

PRELIMINARY BEDROCK GEOLOGY OF MCGRATH B-3 QUADRANGLE, ALASKA

By Wyatt G. Gilbert, Diana N. Solie, and Douglas B. Dickey

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DESCRIPTION OF MAP UNITS

EXPLANATION

CORRELATION OF MAP UNITS

uTcgf

----- Contact, approximately located

-? --- Probable fault, dotted where covered

- Fault, approximately located, dotted where covered

— 1 — Anticline, showing approximate trace of axial plane

Thrust fault, approximately located, sawteeth on upper plate

---- Major recumbent isoclinal fold, approximate trace of axial surface

Bearing and plunge of primary subisoclinal fold axis

Bearing and plunge of elongate clasts and minerals

Bearing and plunge of secondary kink-fold axis

Strike and dip of primary foliation; commonly parallels bedding

- UNDIFFERENTIATED SURFICIAL DEPOSITS - Undifferentiated surficial deposits including drift, outwash, colluvium, and alluvium.

 COLLUVIUM - Unconsolidated, unsorted angular material (including talus) on steep slopes; mapped where it totally obscures underlying bedrock.
- LANDSLIDE DEPOSITS - Unsorted accumulations of soil and rock materials that result from en masse downslope transport.
- ROCK GLACIER DEPOSITS Lobate, tongue-shaped and spatulate accumulations of shattered bedrock rubble with varying amounts of interstitial silt and ice; includes active rock glaciers.

 COLLUVIUM AND ALLUVIUM Mixed colluvium and alluvium; mapped where small
- streams have reworked material on steep slopes.

 Qal ALLUVIUM - Unconsolidated fluvial gravel, sand, and silt deposited on modern flood plains; commonly forms bars in braided streams.
- ALLUVIAL-FAN DEPOSITS - Poorly sorted, partially stratified, open to cone-shaped accumulations of coarse sand and gravel.
- Qta TERRACE ALLUVIUM - Moderately well stratified silt, sand, and gravel perched on benches or terraces above modern flood plains; more than one age of terrace is represented.
- DRIFT -- Mostly composed of coarse rubbly till; silt and sand content varies.

 ANDESITIC FLOWS AND LAPILLI TUFF -- Dark-gray to green-gray andesitic flows, commonly porphyritic, with aphanitic to fine-grained intersertal groundmass consisting
- of andesine, titanaugite, and opaques with andesine phenocrysts. Propylitization is common with carbonate, chlorite, and epidote as alteration products. Lapilli tuff is commonly light to dark green to gray, with local red, green, purple, and white banding, and subangular chlorite-rich fragments set in a hypocrystalline groundmass. Probably time-correlative with nearby Tertiary intrusives (Reed and Lanphere, 1972).

 RHYOLITE White to light-gray-green, locally banded hypocrystalline rhyolite; typical-
- ly consists of sericitic alkali feldspar and locally resorbed fine-grained quartz phenocrysts set in aphanitic quartzo-feldspathic groundmass; devitrification spherulites are common.

 ANDESITE-TRACHYANDESITE SILLS AND DIKES Andesitic sills and dikes up to 10 m thick that are often subparallel to primary foliation; may include some felsic and
- 10 m thick that are often subparallel to primary foliation; may include some felsic and basaltic dikes. Typically green gray, fine grained, hypidiomorphic-granular, occasionally porphyritic, with up to 80 percent andesine (commonly very altered), up to 20 percent alkali feldspar, and highly altered hornblende, biotite, and pyroxene. Alteration minerals are chlorite, carbonate, opaque minerals, and white mica. Apatite is a common accessory mineral, and fine-grained disseminated pyrite is present locally. Contact effects in adjacent country rock are rare. Probably time correlative with nearby dated Tertiary intrusives (Reed and Lanphere, 1972).
- FELSIC SILLS AND DIKES Felsic sills and dikes up to 5 m thick, generally light pinkish tan to white, aphanitic to fine grained, rarely medium grained, hypocrystalline and holocrystalline with phenocrysts of plagioclase and alkali feldspar common; commonly associated with brown to orange gossanous coating. Groundmass is generally highly altered, with abundant secondary carbonate. Some felsites contain fine-grained disseminated pyrite and display banding caused by variable grain size and texture. South of volcanic pile between Windy Fork and Khuchaynik Creek, spherulites 1 to 2 mm in diameter are present rarely. A 3-m-thick dike of green glass with divitrification spherulites is located in T. 25 N., R. 26 W., sec. 5.
- MAFIC SILLS AND DIKES Mafic sills and dikes up to 5 m thick, generally dark brown, fine grained, panidiomorphic-granular, locally porphyritic or amygdaloidal. Typically very weathered, commonly spheroidally; composes minor portion of hypabys-
- INTRUSIVE DIKE SWARM - Subparallel swarm of andesite dikes that include several felsite and mafic dikes (units Tia, Tif, and Tim, undivided). Includes slivers of lPzs country rock that commonly show minimal to extreme hornfelsing and silicification. Highly silicified country rock at head of rock glacier (T. 26 N., R. 26 W., sec. 8) is gossanous red and contains abundant pyrite.
- FELSITE CONGLOMERATE Very thick bedded, very poorly indurated, orange-weathering, light-brown, poorly sorted, rounded granule-cobble conglomerate in a coarse-sand matrix, with subordinate orange-red weathering, discontinuous coarse-grained sand-stone beds. Clasts are mainly felsite (40-60 percent), lithic fragments (15-30 percent), and quartz (10-25 percent). Age assigned to late Tertiary because of lithologic similarity to late Tertiary continental deposits to the northeast (Wahrhaftig and others, 1969; Gilbert 1979)
- SANDSTONE AND SHALE Thin- to thick-bedded, moderately indurated, reddish-brown-weathering, buff, moderately sorted, subangular to subrounded, fine- to very coarse grained lithoquartzose sandstone interbedded with poorly indurated, fissile, laminated carbonaceous siltstone and mudstone. Clasts in sandstone are mainly argillite (30-60 percent), quartz (20-50 percent), volcanic rock (0-10 percent), and carbonaceous material (0-20 percent). Siltstone and mudstone are locally vitreous and contain plant debris. Age assigned to Tertiary because of lithologic similarity to lower and mid-Tertiary units to the northeast (Wahrhaftig and others, 1969; Gilbert, 1979).
- CONGLOMERATE Thin- to very thick bedded, poorly to moderately indurated, massive to cross-bedded, buff-weathering, gray-brown, moderately sorted, subangular to rounded, granule to cobble conglomerate and minor sandstone. Clasts are mainly quartz (20-40 percent), volcanic rock (0-20 percent), and other lithic fragments (30-70 percent), with scattered carbonaceous debris. Matrix ranges from silt to granule conglomerate. Age assigned to Tertiary because of lithologic similarity to lower and mid-Tertiary continental units to the northeast (Wahrhaftig and others, 1969; Gilbert, 1979).
- LIMESTONE CONGLOMERATE Thick- to very thick bedded, poorly to moderately indurated, massive, greenish-gray, very poorly sorted, subangular to rounded, granule-cobble conglomerate with clay and sand matrix. Clasts are mainly limestone (50-80 percent), basalt (5-50 percent), and lithic fragments (5-20 percent). Lithologically similar to lower and mid-Tertiary continental units to the northeast, but may be equivalent in age to uTcgf (Wahrhaftig and others, 1969; Gilbert, 1979).
- QUARTZOSE LIMESTONE AND CARBONACEOUS SILTSTONE Interbedded thinbedded quartzose limestone and carbonaceous siltstone. Limestone beds are discontinuous, and unit is isoclinally folded; maximum structural thickness is 130 m. Tentatively correlated with Triassic "Pingston" limestone (Jones and others, 1980) 35 km to the southeast because of lithologic similarity.

- ARGILLITE, CHERT, AND AGGLOMERATE Very thin bedded, highly fractured, brown-weathering black argillite and chert depositionally(?) overlying Pzb. In T. 26 N., R. 27 W., sec. 1 (along Khuchaynik Creek), very thin bedded black chert is interbedded with altered green volcanic agglomerate. Age is unknown, but tentatively assigned to Paleozoic because of probable association with Pzll.
- PILLOW BASALT - Dark-green to gray pillow basalt, generally altered to carbonate and chlorite. In T. 26 N., R. 27 W., sec. 10, basalt lacks defined pillow structures and appears interlayered with Pzll. Age unknown, but tentatively assigned to Paleozoic because of probable association with Pzll (see C-C').
- Pz|| LAMINATED LIMESTONE Thin- to very thick bedded, gray laminated limestone, with minor phyllite partings, limestone breccia, and algal structures. Calcite veinlets are locally abundant. Isoclinally folded, with minimum structural thickness of 1100 m. Age unknown, but tentatively assigned to Paleozoic because of lithologic similarity to Pzl.
- ALGAL LIMESTONE - Massive, medium-gray limestone containing algal-like laminations. Fossils from algal-limestone unit in McGrath B-2 Quadrangle suggest latest Silurian to mid-Devonian age (Bundtzen and others, 1982).
- Dolomite - Light-gray, dolomitized algal limestone on peak 5252.
- BLACK SHALE AND LIMESTONES - Sheared, organic black shale; silty, platy limestone with phyllitic partings; and medium- to thin-bedded, laminated gray limestone. Thickness is highly variable; minimum thickness is 450 m; separates two layers of Dl east of the Windy Fork.
- PHYLLITIC CALC-SANDSTONE, CALC-SILTSTONE, AND LIMESTONE - Predominantly very thin to very thick bedded, buff- to orange-weathering, light- to medium-gray phyllitic calc-sandstone; thinly laminated to thin-bedded, orange- to brown-weathering, gray to gray-green phyllitic calc-siltstone and very thin to thin-bedded gray silty limestone. Calc-sandstone is micaceous, very coarse grained to very fine grained, and locally displays cross-bedding or graded bedding. Coarser clasts are commonly flattened and stretched.
- Phyllitic siltstone commonly grades into calc-sandstone or limy siltstone, and rarely displays cross-beds and pyrite crystals on partings. Silver-weathering, thinly laminated gray phyllites occur locally as partings and layers up to several meters thick. Subparallel and crosscutting quartz and calcite veinlets are common. Probably comprises Pzsl and Pzs units of Bundtzen and others (1982). Unit is subisoclinally to isoclinally folded at outcrop to map scale, and structurally thickened to approximately 8800 m. Open kink folds, crenulations, cross-cutting cleavage, and "pencils" at fold noses are locally pervasive. In McGrath B-3 Quadrangle, age of unit can only be shown as pre-Holocene, but presumed continuity with similar rocks in the Cheeneetnuk River area (Gilbert, 1982)
- LAMINATED LIMESTONE Thin- to very thick bedded, medium-gray-weathering, dark-gray laminated limestone generally included as part of Pzs, but locally mapped separately. No stratigraphic position is implied with respect to Pzs. Limestone is generally silty and contains irregular quartz and calcite veinlets, phyllite partings, crossbeds, orange-red-weathered surfaces, and rare algal-like structures. Limestone bed east of Windy Fork in southeast corner of quadrangle is carbonate breccia.

suggests lower Paleozoic age.

- Prince Phyllitic Argillite, Shale, and slate generally included in Prince Prince Prince Prince Phyllitic argillite, shale, and slate generally included in Prince P
- GREENSTONE - Discontinuous layers up to 5 m thick of locally sheared, locally phyllitic, medium-grained, chloritic hornblende-augite greenstone with rare malachite

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phyllitic, with black carbonaceous streaks on cleavage surfaces.

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