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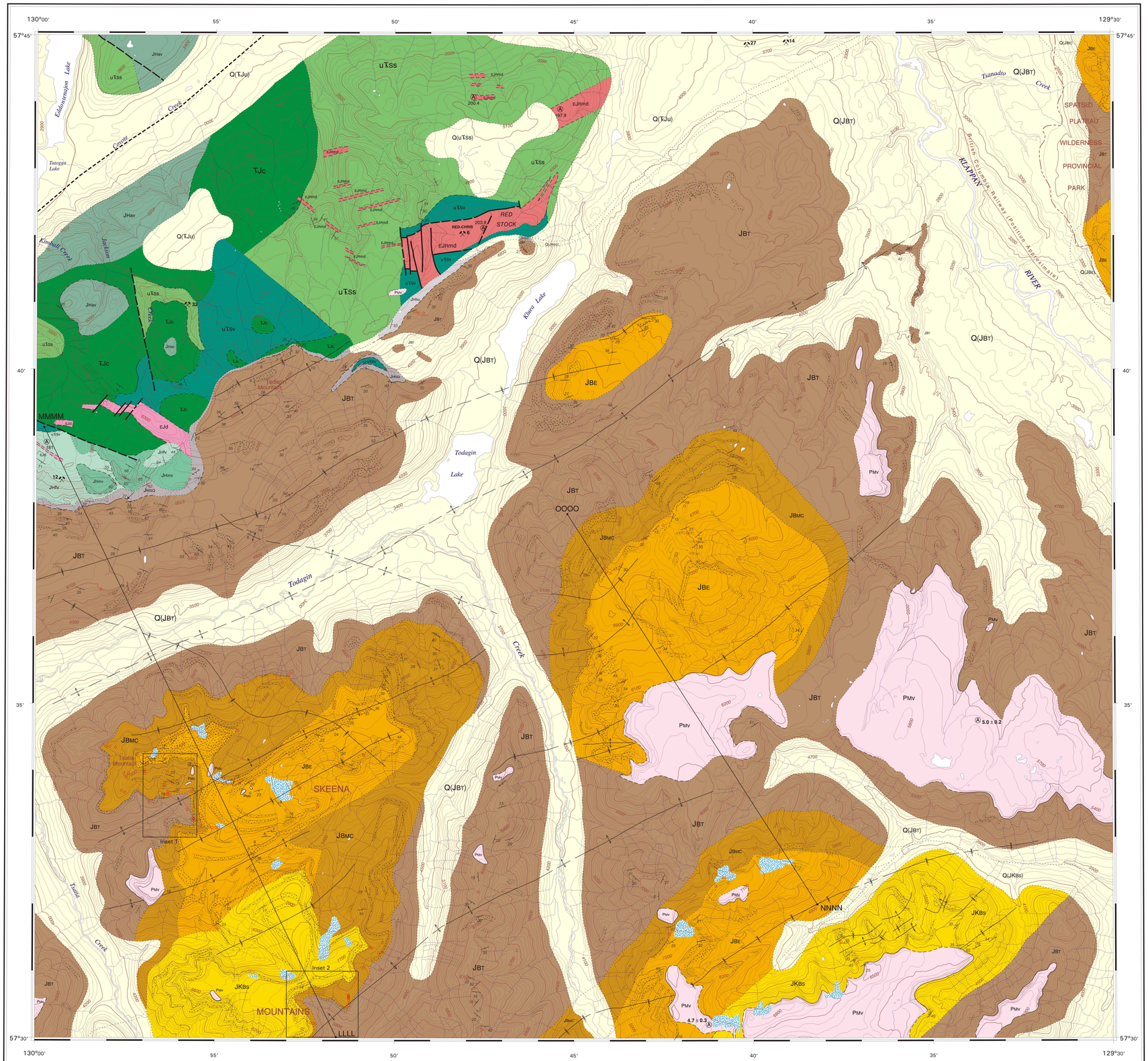
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA



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

Canada

Geology by C.A. Evenchick (1985, 1989, 1990) and G.M. Green (1989)

Map compilation by C.A. Evenchick

Digital geological cartography by C.L. Wagner and R. Cocking, Earth Sciences 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 2028A

GEOLOGY

KLUEA 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 the ESS Info

Mean magnetic declination 2004, 23°48′E, decreasing 15.4′ annually

Elevations in feet above mean sea level

Contour interval 100 feet

104 G/16	104 H/13	104 H/14
104 G/9	104 H/12 2028A	104 H/11 2029A
104 G/8	104 H/5 2035A	104 H/6 2034A

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

Published 2004

LEGEND

CENOZOIC

QUATERNARY
PLEISTOCENE AND RECENT

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

TERTIARY
PLIOCENE

PMv — *MAITLAND VOLCANICS: olivine basalt flows; columnar jointed, with rare pillows and breccia; 5.2 to 4.6 Ma (K-Ar; dated rocks are in 104 H/5, /12, /13).*

MESOZOIC

JURASSIC AND CRETACEOUS
UPPER JURASSIC AND LOWER CRETACEOUS
BOWSER LAKE GROUP (unit JKBs)

JKBs — *SKELHORNE ASSEMBLAGE (deltaic assemblage): thinly intermixed and varicoloured siltstone, sandstone, and conglomerate (with or without coal), commonly arranged in coarsening- and thickening-upward cycles; common features of sandstone are parallel bedding, crossbedding, ripples, burrows, bivalve coquina, and brown-, green-, and grey-weathering; conglomerate is rusty- and grey-weathering, but constitutes a lower proportion (15–30%) of the unit than in the Eaglenest assemblage; conglomerate units, up to 50 m thick, cap cycles up to 70 m thick, and tops locally have megaripples; plant and marine fossils are ubiquitous, and trace fossils including Skolithus and Diplocraterion are present, as are tree fragments several metres long.*

JURASSIC
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, with 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 synsedpositional faults and folds; chert-pebble conglomerate occurs as lenses; marine fossils.*

LOWER AND MIDDLE JURASSIC
HAZELTON GROUP (units JHMV–JHSQ)
PLIENSBACHIAN TO BAJOCIAN
SPATSIZI FORMATION (units JHSU and JHSQ*)*

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

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

PLIENSBACHIAN TO TOARCIAN

JHFV — *Felsic volcanic, volcaniclastic, and epiclastic rocks: includes breccia, conglomerate, feldspathic wacke, felsic volcanic sandstone, dark mudstone, and welded lapilli, ash, and dust tuffs; volcanic rocks aphyric to locally quartz-feldspar-phyric, locally flow-banded (massive rhyolite is ca. 181 Ma, U-Pb).*

JHAV — *Andesitic volcanic breccia and conglomerate: feldspar-hornblende–porphyritic, andesitic to dacitic debris flows and lahars, minor flows; includes intercalated green and maroon epiclastic conglomerate and crystal lithic wacke, locally altered to epidote-chlorite-calcite or chlorite-calcite.*

JHMV — *Mafic to intermediate volcanic rocks: plagioclase microphyric amgdaloidal flows and pillow breccia; massive and columnar-jointed flows; local pillowed flows; includes intercalations of feldspathic wacke and siltstone.*

EARLY JURASSIC

EJD — *Massive, equigranular pyroxene diorite.*

EJRMD — *Red Stock and related intrusions: hornblende monzonite, quartz monzonite porphyry; 203.8 ± 1.3 Ma (U-Pb); dykes (197.9 Ma, U-Pb) are hornblende quartz diorite, monzodiorite, and monzonite.*

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

TRJC — *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, felsic to intermediate granitoid rocks, and limestone.*

TRJU — *Undivided Stuhini Group, unit TRJc, and Griffith Creek volcanics; may include Cold Fish Volcanics; unit only inferred on this map to underlying unit Q.*

TRIASSIC
UPPER TRIASSIC
(?)CARNIAN TO NORIAN
STUHINI GROUP (units uTSs and uTSv)

uTSv — *Mafic lava flows, mainly aphyric to augite-phyric; minor conglomerate, sandstone, mudstone, limestone, and olistostrome.*

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

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)

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

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

Open, inclined anticline, trace of axial surface (defined, approximate); 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

Cross-section location. The cross-sections for this map area are shown in Figure 173 of GSC Bulletin 577 (Evenchick and Thorkelson, in press) A B

Bedding (inclined, vertical) 30 90

Cleavage (inclined, vertical) 20 90

Fold axis 10

Fossil location

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

Radiometric age (in Ma) 200

Conglomerate

Icefield

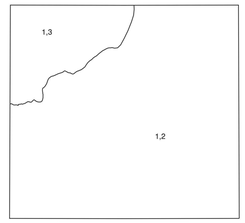


Figure 1. Reference map for NTS 104 H/12

Sources of information for this compilation are geological mapping by 1) C.A. Evenchick and G.M. Green, 1989, 1990, Green (1992); 2) H. Gabrielse and H.W. Tipper, 1979, 1981 (most of the fieldwork by T. England and R. Hughes in 1981) (1984); and 3) Ash et al. (1997). Geology of the Red-Chris deposit is generalized and modified after Schink (1977), who inferred contacts beneath unit Q based on surface trenches and drill data, and from recent mapping by Ash et al. (1997).

U-Pb ages of units JHfv and EJRmd from Friedman and Ash (1997) and Ash et al. (1997).

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) and Gabrielse and Tipper (1984). Geology of the surrounding region (NTS 104 H) and descriptive notes are given by Evenchick and Thorkelson (in press).

REFERENCES

Ash, C.H., Macdonald, R.W.J., Stinson, P.K., Fraser, T.M., Read, P.F., Psutka, J.F., Nelson, K.J., Arden, K.M., Friedman, R.M., and Lefebure, D.V.
1997: Geology and mineral occurrences of the Tatogga Lake area; British Columbia Ministry of Energy and Mines, Open File 1997-3 (June 1998 digital version).

Evenchick, C.A. and Thorkelson, D.J.
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Friedman, R.M. and Ash, C.H.
1997: U-Pb age of intrusions related to porphyry Cu-Au mineralization in the Tatogga Lake area, northwestern British Columbia; *in* Geological Fieldwork 1996; British Columbia Ministry of Employment and Investment, Paper 1997-1, p. 291–297.

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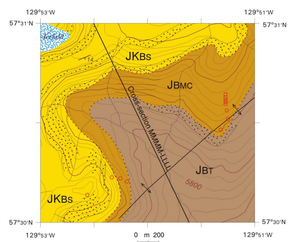
Geological Survey of Canada
1957: Stikine River area, Cassiar District, British Columbia; Geological Survey of Canada, Map 9-1957, scale 1:253 440.

Green, G.M.
1992: Detailed sedimentology of the Bower Lake Group, northern Bowser basin, north-central British Columbia; M.Sc. thesis, Carleton University, Ottawa, Ontario, 197 p.

Schink, E.A.
1977: Geology of the Red-Chris porphyry copper deposit, northwestern British Columbia; M.Sc. thesis, Queen's University, Kingston, Ontario, 211 p.



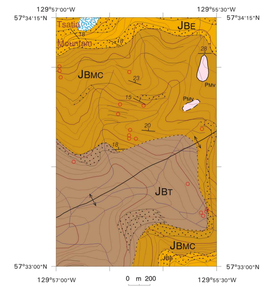


Figure 2. Detail of areas with high density of fossil locations

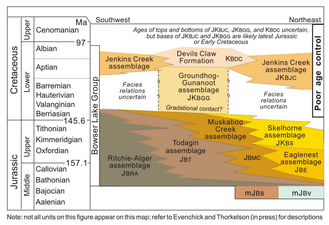


Figure 3. Approximate ages and relationships of units in the Bowser Lake Group

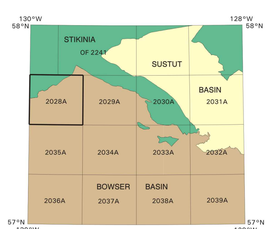


Figure 4. Tectonic elements of Spatsizi River map area (NTS 104 H) and location of NTS 104 H/12 (Map 2028A)

ID	MINFILE	NAMES	EASTING	NORTHING	COMMODITY	STATUS
6	104H 005	RED-CHRIS; MAIN; EAST; CHRIS; RED; SUS; WINDY; MONEY; WINDY 1-12	452200	6395440	Cu, Au, Pb, Zn, Mo	Developed prospect
12	104H 011	RAM; RAM 1-10	441000	6388750	Mo	Showing
14	104H 013	BONANZA	461240	6400660	Cu, Au, Pb, Zn, Mo	Showing
27	104H 026	ELDORADO	460150	6400600	Cu, Au, Pb, Zn, Mo	Showing
32	104H 031	GIN	444542	6393563	Cu, Au, Ag, Pb, Zn, As, Hg, Sb	Showing

Table 1. Mineral occurrence data for Kluea Lake area.

Recommended citation:
Evenchick, C.A. and Green, G.M.
2004: Geology, Kluea Lake, British Columbia; Geological Survey of Canada, Map 2028A, scale 1:50 000.