

**Geologic Map of the Goldfield Quadrangle  
and the Northern Part of the Superstition  
Mts. SW Quadrangle, Maricopa and Pinal  
Counties, Arizona**

by  
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**UNIT DESCRIPTIONS**

**Quaternary**

Qs **Quaternary surficial deposits**—Contains unconsolidated to moderately well-consolidated sand, gravel and conglomerate deposits of various ages.

**Tertiary**

Tbu **Basalt**—Very fine-grained, dark grey to black basalt containing 1-2 mm phenocrysts of clear plagioclase, olivine altered to red iron oxides, and rare clear nepheline.

Tsv **Volcaniclastic sandstone**—Yellow, thinly bedded volcaniclastic sandstone and minor tuff. Excellent exposures along First Water Creek contain thin bedded air-fall tuff layers up to 1 meter or so thick.

Tq **Quartz latite**—Crystal-rich (>35%) lavas containing plagioclase, sanidine, quartz, and biotite ± hornblende. Quartz phenocrysts are typically large (up to 1 cm) and embayed. This unit is very resistant and forms steep cliffs in the northeast corner of the map area. Frowell (1984) described variations in the percentage and abundance of phenocrysts for separate flows and named the unit the Peters Canyon dome complex.

Tfr **Lithic tuff**—Commonly nonbedded, but locally bedded massive yellow lithic tuff containing 1-3 mm phenocrysts of subhedral biotite and plagioclase.

Trd **Rhyodacite breccia**—Yellow to grey brecciated rhyodacite lava containing about 5% 1-3 mm subhedral phenocrysts of biotite, plagioclase, and quartz. Exposed below Black Mesa and Malpais Mountain. Locally, it resembles a sedimentary breccia.

Ts **Superstition Tuff (undifferentiated)**—A very thick (several 100's of meters) sequence of crystal-rich rhyodacite ash-flow tuff containing 25-40% phenocrysts of feldspar, biotite, and resorbed quartz. Quartz phenocrysts, commonly as large as 1 cm, comprise about half of the total phenocryst population which seems to distinguish this unit from the Comet Peak Tuff (map unit Tsp) in which quartz comprises one third or less of the phenocrysts. The size range of the other phenocrysts is 1-5 mm. The Superstition Tuff is separated into numerous sub-units by poorly welded to nonwelded zones of varying thickness (1-20 meters) that are commonly lithic-rich. Some zones appear to represent thin autobrecciated lava flows of dacite (and mafic lavas in the Weavers Needle Quadrangle).

Tsuf **Upper and Lower Flatiron members of the Superstition Tuff**—Two prominent members (lower, Tsuf, and upper, Tsuf) named for "The Flatiron", which make up the high, flat peaks at the west end of the Superstition Mountains.

Tsm **Miners Needle member of the Superstition Tuff**—Lithic-rich, nonwelded tuff zone, 2-3 meters thick that is shown without thickness on the map (i.e., the contact between the Hieroglyphic and Peralt Canyon members). In some areas lithic-rich tufts of the Miners Needle member grade into thin autobrecciated dacite.

Tsp **Peralt member of the Superstition Tuff**—A thick, typically massive unit that underlies the Flatiron members and overlies the Hieroglyphic member. The base is defined by the top of the Miners Needle member.

Tsh **Hieroglyphic member of the Superstition Tuff**—The lower part of this unit in its type area of Hieroglyphic Spring is dark red-brown in color and contains distinctive, dark red-colored, poorly compacted crystal-rich pumice fragments or magma clots from 2-20 cm wide.

Tcp **Tuff of Comet Peak**—Crystal-rich, rhyodacite, welded ash-flow tuff containing 30-40% phenocrysts of feldspar, quartz, and biotite. Marginally distinguishable(?) from the Superstition Tuff because feldspar phenocrysts are more abundant than quartz, but very similar in all other aspects.

Tct **Tuff of Comet Peak, poorly welded interval**—Lithic-rich, poorly welded zone of the Comet Peak Tuff.

Tri **Intrusive rhyolite**—Contains <5% nonhedral to subhedral phenocrysts of feldspar and biotite in a tan to light grey aphanitic groundmass. Forms dikes at Dinosaur Mountain and one dike in Hieroglyphic Canyon. Commonly flow-banded.

Tdi **Intrusive dacite**—Crystal rich dacite 1-10 mm subhedral to euhedral phenocrysts of light grey plagioclase, black biotite and hornblende and less abundant resorbed quartz, all in a pale green to tan aphanitic matrix.

Tr **Rhyolite**—Crystal-poor, light tan lavas containing less than 2% subhedral 1-3 mm phenocrysts of clear plagioclase and black biotite in a tan, aphanitic matrix.

Tsx **Mesobreccia**—Very poorly sorted, clast-supported rock avalanche deposits interbedded with welded tuff. Various volcanic clasts, and clasts of granite and Pinal Schist, though as large as several meters, are typically less than 1 meter in size, surrounded by a tuffaceous and/or granular sedimentary matrix.

Tsxg **Megabreccia**—Lithic breccias with matrix similar to map unit Tsx, but distinguished because of the exceptionally large size (greater than tens of meters) and monolithic character of the lithic blocks. Composed of large blocks of rhyolite and/or dacite.

Tdc **Dacite**—Crystal-rich lavas containing subhedral 1-15 mm phenocrysts of clear to light grey plagioclase and subhedral to euhedral 1-8 mm phenocrysts of biotite and hornblende in a dark maroon to blue-purple aphanitic matrix.

Tss **Sandstone**—Thinly bedded, moderately sorted volcaniclastic sandstone composed of subangular sand- and gravel-size clasts of dacite in a purple, sandy matrix.

Tdl **Lower dacite**—Relatively crystal-poor lava (2-5% phenocrysts). Contains phenocrysts of subhedral biotite, hornblende, and feldspar (probably plagioclase) in a grey to maroon aphanitic groundmass. Mafics are commonly altered to hematite.

Tl **Bedded tuff**—Undivided yellow to tan bedded lithic tufts containing various subangular volcanic clasts and less abundant granite. Near the Massacre Grounds the unit contains steep tabular cross-beds with fine-grained well-sorted sand-sized sand grains and eolian in character.

Tb **Basalt**—Fine-grained, medium to dark grey flows and locally autobreccia containing 1-3 mm phenocrysts of clear plagioclase, and olivine altered to red iron oxides. Locally interbedded with dacite and conglomerate.

Tc **Conglomerate**—Poorly sorted cobble conglomerate in a red, sandy, arkosic matrix, locally interbedded with thin red sandstone layers (which are rarely exposed). Contains mostly clasts derived from the Younger Proterozoic Apache Group.

Tcs **Sandstone**—Consists of thinly bedded, clast-supported gravely sandstone and minor conglomerate, containing subangular clasts derived almost entirely from nonfoliated granite.

Tsc **Conglomerate and sandstone, undivided**—Interbedded red sandstone and conglomerate. The unit contains a mixture of granitic and proterozoic clast types contained in both map units Tc and Ts.

**Cretaceous or Tertiary**

TKp **Porphyry**—Grey-tan porphyritic rock containing 2-15 mm orthoclase phenocrysts and small clots of green-black biotite, in a fine-grained to aphanitic matrix of feldspar and quartz.

**Proterozoic**

Yd **Diabase**—Dark grey-green diabase composed of 1-5 mm, interlocking, tabular, subhedral phenocrysts of green to black pyroxene, clear to white plagioclase, and 1-3 mm opaque minerals (magnetite?).

Ym **Mescal Limestone**—Light grey limestone and/or dolomite commonly with 10-30 cm-thick beds which erode into step-like layers on weathered surfaces. Contains 1-3 cm-thick layers of brown chert.

Yds **Dripping Spring Quartzite**—Light tan to pink and white, well sorted metamorphosed sandstone interbedded with minor pebble-sized sandy conglomerate and siltstone, containing subrounded sand-size grains of quartz and light pink feldspar in a siliceous matrix. Cross-beds are abundant.

Ybc **Barnes Conglomerate member of the Dripping Spring Quartzite**—Grey to tan, 1-3 meter-thick conglomerate containing moderately well-sorted, well-rounded pebbles and small cobbles of white vein quartz, and grey, red, and tan quartzite and jasper, all in a tan to grey, sandy, arkosic, siliceous matrix.

Yp **Pioneer Shale**—This unit consists of thinly bedded purple, and locally tan, shale and siltstone. It is exposed in small, discontinuous outcrops on the southeast edge of the map.

YXd **Diorite**—Coarse-grained, nonfoliated rock containing 1-6 mm subhedral phenocrysts of dark green to black amphibole and variable, but lesser amounts, of light grey plagioclase.

YXg **Granite**—Heterogeneous, light grey intrusive rock containing 1-3 cm subhedral phenocrysts of pink orthoclase and phenocrysts of milky grey quartz, white subhedral plagioclase, and clumps of subhedral biotite.

Xgf **Foliated granite**—Has a similar composition as map unit YXg. Exposed only in low hills east of Hieroglyphic Canyon. Intensity of foliation increases from south to north.

Xp **Pinal Schist**—The unit is dominated by silver-grey metapelites containing fine-grained quartz and sericite, but also includes thin layers of marbles, calc-silicates, quartzites and amphibolites (in most areas mapped separately).

Xpa **Pinal Schist amphibolite**—Dark green to black, foliated, fine-grained, epidote-rich amphibole with lesser amounts of white to pink feldspar and quartz, which form thin, 1-3 mm-thick, discontinuous leucosomes. Locally very rich in epidote.

Xg **Orthogneiss**—Coarse- to medium-grained foliated granitic protolith consisting of discontinuous melanosomes of dark green biotite up to 2 mm thick and leucosomes of pink and white feldspar and clear-grey quartz.

**Map Symbols**

- Eutaxitic foliation in welded tuff, and flow foliation
- Metamorphic foliation, with lineation
- Bedding
- Contact, dashed where approximately located
- Fault with attitude, ball on downthrown side, dashed where uncertain, dotted where concealed
- Mafic dike
- Dacitic dike
- Felsic dike
- Marker bed

**Map Symbols**

N  
MN  
12.5°

**INDEX MAP OF ARIZONA**  
Showing Location of Pinal County

Map Area

NORTH

SCALE 1:24,000

0 1000 2000 3000 4000 5000 6000 7000 FEET

0 5 10 KILOMETER

TOPOGRAPHIC CONTOUR INTERVAL 20 FEET