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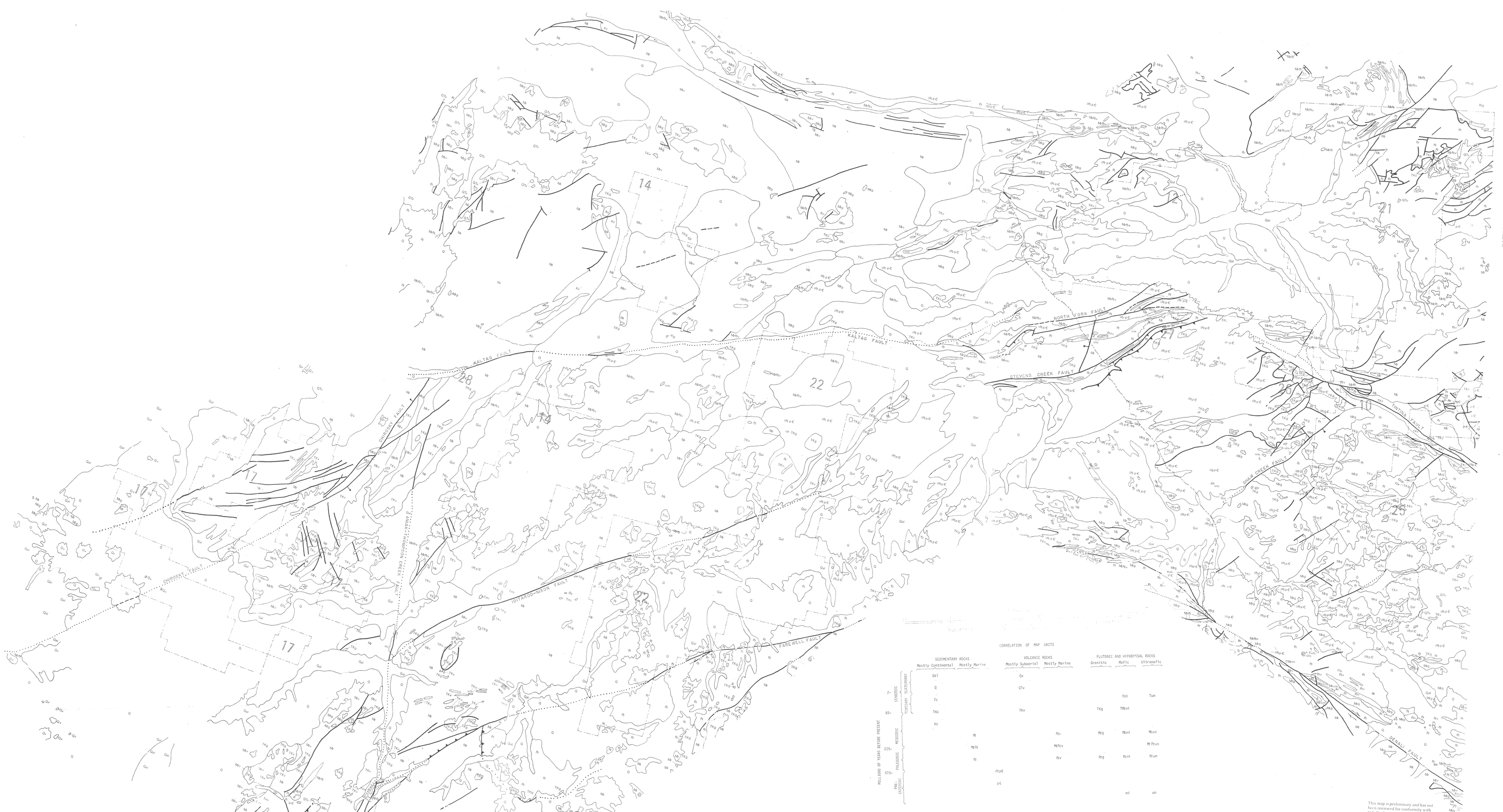

The compilers acknowledge the helpful assistance of W. P. Brosgé, R. M. Chapman, J. M. Moore, H. L. Foster and W. W. Patton, Jr.

PRELIMINARY GEOLOGIC MAP OF CENTRAL ALASKA

COMPILED BY

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1977

CORRELATION OF MAP UNITS

	SEDIMENTARY ROCKS		VOLCANIC ROCKS		PLUTONIC AND HYPABYSSAL ROCKS		
	Mostly Continental	Mostly Marine	Mostly Subaerial	Mostly Marine	Granitic	Mafic	Ultramafic
QUATERNARY	Qal, Q		Qv				
TERTIARY	Tc		QTv				
CENOZOIC 2-					Tgd		Tum
65-	TKu		TKv		TKg	TMzul	
MESOZOIC	Kc				Mzg	Mzul	Mzum
MILLIONS OF YEARS BEFORE PRESENT 225-	Mz		Mzv				Mz Pzum
PALEOZOIC	Pz		Mz Pzv		Mzg	Mzul	Pzum
570-			Pzv		Pzg	Pzul	
PRE-PALEOZOIC	pЄ						
						ul	um

DESCRIPTION OF MAP UNITS

SEDIMENTARY ROCKS
MOSTLY CONTINENTAL

Qal — HOLOCENE DEPOSITS - Alluvial, glacial, lacustrine, swamp, low marine terrace, estuarine, landslide, flood plain and beach deposits

Q — QUATERNARY DEPOSITS - Alluvial fan, terrace and pediment, gravel, reworked sand and silt, beach, wind-blown sand, glacial till, reworked sand and silt, flood plain, beach, marginal, and outwash sand and silt

Tc — TERTIARY DEPOSITS - Pebble to boulder conglomerate and coarse sandstone with interbedded mudflow deposits; sandstone, siltstone, and claystone; lignite and lignite beds; tuffaceous siltstone; the Chicken area and the Sanuma Gravel

TKu — TERTIARY AND UPPER CRETACEOUS DEPOSITS - Conglomerate, breccia, sandstone, siltstone, shale, tuffaceous sandstone, mudstone, shale, tuffaceous sandstone, and pebble conglomerate.

Kc — CRETACEOUS ROCKS - Shale, siltstone, and pebble conglomerate. Sandstone, tuffaceous sandstone, and chert conglomerate. Interbeds of flowstone, graywacke, and thin coal seams. Sandstone, tuffaceous sandstone, siltstone, shale, tuff and chert

MOSTLY MARINE. IN PART METAMORPHOSED

Mz — MESOZOIC ROCKS - Shale, carbonaceous shale, sandstone, quartzite, conglomerate, graywacke, argillite, mudstone and claystone. Mafic lava, volcanic greywacke and conglomerate, agglomerate and bentonite. Some coal beds

Mz Pz — MESOZOIC AND PALEOZOIC ROCKS - Siltstone, chert, and mafic volcanic rocks including tuff and pillow flows, with lesser amounts of calcareous siltstone, graywacke, conglomerate, and limestone. Include the Nikolai Greenstone of Permian to Cretaceous age in southwestern Alaska

Pz — PALEOZOIC ROCKS - Graywacke, sandstone and shale; siltstone, mudstone, conglomerate, calcareous shale with subordinate greenstone, dolomite, chert, and quartzite with subordinate greenschist and amphibolite facies. Includes greenschist and amphibolite facies. Limestone, marble and dolomite most common in the Silurian, Devonian, and Mississippian. Includes limestone and dolomitic limestone of the Lake Superior type in the Ogilvie Mountains and the Mississippian and volcanic rocks in the Lime Hills and in the Kokhanok River. In east-central part of area includes Tonsina Group and some of the unnamed sedimentary and metalgenous rocks formerly included in the Birch Creek Schist and Nisutlin Assemblage

Ꝑz pЄ — LOWER PALEOZOIC AND(OR) PRECAMBRIAN SEDIMENTARY AND VOLCANIC ROCKS - Quartzite schist, mafic greenschist, calcareous phyllite, quartzite schist, phyllite, chert, quartzite, carbonaceous quartz schist, phyllite, siltstone, chert, quartzite. Includes phyllite, sandstone, and quartzite of the Ordovician and Silurian age in the White Mountains area, and phyllite and quartz schist of many different compositions, and schist and gneiss of many different compositions, most of which are greenschist and amphibolite facies, much of which in the southeast part of the area, formerly included in the Southeast part of the map area. Quartzite grit and marble and green schist of the Livengood region are of probable Precambrian age

pЄ — PRECAMBRIAN SEDIMENTARY AND VOLCANIC ROCKS - Limestone, dolomitic limestone, marble, quartzite, mafic volcanics and ferruginous siliceous red beds, dolomite and quartzite of the Tindir Group in east-central part of the map area; interbedded sandstone, quartzite, phyllite, metabasalt, and metagabbro, and lesser amounts of mafic volcanic, and mafic tuff and lower albite-epidote amphibolite morphosed to upper greenschist and lower albite-epidote amphibolite facies in the Yukutkin Schist, southwestern part of map area

VOLCANIC ROCKS
MOSTLY SUBAERIAL. IN PART HYPABYSSAL

Qv — QUATERNARY VOLCANIC ROCKS - Alkali olivine basalt with minor trachyte and basanite on Nunivak and Nelson Islands and in the Yukon delta-St. Michael region. Olivine basalt, containing peridotite and granulite inclusions, in lava flows and cinder cones in the Wrangell Mountains area

QTv — QUATERNARY AND(OR) TERTIARY VOLCANIC ROCKS - Basaltic and andesitic flows and associated pyroclastic rocks. Includes alkali olivine basalt flows and olivine basalt to area east of Lake Minchumina, and olivine basalt to area east of Nulato on western Nunivak Island

TKv — TERTIARY AND CRETACEOUS VOLCANIC ROCKS - Lava, tuff (in part welded), tuff breccia, breccia, and volcanic conglomerate, in part of the Kenai Peninsula and Cook Inlet area; Tertiary and upper Cretaceous rhyolitic and andesitic porphyritic flows, tuffs, and breccias northwest of Lake Minchumina; mafic and felsic lava, tuff (in part welded), and associated sedimentary rocks in volcanic conglomerate, and tuffaceous sandstone; Tertiary and Cretaceous rhyolitic and andesitic porphyritic flows, Tertiary and Cretaceous rhyolite and trachyandesite porphyritic flows, breccia, conglomerate, and tuff of acidic and intermediate composition; Tertiary and Cretaceous andesite porphyritic rhyolite and dacite flows, tuffs, and associated hypabyssal intrusive rocks of Tertiary and Cretaceous age in the lower Kuskokwim River region and Yukon-Tanana upland

MOSTLY MARINE

Mzv — MESOZOIC VOLCANIC ROCKS - Basaltic and andesitic flows, flow breccia, agglomerate, and tuff; in southeastern part of map area, tuffaceous sandstone and volcanic greywacke; in part of Juneau quadrangle, mafic volcanic rocks and mafic tuff breccia underlain by thin sedimentary breccia south of the Jefferson-Kruzof fault; an andesitic volcanic assemblage composed predominantly of volcaniclastic rocks and associated rocks of the Hyd Formation; hypabyssal rock largely of pre-Silurian age in the Yukon-Koyukuk basin; hypabyssal rocks and porphyritic gyrosene andesite flows and hypabyssal rocks of Cretaceous age west of Cape Denbigh; porphyritic gyrosene andesite and trachyte flows, flow breccia, and tuff of Jurassic age in the Ketchikan area; andesite breccia, agglomerate and conglomerate of Jurassic and Cretaceous age west of the Seward Peninsula and in the Koyukuk River basin

Mz Pz v — MESOZOIC AND PALEOZOIC VOLCANIC ROCKS - Igneous complex of mafic and felsic volcanic rocks, in part of large part ophiolitic. Complex composed of basalt, diabase diorite, gabbro, radiolarian chert, slate, serpentinized peridotite and dunite ranging in age from Permian to Jurassic in the Chugach Mountains; basalt flows, tuffs, breccias, and interbedded volcaniclastic rocks. Includes Rampart Group and Circle Volcanics

Pzv — PALEOZOIC VOLCANIC ROCKS - Mafic volcanic and associated rocks of the rocks with minor interbedded pyroclastic rocks; in the Ogilvie Mountains, Devonian and Mississippian ophiolitic complex of metagabbro, serpentinite, and greenstone of probable Permian age on Cape Newenham in southwest Alaska; Devonian and Mississippian rocks of the Ogilvie Mountains, Devonian and Mississippian rocks of the Woodchopper Ophiolite in the east-central part of the area; and greenstone with subordinate chert, quartzite phyllite, metabrite, and metagabbro of Devonian age and older south of the Tanana River in the southeast part of the area

PLUTONIC AND HYPABYSSAL ROCKS
GRANITIC ROCKS

Tkg — TERTIARY AND CRETACEOUS GRANITIC ROCKS - Mainly rocks ranging in composition from granite to quartz diorite, with local alkali granite and granodiorite

Mzg — MESOZOIC GRANITIC ROCKS - Mainly granodiorite and quartz diorite with subordinate granite, syenite, quartz monzonite, and quartz syenite. Includes most of the plutonic rocks of Triassic and Cretaceous age. Includes extensively migmatitic granodiorite bodies in arc along the central Alaska Range

Pzg — PALEOZOIC GRANITIC ROCKS - Biotite granite and quartz monzonite of Carboniferous age in northeast part of map area

MAFIC INTRUSIVE ROCKS

Tmi — TERTIARY MAFIC ROCKS - Pyroxene diorite, gabbro, diabase, and basalt; age uncertain

TMzul — TERTIARY AND(OR) MESOZOIC MAFIC ROCKS - Gabbro, basalt, and minor ultramafic. Probably mostly of Tertiary age

Mzul — MESOZOIC MAFIC ROCKS - Gabbro and diorite with subordinate basalt and diabase; for most part highly altered; age uncertain in part; includes Nikolai Greenstone in Yukon-Tanana upland

Pzul — PALEOZOIC MAFIC ROCKS - Mainly gabbro, diorite, and diabase; includes mafic and ultramafic rocks of pre-Late Devonian age in the Livengood area

ul — MAFIC INTRUSIVE ROCKS OF UNKNOWN AGE - Primarily gabbro and diabase

ULTRAMAFIC ROCKS

Tum — TERTIARY ULTRAMAFIC ROCKS - Dunite and serpentinite

Mzum — MESOZOIC ULTRAMAFIC ROCKS - Serpentinite, mainly of Cretaceous age

Mz Pzum — MESOZOIC AND PALEOZOIC ULTRAMAFIC ROCKS - Serpentinized peridotite

Pzum — PALEOZOIC ULTRAMAFIC ROCKS - Serpentinite, peridotite, dunite, and pyroxenite

um — ULTRAMAFIC ROCKS OF UNCERTAIN AGE - Serpentinized dunite, peridotite, and pyroxenite

MAP SYMBOLS

Contact, approximately located
Dotted where concealed or inferred

Fault, approximately located. Dotted where concealed or inferred. Bar and ball on downthrown side. Arrows indicate relative net horizontal movement. Teeth on upper plate of thrust faults

Modified and adapted from parts of the following:

Beikman, Helen M., 1974, Preliminary geologic map of the southwest quadrant of Alaska: U.S. Geol. Survey Misc. Field Studies Map MF-611, 2 sheets, scale 1:1,000,000.

Beikman, Helen M., 1974, Preliminary geologic map of the southeast quadrant of Alaska: U.S. Geol. Survey Misc. Field Studies Map MF-612, 2 sheets, scale 1:1,000,000.

Beikman, Helen M., and Lathram, Ernest H., 1976, Preliminary geologic map of northern Alaska: U.S. Geol. Survey Misc. Field Studies Map MF-792, 2 sheets, scale 1:1,000,000.

This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey standards and nomenclature.