GEOLOGIC MAP OF THE LOOKOUT MOUNTAIN 7 ½' QUADRANGLE, PINAL COUNTY, ARIZONA

by
Young, J.J., Spencer, J.E., MacFarlane, B.J., and Richard, S.M.

February 2010

Arizona Geological Survey Digital Geologic Map 66 (DGM-66), version 2.0

Citation for this map:
Young, J.J., Spencer, J.E., MacFarlane, B.J., and Richard, S.M., 2009, Geologic map of the Lookout Mountain 7½' Quadrangle, Pinal County, Arizona: Arizona Geological Survey Digital Geologic Map DGM-66, scale 1:24,000.

(Research supported by the U.S. Geological Survey, National Cooperative Geologic Mapping Program, under assistance award number 07HQAG0110. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.)

Map Unit Descriptions

San Pedro and Aravaipa River Alluvium

- **Qyr,f** **Active river channel deposits** - unconsolidated, very poorly sorted sandy to cobbly beds in active river channels
- **Qyr,f** **Flood channel and low terrace deposit** - unconsolidated sand, gravel and silt deposits on bars, low terraces and flood channels
- **Qyr,f** **Historical river terrace deposits** - unconsolidated sand, gravel and silt deposits on low terraces inset below the abandoned early historical floodplain
- **Qyr,f** **Latest Holocene to historical river deposits** - silt, clay, sand and minor gravel deposits underlying the early historical floodplain
- **Qyr,f** **Late to Early Holocene San Pedro terrace deposits** - silt, clay, sand and minor gravel terrace deposits slightly above the early historical floodplain
- **Qlsr** **Late Pleistocene river terrace deposits** - gravelly, sandy river terrace deposits up to 25 m above the active river channel
- **Qlsr** **Middle to late Pleistocene river terraces** - older, higher gravelly, sandy river terrace deposits
- **Qlsr** **Early to middle Pleistocene river gravel terraces** - oldest, highest preserved gravelly, sandy river terrace deposits

Piedmont Alluvium

- **Qy$_r$** **Active tributary channel alluvium** - Unconsolidated, very poorly sorted sandy to cobbly ephemeral piedmont-tributary channel deposits
- **Qy$_3$** **Latest Holocene alluvium** - Ephemeral tributary channel deposits and low-lying piedmont channel terraces flanking active drainages
- **Qy$_2$** **Late Holocene alluvium** - Planar terrace deposits located along incised drainages, broad low-relief distal fan deposits onlapping onto Holocene river alluvium, and infrequently active tributary drainage deposits
- **Qy$_f$** **Late Holocene alluvial fan** - Active portions of young fan deposits exhibiting distributary drainage patterns
- **Qy$_1$** **Early to late Holocene alluvium** - Broad, low-relief, undulating fan and sheet deposits exhibiting widespread, shallow braided drainage patterns
- **Ql$_3$** **Late Pleistocene alluvium** - gravelly and sandy late Pleistocene fan and terrace deposits with moderately developed orange-colored soils
- **Ql$_2$** **Middle to late Pleistocene alluvium** - gravelly and sandy late Pleistocene fan and terrace deposits with moderately developed orange-colored soils
- **Ql$_1$** **Early to middle Pleistocene alluvium** - gravelly deposits associated with high, planar to broadly rounded alluvial fan surfaces, with dark red clay-rich soils
- **Qo** **Early Pleistocene fan gravel** - highest elevation, moderately consolidated gravelly deposits with variable soil development
- **Qlu** **Pleistocene alluvial terrace - undivided** - coarse clastic alluvial fan and terrace deposits with slightly to moderately reddened soils
- **QTa** **Late Pliocene to early Pleistocene fan gravel** - coarse, moderately to well-consolidated gravelly deposits capping high rounded ridges; often indistinguishable from coarse-grained Quiburis.

Basin Fill Deposits

- **Tqc** **Late Miocene to Pliocene Quiburis deposits, conglomeratic** - Poorly sorted, moderately to strongly indurated alluvial fan deposits
- **Tql** **Late Miocene to Pliocene Quiburis deposits, lacustrine facies** - Fine-grained, laminated playa and lacustrine deposits

Oligocene to lower Miocene volcanic units

- **Trx** **Rhyolite intrusion and intrusive breccia** - At the south edge of the map area, this unit consists of crystal-poor, massive to flow-banded rhyolite and clast-supported brecciated rhyolite.
- **Tvl** **Latite lava flows** - Aphanitic and locally vitric, flow-banded lava flows and autobreccia. Locally includes andesitic to basaltic lava flows (Krieger, 1968).
- **Ta** **Andesite** - Three small, widely separated, exposures of dark-gray andesite (from Krieger, 1968).

Other Units -

- **Qtc** **Quaternary talus and colluvium deposits** - Quaternary talus and colluvium deposits
- **d** **Disturbed Deposits** - Areas that have been altered by mining and development.
- **Qs** **Surficial deposits - undivided** - Surficial deposits that are not distinguishable due to intermixing of depositional systems and mapping scale.
- **Plowed areas** - Historically or actively plowed fields, irrigated pasture, and other lightly disturbed ground.
- **TKr** **Rhyolite dike** - Rhyolitic dike with phenocrysts of quartz (<3 mm), plagioclase, sanidine, and biotite (Krieger, 1968).

Mesozoic sedimentary unit

- **Mzs** **Clastic sedimentary rocks** - Sandstone and siltstone with basal conglomerate and chert-fragment breccia.

Paleozoic sedimentary units

- **Me** **Escabrosa Limestone** - Resistant, massive to thick bedded limestone, generally gray or yellowish to greenish gray. Fossil crinoids, coral, and brachiopods are common (Krieger, 1968).
- **Dm** **Martin Formation** - Slope forming, interbedded carbonate and siltstone.
- **Ca** **Abrigo Formation** - Thin- to thick-bedded, cross bedded, dolomitic sandstone with local dolomite, siltstone, sandstone, and intraformational conglomerate. Dark chocolate-brown calcareous sandstone is characteristic of this unit in easternmost exposures.
- **Cb** **Bolsa Quartzite** - Fine- to locally medium-grained sandstone, plane bedded to cross bedded. Sandstone varies from chocolate brown to orangish tan to white. Sandstone is coarse to granule within basal several meters. Includes locally abundant, cylindrical trace fossils (burrows?), <1 cm diameter.

Mesoproterozoic Apache Group and diabase

- **Yd** **Diabase** - Dark greenish gray to olive gray, medium grained diabase forming sills and dikes in all Proterozoic rock units.
- **Yt** **Troy Quartzite** - Thin-bedded sandstone and granule to small pebble conglomerate.
- **Ym** **Mescal Limestone** - Thick to thin bedded, brown to gray dolomite and silty to cherty dolomite, less abundant laminated limestone, and brown dolomitic sandstone locally at base (Krieger, 1968). Asbestos veins are locally present near intrusive contact with diabase.
- **Yds** **Dripping Spring Quartzite** - Feldspathic, arkosic, and quartzose sandstone and less abundant siltstone. Sands are typically fine to medium grained and appear feldspathic with red K-feldspar grains. Sandstone is locally cross bedded.
- **Ydsb** **Barnes Conglomerate Member, Dripping Spring Quartzite** - Up to 4 m of pebble and cobble conglomerate, with well rounded clasts up to 12 cm diameter of quartzite, vein quartz, and red jasper, in a matrix of red to gray arkosic sandstone (Krieger, 1968).
- **Yp** **Pioneer Formation** - Very fine grained to coarse-grained, locally cross-bedded sandstone. Grain size generally decreases up section (Krieger, 1968).

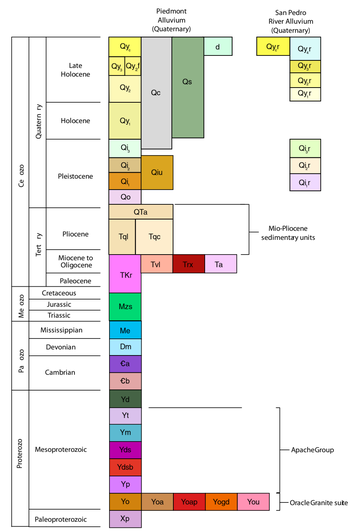
Mesoproterozoic granitoid units

- **Yo** **Oracle Granite** - Porphyritic, medium- to coarse-grained biotite granite ("quartz monzonite" of Krieger [1968]). Microcline phenocrysts are as large as 2 x 4 cm and somewhat poikilitic, with included mafic minerals imparting a speckled appearance. K-feldspar is commonly pink to reddish, and mafic minerals are generally abundant (7-12%).
- **Yoa** **Oracle Granite, alaskitic** - Equigranular, medium to coarse grained, dark orange to pale red alaskite that is gradational with the Oracle Granite (Krieger, 1968). Local porphyry, aplite, and potassic granite were included with this map unit by Krieger (1968).
- **Yoap** **Oracle Granite, aplitic** - White to pale orange to light brownish gray, fine-grained leucogranite dikes, locally pegmatitic or muscovitic (Krieger, 1968).
- **Yogd** **Oracle Granite, granodioritic** - Medium-grained, gray granite or granodiorite containing biotite and hornblende (Krieger, 1968).
- **You** **Oracle Granite, undivided** - Oracle Granite, undivided

Paleoproterozoic metamorphic unit

- **Xp** **Pinal Schist** - Faintly laminated, very fine-grained, medium to dark gray, foliated to weakly schistose sandstone to siltstone.

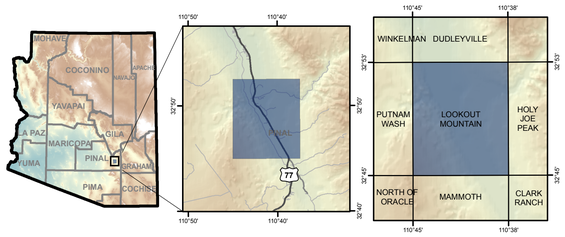
Correlation of Units



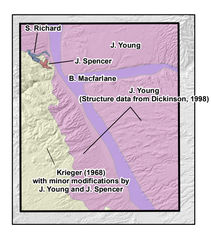
Map Symbol Descriptions

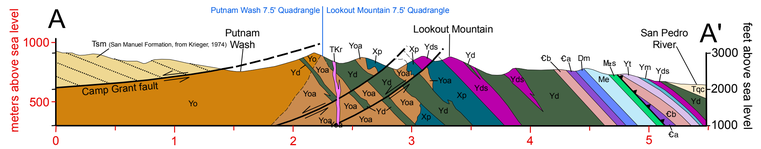
- Horizontal bedding
- Inclined bedding showing strike and dip
- Overturned bedding showing strike and dip
- Overturned bedding, showing strike and dip. Facing indicators present at this location
- Transposed bedding showing strike and dip
- Slickenside (fault-surface striae)
- Fault attitude
- Minor fault or vein orientation, showing strike and dip
- Accurately located contact
- Approximattely located contact
- Contact, concealed beneath surficial units
- Accurately located fault
- Approximately located fault
- Fault, concealed beneath surficial units
- Approximately located fault, inferred
- Accurately locate thrust fault
- Approximately located thrust fault

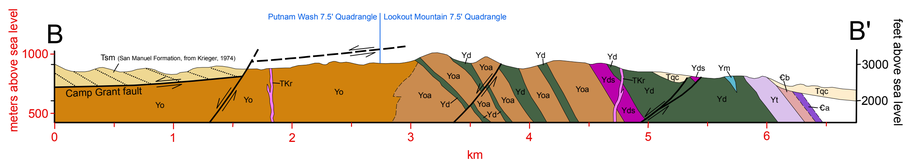
Location Map
Mapped Area Shown in Blue



Mapping Responsibility







Topographic base from USGS 1:24,000 Quadrangle Series.
Seamless basemap generated using iGage All Topo Pro software.

Projection Information:
North American Datum of 1983.
1000-meter Universal Transverse Mercator grid tics, zone 12, shown in blue.

Cartography and Map Layout by Ryan J. Clark and Helen Ireland

SCALE 1:24 000

1 0.5 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0.5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET

2007 MAGNETIC NORTH DECLINATION

Arizona Geological Survey
416 W. Congress Street, Suite 100
Tucson, AZ 85701
(520) 770-3500
www.azgs.az.gov

References Cited

Dickinson, W.R., 1998, Facies map of post-mid-Miocene Quiburis Formation, San Pedro trough, Pinal, Pima, Gila, Graham, and Cochise Counties, Arizona: Arizona Geological Survey Contributed Map CM-98-A, ten sheets, scale 1:24,000, with 6 p. text.

Krieger, M.H., 1968, Geologic map of the Lookout Mountain quadrangle, Pinal County, Arizona: U.S. Geological Survey Geologic Quadrangle Map GQ-670, 2 p., 1 sheet, scale 1:24,000.

Krieger, M.H., 1974, Geologic map of the Putnam Wash quadrangle, Pinal County, Arizona: U. S. Geological Survey Quadrangle Map GQ-1109, scale 1:24,000.