

# GEOLOGIC MAP OF THE WILDHORSE MOUNTAIN 7 1/2' QUADRANGLE, COCHISE COUNTY, ARIZONA

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 Arizona Geological Survey Digital Geologic Map 62  
 (DGM-62), version 2.0  
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1:24,000 scale

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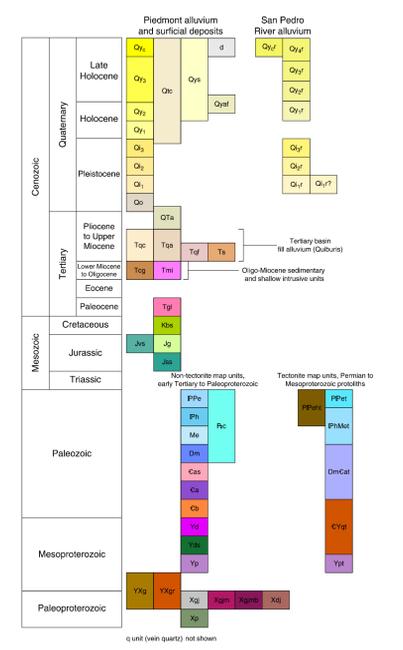
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## Map Unit Descriptions

Other units	Tertiary Basin Fill alluvium	Paleozoic
Plowed areas - historically or actively plowed fields, irrigated pastures, and other lightly disturbed ground.	Red sandstone, silty sandstone, and siltstone - massive to bedded; reddish brown (PZC 10YR 5/6) to gray silty sandstone, and mudstone forming low-relief outcrops. Unit Ts correlates to the lower Saint David Formation of Gray (1965), and Smith (1967).	Carbonate, undivided (Paleozoic) - Carbonate rocks including pale gray limestone, tan dolomite, and tan silty dolomite with less common tan siltstone and silty carbonate.
Disturbed ground - heavily disturbed ground due to agriculture, extensive excavation, or construction of earth dams.	Late Miocene to Pliocene Qulburis deposits, alluvial fan facies - Sandy to gravelly, moderately to strongly indurated alluvial fan deposits.	Earp Formation of the Naco Group (Pennsylvanian to Permian) - Interbedded the graded quartzose sandstone and variably silty to pure limestone.
Quaternary hillslope talus and colluvium - unconsolidated to weakly consolidated, very poorly sorted angular rock blocks deposited at the base of bedrock slopes.	Pliocene Qulburis basin fill deposits, distal fan to axial valley deposits - alternating thin unconsolidated beds of silt to very fine sand with sparse pebbles and shingles.	Horquilla Limestone (Pennsylvanian) - Medium to light gray, massive, thick bedded, and medium bedded limestone with very sparse, possibly secondary, silica shinglers and biots. Also includes sparse 5-15 m thick cherty beds.
<b>San Pedro River alluvium</b>	Pliocene Qulburis basin fill deposits, fanlomerate - completely indurated (stage III-IV) sections of Qulburis basin fill sediments.	Escabrosa Limestone (Mississippian) - Typically massive medium to pale gray limestone.
Active river channel deposits - unconsolidated, very poorly sorted sandy to cobbly beds in active river channels.	<b>Bedrock units</b>	Martín Formation (Devonian) - Typically tan to gray dolomite, silty dolomite, sandy dolomite, and limestone. Bedding is apparent on a scale of 1-100 cm.
Flood channel and low terrace deposits - unconsolidated sand, gravel and silt deposits on bars, low terraces and flood channels.	Mafic intrusion (Miocene) - Hypabyssal basaltic intrusion.	Abrigó Formation (Cambrian) - Very fine grained, somewhat calcareous, quartzose sandstone that is pale to medium orange tan to yellowish orange, and is laminated to thin bedded.
Historical river terrace deposits - unconsolidated sand, gravel and silt deposits on low terraces inset below the abandoned early historical floodplain.	Conglomerate (Miocene) - Generally poorly to moderately bedded and poorly sorted conglomerate with bed dips of 10° to 50°.	Abrigó Formation, upper sandstone member (Cambrian) - Fine grained, very quartz rich, well sorted sandstone, medium to pale brown sandstone, with numerous iron oxide pits after altered grains that were possibly originally calcareous.
Latest Holocene to historical river deposits - silt, clay, sand and minor gravel deposits underlying the early historical floodplain.	Heterogeneous pegmatitic leucogranite (Eocene) - Leucogranite that varies from highly heterogeneous and pegmatitic, to medium to fine grained muscovite granite, to very fine grained leucogranite that is locally so siliceous that it grades into pure silica.	Bolsa Quartzite (Cambrian) - Generally fine to medium grained, quartz-rich sandstone. Near base, the unit is commonly brown or contains magnetite laminae that clearly reveal 9-20 cm thick trough cross beds, locally with coarse sand or pebbly sand at base of troughs.
Late to early Holocene river terrace deposits - silt, clay, sand and minor gravel terrace deposits slightly above the early historical floodplain.	<b>Mesozoic - Johnny Lyon Hills</b>	Sierra Ancha diabase (Mesoproterozoic) - Dark greenish black mafic diabase with shapic fabric and cleavage.
Late Pleistocene river terrace deposits - gravelly, sandy river terrace deposits up to 25 m above the active river channel.	Sandstone, Bixbee Group (upper Jurassic to middle Cretaceous) - Sandstone with sparse, thin, dark magnetite-rich laminae that define bedding.	Dripping Spring Quartzite (Mesoproterozoic) - Pale orange brown, indurated quartzite composed of fine grained to very fine grained sandstone and siltstone; includes pebbly zone - 50 cm thick that consists mostly of <1 cm bulb quartzite clasts, locally up to 1 cm.
Middle to late Pleistocene river terrace deposits - older, higher gravelly, sandy river terrace deposits.	Gneiss conglomerate member of the Bixbee Group (Jurassic) - Massive to locally bedded, locally moderately well bedded, clast-supported conglomerate. Clasts are generally <20 cm, subrounded to subangular, mostly pale to medium gray limestone, less common fine-grained quartzose sandstone.	Pioneer Formation (Mesoproterozoic) - Reddish brown, very fine grained sandstone and dark brown phyllite. A 10-40 cm thick, coarse, poorly sorted sandstone containing angular pebbles (<1 cm) forms the base of the unit.
Early to middle Pleistocene river terrace deposits - oldest, highest preserved gravelly, sandy river terrace deposits.	Sandstone (Jurassic) - Mostly medium- to fine-grained, pale tan sandstone and medium brown, quartzose siltstone. Local medium to coarse sandstone beds contain planar cross beds.	Bolsa granite, undivided (Paleoproterozoic or Mesoproterozoic) - Porphyritic bottle quartz monzonite to granodiorite in the foreground of the San Pedro detachment fault. Feldspar crystals (usually K-feldspar, but sometimes oligoclase) in a coarse-grained hypidiomorphic-granular groundmass (Lingrey, 1982).
Possible early to middle Pleistocene river terrace deposits - terraces strongly resembling Q1r river gravel terraces but due to position within the landscape and access restrictions a level of uncertainty remains.	Volcanic-biitic conglomerate and sandstone (Jurassic) - Volcanic-biitic conglomerate and sandstone, small cobbles and pebbles consist of light gray volcanic or hypabyssal debris.	Johnny Lyon granodiorite (Paleoproterozoic) - Medium-grained bottle granodiorite with locally 1-4 cm long, K-feldspar megacrysts that make up 10-25% of the rock unit, and 10-15% mafic minerals, most of which is probably biotite.
<b>Piedmont alluvium and surficial deposits</b>	Sandstone (Jurassic) - Mostly medium- to fine-grained, pale tan sandstone and medium brown, quartzose siltstone. Local medium to coarse sandstone beds contain planar cross beds.	Diabase rocks associated with Johnny Lyon granodiorite (Paleoproterozoic) - Dark colored, mafic dioritic rock that forms local, small irregular bodies in Johnny Lyon Granodiorite. Texturally similar to non-porphyritic parts of Johnny Lyon Granodiorite.
Modern stream channel deposits - unconsolidated, very poorly sorted sandy to cobbly ephemeral piedmont channel deposits.	<b>Paleozoic and Mesoproterozoic Tectonites, Little Rincon Mountains</b> - Highly deformed, very low to medium grade metamorphic rocks derived from Apache Group and Paleozoic sedimentary rocks. Age of deformation and metamorphism not well constrained, but interpreted to be Late Paleozoic and Middle Tertiary in age.	Mylonitic Johnny Lyon granodiorite (Paleoproterozoic) - Mylonitic granodiorite above the Wildhorse Mountain thrust.
Latest Holocene alluvium - indistinct tributary channel deposits and low-lying piedmont channel terraces flanking active drainages.	Tectonite derived from Earp Formation (Pennsylvanian to Permian protolith) - Generally consists of medium to light gray limestone, silty limestone, sandy limestone, and beds of quartzite.	Breciated mylonitic Johnny Lyon granodiorite (Paleoproterozoic) - Breciated mylonitic granodiorite above the Wildhorse Mountain thrust.
Late Holocene alluvium, active fan deposits - active portions of young fan deposits exhibiting distributary drainage patterns.	Tectonite derived from Horquilla Limestone and Earp Formation, undivided (Pennsylvanian to Permian protolith) - Interbedded marble and calc-siltate gneiss (Lingrey, 1982).	Pinal Schist (Paleoproterozoic) - Very fine grained quartzitic schist.
Late Holocene alluvium - planar terrace deposits located along incised drainages, broad low-relief distal fan deposits overlapping onto Holocene river alluvium, and infrequently active tributary drainage deposits.	Marble tectonite derived from Horquilla Limestone and Escabrosa Limestone, undivided (Mississippian to Pennsylvanian protolith) - Calcitic marble, slightly siliceous calcite marble, and zones up to tens of cm thick of calcite marble containing silt or very fine sand. Colors are variable, and include whitish tan, pale red, pale gray, and grayish white.	
Older Holocene alluvium - broad, low-relief, undulating fan deposits exhibiting widespread, shallow braided drainage patterns.	Tectonite derived from Martín Formation and Abrigó Formation, undivided (Devonian and Cambrian protoliths) - Gray and dusty white calcite marble and tan, dolomitic marble, commonly with siliceous marble containing silt or fine sand, with intergrading silty to sandy layers and marble layers on a scale of 2-20 mm.	
Late Pleistocene alluvial fan and terrace deposits - relatively plain, reddish terraces marked by angular to subangular pebbles to cobbles.	Dripping Spring Quartzite and Bolsa Quartzite, undivided, tectonite (Middle Proterozoic and Cambrian protoliths) - White, light to medium gray, or pale reddish gray quartzite, with laminae and thin beds that reveal transposed bedding. Several conglomerate beds, 0.5 to 3 m thick, contain quartzite clasts that are flattened parallel to compositional layering and that rarely exceed 10 cm in largest dimension.	
Middle to late Pleistocene alluvial fan and terrace deposits - broad planar fan terraces capping Qulburis basin fill deposits, inset into older, more well-rounded alluvial deposits, or lining significant piedmont drainages.	Tectonite derived from Pioneer Shale (Mesoproterozoic protolith) - Fine grained quartzite, argillite, lenticular quartzite, and phyllitic rocks.	
Early to middle Pleistocene alluvial fan and terrace deposits - high-standing, moderately to well-rounded alluvial deposits exhibiting strong carbonate accumulation (where preserved) capping underlying Qulburis basin fill deposits.		
Early Pleistocene alluvium - Very high, moderately consolidated gravelly deposits with variable silt development.		
Late Pliocene to early Pleistocene fan gravel - coarse, moderately to well-consolidated gravelly deposits capping high rounded ridges.		

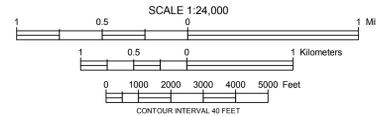
## Unit Correlation



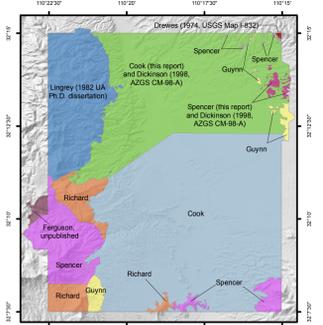
## Map Symbol Explanation

Bedding	Contacts
bedding, inclined	approximate contact
bedding, inclined, approximate	accurate contact
bedding, inclined with tops known	concealed contact
bedding, overturned	scratched contact
bedding, horizontal	quered dashed contact
bedding, overturned w/tops known	
Faults	
fault, accurate	fault, approximate
fault, concealed	
Foliation, Tectonic	
generic irregular/contorted foliation, inclined	Thrust fault, not directed, accurate
transposed bedding, inclined	fault, approximate, hypothetical
generic foliation, inclined, open triangle	fault, low-angle, accurate
generic foliation, inclined, closed triangle	fault, low-angle, approximate
	fault, detachment, accurate
	fault, detachment, approximate
	shear zone, low-angle normal, accurate
Cleavage	
close disjunct cleavage, inclined	
superimposed disjunct cleavage, inclined	
crenulation cleavage/axial surface foliation, inclined	marker bed
Mylonite series	
weak protomylonite	intermediate dike
protomylonite	mafic dike
	porphyritic andesite dike
	aplite dike
Joint	
inclined joint	
Fold Hinge Surface Trace	
anticline	
overturned anticline	
overturned syncline	
Fold Hinge	
Z-fold (dextral)	
minor folds	
Lineation	
generic lineation in foliation	slickenside striae lineation
L-tectonite fabric	fault attitude
intersection lineation between cleavage and foliation	Fault or vein orientation
lineation in foliation, with normal-sense shear indicators	mineralized vein

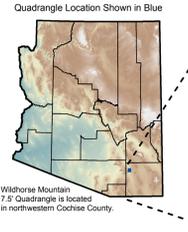
Topographic base from USGS 1:24,000 scale quadrangle series.  
 Projection NAD 83. Latitude-longitude and UTM grids are NAD 83, zone 12,  
 1000-meter Universal Transverse Mercator grid cells, zone 12, shown in blue.



## Mapping Responsibility



## Location Index Map



## Cochise County



## Adjoining 7.5' Quadrangles

