



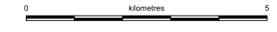
British Columbia Geological Survey - Geological Survey of Canada
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 GSC Open File 8757

Turtle Lake Geology

NTS 104M/16

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Scale 1:50 000*



LEGEND

This legend adopts a consistent, easily parsed, machine-readable format. Descriptive segments are separated by the pipe symbol (|), as follows: composition | colour, texture | mineralogy | structure | other distinguishing features | interpreted environment, correlation, age (isotopic, fossil).

LAYERED ROCKS

UPPER CRETACEOUS

Windy-Table suite

- uKW undivided volcanic and volcanosedimentary strata; compositionally diverse, ranging from basalt flows to rhyolite tuff ||| isotopic age determinations are ~86.5 Ma, 80.63 ± 0.07 Ma, 79.7 ± 1.3 Ma (Mihalynuk et al., 2011) and ~3m south-southeast of the map area, 85.0 ± 1.6 Ma (Zagorevski et al., 2017)
- uKWa andesitic, medium-grained feldspar porphyry flows and interflow breccia | dark grey weathering | interlayered on scale of 1-10 m | generally flat-lying, ribbed outcrops with resistant flows and relatively recessive interflow units
- uKWb basalt flows and tuff | dark grey, green tuff and black basalt; locally with sparse, light-coloured lapilli; fine-grained ||| clastic-rich part of the unit formed zircon dates at 79.7 ± 1.3 Ma
- uKWc monomict volcanic conglomerate | grey-green, commonly orange-weathering, dense, medium-grained | feldspar > hornblende-porphyrityc | clasts ranging up to metre size
- uKWv rhyolite lapilli tuff to dust tuff | light grey, pale green, to rusty red weathering | typically aphyric ||| tuff on Tahli lakeshore dated at 80.63 ± 0.07 Ma, Sunday Peak includes probable flow breccia and conglomerate dated at ~86.5 Ma

LOWER CRETACEOUS

- lKc limestone breccia with quartz-rich sandstone matrix | maroon | ferruginous | limestone clasts angular to rounded ||| interpreted as karst deposits containing detrital zircons as young as 111 Ma; where too small to be shown to scale, localities are marked with "

LOWER JURASSIC

Laberge Group

- lLs undivided marine sedimentary rocks of the Whitehorse Trough; mainly coarse wacke and lesser argillaceous and conglomeratic arenites | map area to the west and south contains ammonites of Sinuotitan, Puzosia, and possibly Toarcian age. Regionally ranges from Hettangian (in Yukon) to Bajocian (south of Taku River)
- lLw feldspathic wacke, lesser conglomerate and siltstone to argillite interbeds | mineral grains commonly coarse | feldspar > quartz; where locally hornblende-rich indicated by 'hb' | tabular beds and homogeneous dikes up to 10 m thick
- lLr siltstone and argillite | rusty and angular weathering ||| commonly well-layered, centimetres thick beds | well indurated
- lLrf Riechhofen formation: rhythmically bedded argillite-siltstone couplets | alternate dark brown and tan || beds generally 1-10 cm thick ||| interpreted as over lobe turbidite fan deposits; occurs at multiple stratigraphic levels

CARBONIFEROUS TO EARLY JURASSIC

- Former Cache Creek composite terrane divided here into upper plate Atlin terrane (Nahlin and Nakina suites) and lower plate Tahli terrane (Horsfield and Keshik formations)
- uPhb Nakina suite: basalt flows, hyaloclastite and related silt and dikes | aphyric to finely feldspar- and lesser pyroxene-phyric ||| age unknown in map area, but affiliation with Nakina basalt and tephritic intrusive rocks to the southwest suggests a Middle to Upper Permian age
- uPhm marlite tectonite, mainly horzorigite, lesser harzorigite and dunite ||| occurs as lenses along the Silver Salmon fault | age unknown in map area, but affiliation with Nakina basalt and tephritic intrusive rocks to the southwest suggests a Middle to Upper Permian age
- uPhk Keshik Formation: mainly neoclastic argillite, lesser cherty argillite, argillite, siltstone and rare conglomerate (grey to black, to white where strongly recrystallized; argillite interbeds can be bleached yellow to white and rusty where pyritic) | well bedded, "ribbed", locally strongly sheared and phacocoidal ||| not directly dated in the Turtle Lake area | contains Middle Tertiary radiolaria at Graham Creek (20 km south). "Redlands Formation" is a legacy unit, and may include chert belonging to the Carboniferous to Permian Horsfield Formation as well as Middle Tertiary to Lower Jurassic Farnsworth Formation best defined near Atlin
- uPhl Horsfield Formation limestone | light-grey to cream-weathering, locally dark grey especially with increase in chert component (CPHs1) | mainly massive, locally well-bedded, especially with increasing chert content ||| age based on fossils and detrital zircons ranges from Carboniferous to Upper Permian
- uPhv Horsfield Formation volcanic rocks: mainly carbonate-cemented tuff | green and white to maroon; may display dun weathering | commonly chertified; commonly chertified; typically display coarse layered basalt geochemical characteristics | detrital zircons near Turtle Lake suggests a Late Carboniferous to Early Permian age of volcanism; lenses too small to show at the scale of the map are denoted by "

INTRUSIVE ROCKS

- Early Eocene Hyder suite, ~56 Ma (also known as "Slicko intrusive suite")
 - EEHq quartz diorite | light grey normally bedded, more abundant than hornblende | blocky weathering ||| two separate bodies within the map area returned isotopic ages of 56 Ma
 - EEHd diorite or gabbro
 - EEHg granodiorite | light grey to nearly white weathering | border zones may contain greater concentrations of biotite and hornblende than leucocratic interior |||
 - EEHh quartz-feldspar-biotite porphyry | orange to greenish-weathering ||| commonly pyritic ||| tabular body ||| probably Early Eocene

Cretaceous Coast Belt intrusions

- LKq granite | light grey, medium- to coarse-grained
- LKg granodiorite to tonalite | light orange to light grey, medium- to coarse-grained ||| typically biotite > hornblende, locally K-feldspar porphyritic ||| includes Racine body with cooling age of 84 Ma

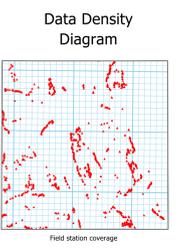
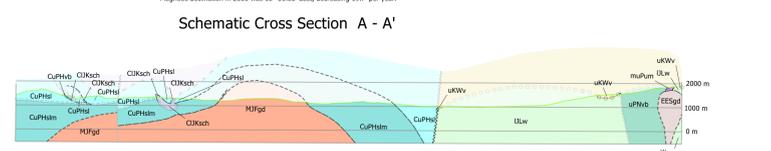
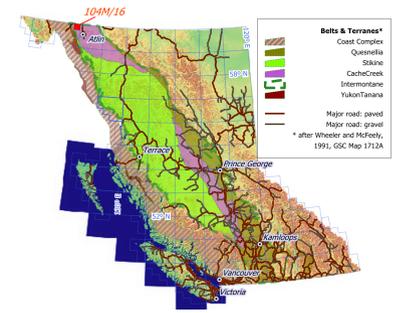
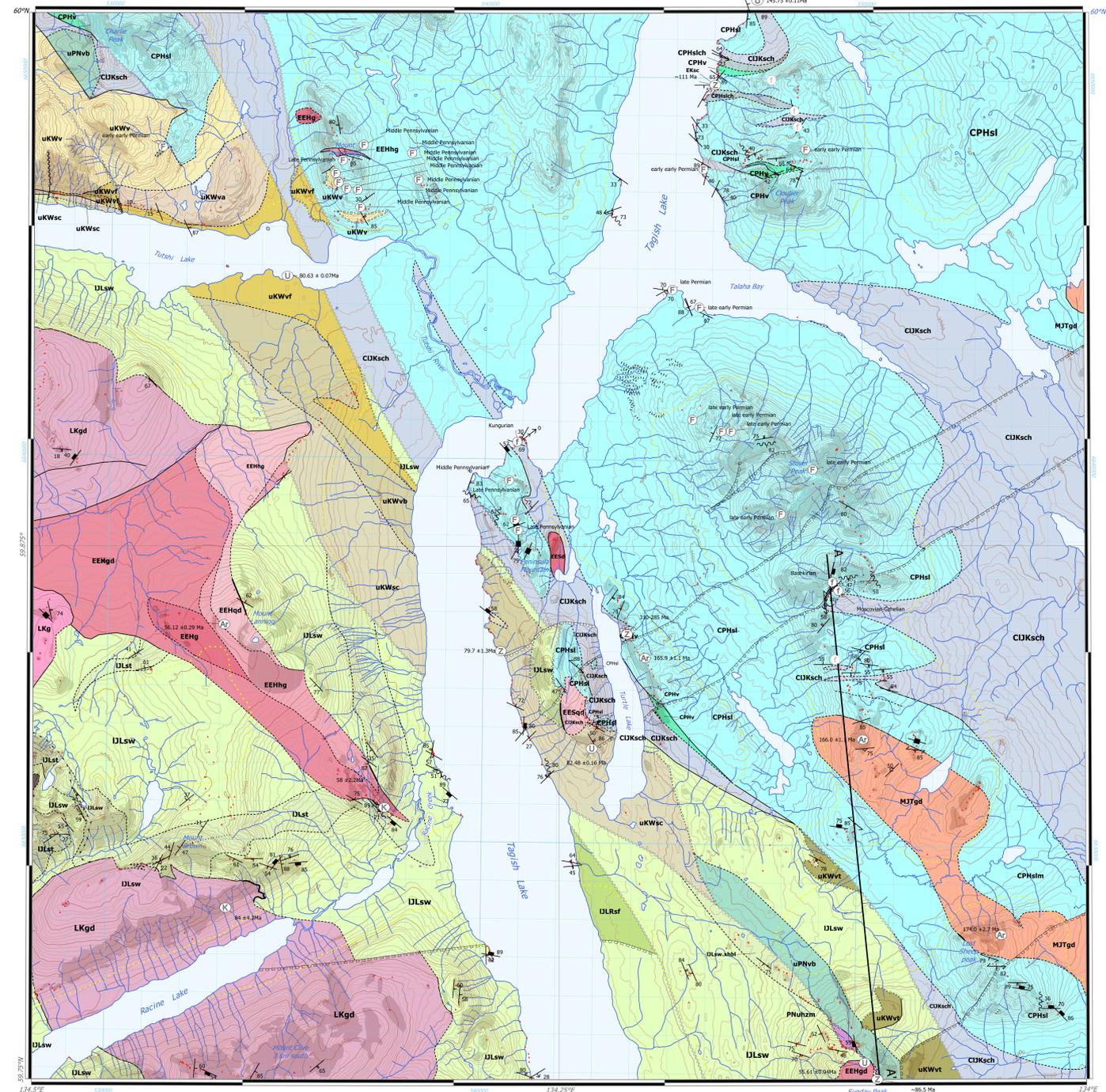
Middle Jurassic Fourth of July suite, ~172 Ma

- MJFg polyphase granite to diorite | white to dark grey to pink, medium- to coarse-grained, locally pegmatitic ||| syn-kinematic fabrics, mainly in early, more mafic phases cut by isotropic, typically more felsic phases | late lamprophyre dikes may be part of suite | cooling ages in map area range from 166 to 174 Ma

SYMBOLS

- Geological contact: defined, approximate, inferred
- Unconformity: defined, approximate, inferred
- Fault: defined, approximate, inferred
- Detachment fault, approx. inferred
- Thrust fault, defined, approx. inferred
- Bedding: tops indicated, overturned, inclined, vertical
- Igneous flow banding, dike
- Slaty cleavage, schistosity (inclined, vertical), minor fold
- Joint, brittle fault
- Fossil occurrence: macrofossil, microfossil
- Isotopic age: U-Pb zircon CA-TIMS, LA-ICPMS/SHRIMP, 40-39Ar
- Thick Quaternary cover, approximate limit in valley bottoms
- Esker flow direction indicated
- Lakes, wetlands (swamps and marshes)
- Outcrop
- Field observation station

* mapping coverage is highly irregular and does not conform with the BC Geological Survey 1:50,000 mapping specification of at least one field station per square kilometre. In many areas, satellite imagery of various vintages and lacking georeferencing have been used to extrapolate contacts. Location of such contacts may vary by up to ~500 m.



Sources of geological data

Atken, J.D., 1959. Atlin map-area, British Columbia. Geological Survey of Canada, Memoir 307, 89 p.
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 Zagorevski, A., Mihalynuk, M.G., Joyce, N., and Anderson, R.G., 2017. Late Cretaceous magmatism in the Atlin-Tagish area, northern British Columbia (104M, 104N). In: Geological Fieldwork 2016, British Columbia Ministry of Energy and Mines, British Columbia Geological Survey Paper 2017-1, pp. 133-152.

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