |
| 815-827 | Siltstone. Black, shaly, carbonaceous (??). Badly fractured (30° from vertical). |

E. O. H.

CABIN CREEK, BRITISH COLUMBIA

Drill Hole No. 6

Location: 600'S., 1550' W. of
NE corner of L 3508.

Started: July 19, 1969

Elevation: 5,240'

Finished: July 25, 1969

Logged By: Jonathan Berg and
John G. Winston

| <u>Footage</u> | <u>Description</u> |
|------------------------|--|
| 0-20' | No Core (conglomerate) |
| 20-25 | Conglomerate. Chert and quartzite pebbles with medium- to coarse-grained sandstone matrix. Pebbles range from $\frac{1}{4}$ " to 2" in diameter and are well rounded. |
| 25-26 | Shaly clay. Brown to pink. Typical of contact between overlying Blairmore and underlying Kootenay fms. |
| 26-64 | Sandstone. Fine- to medium-grained, light grey. Quite porous and friable in places. Moderately broken. Becomes carbonaceous with depth. Contains interbedded lenses or layers of conglomerate and coarse-grained sandstone. Conglomerate at 53-54 $\frac{1}{2}$ '. Bedding is somewhat distinct in places. $\Delta = 50^{\circ}$. |
| 64-92 | Carbonaceous shale. Brown to black. <u>Coal</u> at 70-70 $\frac{1}{2}$ ', 73-74 $\frac{1}{2}$ ', 76-77', and 86 $\frac{1}{2}$ -87'. |
| 92-122 $\frac{1}{2}$ | Siltstone. Yellow-brown, argillaceous, becoming grey and carbonaceous toward base. (102 $\frac{1}{2}$ -115) Brown, fine-grained, argillaceous sandstone. Vague bedding: $\Delta = 55^{\circ}$. (121-122 $\frac{1}{2}$) Breccia. Sandstone fragments in siltstone matrix. |
| 122 $\frac{1}{2}$ -157 | Sandstone. Fine- to medium-grained, light grey, cross-bedded. Interbedded with siltstone near top; interbedded with conglomerate below 138'. Extremely broken at 156 $\frac{1}{2}$ -157'. Bedding distinct. $\Delta = 62^{\circ}$. |
| 157-167 | Siltstone. Brown-grey, argillaceous, massive. Extremely broken at 166 $\frac{1}{2}$ -167'. |
| 167-194 | Sandstone. Fine- to medium-grained, brown-grey, argillaceous. Bedding indistinct. Moderately to extremely broken. Interbedded with shale and siltstone. |
| 194-234 | Siltstone. Black, carbonaceous. Interbedded with shale and <u>coal</u> . <u>Coal</u> at 209-210', 212-213', 214-215 $\frac{1}{2}$ '. |
| 234-298 $\frac{1}{2}$ | Sandstone. Medium-grained, grey, cross-bedded. Bedding distinct. $\Delta = 63^{\circ}$. |

| Footage | Description |
|--------------------------------------|---|
| 289 $\frac{1}{2}$ -344 | Siltstone. Massive, argillaceous. Brown above 311', grey below. Breccia at 310-311'. |
| 344-387 | Sandstone. Medium-grained, light grey, cross-bedded. Interbedded with siltstone. $\Delta = 60^\circ$. |
| 387-398 | Siltstone. Dark grey with interbedded shale and thin <u>coal</u> stringers. |
| 398-461 $\frac{1}{2}$ | <u>Coal</u> . Moderately broken with scattered pyrite. Interbedded sandstone and shale at 435 $\frac{1}{2}$ -442'. Black shale at 451 $\frac{1}{2}$ -456', 458-459', and 460 $\frac{3}{4}$ -461'. |
| 461 $\frac{1}{2}$ -554 | Siltstone. Dark grey. Interbedded with fine- to medium-grained "salt and pepper" sandstone. Extremely cross-bedded in places. <u>Coal</u> at 523-525 $\frac{1}{2}$ ' with scattered pyrite, and at 531-532 $\frac{1}{2}$ '. |
| 554-577 | Sandstone. Medium-grained, slightly cross-bedded. Contains interbedded siltstone and carbonaceous material. Δ various from 55 $^\circ$ -60 $^\circ$. |
| 577-601 $\frac{1}{2}$ | Siltstone. Dark grey, cross-bedded. Bedding difficult to determine. $\Delta =$ (approx) 60 $^\circ$. |
| 601 $\frac{1}{2}$ -631 $\frac{1}{2}$ | <u>Coal</u> . Scattered shaly zones, and scattered pyrite. Shale at 613-614'. |
| 631 $\frac{1}{2}$ -737 | Sandstone. Massive, light grey, medium- to fine-grained. Abundant pyrite in places. <u>Below 661'</u> the sandstone becomes extremely fine-grained, dark grey or brown, and displays occasional vague cross-bedding. Interbedded with siltstone. Breccia at 696-700'. $\Delta =$ (approx) 70 $^\circ$. |

E. O. H.

CABIN CREEK, BRITISH COLUMBIA

Drill Hole No. 7

Location: 1550'S., 2100 W. of NE
corner of L 3509.

Started: July 26, 1969

Elevation: 6,260'

Finished: August 3, 1969

Logged by: Jonathan Berg and
John G. Winston

| <u>Footage</u> | <u>Description</u> |
|------------------------|---|
| 0-45 | Surface. |
| 45-59 $\frac{1}{2}$ | Coal. Mainly blossom (near surface) to 53'. Below 53' mainly vitrain. |
| 59 $\frac{1}{2}$ -124 | Siltstone. Grey, interbedded with fine-grained sandstone. Occasional <u>coal</u> stringers near top. Vague bedding. $\Delta = 65^{\circ}$. |
| 124-159 | Sandstone. Grey, medium- to fine-grained. Distinct bedding. $\Delta = 73^{\circ}$. |
| 159-161 $\frac{1}{2}$ | <u>Coal</u> . Shaly. |
| 161 $\frac{1}{2}$ -800 | Shale and siltstone. Grey near top, becoming black near base. Numerous calcite veins. $\Delta = 67^{\circ}$. |

E. O. H.

ANALYSES OF DRILL CORES, FLATHEAD PROJECT, BRITISH COLUMBIA

Page 1 of 2

B. Cleaned Coal, Raw Fines, and Cleaned Coal Reject

| DEPTH | DRILL HOLE NO.2 | | | | | DRILL HOLE NO.1 | DRILL HOLE NO.3 |
|---|-----------------|-------|-------|---------|--------|-----------------|-----------------|
| | 146' | 364' | 406' | 634' | 654'9" | 357' | 94' |
| Top of Bed | 153' | 394' | 427' | 649'10" | 673' | 365' | 102' |
| Base of Bed | | | | | | | |
| <u>CLEANED COAL</u> | | | | | | | |
| <u>3/4" x 1/4" Composite 1.50 Float</u> | | | | | | | |
| Weight Percent, Head Sample | 5.63 | 23.88 | 24.11 | 20.75 | 13.98 | 12.01 | 23.05 |
| <u>Prox. Analysis, Dry Basis</u> | | | | | | | |
| Ash | 10.30 | 10.59 | 12.04 | 13.57 | 13.50 | 10.73 | 15.64 |
| Vol. Matter | 26.59 | 21.98 | 22.83 | 22.45 | 24.17 | 24.86 | 22.25 |
| Btu | 13490 | 13579 | 13328 | 13167 | 13282 | 13543 | 12979 |
| Sulfur | 1.00 | 0.44 | 0.46 | 0.55 | 0.73 | 0.91 | 0.85 |
| <u>1/4" x 28-M Composite 1.50 Float</u> | | | | | | | |
| Weight Percent, Head Sample | 28.83 | 28.96 | 26.06 | 29.45 | 20.90 | 37.68 | 31.96 |
| <u>Prox. Analysis, Dry Basis</u> | | | | | | | |
| Ash | 6.64 | 7.98 | 10.37 | 11.02 | 11.77 | 8.29 | 11.52 |
| Vol. Matter | 30.88 | 22.74 | 23.53 | 24.05 | 25.28 | 25.42 | 24.26 |
| Btu | 14369 | 14043 | 13651 | 13597 | 13476 | 13885 | 13692 |
| Sulfur | 0.55 | 0.32 | 0.47 | 0.60 | 0.67 | 0.55 | 0.67 |
| <u>28-M x 200-M, Composite 1.60 Float</u> | | | | | | | |
| Weight Percent, Head Sample | 30.49 | 19.31 | 9.36 | 9.06 | 15.75 | 24.45 | 10.10 |
| <u>Prox. Analysis, Dry Basis</u> | | | | | | | |
| Ash | 5.80 | 5.91 | 10.43 | 10.41 | 11.73 | 6.33 | 9.85 |
| Vol. Matter | 30.35 | 26.68 | 25.18 | 26.76 | 27.15 | 27.81 | 26.72 |
| Btu | 14362 | 14256 | 13622 | 13682 | 13513 | 14386 | 13897 |
| Sulfur | 0.47 | 0.42 | 0.52 | 0.59 | 0.70 | 0.48 | 0.74 |

ANALYSES OF DRILL CORES, FLATHEAD PROJECT, BRITISH COLUMBIA

Page 2 of 2

B. Cleaned Coal, Raw Fines, and Cleaned Coal Reject

| DEPTH | DRILL HOLE NO.2 | | | | | DRILL HOLE NO.1 | DRILL HOLE NO.3 |
|-------------------------------|-----------------|-------|-------|---------|--------|-----------------|-----------------|
| Top of Bed | 146' | 364' | 406' | 634' | 654'9" | 357' | 94' |
| Base of Bed | 153' | 394' | 427' | 649'10" | 673' | 365' | 102' |
| <u>CLEANED COAL CONTINUED</u> | | | | | | | |
| 3/4" x 200-M, Composite Float | | | | | | | |
| Weight Percent, Head Sample | 64.95 | 72.15 | 59.53 | 59.26 | 50.63 | 74.14 | 65.11 |
| Prox. Analysis, Dry Basis | | | | | | | |
| Ash | 6.56 | 8.29 | 11.05 | 11.82 | 12.23 | 8.06 | 12.71 |
| Vol. Matter | 30.26 | 23.54 | 23.50 | 23.91 | 25.55 | 26.11 | 23.93 |
| Btu | 14289 | 13946 | 13515 | 13458 | 13434 | 13995 | 13471 |
| Sulfur | 0.55 | 0.39 | 0.47 | 0.58 | 0.69 | 0.59 | 0.75 |
| <u>RAW COAL</u> | | | | | | | |
| 200-M x 0 | | | | | | | |
| Weight Percent, Head Sample | 9.3 | 3.9 | 1.7 | 1.8 | 3.8 | 4.9 | 2.0 |
| Prox. Analysis, Dry Basis | | | | | | | |
| Ash | 10.75 | 14.30 | 19.60 | 17.73 | 23.01 | 15.09 | 21.15 |
| Btu | 13781 | 12769 | 12028 | 12392 | 11507 | 13142 | 11973 |
| Sulfur | 0.55 | 0.40 | 0.66 | 0.66 | 0.75 | 0.56 | 0.79 |
| <u>REJECT</u> | | | | | | | |
| 3/4" x 200-M, Composite Sink | | | | | | | |
| Weight Percent, Head Sample | 25.75 | 23.95 | 38.77 | 38.94 | 45.57 | 20.96 | 32.89 |
| Prox. Analysis, Dry Basis | | | | | | | |
| Ash | 61.78 | 47.17 | 50.22 | 48.04 | 52.94 | 50.71 | 47.93 |
| Btu | 4926 | 6682 | 5992 | 6514 | 6067 | 6452 | 7342 |
| Sulfur | 1.51 | 0.60 | 0.35 | 0.52 | 0.64 | 1.43 | 0.86 |

ANALYSES OF DRILL CORES, FLATHEAD PROJECT, BRITISH COLUMBIA

C. Free Swelling Indices

| DEPTH | DRILL HOLE NO.2 | | | | | DRILL HOLE NO.1 | DRILL HOLE NO.3 |
|----------------------------|-----------------|------|------|---------|--------|-----------------|-----------------|
| | 146' | 364' | 406' | 634' | 654'9" | 357' | 94' |
| Top of Bed | 146' | 364' | 406' | 634' | 654'9" | 357' | 94' |
| Base of Bed | 153' | 394' | 427' | 649'10" | 673' | 365' | 102' |
| <u>FREE SWELLING INDEX</u> | | | | | | | |
| Raw Coal, Head Sample | 6.5 | 2.0 | 2.0 | 2.5 | 4.0 | 5.5 | 6.0 |
| Cleaned Coal | | | | | | | |
| <u>3/4" x 1/4"</u> | | | | | | | |
| Float 1.35 | 4.5 | 2.0 | 5.0 | 6.5 | 7.0 | 4.5 | 7.5 |
| 1.35 x 1.45 | 1.5 | 1.5 | 1.0 | 1.5 | 5.5 | 1.5 | 6.0 |
| 1.45 x 1.50 | 1.5 | 1.0 | 1.0 | 2.0 | 2.5 | 1.5 | 4.5 |
| <u>1/4" x 28-M</u> | | | | | | | |
| Float 1.35 | 8.0 | 3.5 | 7.5 | 7.5 | 8.0 | 8.5 | 9.0 |
| 1.35 x 1.45 | 1.5 | 1.0 | 1.0 | 1.5 | 3.0 | 1.0 | 5.0 |
| 1.45 x 1.50 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.5 | 4.5 |
| <u>28-M x 200-M</u> | | | | | | | |
| Composite 1.60 Float | 7.5 | 2.0 | 4.5 | 7.5 | 7.0 | 7.5 | 8.5 |
| Raw Coal | | | | | | | |
| 28-M x 0 | 8.0 | 3.0 | 6.5 | 6.5 | 6.5 | 7.5 | 8.0 |

ANALYSES OF DRILL CORES, FLATHEAD PROJECT, BRITISH COLUMBIA

D. Cleaned Coal Plasticity

| DEPTH | DRILL HOLE NO.2 | | | | | DRILL HOLE NO.1 | DRILL HOLE NO.3 |
|-------------|-----------------|------|------|---------|--------|-----------------|-----------------|
| Top of Bed | 146' | 364' | 406' | 634' | 654'9" | 357' | 94' |
| Base of Bed | 153' | 394' | 427' | 649'10" | 673' | 365' | 102' |

CLEANED COAL PLASTICITY

3/4" x 1/4", Composite 1.50 Float

Maximum Fluidity

D.D.P.M.

(a) 0.0 1.8 (a) 63.30 (a) (a)

Fluidity Temps., °C

Maximum

(a) - 456 (a) 441 (a) (a)

Initial

(a) - 438 (a) 403 (a) (a)

Final

(a) - 459 (a) 479 (a) (a)

Range

(a) - 21 (a) 76 (a) (a)

1/4" x 28-M, Composite 1.50 Float

Maximum Fluidity

D.D.P.M.

(a) 0.0 (a) 31.0 13.5 (a) (a)

Fluidity Temps., °C

Maximum

(a) - (a) 447 411 (a) (a)

Initial

(a) - (a) 414 393 (a) (a)

Final

(a) - (a) 469 420 (a) (a)

Range

(a) - (a) 55 27 (a) (a)

28-M x 200-M, Composite 1.60 Float

Maximum Fluidity

D.D.P.M.

119.0 0.0 4.5 165.0 227.0 7.2 2925.0

Temps., °C

Initial

444 - 456 453 459 456

Final

408 - 432 411 432 402

Range

471 - 468 486 476 497

63 - 36 79 44 95

(a) Insufficient sample for test.

ANALYSES OF DRILL CORES, FLATHEAD PROJECT, BRITISH COLUMBIA

E. Ash Softening Temperatures, Cleaned Coal

| | DEPTH | DRILL HOLE NO.2 | | | | | DRILL HOLE NO.1 | DRILL HOLE NO.3 |
|---|-------------|-----------------|-------|-------|---------|--------|-----------------|-----------------|
| | Top of Bed | 146' | 364' | 406' | 634' | 654'9" | 357' | 94' |
| | Base of Bed | 153' | 394' | 427' | 649'10" | 673' | 365' | 102' |
| CLEANED COAL | | | | | | | | |
| ASH SOFTENING TEMPS., °F(b) | | | | | | | | |
| <u>3/4" x 1/4", Composite 1.50 Float</u> | | | | | | | | |
| Initial Deformation | (a) | 2260 | 2360 | (a) | +2700 | | (a) | (a) |
| Softening | (a) | 2380 | 2550 | (a) | +2700 | | (a) | (a) |
| Hemispherical | (a) | 2420 | 2610 | (a) | +2700 | | (a) | (a) |
| Fluid | (a) | 2535 | 2700 | (a) | +2700 | | (a) | (a) |
| <u>1/4" x 28-M, Composite 1.50 Float</u> | | | | | | | | |
| Initial Deformation | (a) | 2180 | (a) | 2400 | +2700 | | (a) | (a) |
| Softening | (a) | 2380 | (a) | +2700 | +2700 | | (a) | (a) |
| Hemispherical | (a) | 2410 | (a) | +2700 | +2700 | | (a) | (a) |
| Fluid | (a) | 2530 | (a) | +2700 | +2700 | | (a) | (a) |
| <u>28-M x 200-M, Composite 1.60 Float</u> | | | | | | | | |
| Initial Deformation | +2700 | 2250 | 2670 | 2490 | +2700 | +2700 | | +2700 |
| Softening | +2700 | 2510 | +2700 | +2700 | +2700 | +2700 | | +2700 |
| Hemispherical | +2700 | 2560 | +2700 | +2700 | +2700 | +2700 | | +2700 |
| Fluid | +2700 | +2700 | +2700 | +2700 | +2700 | +2700 | | +2700 |

(a) Insufficient sample for test.

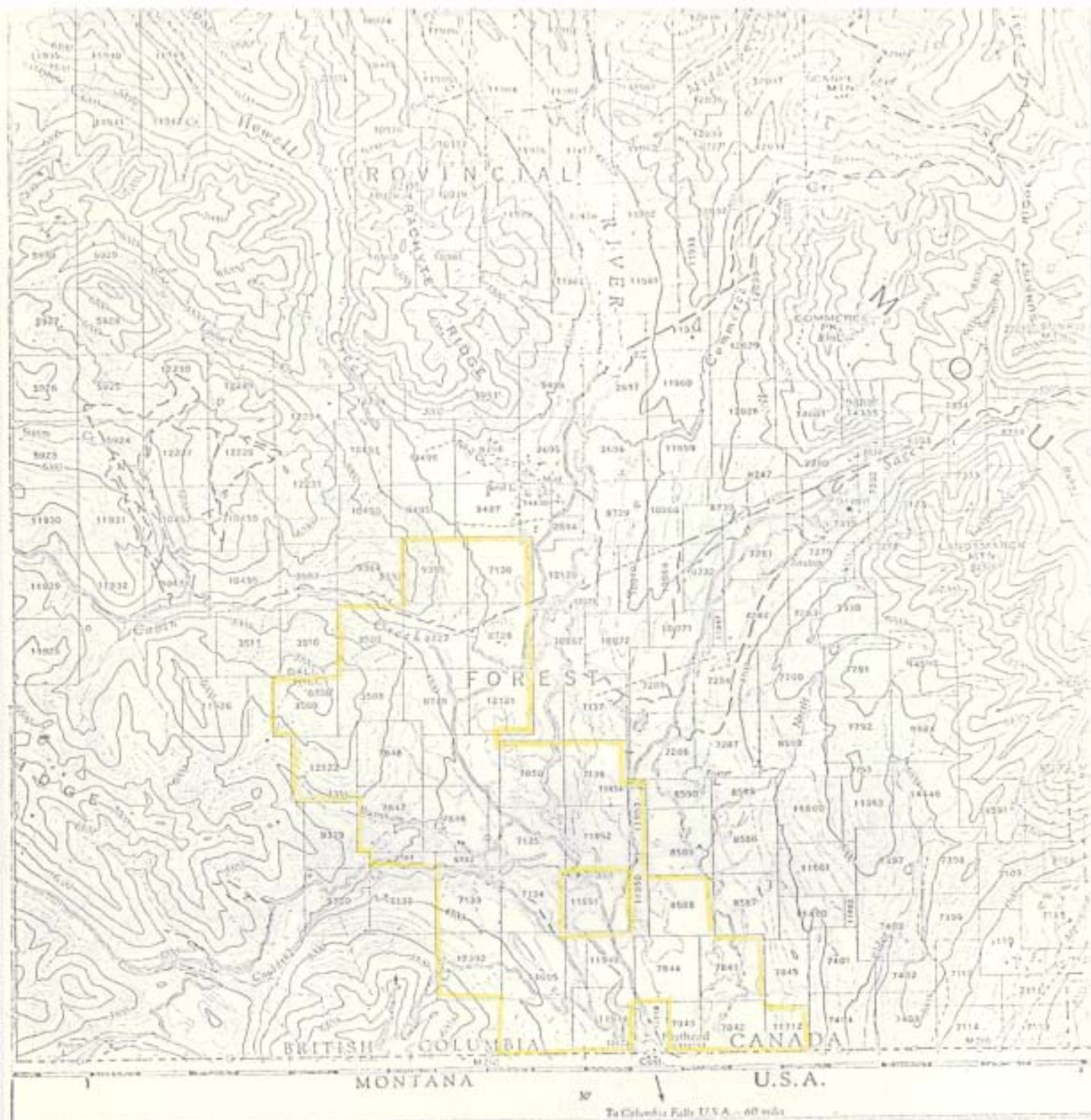
(b) Reducing Atmosphere

| | | | | | | | | | | | | | | |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|------|-------|
| Moisture.....per cent | 4-7a | ..... | 2-0a | ..... | 9-2a | ..... | 1-4a | ..... | 4-9 | ..... | 1-6 | ..... | 2-3 | ..... |
| Ash....." | 12-0 | 12-6 | 9-4 | 9-6 | 10-7 | 11-8 | 15-2 | 15-4 | 15-7 | 16-5 | 21-2 | 21-6 | 16-4 | 16-8 |
| Volatile matter....." | 24-1 | 25-3 | 22-6 | 23-0 | 24-4 | 20-9 | 21-9 | 22-2 | 21-9 | 23-0 | 20-9 | 21-2 | 21-1 | 21-6 |
| Fixed carbon....." | 59-2 | 62-1 | 68-0 | 67-4 | 55-7 | 61-3 | 61-5 | 62-4 | 57-5 | 60-5 | 50-3 | 57-2 | 60-2 | 61-6 |
| <i>Ultimate Analysis—</i> | | | | | | | | | | | | | | |
| Carbon.....per cent | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 67-7 | 68-7 | 71-2 | 73-0 |
| Hydrogen....." | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 4-0 | 3-9 | 4-2 | 4-0 |
| Ash....." | 12-0 | 12-6 | 9-4 | 9-6 | 10-7 | 11-8 | 15-2 | 15-4 | 15-7 | 16-6 | 21-2 | 21-6 | 16-4 | 16-8 |
| Sulphur....." | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 0-3 | 0-3 | 0-3 | 0-3 | 0-2 | 0-2 |
| Nitrogen....." | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1-0 | 1-0 | 1-1 | 1-1 |
| Oxygen....." | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 5-8 | 4-3 | 6-9 | 4-9 |

| | | | | | | | | |
|-----------------------------------|---|-------|-------|-------|--------------------------------------|------------------|--------------------|-----------------------------|
| <i>Caloric Value—</i> | | | | | | | | |
| B.t.u. per lb., gross..... | ..... | ..... | ..... | ..... | ..... | 11,830 | 12,600 | 11,530 11,770 12,350 12,650 |
| Fuel ratio..... | 2-45 | 2-90 | 2-30 | 2-80 | 2-65 | 2-70 | 2-55 | |
| Caking properties..... | b | b | b | b | Poor | Poor | ..... |  |
| Ash softening temperature.....°F. | ..... | ..... | ..... | ..... | ..... | Above 2700 | 2490 | |
| Rank classification..... | All medium volatile bituminous..... | | | | | | | |
| Taken by..... | J. D. MacKenzie, Geological Survey..... | | | | B. R. MacKay, Geological Survey..... | | | |
| Date..... | September 1914..... | | | | August 27, 1930 | August 1931..... | June 29, 1932..... | |

a These samples had entirely lost surface moisture.

b Field tests indicate that the coals had definite caking properties.



FLATHEAD

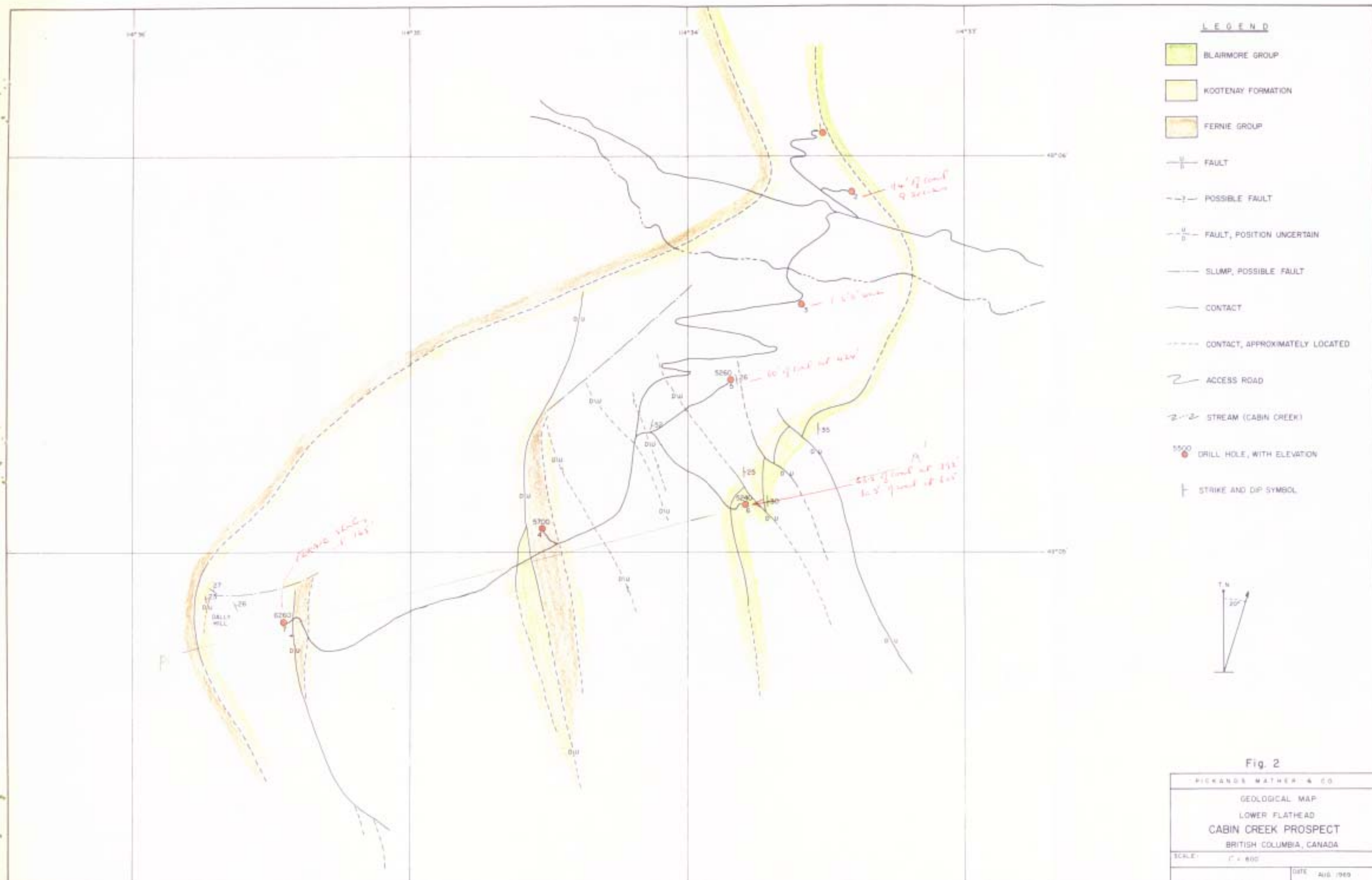
BRITISH COLUMBIA
KOOTENAY LAND DISTRICT

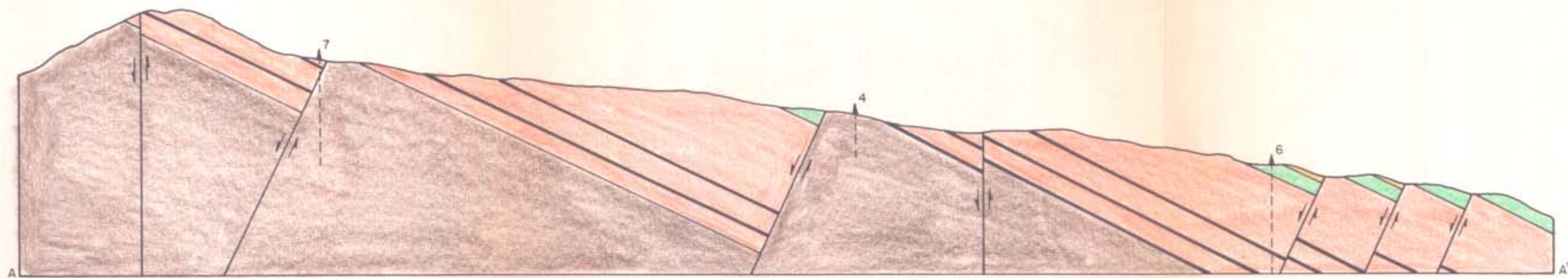
Scale 1:126,720 or 1 Inch to 2 Miles

Miles 1 2 3 4 5 6 7 8 10 Miles

— BOUNDARY OF R.C.V. LANDS

A.D. Hingler
Figure 1



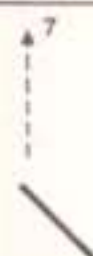


LEGEND

- BLAIRMORE GROUP
- KOOTENAY FORMATION
- FERNIE GROUP
- OVERBURDEN

*max
thickness
about 1,050'*

NOTE



REPRESENTS DRILL HOLE LOCATIONS

THE DARK LINES IN KOOTENAY = COAL SEAMS

Fig. 3

PICKANDS MATHER & CO.

GEOLOGICAL CROSS SECTION
CABIN CREEK PROSPECT

SCALE: 1" = 600'

DATE OCT. 1969

00358 (1) ①

F. D. Effinger

DRILL HOLE NUMBERS

DRILL HOLE NUMBERS

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|

F. D. Effinger

K-SAGE CREEK - 69(2)A.

CONFIDENTIAL
OPEN FILE

LEGISLATIVE BRANCH
ASSESSMENT REPORT

00 358

ROYAL CANADIAN VENTURES LTD. &
ASSOC. COS.

Chapman Helicopters
Cranbrook
14000 ft.

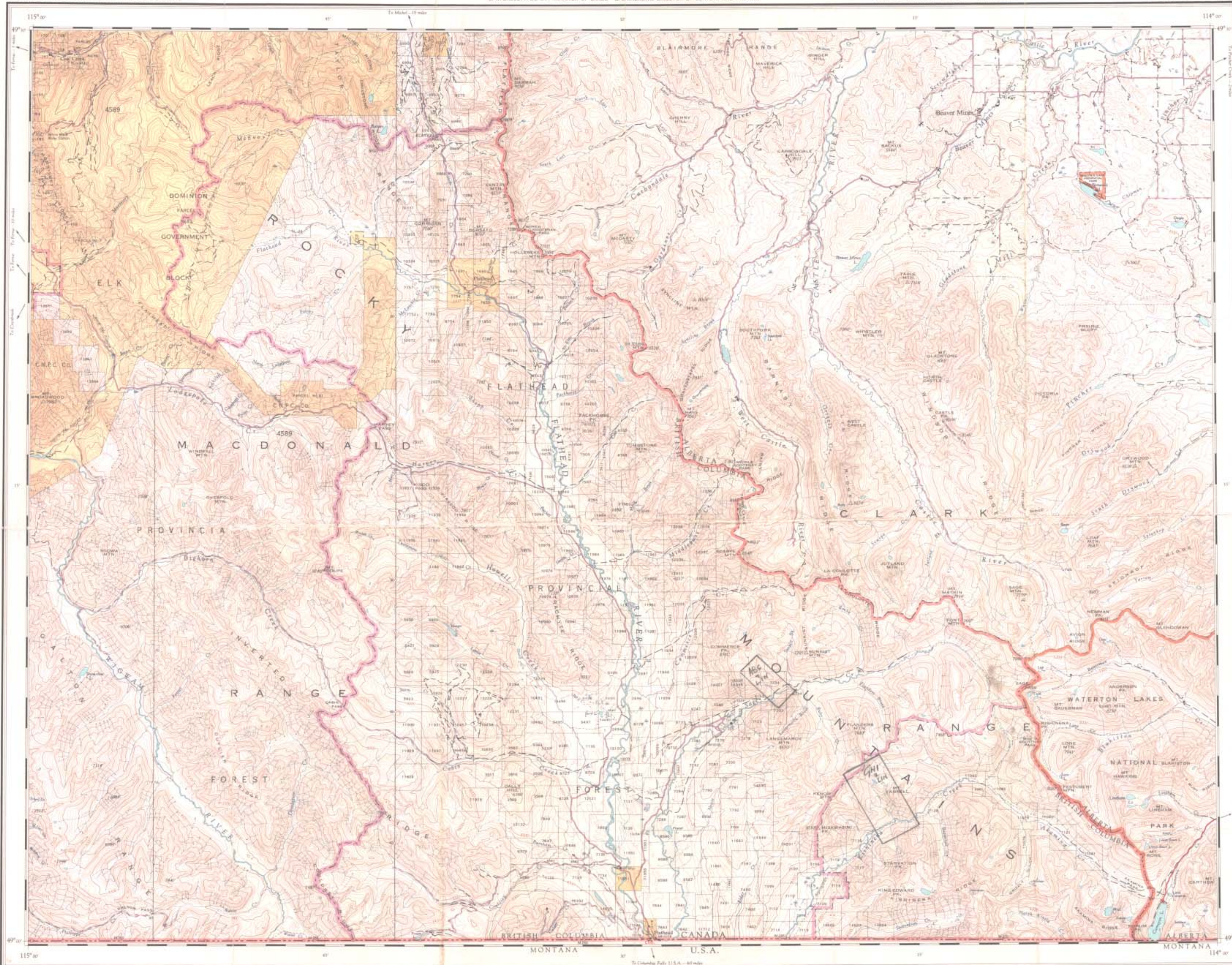


DEPARTMENT OF LANDS, FORESTS, AND WATER RESOURCES
BRITISH COLUMBIA
HONOURABLE R. G. WILLISTON, MINISTER
E. W. BASSETT, DEPUTY MINISTER OF LANDS G. S. ANDREWS, DIRECTOR OF SURVEYS AND MAPPING

FIRST STATUS EDITION — March 16, 1963

SHEET 82G/SE

NATIONAL TOPOGRAPHIC SYSTEM



Flathead Camp
situated near
Beaver Lake

First Status Edition compiled and published by the Geographic Division, Survey and Mapping Branch,
Department of Lands, Forests and Water Resources, Victoria, B.C. 1963.

RELIABILITY
Platitudes compiled from Provincial Government survey
monuments, 1961, B.C. at 1:50,000.
Contours compiled from Dept. of Mines & Technical Surveys,
Ore Survey, 1953-54.
Culture record from 1962-63, B.C. at 1:50,000.
Alberta portion compiled from Dept. of Mines & Technical Surveys,
Ore Survey, 1953-54.

Copies of this map may be obtained from Geographic
Division, Survey and Mapping Branch, Department of
Lands, Forests, and Water Resources, Victoria, B.C.

REFERENCE

Lands alienated or reserved by application
under the Land Act
Surveyed Timber Lands, Leases, or Bents
Indian Reserves
Government Reserves
Land Claims Boundary
Timber Farm License
Provincial Forest Boundary
Municipalities
Park
Camp or Port of Call
Power Service License
Post Office
School
Church
Hospital
Building
Cemetery
Water Course
Historic Monument
International Boundary and Monument
Jurisdictional Boundary and Monument

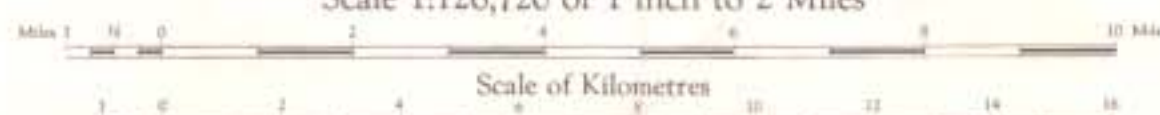


FLATHEAD

BRITISH COLUMBIA
KOOTENAY LAND DISTRICT

SG 69(2)A

Scale 1:126,720 or 1 inch to 2 Miles



Map projection: Transverse Mercator, 20° N. Base at 1960.
(Distances approximately 2° 30' annually)
N.T.S. (Not To Scale)

358(2)

#1

REFERENCE

Road, Hard Surface, All Weather
Road, Surface, All Weather
Engage, Loose Surface, Dry Weather
Abandoned Road
Railroad
Main Telephone Line
Main Electric Power Line
Highway, Control Lines
Common (Control Line)
Elevation in feet above mean sea level
International Boundary
Survey in March
Dam
Water Tunnel
Tow Mill
Crested Pig
Spring
Glacier
Mine
Customs Office
Navigation Light
International Lake or National Boundary

Universal Transverse Mercator Projection



Scale: 1:126,720 or 1 inch to 2 Miles
Distances approximately 2° 30' annually
N.T.S. (Not To Scale)

FLATHEAD, B.C.
SHEET 82G/SE
FIRST STATUS EDITION