



COAL TRENDS IN THE GETHING FORMATION—AN UPDATE

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INTRODUCTION

This study focuses on the Gething Formation between the Sukunka River and Kinuseo Creek, an area in which a major marine tongue separates the Gething Formation into upper and lower coal-bearing sequences. In previous work the writer has reported on the southern limits of the marine tongue and the northern and eastern limits of the upper coal measures by a compilation of all available coal and petroleum well data. Two major lines of section were drawn in support of this work (Legun, 1987).

Work in 1987 focuses on measuring field sections and collating section data from coal assessment reports. The field sections complement lines of section based largely on geophysical log data. A computer database was compiled to permit manipulation of stratigraphic data from more than 500 locations. I am indebted to Ward Kilby of the Geological Survey Branch for facilitating this task. In addition, field mapping and seam tracing was done in the vicinity of the Teck Corporation Bullmoose mine and one diamond-drill hole (QHD 86010) was logged in detail. I was assisted in these tasks by George Walker.

STRATIGRAPHIC TERMINOLOGY

Duff and Gilchrist (1983) informally divided the Gething Formation into three units: the Upper, Middle and Lower Gething. The Middle Gething is an upward-coarsening sequence, grading from shale to sandstone, containing marine fauna. Also called the Gething marine tongue, it separates the upper and lower coal measures. Gibson (1987, in press)

however revises this subdivision and formally defines three new units: the Chamberlain, Bullmoose and Gaylard members. The principal change to Duff and Gilchrist's subdivision has been to split the Middle Gething. The thick sandstone of the upper half of the coarsening-up sequence is incorporated in the Chamber member and the shale below constitutes the Bullmoose member; the Lower Gething remains intact and is renamed the Gaylard member. At its top, the Gaylard member often includes some combination of chert-pebble conglomerate, glauconitic sandstone and quartzitic arenite, in lithological contrast to the shales above (Bullmoose member) and the coal measures below. Oil company geologists correlate this unit and everything stratigraphically above it as equivalent to the Bluesky Formation of the plains. A chart showing correspondence of stratigraphic nomenclature is shown in Table 4-5-1.

STRATIGRAPHIC CORRELATIONS—PRELIMINARY RESULTS

Field sections measured during the course of fieldwork in 1987 are listed in Table 4-5-2. In general, exposure of the more recessive parts of the stratigraphy is poor, with the notable exception of sections at Mount Reesor and the Quintette mine (Eagle's Nest). Sections were also examined at Mount Collier and on the west limb of the Five Cabin Creek syncline. These sections correspond with a stratigraphic interval below the marine tongue.

For the purposes of this summary, a line of section was chosen from well BP et al Bullmoose (W.A. 4974) to well Oakwood et al Murray (W.A. 5189). Geographically this extends from near Mount Spieker in the north, through the Quintette mine area to Babcock Creek (Figure 4-5-1). It includes measured sections at Mount Reesor and the Eagle's Nest and several coal exploration boreholes (diamond and

TABLE 4-5-1
STRATIGRAPHIC NOMENCLATURE FOR THE GETHING FORMATION IN THE FOOTHILLS AND PLAINS OF NORTHEASTERN BRITISH COLUMBIA

Stratigraphic Unit	Williams (1984)	Duff and Gilchrist (1983)	Gibson (1987), Legun (1987)	Legun (1987)	Oppelt (1986)
Upper coal measures	Bluesky facies B ₁	Upper Gething (Chamberlain member)	Chamberlain member	Upper Gething (Chamberlain member)	Upper Gething (Chamberlain member)
Sandstone	Bluesky facies B	Middle Gething (Gething marine tongue)	Bullmoose member	Middle Gething	Bluesky Fm. facies B
Shale					
Glauconitic sst. conglomerate, quartzitic sst.	Bluesky facies C	Lower Gething	Gaylard member	Lower Gething	Bluesky Fm. facies C
Lower coal measures	Gething Fm.				Lower Gething

British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1987, Paper 1988-1.

rotary). The data were reduced to a common lithologic "denominator" as the data from the measured sections are much more complete than that which can be interpreted from well logs. The three newly defined members of the Gething Formation are discussed in the context of their correlation (Figure 4-5-2).

CHAMBERLAIN MEMBER

Toward the Quintette mine there is an increase in the thickness of channel sandstones in the Chamberlain member.

TABLE 4-5-2. MEASURED SECTIONS

	UTMN	UTME
West Wolverine 1	6094000	611000
West Wolverine 2	6094650	611650
Wolverine dump	6095650	612650
Eagle's Nest	6097250	615330
West Quintette	6080150	633500
Mt. Reesor	6104400	601100
Mt. Chamberlain	6113000	590350
Quintette Mtn.	6080900	636600

Major channel deposits are absent in BP et al Bullmoose, are about 12 metres thick in the section on Mount Reesor, and at least 30 metres thick at the Eagle's Nest between the Mesa and Wolverine pits. To the southeast, along the line of section, the channel deposits thin to 22 metres in QHD 86010, to 10 metres in QBR 8121 and to 13 metres in QBD 7102. In Oakwood *et al.* Murray (W.A. 5189) the presence of a channel deposit is uncertain as the host sandstone appears to coarsen upward rather than fine upward at its base. Data from the line of section are combined with thickness data from drill holes off the line of section.

A preliminary assessment suggests a lobe of distributary channel sands which thins in a wide arc extending from northwest to southeast and is centred near the Eagle's Nest. There is poor coal development associated with the channel sandstones and the Skeeter and Chamberlain seams, which are several metres thick in the B.P. Sukunka deposit to the north, are missing at the Quintette mine. The only coal seam of economic thickness in the Chamberlain member along the line of section is the Bird seam. At the north end of the line of

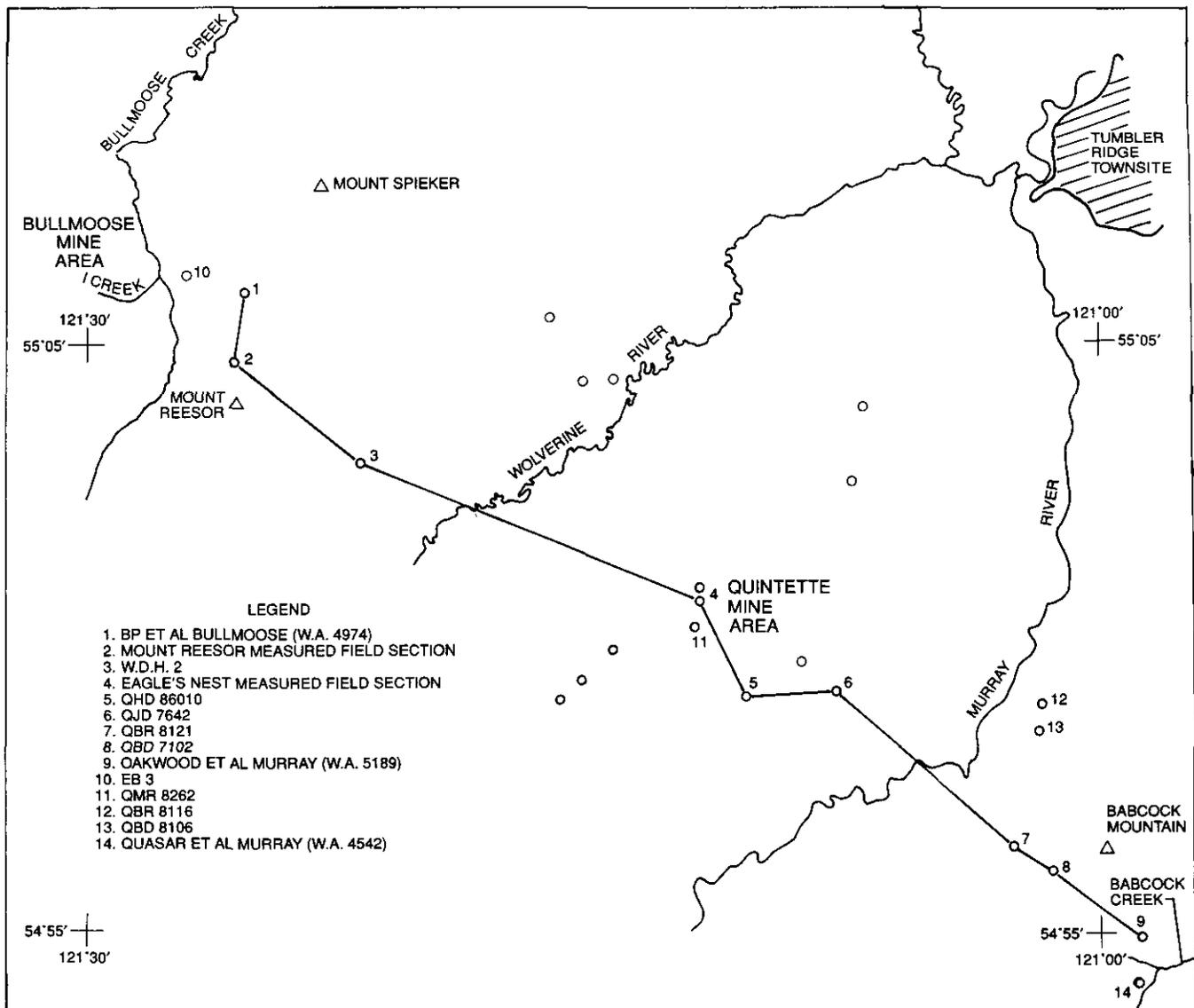


Figure 4-5-1. Line of section locations of stratigraphic data referenced in text.

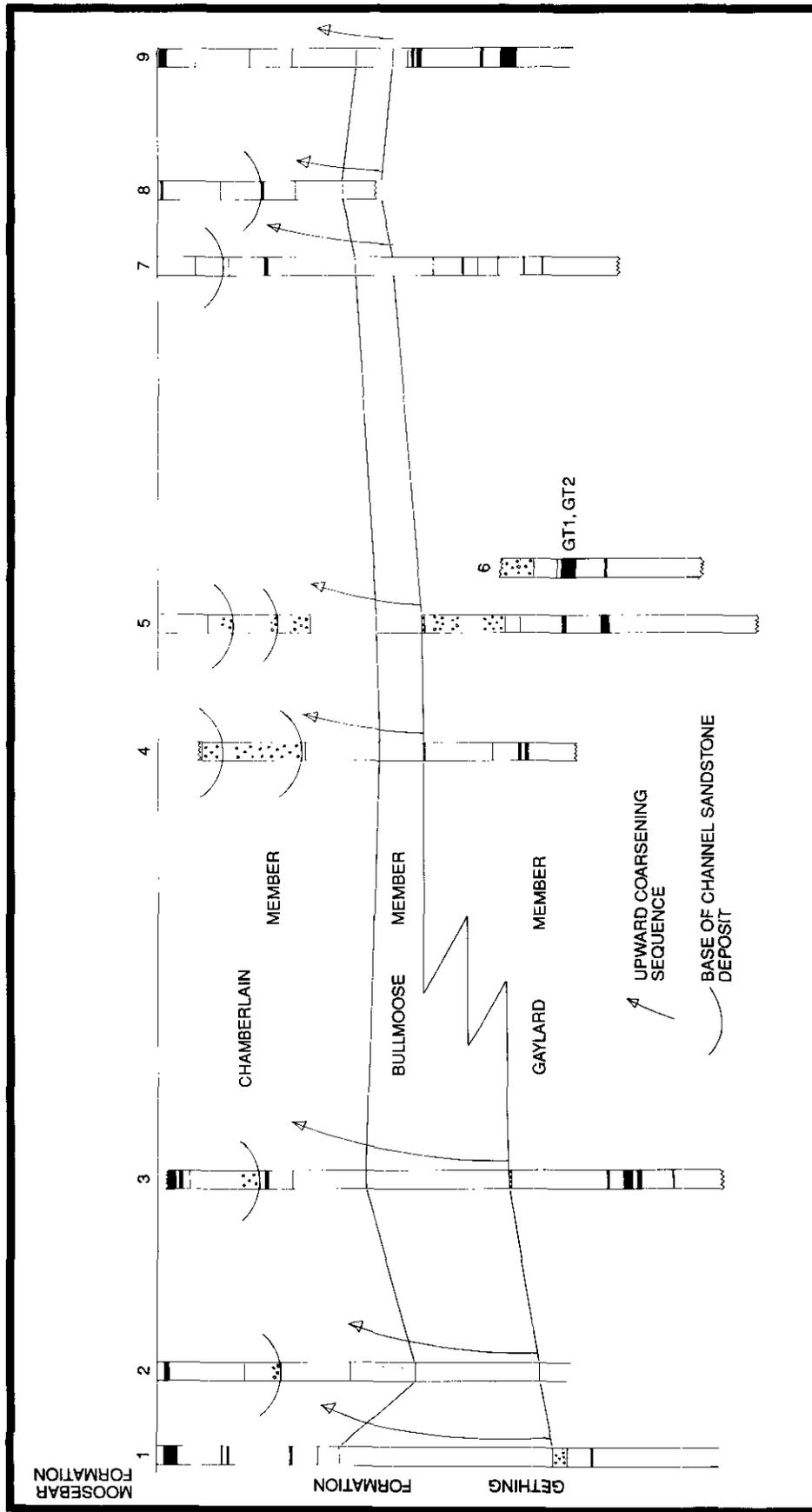


Figure 4-5-2. Correlation of the Gething Formation (see Figure 4-5-1 for locations).

section, near Mount Spieker, it reaches 5 metres in composite thickness. Exploration work on the Gething Formation was done in this area by Ranger Oil Ltd. in 1977 and 1982. More recently Bullmoose mine geologists exposed a composite thickness of up to 3.5 metres of coal along the southwest limb of the South Fork syncline. The writer traced the seam through a number of fold zones in the vicinity of the mine. The extrapolation of this trace indicates potential for preservation of the Bird seam in the hinge area of the South Fork syncline across I Creek (Figure 4-5-1). The area of preservation would be small (about 1 square kilometre) but close to surface. The closest drill hole to this area is EB 3 to the east, which intersected 2.5 metres of the Bird seam.

BULLMOOSE MEMBER SHALES AND BASAL SANDSTONES OF THE CHAMBERLAIN MEMBER

The Bullmoose member thins from 50 metres in the north to 15 metres at the Quintette mine. It consists of marine shale mottled with trace fossils and graded siltstones (turbidites). The shale passes stratigraphically upward into interbedded sheet sandstones and siltstones. The upward appearance of thick, parallel-laminated to low-angle crossbedded arenites marks the contact with the Chamberlain member. The entire lithological transition constitutes an upward-coarsening sequence which is marked on each drill hole along the line of section. The shale of the Bullmoose member becomes more silty to the south and the proportion of sand to shale in the upward-coarsening sequence is greater. This suggests a southward shoaling of the marine embayment represented by the shale deposits of the Bullmoose member.

The sandstone facies appears to represent wave-dominated delta-front deposits. At Mount Reesor, hummocky and swaly cross-stratification appears to represent storm activity on this front, alternating with periods of quiescence marked by horizons of intense vertical burrowing. To the south at Quintette, bioturbation is lacking and the sandstones include thin sheet-like beds of conglomerate.

GAYLARD MEMBER

South along the line of section, shales of the Bullmoose member appear to pass laterally into sandstones, then conglomerates and finally coal measures of the Gaylard member. The lateral change is first marked in the stratigraphic section at the Eagle's Nest. Here, the Bullmoose shales are apparently replaced by 22 metres of horizontally laminated and low-angle crossbedded arenites of probable shallow-marine origin. To the south, at QHD 86010, the arenites are replaced by 32 metres of clean quartzitic conglomerates and quartzitic arenite. The basal contact is marked by a rapid increase in argillaceous content and a "dirty" appearance (lithic matrix of the arenite) suggesting derivation of the upper lithology by reworking and "washing" of the pre-existing rocks. These shoreface or coastal bar deposits pass southward along the line of section into coal measures, as evidenced in QBR 8121 and the Oakwood et al Murray well (W.A. 5189).

Coals of economic thickness in the Gaylard member south of the Sukunka River include the "middle" coals of the

Sukunka deposit and the Hermann Gething coals at Quintette. The Hermann Gething coals, GT1 and GT2, are shown on the line of section. They lie 43 metres below the top of the Gaylard member, 130 metres below the Moosebar-Gething contact and comprise 5 to 6 metres of coal. This thickness, however, does not appear to persist laterally. To the northwest, the coals thin to less than 4 metres (apparent thickness) in QMR 8262 (56 metres depth) and less than 2 metres at the Eagle's Nest, at about the same stratigraphic position. The stratigraphic position of these coals was not reached in drill holes to the east (QBD 8106, QBR 8116). To the southeast there are only very thin coals in QBR 8121, but further away, thick (up to 7 metres) coals are present about 37 metres below the top of the Gaylard member in Oakwood et al Murray (W.A. 5189) and Quasar et al Murray (W.A. 4542). These wells are located south of Babcock Mountain in an area untested for coal at this stratigraphic interval. The coal is found at depth in the petroleum wells but fold structures bring the interval close to surface nearby (for example, Waterfall Creek anticline).

FUTURE WORK

Future work will include a stratigraphic fence diagram of the three members of the Gething Formation. This is probably the best means of gaining an overview of coal thickness trends and lateral facies relationships with a minimum of effort and time.

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