COAL INVESTIGATIONS

EAST KOOTENAY COALFIELD

By David E. Pearson

INTRODUCTION

Systematic 1:10 000 scale mapping of the Crowsnest Coalfield commenced in the 1976 field season, when approximately 120 square kilometres was mapped. The area covered by the mapping project is indicated on Figure 18. The intent of this ongoing study is to provide up-to-date and reliable data for a thorough evaluation of coal resources.

The sub-areas mapped include freehold ground held by Kaiser Resources Ltd. and Kaiser Coal (Canada) Ltd., and also Parcel 73, the Northern Dominion Coal Block.

STRUCTURE

Structure is the single most important factor in localizing the coal measures in this district, and an understanding of it is fundamental to any discussions of geology.

Two types of structure dominate the district. First, there are reverse faults, the movement surfaces of which dip steeper than the bedding but in the same direction. The attitude of these faults changes about the Sparwood syncline (indicated on Fig. 18, to the east of Sparwood and to the west of Natal and Michel). These faults are caused by failure during flexural slip folding – the mechanism that caused this syncline.

Second, there are much larger faults that transect the area between Olson and Hosmer. These are regarded as thrust faults, the effect of which is to juxtapose allochthonous thrust plates E to B upon plate A (Fig. 18). The syncline indicated on thrust plate B has an overturned western limb, caused by drag against plates C, D, and E as they were pushed toward the northeast. This is illustrated diagrammatically on Figure 19, which is a cartoon section across the key area of the Northern Dominion Coal Block. From these two figures it is apparent that sections that are the right-way-up, sit directly upon sections with the same dip value, but which are inverted.

Such large-scale structures do not permit the uninterrupted tracing of coal seams, so that correlation by other methods must be utilized. They do, however, render useless the mining potential of some geographic areas while enhancing that of others.

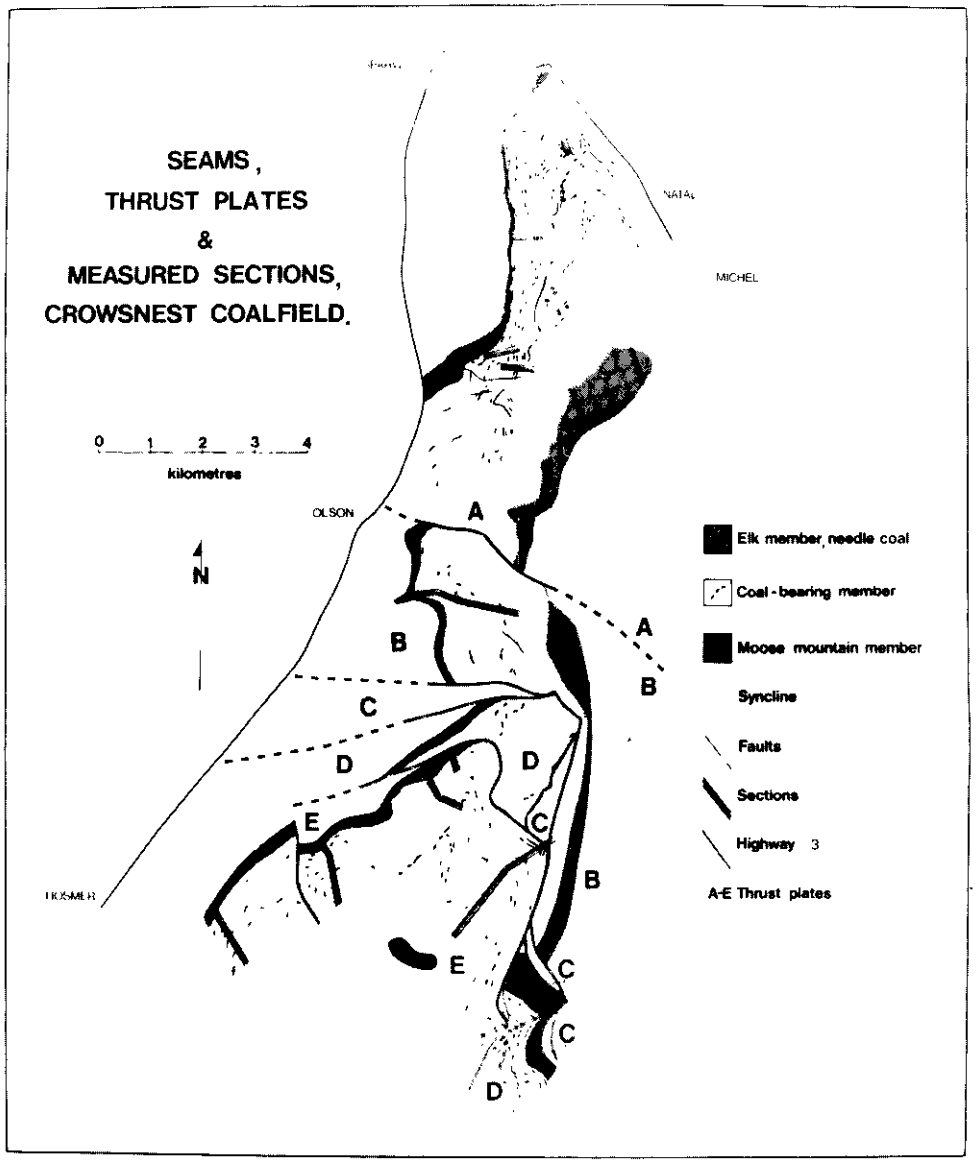

Figure 18. Area mapped in 1976 field season.

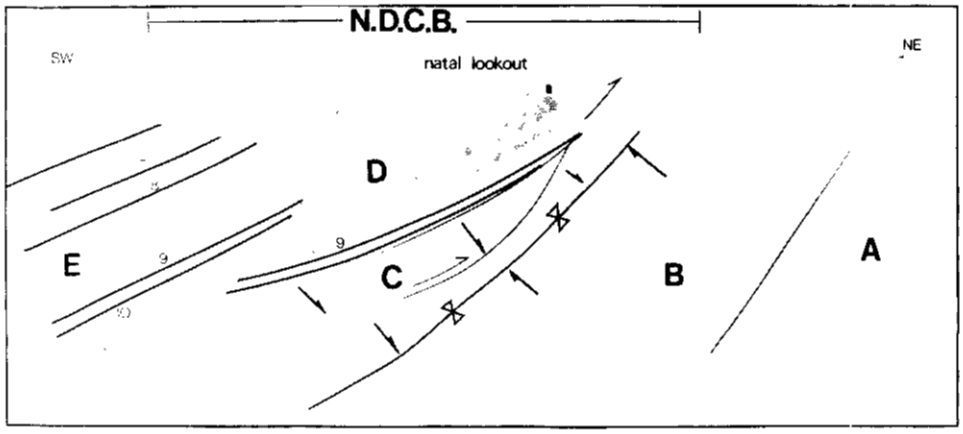

Figure 19. Cartoon section across the Northern Dominion Coal Block. Open arrows indicate relative movement along thrust surfaces; closed arrows indicate stratigraphic tops; grey bands on plates E and D indicate the positions of the prominent '9-seam' sandstone bodies.

Stratigraphy

The trace of a basal sandstone, the Moose Mountain Member, from Sparwood Ridge to Hosmer Ridge is indicated on Figure 18, along with the trace of the lowermost Elk Member. The coal measures sit between these two members. The base of the 'Elk Member,' on plate A, is taken as the thick conglomerate above which 'needle coal' is first found. Needle coal is a cannel coal that displays fossil pine needles on weathered surfaces. A similar conglomerate, possibly the same one, is found beneath needle coals on thrust plates B and E.

On Figure 18, every occurrence of coal over 500 centimetres thick is indicated and where significant shale bands split seams, more than one seam is indicated. Correlation of such exposures along Sparwood Ridge is excellent, and continuity of most seams (10 through 1) is demonstrable (Fig. 20). With certain exceptions, the measured section on Razor Ridge (on thrust plate B) can, in general, be correlated with the measured sections on Sparwood Ridge; the exceptions being that seam 9 is missing on Razor Ridge and a thick sand above the **trace** of 9 seam becomes more apparent.

Correlation of seams on thrust plate E is less reliable. From the eastern margin of the plate on Wheeler Ridge to its northern apex on Hosmer Ridge, correlation is good (Fig. 21, measured sections D and C). Correlations along the western side of Hosmer Ridge, however, are poor (measured sections A to C, Fig. 21), and should be regarded as tentative.

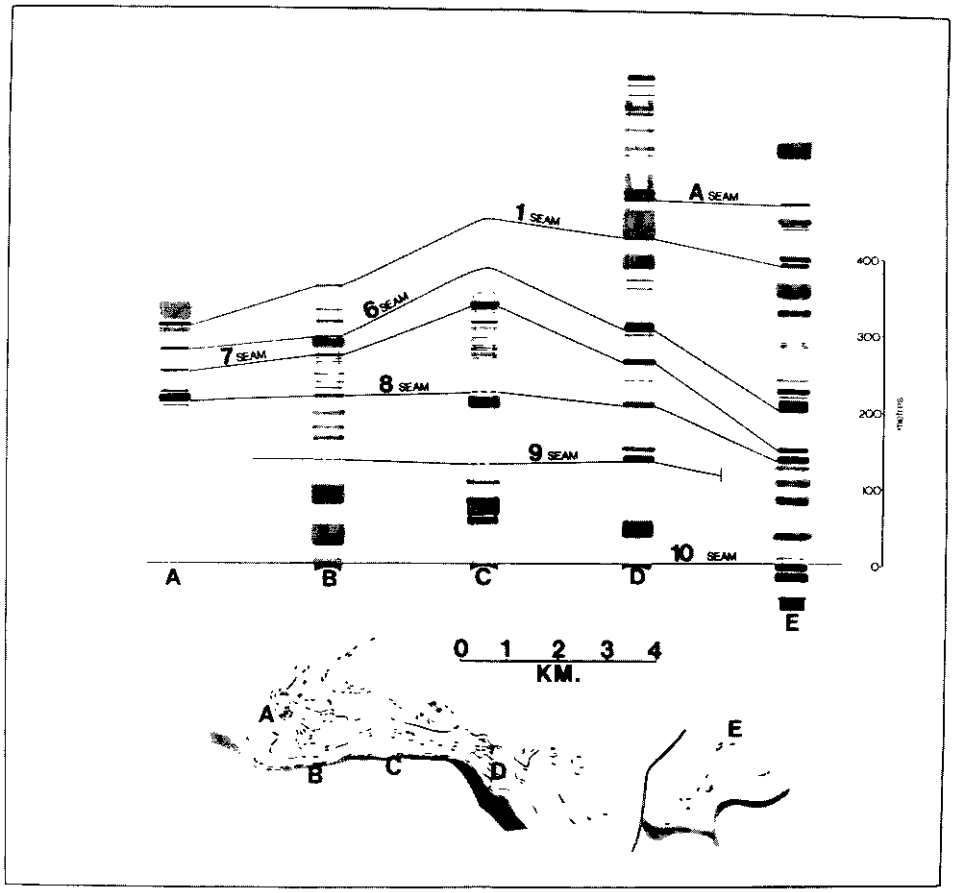

Figure 20. Correlation of measured sections on Sparwood Ridge. Grey areas on diagram indicate the positions and thicknesses of major sandstone bodies. Razor Ridge section is included on the far right of the diagram (Section E).

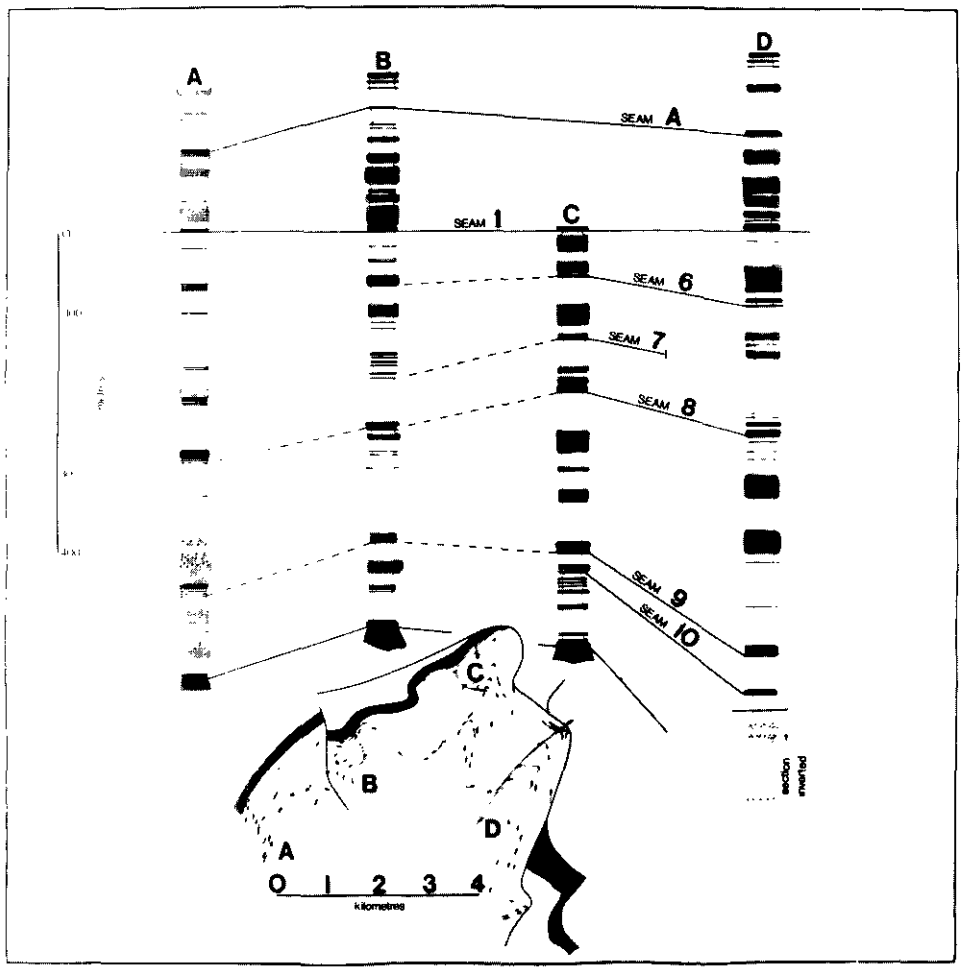

Figure 21. Correlation of measured sections on thrust plate E (Hosmer Ridge, Wheeler Ridge Area). Dark grey areas are basal Moose Mountain Member; medium greys in sections are prominent sandstone bodies; the light grey area is inverted Elk Member. Dashed lines indicate uncertain and tentative correlations.

Since the construction of Figures 20 and 21, it has been realized that the 4-metre-thick shale that splits 10 seam on Razor Ridge (section E, Fig. 20) thickens to the south (palinspastically the southwest), so that seams labelled 9 and 10 in sections C and D (Fig. 20) are respectively Upper 10 and Lower 10, separated by 15 metres in section C, and 41 metres in section D. No other correlations between the various plates have been attempted at this early date.

LABORATORY STUDIES

Laboratory studies on 125 channel samples of coal (approximately 1.5 tonnes) are to be performed. Each sample is to be ranked petrographically, and the maceral types identified. X-ray diffraction of the low-temperature ash will determine what constitutes mineral matters in these samples. X-ray fluorescence of whole coal is planned using whole-coal internal standards obtained from the Illinois Geological Survey.

ACKNOWLEDGMENTS

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