



British Columbia Geological Survey Geological Fieldwork 1981

BOWRON RIVER PROGRESS REPORT

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This study of the Bowron River coal deposit, supported by grants from the British Columbia Ministry of Energy, Mines and Petroleum Resources and contributing to an M.Sc. degree, is now in the final stages. It includes two and a half seasons of work in the Bowron River valley under I. Borovic in association with Norco Resources Ltd. and combines a compilation of previous work and present drill results. The most recent results included were obtained during the spring and summer of 1981. Prior to this drill program there was insufficient information to conduct a meaningful study of the stratigraphy and lithologies of the coal deposit. Data collection time was lengthy due to spacing of the drill programs and adverse drilling conditions.

During the two seasons of drilling 22 holes were attempted (10 rotary and 12 diamond-drill holes). Also during this period limited seismic and geomagnetic surveys were conducted. Further drilling is required to accurately delineate the fault contact between the sedimentary rocks and the underlying volcanic rocks, and to resolve problems regarding faulting versus lithofacies changes. Norco Resources Ltd. plans to continue drilling late this fall.

Between drilling programs, the lithologies and stratigraphy of the sediments were analysed at the University of British Columbia. These studies included definition of the lithologies and associated sedimentary structures, analysis and mapping of the lithofacies, determination of the lithofacies, determination of the subsurface structure, maceral and reflectivity analysis of the coals, X-ray diffraction analysis of some of the shales, and petrology of the conglomerates and sandstones. Some of the results obtained from these studies are as follows:

- (1) Thirteen distinct lithologies exist within the Bowron River basin. The lithologies may occur singly, or in combinations of several types. Two lithologies of the Mountain Group Slide crop out in the basin. These are greenstones of the Antler Formation and two different limestones which have been assigned to the Greenberry Limestone Member of the Guyet Formation.
- (2) Sediments in the Bowron River basin can be broadly separated into three facies groups. These are a lacustrine facies, an alluvial fan to plan facies, and a transitional facies which contains elements of both lacustrine, and alluvial facies.
- (3) A predictable stratigraphy is best developed in the lacustrine facies, and most poorly developed in the alluvial fan to plan facies.

- (4) Subsurface structure involves little folding except locally along fault contacts. The structure is dominated by high-angle block faults. Two patterns of faulting exist: one set of faults parallel to the trend of the basin. The other trends northeastward across the basin. The general form of the basin appears to be a faulted, asymmetrical syncline.
- (5) The coal has sub-bituminous rank. Maceral and reflectivity analysis are in general agreement with previous work by Donaldson of the Geological Survey of Canada. The coal consists of vitrinite, vitrinite precursors (telinite and collinite), and various exinites of which resinite and cutinite were the most abundant. Reflectivity values were variable but generally agreed with those obtained by Donaldson. There was no apparent increase in reflectivity with depth of burial.
- (6) Examination of some of the shales, particularly those with swelling properties, showed that they consist of quartz chlorite, illite, and micas. Despite the swelling or disaggregating nature of these shales on exposure to rain water, only one sample contained abundant smectites.
- (7) Shales from the lacustrine facies were tested for palynomorph content. Most possessed an abundant palynomorph assemblage that correlates with Middle to Late Paleocene assemblages. The flora represents a warm to temperate, wet paleoclimate. This is the first documented Paleocene assemblage described in British Columbia.
- (8) Conglomerates and sandstones were sampled and examined under a petrologic microscope. They consist of quartz of various types, argillitic and phyllitic clasts, limestone clasts, and carbonaceous materials. On the basis of composition the most likely sources for the Bowron River sediments are the Guyet Formation and the upper Cariboo Group.