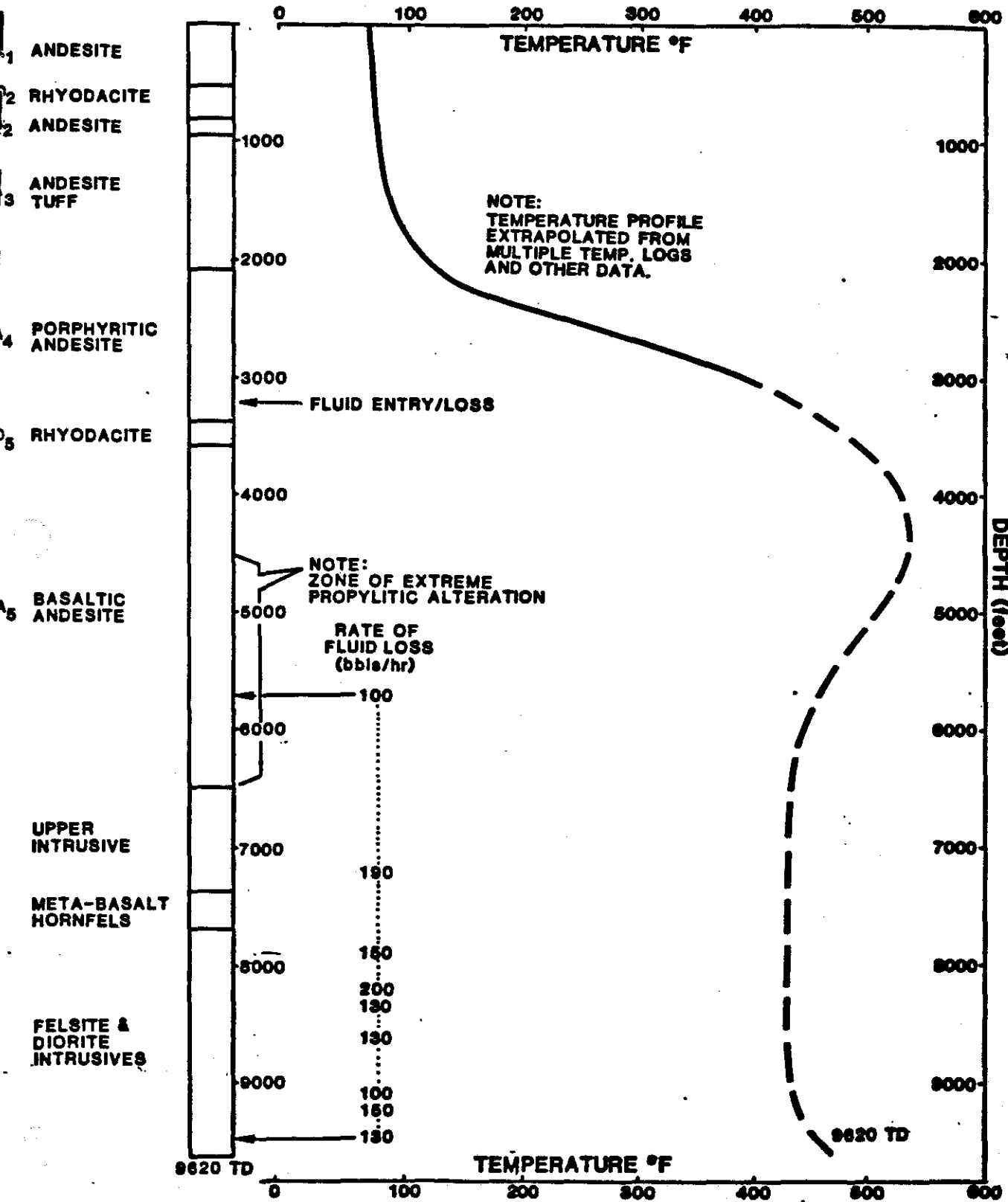


MEDICINE LAKE, CA. 17A-6 Well Data



Geologic summary, 17A-6 GMF

The following is intended to be a brief summary of the volcanic stratigraphy encountered during drilling of the 17A-6 well, Medicine Lake, Glass Mountain Federal Unit. The analytical work was performed by M. Keskinen and J. Sternfeld, and summarized by M. Woodruff.

The different rock units encountered in 17A-6 can be separated into several gross lithologic units. The volcanic units are all complex sequences of lava flows, cinder scoria, tuffs and vitrophyres which represent multiple eruptive events. These units are recognized and defined by average whole rock chemistries, minor element geochemical parameters, and associated mineralogical assemblages, and have been labelled by rock type on the following basis:

less than 52% SiO₂ - basalt
52-57% SiO₂ - basaltic andesite
57-62% SiO₂ - andesite
62-67% SiO₂ - dacite
67-72% SiO₂ - rhyodacite
greater than 72% SiO₂ - rhyolite

Below 7710', all rocks are phaneritic rocks of igneous origin. Complex intergrowth textures are observed; micrographic, granophyric and myrmekitic, indicative of rapid crystallization under equilibrium conditions. The combination of fine grained phaneritic and interpenetrative textures are common to shallow intrusives, e.g. dikes, sills, small stocks.

<u>Depth (ft) from KB*</u>	<u>Description</u>
0 - 70	Alluvium, pumice, scoria and weathered andesite
70 - 520	Unit A ₁ , - ANDESITE. Probably equivalent to Qpa (platy andesite) of Ciancanelli (1983) and rampart andesite of Mertzman (1977). Average SiO ₂ 59.4%. SI=15.4. Mineralogy: plagioclase + K-feldspar + angite + trace cristobalite + hematite. Essentially fresh.
520 - 800	Unit RD ₂ - RHYODACITE. Average SiO ₂ 71.9%, SI = 3.4. Glassy 520' to 620', vitric to aphanitic to 800'. Mineralogy: plagioclase + quartz + K-feldspar + cristobalite + magnetite +

*Note: KB elevation 6771'

augite + ilmenite. Very slight devitrification of glass.

800 - 950

Unit A₂ - ANDESITE. Average SiO₂ 57.6%, SI = 21.5. Mineralogy: plagioclase + K-feldspar + pyroxenes + trace magnetite + ilmenite. Essentially fresh.

950 - 2100

Unit A₃ - ANDESITE TUFF and related DACITE and ANDESITE flows. Average SiO₂ 60.6%, SI = 14.5. Mineralogy: plagioclase + K-feldspar + cristobalite + augite + traces hematite, quartz, ilmenite. Alteration includes quartz veinlets, occasional zeolites in amygdules, localized calcite and smectite.

2100 - 3300

Unit A₄ - PORPHYRITIC ANDESITE. Average SiO₂ 59.7%, SI = 15.8. Mineralogy: plagioclase + quartz + magnetite + pyroxenes. Alteration: clay and silica in amygdules, calcite and opal fracture filling and veining.

3330 - 3560

Unit RD₅ - RHYODACITE flows and TUFF. Average SiO₂ 70.0%. SI = 6.2. Mineralogy: plagioclase + quartz + K-feldspar + augite + ilmenite + hematite. Alteration: quartz and calcite veinlets, clay/chlorite in amygdules, calcite altering glass and feldspars.

3560 - 6500

Unit A₅ - BASALTIC ANDESITE. Average SiO₂ 56.8%, SI = 15.4. Mineralogy: plagioclase + quartz + K-feldspar + magnetite + hematite + augite. Alteration: above 4400' - calcite and silica veining, clays/chlorite, quartz and calcite in amygdules, feldspars quite altered, pyroxenes rimmed with Fe-oxides. Below 4400' - extensive propylitic alteration includes zones of extreme leaching and calc-silicate replacement. Alteration minerals include calcite, quartz, chlorite, pyrite, chalcopyrite, zeolites, chalcedony, prehnite, epidote, orange feldspar.

6500 - 7350

UPPER INTRUSIVE UNIT - fine grained to aphanitic white-pinkish felsite. Average SiO_2 77%, SI = 1.5. Alteration minerals include traces of pyrite, biotite, magnetite, vein quartz, epidote, misc. zeolites.

7350 - 7710

META-BASALT with rare to occasional plagioclase phenocrysts grading to BIOTITE-HORNFELS/AMPHIBOLITE. No chemistry performed. Alteration minerals: White and clear silica veining, epidote, chlorite, calcite, sulfides, actinolite, biotite, amphibole, zeolites.

7710 - 9620 (TD)

Intercalated MICRODIORITE and FELSITE porphyry. The microdiorite averages 68.97% SiO_2 , SI = 8.6, and is fine grained and mafic rich (mafics greater than 10%) with green amphibole, biotite and magnetite in a groundmass dominated by gray plagioclase. The felsite porphyry averages 73.13% SiO_2 , SI = 5.99, and is mafic poor (usually 3-5%) with green amphibole, biotite and magnetite in a groundmass of white plagioclase and quartz. Alteration includes epidote, quartz, pyrite, feldspar, amphibole, biotite.