GEOLOGICAL SURVEY OF CANADA

DEPARTMENT OF ENERGY, MINES AND RESOURCES

PAPER 66-7

JURASSIC AND CRETACEOUS STRATIGRAPHY BETWEEN PEACE AND TETSA RIVERS, NORTHEASTERN BRITISH COLUMBIA

(Report and 5 figures)

D. F. Stott

Price $1.00

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Price subject to change without notice

ROGER DUHAMEL, F.R.S.C.
Queen's Printer and Controller of Stationery
Ottawa, Canada
1967

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ABSTRACT

Jurassic and Cretaceous rocks of northeastern British Columbia comprise a thick succession of intertonguing marine and continental sandstones and shales, resting unconformably on rocks of Triassic age. A regional unconformity within the Cretaceous sequence truncates lowermost Cretaceous and Jurassic strata. Complex facies changes result in many nomenclatorial difficulties. Tentative correlations are presented in tabular form and an extensive appendix presents details of measured stratigraphic sections.

JURASSIC AND CRETACEOUS STRATIGRAPHY BETWEEN PEACE AND TETSA RIVERS, NORTHEASTERN BRITISH COLUMBIA

INTRODUCTION

This report is one of a series dealing mainly with the stratigraphy of Cretaceous rocks in the Rocky Mountain Foothills of northeastern British Columbia. Studies of outcrops north of Peace River began in 1961 and continued during 1962 and 1964. During the first two years, studies were confined within Halfway River (94B)[1] and Trutch (94G) map-areas; during the last year they were mainly within the Trutch and Fort Nelson (94J) map-areas. The stratigraphy of the Lower Cretaceous Fort St. John Group and the Upper Cretaceous Smoky Group in the region south of Peace River has been described in several previous papers (Stott, 1960a, 1961a, 1961b, 1963, in press). Cretaceous rocks in the District of Mackenzie lying north of this region have been described also (Stott, 1960b).

Jurassic shales in the vicinity of Peace River were briefly described in Williams and Bocock (1932), Beach and Spivak (1944), and McLearn (1940). The pioneer work of McLearn (1918, 1923, 1931, 1933, 1944, 1945) has served as a basis of most of the later studies of Cretaceous stratigraphy. Lowermost Cretaceous marine rocks in the vicinity of Peace River were first recognized by Mathews (1947) and more recently described by Hughes (1964). Many of the Cretaceous formations in the region north of Peace River were first defined by Kindle (1944) and Hage (1944), and Cretaceous rocks west of Fort Nelson were described by Williams (1944). Most of the early reports were later summarized by McLearn and Kindle (1950) and also reviewed by Henderson (1954) who discussed some of the problems. Jurassic rocks in the subsurface were described by Lackie (1958) and also Hamilton (1962) who correlated them with outcrop sections. Cretaceous rocks in the Peace River Plains were subdivided by the Alberta Study Group (1954) and their formations have wide application in northeastern British Columbia. Upper Cretaceous rocks in the vicinity of Peace River were summarized by Stelck (1962). The Halfway and Charlie Lake map-areas were mapped by Irish (1958, 1961, 1963) and Trutch, by Pelletier and Stott (1963). Currently, the mapping of the Rocky Mountains and Foothills north of Peace River in northeastern British Columbia is being completed by Operation Liard, of which this study is a part.

Several outcrop sections, representative of the succession, are given in the Appendix.

Triassic fauna was identified and dated by E.T. Tozer; Jurassic macrofauna, by Hans Frebold; Jurassic microfauna, by T.P. Chamney, Cretaceous microflora, by D.C. McGregor; Cretaceous megafauna, by J.A. Jeletzky; and Cretaceous megaflora, by W.A. Bell and D.C. McGregor.

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[1]Numbers and letters refer to the National Topographic System.

Helicopter transportation was used for most of the studies except for a brief time in 1961 when packhorses were used. The writer gratefully acknowledges the services provided by R. Burton, E. Haylock, and K. Harding of Okanagan Helicopters Limited, F. Nobels and J. Ward of Foothills Aviation Limited, and J. Davies and M. Brown of Bullock Wings and Rotors Limited.

Logistics of the operation in 1962 were the responsibility of B.R. Pelletier and in 1964, of G.C. Taylor. Their cooperation and interest have contributed immeasurably to this study. Assistance in the field was given in 1961 by M.L. Larson; in 1962, by A.R. Clark and M.J. Osatenko; in 1964, by R. Armstrong, M. Wooding, D. Hetherington, and D. McDougall. The writer is also indebted to W. Boring, R. Cameron, O. Gauthier, A. Lamont, D. McDougall, R.L. Ross, I. Severson, and S. McWhinnie, all of whom assisted in camp operations.

STRATIGRAPHY

Jurassic and Cretaceous formations embrace a thick succession of intertonguing marine and continental sandstones and shales. These rocks lie unconformably on rocks of Triassic age (see Pelletier, 1960, 1961, 1963, 1964). Jurassic and basal Cretaceous outcrops occur only in the Foothills, generally on high ridges along the flanks of folds. No exposures of these rocks are known to lie within the more highly folded and thrust-faulted Palaeozoic rocks of the Rocky Mountains to the west. Lower Cretaceous beds appear in synclines along the western side of the Foothills but are most prominent in the gently folded eastern side. Successively younger beds outcrop eastward with uppermost Lower Cretaceous beds occurring near the western edge of the Plains region along a prominent escarpment that extends northward from Peace River to the District of Mackenzie. Throughout most of the region, the youngest beds are those of the Upper Cretaceous Dunvegan Formation although some poorly known beds of the younger Kaskapau Formation occur in the southeastern corner of the region.

A regional erosional unconformity, present within the Cretaceous succession, truncates lowermost Cretaceous and Jurassic strata in a northeasterly direction and those beds do not extend beyond Prophet River.

Numerous nomenclatural problems have arisen, partly as a result of initial studies being limited to small and widely separated areas, and also due in large measure to the many complex facies changes within these rocks. It is not the purpose of this paper to discuss those problems in detail and the terminology used herein is tentative, pending publication of final detailed reports.

The rocks below the regional unconformity have been subdivided into three formations. Jurassic shales, included in the Fernie Formation, grade upward into quartzose sandstone of the Monteith Formation (Fig. 3). An overlying succession of marine siltstone, sandstone, and mudstone, being in part equivalent to the type Beattie Peaks, is included in the Beattie Peaks Formation and (?) younger beds. That succession is overlain unconformably by the Lower Cretaceous Cadomin Formation that is recognized only as far north as Graham River, and beyond there, by the Gething Formation (Fig. 4). The overlying Fort St. John Group comprises, in ascending order, the

TABLE OF FORMATIONS

	Formation	Thickness (feet)	Lithology
Upper Cretaceous	Kotaneelee	?	Dark grey, marine shale
	Kaskapau	?	Dark grey, marine shale; some sandstone
	Dunvegan	350-600	Massive conglomerate; fine- to coarse-grained sandstone; some carbonaceous shale
Lower Cretaceous	Sully	250-700+	Dark grey, marine shale with sideritic concretions; prominent marker bed of fish remains
	Sikanni	350-900	Fine-grained, cross-bedded, marine sandstone; rusty weathering, silty mudstone
	Buckinghorse	3,000-3,500	Dark grey, marine shale with sideritic concretions; fine-grained, thin- to thick-bedded sandstone
	Gething	0-1,300	Fine-grained, cherty, marine sandstone; rusty weathering, rubbly to blocky shales; minor conglomerate and carbonaceous shale; rare coal seams
	Cadomin	400-770	Massive conglomerate and coarse-grained sandstone; carbonaceous shale; minor coal
	Regional erosional unconformity; bevels rock of succeedingly older age northward and eastward.		
	Beattie Peaks and (?) younger beds	0-1,580	Interbedded mudstone, siltstone, and fine-grained sandstone; thick-bedded sandstone in middle; minor carbonaceous sediments and coquinas
	Monteith	0-975	Massive, quartzose sandstone; alternating units of sandstone and mudstone; minor conglomerate
Jurassic	Fernie	0-800	Calcareous and phosphatic shales; rusty weathering shales; glauconitic siltstone; sideritic shales; thinly interbedded sandstone, shale, and siltstone

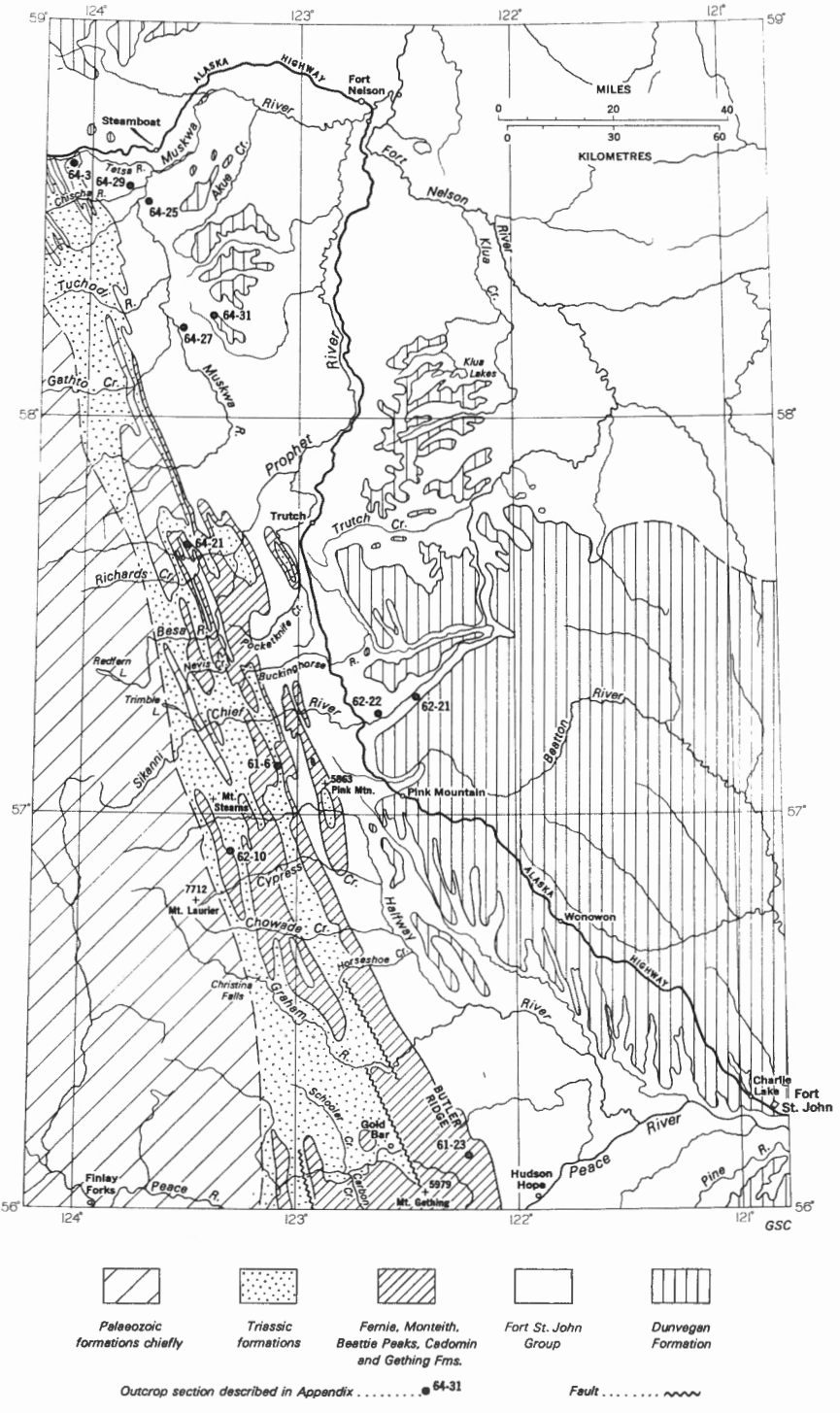

Figure 1. Distribution of Jurassic and Cretaceous rocks and locations of outcrop sections

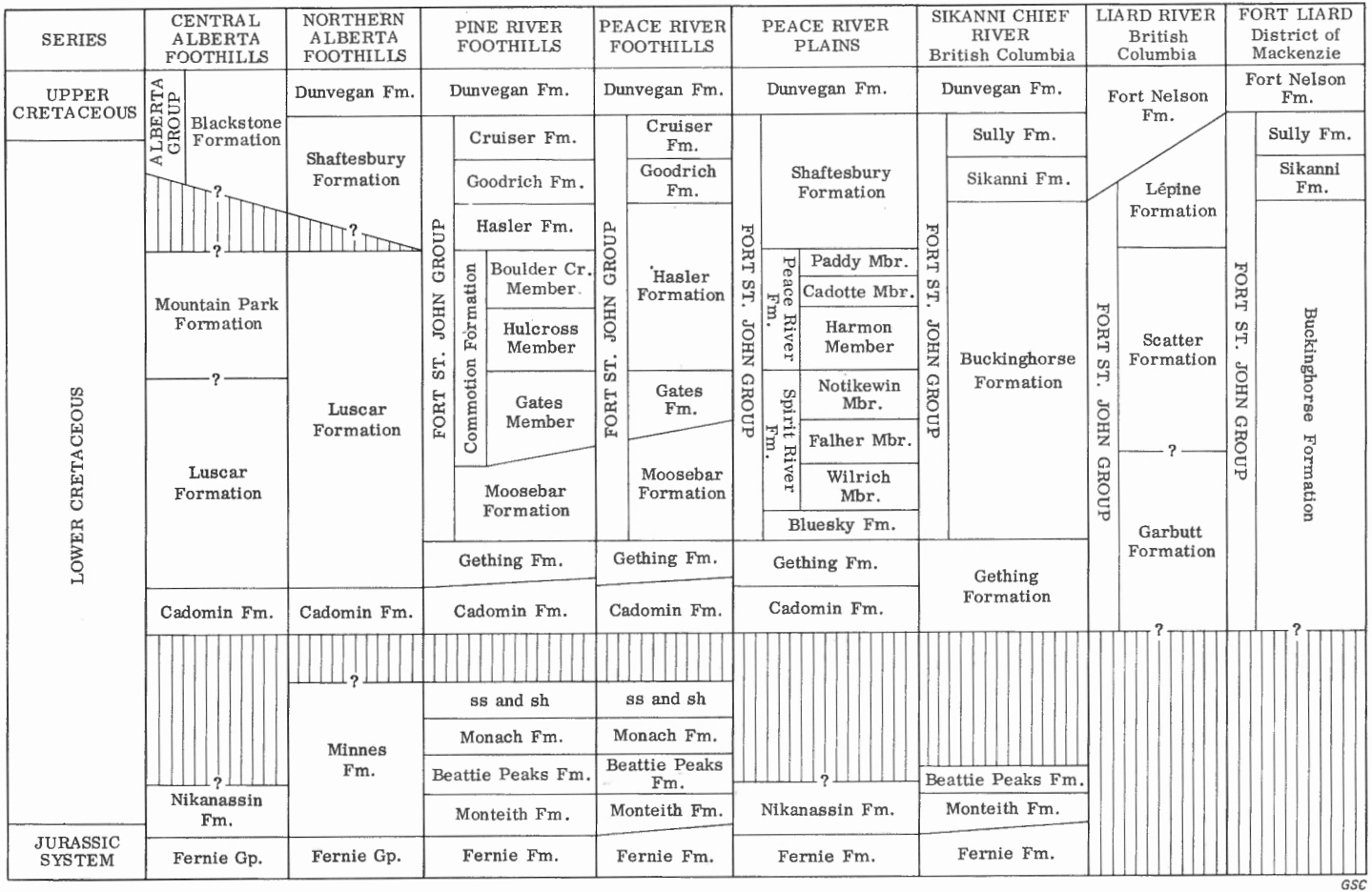

Figure 2. Correlation of Jurassic and Cretaceous rocks of northern Rocky Mountain Foothills and adjacent areas

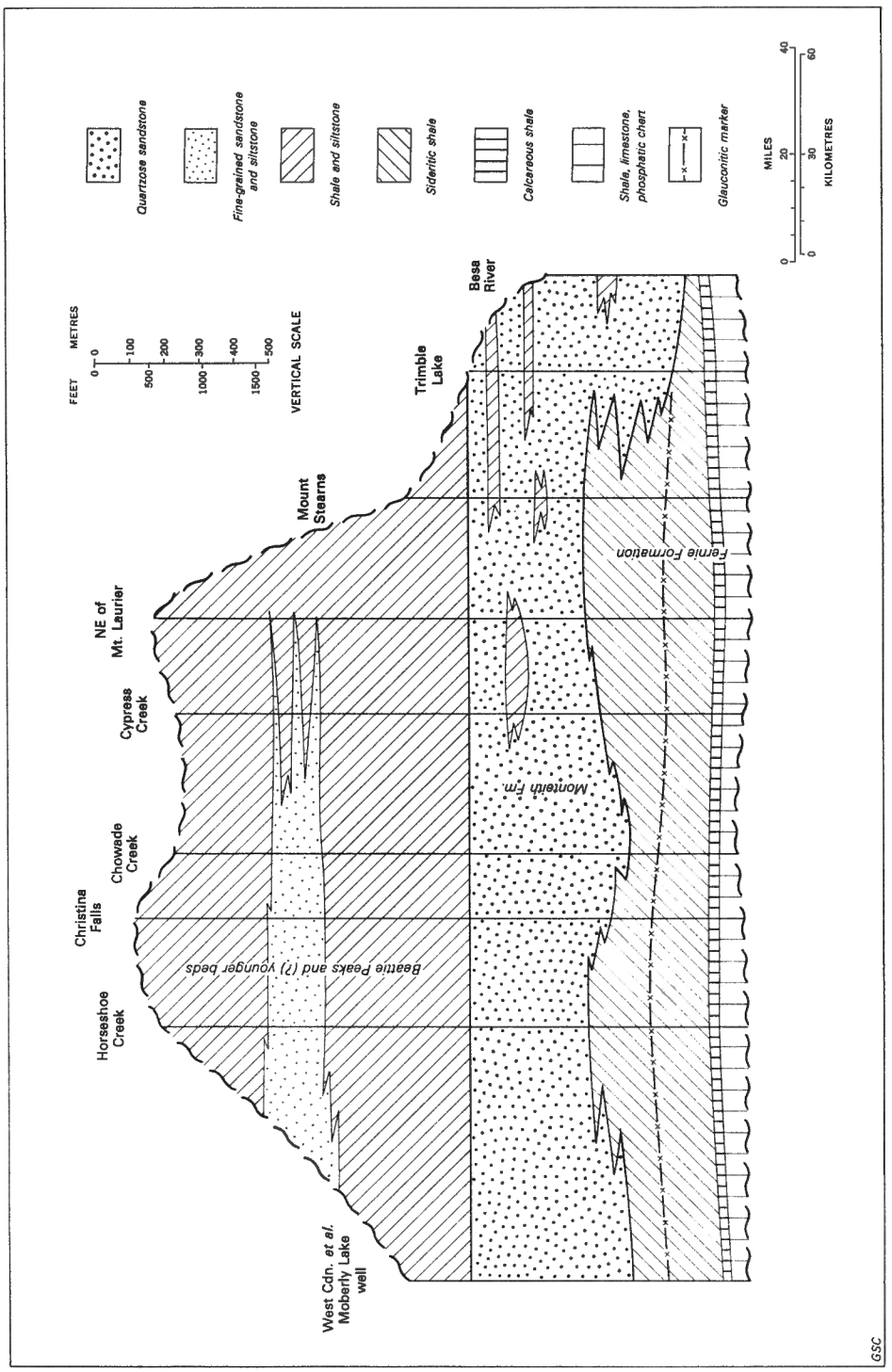

Figure 3. Schematic diagram illustrating facies and approximate thicknesses of Fernie, Beattie Peaks and (?) younger beds, northeastern British Columbia

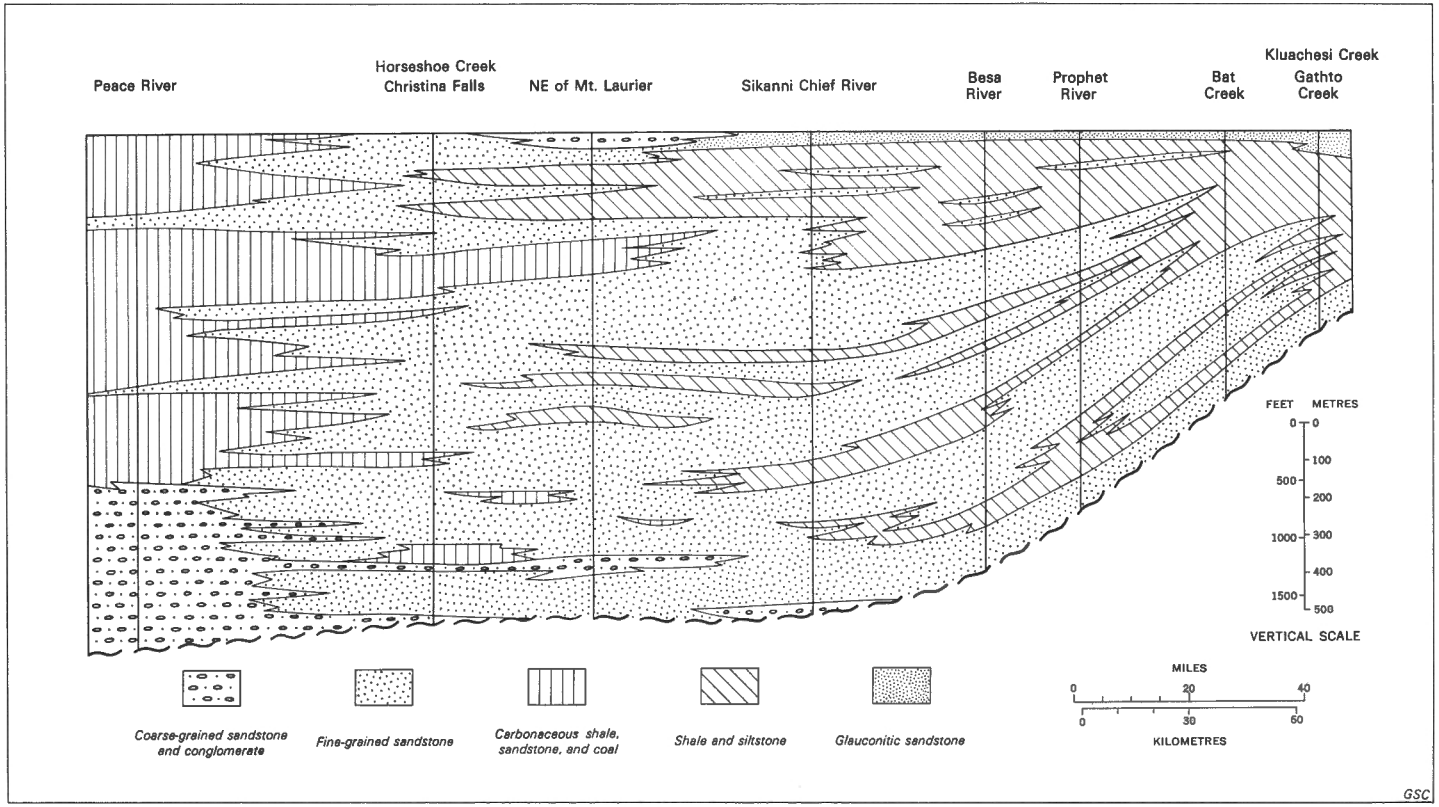

Figure 4. Schematic diagram illustrating facies and approximate thicknesses of Cadomin and Gething Formations, northeastern British Columbia

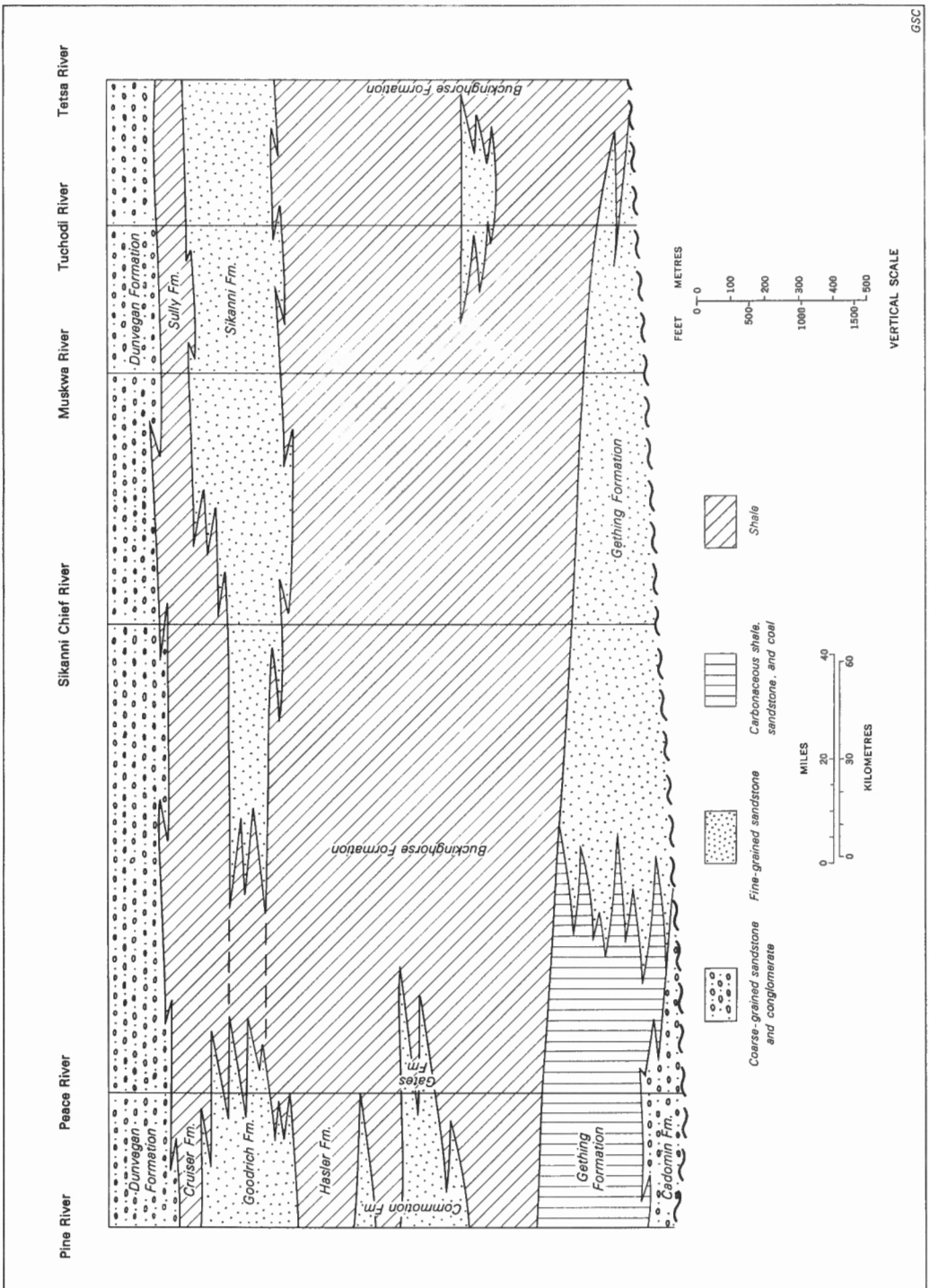

Figure 5. Schematic diagram illustrating facies and approximate thicknesses of Cadomin and Gething Formations, Fort St. John Group, and Dunvegan Formation, northeastern British Columbia

Buckinghorse, Sikanni, and Sully Formations (Fig. 5). Prominent sandstones within the Buckinghorse Formation between Muskwa and Tetsa Rivers may be equivalent in part to the Scatter Formation of the Toad-Liard region to the north. A thick succession of conglomerate and coarse-grained sandstone, assigned to the Dunvegan Formation in the more southerly part of the region, has been included by others in the Fort Nelson Formation north of Alaska Highway. In general, the sandstones of the Monteith and Gething become siltier and appear to grade into a shaly facies toward the north. Depositional control of those lower formations may have been related to the Peace River Arch. Shoreline trends of the upper Fort St. John Group are more closely related to the structural trends of the Rocky Mountains and apparently were controlled by early Laramide movements.

The Fernie, Monteith, and Beattie Peaks beds form a wedge-shaped deposit that is thickest in the western Foothills, reaching a maximum of about 3,600 feet (Fig. 3) and thinning to an erosional edge in the Plains to the east. The combined Gething Formation, Fort St. John Group, and Dunvegan Formation have a thickness between 5,000 to 6,000 feet (Fig. 5).

FERNIE FORMATION

Jurassic rocks north of Peace River were first reported by Hage (1944) who examined outcrops in the vicinity of Pink Mountain and Sikanni Chief River. The distribution and general lithology were outlined in later reports by Irish (1961, 1963), Hamilton (1962), Pelletier and Stott (1963).

Throughout most of this region, the Fernie Formation lies unconformably on calcareous sediments of the Triassic Pardonet Formation. Pre-Fernie erosion is indicated by the disappearance of younger Triassic beds northward and the unconformity is marked by a thin layer of breccia at the base of the Fernie sediments. The upper Fernie beds are gradational into the overlying Monteith sandstone. The contact appears to occur at progressively higher stratigraphic levels in the region of Halfway River but the assumed diachronism has not been substantiated by fossil evidence.

The Fernie maintains a fairly constant thickness of about 700 feet along the strike of the western Foothills south of Halfway River but decreases to about 250 feet near Besa River (Fig. 3). The northwestward decrease resulted from the development in strata equivalent to upper Fernie of sandstones that are included in the Monteith Formation. The most easterly complete section is only 256 feet and that easterly thinning appears to be related to depositional convergence. Pre-Gething erosion has removed much of the Fernie along the eastern Foothills and the formation is recognized only as far north as Pocketknife Creek.

The Fernie Formation consists dominantly of dark grey to black shales with interbedded sandstone in the upper part. The basal Nordegg Member comprises calcareous siltstone, limestone, shale, and phosphatic chert. It varies in thickness from 56 to 209 feet. A thin succession of black, calcareous, papery shales overlying the Nordegg Member may be equivalent to the Paper Shales of southwestern Alberta. Rusty weathering shales, 65 to 270 feet thick, are typical of much of the middle Fernie. A thin, highly glauconitic siltstone with small pebbles and coarse-grained quartz

forms a marker horizon with the upper Fernie and is a key bed for lithologic correlation with the succession. Rusty weathering shales containing sideritic concretions overlie the glauconitic marker and grade upward into a succession of interbedded sandstone, siltstone and shale.

The Nordegg Member contains the Arniotites fauna of Sinemurian age. Microfaunal assemblages from the overlying rusty weathering shales indicate, according to Chamney, that the lithologic units of northeastern British Columbia can be closely equated with the Rock Creek Member, Grey Beds, Green Beds, and Passage Beds of southwestern Alberta (see Frebold, 1957, 1958).

MONTEITH FORMATION

Fine- to coarse-grained quartzose sandstones lying above the Fernie shales are included in the Monteith Formation (Mathews, 1947; see also Hughes, 1964). In addition, the formation contains thin conglomerates and beds of shale which become more abundant northward.

The Monteith Formation extends across Peace River from its type region in the Carbon Creek basin. In the vicinity of the canyon and Butler Ridge, those beds have been included by some workers in the Dunlevy Formation. In the area north of Graham River, the Monteith Formation occurs as prominent ridges that outline a series of folds extending northward into Trutch map-area (Pelletier and Stott, 1963). The most westerly exposures occur northeast of Mount Laurier and near Mount Stearns. Beyond Halfway River, the pre-Gething unconformity bevels much of the succession in a northeasterly direction and only the lower part of the Monteith occurs in the more northerly exposures between Besa River and Richards Creek. The easternmost outcrop is just east of Headstone Creek.

One of the thickest known sections south of Halfway River is near Chowade River where a maximum of over 700 feet is found. The formation decreases to less than 600 feet near Mount Stearns but thickens northward to 975 feet near Trimble Lake. The variations are related to a lateral facies change in the lower beds; where they are dominantly shale they are included in the underlying Fernie Formation (Fig. 3).

Two major units are recognized within the Monteith. The lower unit, a shaly facies, comprises mainly alternating sandstone and shale. The upper one comprises much of the massive, quartzose sandstone. These facies, however, are mutually intertonguing and separation of two distinct units is not always possible. The alternating units of the lower subdivision range from 5 to 50 feet thick and the proportion of the two main rock types vary greatly from one locality to another. Sandstones of the upper Monteith are commonly massive to thick-bedded and weather a distinctive dull grey. Those sandstones consist almost entirely of quartz grains that range from fine to coarse grained. Near Mount Stearns, the massive quartzose sandstones pass laterally into alternating units of very fine grained sandstone and shale, becoming inseparable from the lower unit and also bearing considerable resemblance to the upper transitional beds of the Fernie.

Beds included in the Monteith north of Peace River are correlated with type Monteith of Carbon Creek region which is dated as latest Jurassic to earliest Cretaceous (see Hughes, 1964). Inasmuch as the Monteith is underlain by Upper Jurassic beds and is overlain by the middle to late Valanginian Beattie Peaks beds, the formation in the region north of Peace River ranges in age from Late Jurassic to early Valanginian.

BEATTIE PEAKS FORMATION AND (?) YOUNGER BEDS

The Beattie Peaks Formation, defined by Mathews (1947), is a succession of recessive, platy shales, shaly sandstone, and sandstone. In the region north of Peace River, strata between the Monteith and the pre-Gething unconformity may contain beds younger than those of the type Beattie Peaks, possibly including beds approximately equivalent to the type Monach Formation (Mathews, 1947) and also to overlying beds below the Cadomin and Gething sediments.

The base of the succession north of Peace River is marked by the abrupt contact with massive Monteith sandstone. The contact is probably disconformable. The upper boundary is the pre-Gething unconformity that bevels the strata from south to north and west to east.

Beattie Peaks and (?) younger beds can be recognized and mapped as far north as Mount Stearns, forming a broad, recessive succession between the prominent ridge-forming Monteith and Gething sandstones. The most complete exposures lie between Cypress Creek and Halfway River. The formation maintains a relatively constant thickness of about 1,300 feet along the western Foothills but thins rapidly eastward as a result of pre-Gething erosion to only a few hundred feet in the eastern Foothills.

Three major units can be recognized south of Halfway River (Fig. 3). The lower one, consisting of interbedded silty mudstone, lenticular sandstones, and thin coquinas, is possibly equivalent to the type Beattie Peaks. The sandstones of the lower unit are grey, finely and uniformly laminated, generally siliceous, and weather brown to rusty. These sandstones, occurring in 4- to 10-foot units, range from flaggy to thin-bedded and commonly do not form continuous beds. Rather, they occur as lenticular bodies having many characteristic features of channel-fill. The shales are silty, dark grey to brownish grey, weather brown to rust, and contain some concretions. The middle unit of fine-grained, thin- to thick-bedded sandstone may be equivalent to the type Monach Formation. However, those sandstones are not as coarse grained nor as readily differentiated from the enclosing strata as those of the type Monach. An upper succession of interbedded sandstone and shale may correlate with somewhat similar beds between the Monach Formation and Cadomin-Gething succession in the Carbon Creek basin. All these beds contain abundant wackes as well as arenites. Moreover, lithic fragments are much more numerous than in the underlying Monteith sandstones.

Fauna obtained from the lower and middle part of the Beattie Peaks and (?) younger beds includes Acroteuthis cf. A. subquadratus (Roemer), Cylindroteuthis? sp. indet., Buchia n. sp. aff. B. inflata (Toula), Buchia aff. B. crassicollis (Keyserling) and Buchia cf. B. sublaevis

(Keyserling). This fauna was dated by J.A. Jeletzky as middle to late Valanginian. It is apparent that fauna similar to that of the type Beattie Peaks and Monach (see Hughes, 1964) is also present in lithologically similar and stratigraphically equivalent beds north of Peace River.

PRE-GETHING UNCONFORMITY

A regional erosional unconformity separates the Jurassic and earliest Cretaceous rocks from younger Lower Cretaceous beds. The unconformity lies at the base of the Cadomin conglomerates or equivalent Gething sandstone and above succeedingly older beds northward from Peace River and eastward from the Foothills to the Plains. This unconformity, also present south of Peace River, was discussed by McLearn (1944), McLearn and Kindle (1950), Warren and Stelck (1958), Loranger (1958, 1960), Ziegler and Pocock (1960), Gussow (1960), and Stott (in press).

The unconformity is regionally angular but that relationship is not generally apparent in surface outcrop. In terms of thickness, the pre-Gething erosion has removed several thousand feet of sediments. Over 2,800 feet of beds were measured between Triassic and Gething strata northeast of Mount Laurier but the sequence decreases to zero northeastward between there and Pocketknife anticline and northward between Halfway River and Richards Creek.

In the vicinity of Peace River canyon, the Cadomin is in contact with strata low in the Beattie Peaks Formation. The Monteith beds disappear eastward and the unconformity bevels successively older beds of the Fernie Formation. Northward, the Gething lies successively on middle to late Valanginian Beattie Peaks strata between Graham and Halfway Rivers, on late Jurassic to earliest Cretaceous Monteith sandstones south of Sikanni Chief River, on Jurassic Fernie shales between there and Richards Creek, and on Triassic rocks farther north. Similarly, in an eastward direction, the Gething lies on the Beattie Peaks succession northeast of Mount Laurier, then on Monteith beds and finally on basal Fernie beds at Pink Mountain. To the northeast, Gething strata lie directly on the Triassic succession. These relationships indicate that the major erosional period was in post-Valanginian time. As the overlying Gething can be dated as pre-middle Albian by its position below dated marine shale, the major erosional period can be dated as occurring within the interval of Hauterivian to (?) Aptian.

CADOMIN FORMATION

The Cadomin Formation (MacKay, 1929, p. 9B; 1930, p. 1310) consists of conglomerate containing well-rounded pebbles, cobbles, and boulders of extremely resistant rocks. In the vicinity of Peace River canyon, a succession of coarse-grained, conglomeratic sandstone occurs below the Gething Formation in a stratigraphic position corresponding to that of the Cadomin Formation. These beds are lithologically similar to some beds included in the Cadomin south of Peace River (see Stott, 1963; in press).

These beds outcrop at the Head of the Canyon where over 300 feet were measured. A computed thickness of 700 feet was reported by Hughes (1964, p. 46) from the drill-hole located at the west end of Peace River canyon.

More than 500 feet of conglomeratic sandstone is exposed on Mount Gething and more than 660 feet on Butler Ridge.

In the canyon, the uppermost beds of the Cadomin can be seen to grade laterally into the Gething coal-bearing beds. Similar facies changes occur in the surrounding area and the thick conglomeratic sandstone on Butler Ridge may be equivalent in part to the type Gething Formation. Studies north of there indicate that the conglomeratic sediments grade laterally into fine-grained sandstones and shales (Fig. 4). As those beds cannot be separated from overlying beds, equivalent strata are included in and mapped with the Gething Formation.

The sandstone occurs in massive 5- to 20-foot beds that weather reddish brown to grey. It ranges from fine to coarse grained and is commonly well indurated. Bedding is not always apparent but both planar and crossbedded units are present. Pebbles are not always present but may be disseminated throughout a bed, form thin lenses or streaks, and in a few places develop into beds of conglomerate as much as 10 feet thick. The pebbles, commonly well rounded, are composed mainly of chert with some quartzite, rarely exceed 1 inch in diameter, and are embedded in a matrix of strongly cemented sandstone. Some thin beds of dark grey shales, silty mudstones and coal are interbedded with the conglomeratic sandstones.

The Cadomin and Gething Formations south of Peace River are considered part of one depositional sequence (Stott, 1963; in press). A similar relationship is apparent north of the river where the alluvial gravels of the Cadomin grade into the floodplain and transitional deposits of the Gething Formation.

The Cadomin Formation and equivalent beds in the western Foothills lie on beds which, according to J.A. Jeletzky, contain a fauna of middle to late Valanginian age.

GETHING FORMATION

The Gething Formation, defined in the Peace River canyon by McLearn (1923, p. 4B) comprises interbedded mudstone, coal and sandstone. The Gething Formation north of the river, in contrast to the coal-bearing succession of the type section, is dominantly fine-grained cherty sandstone of presumably marine origin. Conglomerate, a minor constituent, is most abundant and coarsest in the westernmost sections, being well developed northeast of Mount Laurier and near Trimble Lake. The formation grades laterally northward into thinly interbedded sandstone and shale, and presumably into shales of the Buckinghorse Formation.

The lower contact of the Gething Formation north of Graham River marks a distinct change in lithology from the shaly sediments of the Beattie Peaks to the massive Gething sandstones. Where the Gething sediments lie on Monteith sandstones, the lithologic contrast is not so marked although Gething sandstones are generally characterized by an increase of chert grains. The upper contact with the overlying Fort St. John shales is abrupt in the region south of Prophet River but northward the upper Gething becomes shaly and the beds assume a more gradational appearance.

The Gething Formation extends northward from Peace River to Tuchodi River where the sandstones disappear from the succession. It is recognized in the subsurface eastward beyong the Alaska Highway. Between Peace and Halfway Rivers, the formation varies from 1,100 to 1,300 feet thick. It maintains that thickness along the western Foothills almost to Prophet River but thins eastward to about 900 feet. Beyond Prophet River, it thins rapidly to about 500 feet at Gathto Creek and only about 50 feet of sandstone is present on Chlotapecta Creek. Much of the thinning is related to depositional convergence but some may be due to non-deposition in the north of beds equivalent to the basal Gething of more southerly regions.

Sandstones of the Gething Formation are fine to coarse grained, brown to grey, laminated, and brown weathering. Carbonaceous material, so abundant south of Peace River, is notably absent and coal beds disappear from the succession. Sandstones become better sorted northward, the prominent crossbedding of more southerly exposures becomes less pronounced, and bedding becomes more uniform. Dark grey, rusty weathering shales are well represented north of Sikanni Chief River, forming almost the entire upper half of the formation north of Prophet River (Fig. 4).

A bed of highly glauconitic silty sandstone marks the upper limit of sandstone development where the Gething and basal Fort St. John shales are clearly exposed. This bed is 5 to 20 feet thick and weathers greenish brown. Its upper part may be concretionary in which case the contact with overlying shales is abrupt. It is believed that this bed may represent some part of the Bluesky Formation, a strongly glauconitic sandstone found in the subsurface of the Peace River Plains (see Alberta Study Group, 1954).

Flora obtained from the Gething Formation at Peace River is considered by Bell and McGregor to be of the same age as the lower Blairmore flora that was generally considered to be Aptian (Bell, 1956). A similar flora, containing a much larger number of lower Blairmore species, was obtained from the Lower member of the Commotion Formation south of Pine River. As the Commotion Formation contains marine fossils of Middle Albian age (Stott, 1963), it is apparent that the "Lower Blairmore-Luscar-Gething" flora extends upwards into rocks of Middle Albian age. Therefore, the dating of the Gething Formation on floral evidence alone is inconclusive. Beds of Middle to Late Valanginian age lie much below the Gething Formation in the western Foothills and Middle Albian Buckinghorse shales overlie it. An assemblage of plant microfossils from the type Gething Formation along Peace River and Aylard Creek were identified and dated by McGregor as Valanginian to Albian. Thus, the available stratigraphic and fossil evidence indicates that the Cadomin-Gething succession can be dated as Hauterivian to early Albian.

FORT ST. JOHN GROUP

Lower Cretaceous rocks, predominantly of marine origin were defined along Peace River by Dawson (1881) as the Fort St. John Group. They have since been divided into the Moosebar, Gates, Hasler, Goodrich, and Cruiser Formations (see McLearn and Kindle, 1950; also Stott, 1963, in press). However, other subdivisions are recognized north of Peace River and nomenclature modified from that of Hage (1944) is most useful in this

region. The thick succession of marine shales is divided by the Sikanni sandstone; lower shales are included in the Buckinghorse Formation and upper shales are included in the Sully Formation.

BUCKINGHORSE FORMATION

The Buckinghorse Formation (Hage, 1944) consists of silty, marine shale with some minor siltstone. In the type locality on Buckinghorse River, the formation is underlain by the Gething Formation and overlain gradationally by the Sikanni Formation. The type section, extending for several miles along the river, is involved in some folding and faulting and is not entirely exposed; a detailed measurement is not readily obtainable. Hage (1944) estimated that thickness to be 3,300 to 3,600 feet and data from wells drilled in the area indicate the estimate to be approximately correct. Farther north, the shale succession below the Sikanni sandstone is in the order of 3,500 feet.

The Buckinghorse Formation extends northwesterly in a broad, low-lying belt along the eastern edge of the Foothills and is present in the centre of a few synclines within the folded belt. The most continuous exposure in the northern part of the region is along Tetsa River where about 2,100 feet are exposed above Triassic sediments.

The contact of the Buckinghorse Formation with the Gething sediments has a transitional appearance in some places, but in others is distinct and abrupt. The transitional beds on Sikanni Chief River are over 200 feet thick (see Hage, 1944) and increase to more than 300 feet north of Gathto Creek. However, the previously noted persistent, highly glauconitic sandstone at the top of the transition beds is included in the Gething Formation. The base of the Buckinghorse shales, therefore, apparently lies at approximately the same stratigraphic horizon as far north as Tuchodi River. Beyond there, basal shales may include beds equivalent to the Gething Formation. The basal beds of the Buckinghorse Formation are well exposed just west of Mile 375 on the Alaska Highway. At that locality, 9 feet of sandstone with minor conglomerate and interbedded, silty mudstone lie on fine-grained sandstone of the Triassic Liard Formation.

According to Henderson (1954, p. 2284), the shales below the middle sandstones of the Buckinghorse are 2,040 feet thick. That thickness, computed in part from structure and composite sections agrees closely with the section measured on Tetsa River (section 64-3). Prominent siltstones exposed within the thick succession on Tetsa River and occurring within 1,500 feet of the base lie below the middle sandstones found on Chischa River and Chlotapecta Creek. Correlation with the Phillips S.R. West Canadian Kledo c-14-6 well, a few miles northwest suggests that sandy beds of the Tetsa section are approximately equivalent to a sandy, silty succession identified within the lower 2,000 feet of Buckinghorse.

Basal Buckinghorse shales in the type region are black, rusty weathering with large, reddish weathering, sideritic concretions. They contain large masses of marcasite and are heavily coated with a yellow efflorescence. Those beds are overlain by a succession of rusty weathering, rubbly to flaky shales containing only rare concretions. A succeeding

interval of concretionary shales grades upward into argillaceous siltstone. Those beds are separated from the Sikanni Formation by a thick interval of concretionary, silty mudstone. The upper beds are gradational into the overlying Sikanni and the contact is drawn at the base of thick-bedded sandstone.

In the Tuchodi-Tetsa region, the Buckinghorse is readily divisible into three parts which may correspond with the Garbutt, Scatter, and Lepine Formations of the Toad-Liard region (see Kindle, 1944; McLearn and Kindle, 1950). Two prominent beds of sandstone, occurring about 800 feet above the base may represent part of the Scatter sandstones. A 15-foot interval of sandstone in 6-inch to 1-foot beds on Prophet River opposite Beaver Creek may be partly equivalent. The sandstones, more than 250 feet thick on Chischa River are fine grained, brownish grey, flaggy to thick-bedded. These beds appear to grade into argillaceous siltstone on Tetsa River. The basal shales, well exposed on Chlotapecta Creek, Chischa, and Tetsa Rivers, consist of concretionary, silty, dark grey mudstones. Beds lying between the lower sandstones and the Sikanni Formation are well exposed in several gullies on the escarpment east of Muskwa River. They comprise concretionary shale at the base, flaky, rusty shale in the middle, and silty shale with platy siltstone in the upper part.

The Buckinghorse Formation contains the Lemuroceras-Beudanticeras and Gastroplites faunas (see McLearn and Kindle, 1950; Henderson, 1954), and includes beds lying below the late Albian Neogastroplites zone. The Lemuroceras-Beudanticeras and Gastroplites faunas are now considered by Jeletzky (1964, table 1) to be ? late Lower Albian to Middle Albian. The Buckinghorse can therefore be correlated with the Moosebar, Gates, and Hasler Formations of upper Peace River and with the Spirit River, Peace River, and lower Shaftesbury Formations of the Plains.

SIKANNI FORMATION

The Sikanni Formation as originally defined by Hage (1944) included beds to the base of the Dunvegan Formation and comprised two members, a lower sandstone and an upper shale. It is most useful to recognize the upper shale member as a separate formation and the Sikanni Formation was restricted to include only the sandstone succession (Stott, 1960b).

In the type region on Sikanni Chief River, the Sikanni consists of four sandstone units separated by thin intervals of silty shale. To the south along the escarpment east of Halfway River, only three sandstones were noted. Northward across Prophet River, the number of sandstones increases to as many as eleven, which resulted in it being informally designated as the 7-11 member by Henderson (1954). The increase in number and thickness of the sandstones is related to a lateral facies change in both Buckinghorse and Sully shales. These sandstones represent the nearshore facies of the Buckinghorse sea and attain their maximum development between Prophet and Dunedin Rivers.

The lower beds of the Sikanni are transitional into the underlying Buckinghorse sediments. The upper contact seems to be more abrupt within a rapid change from resistant to recessive beds but the contact is nowhere well exposed. However, neither the upper nor lower boundary lie at any persistent stratigraphic horizon from one place to another but are drawn at different levels as successive sandstones grade laterally into shale. The contact of the Buckinghorse and Sikanni Formations is well exposed west of Mile 351 on the Alaska Highway and the Sikanni sandstones are exposed in numerous road cuts for several miles beyond there.

The Sikanni Formation is 380 feet in its type section along Sikanni Chief River east of the Alaska Highway. It increases to about 800 feet along the escarpment east of Muskwa River and maintains that approximate thickness as far north as Dunedin River. The sandstone grades laterally eastward into interbedded silty sandstone, siltstone, and shale, becoming much less resistant in the vicinity of the north-flowing Prophet River. Outcrops of equivalent beds are present along Jackfish Creek and along Fort Nelson River near Klua Creek.

Sandstones of the Sikanni Formation are fine grained, finely laminated, brown, and brown weathering. Bedding is flaggy to thick bedded and units range from less than one foot to as much as 100 feet. Shales are silty, dark grey to black, platy to blocky, and contain some sideritic concretions.

The Sikanni Formation contains the late Albian Neogastroplites fauna (see McLearn and Kindle, 1950; Henderson, 1954). It is correlated with the Goodrich Formation south of Peace River and with the middle part of the Shaftesbury Formation of the Plains. In the most westerly exposures, it may include beds equivalent to the "Fish Scale" marker horizon which occurs in a shale facies in the eastern part of the region.

SULLY FORMATION

The Sully Formation (Stott, 1960b) comprises those shales lying between the Sikanni and Dunvegan (Fort Nelson) Formations. It is reasonably well exposed in the canyons of Sikanni Chief and Buckinghorse Rivers but farther north it is generally covered by talus or vegetation. It forms a thin, recessive unit below the massive cliffs of the Dunvegan and can be readily mapped throughout the region.

The base apparently lies on successively older sandstones from west to east; the shales appear to intertongue with Sikanni sandstones and the lower boundary changes stratigraphic position within relatively short distances. The upper boundary of the Sully Formation lies within a gradational succession of interbedded sandstone and shale at the base of the Dunvegan and is drawn at the base of the first unit of thick- to massive-bedded sandstone. That contact appears to lie at approximately the same stratigraphic horizon along the Muskwa escarpment, but may vary considerably elsewhere in the region.

The thickness of the Sully varies across strike although it seems to remain at about 300 feet on the escarpment. It is over 700 feet in the Sikanni Chief canyon. The variation is the result of the lateral change in lithologic facies, mainly in the lower part of the succession although some changes may also occur in the upper beds.

The basal Sully consists of silty, rubbly, dark grey shales with some rusty weathering, sideritic concretions. In the canyon of Sikanni Chief River, a prominent bed of silty sandstone occurs approximately 200 feet above the base. It contains abundant fish scales and fragments and also thin seams of bentonite. In subsurface studies that bed is recognized as the widely distributed Fish-Scale marker. The middle part of the Sully in that region is predominantly flaky, rusty weathering shale with much yellow efflorescence and selenite crystals. The upper beds are siltier, include some sideritic concretions and contain interbedded siltstone, fine-grained sandstone in half-inch to three-inch beds near the top. The sandstone is similar to that found in the more massive beds at the base of the Dunvegan Formation.

The age of the Sully is inferred from its stratigraphic position. It lies on the Sikanni Formation dated as late Albian and is overlain by the Dunvegan Formation which is generally considered to be late Cenomanian. Thus, the Sully can be dated as latest Albian to early Cenomanian and is approximately equivalent to the Cruiser Formation south of Peace River (see McLearn and Kindle, 1950; Stott, 1963, in press). The "Fish-Scale" marker bed is generally considered (see Stelck, 1962) to approximate the boundary between Early and Late Cretaceous.

DUNVEGAN FORMATION

The Dunvegan Formation, defined by Dawson (1881) includes a succession of sandstone and interbedded shale above the Fort St. John Group and below the Smoky Group. It has been mapped north of the type locality on Peace River as far as Klua Lakes. Isolated remnants occur between Muskwa and Prophet Rivers and similar beds can be followed northward to the type section of the Fort Nelson Formation (Kindle, 1944) on Liard River. The designated type section of the Fort Nelson includes beds equivalent to the Sikanni and Sully Formation but the section described farther north on Liard River by Kindle appears to be restricted to the beds equivalent to the Dunvegan Formation. The Fort Nelson as described by Stott (1960b) in the District of Mackenzie includes conglomerates and coarse-grained sandstones similar to and approximately equivalent to the restricted Fort Nelson and Dunvegan.

The Dunvegan beds are exposed almost continuously in vertical cliffs at the top of the Sikanni Chief and Buckinghorse canyons and around the remnants extending north to Klua Lakes. The more massive beds are well exposed between Muskwa and Prophet Rivers but vegetation and talus covers much of the lower part of the formation in many places. The formation is estimated to be about 500 feet thick in the southeastern part of the region and 478 feet were measured east of Tuchodi River to the north.

Along the Muskwa escarpment, the basal beds consist of massive to thick-bedded, fine- to medium-grained sandstone overlain by a few tens of feet of shale. Three units, 50 to 100 feet thick, of massive conglomerate occur in the upper part. Thin, recessive intervals between the conglomerates contain poorly exposed sandstone and carbonaceous shale. The conglomerate, composed mainly of chert with some quartzite, contains pebbles ranging from one-eighth to 3 inches in diameter. The matrix consists of medium- to coarse-grained sandstone.

The Dunvegan Formation contains sediments of the deltaic and nearshore environments. It records the most major advance of those environments into the present Plains region north of Peace River since the previous widespread continental deposition of Gething sediments.

No fossils were found in the Dunvegan Formation north of Peace River. However, the Dunvegan on Peace River is generally considered (see McLearn and Kindle, 1950; Bell, 1963; Stelck, 1962) to be late Cenomanian and there is no evidence to suggest any marked diachronism of the conglomeratic sediments to the north.

KASKAPAU FORMATION

Only the basal beds of the Smoky Group are exposed in the vicinity of Peace River and they are included in the Kaskapau Formation of Cenomanian and Turonian age. Throughout most of the region, those beds are concealed by glacial sediments. Irish (1958) reported small exposures on Peace River at the provincial boundary. Kaskapau beds possibly extend northward into Trutch map-area but no exposures are known. The basal Kaskapau beds include silty, dark grey, sideritic, rusty weathering shales and some thin interbeds of siltstone.

KOTANEELEE FORMATION

The Kotaneelee Formation (Hage, 1945; see also Stott, 1960a) appears to extend southward into British Columbia beyond Dunedin River. The shales mapped by Kindle (1944) as overlying the Fort Nelson apparently belong to the Kotaneelee Formation.

A hiatus representing all the Turonian stage occurs between the Fort Nelson and Kotaneelee Formations in the District of Mackenzie.

ECONOMIC GEOLOGY

This thick succession of predominantly marine rocks contains shales that can be considered potential source rocks and sandstones that can be considered potential reservoir rocks for natural hydrocarbons. Furthermore, the sandstones grade laterally into marine shales, forming stratigraphic traps. In addition, structures favourable for the accumulation of oil and gas may have been produced by folds within the Foothills. Lower Cretaceous rocks are exposed on the flanks of many of the more westerly

structures but are covered by younger sediments on gentle flexures in the eastern Foothills and adjacent plains and may be considered as potential producing horizons.

The post-Jurassic erosion, now represented by the pre-Gething unconformity, left Triassic rocks in the Jedney-Laprise area with an uneven topography, including some well-developed drainage patterns. Although much of the Triassic production is controlled by other factors, erosional topography plays some part in the localization of natural gas.

Monteith sandstones are generally well sorted and exhibit considerable porosity within the Foothills. Farther east in the Buick Creek area, petroleum and gas are obtained from similar sandstones considered to lie within beds equivalent to Gething or Bluesky. It may be that some of those producing sandstones are older and in part equivalent to the Monteith or sandstones representing reworked Monteith. The eastern limit of the quartzose sandstones lies slightly east of the Alaska Highway, trending southeastward from near Pink Mountain to Peace River at the British Columbia-Alberta boundary. Determination of the erosional edge may be critical in outlining the potential area.

The Cadomin-Gething succession has already proven to be a reservoir of petroleum and natural gas in northeastern British Columbia. Petroleum is obtained from those beds in the Aitken Creek, Beatton River, West, Buick Creek, and Charlie Lake fields. Natural gas is obtained from the succession in the Aitken Creek, Boundary Lake, Buick Creek, West, Fort St. John Airport, Fort St. John Southeast, and Montney fields. The success, to date, warrants anticipation of additional discoveries in those rocks. A major facies change occurs within the succession from predominantly carbonaceous sediments near Peace River to marine sandstone to the north and east. Well sorted, porous sandstones of the nearshore facies can therefore be expected in the western Plains and eastern Foothills northwestward from Fort St. John to Muskwa River.

The sandstones appearing in the Buckinghorse Formation in the northern part of the region apparently are widely distributed beneath the northern Plains. They have not yet been studied in detail and their potentialities are not well known.

The Sikanni sandstones are known to grade laterally into siltstones and shales east of the Alaska Highway and north of Sikanni Chief River. However, they are widespread south of the river and should be considered as potential reservoir rock.

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APPENDIX

Section 62-10. Fernie, Monteith,and Beattie Peaks Formations and younger beds, Halfway map-area, British Columbia, 56°55'N, 123°18'W

Unit	Lithology	Thickness (feet)	Height above base (feet)
	Top of ridge		
	GETHING FORMATION		
1	Sandstone, fine-grained, cherty, laminated; massive; beds of coarse-grained sandstone and conglomerate; pebbles as much as 1"		
	BEATTIE PEAKS FORMATION and (?) younger beds		
96	Partly covered and recessive; interbedded siltstone and shale with some sandstone..	40	1,452
95	Sandstone, fine-grained; thick-bedded; light brown weathering	5	1,412
94	Covered. Much platy siltstone in talus.....	80	1,407
93	Sandstone, fine-grained; platy	3	1,327
92	Mudstone and siltstone; interbedded; black; platy	20	1,324
91	Sandstone, fine-grained, laminated; flaggy; brown weathering	3	1,304
90	Covered.....	45	1,301
89	Sandstone, fine-grained, laminated, grey; rusty brown weathering	2	1,256
88	Siltstone to mudstone; sandier at top; bedded	11	1,254
87	Mostly covered. Mudstone in talus	32	1,243
86	Sandstone, fine-grained, grey, laminated, slightly calcareous, ferruginous; thick-bedded.....	28	1,211
85	Siltstone, argillaceous, to mudstone at base; upper part mostly covered.....	25	1,183
84	Sandstone, medium-grained, grey, calcareous, laminated, ferruginous; brown weathering	4	1,158

Unit	Lithology	Thickness (feet)	Height above base (feet)
83	Mostly covered. Some siltstone and medium grained sandstone	24	1,154
82	Sandstone, medium-grained, grey, laminated, cross-laminated; massive; grey weathering; slightly calcareous and ferruginous	13	1,130
81	Sandstone, fine-grained, laminated, calcareous, ferruginous	4	1,117
80	Covered	35	1,113
79	Sandstone, fine-grained, laminated, ferruginous, calcareous; massive; grey weathering...	11	1,078
78	Covered	63	1.067
77	Siltstone, argillaceous, dark grey; bedded....	15	1,004
76	Covered and recessive	20	989
75	Sandstone, fine-grained, laminated, grey; massive; grey weathering	27	969
74	Partly covered. Sandstone, fine-grained; thick-bedded	11	942
73	Sandstone, as above; massive; thin, lenticular conglomerate at base; some pebbles of black chert	17	931
72	Sandstone, fine-grained, cherty, homogeneous, grey, slightly calcareous; massive; grey weathering	16	914
71	Mostly covered. Some shale and sandstone...	36	898
70	Sandstone, fine-grained, well sorted, grey, cherty, slightly calcareous; massive; grey weathering	68	862
69	Talus covered	45	794
68	Siltstone, argillaceous; some mudstone; rusty weathering; bedded.....	28	749
67	Siltstone, argillaceous; interbedded mudstone; some fine-grained laminated sandstone at top	12	721
66	Siltstone, sandy, argillaceous, grading into argillaceous sandstone, laminated; beds 1"-2"; some interbedded shale.....	18	709
65	Mudstone, rubbly to blocky; rusty weathering; grades into overlying beds.....	14	691

Unit	Lithology	Thickness (feet)	Height above base (feet)
64	Mudstone, silty, rusty weathering; grading upwards into sandy siltstone with 2"-1' beds of fine-grained sandstone near top	13	677
63	Sandstone, fine-grained, laminated, siliceous.	5	664
62	Mudstone, very silty; grading upward into argillaceous siltstone	14	659
61	Siltstone, sandy, argillaceous, grey; blocky to bedded; rusty weathering	19	645
60	Sandstone, fine-grained, laminated, siliceous; rusty brown weathering	2	626
59	Siltstone, argillaceous, sandy; rusty weathering; interbedded mudstone at top; sandier at top	13	624
58	Mudstone	1	611
57	Siltstone, sandy; blocky; rusty weathering	14	610
56	Siltstone, argillaceous, and mudstone; rusty weathering; grades into overlying beds	13	596
55	Sandstone, fine-grained, siliceous laminated; brownish weathering; channel-fill	3	583
	GSC loc. 52204 Belemnitacea (true belemnites), genus and species indet.		
54	Siltstone and shale, silty; grading upward into interbedded sandstone and siltstone; beds 1"-2"; sandstone, very fine-grained, argillaceous, laminated, grey; unit weathers rusty	26	580
53	Mudstone, silty; grades into argillaceous siltstone with some sandstone at top; bedded	23	554
52	Sandstone, fine-grained, laminated, grey, siliceous; thick-bedded; brown weathering	4	531
51	Sandstone; some shale-pebble conglomerate	1	527
50	Mudstone, silty; some siltstone, argillaceous, laminated	5	526
49	Sandstone, fine-grained, laminated, grey, siliceous; thick-bedded; lenticular channel-fill; brown weathering	4	521
48	Siltstone, sandy, argillaceous; some channel fill	19	517

Unit	Lithology	Thickness (feet)	Height above base (feet)
47	Sandstone, fine-grained, laminated, grey; rusty brown weathering	2	498
46	Siltstone, argillaceous, sandy; interbedded mudstone, 25%; grading into sandstone, argillaceous, fine-grained, laminated, beds 1"-3".....	22	496
45	Sandstone, fine-grained, laminated	1	474
44	Mudstone, silty; blocky to platy; grading into argillaceous siltstone with some laminated sandstone beds (1"-2") at top; striped appearance	18	473
43	Sandstone, fine-grained, laminated, grey; interbedded shale, 40%, beds 2"-6".....	10	455
42	Sandstone, fine-grained, lenticular.....	4	445
41	Mudstone, very silty; grading upward into argillaceous siltstone and sandstone, fine-grained, laminated; bedded.....	13	441
40	Sandstone, fine-grained, laminated, grey; thick-bedded; rusty brown weathering...	5	428
39	Siltstone, argillaceous, blocky to bedded; mottling; dark grey.....	8	423
38	Siltstone, sandy, laminated, to sandstone, argillaceous, dark grey; bedded; channel-fill sandstone, 25%.....	30	415
37	Sandstone, fine-grained, laminated, grey, siliceous, hard; thick-bedded; brown weathering; some silty shale and argillaceous siltstone.....	6	385
36	Siltstone, sandy, to sandstone, argillaceous laminated, dark grey; blocky to bedded..	4	379
35	Sandstone, fine-grained; thick-bedded; brown weathering	3	375
34	Siltstone, sandy, laminated, to sandstone, argillaceous, bedded.....	8	372
33	Sandstone and siltstone; channel-fill and lenticular bodies.....	5	364
32	Siltstone, sandy, argillaceous, bedded; grades into fine-grained sandstone; some channel fill.....	13	359

Unit	Lithology	Thickness (feet)	Height above base (feet)
31	Sandstone, fine-grained, laminated, siliceous, hard; brown weathering.....	5	346
30	Siltstone, very argillaceous; blocky to massive; dark grey; rusty weathering.....	7	341
29	Sandstone, fine-grained, laminated, siliceous, grey; rusty brown weathering; thick-bedded; channel-fill structures, 5' thick; shale and siltstone, 40%, between channels	21	334
28	Sandstone, fine-grained, laminated, siliceous, grey; brown weathering.....	2	313
27	Siltstone, sandy, argillaceous, laminated; blocky to flaggy; grades into argillaceous sandstone at top	22	311
26	Sandstone, fine-grained, laminated; channel-fill	3	289
25	Mudstone, rubbly; rusty weathering	5	286
24	Siltstone, argillaceous; blocky; grading into sandstone, very argillaceous, laminated; some lenticular sandstone, fine-grained.	14.5	281
23	Sandstone, fine-grained, laminated, brown weathering.....	1.5	266.5
	GSC loc. 52221 Belemnitacea (true belemnites) genus and species indet. Inoceramus? sp. indet.		
22	Mudstone, silty; blocky; rusty weathering; grades into siltstone, argillaceous, blocky to flaggy; some interbedded shale.....	21	265
21	Sandstone, fine-grained, grey; thick-bedded; brown weathering.....	5	244
20	Siltstone, very argillaceous; blocky; very sandy and flaggy in lower half.....	10	239
19	Sandstone, fine-grained, siliceous; thick-bedded; light brown weathering.....	1.5	229
18	Mudstone, silty; blocky; rusty weathering	7.5	227.5
17	Siltstone, very argillaceous; blocky; sandy and laminated at top.....	13	220

Unit	Lithology	Thickness (feet)	Height above base (feet)
16	Sandstone, fine-grained, grey, siliceous; thick-bedded; rusty brown weathering...	5	207
15	Mudstone, silty, to siltstone, argillaceous, dark grey; blocky.....	15	202
14	Sandstone, fine-grained, grey, laminated, siliceous; brown weathering.....	3	187
13	Siltstone, argillaceous, to mudstone; dark grey.....	6	184
12	Siltstone, argillaceous; some mudstone;three beds, each 1' thick, with fossils; sandstone, laminated, orange weathering; thin-bedded.....	12	178
11	Shale, platy, silty; grading upward into interbedded sandstone and shale, 50%; few thin beds of shell debris.....	15	166
10	Sandstone, brown, laminated; highly fossiliferous.....	3.5	151
	GSC loc. 52200 Buchia n. sp. aff. inflata (Toula)		
9	Siltstone, argillaceous to sandy; few thin beds of shell debris.....	11.5	147.5
8	Sandstone, fine-grained, siliceous, laminated; some interbedded siltstone, argillaceous, dark grey.....	4	136
	GSC loc. 52218 Buchia n. sp. aff. inflata (Toula) Acroteuthis cf. A. subquadratus (Roemer)		
7	Mudstone, silty, to siltstone, argillaceous, dark grey, flaggy; sandier at top, beds 1"-3".....	20	132
6	Covered.....	10	112
5	Siltstone, sandy, argillaceous, dark grey, laminated; some sandstone, especially at top.....	18	102
4	Sandstone, fine-grained, laminated, grey, silty; interbedded siltstone and shale (40%); beds 2"-1'.....	18	84
	GSC loc. 52197 Acroteuthis sp. indet. ?		
3	Shale, silty; platy; thin siltstone layers.....	5	66

Unit	Lithology	Thickness (feet)	Height above base (feet)
2	Sandstone, fine-grained, finely laminated, black; platy to thin-bedded; some interbedded shale.....	3	61
1	Covered.....	58	58
	MONTEITH FORMATION		
25	Sandstone, fine-grained, laminated to homogeneous; somewhat silty with some platy siltstone and shale at base; cleaner and laminated at top; grey weathering.....	15	599
24	Sandstone, fine-grained, laminated to homogeneous, dark grey; thin-bedded; grey weathering.....	35	584
23	Sandstone, fine-grained; platy to flaggy; some interbedded siltstone and sandstone.....	16	549
22	Covered.....	5	533
21	Sandstone, fine-grained, laminated to homogeneous, siliceous, brownish grey; thick-bedded; grey weathering.....	12	528
20	Mostly covered. Interbedded siltstone and shale; platy.....	55	516
19	Sandstone, fine-grained; flaggy; brownish grey.....	8	461
18	Sandstone, fine-grained, laminated, ferruginous, brownish grey, calcareous; thin- to thick-bedded; grey weathering; cleaner at top.....	69	453
17	Interbedded sandstone and siltstone; not well exposed.....	6	384
16	Sandstone, fine-grained, laminated, siliceous, grey; thin-bedded but massive appearance; grey weathering.....	10	378
15	Sandstone, fine-grained, laminated, brown, ferruginous; some interbedded siltstone; brown weathering	13	368
14	Covered. Some interbedded siltstone and mudstone.....	19	355

Unit	Lithology	Thickness (feet)	Height above base (feet)
13	Sandstone, fine-grained, laminated, brownish grey, siliceous; thick-bedded to massive; light brown weathering.....	14	336
12	Mudstone, silty, black; some interbedded siltstone, platy.....	5	322
11	Sandstone, fine-grained, laminated, brown; brown weathering.....	10	317
10	Covered.....	24	307
9	Sandstone, fine-grained, laminated, grey; thin-bedded.....	7	283
8	Mostly covered. Interbedded mudstone and siltstone; some sandstone.....	36	276
7	Sandstone, fine-grained, laminated, quartzose, siliceous; thin- to thick-bedded; better sorted at top.....	49	240
6	Covered. Some interbedded siltstone and shale.....	60	191
5	Sandstone, fine-grained, laminated, ferruginous, calcareous, brown; thick-bedded; grey to brown weathering.....	17	131
4	Covered. Interbedded mudstone and siltstone.....	50	114
3	Sandstone, fine-grained, quartzose, grey, siliceous, hard, ferruginous; thick-bedded; grey weathering.....	12	64
2	Covered.....	17	52
1	Sandstone, fine-grained, quartzose, siliceous, hard, grey; thick-bedded to massive; grey to rusty weathering; thin layers of coarse-grained sandstone at top.....	35	35
	FERNIE FORMATION		
16	Sandstone, fine-grained, laminated, siliceous, grey; interbedded siltstone and shale, 30%, rusty weathering; flaggy to thin-bedded.....	15	321
15	Shale, silty, dark grey; platy; rusty weathering; some thin siltstone at top; grades into overlying unit.....	11	306

Unit	Lithology	Thickness (feet)	Height above base (feet)
14	Sandstone, fine-grained, laminated,grey, siliceous, rusty weathering; inter-bedded siltstone and shale, 40%.....	11	295
13	Siltstone and shale interbedded; dark grey, platy; rusty weathering ; some platy sandstone; grades into overlying unit.....	13	284
12	Sandstone, fine-grained, quartzose, hard, siliceous, laminated; beds 2"-6"; interbedded siltstone and shale, 40% platy; more sand near top.....	6	271
11	Shale and siltstone, 40%; thinly interbedded; platy; rusty weathering.....	10	265
10	Sandstone, fine-grained, laminated; platy; cross-laminated.....	2	255
9	Mudstone, silty; platy; rusty weathering; few sideritic concretions; mostly talus covered; few inches of sandy glauconitic mudstone near top.....	44	253
8	Talus covered. Shale, much as below; reddish sideritic concretions.....	55	209
7	Talus covered. Mudstone, silty, black; blocky; glauconitic in lower 10'.....	44	154
6	Mostly talus covered. Siltstone, black, rubbly, glauconitic.....	3	110
5	Mostly covered. Shale, black, rubbly to papery; rusty weathering.....	23	107
	Nordegg Member		
4	Siltstone, argillaceous, blocky, calcareous, phosphatic.....	1	84
3	Siltstone, argillaceous, black, laminated, calcareous; brownish grey weathering....	4	83
2	Shale, silty, black, calcareous; platy; some platy siltstone.....	14	79
1	Mostly covered. Siltstone, calcareous, black, hard; shale, calcareous, black, platy to papery.....	65	65
	PARDONET FORMATION (Triassic)		
	Limestone, bioclastic, bluish grey, thin-bedded; highly fossiliferous with Monotis subcircularis Gabb (Norian) — GSC loc. 52239		

Section 61-23. Cadomin Formation, Butler Ridge, Halfway Ridge map-area, British Columbia, 56° 10' N, 122° 15' W.

Unit	Lithology	Thickness (feet)	Height above base (feet)
	Top of ridge		
21	Sandstone, medium- to coarse-grained; lenses of conglomerate; disseminated pebbles.....	22	663
20	Covered.....	19	641
19	Sandstone, fine- to medium-grained, grey; massive.....	16	622
18	Covered.....	100	606
17	Sandstone, medium-grained; massive; some coarse-grained sandstone and lenticular conglomerate.....	51	506
16	Covered.....	86	455
15	Sandstone, fine-grained, laminated, brown; platy to flaggy.....	9	369
14	Sandstone, medium-grained, laminated, grey; massive; some lenticular conglomerate.....	27	360
13	Covered. Some coal in talus at top.....	45	333
12	Sandstone, fine- to medium-grained.....	2	288
11	Covered. Some coal at base.....	23	286
10	Sandstone, fine-grained, laminated, grey; thick-bedded.....	3	263
9	Partly covered. Some platy siltstone and shale..	29	260
8	Sandstone, fine-grained, laminated, grey; somewhat flaggy toward top.....	21	231
7	Sandstone, fine- to medium-grained, laminated; brownish grey; thin-bedded.....	5	210
6	Covered.....	53	205
5	Sandstone, medium-grained; some coarse-grained sandstone and few pebbles; massive.....	19	152

Unit	Lithology	Thickness (feet)	Height above base (feet)
4	Covered.....	43	133
3	Sandstone, fine- to medium-grained.....	32	90
2	Sandstone, fine- to medium-grained; massive; some coarse-grained sandstone and pebbles in basal 10'.....	50	58
1	Sandstone, medium-grained, laminated, brownish grey; massive.....	8	8
	Core of anticline		

Section 61-6. Gething Formation, ridge east of Marion Lake, Trutch map-area, B.C. 57° 09' N, 123° 06' W.

Unit	Lithology	Thickness (feet)	Height above base (feet)
	Overlying beds are not exposed but Buckinghorse Formation must be present within small interval		
	GETHING FORMATION		
159	Sandstone, fine-grained, laminated, brown...	4	1,008.5
158	Covered	5	1,004.5
157	Sandstone, fine-grained, laminated, brownish grey	3	999.5
156	Covered. Some shale at top	5	996.5
155	Sandstone, silty, grey; grey weathering.....	4	991.5
154	Covered.....	4	987.5
153	Sandstone, fine-grained, laminated, grey; some shale.....	11	983.5
152	Covered.....	18	972.5
151	Sandstone, fine-grained, laminated, grey; thin-bedded; grey weathering.....	7	954.5
150	Covered. Approximately.....	15	947.5
149	Sandstone, fine-grained, grey; medium-bedded.	7	932.5
148	Covered.....	6	925.5
147	Sandstone, fine-grained, grey.....	3	919.5
146	Covered. Approximately.....	28	916.5
145	Sandstone, fine-grained, argillaceous, carbonaceous; thick-bedded; grey weathering.....	3	888.5
144	Covered.....	5	885.5
143	Sandstone, fine-grained, argillaceous, carbonaceous, dark grey; thick-bedded; grey weathering.....	7	880.5
142	Covered.....	4	873.5

Unit	Lithology	Thickness (feet)	Height above base (feet)
141	Sandstone, fine-grained, homogeneous; black and carbonaceous at base, becoming cleaner and grey at top; thick-bedded; grey weathering.....	22	869.5
140	Covered.....	23	847.5
139	Sandstone, fine-grained, laminated, grey; thick-bedded; light brown weathering...	20	824.5
138	Mostly covered. Some siltstone and shale...	10	804.5
137	Sandstone, fine-grained, grey, homogeneous; thick-bedded to massive; grey to rusty brown weathering.....	9	794.5
136	Covered.....	6	785.5
135	Sandstone, fine-grained, laminated, grey; thick-bedded; grey weathering.....	6	779.5
134	Siltstone, sandy, platy, brown.....	3	773.5
133	Covered.....	1.5	770.5
132	Sandstone, fine-grained, laminated.....	1	769
131	Covered.....	2	768
130	Sandstone, fine-grained, laminated, brown; bedding not well developed.....	5	766
129	Covered.....	4	761
128	Sandstone, fine-grained, laminated, cross-laminated, grey, carbonaceous; thin- to medium-bedded; brown weathering...	7	757
127	Shale, silty, carbonaceous, brownish grey...	3	750
126	Sandstone, fine-grained, laminated; some carbonaceous shale.....	2.5	747
125	Sandstone and shale interbedded, carbonaceous; beds 2"-6".....	12	744.5
124	Shale, silty, dark grey; some sandstone.....	4	732.5
123	Sandstone, fine-grained, laminated, cross-laminated, brownish grey, thin-bedded; brown weathering.....	2	728.5
122	Partly covered. Shale, brown, grading upwards into siltstone.....	6	726.5

Unit	Lithology	Thickness (feet)	Height above base (feet)
121	Sandstone, fine-grained, laminated, cross-laminated, grey; medium-bedded; carbonaceous fragments.....	12	720.5
120	Shale dark grey; rubbly to platy.....	1	708.5
119	Sandstone, fine-grained, argillaceous, laminated dark grey to brownish grey; thin-bedded.....	8	707.5
118	Shale, silty, black to dark grey; siltstone in upper half.....	19	699.5
117	Sandstone, fine-grained, argillaceous, brownish grey, homogeneous to laminated; thick-bedded; grey weathering.	4	680.5
116	Covered.....	10	676.5
115	Sandstone, fine-grained, laminated, cross-laminated, brownish grey; thin-bedded; brown weathering.....	5	666.5
114	Shale and siltstone interbedded (60-40); beds 2" - 6"; shale, dark grey, platy; siltstone, sandy, laminated.....	13	661.5
113	Sandstone, fine- to medium-grained, laminated, crosslaminated, brown; thick-bedded; brown weathering.....	3	648.5
112	Shale and siltstone interbedded; brown, carbonaceous, platy.....	2	645.5
111	Sandstone, fine-grained, brown.....	1	643.5
110	Shale, brown, carbonaceous, silty, platy....	0.5	642.5
109	Sandstone, fine-grained, brown, laminated...	0.5	642
108	Shale, brown, carbonaceous, silty, platy....	1	641.5
107	Sandstone, fine-grained, brownish-grey, laminated, crosslaminated; bedding poorly developed; some crossbedding; some coarse-grained sandstone at base; channel-fill structure at base with layer of concretionary breccia.....	18	640.5
106	Sandstone, fine-grained, laminated, brown; thin-bedded.....	4	622.5
105	Sandstone, fine-grained, laminated, brown...	2	618.5
104	Siltstone and shale, interbedded.....	2	616.5

Unit	Lithology	Thickness (feet)	Height above base (feet)
103	Sandstone, fine-grained, laminated, cross-laminated, brownish grey, calcareous; brown weathering.....	7	614.5
102	Shale, brown, rubbly; cut-and-fill structure ..	4	607.5
101	Sandstone, fine-grained, laminated, cross-laminated, brownish grey; brown weathering.....	3	603.5
100	Shale and siltstone interbedded; dark grey to black; platy.....	3	600.5
99	Sandstone, fine-grained, brown, laminated, cross-laminated, carbonaceous.....	4	597.5
98	Shale, dark grey.....	3	593.5
97	Sandstone, fine-grained, laminated, brownish grey.....	2	590.5
96	Mudstone and siltstone interbedded.....	5	588.5
95	Sandstone-fine-grained, laminated, cross-laminated, brownish grey; grey weathering, beds 4" - 6"	7	583.5
94	Shale and sandstone interbedded.....	3	576.5
93	Sandstone, fine-grained, brownish grey, laminated, crosslaminated; some shaly layers	9	573.5
92	Shale, dark grey, platy.....	3	564.5
91	Shale, coaly.....	1	561.5
90	Sandstone, fine-grained, brown, laminated; medium-bedded; grey to rusty weathering.....	10	560.5
89	Shale, brownish grey; rubbly at base, platy towards top; brown weathering; grading upwards into siltstone.....	9	550.5
88	Sandstone, silty, laminated, fine-grained; becoming less silty at top; flaggy to thin-bedded.....	6	541.5
87	Shale, rubbly to platy, brownish grey; grades into overlying unit.....	6	535.5
86	Sandstone, fine-grained, brownish grey, laminated; medium-bedded.....	3	529.5
85	Siltstone and shale interbedded; platy, dark grey.....	3	526.5

Unit	Lithology	Thickness (feet)	Height above base (feet)
84	Sandstone, fine-grained, laminated, brownish grey; medium-bedded.....	6	523.5
83	Siltstone and shale, black.....	1	517.5
82	Sandstone, fine-grained, laminated, brownish grey; beds 2"-4".....	16	516.5
81	Sandstone, coarse-grained, homogeneous to laminated, grey; thick-bedded cut-and-fill structure at base; pebbles in basal beds...	8	500.5
80	Siltstone, sandy, platy to flaggy; rusty weathering.....	6	492.5
79	Sandstone, fine-grained, brownish grey, laminated; thin-bedded; brownish grey weathering.....	6	486.5
78	Shale, silty brownish grey, platy.....	2	480.5
77	Sandstone, fine-grained, grey.....	3	478.5
76	Shale, silty, dark grey; platy; rusty weathering; siltier at top.....	8	475.5
75	Sandstone, fine-grained, grey.....	2	467.5
74	Siltstone and shale, interbedded.....	5	465.5
73	Sandstone, fine-grained, dark grey, homogeneous; medium-bedded.....	10	460.5
72	Sandstone, fine-grained, grey; flaggy to thin-bedded; some shale.....	11	450.5
71	Sandstone, fine-grained, grey; flaggy; silty at base.....	9	439.5
70	Sandstone, very fine-grained, brownish grey; thick-bedded; grey to brown weathering.....	9	430.5
69	Shale, rubbly; rusty weathering.....	3	421.5
68	Siltstone, sandy, brown.....	2	418.5
67	Coal and carbonaceous shale	1	416.5
66	Sandstone, fine-grained, grey to brownish grey; medium-bedded, grey weathering..	7	415.5
65	Shale, coaly.....	2	408.5
64	Siltstone, sandy, black; platy; rusty weathering; grades into sandstone.....	9	406.5

Unit	Lithology	Thickness (feet)	Height above base (feet)
63	Sandstone, fine-grained, dark grey; medium-bedded.....	4	397.5
62	Siltstone, sandy; platy; rusty weathering; grades into overlying unit.....	3	393.5
61	Covered.....	16	390.5
60	Siltstone, sandy, laminated; platy; rusty weathering; grading upward into sandstone.....	7	374.5
59	Shale, coaly, and coal.....	1	367.5
58	Sandstone, fine-grained, laminated and cross-laminated, grey; flaggy at base, thicker towards top.....	21	366.5
57	Shale, coaly, and coal.....	1	345.5
56	Sandstone, fine-grained, laminated to homogeneous; medium- to thick-bedded; grey weathering.....	9	344.5
55	Partly covered. Shale and siltstone interbedded.....	4	335.5
54	Sandstone, fine-grained, medium-bedded....	5	331.5
53	Shale; some siltstone and sandstone; dark grey; carbonaceous.....	5	326.5
52	Sandstone, fine-grained, laminated, brownish grey; thick-bedded; some shaly layers near top.....	7	321.5
51	Partly covered. Shale and siltstone.....	5	314.5
50	Sandstone, fine-grained, dark grey, laminated, cross -laminated; thick-bedded; grey weathering.....	10	309.5
49	Covered.....	16	299.5
48	Sandstone, fine-grained, laminated; flaggy to thin-bedded.....	4	283.5
47	Siltstone and shale, coaly, black.....	2	279.5
46	Sandstone, fine-grained, laminated, grey; flaggy to thin-bedded; grey to rusty weathering.....	7	277.5
45	Shale and siltstone interbedded, dark grey to black; platy; rusty weathering; interference ripple marks.....	5.5	270.5

Unit	Lithology	Thickness (feet)	Height above base (feet)
44	Sandstone, fine-grained, laminated, cross-laminated, brownish grey; flaggy to thin-bedded; thick-bedded at top; ripple marks.....	3	265
43	Sandstone, fine-grained,; flaggy to thin-bedded.....	3	262
42	Partly covered. Siltstone, sandstone, and shale.....	32	259
41	Siltstone, black; platy; some shale at base; grading upwards into sandstone, silty, platy.....	18	227
40	Sandstone, argillaceous, fine-grained, black, dark brown to grey weathering.....	2	209
39	Siltstone and shale interbedded (60-40); siltstone, argillaceous, dark grey, blocky to platy; shale, silty, platy to rubbly, rusty weathering; beds 1' - 1½'.....	15	207
38	Partly covered. Shale and siltstone.....	6	192
37	Sandstone, silty, black, carbonaceous, thin-bedded to flaggy; grey weathering.....	3	186
36	Sandstone, fine-grained, brownish grey, laminated to homogeneous; medium-bedded.....	4	183
35	Mudstone and siltstone, dark grey to black; some sandstone.....	5	179
34	Sandstone, fine-grained, carbonaceous, medium to dark grey; thick-bedded; grey weathering.....	6	174
33	Siltstone, fine and shale interbedded, platy; grey to brown weathering.....	1.5	168
32	Sandstone, fine-grained, grey.....	0.5	166.5
31	Shale, black; rubbly at base, platy to blocky at top.....	2	166
30	Sandstone, fine-grained, homogeneous, grey; thick-bedded; grey to brown weathering...	5.5	164
29	Coal and coaly shale.....	1	158.5
28	Sandstone, fine-grained, grey.....	2.5	157.5
27	Sandstone and shale interbedded; 2"-3" beds...	5	155

Unit	Lithology	Thickness (feet)	Height above base (feet)
26	Sandstone, fine-grained, grey, silty, thick- to massive bedded; rusty brown weathering.....	8	150
25	Not well exposed. Interbedded siltstone and shale with some sandstone.....	7	142
24	Partly covered. Shale with some siltstone....	6	135
23	Sandstone, fine-grained, grey, homogeneous; thin-bedded at base, thicker at top; rusty brown weathering.....	7	129
22	Siltstone and shale interbedded, platy.....	2	122
21	Sandstone, fine-grained, grey, quartzose; rusty weathering.....	4	120
20	Sandstone, coarse-grained, brownish grey; beds 3"-6"; disseminated pebbles.....	3	116
19	Sandstone, fine-grained, homogeneous to laminated; thick- to medium-bedded; rusty weathering.....	4	113
18	Sandstone, fine-grained; flaggy; some shale...	1	109
17	Sandstone, fine-grained; grey, medium- to thick-bedded.....	11	108
16	Sandstone and shale interbedded.....	0.5	97
15	Sandstone, fine-grained, grey, homogeneous; medium- to thick-bedded; grey to brown weathering.....	7	96.5
14	Siltstone, sandy, shaly at base; platy to flaggy	1.5	89.5
13	Sandstone, fine-grained, brownish grey to dark grey.....	2	88
12	Shale.....	1	86
11	Sandstone, fine-grained, laminated.....	1	85
10	Shale.....	1	84
9	Sandstone, fine-grained, grey; thick-bedded to massive.....	15	83
8	Sandstone, fine-grained, grey; medium to thick-bedded; grey to brown weathering...	3	68
7	Covered.....	14	65

Unit	Lithology	Thickness (feet)	Height above base (feet)
6	Sandstone, fine-grained, homogeneous to laminated, grey.....	2	51
5	Partly covered. Sandstone, fine-grained, grey.....	9	49
4	Sandstone, fine-grained, grey; thick-bedded.....	9	40
3	Conglomerate and coarse-grained sandstone; pebbles up to 1" in diameter, sandstone, grey, sugary texture; thick-bedded.....	10	31
2	Mostly covered. Sandstone.....	6	21
1	Sandstone, coarse-grained, brown, sugary texture; thick-bedded to massive; some disseminated pebbles.....	15	15
	Contact of Gething and Fernie formations is not exposed but Fernie scree appears on slope. Measurement probably starts several feet above base of Gething formation.		
	FERNIE FORMATION		
	Talus covered. Shale and siltstone, black; platy. Contacts not seen.....	100	100

TRIASSIC
PARDONET FORMATION

Limestone
GSC loc 52235
Monotis scutiformis pinensis Westermann
Age: Norian, probably Himavatites zone

Section 64-21. Gething Formation, east flank of anticline, north of Prophet River, Trutch map-area, B.C., 57°41'N, 123°30'W.

Unit	Lithology	Thickness (feet)	Height above base (feet)
	BUCKINGHORSE FORMATION		
	End of exposure		
6	Mudstone, dark grey to black; rubbly; rusty weathering; few thin beds of concretions at base and rows of large concretions toward top.....	35	240
5	Mudstone, dark grey to black; rubbly to blocky; reddish brown weathering concretions; bentonite seam at 36'.....	46	205
4	Mudstone, as above; large concretions in rows; bentonite at top.....	47	159
3	Mudstone, black; rubbly; large reddish brown weathering concretions; bentonite at top.....	12	112
2	Mostly covered. Mudstone. Approximately...	90	100
1	Mudstone, black; rubbly; few concretionary layers.....	10	10
	GETHING FORMATION		
74	Sandstone, fine-grained, grey, siliceous; thick-bedded; rusty brown weathering; glauconitic; traces of wood fragments.....	6	841
73	Mudstone, dark grey to black; rubbly to blocky; interbedded platy siltstone; few concretions; striped appearance.....	33	835
72	Mudstone, as above; rusty weathering; few thin beds of concretionary sandstone.....	34	802
71	Sandstone and interbedded mudstone; grading upward into sandstone, fine-grained, laminated, siliceous; thin-bedded; rusty brown weathering.....	18	768
70	Sandstone, as above, platy; mudstone, 25%....	5	750
69	Mudstone, dark grey; platy.....	2	745
68	Sandstone, fine-grained, grey, siliceous; rusty brown weathering.....	2	743

Unit	Lithology	Thickness (feet)	Height above base (feet)
67	Mudstone, dark grey to black; rubbly to blocky; some sandstone as above, 20%, beds 1" - 2".....	24	741
66	Sandstone, fine-grained, grey, siliceous; rusty brown weathering; small pebbles on basal surface.....	1	719
65	Mudstone.....	8	716
64	Sandstone, fine-grained, laminated, siliceous; thin- to thick-bedded; rusty brown weathering; interbedded mudstone, 10%.....	10	708
63	Mudstone, dark grey; rubbly; few thin beds of sandstone; some concretions.....	7	698
62	Mudstone and interbedded lenticular sandstone, 40%.....	15	691
61	Mudstone, blocky; capped by channel sandstone, fine-grained, laminated, brown weathering.....	18	676
60	Covered.....	15	658
59	Mudstone, dark grey to black; rubbly to blocky.....	50	643
58	Siltstone, argillaceous to sandy; blocky to platy; rusty weathering.....	10	593
57	Sandstone, fine-grained, laminated.....	2	583
56	Siltstone to sandstone, very argillaceous, black; platy; mudstone, 10%.....	8	581
55	Siltstone, argillaceous; platy.....	3	573
54	Sandstone, fine-grained, argillaceous; flaggy.....	10	570
53	Mudstone, dark grey to black, rubbly to platy; silty at top.....	14	560
52	Sandstone, fine-grained, dark grey, siliceous; flaggy to thin-bedded; crossbedded; thick-bedded at top; rusty brown weathering.....	33	546

Unit	Lithology	Thickness (feet)	Height above base (feet)
51	Mudstone, dark grey to black; rubbly to blocky; rusty weathering; some siltstone near base; siltier at top.....	13	513
50	Sandstone, very argillaceous and platy at base; becoming fine-grained, grey, siliceous; flaggy to thin-bedded; rusty brown weathering.....	13	500
49	Sandstone, fine-grained, grey, siliceous; flaggy to thin-bedded; rusty weathering...	3	487
48	Mudstone, silty; platy.....	2	484
47	Sandstone, fine-grained, siliceous; thin-bedded.....	2	482
46	Mudstone, rubbly; interbedded sandstone, 30%.....	4	480
45	Sandstone, fine-grained, grey, siliceous; flaggy.....	7	476
44	Sandstone, argillaceous; flaggy; some mudstone at base.....	5	469
43	Sandstone, argillaceous at base; becoming fine-grained, siliceous; thin-bedded at top.....	9	464
42	Sandstone, very fine-grained, silty, siliceous; thin-bedded; some mudstone at base.....	4	455
41	Mudstone, dark grey to black; rubbly to platy.....	11	451
40	Sandstone, fine-grained, grey, homogeneous, siliceous; thin- to thick-bedded; brown weathering.....	25	440
39	Sandstone, fine- to medium-grained; siliceous, grey, homogeneous; thin- to thick-bedded; brown weathering; finer grained at top....	18	415
38	Mudstone, silty; thin beds of sandstone in middle.....	5	397
37	Sandstone, fine-grained, siliceous, grey; flaggy to thin-bedded; brownish grey weathering; few thin beds of mudstone...	12	392
36	Siltstone, sandy, dark grey; platy to flaggy; rusty brown weathering.....	7	380

Unit	Lithology	Thickness (feet)	Height above base (feet)
35	Sandstone, fine-grained, grey, slightly argillaceous; flaggy to thin-bedded.....	10	373
34	Sandstone, fine-grained, siliceous; rusty brown weathering.....	5	363
33	Mudstone, black; very silty; platy.....	2	358
32	Sandstone, fine-grained, grey, siliceous; flaggy to thin-bedded; some inter-bedded mudstone, 10%.....	12	356
31	Mostly covered. Mudstone.....	28	344
30	Partly covered. Sandstone.....	9	316
29	Covered.....	5	307
28	Sandstone, fine-grained, grey, siliceous; thick-bedded; rusty brown weathering....	9	302
27	Poorly exposed. Mudstone.....	5	293
26	Sandstone, fine-grained, grey, siliceous; thin- to thick-bedded.....	5	288
25	Siltstone, argillaceous, blocky; grading upward into argillaceous sandstone.....	7	283
24	Sandstone, silty, dark grey; thin-bedded; rusty weathering.....	3	276
23	Mudstone, silty; blocky; rusty weathering....	15	273
22	Sandstone, fine-grained, laminated, grey; ripple marks.....	3	258
21	Mudstone, silty, dark grey; platy; rusty weathering.....	3	255
20	Sandstone, fine-grained; flaggy; mudstone...	2	252
19	Sandstone, very argillaceous, black; flaggy, with mudstone, at base; grading upward into cleaner, thin-bedded sandstone; ripple-marks.....	19	250
18	Sandstone, very argillaceous, black; flaggy; rusty weathering.....	10	231
17	Mudstone, dark grey; rubbly; rusty weathering.....	18	221
16	Sandstone, argillaceous; flaggy.....	5	203

Unit	Lithology	Thickness (feet)	Height above base (feet)
15	Mudstone, poorly exposed.....	17	198
14	Sandstone, as above.....	5	181
13	Mostly covered. Some mudstone.....	55	176
12	Sandstone, fine-grained, grey; thin-bedded; rusty brown weathering.....	10	121
11	Mudstone, poorly exposed.....	25	111
10	Sandstone, fine-grained, grey, slightly argillaceous; thin-bedded; rusty brown weathering.....	6	86
9	Mudstone, very silty, dark grey; rusty weathering; interbedded siltstone, 30%....	6	80
8	Siltstone, sandy, argillaceous; platy; grading upward into sandstone, fine-grained, thin-bedded; some rubbly mudstone.....	7	74
7	Mudstone, very silty, platy; interbedded sandy siltstone and sandstone, 40%, platy; rusty weathering.....	7	67
6	Sandstone, fine-grained, argillaceous, dark grey; flaggy to thin-bedded; rusty weathering; some argillaceous siltstone at base.....	9	60
5	Sandstone, fine-grained, grey, siliceous; flaggy to thin-bedded; rusty brown weathering; six inches of mudstone at base.....	10	51
4	Sandstone, fine-grained, siliceous, black, coaly; poorly bedded.....	2	41
3	Sandstone, fine-grained, homogeneous, grey, siliceous, thin-bedded; grey weathering.....	17	39
2	Sandstone, fine-grained; becoming medium- to coarse-grained, grey, siliceous; thin-bedded; brownish grey weathering....	10	22
1	Mudstone, silty, black; platy, rusty weathering; interbedded sandstone, 30%, argillaceous, platy to flaggy.....	12	12

Unit	Lithology	Thickness (feet)	Height above base (feet)
	Upper beds of Triassic rocks are truncated by the overlying Gething unit. More than 6 feet of additional Triassic beds are present upslope from where measurement begins.		
	TRIASSIC		
	Limestone, dense, grey weathering, and interbedded calcareous black shale.		

Section 64-3. Buckinghorse Formation, south side of Tetsa River, west flank of anticline, opposite Mile 367 to 368, Alaska Highway, 58° 40'N, 124° 07'W.

Unit	Lithology	Thickness (feet)	Height above base (feet)
	BUCKINGHORSE FORMATION		
	Axis of syncline, no higher exposures		
80	Mudstone, rubbly; rusty weathering; few concretions. Inaccessible	100	2,094
79	Mudstone, very silty; blocky, rusty weathering. Inaccessible	25	1,994
78	Mudstone, very silty; blocky; rusty weathering; reddish brown weathering concretions	20	1,969
77	Covered	12	1,949
76	Mudstone, very silty; blocky to platy; some reddish brown weathering concretions	15	1,937
75	Covered	35	1,922
74	Shale, dark grey; rubbly; rusty weathering; slightly siltier and platy at top; few concretions	40	1,887
73	Mudstone, blocky to platy; rusty weathering.	6	1,847
72	Covered by mud flow	200	1,841
71	Siltstone and interbedded shale, platy; poorly exposed	5	1,641
70	Shale, rubbly to platy; rusty weathering; striped appearance; few concretions	70	1,636
69	Covered	20	1,566
68	Shale, dark grey; rubbly at base, becoming siltier and platy toward top; rusty weathering; few sideritic concretions	48	1,546
67	Shale, dark grey; rubbly at base, becoming silty and platy toward top.	37	1,498
66	Covered	20	1,461
65	Mudstone and siltstone (60-40), as above; few concretionary layers	21	1,441

Unit	Lithology	Thickness (feet)	Height above base (feet)
64	Mudstone, silty, and siltstone, argillaceous dark grey; platy; rusty weathering. Siltstone increases from 40% to 60% at top	55	1,420
63	Shale, rubbly, rusty weathering	15	1,365
62	Mudstone, silty, and siltstone, interbedded.	5	1,350
61	Covered	10	1,345
60	Sandstone, fine-grained, argillaceous, dark grey, laminated, cross-laminated; flaggy; greyish brown weathering; some concretions, orange-weathering	4	1,335
59	Covered	15	1,331
58	Shale, dark grey to black; rubbly; rusty weathering	6	1,316
57	Siltstone, argillaceous, dark grey; platy; few thin interbeds of rubbly shale	22	1,310
56	Siltstone, dark grey, argillaceous; platy; rusty weathering; interbedded shale, 20% Inaccessible	25	1,288
55	Shale, dark grey to black; rubbly; rusty weathering; few large concretions	6	1,263
54	Siltstone, argillaceous, laminated, platy, rusty weathering; some interbedded shale	5	1,257
53	Shale, dark grey to black; rubbly; rusty weathering	6	1,252
	drag fold		
52	Shale, dark grey to black; rubbly; rusty weathering	10	1,246
51	Covered	50	1,236
50	Shale, dark grey; platy; rusty weathering; siltstone, argillaceous; platy; 50%	24	1,186
49	Shale, silty, dark grey; platy; rusty weathering; few platy siltstones	20	1,162
48	Mudstone, silty; blocky; siltstone, argillaceous, platy, 50%; few small concretions	10	1,142

Unit	Lithology	Thickness (feet)	Height above base (feet)
47	Siltstone, dark grey, argillaceous; platy ...	5	1,132
46	Sandstone, very fine-grained, silty, laminated, grey; interbeds of shale, rusty weathering, 40%	3	1,127
45	Siltstone, laminated; platy; rusty weathering.	3	1,124
44	Sandstone, very fine-grained, silty; beds 2"-3"; thin interbeds of shale	2	1,121
43	Siltstone, platy; thin interbeds of shale. Inaccessible	26	1,119
42	Shale, rusty weathering; some interbedded platy siltstone. Inaccessible	75	1,093
41	Siltstone, platy; some interbedded shale. Inaccessible	10	1,018
40	Partly covered. Siltstone and shale interbedded. Inaccessible	20	1,008
39	Shale, black, rubbly; some interbedded platy sandstone; few concretionary layers	20	988
	shear		
38	Shale, grading upward into interbedded siltstone and shale	15	968
37	Siltstone and shale interbedded; platy, flaggy	8	953
36	Covered	25	945
35	Shale, black, rubbly, rusty weathering; rare concretions	70	920
34	Shale, black, rubbly to splintery; rusty weathering	28	850
33	Covered	35	822
	shear		
32	Shale, black, rubbly to flaky; rusty weathering; few hard beds.....	25	787
31	Shale, rubbly to platy; few reddish brown weathering concretionary beds. Inaccessible. Estimated.	60	762

Unit	Lithology	Thickness (feet)	Height above base (feet)
30	Siltstone, argillaceous; platy; rusty weathering. Inaccessible.....	20	702
29	Shale, silty; rusty weathering; rubbly, becoming blocky at top; 3" bentonite with shale in middle at 20' above base .	25	682
28	Shale, black; flaky; rusty weathering; thin concretionary beds; 1" of bentonite at 12' from base, ½", at 13' and 15' from base; 6" argillaceous sandstone at top	58	657
27	Shale, silty; platy to blocky; rusty weathering; few concretionary beds	6	599
26	Shale, black; rubbly; rusty weathering.....	10	593
25	Shale, rubbly, rusty weathering; numerous thin concretionary beds producing platy appearance	15	583
24	Shale, black; flaky; rusty weathering; few concretions; 3" of bentonite at 10' and at 15' above base.....	25	568
	small creek gully		
23	Shale, black; flaky to rubbly; rusty weathering few concretions; bentonite 5' below top.	45	543
22	Shale, black; flaky; rusty weathering; thin hard dolomitic beds; few small concretions	22	498
21	Shale, rubbly to flaky; rusty weathering; small sideritic concretions; bentonite at base	23	476
20	Shale, rubbly to platy; rusty weathering; inaccessible and partly covered.....	20	453
	shear		
19	Shale, rusty weathering; rubbly to platy; inaccessible	25	433
18	Shale, rusty weathering; platy; numerous concretions; 1' laminated yellowish grey platy bed at top; inaccessible	60	408

Unit	Lithology	Thickness (feet)	Height above base (feet)
17	Shale, rubbly to flaky; rusty weathering; numerous irregular sideritic concretions with pyritic centres	13	348
16	Shale, black; flaky to blocky; rusty weathering; small concretions; topped by 4" concretionary siltstone.....	22	335
15	Shale, black; flaky to blocky; very rusty weathering; yellow efflorescence; selenite; small sideritic concretions; small pyritic nodules	60	313
14	Shale, rubbly to flaky; rusty weathering.	30	253
	small creek		
13	Partly covered, shale as below.....	11	223
12	Shale, black, very rubbly; soft; very rusty weathering; selenite; some large concretions.....	10	212
	shear		
11	Shale, black, flaky	5	202
	shear		
10	Shale, black, flaky; thin beds of dolomite, yellowish grey weathering; few large kettle concretions	7	197
9	Shale, rubbly; rusty weathering; selenite; large sideritic concretions	15	190
8	Shale, black; rubbly to flaky; rusty weathering; thin sideritic concretions; partly inaccessible	7	175
7	Shale, black; very rubbly; rusty weathering; much yellow efflorescence; selenite; some silty concretionary layers at top	13	168
	shear		
6	Shale, black; rusty weathering, rubbly; rare small sideritic concretions	20	155

Unit	Lithology	Thickness (feet)	Height above base (feet)
5	Shale, silty; blocky; rusty weathering; large oval concretions	12	135
4	Shale to mudstone, black; rubbly to blocky; rusty weathering; some yellow efflorescence; rows of concretions, 4" - 6" thick, reddish brown weathering, some are septarian with well developed quartz crystals	40	123
	small creek		
3	Shale, black; rubbly; rusty weathering; large concretions in rows	40	83
2	Shale, black; rubbly; rusty weathering; rows of large sideritic concretions, reddish brown weathering	15	43
1	Mostly covered. Shale, black; rubbly; rusty weathering; scattered sideritic concretions	28	28
	Contact with underlying Triassic sediments is not exposed but shales apparently lie directly on latter		
	TRIASSIC		
	Siltstone, calcareous, dark grey, platy to irregularly bedded	12	

Section 64-29. Sandstones of Buckinghorse Formation, centre of anticline, Chischa River, Fort Nelson map-area, British Columbia.

Unit	Lithology	Thickness (feet)	Height above base (feet)
	BUCKINGHORSE FORMATION		
24	Mudstone, black; rubbly; rusty weathering; scattered reddish brown weathering concretions.....		
23	Mudstone, blocky; rusty weathering; very silty at top, with sandy siltstone.....	5	267
22	Sandstone, fine-grained, laminated, cross-laminated, siliceous, grey; thick-bedded; brownish grey weathering.....	8	262
21	Mudstone, black; blocky; rusty weathering; grading upward into argillaceous siltstone.....	12	254
20	Sandstone, fine-grained, laminated, grey, siliceous; thick-bedded; brown weathering.....	5	242
19	Mudstone, black; rusty weathering; rubbly at base, grading upward into argillaceous, blocky siltstone.....	31	237
18	Siltstone, argillaceous; blocky; rusty weathering.....	4	206
17	Mudstone, blocky; silty, grading into overlying beds; concretionary at base.....	3	202
16	Sandstone, fine-grained; platy.....	2	199
15	Mudstone, silty; platy.....	1.5	197
14	Sandstone, fine-grained, grey, siliceous, laminated, crosslaminated; thick-bedded; some beds of poorly laminated silty sandstone.....	46	195.5
	shear		
13	Sandstone, fine-grained, laminated, thin- to thick-bedded.....	7	149.5
12	Sandstone, silty, grey, laminated, thin-bedded; light brown weathering; concretionary zones.....	6.5	142.5

Unit	Lithology	Thickness (feet)	Height above base (feet)
11	Mudstone, black; rubbly; rusty weathering; becoming very silty and blocky at top; large reddish brown weathering concretions in lower part.....	66	136
10	Sandstone, fine-grained, laminated, grey; platy.....	1	70
9	Mudstone, black, silty; platy; rusty weathering; some concretions.....	4	69
8	Sandstone, fine-grained, laminated, cross-laminated; thin-bedded; some interbeds of poorly bedded sandstone.....	17	65
7	Sandstone, very silty, grey, siliceous, poorly bedded; brownish grey weathering; concretionary layers.....	5	48
6	Sandstone, fine-grained, grey, laminated, crosslaminated, siliceous; thin-bedded; concretionary layers.....	16	43
5	Sandstone, very silty; poorly bedded.....	5	27
4	Sandstone, fine-grained, grey, laminated, crosslaminated; thin-bedded; grey weathering; concretionary layers.....	3	22
3	Sandstone, fine-grained, silty, laminated; poorly bedded; brownish grey weathering; concretionary layers.....	7	19
2	Sandstone, fine-grained, grey, laminated, thin-bedded; some sandstone as above.....	3	12
1	Sandstone, very silty, grey; poorly bedded; some laminated sandstone lenses; concretionary layers.....	9	9
	River level, end of exposures		

Section 64-25. Buckinghorse Formation, gully on east side of Muskwa River, opposite mouth of Chlotapecta Creek, Fort Nelson map-area, British Columbia.

Unit	Lithology	Thickness (feet)	Height above base (feet)
	SIKANNI FORMATION		
1	1st Sandstone, thin-bedded at base, thick-bedded at top.....	45	
	BUCKINGHORSE FORMATION		
40	Mudstone, very silty; interbedded siltstone and platy sandstone; rusty weathering....	20	2,151
39	Mudstone, black; rubbly; rusty weathering; some thin sandstones and 1' of sandstone at top; thin concretionary layers, reddish brown weathering.....	110	2,131
38	Mudstone, black; blocky; rusty weathering; very silty with siltstone at top; well developed concretionary layers, reddish brown weathering.....	60	2,021
37	Mudstone, black, rubbly, rusty weathering; rare thin bed of platy sandstone; reddish brown weathering concretionary layers.....	185	1,961
36	Mudstone. Inaccessible. Approximately.....	150	1,776
35	Mudstone, black, rubbly; thin lenticular siltstones, 10%.....	20	1,626
34	Mudstone, black; rubbly; rusty weathering; sandstone bed at top; few concretionary layers.....	75	1,606
33	Mudstone, black; rubbly; rusty weathering; platy sandstone, 1" - 3" beds, finely laminated and crosslaminated, 5-10%....	65	1,531
32	Mudstone, black; rubbly; rusty weathering; rare platy sandstone; poorly developed concretionary layers.....	135	1,466
31	Mudstone, black; rubbly; rusty weathering; poorly developed concretionary layers; few separate concretions at top.....	102	1,331

Unit	Lithology	Thickness (feet)	Height above base (feet)
30	Mudstone, black; rubbly; rusty weathering; yellow efflorescence; 1" - 2" beds of platy sandstone at irregular intervals.....	100	1,229
29	Mudstone, black; rubbly; rusty weathering; yellow efflorescence; poorly developed concretionary layers.....	130	1,129
28	Mudstone, black; rubbly; rusty weathering; poorly developed concretionary layers; 1" bed of bentonite at top.....	50	999
27	Mudstone, black; rubbly to splintery; rusty weathering; poorly developed concretionary layers; few thin layers of bentonite; 1" - 2" platy sandstone at top.....	65	949
26	Mudstone, black; rubbly; rusty weathering; few thin beds of platy sandstone toward top.....	30	884
25	Mudstone, black; rubbly; rusty weathering; several beds 3" - 4", laminated silty platy sandstone toward top; few thin bentonite beds.....	80	854
24	Mudstone, black; rubbly; rusty weathering; few sandy concretionary beds, 1" - 2".....	20	774
23	Covered. Approximately.....	75	754
22	Mudstone, black; rubbly to flaky; yellow efflorescence; rusty weathering; few thin beds of platy concretionary sandstone.....	25	679
21	Mudstone, as above; thin concretionary beds give striped appearance.....	60	654
20	Mudstone, black; rubbly to flaky; yellow efflorescence; rusty weathering; few concretionary layers.....	30	594
19	Mudstone, as above; topped by concretionary layers.....	15	564
18	Mudstone, black, flaky to rubbly; yellow efflorescence; rusty weathering.....	50	549
	Remainder of section was measured on cliff immediately above Scatter sandstones. Some gap may occur between these beds and overlying beds measured in main creek		

Unit	Lithology	Thickness (feet)	Height above base (feet)
17	Mudstone, black; rubbly to splintery; rusty weathering; rare concretions, reddish brown weathering.....	125	499
16	Mudstone, black; rubbly; rusty weathering; few concretions, reddish brown weathering.....	50	374
15	Mudstone, black; rubbly to blocky; rusty weathering; siltier at top; some concretions, reddish brown weathering.....	75	324
14	Mudstone, black; rubbly to blocky; rusty weathering; some concretions, reddish brown weathering; topped by 6" of sandstone.....	105	249
13	Sandstone, fine-grained, laminated.....	2	144
12	Mudstone, very silty, black; rusty weathering.....	4	142
11	Sandstone, fine-grained, grey, siliceous, laminated, crosslaminated; cross-bedded, thick-bedded; brownish grey weathering.....	8	138
10	Mudstone, silty, black; rusty weathering; some beds of sandstone, very fine-grained, platy to flaggy, rusty weathering.....	13	130
9	Sandstone, fine-grained, grey, siliceous, laminated, cross-laminated; cross-bedded, thick-bedded; brownish grey weathering.....	6	117
8	Mudstone, silty, black; rusty weathering grading upward into argillaceous siltstone, blocky, rusty weathering; some lenses of sandstone; rare concretions, reddish brown weathering.....	9.5	111
7	Sandstone, fine-grained, siliceous, brownish grey, laminated; concretionary layer....	1	101.5
6	Mudstone, black; rubbly; rusty weathering; becoming slightly siltier at top. Partly talus covered.....	29	100.5
5	Siltstone, argillaceous, black; blocky; rusty weathering; some silty mudstone at base..	7	71.5

Unit	Lithology	Thickness (feet)	Height above base (feet)
4	Sandstone, very fine-grained, grey, siliceous, very finely laminated, crosslaminated; crossbedded, thick-bedded to massive; brownish grey weathering; few concretionary zones; worm burrows and tracks.....	46	64.5
3	Mudstone, very silty, blocky, rusty weathering.....	3.5	18.5
2	Sandstone, fine-grained, grey, siliceous, brownish grey; brownish grey weathering.....	1	15
1	Mudstone, very silty, to siltstone, argillaceous, blocky, black; rusty weathering; few sandy lenses; very silty to sandy at top.....	14	14
	River level; end of exposure		

Section 62-22. Sikanni Formation, Sikanni Chief River, below Barker Creek. Trutch map-area, British Columbia, 57° 15'N, 112° 32'W.

Unit	Lithology	Thickness (feet)	Height above base (feet)
	Top of ridge		
	SIKANNI FORMATION		
	4th Sandstone		
14	Sandstone, fine-grained, grey, finely and uniformly laminated; festoon cross-bedding; thick-bedded; platy; light brownish grey weathering.....	14	351
	3rd Shale		
13	Siltstone, argillaceous, sandy, platy.....	4	337
12	Covered, recessive.....	60	333
	3rd Sandstone		
11	Sandstone, fine-grained, laminated, brownish grey; shaly at base; some intervals of silty mudstone; few concretions.....	16	273
10	Sandstone, fine-grained, laminated, brownish grey; interbedded sandy siltstone, 40%; some crossbedding; light brownish grey weathering.....	7	257
	2nd Shale		
9	Siltstone, argillaceous, sandy; blocky to flaggy; few concretions.....	7	250
8	Covered, recessive.....	85	243
	2nd Sandstone		
7	Sandstone, fine-grained, laminated, brownish grey; argillaceous at base with some shaly layers; platy to thin-bedded; pebbles on upper surface, chert, quartzite, well rounded, as much as 1".....	8	158
6	Sandstone as above; thick-bedded.....	9	150
5	Sandstone, fine-grained, laminated, brownish grey; thin- to thick-bedded; weathers platy; some thin shale layers; cross-bedded.....	25	141

Unit	Lithology	Thickness (feet)	Height above base (feet)
	1st Shale		
4	Siltstone, sandy, argillaceous, flaggy to platy...	3	116
3	Mostly covered, recessive.....	76	113
	1st Sandstone		
2	Sandstone, fine-grained, laminated, brownish grey; thick-bedded.....	28	37
1	Sandstone, fine-grained, laminated, brownish grey; flaggy to thin-bedded; cross-laminated; festoon crossbedding; few concretions.....	9	9
	BUCKINGHORSE FORMATION		
4	Partly covered. Mudstone in lower half; sandstone and interbedded shale in upper 5'.....	42	103
3	Mudstone, silty, blocky; thin concretionary layers and concretions; siltier at top; few thin beds of laminated sandstone.....	29	61
2	Mudstone, silty; blocky; dark grey; small sideritic concretions.....	13	32
1	Shale, dark grey to black, blocky.....	19	19
	River level		

Section 64-27. Sikanni Formation, on escarpment east of Muskwa River, just north of mouth of Kluachesi River, Fort Nelson map-area, British Columbia.

Unit	Lithology	Thickness (feet)	Height above base (feet)
	SIKANNI FORMATION		
	Top of ridge, end of exposures		
23	Mostly covered by talus of sandstone blocks. Upper 50 feet is sandstone, fine-grained, laminated, brown; flaggy to thin-bedded; crossbedded; brown weathering; some mudstone. Some lower sandstones outcrop along the ridge.....	470	812
22	Sandstone, fine-grained, siliceous, grey; thick-bedded to massive brown to grey weathering.....	15	342
21	Mudstone.....	2	327
20	Sandstone, as above.....	20	325
19	Mudstone, black; blocky.....	6	305
18	Sandstone, fine-grained, siliceous; thick-bedded; some mudstone.....	10	299
17	Mudstone and siltstone; interbedded sandstone, 40%.....	7	289
16	Sandstone, fine-grained, poorly laminated, brownish grey, siliceous; thick-bedded to massive; grey weathering; poorly exposed at top.....	35	282
15	Mudstone.....	1	247
14	Sandstone, fine-grained, laminated, cross-laminated, grey, siliceous, thick-bedded to massive; brown to grey weathering; some channel-fill at base; tracks and trails.....	28	246
13	Mudstone, silty; blocky; few thin beds of silty sandstone and rare concretionary layer.....	24	218
12	Siltstone, argillaceous, black to dark grey; some mudstone; sandstone, 40%, fine-grained, laminated, brownish grey weathering; platy to thin-bedded.....	8	194

Unit	Lithology	Thickness (feet)	Height above base (feet)
11	Mudstone, very silty, black; siltstone at top; layers of reddish brown weathering concretions.....	19	186
10	Sandstone, fine-grained, laminated, siliceous; rusty brown to grey weathering.....	1	167
9	Mudstone, silty; blocky; siltier at top, with argillaceous siltstone; few concretions.....	39	166
8	Siltstone, argillaceous; blocky; some interbedded mudstone; thin orange-weathering concretions.....	5	127
7	Mudstone, rubbly, black; interbedded sandstone, 40%, 6" - 1' beds, laminated, rusty brown weathering.....	6	122
6	Mudstone, black; rubbly; rusty weathering; few concretionary layers, reddish brown weathering.....	49	116
5	Sandstone, fine-grained, grey, siliceous; poorly bedded; knobbly; brownish grey weathering.....	9	67
4	Sandstone, fine-grained, laminated, grey, siliceous; massive; brownish grey weathering; few concretions.....	12	58
3	Mudstone, black, silty, blocky; some lenticular sandstone; rusty weathering; some concretions, reddish brown weathering.....	20	46
2	Mudstone, silty, black, blocky; interbedded sandstone, 40%, fine-grained, laminated, platy to flaggy; some concretions, reddish brown weathering.....	11	26
1	Sandstone, fine-grained, laminated grey, crosslaminated; platy to thick-bedded; rusty to brownish grey weathering; few thin beds of mudstone; some concretions, reddish brown weathering.....	15	15
	BUCKINGHORSE FORMATION		
2	Mudstone, very silty, brownish grey; rusty weathering; blocky to platy; 4"-6" beds of argillaceous laminated sandstone; some concretions.....	12	92

Unit	Lithology	Thickness (feet)	Height above base (feet)
1	Mudstone, black; rubbly to blocky; rusty weathering; becoming silty and platy toward top; reddish brown weathering concretions. Partly talus covered.....	80	80
	End of exposure		

Section 62-21. Sully Formation, Sikanni Chief River, south side between Mistahae and Kettle Creeks; Trutch map-area, British Columbia, 57° 17'N, 112° 25'W.

Unit	Lithology	Thickness (feet)	Height above base (feet)
	DUNVEGAN FORMATION		
6	Sandstone, coarse-grained, laminated; massive. Inaccessible.....	45	138
5	Sandstone, fine-grained, laminated; massive...	17	93
4	Shale.....	4	76
3	Sandstone, fine-grained, laminated, brown; thick-bedded.....	10	72
2	Shale and siltstone, interbedded.....	17	62
1	Sandstone, fine-grained, laminated, brown, thick-bedded to massive; cross-bedded; brown weathering.....	45	45
	SULLY FORMATION		
19	Shale, silty.....	3	718
18	Sandstone, fine-grained, laminated; thin-bedded; lenticular; some shale.....	11	715
17	Shale, silty; some thin siltstones in upper part.....	30	704
16	Sandstone, fine-grained, laminated, brown; thin-bedded; brown weathering; inter-bedded platy shale, 40%.....	16	674
15	Mudstone, silty.....	4	658
14	Sandstone, very fine-grained, silty, brownish grey; platy; some interbedded shale.....	3	654
13	Mudstone, silty, blocky; few sideritic layers; siltier at top.....	70	651
12	Mudstone, silty; blocky; rusty weathering; few concretionary layers.....	50	581
11	Covered.....	115	531
10	Mudstone, dark grey; yellow efflorescence; thin layer of bentonite; selenite.....	15	416
9	Covered.....	150	401

Unit	Lithology	Thickness (feet)	Height above base (feet)
8	Mudstone, silty; platy; some siltstone.....	28	251
7	Partly covered. Mudstone, silty.....	14	223
6	Siltstone, argillaceous; platy; rusty weathering; fragmental fossil fragments in layer at top.....	4	209
5	Siltstone, very argillaceous; platy; concretionary sandy and bentonitic layers at top and base; fish fragments.....	2	205
4	Siltstone, very argillaceous; platy; interbedded mudstone; rusty weathering.....	18	203
3	Covered.....	115	185
2	Siltstone, argillaceous, and mudstone; platy; some concretions and platy siltstone at top.....	5	70
1	Mostly covered. Mudstone, rubbly, dark grey to black; sulphur stained.....	65	65
	(May be a gap of 20-30' - contact with Sikanni sandstone not exposed)		

SIKANNI FORMATION

Section 64-31. Dunvegan Formation, on escarpment east of Tuchodi River, Fort Nelson map-area, British Columbia, 58°16'N, 123°25'W.

Unit	Lithology	Thickness (feet)	Height above base (feet)
	DUNVEGAN FORMATION		
	Top of ridge, end of exposure		
21	Conglomerate, grey; massive; some cross-bedding; considerable sandy matrix and very sandy at base; pebbles up to 3", average ½"-1".....	28	478
20	Sandstone, coarse-grained; flaggy to thick-bedded; crossbedded; conglomeratic lenses.....	20	450
19	Conglomerate, grey; massive; pebbles up to 2".....	15	430
18	Mostly covered. Some argillaceous siltstone and mudstone at base.....	32	415
17	Conglomerate, grey; massive; some cross-bedding; pebbles ½" - 1"; much coarse-grained sandstone matrix.....	33	383
16	Conglomerate, grey; massive; some sandy matrix, and sandstone in middle; pebbles ¼" - 2", average 1"; quartz, chert, quartzite, argillite; rounded; black, green, blue, white.....	42	350
15	Partly covered and inaccessible. Mudstone, black to olive brown; rubbly and flaky in talus.....	45	308
14	Conglomerate, grey; massive; brownish grey weathering; matrix of coarse-grained sandstone; lower part is mainly sandstone with abundant streaks and lenses of pebbles; parallel to crossbedded; pebbles, 1/8" - 4"; rounded; black, green, pink, white, grey, blue; light yellowish brown; chert, quartz, quartzite, argillite.....	87	263
13	Covered. Mudstone talus at base, some at top.....	43	176
12	Sandstone, fine-grained, silty, siliceous, greenish grey; thick-bedded at base; becoming argillaceous and silty and very platy at top.....	7	133

Unit	Lithology	Thickness (feet)	Height above base (feet)
11	Mudstone. Poorly exposed.....	3	126
10	Sandstone, medium-grained, siliceous, grey; thick-bedded; brownish grey weathering.....	7	123
9	Mudstone. Mostly covered.....	23	116
8	Mudstone, rubbly to blocky; dark olive grey; siltier at top.....	12	93
7	Mudstone, dark olive brown to dark brownish grey; blocky; very silty in upper 2'.....	17	81
6	Sandstone, fine-grained, to siltstone, brownish grey to greenish grey; thick-bedded; greenish to rusty weathering.....	4	64
5	Mudstone, very silty, platy to blocky; dark brownish grey; 6" bed of sandstone near base.....	6	60
4	Sandstone, medium- to coarse-grained, brownish grey; massive to thick-bedded; brown weathering; conglomeratic lenses.....	13	54
3	Conglomerate, grey; massive; some lenses and streaks of sandstone; pebbles; 1/8"- 2", average ½"-1"; sandier at top; truncates underlying beds.....	34	41
2	Mudstone, very silty, platy; lenticular sandstone, 50%; cut out along slope by overlying beds.....	3	7
1	Sandstone, fine-grained, laminated, siliceous, brownish grey; thick-bedded.....	4	4
	End of exposure		