

FACIES STRATIGRAPHY, HOMESTAKE GRID AREA

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The facies described in the report of 87.08.06 are applicable to the Homestake grid area where they have been studied in more detail and erected into a provisional stratigraphy as shown on the Figure. Minor subdivision of the facies is possible. The sequence assumes the units all face east and there are no significant duplications in the Grid Area. This seems reasonable given unique units Fvb, F1, Fc₂. The following describes briefly the units from the top down.

- Fvb - a grey green massive looking volcanic unit with feldspar phenocrysts about 1 mm in diameter. Good fresh specimens invariably show these rocks to be lapilli tuffs to fine tuff breccias. Most larger clasts are 1 to 3 cm. - Composition probably andesitic as quartz occurs sparsely.

- Fvd - rare in Homestake Grid - a few localities in the south. A prominent unit in the Yellow Jacker South Franklin Creek area. This is another chiefly pyroclastic unit that occurs in the same stratigraphic position and may interfinger with Fvb. Fvd is a grey to greenish grey lapilli tuff to ruff breccia with quartz phenocrysts in clasts and matrix.

- Fsa - a sedimentary unit of volcanic prominence but not strictly a volcanic sandstone. A greenish grey to pinkish grey weathered fine to medium, rarely coarse sandstone that is very dense and difficult to establish is a sandstone except in fresh specimen in good light. Grading is usually good and some grains are rounded (Finely banded specimen are not rare). Feldspar and quartz dominate but mafic and lithic clasts occur. Where hornfelsed difficult to distinguish from a volcanic rock. (Fsv) - Grades to lithic volcanic sandstone which is green. Rare in Homestake grid, common elsewhere.
(Fpt) - May grade to feldspar porphyry tuff.

- Fc₁ - This symbol not used on map but upper Fc is Fc₁ - a granule conglomerate of rounded quartz clasts with white and black chert, minor limestone.

- Fc₂ - Major heterolithic conglomerate unit that is quite variable but characterized by limestone clasts up to 1 m but usually much smaller in matrix of argillite, chert or sandstone. Some quartz granule conglomerate usually present as well as well banded fine to medium sandstone (Fsa) - may represent partial slump of limestone into local sedimentary basin.

- Fp - A hornblende feldspar porphyry - commonly crowded with 25-35% phenocrysts - (plagioclase + Kfeldspar ca 20-25% of 1-2 mm crystals, hornblende needles up to 2 mm long). Commonly a light green fresh with prominent feldspars but weathered specimen commonly have matrix stained black with manganese or iron. Fp is a complex of massive bodies dykes, sills and/or flows with some lapilli tuffs of cognate clasts - very difficult to identify. (Fpt) - Fpt grades to Fsa and to tuffaceous argillite (Fat) in Northeast corner of map.
- Fa - Fine sedimentary rocks that are similar in general appearance but range from pure black, to buff chert (Fac) to cherty siltstone to black or bleached argillite. Normally highly fractured with at least a weak pyritic stockwork. Some localities show bleaching in Stockwork or bedded paleums. Transformed in North to intense biotite quartz hornfels.
- GP - Not part of Franklin sequence as cuts Averill Alkaline Complex but can be confused with Fp. - GP=grey porphyry - also crowded with plagioclase, some hornblende and essential quartz in an aphanitic grey matrix. (Plag - 15-20%, 1 to 2 mm hornblende 5% less than 1 mm, quartz 1-3% in large resorbed grains 1-3 mm.)

LEGEND PLATINUM BLONDE PROPERTY

MARRON FORMATION

T trachyte flows

KETTLE RIVER FORMATION

Kr McKinley rhyolite member

Kf/Ka fanglomerate member, arkose member

EOCENE

NORTH PLATEAU PLUTON

G4 fine-med. hb. granodiorite

PULASKITE PORPHYRY

Pu pulaskite, mafic syenite

ALDIE PLUTON

D f-med. hypidiomorphic diorite

BLUEJOINT MOUNTAIN PLUTON

G3 coarse pink granite, G3a contact aplite, f.sphene granite, gneiss.

GREY PORPHYRY

GP crowded pc, bi, qtz porphyry

WEST FORK PLUTON

G2 med. hb. granodiorite; G2a hypidiomorphic granite, G2 aplite

MESOZOIC

AVERILL ALKALINE COMPLEX

S syenite, quartz syenite

cTS/TS coarse trachitic px. syenite; fine & med. TS.

Px coarse to fine pyroxenite

MD/MG med. monzodiorite, med monzo gabbro

M fine sparsely prophyritic monzonite

GLOUCESTER PLUTON

G1/G1a f-m hb. granodiorite; G1a fine facies

FRANKLIN (ANARCHIST) GORUP
Facies

Fl limestone

Fc fine heterolithic conglomerate

Fa argillite, siltstone & chert

Fs volcanic and arkosic sandstone

Fp crowded feldspar-hornblende porphyry

Fv aphanitic volcanic flows & breccias

PERMO - CARBONIFEROUS

PLUTONS

<u>No.</u>	<u>Map Symbol</u>	<u>Informal Name</u>	<u>Main Composition</u>	<u>Age Relations</u>	<u>Correlation</u>
✓ 1	G1 G1a	Gloucester Pluton	fine medium hornblende granodiorite fine grained phase	post Franklin Group pre Averill	Nelson?
✓ 2	PX	Averill Alkaline Complex pyroxenite phase	- coarse to fine pyroxenite mica and feldspathic pyroxenite	post Gloucester Pluton - pre Monzonite s syenite.	lc
	MG	{ Monzogabbro	- fine medium grained monzogabbro and relatives	} post pyroxenite - pre trachytic syenite	
	MD	{ monzodiorite	- fine medium monzodiorite		
	M	{ monzonite	- fine slightly prophyritic monzonite		
	cTS	{ coarse syenite	- cs and very cs trachytic pyroxene syenite		
	TS	{ fine and medium syenite	- fine and med. trachytic pyroxene syenite	post monzonite suite - <i>pre</i> west Fork pluton Kettle River Fm	
3	G2	West Fork Pluton	- medium hornblende granodiorite	post Averill Alkaline Complex- pre pulaskite	
	G2a	late phase	- fine-medium hypidiomorphic granite		
	G2b	late phase	- fine allotriomorphic aplite		
4	G3	Bluejoint Mountain Pluton	- coarse quartzose pinkish granite	post Averill Alkaline Complex pre-Kettle River Fm	Valhalla?
	G3a	contact phases	- aplitic to fine grained sphene-granite	post Averill Alkaline Complex	
5	D1	Aldie Pluton	- fine medium hypidiomorphic diorite	post Averill Alkaline Complex pre pulaskite	
6	G4	North Plateau Pluton	- fine medium granodiorite	probably post pulaskite - <i>post Kettle River</i>	
<u>HYPABYSSAL INTRUSIONS</u>					
[7	[Pu(S)	Pulaskite, mafic syenite	- glomeroporphyratic K-feldspar porphyry - holocrystalline pyroxene syenite	post West Fork Pluton - pre Plateau <i>Pluton</i>	Coryell?
8	GP	Grey porphyry	- grey crowded plagioclase, biotite, quartz porphyry	post Averill - pre Kettle River	West Fork

Kettle River

G2.

G3.

D1

[7

SUMMARY FIELD DESCRIPTIONS, INTRUSIVE ROCKS

1. Gloucester Pluton - fine to medium grained, hypidiomorphic hornblende granodiorite - fairly commonly shleritized; 15-20% hb, 15-20% quartz fine grained in matrix, 45%? pc, 15% kf in matrix. Slightly finer than West Fork granodiorite, 2mm average no. 3 to 4mm. Fine grain phase on northeast border (G1a).
versus
3. West Fork Pluton - medium grained (av 3 to 4mm - hb up to 7mm long) - hornblende granodiorite - usually fresh, composition 20% hb, 5% biotite, 15% quartz, 45% plaq., 15% Kf - hypiomorphic texture. Aplitic and hypromorphic granite phases
4. Bluejoint Mtn. Pluton - coarse (av. >5mm), virtually allotino morphic granite with large irregular grey quartz, mottled buff to grey weathering; comp. 20-25% quartz, 5% biotite, 5% hornblende, 70% subequal plagioclase and K feld. - contact phases variable from aplitic granite to fine quartzose spher-bearing granite. (30% qtz, 4% hb, 3%, pc, Kf) + *(sphone)*
6. North Plateau Pluton - fine to medium (av ca 3mm) - fresh hornblende granodiorite, hypidiomorphic texture; 15-20% hb, 15-20% qtz of fine grain, 45% ? plaq., 15% Kf in matrix.
5. Aldie Pluton - fine grained, (av. ca 1mm - max pc & hb lengths to 3mm). Comp - weakly foliated leuco diorite; 17 ± 3% hb, 75% zoned plaq., < 5% qtz and accessories
7. Pulaskite - resistant, buff weathering - purplish grey mafic syenite with ca 20% phenocrysts in a very fine grained aphanitic matrix. Glomer to radiating Kf clots with equigranular biotite books, green pyroxene, Kf → bi → diopside?, Kf → bi → px. - prob. related to Coryell
8. Grey porphyry - spotted grey and white porphyry - 30% zoned plaq laths to 2 mm, 5% biotite < 1mm, rare 2-4 mm corroded quartz grains in dense glassy looking grey matrix, possible related to late granite of West Fork.

Note to typist: I should give the compositions in

a uniform abbreviated form as below

quartz = qtz

plagioclase = pc

K feldspar = Kf

hornblende = hb

pyroxene = px

biotite = bi

Magnetite = mt

olivine = ol

2. Averill Alkatline Complex

px - variable from coarse mineralia pyroxenite with crystals to 2cm (rare) cs px with
5-10% 90% px 5-10% felds, 0-2 amber folds (pxs-olivene); m gr foliated px >95% px as
aligned elongated prism + 5% pl m gr micaceous pyroxenite - 3mm ϕ mica. forming 10
to 100% of "altered" pyroxenite
* composition of pyroxenes not known

medium grained

medium grained

M/MD/MG - a gradation sequence from gradational phases
description on basis of hand lens examination contradicts petrographic principles as
for the classification should be based on composition in the feldspars or mafic
minerals largely underterminable. Hence it is based on mafic content
MG > 65% mafic < 90%
MD > 35% mafic < 65%
M > 15% mafic < 35%

which are

M invariably fine grained 0.5 - 1mm average ϕ - with 1 to 5% pheno xts of px and pl
to 5mm. Common mafic comp 20% - rare in feldspars include plagioclase
MD normally fine-medium grained 1-3mm av. ϕ - no phenoxts, 50% px, greenish black,
slightly sliphr foliated fabric contains some plagioclase - may have px altered to bi (ro)
even contains 5% primary? bi
MG normally med. grained, 2-4mm ϕ - comm. be foliated, schieren of pyroxene can
occur large kf oriented laths
metasomatic envelopes to syenite veins occur of very fresh, randomly orientes, px -
alteratio of px to bi common

ϕ symbol for diameter

biotite

TX/CTS a gradational sequence with two main modes - fine to medium grained and coarse
and very coarse. Compositionally virtually identical, - foliated rocks grey to
guff weathering and grey fresh, of 70+10% K feldspar laths (plates) with either
interstitial pyroxene 20-30% (in coarse grained) or parallel prisms in fine and
medium, trace of biotite and magnetite - f.g. laths < 0.5cm, m 0.5-2cm, > 2cm; very
cs. up to 8 cm long.

unintentional

cs. > 2cm

(Sorry for sloppy original)