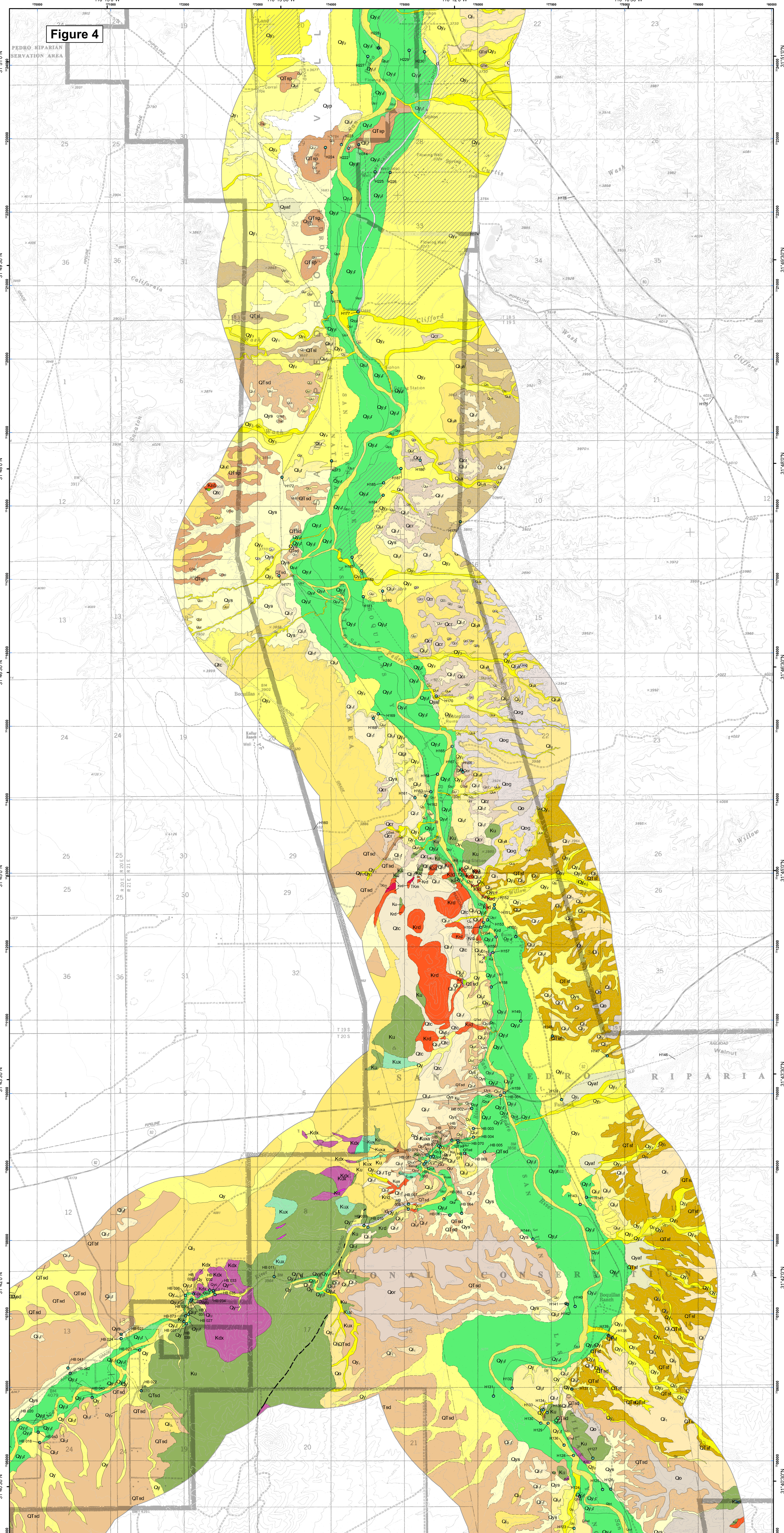
Figure 4



Geologic Map of the San Pedro River, Babocomari River and Aravaipa Creek Corridors, Southeastern Arizona

by

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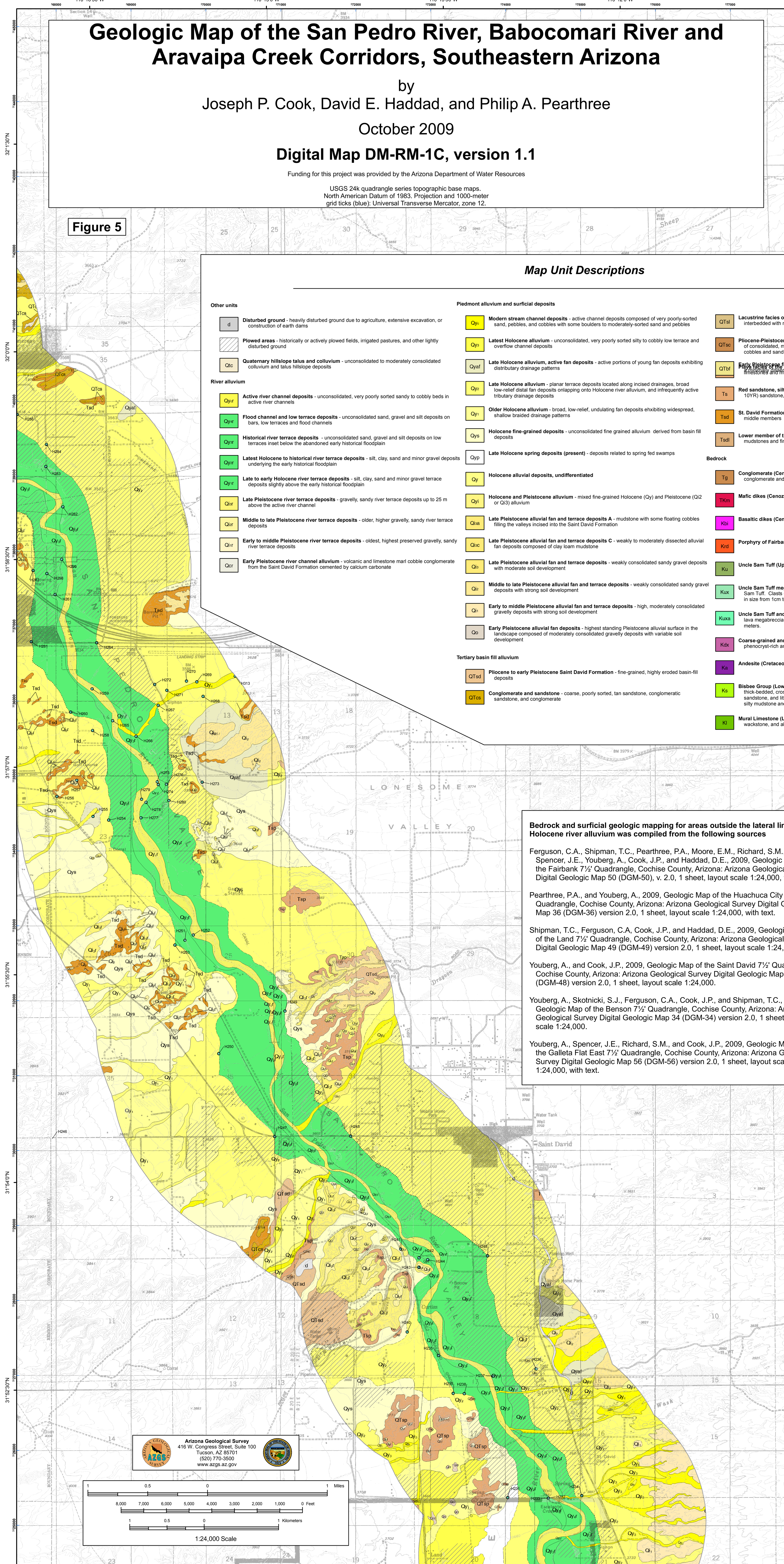
Digital Map DM-RM-1C, version 1.1

Funding for this project was provided by the Arizona Department of Water Resources

USGS 24k quadrangle series topographic base maps.
North American Datum of 1983. Projection and 1000-meter
grid ticks (blue): Universal Transverse Mercator, zone 12.

Figure 5



Map Unit Descriptions

Other units

Unit	Description
d	**Disturbed ground** - heavily disturbed ground due to agriculture, extensive excavation, or construction of earth dams
(hatched)	**Plowed areas** - historically or actively plowed fields, irrigated pastures, and other lightly disturbed ground
Qtc	**Quaternary hillslope talus and colluvium** - unconsolidated to moderately consolidated colluvium and talus hillslope deposits

River alluvium

Unit	Description
Qy_{cr}	**Active river channel deposits** - unconsolidated, very poorly sorted sandy to cobbly beds in active river channels
Qy_{4r}	**Flood channel and low terrace deposits** - unconsolidated sand, gravel and silt deposits on bars, low terraces and flood channels
Qy_{3r}	**Historical river terrace deposits** - unconsolidated sand, gravel and silt deposits on low terraces inset below the abandoned early historical floodplain
Qy_{2r}	**Latest Holocene to historical river terrace deposits** - silt, clay, sand and minor gravel deposits underlying the early historical floodplain
Qy_{1r}	**Late to early Holocene river terrace deposits** - silt, clay, sand and minor gravel terrace deposits slightly above the early historical floodplain
Qi_{3r}	**Late Pleistocene river terrace deposits** - gravelly, sandy river terrace deposits up to 25 m above the active river channel
Qi_{2r}	**Middle to late Pleistocene river terrace deposits** - older, higher gravelly, sandy river terrace deposits
Qi_{1r}	**Early to middle Pleistocene river terrace deposits** - oldest, highest preserved gravelly, sandy river terrace deposits
Qcr	**Early Pleistocene river channel alluvium** - volcanic and limestone marl cobble conglomerate from the Saint David Formation cemented by calcium carbonate

Piedmont alluvium and surficial deposits

Unit	Description
Qy_{c}	**Modern stream channel deposits** - active channel deposits composed of very poorly-sorted sand, pebbles, and cobbles with some boulders to moderately-sorted sand and pebbles
Qy_{3}	**Latest Holocene alluvium** - unconsolidated, very poorly sorted silty to cobbly low terrace and overflow channel deposits
Qyaf	**Late Holocene alluvium, active fan deposits** - active portions of young fan deposits exhibiting distributary drainage patterns
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_{1}	**Older Holocene alluvium** - broad, low-relief, undulating fan deposits ehxibiting widespread, shallow braided drainage patterns
Qys	**Holocene fine-grained deposits** - unconsolidated fine grained alluvium derived from basin fill deposits
Qyp	**Late Holocene spring deposits (present)** - deposits related to spring fed swamps
Qy	**Holocene alluvial deposits, undifferentiated**
Qyi	**Holocene and Pleistocene alluvium** - mixed fine-grained Holocene (Qy) and Pleistocene (Qi2 or Qi3) alluvium
$Qi_{3}a$	**Late Pleistocene alluvial fan and terrace deposits A** - mudstone with some floating cobbles filling the valleys incised into the Saint David Formation
$Qi_{3}c$	**Late Pleistocene alluvial fan and terrace deposits C** - weakly to moderately dissected alluvial fan deposits composed of clay loam mudstone
Qi_{3}	**Late Pleistocene alluvial fan and terrace deposits** - weakly consolidated sandy gravel deposits with moderate soil development
Qi_{2}	**Middle to late Pleistocene alluvial fan and terrace deposits** - weakly consolidated sandy gravel deposits with strong soil development
Qi_{1}	**Early to middle Pleistocene alluvial fan and terrace deposits** - high, moderately consolidated gravelly deposits with strong soil development
Qo	**Early Pleistocene alluvial fan deposits** - highest standing Pleistocene alluvial surface in the landscape composed of moderately consolidated gravelly deposits with variable soil development

Tertiary basin fill alluvium

Unit	Description
QTsd	**Pliocene to early Pleistocene Saint David Formation** - fine-grained, highly eroded basin-fill deposits
QTcs	**Conglomerate and sandstone** - coarse, poorly sorted, tan sandstone, conglomeratic sandstone, and conglomerate
QTsl	**Lacustrine facies of the Saint David Formation** - tabular limestone beds are found with interbedded with red and green mudstones
QTsc	**Pliocene-Pleistocene channel conglomerates** - piedmont channel conglomerates composed of consolidated, matrix supported, moderately to well sorted, subangular to rounded pebble, cobbles and sand
QTbf	**Early Pleistocene fine-grained basin-floor alluvium** - very old relict basin floor deposits forming a minimally dissected surface / **Playa facies of the Saint David Formation** - thick tabular gypsiferous layers interbedded with limestones and mudstone
Ts	**Red sandstone, silty sandstone, and siltstone** - massive to bedded, reddish brown (5YR to 10YR) sandstone, siltstone, and mudstone
Tsd	**St. David Formation, undifferentiated** - St. David Formation which includes the lower and middle members
Tsdl	**Lower member of the St. David Formation** - lower St. David Formation consisting of red mudstones and fine grained sandstones

Bedrock

Unit	Description
Tg	**Conglomerate (Cenozoic)** - Tan, thin- to medium-bedded, pebble-cobble, sandy matrix conglomerate and pebbly sandstone
TKm	**Mafic dikes (Cenozoic-Cretaceous)** - Fine-grained, crystalline matrix porphyry dikes
Kbi	**Basaltic dikes (Cenozoic-Cretaceous)** - Fine-grained basaltic dikes
Krd	**Porphyry of Fairbank (Upper Cretaceous)** - Phenocryst-rich porphyry
Ku	**Uncle Sam Tuff (Upper Cretaceous)** - Phenocryst-rich ash-flow tuff
Kux	**Uncle Sam Tuff megabreccia (Upper Cretaceous)** - Zones of megabreccia within the Uncle Sam Tuff. Clasts of andesite and rhyolitic volcanics, sandstone, argillite, and carbonate range in size from 1cm to several meters.
Kuxa	**Uncle Sam Tuff andesite megabreccia (Upper Cretaceous)** - Zones of monolithic, andesite lava megabreccia within the Uncle Sam Tuff. Clasts range in size from 1cm to several meters.
Kdx	**Coarse-grained andesite (Cretaceous)** - A volcanic complex dominated by coarse-grained, phenocryst-rich andesitic lava
Ka	**Andesite (Cretaceous)** - Amalgamated, andesite lava flows intruded by a myriad of dikes
Ks	**Bisbee Group (Lower Cretaceous)** - Complexly intertonguing sequences of thin- to thick-bedded, cross-stratified and plane-bedded, quartz sandstone, feldspathic quartz sandstone, and lithic-feldspathic quartz sandstone, gray-green to red siltstone, mudstone, silty mudstone and shale
Kl	**Mural Limestone (Lower Cretaceous)** - thin- to medium-bedded, micrite, molluscan skeletal wackstone, and algal-laminated limestone interbedded with subordinate dark shale

Bedrock and surficial geologic mapping for areas outside the lateral limits of Holocene river alluvium was compiled from the following sources

Ferguson, C.A., Shipman, T.C., Pearthree, P.A., Moore, E.M., Richard, S.M., Spencer, J.E., Youberg, A., Cook, J.P., and Haddad, D.E., 2009, Geologic map of the Fairbank 7½' Quadrangle, Cochise County, Arizona: Arizona Geological Survey Digital Geologic Map 50 (DGM-50), v. 2.0, 1 sheet, layout scale 1:24,000, with text.

Pearthree, P.A., and Youberg, A., 2009, Geologic Map of the Huachuca City 7½' Quadrangle, Cochise County, Arizona: Arizona Geological Survey Digital Geologic Map 36 (DGM-36) version 2.0, 1 sheet, layout scale 1:24,000, with text.

Shipman, T.C., Ferguson, C.A, Cook, J.P., and Haddad, D.E., 2009, Geologic Map of the Land 7½' Quadrangle, Cochise County, Arizona: Arizona Geological Survey Digital Geologic Map 49 (DGM-49) version 2.0, 1 sheet, layout scale 1:24,000.

Youberg, A., and Cook, J.P., 2009, Geologic Map of the Saint David 7½' Quadrangle, Cochise County, Arizona: Arizona Geological Survey Digital Geologic Map 48 (DGM-48) version 2.0, 1 sheet, layout scale 1:24,000.

Youberg, A., Skotnicki, S.J., Ferguson, C.A., Cook, J.P., and Shipman, T.C., 2009, Geologic Map of the Benson 7½' Quadrangle, Cochise County, Arizona: Arizona Geological Survey Digital Geologic Map 34 (DGM-34) version 2.0, 1 sheet, layout scale 1:24,000.

Youberg, A., Spencer, J.E., Richard, S.M., and Cook, J.P., 2009, Geologic Map of the Galleta Flat East 7½' Quadrangle, Cochise County, Arizona: Arizona Geological Survey Digital Geologic Map 56 (DGM-56) version 2.0, 1 sheet, layout scale 1:24,000, with text.

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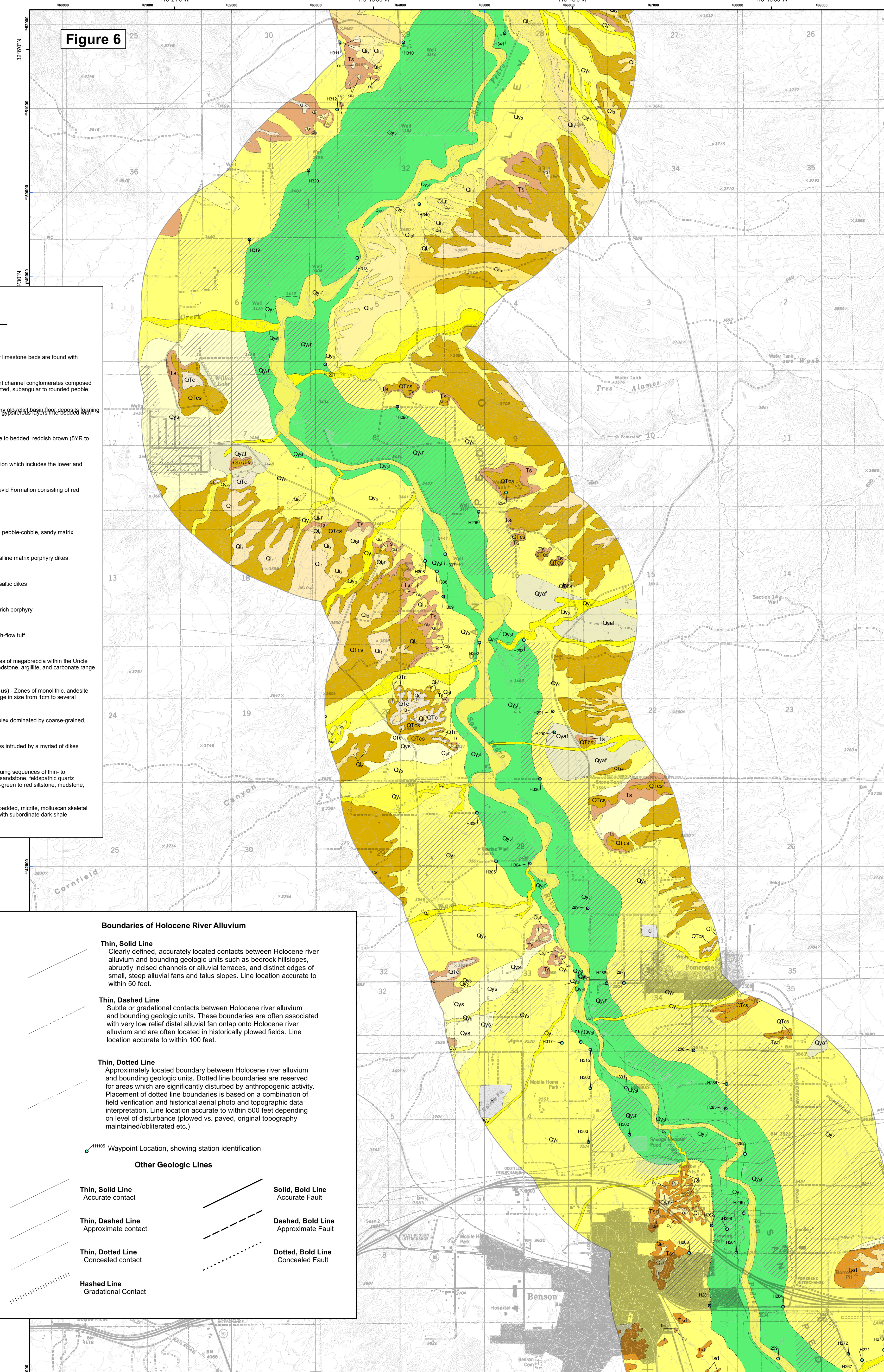
1:24,000 Scale (Miles, Feet, Kilometers)

Figure 6



Boundaries of Holocene River Alluvium

Thin, Solid Line
Clearly defined, accurately located contacts between Holocene river alluvium and bounding geologic units such as bedrock hillslopes, abruptly incised channels or alluvial terraces, and distinct edges of small, steep alluvial fans and talus slopes. Line location accurate to within 50 feet.

Thin, Dashed Line
Subtle or gradational contacts between Holocene river alluvium and bounding geologic units. These boundaries are often associated with very low relief distal alluvial fan onlap onto Holocene river alluvium and are often located in historically plowed fields. Line location accurate to within 100 feet.

Thin, Dotted Line
Approximately located boundary between Holocene river alluvium and bounding geologic units. Dotted line boundaries are reserved for areas which are significantly disturbed by anthropogenic activity. Placement of dotted line boundaries is based on a combination of field verification and historical aerial photo and topographic data interpretation. Line location accurate to within 500 feet depending on level of disturbance (plowed vs. paved, original topography maintained/obliterated etc.)

H1105 Waypoint Location, showing station identification

Other Geologic Lines

Thin, Solid Line Accurate contact

Thin, Dashed Line Approximate contact

Thin, Dotted Line Concealed contact

Hashed Line Gradational Contact

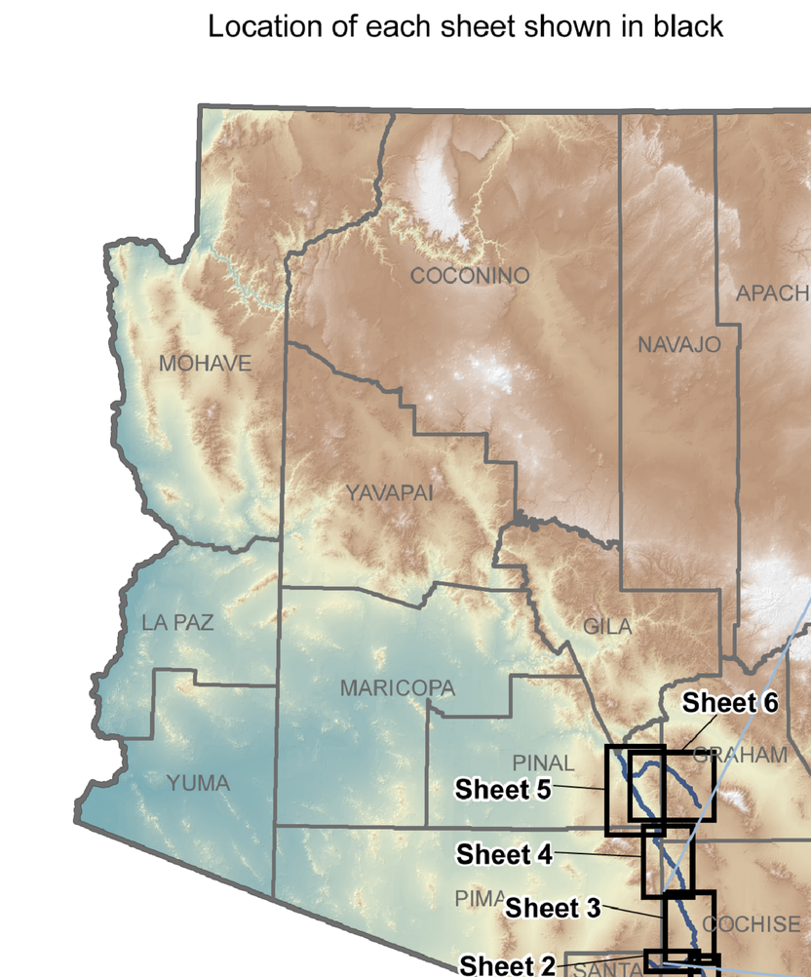
Solid, Bold Line Accurate Fault

Dashed, Bold Line Approximate Fault

Dotted, Bold Line Concealed Fault

Statewide Location Map

Location of each sheet shown in black



Figures on this Sheet

Figure locations shown in red