




**TULIP LAKE LEGEND**




**PRECAMBRIAN\***

**REGIONAL SHEAR ZONES**

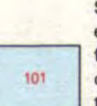
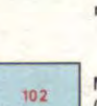

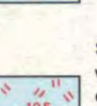
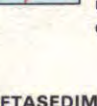
Zones of regional shearing and recrystallization have principally affected granite gneisses and metasedimentary rocks to produce: ultramylonite, mylonite, cataclastic, blastomylonite, and fissar gneiss; megacrystic structure is typically streaky; may contain rounded or angular rock clasts or feldspar porphyroclasts (P).

-  RECRYSTALLIZED MYLONITIC ROCK: dark colored, with white to gray anhedral feldspar porphyroclasts and subhedral feldspar porphyroclasts 10 to 50 mm long; foliated; locally gneissic; aphanitic matrix, locally medium-grained; minor apatite and pagmatite. Parent material largely Slave Granitoids and Arch Lake Granitoids.
-  RECRYSTALLIZED MYLONITIC ROCK: green to black; granulos (allochous) 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.
-  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.


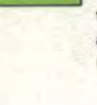
**GRANITOID ROCKS**

-  ARCH LAKE GRANITOID: 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. Matrix mineral content 8 to 14 percent. Commonly mildly cataclastic, with crushed matrix and angular megacrysts.
-  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: Generally light gray to brownish gray to mauve bluish 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 monzonite, with a mean composition of granodiorite.

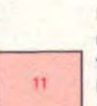
**SLAVE GRANITOID**

-  SLAVE GRANITE PHASE: typically whitish gray locally white to greenish gray to pink feldspar matrix 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 (locally coarse-grained); usually well-foliated. Typically gneissic, in knots 5 to 10 mm across with a biotite envelope; may be locally gneissic; includes minor small-scale mafic lenses of metasedimentary appearance; minor gray white, fine- to medium-grained felsic dikes and quartz veins.
-  MAFC 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 (P).
-  RED SLAVE GRANITE PHASE: similar to Slave Granite Phase but with a distinct pinkish red color.
-  SLAVE PG GRANITE PHASE: typically reddish pink to pink; commonly medium-grained; abundant white to pink to red feldspar megacrysts 5 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 mafic lenses of metasedimentary appearance; minor fine- to medium-grained felsic dikes and quartz veins.

**METASEDIMENTARY ROCKS**

-  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 pure quartzite; dark greenish (bluish) gray (fresh surface); fine-grained; layered, with homogeneous and granular texture, locally scattered pyrite, goethite, and mica to bluish gray quartz pods and veins. Minor amphibole may be present. Common local lithologic gradational variations to (1) fine- to medium-grained, metamorphic quartz-feldspathic (granitic and minor pagmatitic) phase ranging from individual white feldspar porphyroclasts 5 to 15 mm long, to relatively distinct aggregates and masses; commonly foliated to locally gneissic (P); (2) fine-grained, retrograde phyllite and schist (biotite, chlorite, sericite, and uncommonly hornblende), and phyllonites.
-  AMPHIBOLITE: 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.

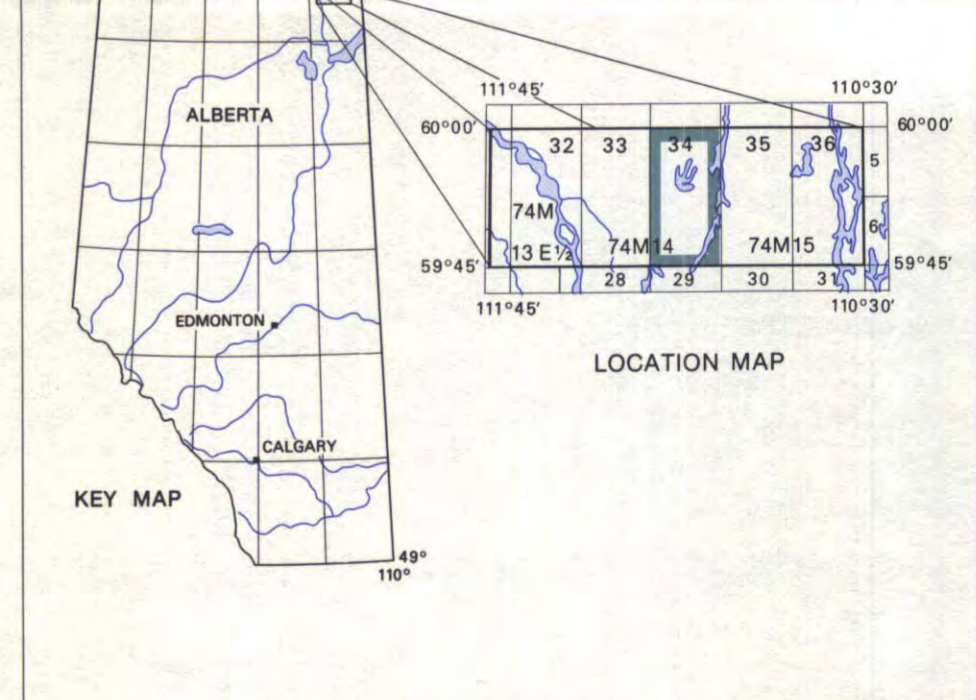
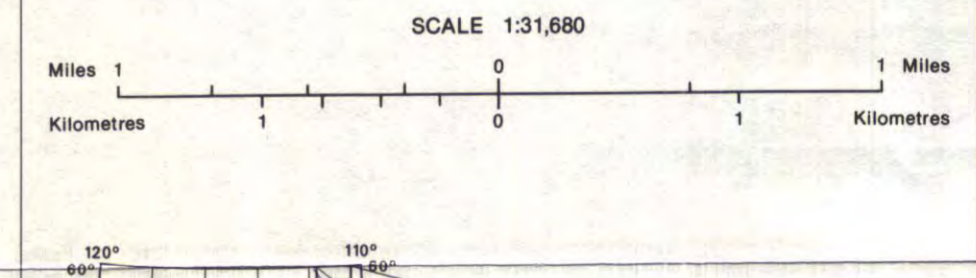
**GRANITE GNEISS**

-  BIOTITE GRANITE GNEISS: typically pink to reddish; quartz-feldspar bands interlayered with mafic bands (biotite, possibly with subhedral hornblende; generally obscured) on hand-specimen scale; fine- to medium-grained; generally equigranular; rarely megacrystic; commonly well banded but may be locally poorly banded to foliated, and boudinaged; composition may be nearly massive. Composition is predominantly granite, with minor granodiorite, quartz diorite, and quartz monzonite. Large areas are migmatitic, particularly where intimately associated with minor lenses, pods, and bands of metasedimentary rocks, pagmatite, 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) .....
- Foliation trend .....
- Lineation (combined with foliation) .....
- Extreme contortion (structural trend shown) .....
- Tight folds (structural trend shown) .....
- Local gneissosity in generally massive to foliated rock .....
- Joint (dip-known, vertical, unknown) .....
- Fault (defined: dip known, fault assumed) .....
- Shear (dip known) .....
- Breccia .....
- Mylonite (local) .....
- Quartz vein .....
- Crystalline standard sample .....
- Metasedimentary rock band standard sample .....
- Mineral occurrence — molybdenite .....
- Radioactivity .....
- Chlorite .....
- Epidote .....
- Garnet .....
- Graphite .....
- Sillimanite .....
- Isotopic age (million years): biotite (b), amphibole (a), K-Ar (k), U of A .....
- 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) .....
- 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.



**Geology of Tulip Lake District, Alberta**

Sheet No. 34

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

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Map to accompany Earth Sciences Report 84-7

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

**ALBERTA RESEARCH COUNCIL**

Natural Resources Division  
Alberta Geological Survey

Base maps compiled from aeromagnetic 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.

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Adjoining Sheet No. 33

Adjoining Sheet No. 35

TP124

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