DESCRIPTION OF MAP UNITS

ALL AREAS OF HEALY QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS

Qs — **Surficial deposits (Quaternary)**

Thd — **Hornblende dacite (Pliocene)**

Tn — **Nenana Gravel (Pliocene and Miocene)**--Poorly consolidated conglomerate and sandstone

Tcb — **Coal-bearing rocks (Miocene to Eocene)**--Mainly siltstone and shale with subbituminous coal and lignite

Ts — **Sedimentary rocks (Miocene? to Paleocene?)**--Mainly poorly consolidated shale, sandstone, siltstone, and conglomerate

Volcanic rocks (Oligocene to Paleocene)--

Tvv — **Flows, pyroclastic rocks, and subvolcanic intrusions**--Subaerial volcanic rocks and subordinate dikes ranging in composition from basalt to rhyolite

Tvim — **Felsic subvolcanic intrusive rocks**-Mainly dikes of rhyolite and dacite

Tvif — **Mafic subvolcanic intrusive rocks**--Mainly dikes of basalt and subordinate andesite

Tfv — **Fluviatile and volcanic rocks (Eocene?)**--Mainly conglomerate, sandstone, and siltstone and a few thin flows of basaltic andesite

Cantwell Formation (Paleocene)--

Tcv — **Volcanic rocks subunit**--Flows of andesite, basalt, rhyolite, and dacite and pyroclastic felsic rocks

Tcs — **Sedimentary rocks**--Mainly conglomerate, sandstone, and shale and a few thin coal beds and volcanic flows and tuffs

PLUTONIC ROCKS

Tgr — **Granitic rocks (Oligocene to Paleocene)**--Mainly granite and granodiorite

Tgrv — **Granitic and volcanic rocks, undivided (Oligocene to Paleocene)**--Border zone between granitic rocks and Tertiary volcanic rocks

TKgr — **Granitic and hypabyssal intrusive rocks (Paleocene? and Late Cretaceous)**--Mainly granodiorite

NORTHERN, EASTERN, AND SOUTH-CENTRAL AREAS OF QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS

Yukon-Tanana terrane

Rocks north of Hines Creek fault

Kvb — **Basaltic subvolcanic rocks (Late Cretaceous)**--Mainly dike swarms

MDt — **Totatlanika Schist (Early Mississippian to Middle Devonian)**--Carbonaceous slate, phyllite, and schist; metachert, quartz-orthoclase-sericite schist and augen gneiss, metavolcanic rocks

Dmf — **Felsic metavolcanic rocks (Late Devonian)**--Metamorphosed rhyolite and quartz latite

Dmb — **Metabasalt and subordinate metasedimentary rocks (Late Devonian)**--Greenschist, metabasalt, and carbonaceous phyllite

Dms — **Metasedimentary rocks (Late Devonian)**--Sericite schist, black slate, and chert

PzK — **Keevy Peak Formation (early Paleozoic)**--Mainly sericite schist, quartzite, arkosic schist, and black schist and phyllite

PzpCp — **Pelitic and quartzose schist sequence (early Paleozoic and Precambrian)**--Quartz sericite (carbonate) schist, quartzite, and black phyllite

Rocks south of Hines Creek fault

Trcs — **Calcareous sedimentary rocks (Late Triassic; middle? Norian to late Karnian)**--Locally metamorphosed, carbonaceous, calcareous shale and sandstone and sandy to silty limestone. Includes sills and dikes of gabbro

Dy — **Yanert Fork sequence (Late Devonian)**--Carbonaceous siliceous mudstone, slate, phyllite, and schist; impure quartzite and metachert, metavolcanic rocks, and marble interbeds. Also dikes and sills of gabbro

Flysch and associated rocks

Kva — **Andesitic subvolcanic intrusive rocks (Late Cretaceous)**--Hornblende andesite

KJf — **Flysch sequence (Early Cretaceous and Late Jurassic)**--Graywacke turbidite, shale, siltstone, and conglomerate Metamorphosed in southeast part of area.

KJfk — **Overthrust flysch-like rocks (Early Cretaceous and Late Jurassic)**--Lithology identical to unit KJf

KJcg — **Conglomerate, sandstone, siltsone, shale, and volcanic rocks (Early Cretaceous and Late Jurassic)**

Talkeetna superterrane (includes Wrangellia terrane)

TRvs — **Metavolcanic, metavolcaniclastic, and subordinate metasedimentary rocks (Late Triassic; late Norian)**--Marine basalt, tuff, slate, and diabase sills.

TRcn — **Chitistone and Nizina Limestones, undivided (Late Triassic; early Norian and late Karnian)**

TRn — **Nikolai Greenstone (Late and (or) Middle Triassic)**--Mainly subaerial flows of amygdaloidal basalt

TRPm — **Metasedimentary rocks sequence (Middle Triassic to Late Pennsylvanian?)**--Black argillite, thin beds of volcanic breccia and sandstone, and limestone overlain by thin-bedded chert. Sills and dikes of gabbro

PPv — **Andesitic volcanic rocks (Early Permian? and Pennsylvanian)**--Volcanic flows and breccias, probably marine

PLUTONIC ROCKS

Kgr — **Granitic rocks (Late and (or) Early Cretaceous)**--Mainly tonalite, quartz diorite, and granodiorite, generally well foliated

Kgrt — **Tourmaline-bearing granite (Late or Early Cretaceous)**

KJum — **Ultramafic rocks (Early Cretaceous or Jurassic)**--Plagioclase-bearing peridotite

Jgb — **Alkali gabbro (Late Jurassic)**

Dmg — **Metagabbro (Late Devonian?)**

SOUTHWESTERN AND WEST-CENTRAL AREAS OF QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS

Ohio Creek area (Chulitna district)

KJa — **Argillite, chert, sandstone, and limestone (Early Cretaceous and Late Jurassic)**

JTrs — **Red and brown sedimentary rocks and basalt (Early Jurassic and Late Triassic)**--Red sandstone, siltstone, conglomerate, and basalt overlain by brown sandstone and siltstone

TRlb — **Limestone and basalt sequence (Late Triassic; Norian?)**

TRr — **Red beds (Late Triassic)**--Red sandstone, siltstone, and conglomerate

TRDv — **Volcanogenic and sedimentary rocks (Early Triassic to Late Devonian)**--Tuffaceous chert, mudstone, and basalt breccia; flysch-like graywacke and mudstone; limestone

Dsb — **Serpentinite, basalt, chert, and gabbro (Late Devonian)**

Flysch and associated rocks

KJfl — **Flysch sequence (Late Cretaceous to Late Jurassic)**

JTrta — **Crystal tuff, argillite, chert, graywacke, and limestone (Late Jurassic to Late Triassic?)**

Rocks of unknown terrane affinity

TRcg — **Conglomerate and volcanic sandstone (Late Triassic; late Norian)**.

Nixon Fork terrane

DOs / ls — **Sedimentary rocks sequence (Middle Devonian to Ordovician)**--Black argillite and siltstone, massive limestone (ls), thinly bedded limestone, and chert

Flysch and rocks of unknown terrane affinity

KJf — **Flysch sequence (Early Cretaceous and Late Jurassic)**--Same rocks as unit KJf in eastern and southern parts of quadrangle

TRbd — **Basalt, diabase, and subordinate sedimentary rocks (Late Triassic; Karnian and Norian)**

TRPs — **Flysch-like sedimentary rocks (Late Triassic to Pennsylvanian)**--Impure sandstone, siltstone, and shale; minor limestone and chert

Tectonic melanges

Kms / msl — **Melange south of McKinley fault (Late and (or) Early Cretaceous)**--Dark-gray flysch, cherty tuff, volcanic sandstone, and blocks of limestone (msl)

Kmn / mnl / mno — **Melange north of McKinley fault (Late and (or)Early Cretaceous)**--Similar to unit Kms but contains recrystallized limestones (mnl) and ophiolitic rocks (mno), mainly serpentinite, basalt, and chert

Contact--Approximately located

Thrust fault--Showing direction of dip of overturned thrust fault. Dashed where inferred; dotted where concealed. Sawteeth on upper plate

High-angle reverse fault--Dashed where inferred; dotted where concealed. Sawteeth on upper plate

Fault--Dashed where inferred; dotted where concealed. Where displacement known, U, upthrown side, D, downthrown side; arrows indicate relative horizontal movement

Postulated position of fault prior to intrusion of plutonic and subvolcanic rocks

Anticline--Showing direction of plunge

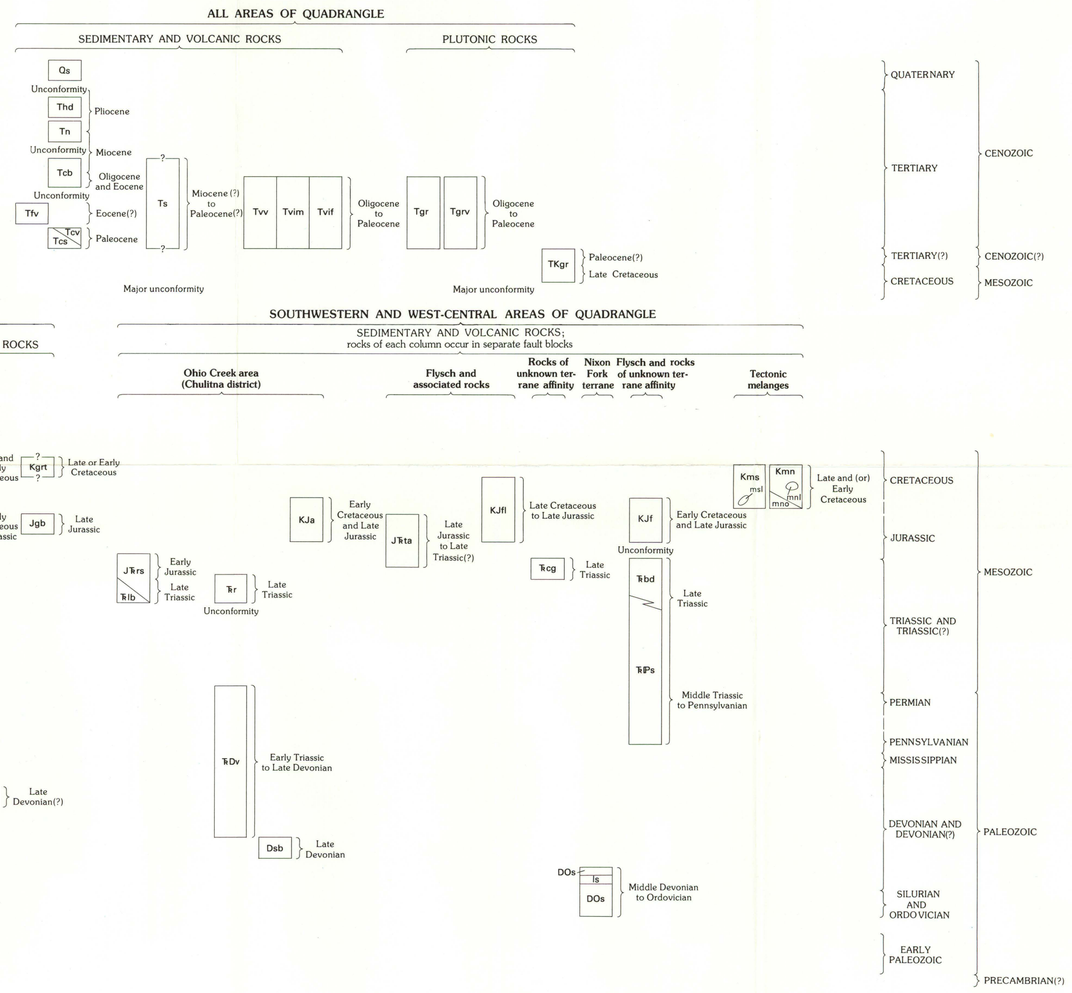
Overturned anticline--Showing direction of dip of limbs and plunge

Syncline--Showing direction of plunge. Dashed where inferred

Overturned syncline--Showing direction of dip of limbs and plunge. Dashed where inferred

Sample locality showing outline of drainage basin area and listing elements with anomalously high concentrations in heavy-mineral-concentrate samples. Elements in parenthesis fall within the 95–98 percentile range, all others are in the 98–100 percent range. See plate 1 for sample numbers

CORRELATION OF MAP UNITS



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DISTRIBUTION OF ANOMALOUSLY HIGH CONCENTRATIONS OF SELECTED ELEMENTS IN HEAVY–MINERAL–CONCENTRATE SAMPLES, HEALY QUADRANGLE, ALASKA