



MOUNT SPIEKER AREA

(93P/3)

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INTRODUCTION

The Mount Spieker map-area lies between 55 degrees 10 minutes and 55 degrees 13 minutes latitude and 121 degrees 28 minutes and 121 degrees 10 minutes of longitude. It is bounded by Bull moose Creek on the northwest and by the Wolverine River on the southwest, encompassing an area of approximately 200 square kilometres. Field mapping was plotted on aerial photographs at a scale of 1:15 000 and final maps will be published on orthophoto mosaics at the same scale.

Upper Jurassic to Middle Cretaceous strata of the Minnes, Bullhead, and Fort St. John Groups underlie the area and contain the coal-bearing Gething and Commotion Formations. The best developed coals of the Gething Formation are the upper and lower Bird seams, which lie close to the top of the formation. The Gates Member contains at least four continuous coal seams totalling approximately 12 metres in thickness.

STRATIGRAPHY

The northwest face of Mount Spieker provides an excellent, nearly continuous exposure of Moosebar through Boulder Creek strata. Here, a number of sections were measured and a lesser number were measured at other locations throughout the map-area. Sections were plotted at a scale of 1:250. Following are brief descriptions of distinctive characteristics of the mapping units and their contacts in the area.

Minnes Group: The Minnes Group is generally composed of thin to thickly interbedded sandstones, siltstones, shale, and coal. The contact with the overlying Cadomin Formation, basal unit of the Bullhead Group, is abrupt but appears conformable. Cadomin conglomerates rest on 5 to 15 metres of siltstones with no gradation between the two.

Bullhead Group

CADOMIN FORMATION: The Cadomin Formation rarely forms a marker horizon within the map-area due mainly to its lack of outcrop in alpine areas (Mount Reesor excepted). The conglomerates are split by thick sandstone-siltstone sequences into two or three conglomerate horizons ranging in thickness from 7 to 20 metres. Clasts range from pebble to cobble size with maximum cobble size up to ± 10 centimetres.

GETHING FORMATION: The contact between Gething and Cadomin Formations is placed above the last major conglomerate unit. Sandstones, siltstones, and shales are interbedded with a number of conglomerate beds. The sandstones are usually crossbedded, weather in platy stacks, and form resistant ridges between the recessive siltstones, shales, and coaly horizons.

Fort St. John Group

MOOSEBAR FORMATION: The Moosebar shales conformably overlie the Gething Formation. The contact is drawn below a 0.5-metre glauconitic, medium-grained sandstone or conglomerate, which is overlain by distinctive black clay shales. On Mount Reesor, the Moosebar Formation was measured to be 80 to 90 metres thick. Rusty weathering ironstone concretions and sideritic-rich mudstone beds in the order of 10 to 20 centimetres thick occur throughout the formation, although they are most prevalent in the lower half.

The upper part of the Moosebar Formation was mapped as a separate unit with the lower contact drawn at the first siltstone or fine-grained sandstone above the black clay shales. This contact was observed to be quite abrupt in places. The siltstones are characterized by bioturbation, worm burrows, and tracks. Black, roughly crescent-shaped worm burrows, which become more abundant up section, are especially indicative. This unit varies from 100 to 140 metres thick in the northern part of the map-area but appears to thin southward, although no complete sections are exposed in the southern part of the map-area. The upper contact is drawn just below a 15 to 20-metre-thick well-crossbedded, fine to medium-grained sandstone which weathers in stacks.

COMMOTION FORMATION

Gates Member: This unit varies from 190 to 230 metres thick and consists of conglomerate, sandstone, siltstone, shale, and coal. The lower contact is at the base of a crossbedded sandstone unit which is generally devoid of the worm burrows, typical of the aforementioned unit. However, 70 to 150 metres above the base is a medium-grained sandstone characterized by large, 1 centimetre wide by 4 to 6 centimetres long, sand-filled worm burrows. Coal seams are found in the middle of the formation within a series of repeated rock units. Pebble conglomerate beds of 5 to 20 metres thick occur near the top of the Gates Member in some locations.

Hulcross Member: The base of the Hulcross is drawn at the first occurrence of grey, rusty weathering, rubbly silt shales. The contact is gradational as the top of the Gates is often silty and recessive. Sideritic concretions and 1 to 3-metre resistant indurated siltstone horizons are other distinguishing characteristics. The member is usually 120 to 150 metres thick.

Boulder Creek: The lower contact is gradational and is placed between the grey silt shales of the Hulcross and the overlying fine-grained, light grey to white, resistant sandstones. The contact zone weathers rusty and is easily distinguishable in the field. Conglomerates, sandstones, siltstones, and some coal horizons constitute Boulder Creek strata which are approximately 130 metres thick. Granule conglomerates with pebble lenses are predominant over the northeastern half of the map-area, with pebble conglomerates characterizing the southwestern half. The upper contact is above the last conglomerate bed and below the grey rubbly silt shale and mud shale of the overlying Shaftesbury Formation.

STRUCTURE

The map-area is transected by two northwesterly trending thrust faults dipping to the southwest. The Mount Spieker thrust, lying on the northeast of Mount Spieker, strikes northwest and dips 10 to 15 degrees

to the southwest. On its eastern edge Gates Member is thrust over Boulder Creek and Shaftesbury strata. On the east side of the north ridge off Mount Spieker, the thrust repeats up to 20 metres of the Moosebar Formation. Below the thrust plane, rocks of the Commotion as well as the Moosebar and Gething are overturned, due probably to drag along the thrust. Where the thrust cuts through Moosebar strata, a zone of faults and folds (including some small east-dipping thrusts) is exposed.

The Two Creek thrust lies to the east of the Mount Spieker thrust and faults Boulder Creek, Hasler, and Gates strata over the younger Shaftesbury rocks. At one location the thrust plane is distinct in outcrop and strikes 149 degrees and dips westerly at 38 degrees. Above the thrust plane for a distance of 15 metres the Boulder Creek rocks are extremely folded and fractured.

PRELIMINARY CONCLUSIONS

The area west of Mount Reesor and east of Windfall Creek was examined to determine the prospect of finding strata younger than the Minnes Group. A ridge extending from Mount Reesor to Windfall Creek offers nearly continuous outcrop across strike. In a few localities, well-developed sandstone and siltstone units were found containing coal seams up to 1.5 metres thick. However, the seams were generally localized and not very continuous. Throughout the area, strata are strongly contorted with chevron folding and faulted anticlinoriums being the dominant structural styles. The conclusion was that the strata observed was Minnes Group, and that in fact, no younger strata exists west of the Cadomin outcrop on the southwest slope of Mount Reesor.

Closely spaced sections along nearly continuous outcrop on the northwest face of Mount Spieker helped to illustrate the rapid facies changes that occur within the Gates and Boulder Creek Members of the Commotion Formation. Considerable changes in lithologies have been observed within distances of less than 30 metres.

The less competent lithologies show considerable minor folding and faulting adjacent to antiformed, competent sandstone and conglomerate units.

The upper Moosebar unit is relatively easy to distinguish in outcrop, core, and some geophysical logs (mainly neutron).