



# British Columbia Geological Survey

## Geological Fieldwork 1977

### QUINSAM AREA, VANCOUVER ISLAND

(92F/13E, 14W; 92K/3W, 4E)

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In 1962 Weldwood of Canada Limited acquired all the assets of Canadian Collieries Limited, including the coal rights held fee simple by way of the Esquimalt and Nanaimo Railway Land Grant. In 1973 Weldwood compiled all available data on coal reserves of these lands and began investigation of several untested areas, including the Quinsam area west of Campbell River. In 1975, 11 boreholes were drilled from which a structural map at 1:15 840 scale was prepared and submitted in a report to the Ministry. In 1976-77 a grid was surveyed and drilling at 500-foot centres was begun. Several trenches were cut in coal, and from one of them a short adit was driven to obtain unweathered coal for testing.

The coal in the Quinsam area could represent a significant addition to the reserves of Vancouver Island, and a program of reconnaissance geological mapping of the area was undertaken.

The writer spent one month producing an outcrop map of most of the area between the upper section of Campbell River and Iron River. In addition, a reconnaissance was made from the lower Iron River eastward past Quinsam Lake. Outcrops were mostly located on 1:63 360 aerial photographs and transferred to 1:50 000 base maps.

Coal seams occur in the Upper Cretaceous Comox Formation, which is poorly exposed over most of the Quinsam area. North of Miller Creek and Beavertail Lake Pleistocene drift is very thick and no Comox rocks are exposed. Between Beavertail and Middle Quinsam Lakes there are scattered exposures of greywacke and conglomerate, flanked on the east by Karmutsen volcanic rocks and on the west by granodiorite of the Quinsam batholith. A coal seam had been exposed in a trench 560 metres north of Middle Quinsam Lake. A ridge of granitic rocks south of Middle Quinsam Lake partly divides the basin, and the lower parts of the sections to the north and south differ considerably. The base of the formation was not seen, but probably lies at the base of a cobble and boulder conglomerate. In a new exposure along Highway 28 north of Gooseneck Lake the conglomerate consists almost entirely of material eroded from the Karmutsen Formation, and the cobbles are well rounded. Pebble conglomerate and pebbly greywacke lie somewhat higher in the section. In a bulldozer cut southeast of the second lake south of Middle Quinsam Lake, the rock is a sedimentary breccia consisting of varied angular fragments in a maroon matrix, and in the bed of the Iron River the conglomerate is a mixture of this breccia plus well-rounded granitic boulders. Karmutsen-derived material is relatively minor. A coal seam lies a few metres above the sedimentary breccia, and an open cut on the same line exposes a second seam with a sandstone roof. Coal with a shale roof exposed in an open cut northeast of the second lake south of Middle Quinsam Lake appears to represent a third seam. These seams pass under well-exposed greywacke and sandstone to the east. Where freshly exposed in a bulldozer cut the greywacke is dark green and gritty and resembles highway cuts southeast of Snakehead Lake. Evidently Karmutsen-derived material was able to enter the south part of the basin in quantity after the coal was laid down. Only one seam was found in the Iron River, and as it has a sandstone roof and lies at least 27 metres above the mixed conglomerate it is probably No. 2 seam. Coal exposed in an open cut and short adit east of Middle Quinsam Lake lies over the nose of the dividing ridge, and may be No. 1 seam near the base of the Comox Formation. A partial analysis of a sample taken adjacent to the adit yielded the following results:

S — 1.97%      P<sub>2</sub>O<sub>5</sub> — 0.62%      ASH — 5.21%

The Comox beds have been warped, tilted, and faulted. North of Middle Quinsam Lake the overall dip is east-northeast at about 8 degrees. Southeast of the long lake the beds are broadly arched, dipping east and southeast on one flank and north to northwest on the other. A shallow trough crosses the Iron River to the east. The dips in this part of the area are locally as much as 27 degrees, but more commonly 10 to 15 degrees.

Near the Iron River iron-copper deposit, sheared Karmutsen rocks have been thrust northwest over the mixed conglomerate. Upstream, a steep normal fault has dropped the coal seam 2 or 3 metres. A fault is inferred to underlie Beavertail Lake and Creek, and another may underlie Snakehead Lake. A fault almost certainly underlies the long lake, dropping Comox beds down against the ridge of granitic rocks. A pronounced airphoto linear through Lukwa Lake has been interpreted as a boundary fault, dropping Comox beds down against the Karmutsen belt, but the writer found Karmutsen outcrops west of this line. The nature of the Comox boundary in this part of the area is simply not known, because the closest Comox outcrop is more than a kilometre from the Karmutsen outcrops.