



## GEOLOGY OF THE SOUTHEASTERN PEACE RIVER COALFIELD

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At present the Peace River Coalfield is the subject of an extensive and continuing study by various Government departments, including the British Columbia Ministry of Mines and Petroleum Resources, which during the 1976 field season conducted a geological program over the southern one-third of the coalfield. The study was initiated as a result of a paucity of information on the geology, structure, and economic potential of this area relative to the remainder of the coalfield. The objectives were twofold: firstly the regional mapping of the licenced and unlicensed areas on a scale of 1:50 000 and secondly to assess the coal potential of the known coal-bearing strata and the economic status of the Minnes Group.

The map-area lies approximately 100 kilometres south of Dawson Creek and extends from Kinuseo Creek on the north to the Alberta border on the south, over a strike distance of 70 kilometres, encompassing an area of 840 square kilometres. Coal licences held by McIntyre Mines Limited – Canadian Superior Exploration Limited (Monkman-Belcourt) and Denison Mines Limited (Belcourt and Saxon) cover the coal-bearing strata in two northwesterly trending belts. The Saxon property received only cursory examination and is not dealt with in this report.

### GEOLOGY

The map-area is underlain by Upper Jurassic and Lower Cretaceous strata, and is bounded on the west by Paleozoic strata (thrust over the Lower Cretaceous formations along their entire strike length) and on the east by Upper Cretaceous formations. The main lithological units are shown on Figure 22. Stott (1968) provides an excellent account of the stratigraphy of the coalfield and only comments pertinent to the map-area follow.

Minnes Group strata occupy the core of a broad northwesterly trending anticlinal structure which extends the length of the map-area.

The Minnes Group was mostly prospected for coal and not mapped in the same detail as the Bullhead and Fort St. John Groups, due to lack of marker horizons, a lack of economic coal seams, and the intense structural deformation.

The Bullhead and Fort St. John Groups occupy two narrow linear belts along the limb of the anticlinal structure. The Cadomin Formation overlies the Minnes Group unconformably and, although greatly variable in thickness, provided an excellent marker horizon readily traceable throughout the map-area. Both the Gething and Moosebar Formations are thinner in the map-area than in the central and northern areas of the coalfield. The Gething Formation ranges from 20 metres to 120 metres and the Moosebar

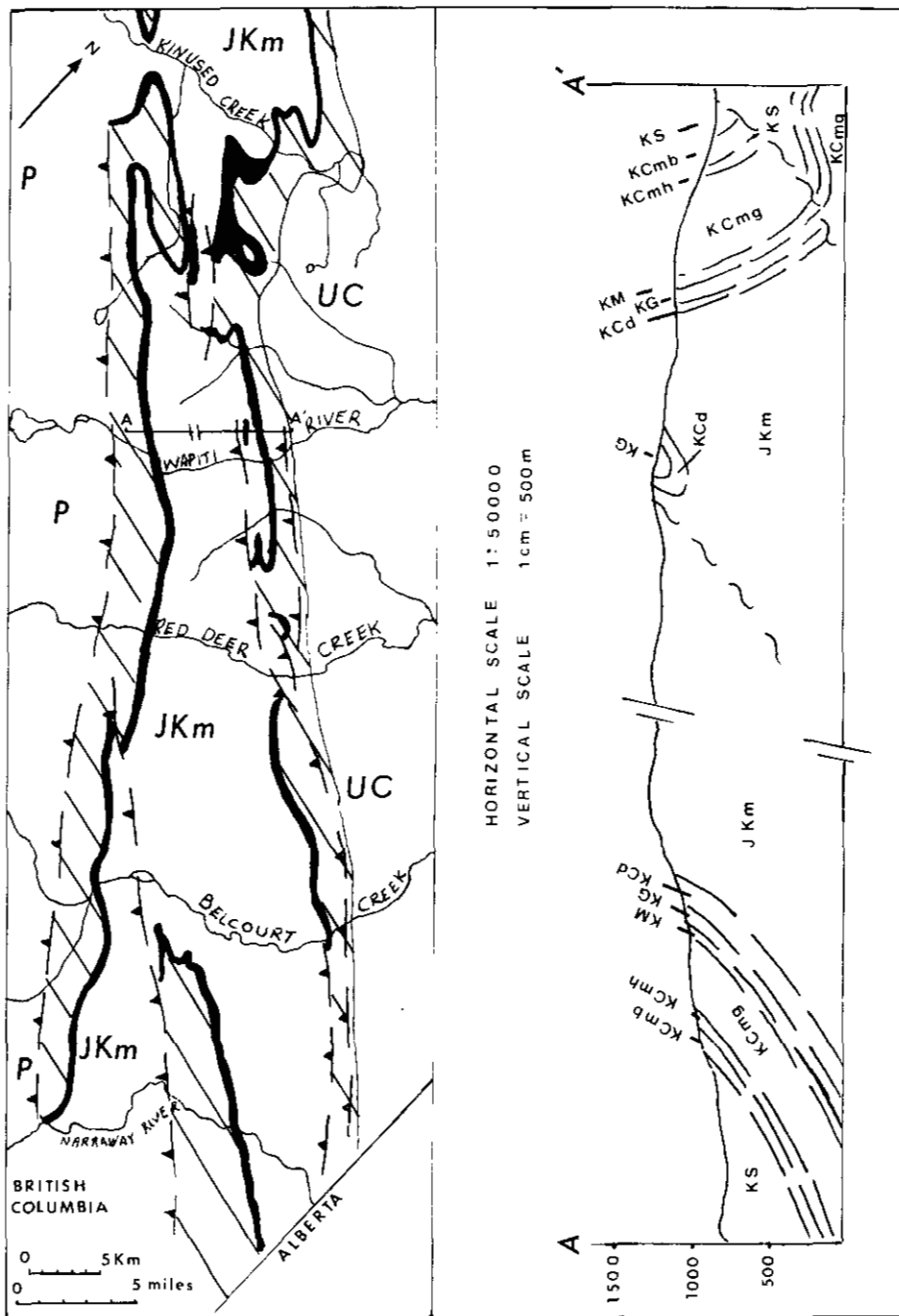






Figure 22. Generalized geological sketch map and cross-section.

LEGEND

- UC** UPPER CRETACEOUS
- LOWER CRETACEOUS**
-  FORT ST. JOHN GROUP
- KS** SHAFTESBURY FORMATION  
SHALES, SILTSTONES, AND SOME SANDSTONE
- COMMOTION FORMATION**
- KCmb** BOULDER CREEK MEMBER  
FINE TO COARSE-GRAINED SANDSTONE,  
CONGLOMERATE, AND MINOR SHALES
- KCmh** HULCROSS MEMBER  
DARK MARINE SHALE WITH SIDERITIC CON-  
CRETIONS, SOME SILTSTONE
- KCmg** GATES MEMBER  
FINE TO COARSE-GRAINED CARBONACEOUS  
SANDSTONES, CONGLOMERATE, MUDSTONE,  
SHALE, AND COAL
- KM** MOOSEBAR FORMATION  
DARK MARINE SHALE AND MUDSTONE
-  BULLHEAD GROUP
- KG** GETHING FORMATION  
CARBONACEOUS SANDSTONE, CONGLOMERATE,  
MUDSTONE, AND COAL
- KCd** CADOMIN FORMATION  
MASSIVE CONGLOMERATE, SOME SANDSTONE
- JKm** MINNES GROUP  
THIN-BEDDED SANDSTONES, MUDSTONES, SHALES, AND  
COAL
- P** PALEOZOIC  
UNDIFFERENTIATED

SYMBOLS

- GROUP OR FORMATION BOUNDARY 
- THRUST FAULT 

Formation averages 45 metres thick. The Gates Member of the Commotion Formation varies from 360 metres in the southwestern belt to 510 metres in the northeastern belt. A transitional zone, characterized by bioturbation and worm burrows, between the marine Moosebar Formation to the non-marine Gates Member, will be useful in determining the Moosebar/Gates contact, especially in drill holes.

The position of the recessive Hulcross Member was in most cases inferred, due to lack of outcrops and dense tree cover, as was the position of the Boulder Creek Member over most of the northern part of the northwestern belt. The Hulcross Member averaged 45 metres and the Boulder Creek Member 90 metres thick.

## STRUCTURE

Structurally the map-area can be divided into three belts: a central belt occupied by the Minnes Group which has undergone faulting and intense folding, both on a major and a minor scale; a southwestern belt of Bullhead and Fort St. John Groups which is relatively undeformed with dips in the order of 30 degrees to 50 degrees to the southwest, and finally a northeastern belt of deformed Bullhead and Fort St. John Groups characterized by *en echelon* folds trending northwest, which are cut by southwesterly dipping thrust faults.

## COAL POTENTIAL

The Minnes Group, although coal-bearing, appears to have little economic potential due to the thin nature of the seams (less than 1 metre) and the intense structural deformation undergone by the Group.

The Gething Formation and Gates Member are the chief coal-bearing strata of the coalfield with the Gething Formation being dominant in the north and the Gates Member in the south. This was borne out in the map-area. However three seams between 1 and 2 metres were located within the Gething Formation indicating that the formation is worthy of continued exploration. The Gates Member has the greatest economic potential in the map-area. With the limited amount of data provided by trenching, correlation could only be very tentative. Seams range from a metre up to 10 metres thick.

A very conservative estimate of the inferred resources of 1 400 million tonnes of coal was computed for the Gates Member within the map-area.

## REFERENCE

- Stott, D. F. (1968): Lower Cretaceous Bullhead and Fort St. John Groups, Between Smoky and Peace Rivers, Rocky Mountain Foothills, Alberta and British Columbia, *Geol. Surv., Canada, Bull.* 152.

