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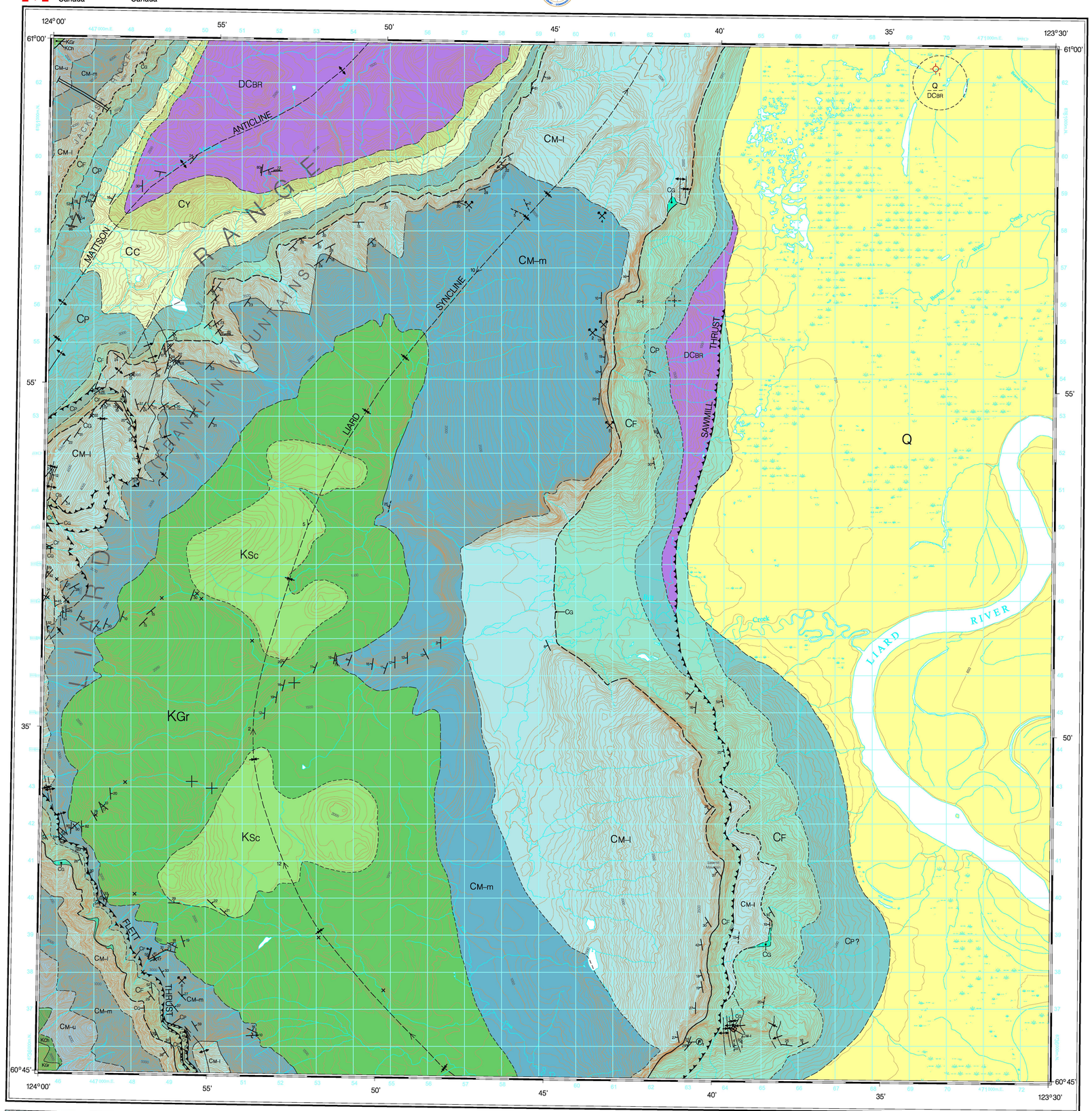
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA



LEGEND

QUATERNARY and Recent

- Q — *Glaciofluvial and fluvial sediments: poorly consolidated gravel, sand, and silt*

MESOZOIC

CRETACEOUS

LOWER CRETACEOUS

- KSc — *SCATTER FORMATION: Resistant, greenish-grey, glauconitic, laminated sandstone; medium- to thick-bedded; silty, concretionary mudstone common in middle part of unit.*
- KGr — *GARBUTT FORMATION: Grey shale and siltstone with sideritic concretions; minor thin-bedded, finely laminated sandstone; may include the Chinkeh Formation where that unit is too thin to map separately.*
- KCh / KCh — *CHINKEH FORMATION: Chert-pebble conglomerate overlain by bioturbated quartz arenite with variable chert content, and argillaceous siltstone; woody or plant debris common.*

PALEOZOIC

PERMIAN

LOWER CARBONIFEROUS

MATTSON FORMATION

- CM–u — *UPPER MEMBER: Light to medium grey, fine- to coarse-grained, locally calcareous or dolomitic quartz arenite and sub-chert-arenite; subordinate fossiliferous limestone, dolostone, and grey to green shale; sandstone commonly shows large-scale crossbedding; fossils in the limestone are commonly silicified.*
- CM–m — *MIDDLE MEMBER: Grey to buff to brown, poorly- to well-indurated, fine-grained quartz arenite with subordinate siltstone and dark shale; minor coal and sandy dolostone; sandstone shows fine- to large-scale crossbedding; typically forms sharp-based, thick-bedded, fining-up sequences.*
- CM–l — *LOWER MEMBER: Greyish-orange weathering, light grey or buff, well-indurated, fine- to very fine-grained quartz arenite interbedded with siltstone and dark grey shale; minor coal, dolostone, and lithoclast breccia; crosslaminae and trace fossils common; typically thin- to medium-bedded with coarsening-up sequences.*
- CG / CG — *GOLATA FORMATION: Dark grey to black shale and silty mudstone; subordinate muddy sandstone and fossiliferous limestone and dolostone; proportion of carbonates decreases and sandstone increases up section.*
- CF — *FLETT FORMATION: Grey, cherty, skeletal lime wackestone and packstone; subordinate grainstone, calcareous shale, mudstone and spiculite; medial unit comprises sandstone, siltstone and mudstone with subordinate limestone; massive bedding; megascale intraformational truncation surfaces common.*
- CP — *PROPHET FORMATION: Greyish-orange weathering, dark grey, calcareous to dolomitic, bedded chert and spiculite; subordinate medium to dark grey, cherty skeletal lime wackestone and packstone, sandstone, and black to dark grey shale; well bedded, commonly rhythmic; megascale intraformational truncation surfaces common.*
- CC — *CLAUSEN FORMATION: Thinly laminated non-calcareous black shale, with minor calcareous layers; minor siltstone and resistant black mudstone; rusty weathering pyritic mudstone nodules.*
- CY — *YOHIN FORMATION: Thin bedded, dark coloured sandstone; interbedded black shale; fossiliferous; limestone or siltstone are dominant in some exposures.*

DEVONIAN AND CARBONIFEROUS

- DCBR — *BESA RIVER FORMATION: Dark grey to black shale, locally weathers buff; sparsely fossiliferous; minor interbedded greyish - orange weathering sandstone, siltstone, lithoclast breccia, dolostone and limestone increasing up section; scattered sideritic nodules.*

Abstract:

This picturesque area is dominated by the Liard Range, Sawmill Mountain and the broad floodplain of the Liard River. The topography is largely structurally controlled: the broad central valley contains Cretaceous rocks preserved in the Liard Syncline; whereas the ranges are underlain by Carboniferous rocks, predominantly sandstones of the Mattson Formation, forming the upturned synclinal limbs. Only one thrust fault beneath Sawmill Mountain is required to account for the observed distribution of units. The Liard Thrust cannot be documented in this map area. Structures are characterized by a dramatic swing from NW-trends in the south to NE-trends in the north. This is believed to result from some combination of subsurface boundary conditions (Hynes and Dixon, 2005). Stratigraphy is updated from earlier regional-scale mapping (Douglas and Norris, 1959, 1976), with the addition of the Prophet, Golata and Chinkeh formations. This map confirms that pre-Cretaceous erosion has removed the Upper Mattson within the Liard Syncline, although it is preserved farther west in the Liard Range. On the basis of a single well penetration, the northern part of the floodplain appears to be underlain by shales of the Besa River Formation. Because abundant small-scale structures in the Flett and Prophet formations in the south broaden the outcrop width of units, the Prophet Formation may extend eastward beneath the river in this area. Six significant coal occurrences have been identified in strata of the Mattson Formation (Hill, 1978). Three of these are listed in the NORMIN database of mineral occurrences of the Northwest Territories.

FOSSIL LOCALITIES

LOCALITY	CATALOGUE NUMBER	FOSSIL	AGE	EASTING, NORTHING (NAD83)	REFERENCE
F_1	*C-417626*	*corals*	*Early Carboniferous; late Middle to early Late Visẽan.*	*463057, 6736113*	*Bamber, 2002*

MINERAL LOCALITIES

LOCALITY #	STATION NAME	COMMODITY	REFERENCE	EASTING, NORTHING (NAD83)
1	*SM-6 & 7*	*coal, 5.0 ft (1.5m)*	*Hill, 1978*	*456816, 6758783*
2	*SM-9*	*coal, approx. 5 ft (1.5m)*	*Hill, 1978*	*460761, 6755056*
3	*L-2*	*coal, 4.1 ft (1.25m)*	*Hill, 1978*	*460750, 6755400*
4	*L-7*	*coal, 3.0 ft (0.9m)*	*Hill, 1978*	*460720, 6758450*
5	*L-1*	*coal, 4.6 ft (1.4m)*	*Hill, 1978*	*460940, 6752820*
6	*SM-3*	*coal, 30 ft (9m) shale with 6 thin coal seams*	*Hill, 1978*	*449376, 6737359*

MAP SYMBOLS

- *Geological boundary (defined, approximate, assumed)*
- *Outcrop stations*
- *Outcrop; remote observation*
- *Bedding (inclined)*
- *Bedding; estimated (inclined)*
- *Crossbedding (dip direction and dip; uncorrected)*
- *Joints*
- *Normal fault*
- *Anticline (defined, approximate, assumed)*
- *Syncline (defined, approximate, assumed)*
- *Anticlinal kink fold - (defined, approximate, assumed) (See diagram below)*
- *Synclinal kink fold- (defined, approximate, assumed) (See diagram below)*
- *Fold axis (trend and plunge; calculated from bedding)*
- *Fault, thrust (known, approximate)*
- *Section location*
- *Mineral locality*
- *Well (dry and abandoned)*
- *Fossil locality*

STRATIGRAPHIC SECTIONS

SECTION	NOTES
1. Section 6, 6A	*127 m, the upper part of Flett Fm (includes Golata at the top); 1132 m, most of the Mattson Fm, includes Lower, Middle and Upper members (Harker, 1963)*
	(NOTE: Section position is approximate, based on published descriptions.)

LIST OF WELLS

	UWID	FULL NAME	SPUD DATE	TD (m)	SURFACE LOCATION (Easting, Northing) NAD83
1	300L206100123300	MESA NAHANNI BUTTE L-20	04 Feb 1973	1468.5	469714, 6762368

FOLD SYMBOLOGY

Fold symbols as used on the map apply to folds having cross-sectional geometries depicted in this diagram (see Stockmal et al., 2002).

References:

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1976: Geology, Fort Liard, District of Mackenzie; Geological Survey of Canada Map 1379A, 1 sheet, 1:250 000 scale.

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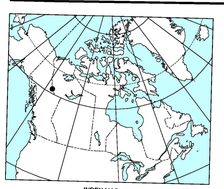
2005: Geological mapping and analogue modelling of the Liard, Kotaneelee, and Tlogotsho Ranges, Northwest Territories, Bulletin of Canadian Petroleum Geology, vol. 53, no. 1, pp. 67-83.

Stockmal, G.S., Kubli, T.E., Currie, L.D., and McDonough, M.R.,
2002: Map symbology and analysis of box and polyclinal folds, with examples from the Rocky Mountain Foothills of northeastern British Columbia and the Liard Ranges of southeastern Yukon Territory and southwestern Northwest Territories; Canadian Journal of Earth Sciences, vol. 39, pp.145-155.



INDEX MAP

Canada

CONTOUR INTERVAL 50 FEET
Elevations in Feet above Mean Sea Level
North American Datum 1983
Transverse Mercador Projection

NATMAP CARTNAT
Canada's National Geoscience Mapping Program
Le Programme national de cartographie géoscientifique du Canada

GEOLOGY

SAWMILL MOUNTAIN (95B/13)

DISTRICT OF MACKENZIE

NORTHWEST TERRITORIES

Scale 1:50 000 Échelle 1/50 000

Kilometres 1 0 1 2 3 Kilomètres

Universal Transverse Mercator Projection | Projection transverse universelle de Mercator

UNIVERSAL TRANSVERSE MERCATOR GRID, ZONE 10

OPEN FILE
DOSSIER PUBLIC
4940
GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
2005

Open files are products that have not gone through the GSC formal publication process.

Les dossiers publics sont des produits qui n'ont pas été soumis au processus officiel de publication de la CGC.

95F/01 Clausen Creek	95G/04 The Twisted Mountain	95G/03 Nahanni Butte
95C/16 Etanda Lakes (GSC OF 1676)	95B/13 Sawmill Mountain (GSC OF 4940)	95B/14 Netla River
95C/09 Chinkeh Creek (GSC OF 3845)	95B/12 Mount Flett	95B/11 Denedothada Creek

NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO ADJOINING GEOLOGICAL SURVEY OF CANADA MAPS

Compilation by L. S. Lane and G. F. Hynes based on fieldwork and studies of vertical air photographs 2001, 2002.
THIS MAP IS A PRODUCT OF THE CENTRAL FORELAND NATMAP PROJECT

Geology from field work by L.S. Lane and G. F. Hynes with additional data from Hill (1978).

Geological cartography by S.M. Romancyshyn and S. Leong

Any revisions or additional geological information from the user would be welcomed by the Geological Survey of Canada

Recommended citation:
Lane, L.S. and Hynes, G.F.
2005: Geology, Sawmill Mountain (95B/13), District of Mackenzie, Northwest Territories; Geological Survey of Canada, Open File 4940, 1 map, scale 1:50,000.