THIRTYNINE MILE VOLCANIC FIELD
THE GEOLOGY OF WITCHER MOUNTAIN

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Based on field relationships, the volcanic rocks of Witcher Mountain on the eastern edge of the Thirtynine Mile volcanic field in Central Colorado can be divided into two general categories. The first category is characterized by extensive flows and associated laharic material. The second category includes dikes that crosscut the flows and a small rhyodacitic dome sitting on the upper flows of Witcher Mountain.

There are two distinct flow units. The first, and volumetrically most significant, flow is a basaltic andesite. The unit is characterized by clinopyroxene phenocrysts and olivine phenocrysts high in magnesium relative to iron oxide (66% MgO:34% FeO). Phenocrysts of plagioclase are rare. The majority of plagioclase exists as groundmass laths (An_{x-y}). Fe-Ti oxides are also present with titanium oxide content ranging from 7-20 weight percent. The second flow is andesitic with normally zoned plagioclase phenocrysts. Plagioclase laths are dominant in the fine-grained matrix and are more sodic than the plagioclase phenocrysts. Hornblende and biotite are the dominant mafic phenocrysts with traces of small clinopyroxene phenocrysts also present. In addition, Fe-Ti oxides are present with titanium oxide content ranging from 10-40 weight percent.

The basaltic dikes crosscutting the flows are characterized by an abundance of clinopyroxene phenocrysts. Olivine exists as phenocrysts as well (59% MgO:41% Feo). Fe-Ti oxides are also present. Titanium oxide content ranges from 12-20 weight percent. The groundmass consists of clinopyroxene and calcic plagioclase laths.

The rhyodacitic unit is characterized by the presence of hornblende and biotite phenocrysts. Andesine phenocrysts are also present. The Fe-Ti oxides present have a range of titanium oxide from 15-35 weight percent. The groundmass consists of alkali feldspar.