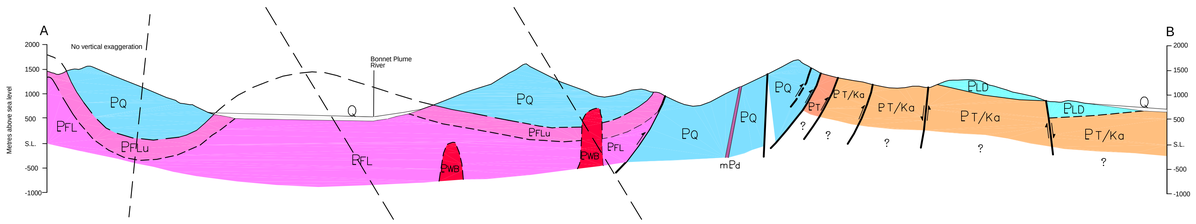
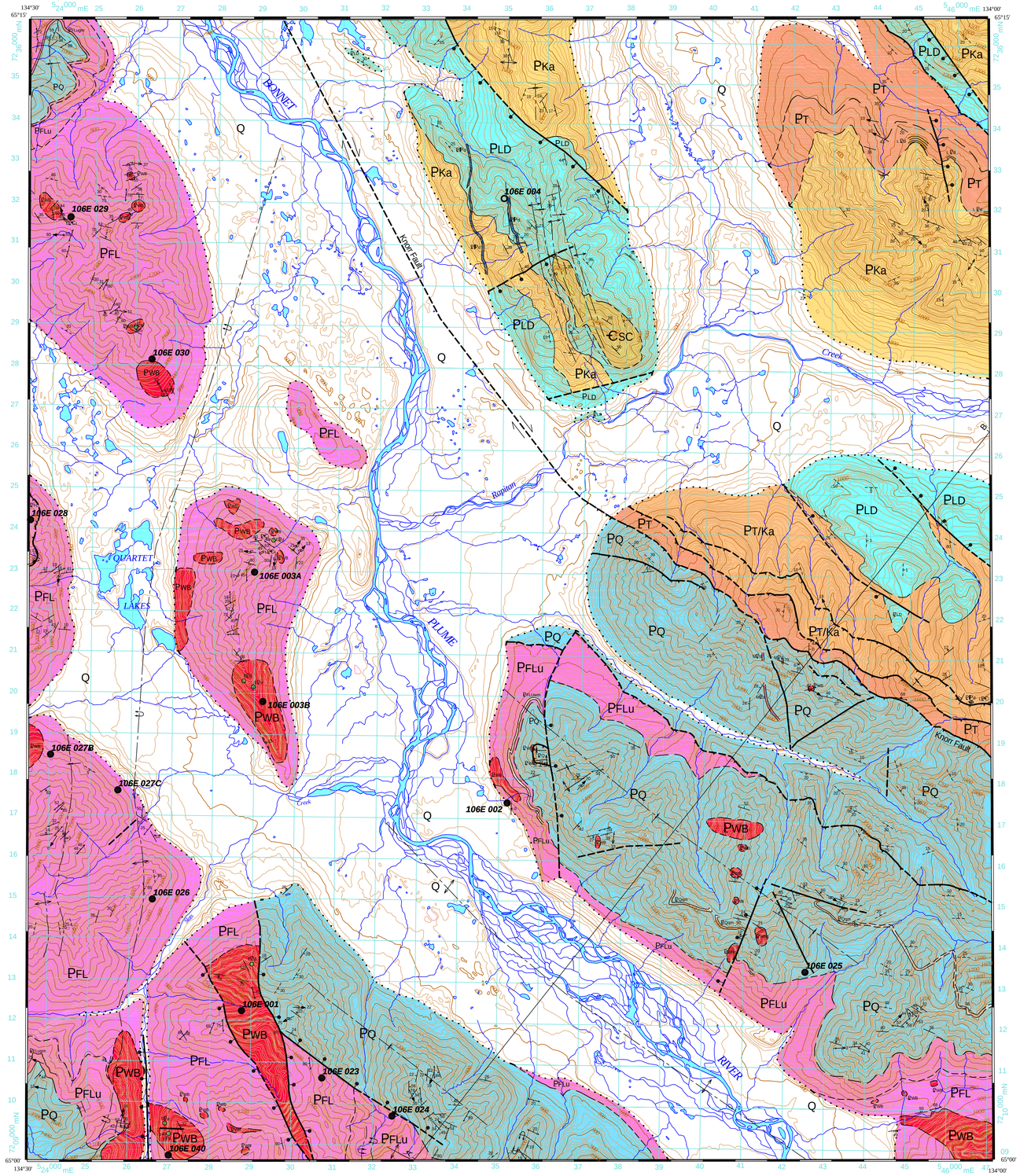
Yukon Government

CELEBRATING 10 YEARS! YUKON GEOLOGY PROGRAM

Canada





LEGEND

STRATIFIED ROCKS

QUATERNARY

Q — Alluvium, colluvium, and glacial deposits

MIDDLE CAMBRIAN (?)

SLATS CREEK FORMATION (?)

CSC — grey-weathering dolostone and purple-weathering mudstone interlayered with carbonate-rich conglomerate and olistostrome brown-weathering, thin- to medium-bedded, plane- to cross-bedded, coarse sandstone and chert-rich granule conglomerate with carbonate matrix.

MIDDLE TO UPPER PROTEROZOIC

MACKENZIE MOUNTAINS SUPERGROUP

PLD — *LITTLE DAL FORMATION*: grey- to yellow-weathering, medium- to thick-bedded micritic dolostone; minor black mudrock.

PKa — *KATHERINE GROUP*: grey- to white- and pinkish-white-weathering, fine- to medium-grained quartz arenite; black-, brown- and purple-weathering siltstone and wacke, locally micaceous, mudcracked and ripple marked; minor dolostone.

PT — *TSEZOTENE FORMATION*: black- to brown-weathering siltstone and wacke, commonly micaceous, mudcracked and ripple-marked; brown- to orange- and grey-weathering, medium- to very thick-bedded dolostone; black-, grey- and maroon-weathering mudrock; minor grey- to white- and pinkish-white-weathering, plane-bedded quartz arenite.

PT/Ka — *TSEZOTENE FORMATION and/or KATHERINE GROUP*

LOWER PROTEROZOIC

WERNECKE SUPERGROUP

PQ / **PQ qm** — *QUARTET GROUP*: black-weathering shale; grey-weathering, thin- to medium-bedded, finely laminated to cross-laminated siltstone; light-grey-weathering, thick-bedded, fine- to medium grained quartz arenite.
- local marker unit of light-grey-weathering quartz arenite.

FAIRCHILD LAKE GROUP

PFLu (qm, wm) — *UPPER FAIRCHILD LAKE GROUP*: black-weathering shale, siltstone and dolomitic siltstone, locally crenulated and kink-banded; orange-, brown-, grey-, and white-weathering dolostone.
- local marker unit of grey-weathering dolostone.
- local marker unit of white-weathering dolostone.

PFL — *LOWER FAIRCHILD LAKE GROUP*: black- to grey-weathering, thin- to medium-bedded, siltstone, shale, and slate, commonly laminated; brown-weathering, thin-bedded silty dolostone; blush- to greenish-grey-weathering phyllite and fine-grained muscovite-chlorite-quartz schist, commonly hosting chloritoid porphyroblasts, crenulations and kink bands.

INTRUSIVE ROCKS

LATE PROTEROZOIC TO EARLY PALEOZOIC

PPd — dark-green-weathering, fine- to medium-grained diorite dykes crosscutting Little Dal Formation and Katherine Group. Dykes locally host veins of epidote, calcite, hematite and malachite.

LATE PROTEROZOIC TO CAMBRIAN

LPCl — *QUARTET LAKES LAMPROPHYRE*: brown-weathering, aphyric to phlogopite-phyric dykes crosscutting Wernecke and Mackenzie Mountains supergroups, and locally hosting abundant xenoliths.

LATE PROTEROZOIC

LPd — *TSEZOTENE SILLS*: dark-green-weathering, fine- to medium-grained diorite within Tsezotene Formation. Locally, diorite is plagioclase-phyric and hosts veins of calcite, quartz and pyrite.

MIDDLE PROTEROZOIC

MPd — *BEAR RIVER DYKES*: dark-green-weathering, fine- to medium-grained diorite crosscuting Quartet Group. Locally, diorite hosts veins of epidote, quartz, calcite, pyrite, chalcopyrite and hematite.

WERNECKE BRECCIA

PWB — grey-weathering, or mottled red-, pink-, brown- and grey-weathering hematitic breccia containing clasts of Wernecke Supergroup and, locally, megaclasts of the Bonnet Plume River Intrusions. Includes metasomatized country rock of the Wernecke Supergroup. Breccia crosscuts foliations, crenulations and kink bands in the Fairchild Lake Group and locally hosts enrichments of Cu (as chalcopyrite), Au, U, Co and Mo (as molybdenite).

PWBd — rusty-weathering pyritic breccia containing clasts of Wernecke Supergroup. Matrix consists primarily of vein quartz and lacks abundant hematite. Tentatively regarded as a variation of Wernecke Breccia but may be unrelated and of different age.

EARLY PROTEROZOIC

EPd — *BONNET PLUME RIVER INTRUSIONS*: greenish-grey-weathering, fine- to medium-grained diorite preserved as megaclasts within Wernecke Breccia. Diorite locally hosts disseminations and veinlets of hematite or magnetite, and chalcopyrite.

SYMBOLS

- Stratigraphic or intrusive contact — known, approximate, assumed
- Normal fault (pegs on downthrown side) — known, approximate, assumed
- Strike-slip fault — assumed beneath cover
- Thrust or reverse fault (teeth on hanging wall) — known, approximate, assumed
- Bedding — inclined, overturned, vertical, top unknown, top observed; estimate from distant sighting
- Slaty cleavage, schistosity — inclined
- Fold — syncline: upright, inclined, overturned; anticline: inclined, overturned (inclined folds have shorter arrow on steeper limb)
- Minor Fold — minor fold, showing vergence, upright
- Line of cross section — A B
- Limit of outcrop

MINERAL OCCURRENCES

Yukon MINFILE 2001

Wernecke Breccia
Cu and/or U (+/- Co, Au, Mo, Ba, Ag)

106E 001	Otis	drilled prospect
106E 002	Irene	drilled prospect
106E 003	Quartet	showing
106E 023	Radio	prospect
106E 024	Break	prospect
106E 025	Mountaineer	showing
106E 026	Helikian	prospect
106E 027	Five	prospect
106E 028	Rapitan	showing
106E 029	Ikona	showing
106E 030	Bell	showing
106E 040	Eaton	showing

Unknown affinity
Zn, Pb

106E 004	Farion	showing

REFERENCES

Bell, R.T., 1986. Geological map of northeastern Wernecke Mountains, Yukon Territory. Geological Survey of Canada, Open File 1207.

Delaney, G.D., 1981. The mid-Proterozoic Wernecke Supergroup, Wernecke Mountains, Yukon Territory. *In:* Proterozoic Basins of Canada, F.H.A. Campbell (ed.), Geological Survey of Canada, Paper 81-10, 23 p.

Deklerk, R. (compiler), 2002. Yukon MINFILE - A database of mineral occurrences. Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada.

Hunt, J.A., Laughton, J.R., Brideau, M.A., Thorkelson, D.J., Brookes, M.L. and Baker, T., 2002. New mapping around the Slab iron oxide-copper-gold occurrence, Wernecke Mountains (parts of NTS 106C/13, 106D/16, 106E/1 and 106F/4), Yukon. *In:* Yukon Exploration and Geology 2001, D.S. Emond, L.H. Weston and L.L. Lewis (eds.), Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, p. 125-138.

Laznicka, P. and Gaboury, D., 1988. Wernecke breccias and Fe, Cu, U mineralization: Quartet Mountain-Igor area (NTS 106E); *In:* Yukon Geology, vol. 2, J.G. Abbott (ed.), Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, p. 42-50.

Norris, D.K., 1981. Wind River. Geological Survey of Canada, Map 1528A, 1:250 000 scale.

Thorkelson, D.J., 2000. Geology and mineral occurrences of the Slats Creek, Fairchild Lake and "Dolores Creek" areas Wernecke Mountains, Yukon (106D/16, 106C/13, 106C/14). Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, Bulletin 10, 73 p.

Recommended Citation

Thorkelson, D.J., Laughton, J.R and Hunt J.A., 2002. Geological map of Quartet Lakes map area (106E/1), Wernecke Mountains, Yukon (1:50 000 scale). Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada. Geoscience Map 2002-2.

This map is a companion to: Thorkelson, D.J., Laughton, J.R. and Hunt, J.A., 2003. Geology and mineral occurrences of the Quartet Lakes map area, Wernecke Mountains, Yukon. In: Yukon Exploration and Geology 2002, D.S. Emond and L.L. Lewis (eds.), Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada.

Digital cartography by Amy Stuart, Yukon Geology Program, Whitehorse, Yukon.

Copies of this map, the accompanying report, and Yukon MINFILE may be purchased from Geoscience Information and Sales, c/o Whitehorse Mining Recorder, Indian and Northern Affairs Canada, Room 102-300 Main St, Whitehorse, Yukon Y1A 2B5. Phone 867-667-3266. Fax 867-667-3267. E-mail geosales@inac.gc.ca

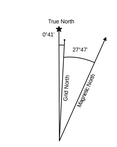
Store map in a dark area to prevent colours from fading.

ONE THOUSAND METRE
Universal Transverse Mercator Grid
ZONE 8

QUARTET LAKES
106 E/1
YUKON TERRITORY
SCALE 1:50 000

Miles 1 0 1 2 3 Miles
Metres 1000 0 1000 2000 3000 4000 Metres

CONTOUR INTERVAL 20 METRES
Elevations in feet above Mean Sea Level
North American Datum 1983
Transverse Mercator Projection



Use diagram to obtain numerical values
APPROXIMATE MEAN DECLINATION 2002
FOR CENTRE OF MAP
Annual change decreasing 8.3

106E/7	106E/8	106F/5	106F/6
106E/2	**106E/1 This Map**	106F/4	106F/3
106D/15	106D/16 Thorkelson and Wallace, Geoscience Map 1998-9	106C/13 Thorkelson and Wallace, Geoscience Map 1998-10	106C/14 Thorkelson and Wallace, Geoscience Map 1998-11

Indian and Northern Affairs Canada
Exploration and Geological Services Division
Yukon Region

Geoscience Map 2002-02

Geological map of Quartet Lakes map area (106E/1), Wernecke Mountains, Yukon (1:50 000 scale)

by

D.J. Thorkelson*, J.R. Laughton,* and J.A. Hunt

*Department of Earth Sciences
Simon Fraser University
Burnaby, B.C.
V5A 1S6
Ph. 604-291-5390
email: dthorkel@sfu.ca