



EXPLANATION

- QTs Sedimentary deposits
- Tb Basalt lavas
- Tri, Trv Rhyolite tuff and lava of the Avon volcanic rocks (Trv) and associated intrusive rocks (Tri)
- Tli, Tlv Lowland Creek Volcanics (Tlv) and associated quartz latite intrusive rocks (Tli)

QUATERNARY
upper Miocene or lower Pliocene
TERTIARY
upper Eocene and lower Oligocene(?)
middle Eocene

ROCKS OF THE MAIN MAGMA SERIES

- fqm, pr, h, a, gp
- bqm
- Butte Granite and related silicic facies
- a Granophyre
- fqm Felsic monzogranite, compositionally similar to h and pr
- pr Monzogranite of Pulpit Rock
- h Monzogranite at Homestake
- gp Granite porphyry
- bqm Butte Granite
- u, bp
- u Unionville Granodiorite of Knopf (1963)
- bp Granodiorite of Burton Park; provisional assignment to series
- m
- Mafic rocks, mostly gabbroic

ROCKS OF THE SODIC MAGMA SERIES

- lg, pg, mc, mt, d, ap, hc, cg, gr
- Leucocratic granodiorites and monzogranites
- cg Climax Gulch pluton
- gr Associated younger granitic bodies
- lg Unnamed plutons
- pg Porphyritic granodiorite of Knopf (1963); provisional assignment to series
- mc Moose Creek pluton
- mt Moosetown pluton
- d Donald pluton
- hc Hell Canyon pluton
- ap Associated aplite
- mb, rc
- mb Mafic bodies that cut the pluton
- rc Granodiorite of the zoned Rader Creek pluton

BATHOLITHIC ROCKS AND SATELLITIC BODIES NOT ASSIGNED TO MAGMA SERIES

- sl, si, sgd, sm
- Age relations among these units not known; their relative positions in the overall intrusive sequence are uncertain but probably span entire period of batholith emplacement
- sl Leucocratic rocks
- si Intermediate rocks
- sgd Granodioritic rocks
- sm Mafic rocks

Upper Cretaceous and Paleocene
CRETACEOUS AND TERTIARY

ROCKS OF THE BOULDER BATHOLITH

- Kb Basalt flows and flow breccias
- Ki, Kev Elkhorn Mountains Volcanics (Kev) and associated intrusive rocks (Ki)
- MzPz Mesozoic and upper Paleozoic sedimentary rocks
- Pz Paleozoic sedimentary rocks
- pC, pCs Precambrian sedimentary rocks (p-C s) and associated intrusive rocks (p-C i)
- pCm Precambrian metamorphic rocks

Upper Cretaceous
PALEOZOIC AND MESOZOIC
ARCHEAN PROTEROZOIC

Contact
(Shown as solid line regardless of actual nature of contact)

- Normal and reverse faults, dashed where inferred. Ball and bar on downthrown side
- Thrust fault; teeth on side of upper plate
- Tear fault, arrows indicate relative motion
- Syncline and overturned syncline
- Anticline and overturned anticline

• Geochemical sample site

PRELIMINARY MAP OF PLUTONIC UNITS OF THE BOULDER BATHOLITH, SOUTHWESTERN MONTANA
(A DIGITAL REPRESENTATION OF USGS OPEN-FILE REPORT 88-283)

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