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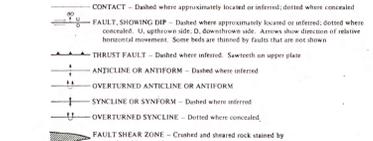
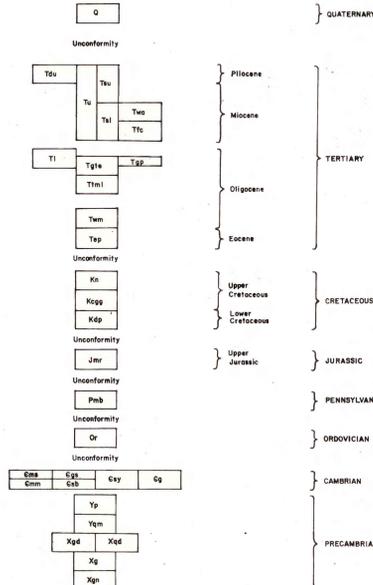
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OPEN-FILE REPORT 82-462
Plate No. II

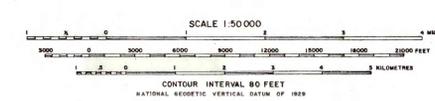
DESCRIPTION OF MAP UNITS

- Q** SURFICIAL DEPOSITS (QUATERNARY) - Includes, landfills, talus, alluvial and glacial deposits.
- Tu** UPPER PART OF IRON MOUNTAIN (MIDDLE DEVONIAN) - Gray gneiss containing well-sorted boulders, cobbles, and pebbles of volcanic and Precambrian rocks deposited by ancestral Arkansas River. Deposits less than 1,100 feet (330 m) above Arkansas River. As much as 100 feet (30 m) thick.
- Ts** SANTA FE FORMATION (PHOENIX TO MICENE) - Gray to light-brown, sandy to loesslike alluvium that covers to several parts of both the upper and lower parts of the Santa Fe Formation.
- Tm** Lower part (Micene) - Light-brown poorly sorted crudely stratified silty clay and coarse sand, well-sorted and locally cemented lenses of boulders, cobbles, and pebbles of possible late Miocene to Pliocene age. Cemented by calcareous carbonate. Contains several hard brown soils. Thickness probably exceeds 100 feet (30 m).
- Tl** Lower part (Micene) - Gray to red poorly sorted crudely stratified alluvium composed of boulders, cobbles, and pebbles 3 inches to 8 inches (7.6 to 20.3 cm) in diameter in a sandy matrix. Pseudotabular metamorphic and igneous rocks generally make up most of the deposit, at some localities contain significant amounts of Cambrian volcanic and sedimentary rocks. Generally distributed along inferred early to middle Miocene stream channels, but may possibly also include post-Miocene deposits. Ranges from a thin to pavement to 100 feet (30 m) in thickness.
- Two** ANDESITE OF WALCH MOUNTAIN (MIOCENE) - Block to dark-green dense stratified olivine-bearing andesite, and basaltic andesite, and minor interbedded tuffs and tuffs in northwest corner of quadrangle. Probably derived from local volcanic vents near Wash Mountain, 15 miles (24 km) to the southwest. About 50 feet (15 m) thick.
- Tc** CONGLOMERATE OF FEAR CREEK (MIOCENE) - Cherty gray well-sorted poorly cemented andesite pebbles and cobble conglomerate, but lower 200 feet (60 m) in well-sorted andesite pebbles and cobble conglomerate, white silt, massive non-bedded ash-flow tuff, and well-sorted sandstone. Lower part in matrix containing coarse sand, silt, and a non-bedded ash-flow tuff covered by andesite flow. More than 400 feet (120 m) thick.
- Ti** LARASKA (OLIGOCENE) - Laminar deposit having volcanic mudstone matrix, pebbles and boulders are composed of andesite, ash-flow tuff, Precambrian gneiss, granite, and metamorphic rocks, and Cambrian system from the McCurtain Mountain area. Mudstone both under and over the Gibbles Park Tuff at Wash Park and are overlain by basalt (Tb). Unit includes gravel north of Talbot Gulch beneath Gibbles Park Tuff. Lahan is 50 feet (15 m) thick.
- Tgt** GIBBLES PARK, THORN RANCH, AND EAST GULCH TUFFS UNDIVIDED (OLIGOCENE) -
Gibbles Park Tuff - Light gray to brown rhythmic ash-flow tuff containing bronze basaltic, chert sandstone, and fragments of gray andesite rock.
Thorn Ranch Tuff - Yellowish gray to gray rhythmic ash-flow tuff containing quartz sandstone and basaltic breccia, and brown and purple micaceous sand and Precambrian rock fragments.
East Gulch Tuff - Gray ash-flow tuff containing sandstone, basaltic, and quartz, and abundant flattened purple lumps and fragments of plagioclase rock.
- Tgp** GIBBLES PARK TUFF (OLIGOCENE) - Lithology described above. More than 160 feet (49 m) thick.
- Tmth** THIRTYNINE MILE ANDANESITE - LOWER MEMBER (OLIGOCENE) - Black to dark-green-gray olivine andesite, weathers to dark reddish or purplish brown. Crops out in northwest corner of quadrangle. Composed of irregularly bedded to massive volcanic breccia. Erupted from local volcanic vents to the west and north. About 130 feet (40 m) thick.
- Tm** WALL MOUNTAIN TUFF (OLIGOCENE) - Pinkish-gray to brown ash-flow tuff, contains abundant rounded and angular basaltic, and rock fragments in glass shard matrix. As much as 200 feet (60 m) thick.
- Top** NICO PARK ALLUVIUM (LOWER EOCENE) - Reddish-brown poorly sorted, crudely stratified alluvium composed of sand to silt and clay, and pebbles 20 feet (6 m) in diameter in a matrix of micaceous silt and clay; lacks volcanic fragments. Contains (bedding in the SW 1/4 sec 22 township) T. 18 S., R. 73 W., along Echo Canyon about 2 miles (3 km) north of Tuff. Probably more than 500 feet (150 m) thick.
- Kn** NIOWARA FORMATION (UPPER CRETACEOUS) - Unbedded. Probably more than 500 feet (150 m) thick.
- Kcp** CARLELL SHALE, GUNN SHORN LIMESTONE, AND GRANITE SHALE (UPPER CRETACEOUS) -
Carlell Shale - In descending order, Gunner Ledge Member, gray-brown hard calcareous sandy limestone composed of shell fragments, Cold Sandstone Member, yellowish-gray massive to thin-bedded sandstone, Blue Hill Shale Member, dark gray micaceous shale containing later organic concretions, Fairport Chalky Shale Member, yellowish-gray soft calcareous shale.
Gunner Limestone - In descending order, Bridge Creek Limestone Member, gray dense limestone rock and gray hard calcareous shale, Hartwood Shale Member, gray shale calcareous limestone, Lincoln Limestone Member, gray-brown thin bedded calcareous and shaly calcareous, contains marl horizons at base.
Granite Shale - Dark gray hard shaly shale containing hard, dark-brown Thatchers Limestone Member about 70 feet (21 m) above the base.
Lanka Sandstone and Freestone Formation (LOWER CRETACEOUS) -
Lanka Sandstone - Yellowish-brown crossbedded fine grained sandstone containing some shaly (Top Creek) Member in the upper middle part. 100 feet (30 m) thick.
Freestone Formation - Coarse sandstone Member at top, contains shaly brown thin-bedded sandstone, gray and black shale, and chert, thickness 80 feet (24 m) underlain by the Lytle Sandstone Member which contains white fine to coarse-grained sandstone, variegated shaly, and pebbly, thickness 120 feet (36 m) thick.
- Jmr** MURRISON AND RALSTON CREEK FORMATIONS (UPPER JURASSIC) - Total thickness about 470 feet (142 m).
Murrison Formation - Yellowish gray, maroon, and green siltstone and claystone and thin beds of sandstone, limestone, and conglomerate. About 120 feet (37 m) thick.
Ralston Creek Formation - Aclay conglomerate, sandstone, and beds of limestone containing andesite pebbles. Locally contains Precambrian rocks. As mapped, locally includes parts of the Triassic and Permian Lohan Formations, such as the crossbedded Lohan Limestone Member, which are too thin to be mapped separately. About 150 feet (45 m) thick.
- Phb** MINTURN FORMATION AND BELDEN FORMATION (PENNSYLVANIAN)
Minturn Formation - Dark gray, dark greenish-gray, and reddish-brown shale, siltstone, and sandstone. Contains dark gray limestone beds throughout that weather yellowish brown and locally contain marine fossils. Upper contact is drawn at top of apparent marine limestone. About 900 feet (274 m) thick.
Belden Formation - Light gray to yellowish gray, and green quartzite sandstone, red shale, and quartz or chert pebbles conglomerate at base.
Minturn Limestone (Lower Devonian) - Pink to gray limestone and cherty dolomite.
- Or** ORDOVICIAN SEDIMENTARY ROCKS - Nearly 300 feet (91 m) thick.
Furness Dolomite (Upper and Middle Ordovician) - Light gray massive to thin-bedded fine-grained dolomite, locally cherty and red stained.
Hastings Sandstone (Middle Ordovician) - White, yellow, and green quartzite sandstone, red shale, and quartz or chert pebbles conglomerate at base.
Minturn Limestone (Lower Ordovician) - Pink to gray limestone and cherty dolomite.
- Cms** MICHLE MOUNTAIN COMPLEX (CAMBIAN) - Composed mass of light gray medium-grained hornblende-bearing gneiss and quartzite veins, with regular rhythmic metamorphic separation and dikes. Intrudes rocks of the complex at Iron Mountain.
- Ecp** STENITE COMPLEX AT TEMOCAT CREEK (CAMBIAN) - Composite rock composed chiefly of light to medium gray fine to medium grained crystalline quartzite with persistent amounts of quartz (similar to other gneiss). Most amounts of amphibole-rich matrix and small amounts of olivine-epidote gabbro (Chusman and others, 1970).
- Cab** BRECIA OF COMPLEX AT TEMOCAT CREEK (CAMBIAN) - Intrusive breccia of igneous and metamorphic rock fragments in a coarse matrix that forms a local early breccia pipe at the margin of complex.
- Cmm** MAPLE ULTRAMAFIC COMPLEX AT IRON MOUNTAIN (CAMBIAN) - Funnel-shaped layered gabbroic complex made up of dark gray to black elongate columnar gabbro interbedded with plagioclase, pyroxene, or olivine-rich differentiates, and cut by discordant mafic and ultramafic intrusions. (Chase and Fisher, 1967).
- Eay** STENITE (CAMBIAN) - Light to medium gray to reddish-brown fine to medium-grained syenitic, rapakivi syenite, quartz-bearing syenite, and mafic suture in small complex in region near the Middle Gulch Tuff.
- Cg** GABRO (CAMBIAN) - Dikes and small irregular intrusive masses composed of black fine to medium-grained gabbro having aphanitic to diaphanous texture. Gabbro forms many small untraced dikes cutting Precambrian rocks of Royal Gorge area, age uncertain, but reported as Cambrian by correlation with other dated masses.
- Yp** PYRAMIT (PRE-CAMBRIAN) - White to pink, coarse crystalline pegmatite composed of quartz, albite, and perthite and lesser muscovite, biotite, and other minerals. Unit mapped along Arkansas River where pegmatite apparently are related to the quartz monzonite pluton (Ypm) to the north. Untraced pegmatite occur in many other parts in the quadrangle where Precambrian rocks are exposed, some of these are probably related to the quartz monzonite (Ypm) and others to the granodiorite (Ygd).
- Ym** QUARTZ MONZONITE OF SILVER PLUME AGE (PRE-CAMBRIAN) - Light gray to pinkish-gray medium-grained quartz monzonite composed of oligoclase, microcline, quartz, biotite, and muscovite. Flow foliation is recorded by aligned tabular feldspar crystals, particularly near margin of dike. Dimension stone has been quarried between Oak Creek and Texas Creek.
- Xgd** GRANODIORITE OF BOULDER CREEK AGE (PRE-CAMBRIAN) - Gray, light gray to pinkish-gray massive to foliate medium to coarse grained granodiorite and lesser amounts of quartz monzonite and quartz diorite. Foliation well developed near margins of pluton and is generally concordant or subconcordant to structure of enclosing gneiss. Intrudes of pluton on less well foliated or massive. Chiefly composed of oligoclase-andesine, microcline, hornblende and/or biotite, and quartz.
- Xgd** QUARTZ DIORITE OF BOULDER CREEK AGE (PRE-CAMBRIAN) - Dark to medium gray, massive to well-foliated quartz diorite. Grades into or is surrounded by granodiorite (Xgd), primarily found in the mafic outer margin of major granodiorite pluton, but forms some small independent plutons. Composed chiefly of oligoclase and hornblende and lesser amounts of biotite, microcline, quartz, and iron oxides.
- Xg** METAGABRO (PRE-CAMBRIAN) - Dark gray to dark reddish-gray massive intrusive mass of gabbro and ultramafic rocks in sec. 9, T. 47 N., R. 12 E. Composed chiefly of hornblende and olivine-labradorite and contains lesser amounts of iron oxides, pyroxene, biotite, and other minerals, metamorphosed during the principal regional metamorphic event.
- Xgn** METAGABBROIC GNEISS (PRE-CAMBRIAN) - Layered gneiss, chiefly feldspathic biotite-quartz-plagioclase gneiss, containing minor amounts of hornblende gneiss, calcic amphibole gneiss, and garnetiferous and sillimanite gneiss. Characteristically gray, brownish gray, or pinkish medium to fine grained well foliated and well bedded. Composed of alternating layers generally in parallel to foliation and may be a scale of a fraction of an inch (1 cm) to several feet (10 m). The gneiss is variably migmatitic, mafic are reddish-orange to white streaks, veins, or small tabular masses of quartz-plagioclase-biotite-hornblende gneiss or other gneiss, or form subconcordant layers. The ultramafic-microcline mineral part in ultramafic rocks indicates that the metamorphic grade reaches the upper part of the amphibolite facies during the principal regional metamorphism. Late post-tectonic mafic dykes indicate local retrograde metamorphism. Gneiss is formed from a volcanic and sedimentary sequence consisting principally of olivine to intermediate flows and tuffs, and sedimentary intertuffs containing volcanic detritus mixed with clastic debris of nonvolcanic origin.

CORRELATION OF MAP UNITS



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BARRINGER RESOURCES
SERVICES FOR THE EARTH SCIENCES

GEOLOGIC MAP

ARKANSAS CANYON PLANNING UNIT
DATA FOR:
BUR. OF LAND MANAGEMENT
COMPLETED: JANUARY, 1981
MAP SCALE=1:50,000
PLATE NO. II
PROJECT 197.50
SERVICES FOR THE EARTH SCIENCES