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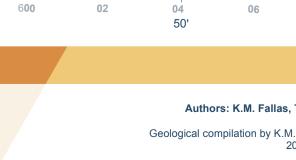
Geoscience Maps

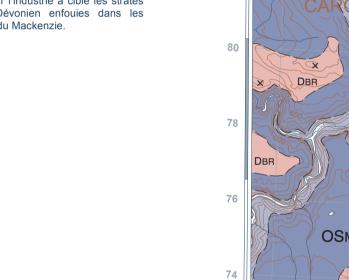
Geological compilation by K.M. Fallas, T. Hadlari, and B.C. MacLean, 2011–2012 Geological field observations by K.M. Fallas, K. Montgomery, M. Sommers, Hadlari R Lemiski R B MacNaughton J Powell 20 D.G. Cook, H.R. Balkwill, and J.D. Aitken, 1969

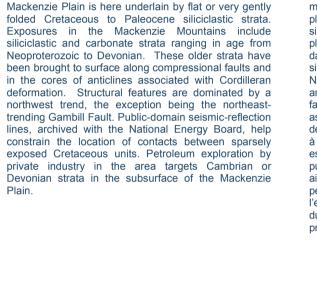
Seismic data interpretation by B.C. MacLean 2010–2012. Stratigraphic sections measured by R.B. MacNaughton, 2012, C.J. Yorath, R.W. Macqueen 1969, J.D. Aitken, 1977, D.K. Norris, 1983, and A.R. Sweet, 1985 and 1988 Geomatics by K.M. Fallas, S.D. Orzeck, and N. Raska

Cartography by S.D. Orzeck Scientific editing by E. Inglis

Authors: K.M. Fallas, T. Hadlari, and B.C. MacLean







96-E/SW 96-E/SE 96-F/SW

6-D/NW 96-D/NE 96-C/NW

96-D/SE

CGM 101 CGM 100 CGM 91

CGM 94 CGM 95 CGM 92

CGM 97 CGM 96 CGM 93

National Topographic System reference and index to adjoining

published Geological Survey of Canada maps

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Abstract

The northeast quadrant of the Carcajou Canyon map

area (NTS 96-D) straddles the Mackenzie Mountains

and Mackenzie Plain, Northwest Territories, rising from

a relatively flat, low-lying plain in the northeast to

Cover illustration

2012-146

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View looking east along the Rouge Mountain River

and orange rocks in the foreground belong to

downstream is Cambro-Ordovician Franklin

from the flank of the Rouge Mountain anticline. Red

Proterozoic Little Dal Group. The yellow exposure

Mountain Formation. Photograph by K.M. Fallas.

Natural Resources Ressources naturelles du Canada

CANADIAN GEOSCIENCE MAP 95

CARCAJOU CANYON

(NORTHEAST)

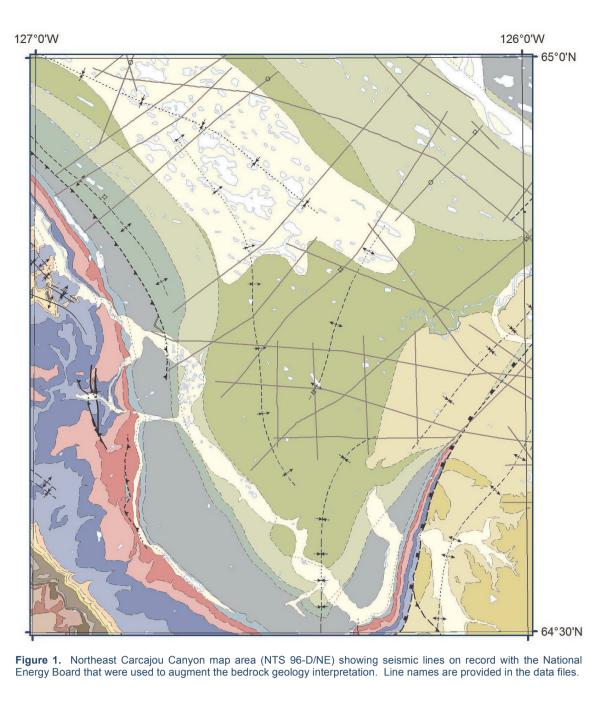
Northwest Territories

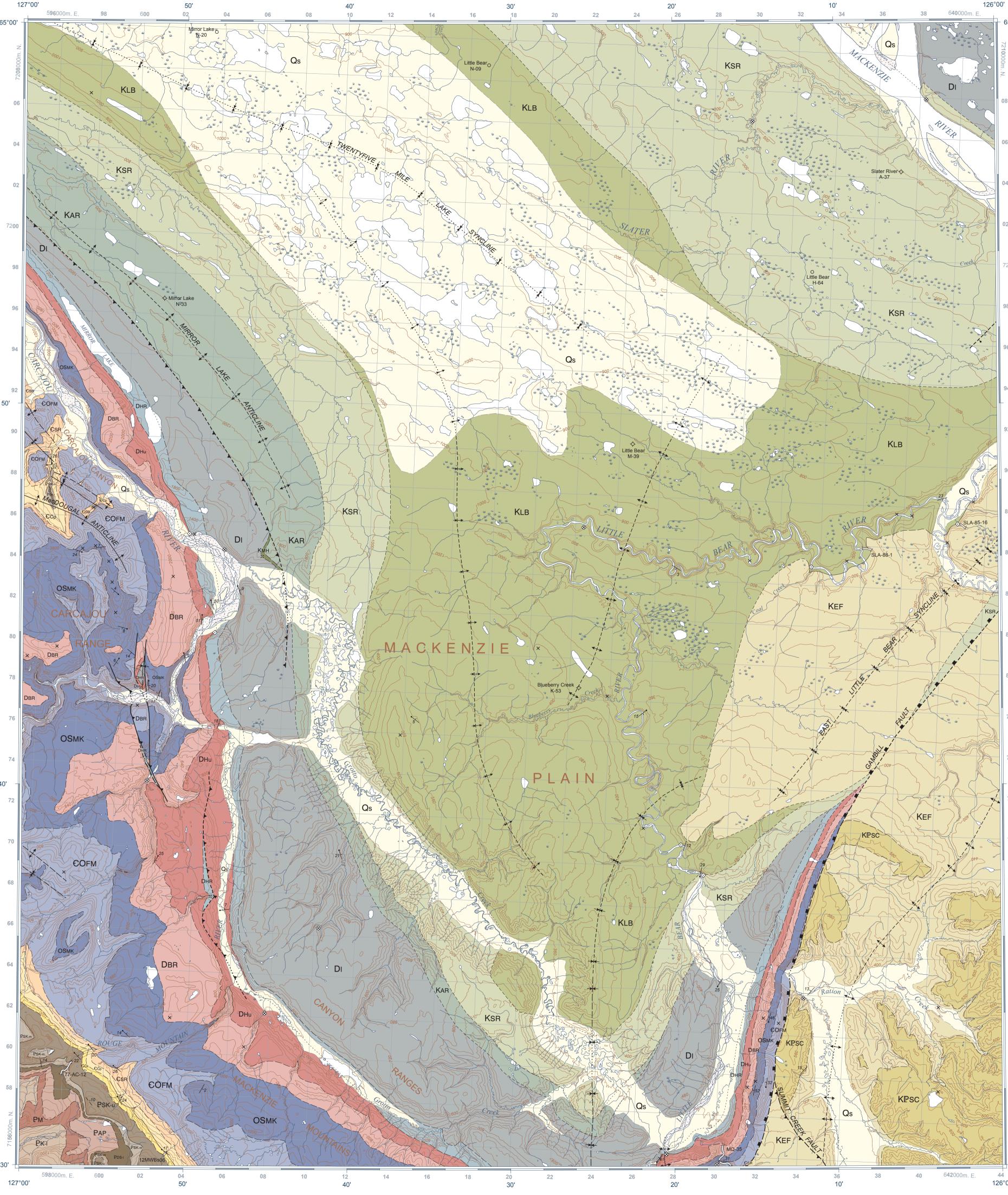
mountainous terrain in the southwest. Much of the

Carcajou Canyon (SNRC 96-D) chevauche les monts Mackenzie et la plaine du Mackenzie (Territoires du Nord-Ouest), où le terrain s'élève depuis une basse plaine relativement plane, au nord-est, à un terrain montagneux, au sud-ouest. La majeure partie de la plaine du Mackenzie repose sur des strates silicoclastiques du Crétacé au Paléocène disposées à plat ou très légèrement plissées. Les affleurements dans les monts Mackenzie comprennent des strates silicoclastiques et carbonatées s'échelonnant en âge du Néoprotérozoïque au Dévionien. Ces strates plus anciennes ont été amenées à la surface le long de failles de compression et dans le coeur d'anticlinaux associés à la déformation cordillérienne. La tendance des entités structurales est à prédominance nord-ouest, à l'exception de la faille de Gambill de direction nordest. Des profils de sismigue-réflexion du domaine public, archivés par l'Office national de l'énergie, ont aidé à circonscrire les contacts des unités du Crétacé peu représentées en affleurement. Dans la région. l'exploration pétrolière par l'industrie a ciblé les strates du Cambrien ou du Dévonien enfouies dans les profondeurs de la plaine du Mackenzie.

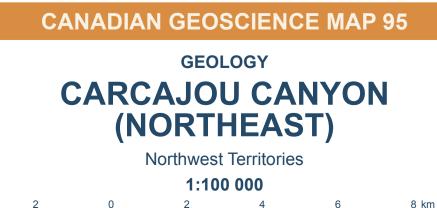
Résumé

Le quadrant nord-est de la région cartographique de





CANADIAN GEOSCIENCE MAP 95



Joint initiative of the Geological Survey of Canada and the Northwest Territories Geoscience Office, conducted under the auspices of the Mackenzie Delta and Corridor Project as part of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) Program.

Logistical support provided by the Polar Continental Shelf Program as part of its ate to promote scientific research in the Canadian No PCSP 02509 01310, 00411, and 00912

Map projection Universal Tranverse Mercator, zone 9. North America Datum 1983

Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications. Elevations above mean sea level are expressed in feet north of 64°45' and metres south of 64°45'

126°00'

6**40**000m. F

QUATERNA	RY
Qs	Quaternary sediment: mud, sand, and gravel: unconsolidated.
	CRETACEOUS TO PALEOCENE Summit Creek Formation: sandstone: lithic arenite, very friable" interbedded with conglomerate: polymict, granules to cobbles, poorly cemented" minor shale: carbonaceous" coal" and ash tuff. Unit locally contains plant remains, and dinosaur fossils in the lower part of the unit.
LATE	CRETACEOUS East Fork Formation: mudstone and shale: locally silty or carbonaceous,
KEF	dark brown to dark grey or black, soft and crumbly, contains sideritic concretions" interbedded with minor sandstone: lithic wacke, grey to brown, very thin- to thin-bedded, friable, laminated, ripple marks, rip-up clasts, and minor trace fossils" and pebble conglomerate: locally occurs at base of unit.
KLB	Little Bear Formation: sandstone: lithic wacke to quartz arenite and chert arenite, mottled grey, greenish-grey, brown, or rusty, thin- to thick-bedded, typically friable and porous, crossbedded, laminated, ripple marks, graded bedding, locally bioturbated" interbedded with mudstone and shale: somewhat silty, dark grey to brown or black, crumbly and soft, minor sideritic concretions" and minor coal.
KSR	Slater River Formation: shale and mudstone: dark brown to dark grey, black, or rusty-brown, soft, crumbly, and fissile, sideritic concretions common, rare fish scales" minor bentonite and ash tuff: white to yellow, pale green, or orange-brown" and minor sandstone: lithic wacke, brown, grey, or rusty, very thin- to thin-bedded, crosslaminated, and bioturbated.
Kar	Y CRETACEOUS Arctic Red Formation: shale and mudstone: locally gypsiferous, dark grey, weathers grey and rusty, variably fissile and soft, sideritic concretions fairly common.
Кмн	Martin House Formation: sandstone: quartz arenite, variably glauconitic, locally conglomeratic, beige to light grey, thin- to thick-bedded, crossbedded, friable, trace fossils common" interbedded with shale or mudstone: medium to dark grey, weathers grey or rusty-brown, proportion of shale and mudstone increases upsection.
DEVONIAN	
Di	Imperial Formation: shale: locally silty, dark grey to greenish-grey, fissile" interbedded with siltstone: locally micaceous or calcareous, greenish-grey to purplish-brown, laminated, bioturbated" and sandstone: lithic wacke to quartz arenite, micaceous, locally calcareous or glauconitic, grey to greenish-grey or brown, very thin- to medium-bedded, laminated and crosslaminated, abundant and diverse trace fossils" and minor limestone: bioclastic, grey to brown or orange, diverse fossil assemblage. Includes Jungle Ridge Member, comprising limestone: lime mudstone, silty, grey, weathers light yellow, very thin- to thin-bedded, laminated, shale partings, and rare fossils.
DHR	Horn River Group: shale: carbonaceous or petroliferous, calcareous to siliceous, locally silty, dark grey or black, weathers grey, black, brown, or rusty, locally fossiliferous" minor limestone: dark grey with tentaculitids, interbedded with shale at base of unit.
DHu	Hume Formation: limestone: wackestone to grainstone, floatstone, medium to dark grey or brownish-grey, typically weathers light grey, thin- to very thick-bedded, parallel to irregular or nodular bedded, fossiliferous with abundant and diverse assemblage. Unit is thicker bedded and cliff-forming in upper part.
DBR	Bear Rock Formation: limestone breccia: variably dolomitic and petroliferous, angular clasts range from granule- to boulder-sized, greyish-brown to grey, weathers light grey, vuggy, massive and rubbly with rare bedded intervals of laminated carbonate, tends to form hoodoos.
ORDOVICIA	N TO SILURIAN Mount Kindle Formation: dolostone: dolowackestone to dolopackstone and
ОЅмк	dolofloatstone, siliceous and cherty, light to dark grey or brownish-grey fresh and weathered surfaces, thin- to very thick-bedded, vuggy, recrystallized, bioturbated, and fossiliferous (mainly silicified corals, crinoids, orthocone cephalopods, and stromatoporoids).
	FO ORDOVICIAN Franklin Mountain Formation: dolostone: dolomudstone to dolograinstone,
С ОFМ	locally calcareous or cherty, grey, cream, or light brown, weathers light grey, yellowish-grey, or orange, very thin- to thick-bedded, typically recrystallized, locally vuggy, stromatolitic, bioturbated, oolitic, crossbedded, or intraclast-bearing" minor shale: greenish-grey or red, fissile, and laminated" and sandstone: lithic wacke to quartz arenite, dolomitic, cream to orange, red, or brown, weathers light orange to red, very thin- to medium-bedded, crossbedded, ripple marks, and bioturbated. Shale and sandstone found in basal part of unit. Alternation, at 1–2 m intervals, of ooid dolograinstone with dolomudstone produces a locally prominent striped appearance in the middle part of the unit.
CAMBRIAN	
ESR	Saline River Formation: shale: silty, grey, red, or green, fissile, minor salt casts, desiccation cracks, and horizontal burrows" evaporite: gypsum, anhydrite, or halite, white and grey to pink or red, very thin- to thin-bedded, bedding typically disturbed and chaotic, dominates middle part of unit" minor dolostone: dolomudstone to dolograinstone, grey to yellow, green, or orange, locally intraclast-bearing, oolitic, stromatolitic" and sandstone: lithic wacke to quartz arenite, calcareous or dolomitic, can be conglomeratic, varicoloured, parallel- and crosslaminated, ripple marks, rip-up clasts, and possible trace fossils.
ССр	Mount Cap Formation: shale: locally silty or dolomitic, dark grey to brown or black, fissile, may contain horizontal burrows, trilobites, and brachiopods, dominates upper part of unit" limestone or dolostone: mudstone to wackestone and bindstone, locally silty, medium to dark grey, weathers orange-brown, parallel to nodular bedded, intraclast-bearing, stromatolitic, bioturbated, few trilobites or brachiopods" and sandstone: quartz wacke to quartz arenite, calcareous and glauconitic, grey to greenish-grey, brown, or orange, very thinto thick-bedded, trace fossils abundant.
ECk	Mount Clark Formation: sandstone: quartz arenite, locally glauconitic, very fine- to coarse-grained, can be conglomeratic at base of unit, white to tan or grey, weathers white to grey or brown, very thin- to thick-bedded, parallel-bedded to crossbedded, horizontal and vertical burrows locally abundant, but of low diversity" minor shale or siltstone: grey.
NEOPROTEROZOIC (Tonian to Cryogenian) Mackenzie Mountains Supergroup (Katherine Group and Little	
Dal G	
PSK-u	Stone Knife Formation, upper part: lime mudstone or dolomudstone: locally argillaceous, light to dark grey, weathers orange, yellowish-grey, and beige, very thin- to thick-bedded, typically parallel-bedded and laminated, some crosslamination, locally stromatolitic, may include molar-tooth structure" minor shale: dark grey, weathers grey or brown, fissile, occurs as partings or very thin interbeds with limestone.
PSK-m	Stone Knife Formation, middle part: shale: variably calcareous, brick red or light green fresh and weathered surfaces, fissile, abundant concretions" lime mudstone: grey or greenish-grey, weathers light greenish-grey, very thin-bedded, nodular, interbedded with shale.
PDS-I	Dodo Creek and lower Stone Knife formations: Dodo Creek Formation: shale and siltstone: dark grey, lesser red or green, synaeresis cracks common" interbedded with sandstone: quartz arenite, slightly micaceous, cream, grey, brown, or red, thin- to medium-bedded, parallel-bedded and crosslaminated" and dolomudstone: locally calcareous, dark grey, weathers grey or orange, thin- to medium-bedded, locally intraclast-bearing. Overlain by lower part of Stone Knife Formation: limestone: lime mudstone to dolomudstone, medium to dark grey, weathers lighter shades of grey, beige, or orange, parallel-laminated, intraclast-bearing, molar-tooth structure, and locally stromatolitic" interbedded with minor shale: dark grey to black. Unit includes a noticeable orange oncolite at base of unit and a locally prominent light grey stromatolite bioherm at top of unit. Combined unit is semirecessive.
Рар	Katherine Group (Eduni, Tawu, Grafe River, Etagochile, Shattered Range, McClure, and Abraham Plains formations) Abraham Plains Formation: sandstone: quartz arenite, hematitic, cream to brown, light grey, orange, pink, or maroon, thin- to very thick-bedded, well cemented, parallel-bedded and crossbedded, crosslaminated, ripple marks,
	rip-up clasts" interbedded with minor conglomerate: granule to pebble, white to orange-brown pink red or purple massive to crossbedded" and sittstope:

rip-up clasts" interbedded with minor conglomerate: granule to pebble, white to orange-brown, pink, red, or purple, massive to crossbedded" and siltstone: locally shaly or micaceous, maroon or green, very thin-bedded, and crosslaminated.

McClure Formation: shale: locally dolomitic or silty, grey, rusty-brown, green, and maroon, fissile, desiccation cracks" interbedded with dolostone: commonly cherty, silty, or sandy, medium grey, weathers to orange or orange-brown, very thin- to thick-bedded, typically stromatolitic, pisolitic, oolitic, intraclast-bearing, and parallel- or crosslaminated" and sandstone: lithic wacke to quartz arenite, can be micaceous, hematitic, or dolomitic, cream to brown, grey, red, or purple, very thin- to medium-bedded, crosslaminated, ripple marks, rip-up clasts, sole marks, and desiccation cracks.

Katherine Group, lower part: Eduni, Tawu, Grafe River, Etagochile, and Shattered Range formations: sandstone: quartz arenite, locally hematitic or micaceous, locally conglomeratic, white to light grey, pink, brown, or orange, very thin- to very thick-bedded, well cemented, parallel- and crossbedded, ripple marks, rip-up clasts, and desiccation cracks" interbedded with minor shale: silty, greenish-grey to pink or red, fissile, desiccation cracks" and dolomudstone: may be calcareous, grey to orange or red, medium-bedded, parallel-laminated, and intraclast-bearing. Shale and carbonate dominate in the Tawu and Etagochile formations.

Geological contact Defined Approximate / Inferred Concealed Drift contact Approximate Fault, motion undefined ----- Defined — — — · Approximate Concealed Normal fault, symbol on hanging-wall side ---- Inferred Reverse fault, symbol on hanging-wall side — — — · Approximate ---- Inferred Concealed Thrust fault, symbol on hanging-wall side ------ Defined ------ Approximate ---- Inferred Concealed Anticline, upright Defined — <u>+</u> — — · Approximate ------ Inferred ···· Concealed Syncline, upright Defined - + Approximate --¥---- Inferred ····X····· Concealed Inclined anticline, upright, shorter arrow on steeper limb ----- Inferred ····↓······ Concealed Monocline, synclinal bend, shorter arrow on steeper limb --+ Inferred ····••• Concealed × Visited outcrop, no measurements Outcrop observed remotely from ground or air Bedding strike and dip, inclined, upright ²⁴ Evidence for younging direction known ¹⁴ No evidence for younging direction ¹⁰, No evidence for younging direction, estimated measurement Fossil locality MQ-35 Measured stratigraphic section with name of section Slater River A-37 Petroleum well with well name Dry and abandoned

Little Bear N-09 O Unknown status

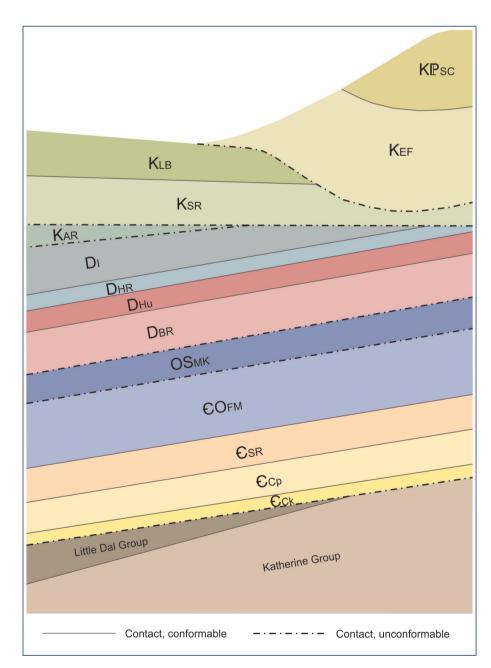


Figure 2. Schematic stratigraphic relationship diagram for northeast Carcajou Canyon map area (NTS 96-D/NE). Erosional unconformities at the base of some Cretaceous units reflect tectonic activity adjacent to the Keele Arch during Cordilleran deformation.

126°00

Some geographic names on this map are not official.

Mean magnetic declination 2013, 23°9'E, decreasing 30' annually. Readings vary from 23°18'E in the NW corner of the map to 22°59'E in the SE

corner of the map.

Geological Survey of Canada welcomes corrections or additional information from users.

Data may include additional features not portrayed on this map. See documentation accompanying the data. Additional references are included in the map information document.

This publication is available for free download through GEOSCAN (http://geoscan.ess.nrcan.gc.ca/).

NOTES

The authors have updated and revised map unit terminology from the Operation Norman map (Aitken et al., 1974). In general, terminology for Cambrian units is that of Dixon and Stasiuk (1998) with modifications by Fallas and MacNaughton (2012), Silurian and Devonian usage follows that of Morrow (1991), and Cretaceous to Paleocene formation names are those of Dixon (1999). Neoproterozoic to Ordovician units have recently undergone revision to their terminology, as outlined below.

Recent stratigraphic work in the Mackenzie Mountains has formalized the Mackenzie Mountains Supergroup and revised its formation-level nomenclature. Within the Katherine Group, the Eduni, Tawu, Grafe River, Etagochile, and Shattered Range formations of Long and Turner (2012) correspond to the lower part of the Katherine Group as shown on the GSC maps for Carcajou Canyon (Aitken et al., 1974), and to the K1 to K5 divisions of Aitken et al. (1978) and Long et al. (2008). Delineation of these new formations depends on the ability to recognize the recessive Tawu and Etagochile formations. These formations are seldom exposed in the mapping area and so the five lower formations of the Katherine Group were grouped during mapping. The McClure and Abraham Plains formations correspond to the upper Katherine Group on the Carcajou Canyon map (Aitken et al., 1974), and to the K6 and K7 divisions of Aitken et al. (1978) and Long et al. (2008).

The Little Dal Group previously was mapped in this region as two units: H5, and Little Dal Formation (Aitken et al. 1974). Regionally, those two units were reorganized into seven informal units of formation scale by Aitken (1981). In the present mapping area, Aitken's terminology can be applied as follows: the lower part of H5 corresponds to the 'Mudcracked formation" the upper part of H5 and the Little Dal Formation correspond to the 'Basinal Assemblage'. Most recently, Turner and Long (2012) have formalized the internal stratigraphy of the Little Dal Group. Their nomenclature applies as follows to the present study area: the Mudcracked formation is now the Dodo Creek Formation" the Basinal Assemblage is now the Stone Knife Formation, consisting of four informal members (1, 2, 3, and 4). In the present series of maps the Dodo Creek Formation and the lower Stone Knife Formation (equivalent to its member 1) have been combined due to similarity of weathering profile and colour. Our middle Stone Knife Formation corresponds to the lower part of member 2 (typically a bright red shale in this area), and the upper Stone Knife Formation encompasses the upper part of member 2 (carbonate dominated).

Previous work by the Geological Survey of Canada in northeast Carcajou Canyon map area (Aitken and Cook, 1974) subdivided the Cambro-Ordovician Franklin Mountain Formation into three informal units. In ascending order they are: Cyclic member, Rhythmic member, and Cherty member (Norford and Macqueen, 1975). On the present maps, these older unit names correspond, in ascending order, to informal lower, middle, and upper members of the Franklin Mountain Formation. These lower, middle, and upper members correspond to the units 1, 2, and 3 of the Franklin Mountain Formation described by Turner (2011).

For detailed information on surficial deposits, here shown as 'Quaternary sediment', see Duk-Rodkin and Hughes (2002).

The names Summit Creek Fault, Twentyfive Mile Lake syncline, Mirror Lake anticline, and East Little Bear syncline have been introduced to facilitate discussion of these structural features. The names Gambill Fault and MacDougal anticline have been incorporated from the older Carcajou Canyon map (Aitken et al., 1974). Cordilleran deformation in this map area has generated folds and thrust faults interpreted to be detached within Proterozoic, Cambrian, or Devonian strata. The Gambill Fault is represented as a reverse fault on the basis of seismicreflection data showing the development of a salt wall above steep faults in Proterozoic strata (MacLean and Cook, 1999).

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