111°30′ R9 25′ Alberta — Northwest Territories Boundary 20′ R8 W4M 111°15′

60°00′ 60°00′

TP126 TP126

55′ 55′

50′ 50′

TP125 TP125

TP124 TP124

59°45′ 111°30′ R9 25′ 20′ R8 W4M 111°15′ 59°45′

Adjoining Sheet no. 28

Adjoining Sheet No. 32

Adjoining Sheet No. 34

Tethul River

D O G R I V E R

McLelland Lake

TULIP LAKE LEGEND

PRECAMBRIAN**

REGIONAL SHEAR ZONES

Zones of regional shearing and recrystallization have principally affected granite gneisses and metasedimentary rocks to produce: ultramylonite, mylonite, cataclasite, blastomylonite, and flaser gneiss; megastructure is typically streaky; may contain rounded or augen rock clasts or feldspar porphyroclasts (*0*).

223 — RECRYSTALLIZED MYLONITIC ROCK: dark colored, with white to gray anhedral feldspar porphyroclasts and euhedral feldspar porphyroblasts 10 to 50 mm long; foliated, locally gneissose; aphanitic matrix, locally medium-grained; minor aplite and pegmatite. Parent material largely Slave Granitoids and Arch Lake Granitoids.

222 — RECRYSTALLIZED MYLONITIC ROCK: green to black; granulose (siliceous) to schistose, with biotite, chlorite, sericite; feldspar and minor quartz porphyroclasts in a massive to foliated, finely banded, aphanitic matrix. Parent material largely metasedimentary rock.

221 — RECRYSTALLIZED MYLONITIC ROCK: mostly light colored, with white to pink feldspar porphyroclasts 5 to 20 mm long making up 2 to 5 percent of the rock, in a foliated, finely banded, aphanitic matrix. Parent material largely granite gneiss.

GRANITOID ROCKS

ARCH LAKE GRANITOIDS

161 — ARCH LAKE GRANITE PHASE: typically reddish overall; 20 to 40 percent red, subhedral, elongate to tabular feldspar megacrysts, from 15 to 30 mm long, aligned subparallel in a medium-grained (locally coarse-grained) usually well-foliated matrix of feldspar, blue quartz and biotite. Locally reduced amounts of feldspar megacrysts. Mafic mineral content 6 to 14 percent. Commonly mildly cataclastic, with crushed matrix and augen megacrysts.

162 — ARCH LAKE TRANSITIONAL GRANITE PHASE: (transitional to Slave Granitoids); typically reddish overall; up to 10 percent white to pink subhedral, elongate to tabular feldspar megacrysts, from 10 to 15 mm long, aligned subparallel in a medium-grained (locally coarse-grained) usually well-foliated matrix of feldspar, blue quartz, and biotite. Quartz content locally reduced from 25 to 10 percent. Commonly mildly cataclastic.

LA BUTTE GRANODIORITE

140 — Generally light gray to brownish gray to mauve (blulsh quartz combined with pink-gray feldspar), of uniform color and texture; in hand specimen specks and aggregates of dark mafic mineral in a lighter gray background. Medium grained but ranging to fine- and coarse-grained, with 8 to 20 mm long feldspar megacrysts from rare to 5 percent abundance in a quartz, feldspar, biotite matrix. Typically massive to uncommonly poorly foliated or locally gneissic. Rock types range from granite to granodiorite, quartz diorite, and quartz monzodiorite, with a mean composition of granodiorite.

SLAVE GRANITOIDS

101 — SLAVE GRANITE PHASE: typically whitish gray (locally white to greenish gray to pink feldspar mottled on a darker background); medium- to coarse-grained (locally fine-grained); up to 5 percent white feldspar megacrysts, 7 to 15 mm long, in a matrix of white feldspars, quartz and biotite (<1 to 5 percent); massive to more commonly foliated (increase in biotite content tends to better define foliation); typically garnetiferous, in knots 5± mm across with a biotite envelope; may be locally gneissic; includes minor small-scale mafelsic lenses of metasedimentary appearance; minor gray white, fine- to medium-grained felsic dykes and quartz veins.

102 — MAFIC SLAVE GRANITE PHASE: similar to Slave Granite but with a notably higher biotite content (up to 10 percent); distinctly foliated.

MEGACRYSTIC COMPONENT: up to 15 percent white feldspar megacrysts 15 to 50 mm long, either randomly oriented or aligned with the foliation of map units 101 and 102 (/).

103 — RED SLAVE GRANITE PHASE: similar to Slave Granite Phase but with a distinct pinkish red color.

105 — SLAVE PQ GRANITE PHASE: typically reddish pink to pink; commonly medium-grained; abundant white to pink to red feldspar megacrysts 6 to 12 mm across in a medium-grained matrix of feldspar, quartz, biotite (4 to 5 percent) and minor sericite; massive to foliated matrix, locally gneissic. The predominant rock type is granite with a gradation towards granodiorite; includes minor small-scale mafelsic lenses of metasedimentary appearance; minor fine- to medium-grained felsic dykes and quartz veins.

METASEDIMENTARY ROCKS

31 — METASEDIMENTARY ROCKS: the high-grade metasedimentary rock types included in this map unit are lithologically and texturally gradational, and in part intermixed on outcrop scale. Typically impure quartzite; dark greenish (bluish) gray (fresh surface); fine-grained; layered, with ferruginous and garnetiferous zones, locally scattered pyrite, gossans, and milky to bluish gray quartz pods and veins. Minor amphibolite may be present. Common local lithologic gradational variations to: (1) fine- to medium-grained, metamorphic quartzo-feldspathic (granitic and minor pegmatitic) phase ranging from individual white feldspar porphyroblasts 5 to 15 mm long, to nebulous or distinct aggregations and masses; commonly foliated to locally gneissic (∿); (2) fine-grained, retrograde phyllite and schist (biotite, chlorite, sericite, and uncommonly hornblende), and phyllonite.

AMPHIBOLITE

20 — Dark brownish green (fresh surface) to grayish green; typically medium grained; biotite may be common; composition ranges from essentially amphibole pure or amphibole rich to a feldspathic biotite amphibolite; commonly foliated but may be banded where feldspar rich; minor pyrite common.

GRANITE GNEISS

11 — BIOTITE GRANITE GNEISS: typically pink to reddish; quartz-feldspar bands interlayered with mafic-rich bands (biotite, possibly with subordinate hornblende; generally chloritic) on hand-specimen scale; fine- to medium-grained, generally equigranular, rarely megacrystic; commonly well banded but may be locally poorly banded to foliated, and leucocratic phases may be nearly massive. Composition is predominantly granite, with minor granodiorite, quartz diorite, and quartz monzodiorite. Large areas are migmatitic, particularly where intimately associated with minor lenses, pods, and bands of metasedimentary rocks, pegmatite, or amphibolite. Minor hornblende granite gneiss.

**NOTE: Rock groups are arranged in approximate chronological sequence. Nomenclature follows Streckeisen (1967): Classification and Nomenclature of Igneous Rocks; Neues Jahrbuch für Mineralogie, Abhandlungen, 107, No. 2 p. 144-240.

- Geological boundary (defined, approximate)
- Foliation (defined: dip known, dip vertical; foliation assumed) 68
- Foliation trend*
- Lineation (combined with foliation) 76 68
- Extreme contortion (structural trend shown)
- Tight folds (structural trend shown)
- Local gneissosity in generally massive to foliated rock
- Joint (dip-known, vertical, unknown) 57
- Fault (defined: dip known; fault assumed) 73
- Shear (dip known) 76
- Breccia
- Mylonite (local)
- Quartz vein
- Crystalline standard sample 472
- Metasedimentary rock band standard sample 62
- Mineral occurrence — molybdenite Mol
- Radioactivity
- Chlorite C
- Epidote E
- Garnet G
- Graphite R
- Sillimanite S
- Isotopic age (million years); biotite (b); amphibole (a); K-Ar (k); U. of A. Δbk1740
- Glacial stria (direction of ice movement shown)
- Drumlin* (outline to scale)
- Crevasse filling* (ridge shown)
- Esker* (flow direction known, unknown)
- Raised beach* (downslope indicated)
- Wind-cut groove (wind direction shown)
- Sand-covered area*
- Small outcrop (map unit shown) 31
- Muskeg
- Drainage (permanent, intermittent)
- Township boundary
- National Park boundary
- Road

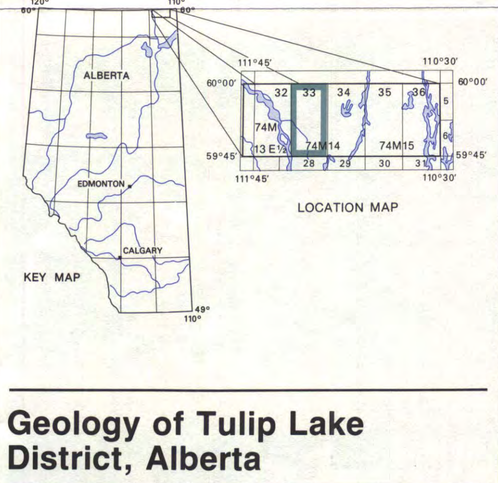
*Aerial photographic interpretation

Approximate magnetic declination 26°28′ East in 1984 decreasing approximately 4.5′ annually for the Tulip Lake map area.

SCALE 1:31,680

Miles 1 0 1 Miles

Kilometres 1 0 1 Kilometres



Geology of Tulip Lake District, Alberta

Sheet No. 33

John D. Godfrey and C. Willem Langenberg, 1974, 1975.

Published 1984
Map to accompany Earth Sciences Report 84-7

Any revisions or additional geological information would be welcomed by the Alberta Research Council.

Base maps compiled from planimetric sheets published by Alberta Energy and Natural Resources, Edmonton.
Aerial photographs covering this area are obtainable from the Alberta Energy and Natural Resources, Edmonton; or the Mapping and Surveys Branch of Energy, Mines and Resources, Ottawa.
Cartography by P. and P. Geo-Graphika Consulting Ltd.
Cartographic editing by Graphic Services, Alberta Research Council

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