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GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA

LEGEND

CENOZOIC

QUATERNARY
PLEISTOCENE AND RECENT

Q — *Glacial till, alluvium, and colluvium; unit designators in parentheses are the inferred underlying bedrock units.*

TERTIARY
(?)PLIOCENE

Tmg — *Microgabbro dyke, possibly correlative with Maitland Volcanics.*

MESOZOIC

CRETACEOUS
UPPER LOWER AND UPPER CRETACEOUS
SUSTUT GROUP (units KTC and KBP)
CAMPANIAN AND MAASTRICHTIAN

KBP — *BROTHERS PEAK FORMATION: sandstone, siltstone, conglomerate, and tuff; sandstone and siltstone are cream- and grey-weathering; tuff is cream-weathering; conglomerate in laterally continuous sheets is most common near base.*

APTIAN OR ALBIAN TO CAMPANIAN

KTC — *TANGO CREEK FORMATION: micaceous sandstone, siltstone, mudstone, and minor quartz grit and pebble conglomerate; sandstone is grey- and green-weathering, occurring as laterally continuous sheets and as lenses; siltstone and mudstone are grey-, black-, and maroon-weathering.*

JURASSIC
UPPER MIDDLE TO UPPER JURASSIC
BOWSER LAKE GROUP (units JBT–JBE)

JBE — *EAGLENEST ASSEMBLAGE (deltaic assemblage): conglomerate, sandstone, siltstone, mudstone, and rare coal; arranged in coarsening- and fining-upward cycles of mudstone to pebble or cobble conglomerate; prominently rusty-weathering and 30 to 80% conglomerate; sheets of conglomerate, up to 50 m thick, include planar beds, tabular-planar cross-stratification and trough cross-stratification, sets locally up to tens of metres thick; sandstone is green-, brown-, and grey-weathering, and has planar cross-stratification and hummocky cross-stratification; sparse marine fossils, but abundant plant fossils, including silicified tree fragments.*

JBMC — *MUSKABOO CREEK ASSEMBLAGE (shelf assemblage): sandstone, siltstone, and conglomerate; primary lithofacies is sandstone, forming laterally continuous, thin- to thick-bedded sheets; less common are siltstone interbedded with sandstone, and lenses of conglomerate; sandstone is green-, brown-, and grey-weathering, thin- to thick-bedded, and locally arranged in coarsening-upward cycles; includes burrows, bivalve coquina, and other marine fossils, common ripple marks and crossbedding, and local hummocky cross-stratification; conglomerate increases in proportion and thickness upsection.*

JBT — *TODAGIN ASSEMBLAGE (slope assemblage): siltstone, fine-grained sandstone, and conglomerate; mainly laminated siltstone and/or fine-grained sandstone, which is dark grey- to black-weathering and includes thin, orange-weathering claystone beds and syndepositional faults and folds; chert-pebble conglomerate occurs as lenses; marine fossils.*

LOWER AND LOWER MIDDLE JURASSIC
HAZELTON GROUP (units JHGfs–JHSQ)
PLIENSBACHIAN TO BAJOCIAN
SPATSIZI FORMATION (units JHSu–JHSQ)

JHSQ — *QUOCK MEMBER: siliceous, well bedded, (?)tuffaceous siltstone, siltstone, and limy siltstone; black-, cream-, rusty-, and pink-weathering.*

JHSM — *MELISSON MEMBER: siliceous and calcareous siltstone and fine-grained sandstone.*

JHSW — *WOLF DEN MEMBER: shale, dark grey- to black-weathering, with minor calcareous concretionary beds.*

JHSJ — *JOAN MEMBER: siltstone, with minor mudstone, limestone, and local basal conglomerate.*

JHSu — *Undivided Spatsizi Formation: siltstone, siliceous siltstone, calcareous siltstone, mudstone, fine-grained sandstone.*

LOWER JURASSIC
LOWER PLIENSBACHIAN
COLD FISH VOLCANICS (units JHCu–JHCs)

JHCs — *Subaerial mafic lava flows interbedded with felsic air-fall tuff and nonwelded ignimbrite, and minor felsic sills, welded ignimbrite, conglomerate, sandstone, shale, and subaqueous mafic lava.*

JHCm — *Marine mafic lava, minor sandstone, shale, limestone, tuff, and subaerial mafic lava.*

JHCf, JHCfi, JHCfs — *Felsic volcanic rocks, including sills, dykes, welded and nonwelded ignimbrite, air-fall tuff-breccia, and lava, with minor mafic lava and epiclastic rocks.* JHCfi: *welded ignimbrite; minor nonwelded ignimbrite and felsic sills.* JHCfs: *felsic sills; minor felsic lava and ignimbrite.* JHCfd: *felsic dykes.*

JHCe, JHCes — *Epiclastic and bioclastic rocks: lahar, breccia, conglomerate, sandstone, siltstone, shale, and limestone, with minor tuff and lava.* JHCes: *shale, siltstone, and limestone.*

JHCl — *Limestone, minor siltstone, and shale.*

JHCu — *Undivided Cold Fish Volcanics.*

HETTANGIAN
GRIFFITH CREEK VOLCANICS (units JHGf and JHGm)

JHGm — *Mafic lava flows, mainly with phenocrysts of plagioclase and augite or hornblende, minor welded ignimbrite and felsic sills, some hosting grains of feldspar, biotite, quartz, or hornblende.*

JHGf, JHGfs — *Felsic to intermediate sills, ignimbrite, and air-fall tuff, some of the units rich in plagioclase, biotite, hornblende, or quartz, with minor epiclastic rocks and mafic lava.* JHGfs: *felsic to intermediate sills, biotite-phyric.*

EARLY JURASSIC
SPATSIZI RIVER STOCK

EJSR — *Fine-grained alkali-feldspar granite; 190.0 ± 7.1 Ma (U-Pb).*

UPPER TRIASSIC TO LOWER JURASSIC
(?)CARNIAN AND (?)NORIAN TO HETTANGIAN AND/OR LOWER SINEMURIAN

TJc, TJcl — *Conglomerate, sandstone, shale, mafic to intermediate volcanic breccia, and olistostrome; conglomerate clasts are mainly hornblende and plagioclase porphyry andesite, but include augite-phyric mafic lava and other volcanic rocks, and felsic to intermediate granitoid rocks.* TJcl: *conglomerate containing abundant clasts of Norian limestone, and varicoloured chert; older than Griffith Creek volcanics.*

TJ — *Undivided Stuhini Group, unit TJc, and Griffith Creek volcanics.*

TJl — *Light grey micrite.*

TJu — *Undivided Stuhini Group, unit TJc, Griffith Creek volcanics, and Cold Fish Volcanics.*

TRIASSIC
UPPER TRIASSIC
(?)CARNIAN TO NORIAN
STUHINI GROUP (unit uTSs)

uTSs — *Mudstone, shale, sandstone, and olistostrome; minor conglomerate and mafic lava.*

G — *Gossan.*

Geological boundary (defined, approximate, assumed or inferred beneath unit Q)

Trace of individual beds from ground observation and airphoto interpretation

Fault, unknown displacement (defined, approximate, assumed or inferred beneath unit Q)

Thrust fault (defined, approximate, assumed or inferred beneath unit Q); symbol on hanging-wall side

Normal fault (defined, approximate, assumed or inferred beneath unit Q); symbol on downthrown side

Steeply dipping fault, dip unknown (defined, approximate, assumed or inferred beneath unit Q); U *on upthrown side,* D *on downthrown side*

Anticline, trace of axial surface (defined, approximate); arrow on line indicates direction of plunge

Syncline, trace of axial surface (defined, approximate, overturned); arrow on line indicates direction of plunge

Open, inclined anticline, trace of axial surface (defined); long arrow points in direction of dip of axial surface

Open, inclined syncline, trace of axial surface (defined, approximate); long arrow points in direction of dip of axial surface

Mafic dyke

Cross-section location. The cross-sections for this map area are shown in Figure 171 of GSC Bulletin 577 (Evenchick and Thorkelson, in press) — A B

Bedding (horizontal, inclined, vertical, overturned) — 30, 25

Cleavage (inclined) — 20

Fault — 15

Fossil location

*Mineral occurrence (*from British Columbia MINFILE; *see Table 1 below)* — 25

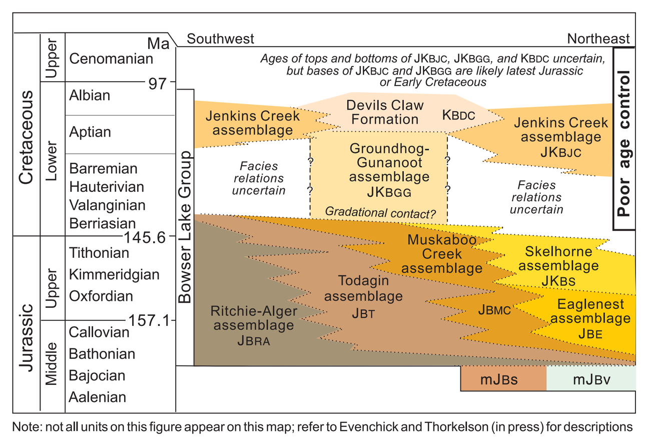
Radiometric age (in Ma) — 200

Conglomerate

Icefield

ID	MINFILE	NAMES	EASTING	NORTHING	COMMODITY	STATUS
18	104H 017	NATION PEAK	506500	6387700	Barite, Pb	Showing

Table 1. Mineral occurrence data for Cold Fish Lake area.



Note: not all units on this figure appear on this map; refer to Evenchick and Thorkelson (in press) for descriptions

Figure 1. Approximate ages and relationships of units in the Bowser Lake Group

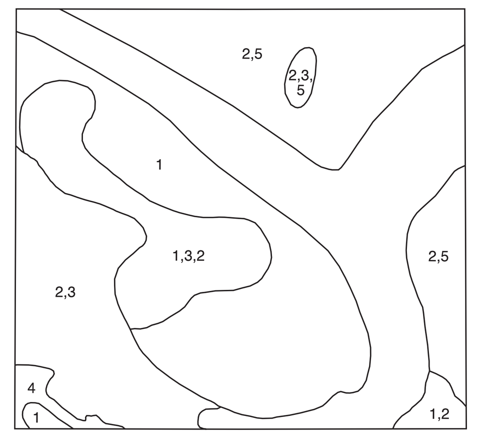


Figure 3. Reference map for NTS 104 H/10

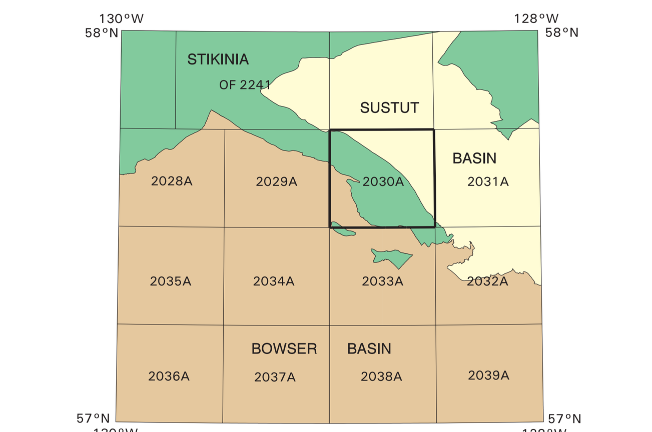


Figure 2. Tectonic elements of Spatsizi River map area (NTS 104 H) and location of NTS 104 H/10 (Map 2030A)

Sources of information for this compilation are geological mapping by 1) D.J. Thorkelson, 1986, 1987; 2) C.A. Evenchick, 1985, 1986, 1988 (with P.S. Mustard), 1989; 3) H. Gabrielse and H.W. Tipper, 1979, 1981, 1983, (1984); 4) Thomson et al. (1986); and 5) Eisbacher (1974). Dates in parentheses are years of publications. Other dates are years of fieldwork from which fieldnotes are the source of information.

Previous geological maps of the region are by Geological Survey of Canada (1957), Eisbacher (1974), Gabrielse and Tipper (1984), Thomson et al. (1986), and Thorkelson (1992).

Geology of the surrounding region (NTS 104 H) and descriptive notes are given by Evenchick and Thorkelson (in press).

REFERENCES

Eisbacher, G.H.
1974: Sedimentary history and tectonic evolution of the Sustut and Sifton basins, north-central British Columbia; Geological Survey of Canada, Paper 73-31, 57 p.

Evenchick, C.A. and Thorkelson, D.J.
In press: Geology of the Spatsizi River map area, north-central British Columbia; Geological Survey of Canada, Bulletin 577.

Gabrielse, H. and Tipper, H.W.
1984: Bedrock geology of Spatsizi map area (104 H); Geological Survey of Canada, Open File 1005, scale 1:125 000.

Geological Survey of Canada
1957: Stikine River area, Cassiar District, British Columbia; Geological Survey of Canada, Map 9-1957, scale 1:254 440.

Thomson, R.C., Smith, P.L., and Tipper, H.W.
1986: Lower to Middle Jurassic (Pliensbachian to Bajocian) stratigraphy of the northern Spatsizi area, north-central British Columbia; Canadian Journal of Earth Sciences, v. 23, p. 1963–1973.

Thorkelson, D.J.
1992: Volcanic and tectonic evolution of the Hazelton Group in Spatsizi River (104 H) map area, north-central British Columbia; Ph.D. thesis, Carleton University, Ottawa, Ontario, 299 p.

Copies of this map may be obtained from the Geological Survey of Canada:
601 Booth Street, Ottawa, Ontario K1A 0E8
3303-33rd Street, N.W., Calgary, Alberta T2L 2A7
101-605 Robson Street, Vancouver, B.C. V6B 5J3

LOCATION MAP

Geology by C.A. Evenchick (1985–1989), D.J. Thorkelson (1986, 1987), P.S. Mustard (1988), H. Gabrielse and H.W. Tipper (1979, 1981, 1983), R.C. Thomson (1983), and G.H. Eisbacher (1973)

Map compilation by C.A. Evenchick and D.J. Thorkelson

Digital geological cartography by C.L. Wagner, S. Churchill, and R. Cocking, Earth Science Sector Information Division (ESS Info), D. Dunn and C. Evenchick, Geological Survey of Canada

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

MAP 2030A

GEOLOGY

COLD FISH LAKE

BRITISH COLUMBIA

Scale 1:50 000/Échelle 1/50 000

kilometres 1 0 1 2 3 4 kilomètres

Universal Transverse Mercator Projection
North American Datum 1927

Projection transverse universelle de Mercator
Système de référence géodésique nord-américain, 1927

Digital base map from data compiled by Geomatics Canada, modified by ESS Info

Mean magnetic declination 2004, 23°48´E, decreasing 15.5´ annually

Elevations in feet above mean sea level

Contour interval 100 feet

Published 2004

104 H/14	104 H/15	104 H/16
104 H/11 2029A	104 H/10 2030A	104 H/9 2031A
104 H/6 2034A	104 H/7 2033A	104 H/8 2032A

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

Recommended citation:
Evenchick, C.A. and Thorkelson, D.J.
2004: Geology, Cold Fish Lake, British Columbia; Geological Survey of Canada, Map 2030A, scale 1:50 000.

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