<u>Attachment 1</u>

Affidavit of Jon R. Ford

AFFIDAVIT OF JON R. FORD

STATE OF COLORADO)
) ss
County of Denver)

JON R. FORD, being first duly sworn, upon his oath deposes and says:

1. I am a principal in the Denver, Colorado firm of Leonard Rice Engineers, Inc. ("LRE"). I have been with that company since 1986. Prior to that time, I worked in various roles as a geologist and geophysicist in Colorado from 1972 to 1986. Among other things, I served as President and Senior Coal and Petroleum Geologist for Resource Technology Corporation in Denver from 1981 to 1985. I was Vice President and Senior Ground Water Geologist for Willard Owens Associates, Inc., in Wheat Ridge, Colorado from 1972 to 1977. A copy of my resume is attached to this affidavit.

2. I received bachelor's degrees in Geological Engineering and Geophysical Engineering from the Colorado School of Mines in 1972. In addition, I have over thirty-five years of experience working in the geology and groundwater hydrology field in Colorado, Arizona, and other parts of the West.

3. I am a Registered Professional Engineer in Colorado, a Registered Professional Geological Engineer in Arizona, and a Registered Professional Geologist in Wyoming.

4. I am a member of various professional groups, including the Arizona Hydrological Society, Colorado Ground Water Association, the Rocky Mountain Association of Geologists, the Society of Exploration Geologists, the American

Association of Petroleum Geologists, and the American Council of Engineering Companies of Colorado.

5. The statements contained in this Affidavit are made based upon my own personal knowledge and upon work performed by me or by the staff at LRE under my direct supervision.

6. I am familiar with issues relating to underground water in Arizona, in part as a result of my work for the Salt River Valley Water Users' Association and the Salt River Project Agricultural Improvement and Power District (collectively, "SRP").

7. I served as a consulting groundwater hydrology expert for SRP in the 1994 evidentiary proceedings before Judge Goodfarb regarding "subflow," which resulted in the Arizona Supreme Court's opinion in In re the General Adjudication of All Rights to Use Water in the Gila River System and Source, 198 Ariz. 330, 9 P.3d 1060 (2000) ("Gila IV").

8. Between 2001 and 2004, I served as a consulting groundwater hydrology expert for SRP in proceedings before Judge Eddward Ballinger of the Maricopa County Superior Court relating to implementation of the Arizona Supreme Court's decision in Gila IV.

9. SRP asked me to assist it in preparing its objections to the Arizona Department of Water Resources' June 2009 subflow zone delineation report for the San Pedro River Watershed. As part of that work, I reviewed ADWR's report and prepared various maps and figures that are included as attachments to SRP's objections to be filed on or about December 28, 2009.

10. In particular, I assisted in the preparation of Sections V through VI of those objections. The technical statements made in those sections are true and correct to the best of my knowledge and professional opinion.

Jon R. Ford

JON R. FORD

SUBSCRIBED AND SWORN TO before me by Jon R. Ford this 18th day of December, 2009.

Martha K. Jones

Notary Public

My Commission Expires:

12/10/2011

MARTHA K. JONES NOTARY PUBLIC STATE OF COLORADO

Jon R. Ford

EDUCATION

B.S., 1972, Geological Engineering, Colorado School of Mines
B.S., 1972, Geophysical Engineering, Colorado School of Mines

REGISTRATION/CERTIFICATION

Registered Professional Engineer: Colorado
Registered Professional Geological Engineer: Arizona
Registered Professional Geologist: Wyoming
A.I.P.G. Certified Professional Geologist

EXPERIENCE

Leonard Rice Engineers, Inc., Denver, Colorado

1986-Present – Principal, Vice President, Senior Ground Water Geologist

Responsible for ground water geology studies, including interpretation and evaluation of hydrogeologic systems, computer modeling, aquifer testing, water supply development, water well drilling, ground water contamination and monitoring, evaluation of mining impacts on ground water systems, ground water/surface water relationships and stream depletions caused by well pumping. Duties require collection and analysis of data, report preparation and expert testimony. Significant projects include:

- Develop and calibrate a MODFLOW ground water model of the Big Chino Basin, Arizona. The purpose of the model is to predict the impact of future pumping on the base flow of the Verde River.
- Develop and calibrate two MODFLOW ground water models in the Verde Valley, Arizona. The purposes of the models were to estimate the Subflow Zone depletion caused by wells located within the lateral limits of the Subflow Zone but completed in a deeper aquifer.
- Evaluation of the hydrogeology of the Box Elder and Beebe Draw alluvial aquifers, preparation of an aquifer mass balance for eleven time periods from 1930 to the present, and estimation of the timing and amount of depletion to the South Platte River caused by irrigation well pumping. This project relied heavily upon GIS tools that we specifically developed for this project. It was done for the Central Colorado Water Conservancy District in support of adjudication of the District's augmentation plans and application to Ground Water Commission for Designated Basin (included expert testimony).
- Served as a member of the U.S. Bureau of Reclamation "C" Aquifer Technical Advisory Group representing the Salt River Project. The Bureau of Reclamation has been tasked with evaluating the feasibility of the "C" Aquifer in northeast Arizona to replace the "N" Aquifer as source of supply for a coal slurry pipeline. My role included review and interpretation of technical data and computer modeling of the aquifer, as well as providing suggestions regarding revisions to the work plan based upon my interpretations. A significant focus of this effort was quantification of future stream depletions due to well pumping and at its impact on endangered aquatic species.
- Evaluation and computer modeling of the South Platte alluvial aquifer in the vicinity of Brighton, Colorado. This work was done for the City of Brighton for various purposes including siting a new well field to meet future water supply needs of the City and to quantify stream depletions due to well pumping.
- Participation in a peer review team of the hydrogeology of the Hueco Bolson and ground water modeling of the Bolson completed by the U.S. Geological Survey. The purpose of this review was to provide the El Paso Water Utilities with an independent assessment of the Bolson aquifer and the computer modeling.
- Computer simulation of Beebe Draw Alluvial Aquifer near Barr Lake to assess return flow pattern of historically irrigated farms and depletion pattern of well pumping to Beebe Seep Canal.

- Design and construction observation of numerous Denver Basin Aquifer wells for Donala Water and Sanitation District, Towne Center Metropolitan District, Heather Gardens, and South Suburban Parks and Recreation.
- Design and construction observation, Little Nell Well and Tourtellotte Spring Collection System, Aspen, Colorado; Sopris Village Well, El Jebel Colorado, Well R2 and West Vail 7, Vail, Colorado; Wells 26 and 31, Beebe Draw Wells A & B, City of Brighton.
- Analysis of Ground Water available for Appropriation, Lakewood, Colorado (includes expert witness testimony and litigation negotiation with objectors).
- Well yield forecast and well field development plan including present value economic analyses for Rangeview Water and Sanitation District, City of Lakewood, City of Arvada, and Donala Water and Sanitation District.
- Hydrogeologic analysis and delineation of fracture system to select well sites, and design and construction observation of two wells at Buttermilk Ski Area, Aspen, CO.
- Evaluation of the Hydrogeologic setting and ground water mass balances of the Big Chino Valley, San Pedro River, and Verde River Basins, Arizona.
- Evaluation and appraisal of value of ground water available for export to Phoenix metropolitan area from two ranches in northwestern Arizona.
- Evaluation of hydrogeologic setting of the Pagosa Springs geothermal reservoir, Pagosa Springs, Colorado.
- Expert testimony in the Gila River Adjudication in Arizona regarding the delineation of appropriable ground water.

Responsible for well pump and pump station design. Significant projects include:

- South Suburban and Lone Tree Golf Course well pump installation (Denver Basin).
- Donala Water and Sanitation District, Towne Center Metropolitan District and Heather Gardens (Denver Basin).
- City of Black Hawk North Clear Creek Pump Station and Infiltration Gallery.
- City of Black Hawk Four Mile Gulch Pump Station.
- Upgrade of Vail Well R2 and Well R6 Pump Station.
- Transient pressure analysis of Eagle Pines Pump Station, Aspen, Colorado.
- Transient Pressure analysis, Little Nell Well, Aspen, Colorado.
- Design and transient pressure analysis, Hidden Valley Booster Pump Stations (3), Black Hawk, Colorado.

1985-1986 – Consulting Geological Engineer

- Conducted detailed geological evaluation of a 198 well, oil field in preparation of field extension drilling program. Drilled two successful wells that proved 8-10 additional drill sites.
- Conducted geologic and engineering evaluation of 120 gas well purchase. Work included reserve forecasts, economic analyses and analysis of undrilled acreage.

Resource Technology Corporation, Denver, Colorado

1981-1985 – President and Senior Coal and Petroleum Geologist/Engineer

- Developed a petroleum exploration model that delineated areas of greatest potential in the Niobrara Formation of the Denver Basin. Model integrated geologic elements of well log analysis, core examination and satellite image analysis with engineering data that included production forecasts and well completion practices.
- Completed a subsurface mapping effort in the Piceance Basin to identify mature source (coal beds) rocks and reservoir rocks. The effort focused on identifying areas where there was secondary permeability of sandstones of the Mesa Verde Formation along with mature gas generating coal beds.
- Designed gas and oil well completions (casing, perforations, cementing, hydro-tracing) for wells in Colorado and Wyoming (D-J and Powder River Basins).

1978-1981 – Vice President and Senior Geologist

Managed a team of up to 30 geologists and technicians that conducted a three-year-long evaluation of coal resources in Colorado, Wyoming, Utah, New Mexico, South Dakota and Montana for the U.S. Geological Survey. Project included detailed subsurface mapping and estimation of reserves of 120 Federal coal leases including leases in the San Juan, Raton, and Piceance Basins. Mapping included coal bed isopach, overburden isopach, structure maps, and coal bed correlation cross-sections.

Digilog Inc., Broomfield, Colorado

1977-1978 – Vice President and Geophysicist

Founded and managed a uranium and coal borehole geophysical logging company. Designed and built state of the art geophysical logging units.

Willard Owens Associates, Inc., Wheat Ridge, Colorado

1972-1977 – Vice President and Senior Ground Water Geologist

Responsible for design and installation of municipal wells in the Denver Basin. Designed and installed high capacity irrigation wells in Kit Carson and Alamosa Counties. Conducted water supply evaluations in Routt, Jefferson, Boulder, Douglas, and Eagle Counties. Served as expert witness before State of Colorado Water Court, and various County Commissions regarding water supply availability. Designed uranium in-situ leaching monitoring programs.

PROFESSIONAL ACTIVITIES

Colorado Ground Water Association
Rocky Mountain Association of Geologists
American Council of Engineering Companies of Colorado
Arizona Hydrological Society
Society of Exploration Geophysicists
American Association of Petroleum Geologists

PUBLICATIONS

Two Examples of Quantification of Subflow Zone Depletion in Arizona, American Institute of Professional Geologists and Arizona Hydrological Society Joint Symposium, Flagstaff, AZ, 2008 (with Thad Kuntz and Stephanie Schmidt).

Using MODFLOW and PEST to Estimate Yields of Horizontal and Radial Collector Wells, Proceedings of MODFLOW and More 2006: Managing Ground Water Systems, Colorado School of Mines, May 21-24, 2006 (with Mike LeFrancois).

Designing Brighton's New Well to Maximize Yield During a Drought, American Society of Civil Engineers Biennial Denver Geotechnical Symposium, Denver, CO, 2004.

Stream Depletion Determination Methods: A Survey; Modeling and non-Modeling Issues, Colorado Bar Association Ground Water Conference, Denver, CO, 2004.

Big Chino Valley Ground Water as the Source of the Verde River, American Water Resources Association Conference, July 2002.

Gila River Adjudication "Issue 2" from the Hydrologist's Perspective – A Panel Presentation, Arizona Water Law Conference, Phoenix, AZ, 2001.

Ground Water Resources of the Denver Basin, a map of ground water available by County, April 2000 (with Heather Justus).

Evaluation of the Pagosa Springs Geothermal Reservoir, American Society of Civil Engineers Conference, Denver, CO, May 1994 (with Dennis McGrane).

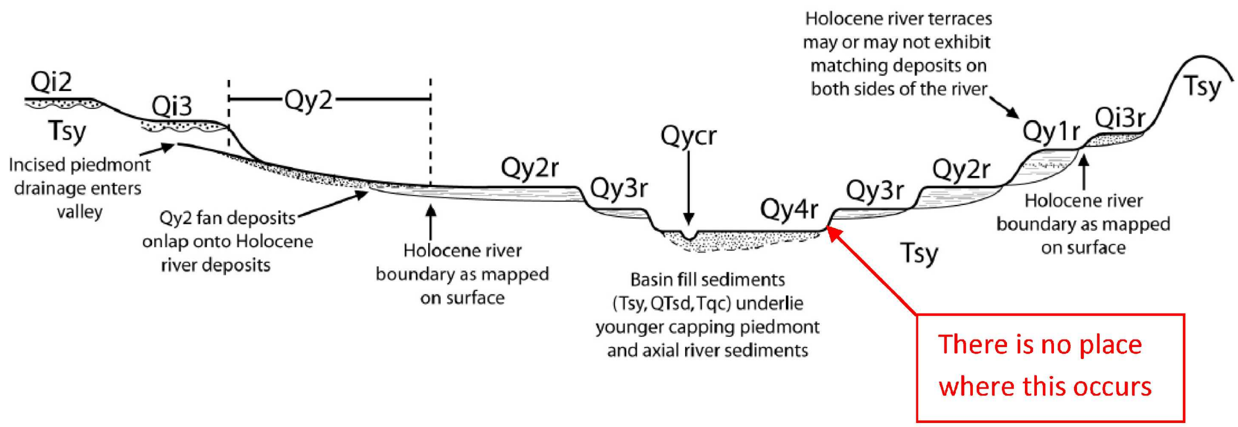
Gila River Recharge Project As An Alternative to Buttes Dam, Conserv90, Phoenix, AZ, August 1990 (with Dennis McGrane).

Resolving a Groundwater Conflict in Colorado, ASCE Water Resources Planning and Management Division Specialty Conference, Norfolk, VA, June 1988 (with Leonard Rice).

<u>Attachment 2</u>

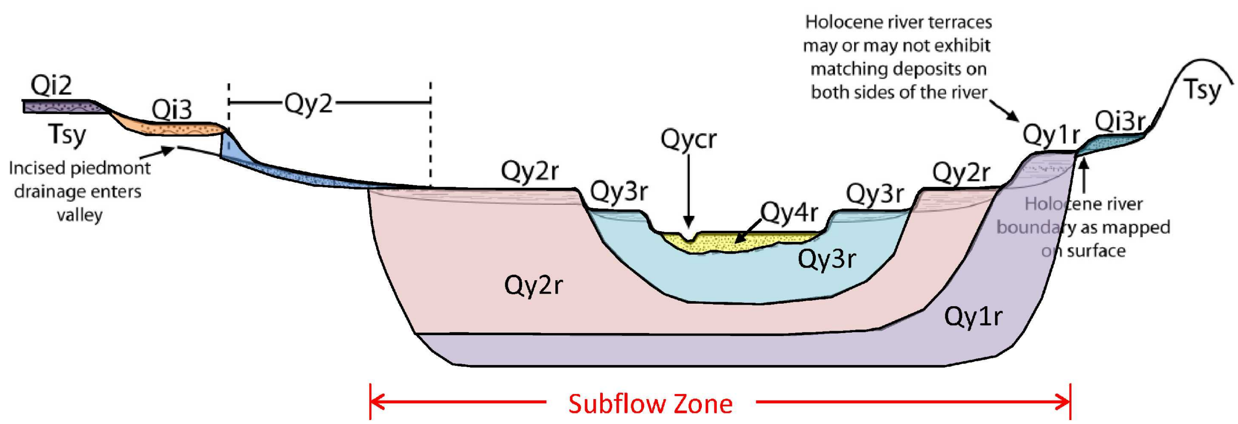
Figures A through M

ADWR/AGS View of Quaternary Stratigraphy



Generalized cross section of geomorphic relationships between Tertiary basin fill (Tsy), Pleistocene piedmont and river (Qi_n and Qi_nr units), and Holocene piedmont and river (Qy_n and Qy_nr units) deposits (from ADWR Figure 4.1, 2009, and AGS Figure 3, 2008).

Corrected Quaternary Stratigraphy



Corrected generalized cross section based upon subsurface interpretation of driller's logs.

Substantial efforts have been made to accurately compile GIS data and documentation. Accuracy is not guaranteed. This product is for reference purposes only and is not to be construed as a legal document or survey instrument.

ATTACHMENT 2
FIGURE A

GENERALIZED QUATERNARY STRATIGRAPHY
SAN PEDRO RIVER FLOODPLAIN

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DECEMBER 2009

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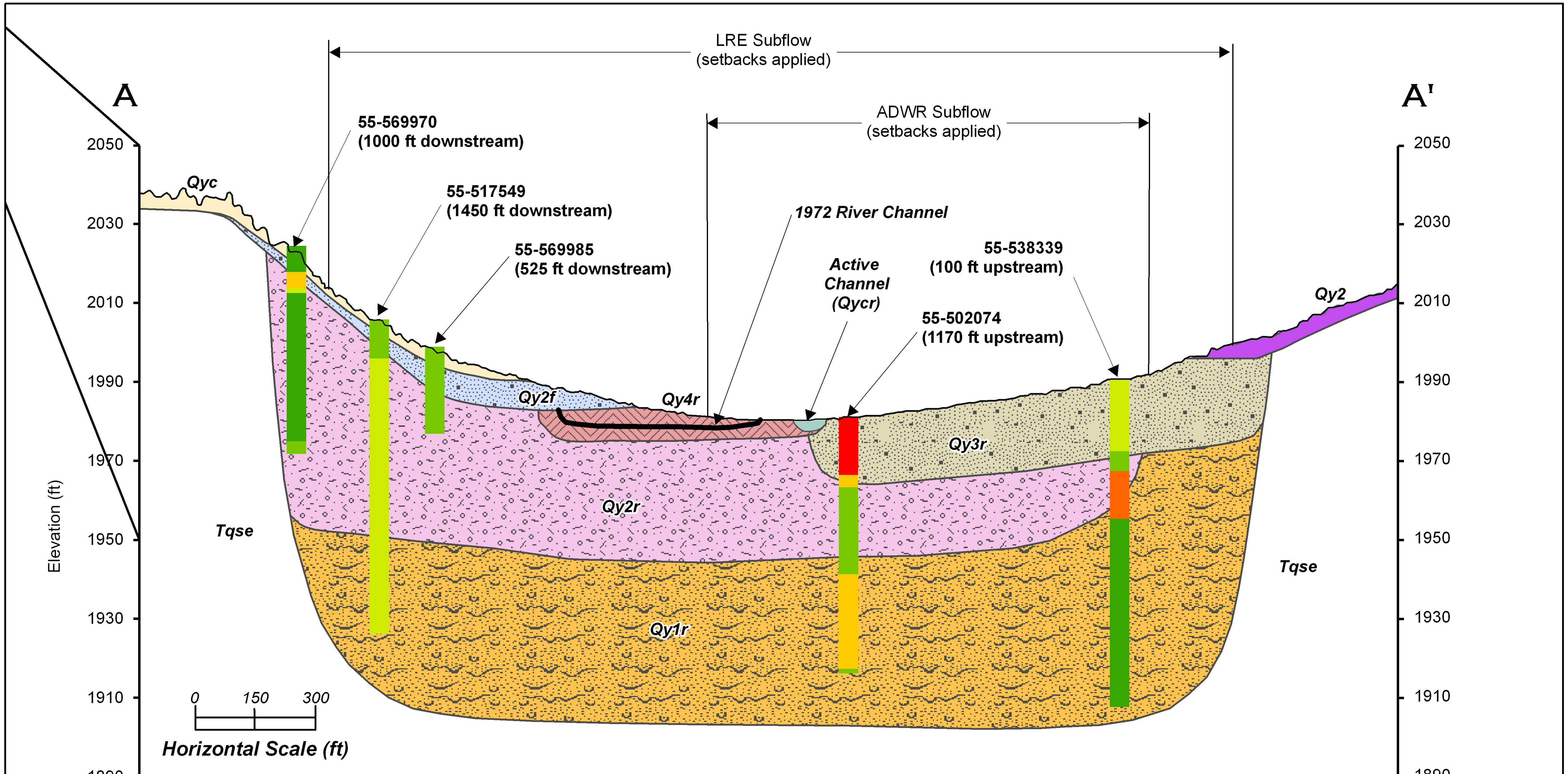

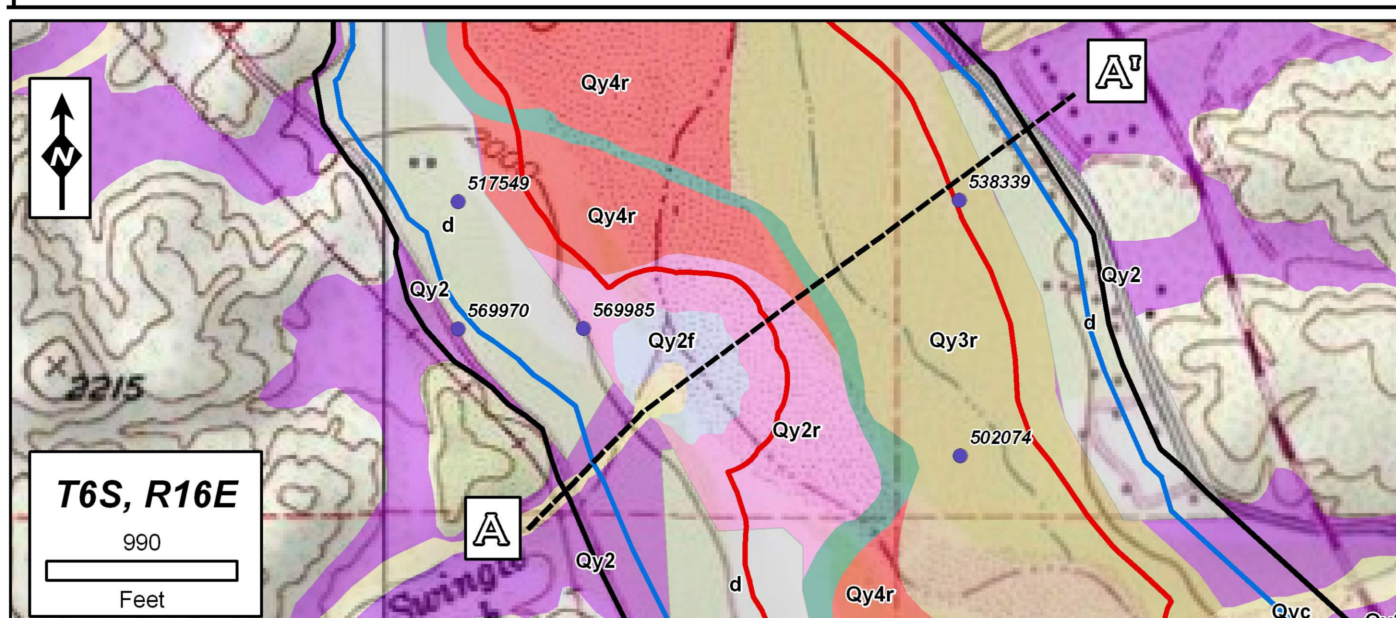

Attachment 2
Figure B

San Pedro Preserve Geologic Cross-Section

River
- Active River Channel (Qycr)
- Flood channel and low terrace deposits (Qy4r)
- Historical river terrace deposits (Qy3r)
- Latest Holocene to historical river terrace deposits (Qy2r)
- Late to early Holocene river terrace deposits (Qy1r)

Tributary
- Modern stream channel deposits (Qyc)
- Older Holocene alluviul fan (Qy2f)
- Late Holocene alluvium (Qy2)

- Pliocene Quibris basin fill deposits, (Tqse)

Qy4r includes 1947, 1955, 1972, 1990, 1994, and current San Pedro River Channels
Qy3r includes 1877, 1910, and 1934 San Pedro River channels

Wellbore Lithology
- Topsoil
- Gravel with sand, silt, and clay
- Clay, silt, and sand
- Gravel and cobbles
- Sand and gravel
- Silt and sand

- Saturated Floodplain Holocene Alluvium
- LRE Subflow Zone
- ADWR Subflow Zone

Surface Geologic mapping from AGS, 2008

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December 2009

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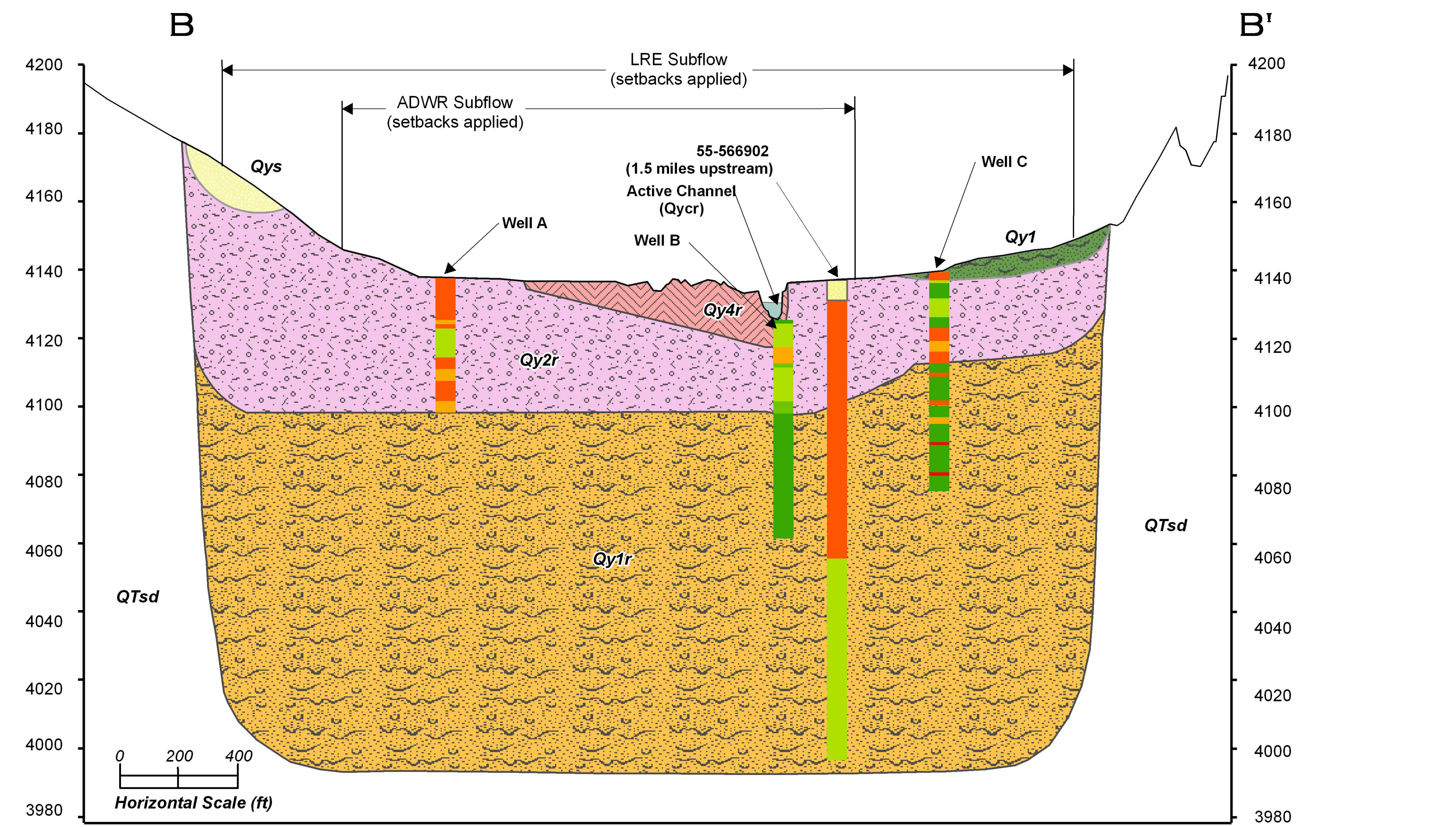

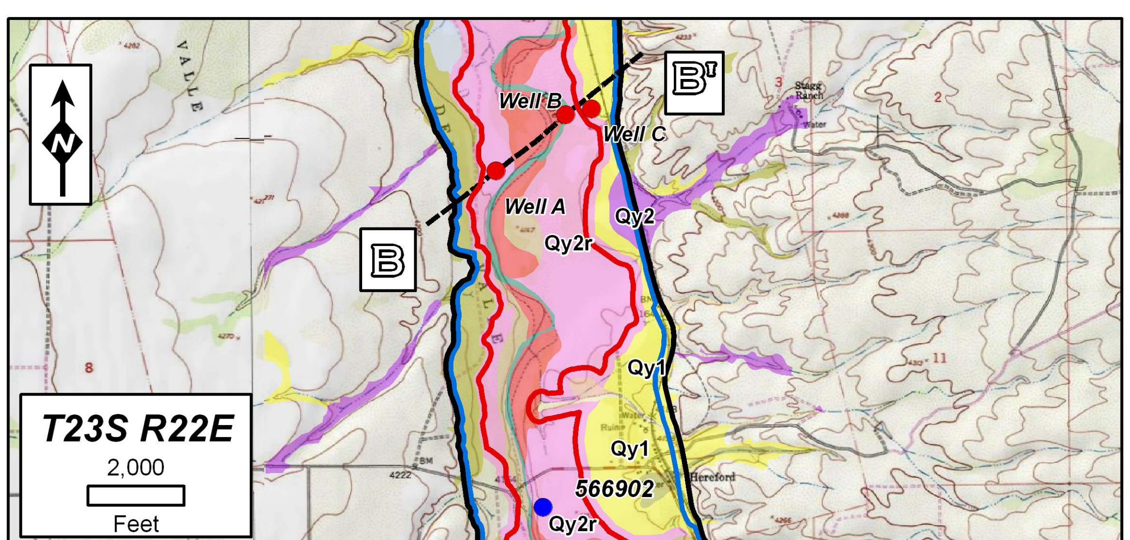

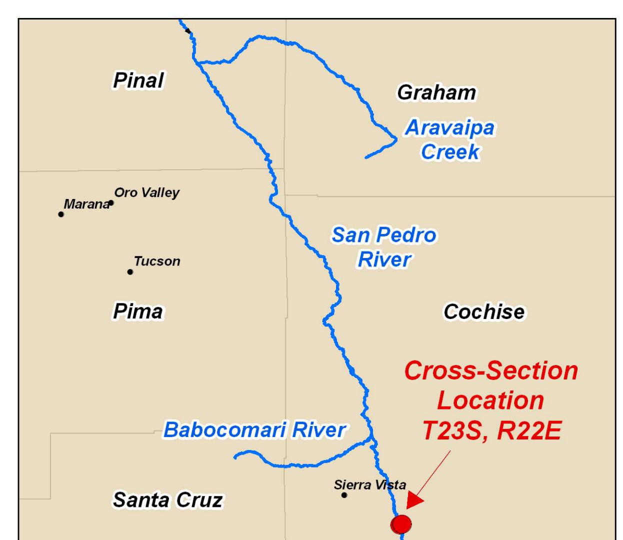

Attachment 2
Figure C

Hereford Meander Cross-Section

River
- Active River Channel (Qycr)
- Flood channel and low terrace deposits (Qy4r)
- Latest Holocene to historical river terrace deposits (Qy2r)
- Late to early Holocene river terrace deposits (Qy1r)

Tributary
- Older Holocene alluvium (Qy1)
- Holocene fine-grained deposits (Qys)
- Pliocene to Pleistocene Saint David Formation (QTsd)

Wellbore Lithology
- Silty Clay
- Gravel
- Sand and Gravel
- Overburden
- Sand
- Clay, Silt, and Sand
- Shale

- Saturated Floodplain Holocene Alluvium
- LRE Subflow Zone
- ADWR Subflow Zone

Surface Geologic mapping from AGS, 2008

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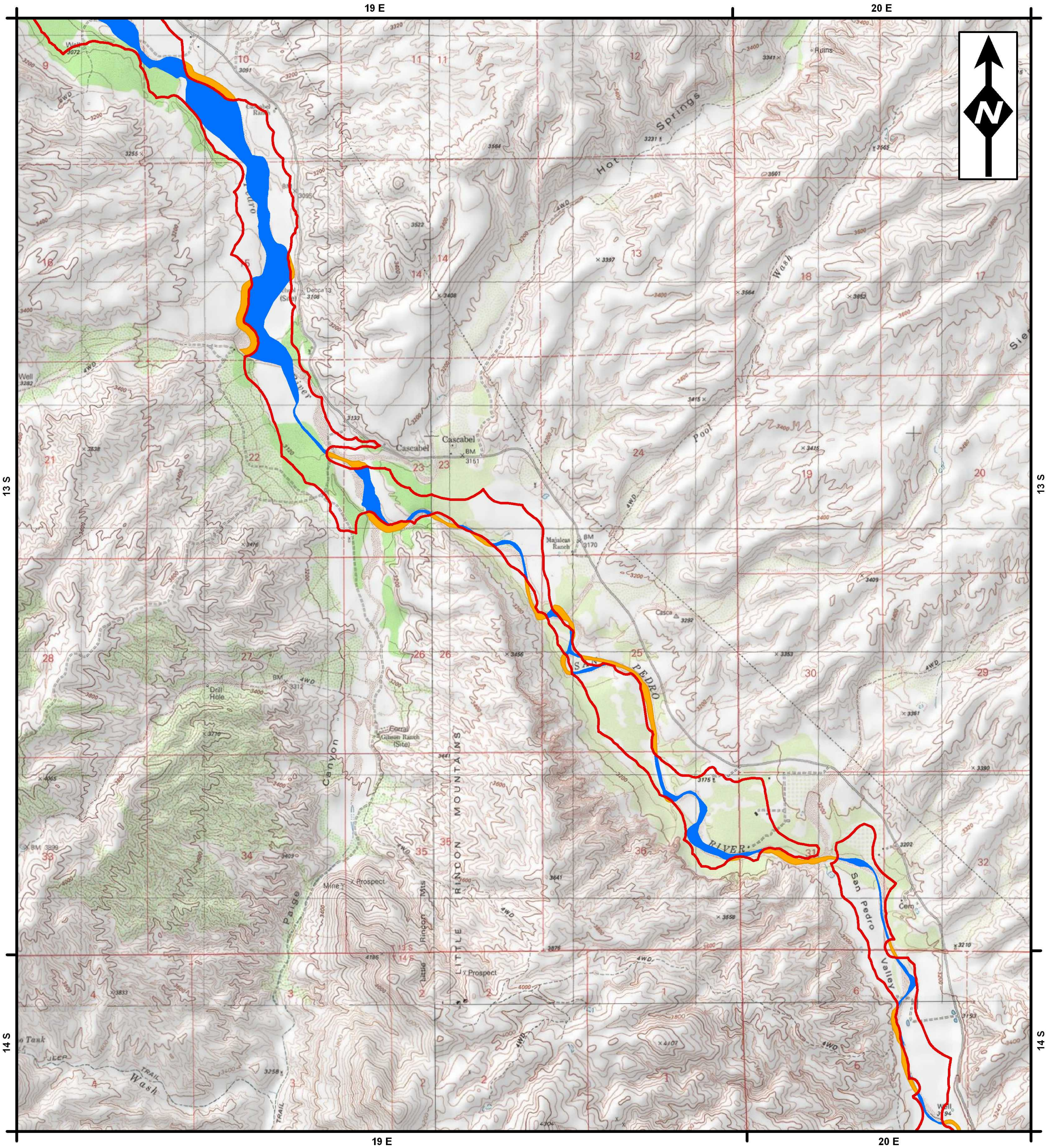
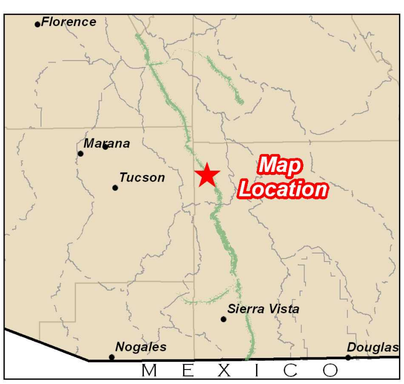
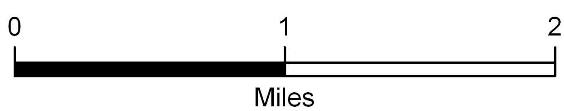




2009 ADWR Subflow Zone

Instances where active river channel is outside of ADWR subflow zone

2008 AGS active river channel



Attachment 2
Figure D

Example Locations where the Active River Channel (ADWR 2009) is Outside of the ADWR Subflow Zone

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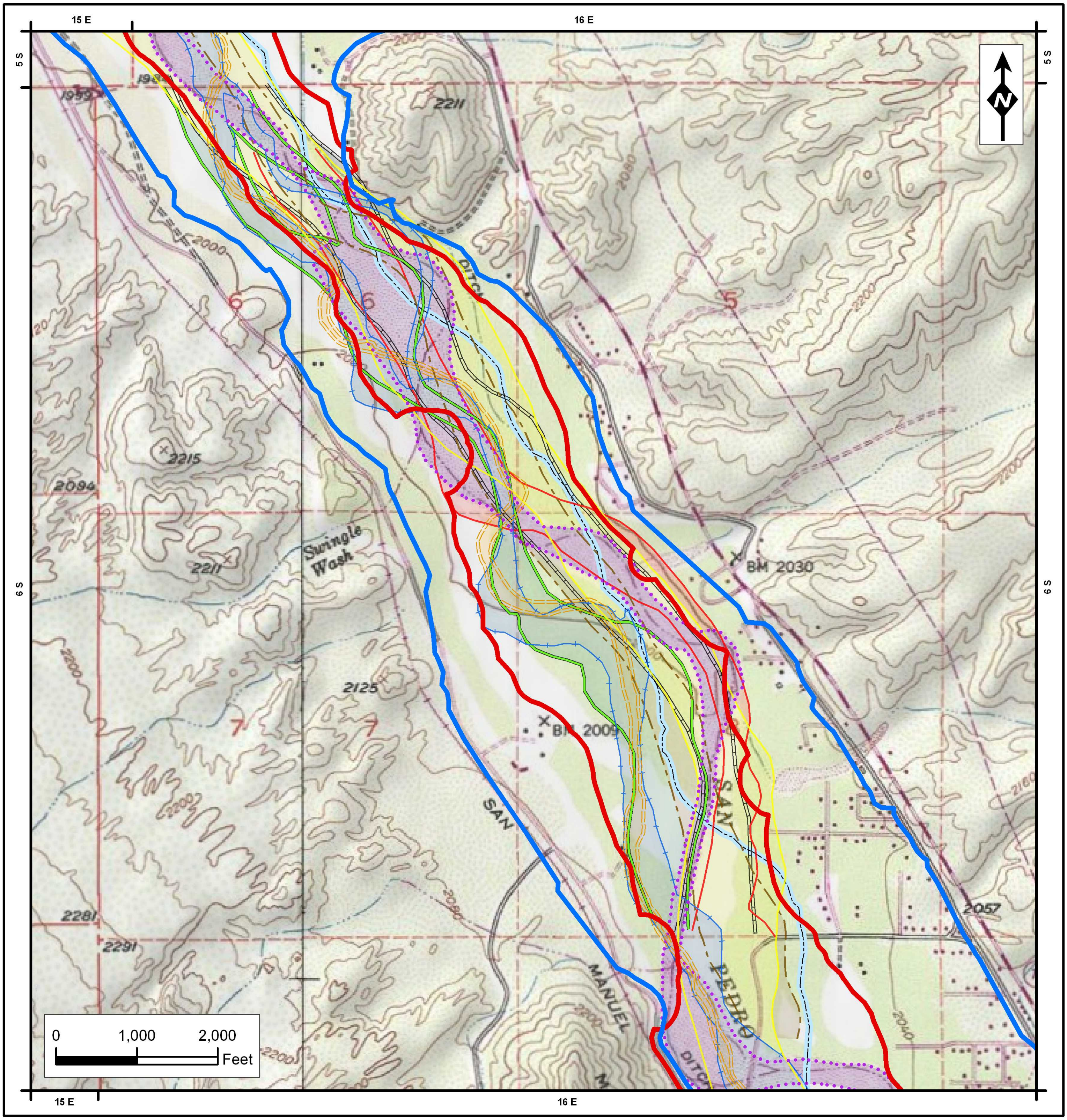

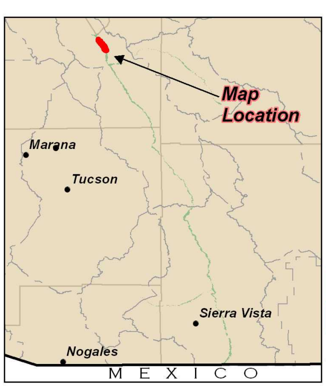

*1877: Survey of Gila and Salt River Meridian, General Land Office
*1910: Winkelman Quadrangle, 30 Minute Series, 1913 Edition, USGS.
*1934: Aerial Photographs, Soil Conservation Service
1947: LRE Aerial Photograph Interpretation
1955: LRE Aerial Photograph Interpretation
*1972: Winkelman, Dudleyville, and Lookout Mountain quadrangles, 7.5 Minute Series, USGS.
1990: LRE Aerial Photograph Interpretation
*1994: Aerial Photographs, Pinal County
2008: Arizona Geological Survey
ADWR Subflow Zone
LRE Subflow Zone

* Indicates that the Data was Derived from Arizona Geological Survey Open-File Report OFR 97-21. Plate 3. Historical Changes in the Active Boundaries of the San Pedro River, Dudleyville Area.

Substantial efforts have been made to accurately compile GIS data and documentation. Accuracy is not guaranteed. This product is for reference purposes only and is not to be construed as a legal document or survey instrument.

Attachment 2
Figure E

San Pedro River Meanders Since 1877

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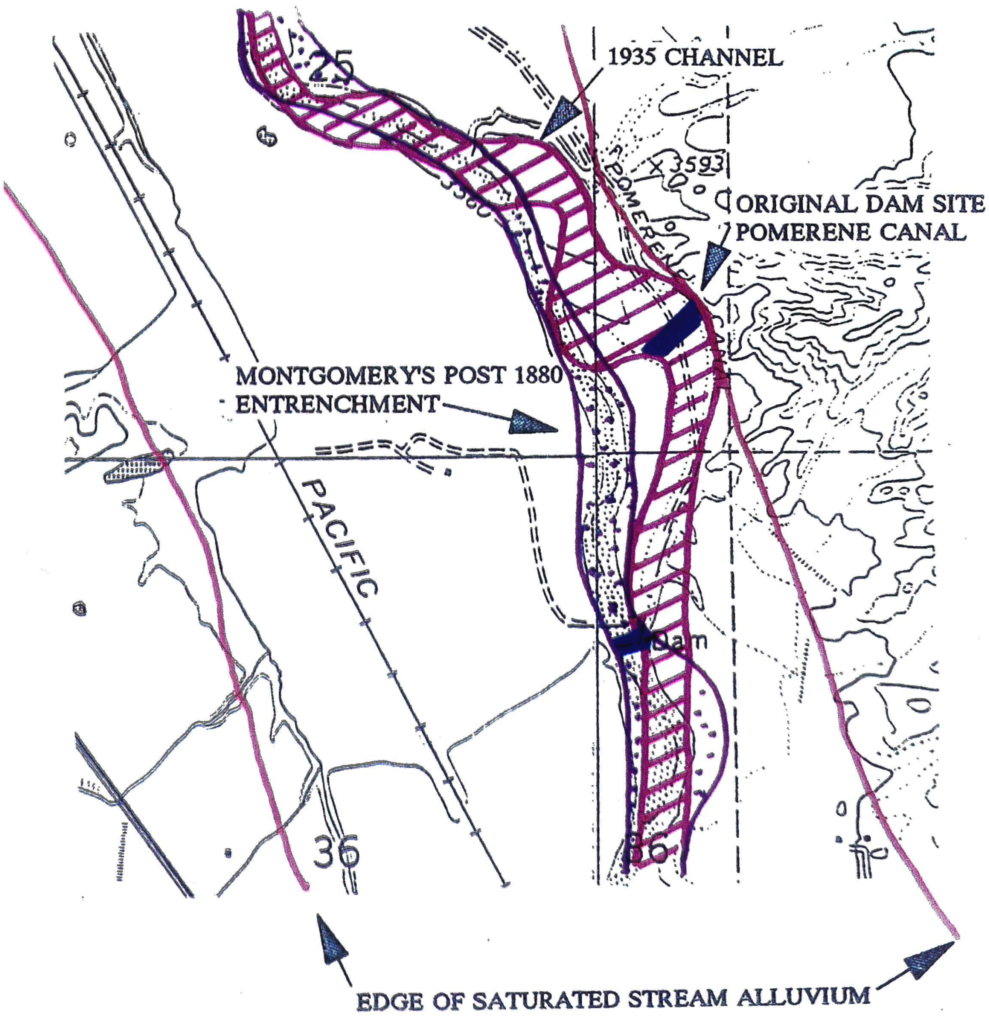
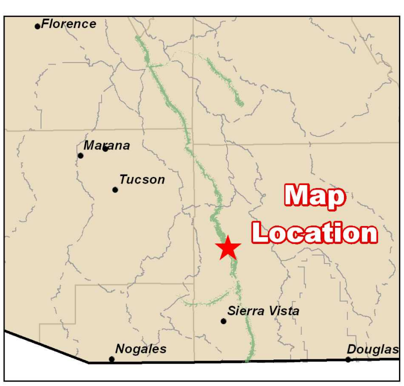
EXTENT OF ENTRENCHMENT OF SAN PEDRO RIVER

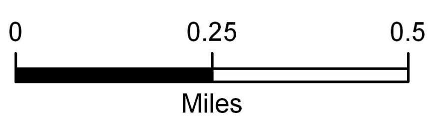
VICINITY OF POMERENE CANAL COMPANY DAM

T.17S., R.20-21E.



Appendix O-3
Exhibit 319





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ATTACHMENT 2
FIGURE F

APPENDIX O-3,
EXHIBIT 319,
1994 ORDER

PROJECT: 695SLW01
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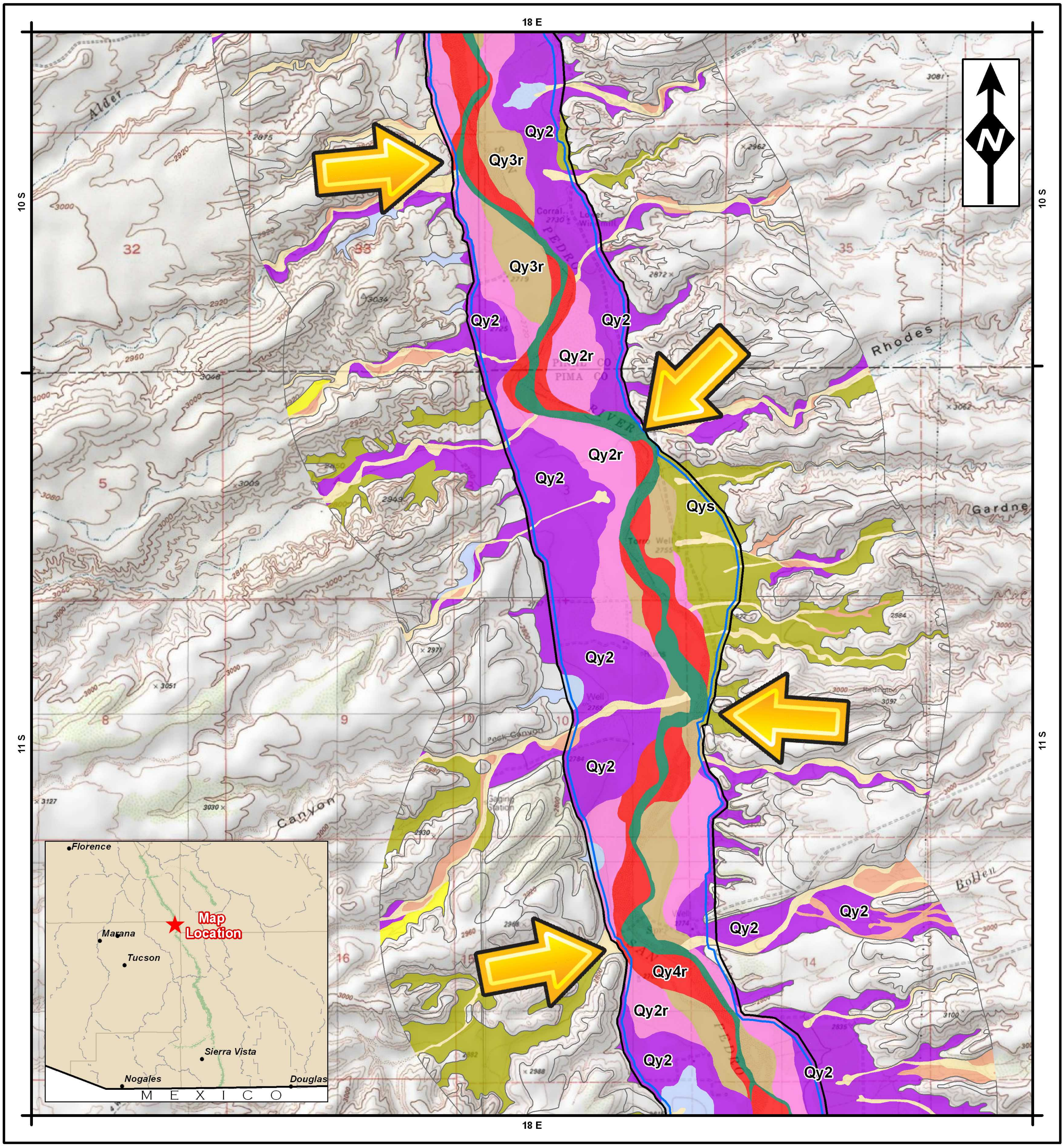

Geologic Unit

River
- Active river channel deposits (Qycr)
- Flood channel and low terrace deposits (Qy4r)
- Historical river terrace deposits (Qy3r)
- Latest Holocene to historical river terrace deposits (Qy2r)
- Late to early Holocene river terrace deposits (Qy1r)

Tributary
- Modern stream channel deposits (Qyc)
- Latest Holocene alluvium (Qy3)
- Older Holocene alluviul fan (Qy2f)
- Late Holocene alluvium (Qy2)
- Older Holocene alluvium (Qy1)
- Holocene fine-grained deposits (Qys)
- Disturbed ground (d)

Geology from AGS 2008

Indicates locations where active river channel meanders from one side of the floodplain to the other

LRE edge of Subflow Zone

LRE edge of Saturated Floodplain Holocene Alluvium

0 50 100

Miles

Substantial efforts have been made to accurately compile GIS data and documentation. Accuracy is not guaranteed. This product is for reference purposes only and is not to be construed as a legal document or survey instrument.

Attachment 2
Figure G

Example Locations where the San Pedro River Meanders Back and Forth Across the Entire Floodplain

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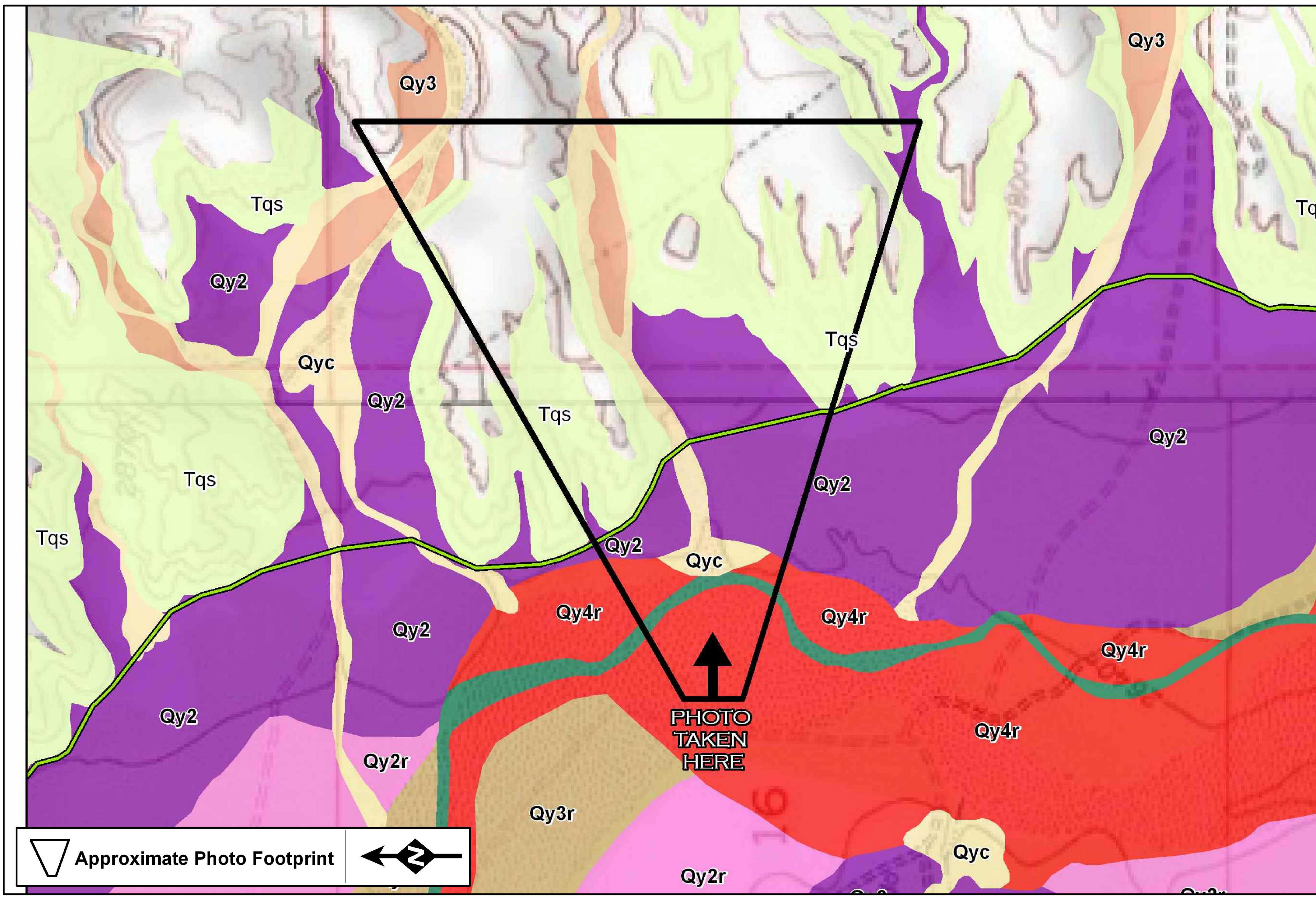

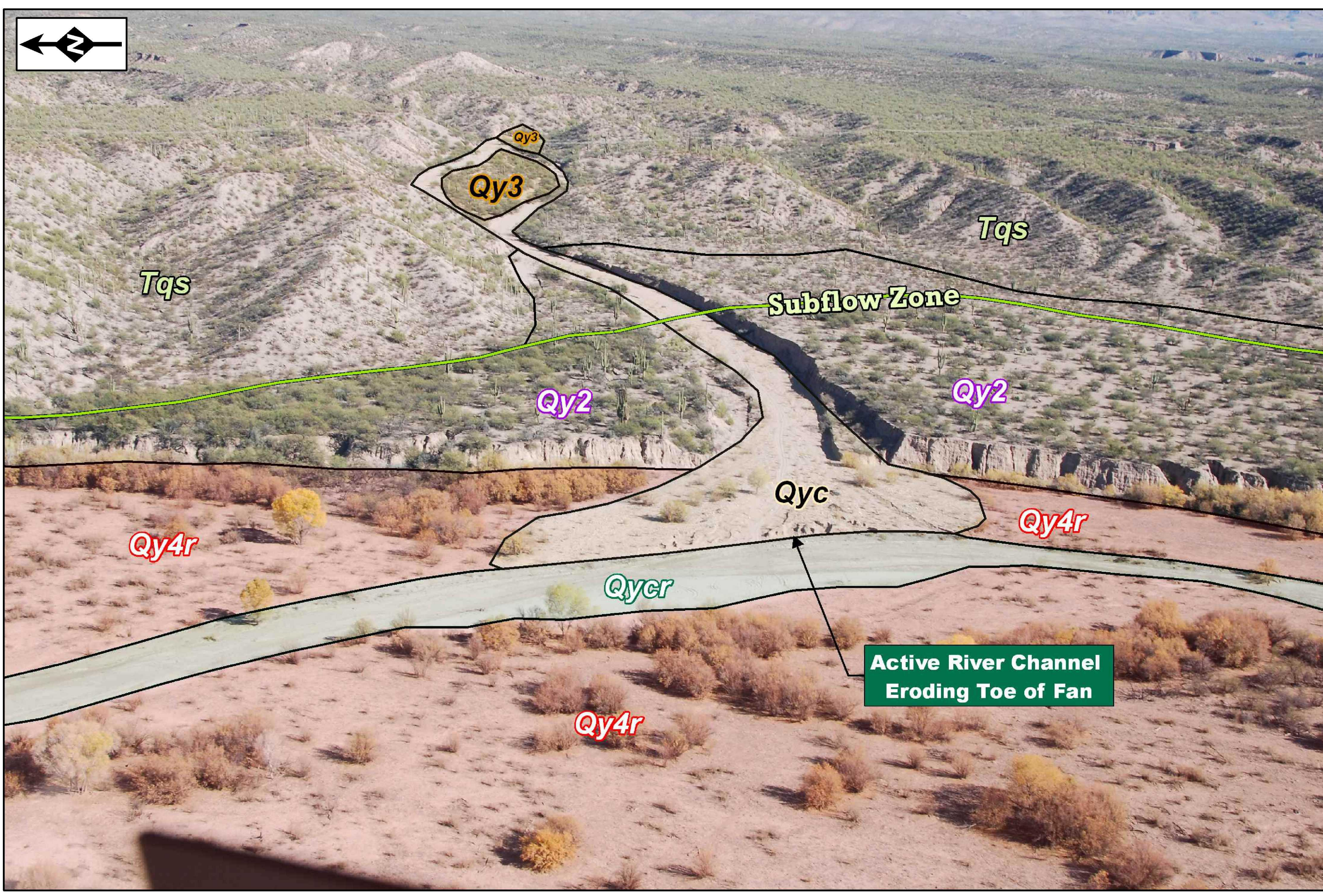

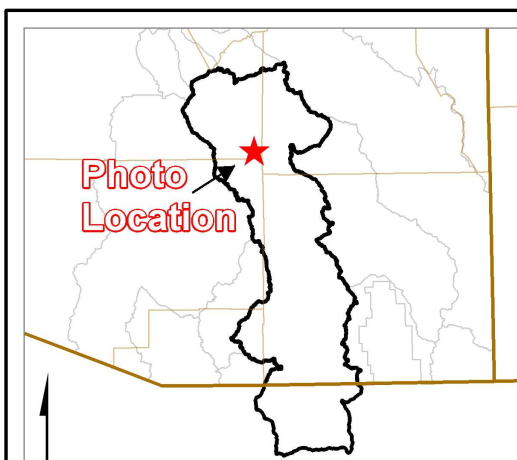

LRE edge of Saturated Floodplain Holocene Alluvium

MAP LEGEND:

RIVER
- Active river channel deposits (Qycr)
- Flood channel and low terrace deposits (Qy4r)
- Historical river terrace deposits (Qy3r)
- Latest Holocene to historical river terrace deposits (Qy2r)

TRIBUTARY
- Modern stream channel deposits (Qyc)
- Latest Holocene alluvium (Qy3)
- Late Holocene alluvium (Qy2)

- Tertiary and Pleistocene basin fill deposits (Tqs)

PHOTOGRAPH LEGEND:

RIVER
- Active river channel deposits (Qycr)
- Flood channel and low terrace deposits (Qy4r)

TRIBUTARY
- Modern stream channel deposits (Qyc)
- Late to early Holocene river terrace deposits (Qy1r)
- Late Holocene alluvium (Qy2)

- Tertiary and Pleistocene basin fill deposits (Tqs)

GEOLOGY FROM AGS 2008

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ATTACHMENT 2
FIGURE H

SAN PEDRO RIVER ACTIVELY ERODING TOE OF ALLUVIAL FAN

DECEMBER 2009
695SLW01

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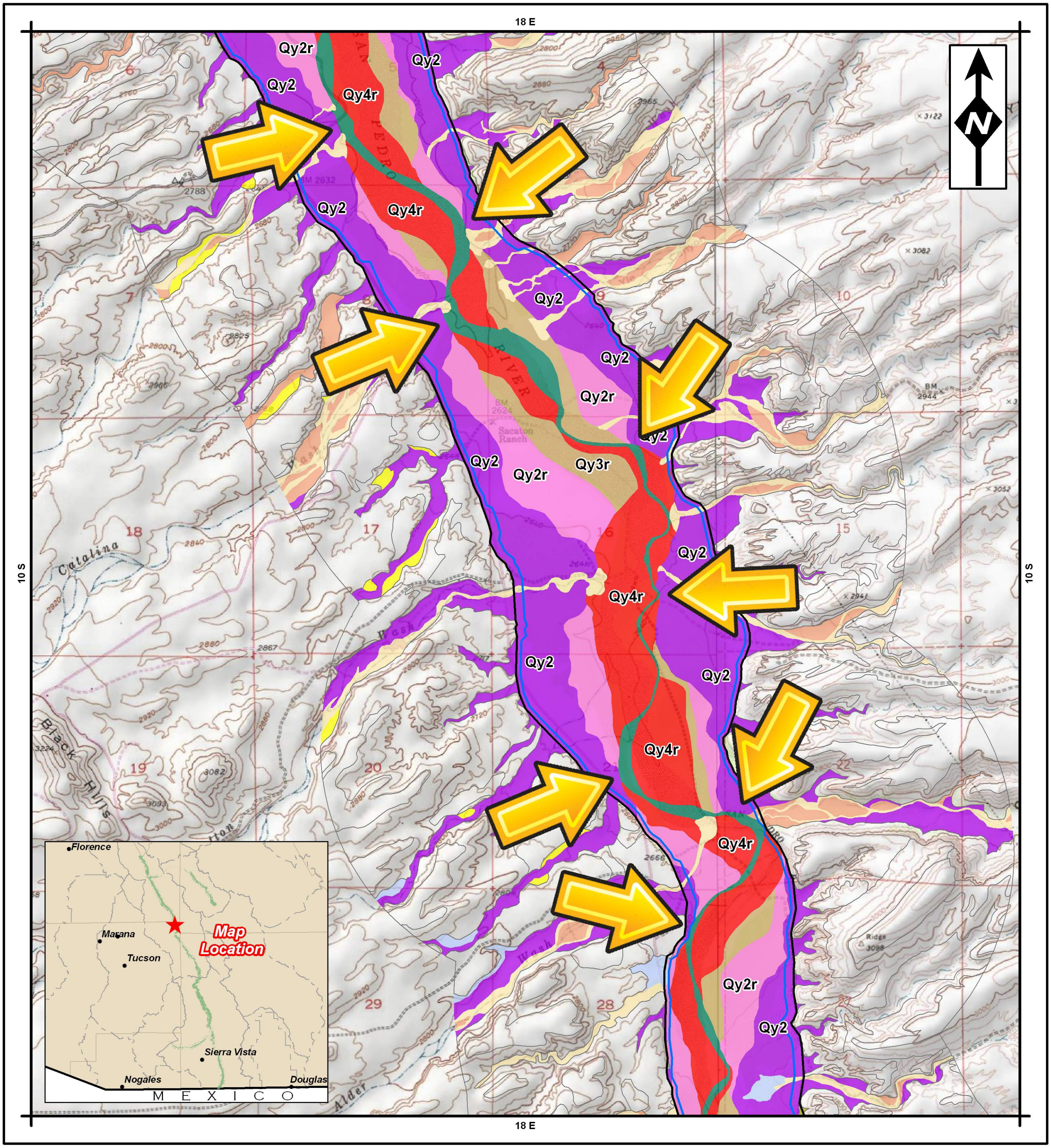

Geologic Unit

River
- Active river channel deposits (Qycr)
- Flood channel and low terrace deposits (Qy4r)
- Historical river terrace deposits (Qy3r)
- Latest Holocene to historical river terrace deposits (Qy2r)
- Late to early Holocene river terrace deposits (Qy1r)

Tributary
- Modern stream channel deposits (Qyc)
- Latest Holocene alluvium (Qy3)
- Older Holocene alluviul fan (Qy2f)
- Late Holocene alluvium (Qy2)
- Older Holocene alluvium (Qy1)
- Holocene fine-grained deposits (Qys)
- Disturbed ground (d)

Geology from AGS 2008

Indicates locations where the current river channel is eroding the late Holocene alluvial fans overlapping the floodplain alluvium

LRE edge of Subflow Zone

LRE edge of Saturated Floodplain Holocene Alluvium

0 50 100

Miles

Substantial efforts have been made to accurately compile GIS data and documentation. Accuracy is not guaranteed. This product is for reference purposes only and is not to be construed as a legal document or survey instrument.

Attachment 2
Figure I

Example Locations where the Active River Channel is Eroding Holocene Alluvial Fans Overlapping the Floodplain Alluvium

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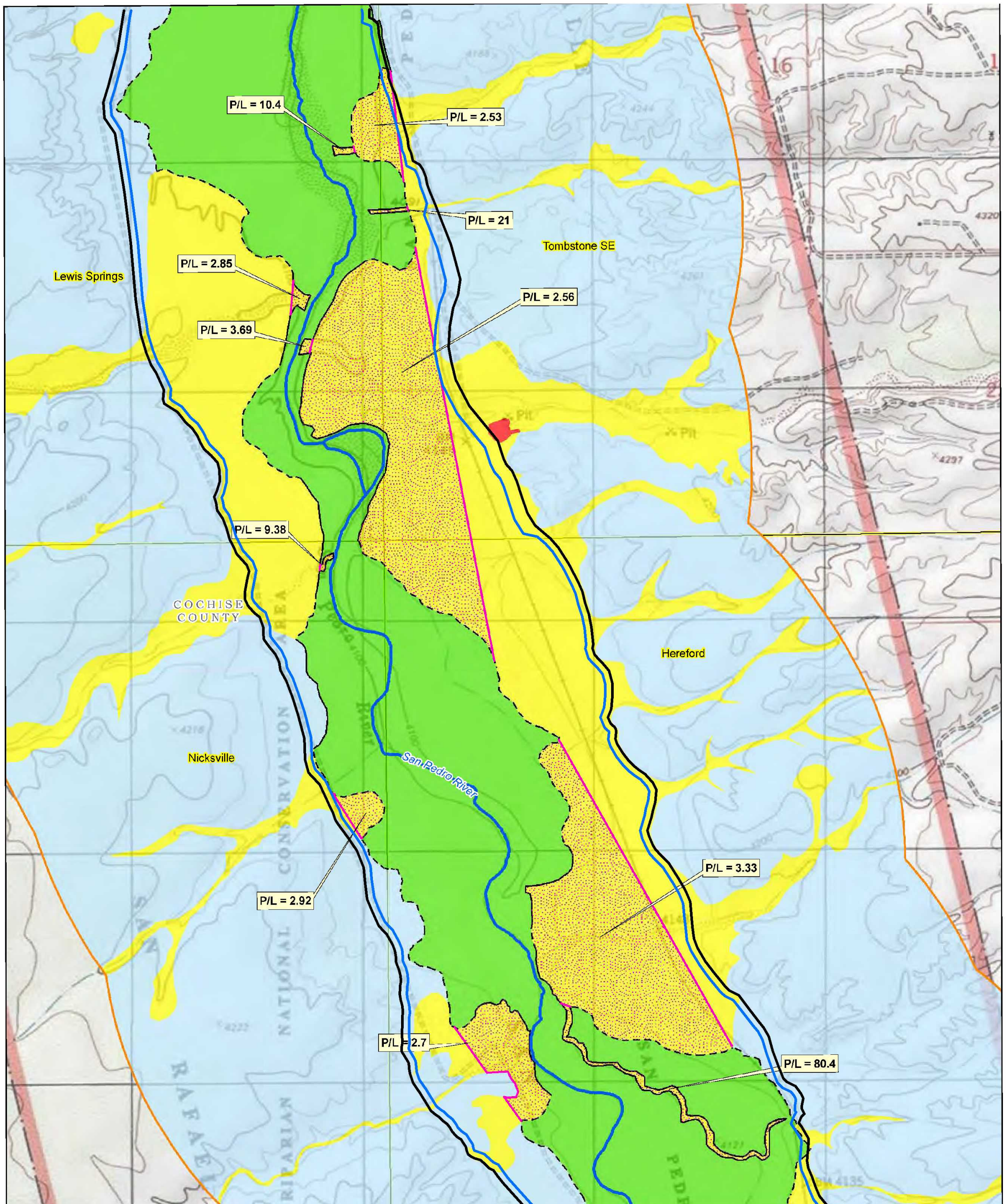
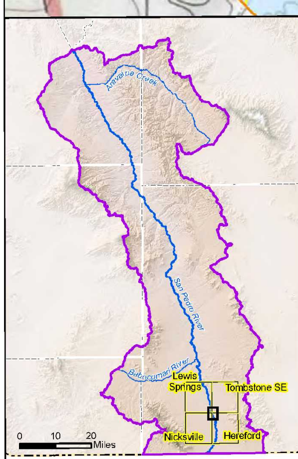




Legend

- Tributary Holocene Alluvium (THA) potentially overlaying Floodplain Holocene Alluvium (FHA)
- Inferred contact line (L)
- P/L — Ratio of perimeter (P) of feature within floodplain to its length (L) at floodplain edge (*only features with P/L ≥ 2.5 are shown*)
- Area Mapped by AZGS (2009)

Generalized Geologic Units*

- FHA [ADWR Subflow Zone]
- THA
- Disturbed (unit not determined)
- Basin Fill
- Bedrock

*See Table 4-2 for AZGS map units used by ADWR to define generalized geologic units in the San Pedro River Watershed.

Contact Between FHA and Other Mapped Units

- Well Defined (± 25 feet accuracy)
- Subtle or Gradational (± 50 feet accuracy)
- Approximate (± 250 feet accuracy)
- Major Stream
- San Pedro River Watershed
- County
- International Boundary
- USGS Topo Quad Boundary

- LRE edge of Subflow Zone
- LRE edge of Saturated Floodplain Holocene Alluvium

Base Map: USGS 1:24,000 Topo

N

0 0.25 0.5 Miles

©
ARIZONA DEPARTMENT OF WATER RESOURCES

Figure D-4a
Application of ADWR Criteria to Address Tributary Holocene Alluvium Mapped Within the San Pedro River Floodplain

Subflow Zone Delineation Report for the San Pedro River Watershed

Note: LRE Subflow Zone and Saturated Floodplain Holocene Alluvium added to ADWR Figure

Substantial efforts have been made to accurately compile GIS data and documentation. Accuracy is not guaranteed. This product is for reference purposes only and is not to be construed as a legal document or survey instrument.

ATTACHMENT 2
FIGURE J

PROJECT: 695SLW01
DECEMBER 2009

LEONARD RICE ENGINEERS, INC.
2000 Clay Street, Suite 300 Denver, Colorado 80211-5119
(303) 455-9589 • (800) 453-9589 • Fax (303) 455-0115

LEONARD RICE ENGINEERS, INC.
2000 Clay Street, Suite 300 Denver, Colorado 80211-5119
(303) 455-9589 ✦ (800) 453-9589 ✦ Fax (303) 455-0115

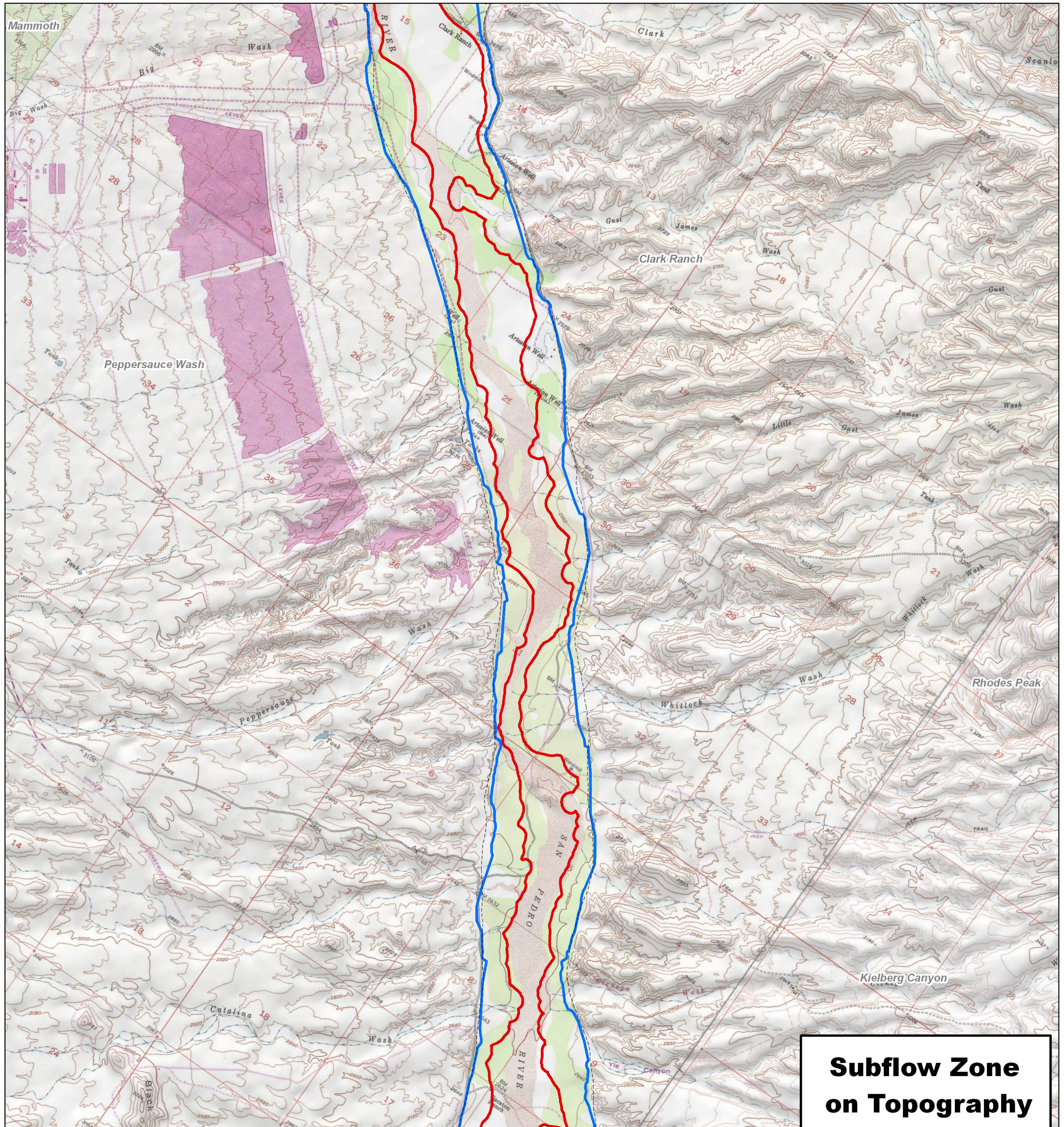
December 2009
695SLW01

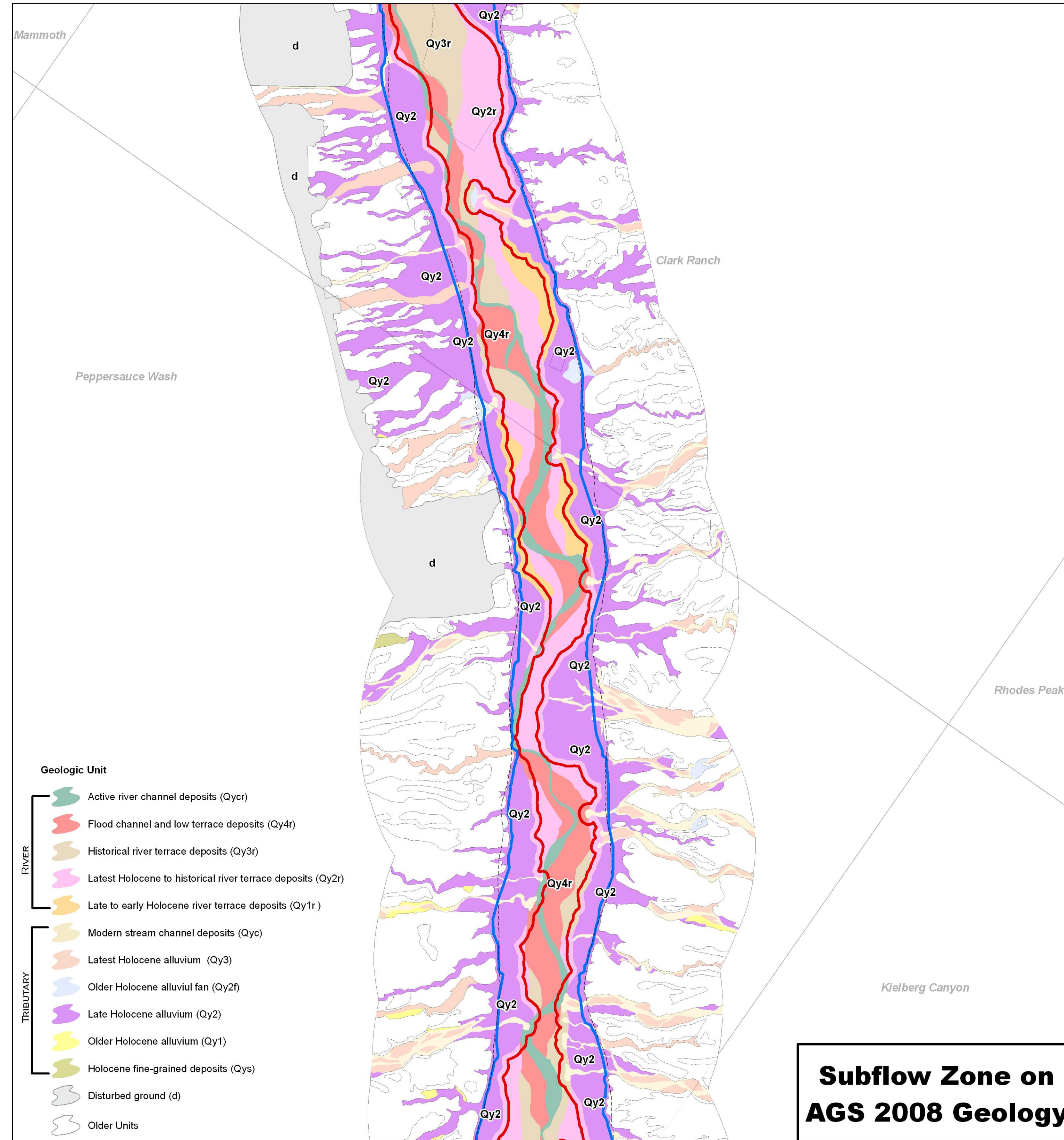
0 1 2 Miles

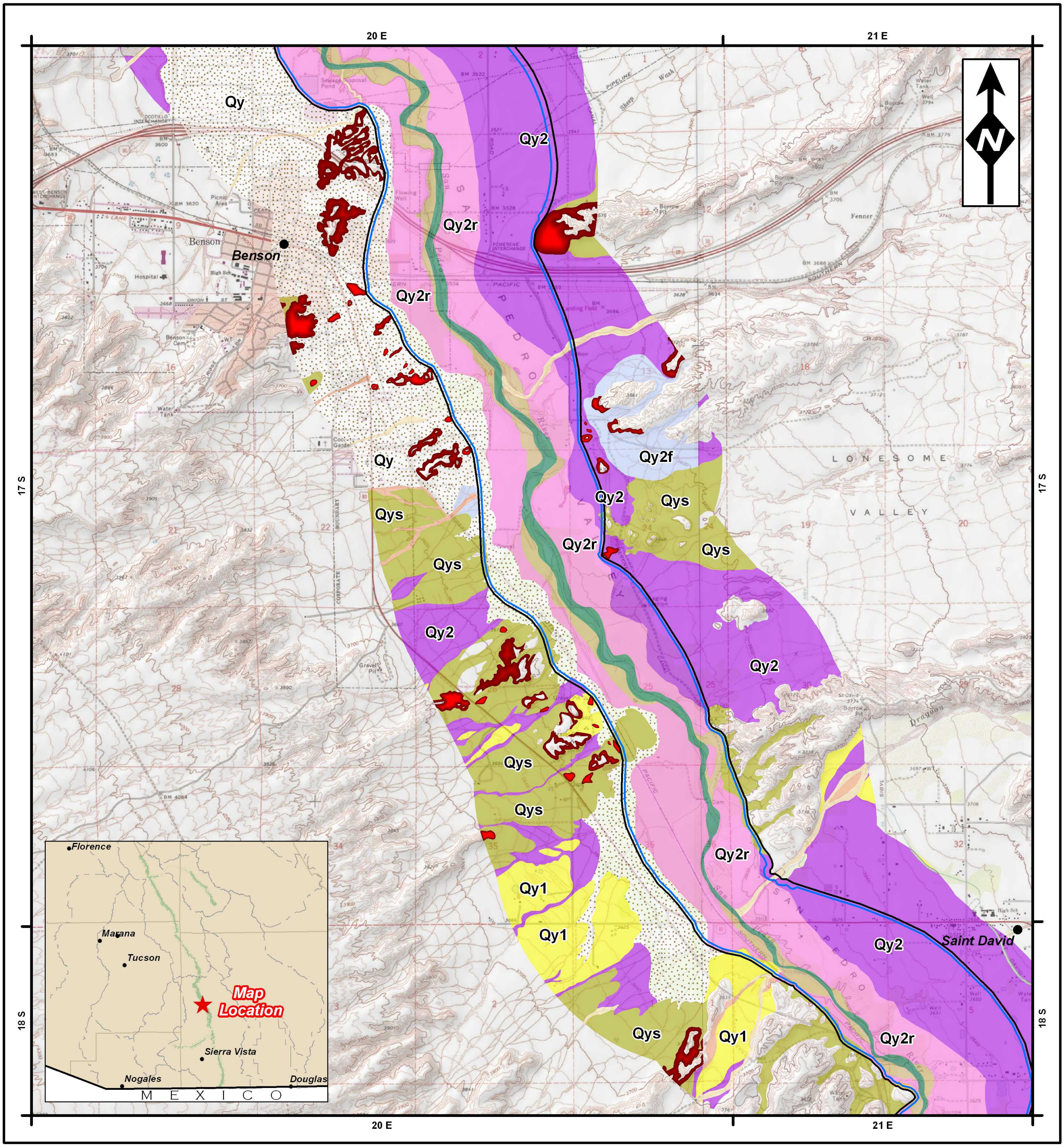
LRE 1994 Subflow Zone
LRE 2009 Subflow Zone
ADWR Subflow Zone

ATTACHMENT 2
FIGURE K
SUBFLOW ZONE COMPARISON

Substantial efforts have been made to accurately compile GIS data and documentation. Accuracy is not guaranteed. This product is for reference purposes only and is not to be construed as a legal document or survey instrument.







Geologic Unit

River
- Active river channel deposits (Qycr)
- Flood channel and low terrace deposits (Qy4r)
- Historical river terrace deposits (Qy3r)
- Latest Holocene to historical river terrace deposits (Qy2r)
- Late to early Holocene river terrace deposits (Qy1r)

Tributary
- Modern stream channel deposits (Qyc)
- Latest Holocene alluvium (Qy3)
- Older Holocene alluviul fan (Qy2f)
- Late Holocene alluvium (Qy2)
- Older Holocene alluvium (Qy1)
- Holocene fine-grained deposits (Qys)

- Holocene deposits undifferentiated (Qy)
- Disturbed ground (d)

Geology from AGS 2008

- Basin fill inliers
- LRE edge of Subflow Zone
- LRE edge of Saturated Floodplain Holocene Alluvium

0 50 100
Miles

Substantial efforts have been made to accurately compile GIS dataand documentation. Accuracy is not guaranteed. This product is for reference purposes only and is not to be construed as a legal document or survey instrument.

Attachment 2
Figure L

Example Locations where Basin Fill Deposits (Inliers) Extrude through Alluvium

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December 2009

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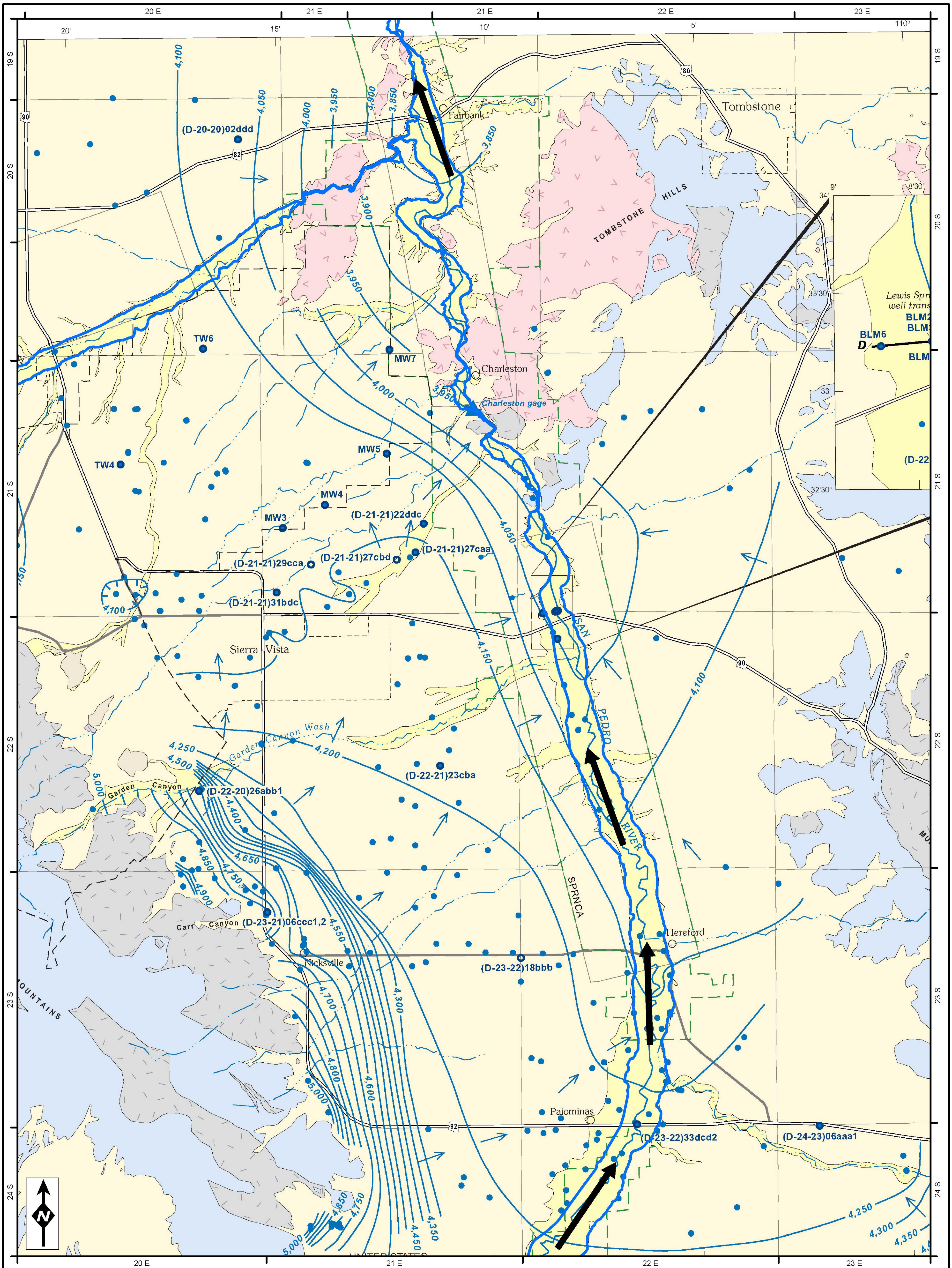
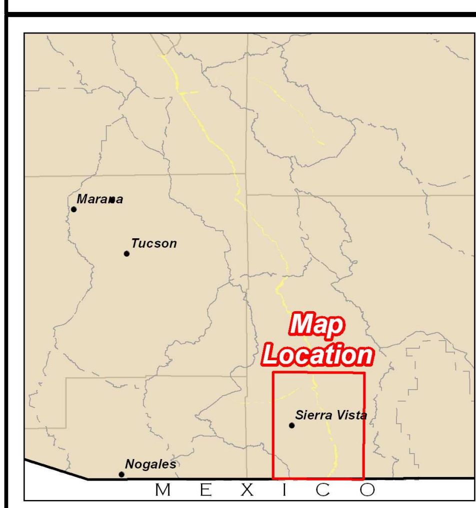
(303) 455-9589✦(800) 453-9589✦Fax (303) 455-0115





LRE edge of Subflow Zone

Driection of ground water flow in Subflow Zone parallel to San Pedro River

Miles
0 2 4

Substantial efforts have been made to accurately compile GIS data and documentation. Accuracy is not guaranteed. This product is for reference purposes only and is not to be construed as a legal document or survey instrument.

Attachment 2
Figure M

Water Table in the Upper San Pedro Basin from USGS WRI 99-4197 (Plate 2)

Project: 695SLW01
December 2009

Leonard Rice Engineers, Inc.
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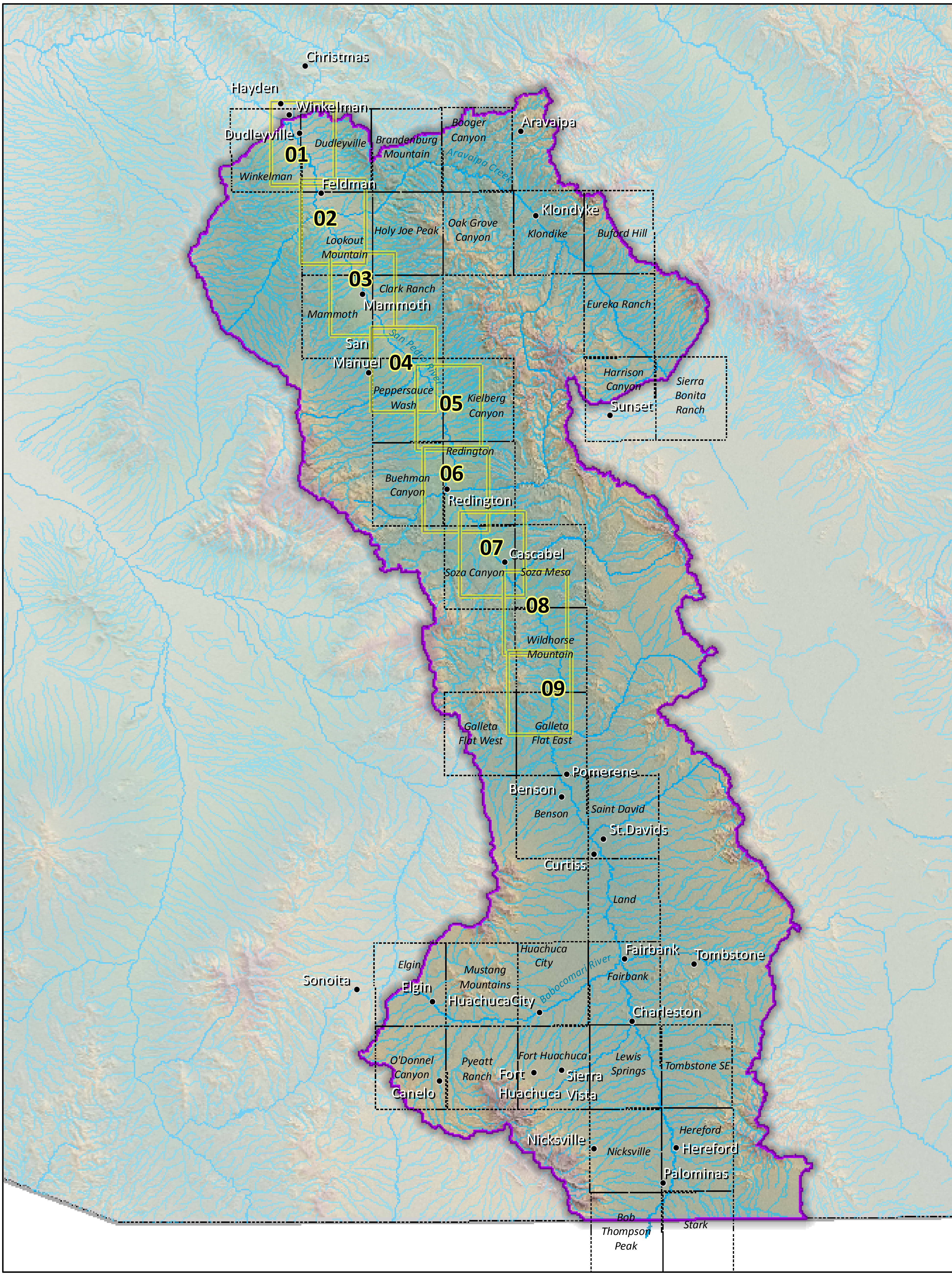
(303) 455-9589 ♦ (800) 453-9589 ♦ Fax (303) 455-0115

<u>Attachment 3</u>

1935 and 2008 Channel Comparison Maps

Attachment 3

Map Index for SRP San Pedro Attachments 3 & 5



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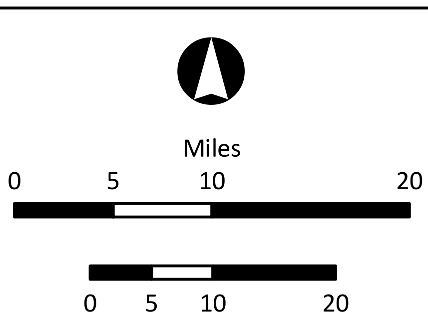


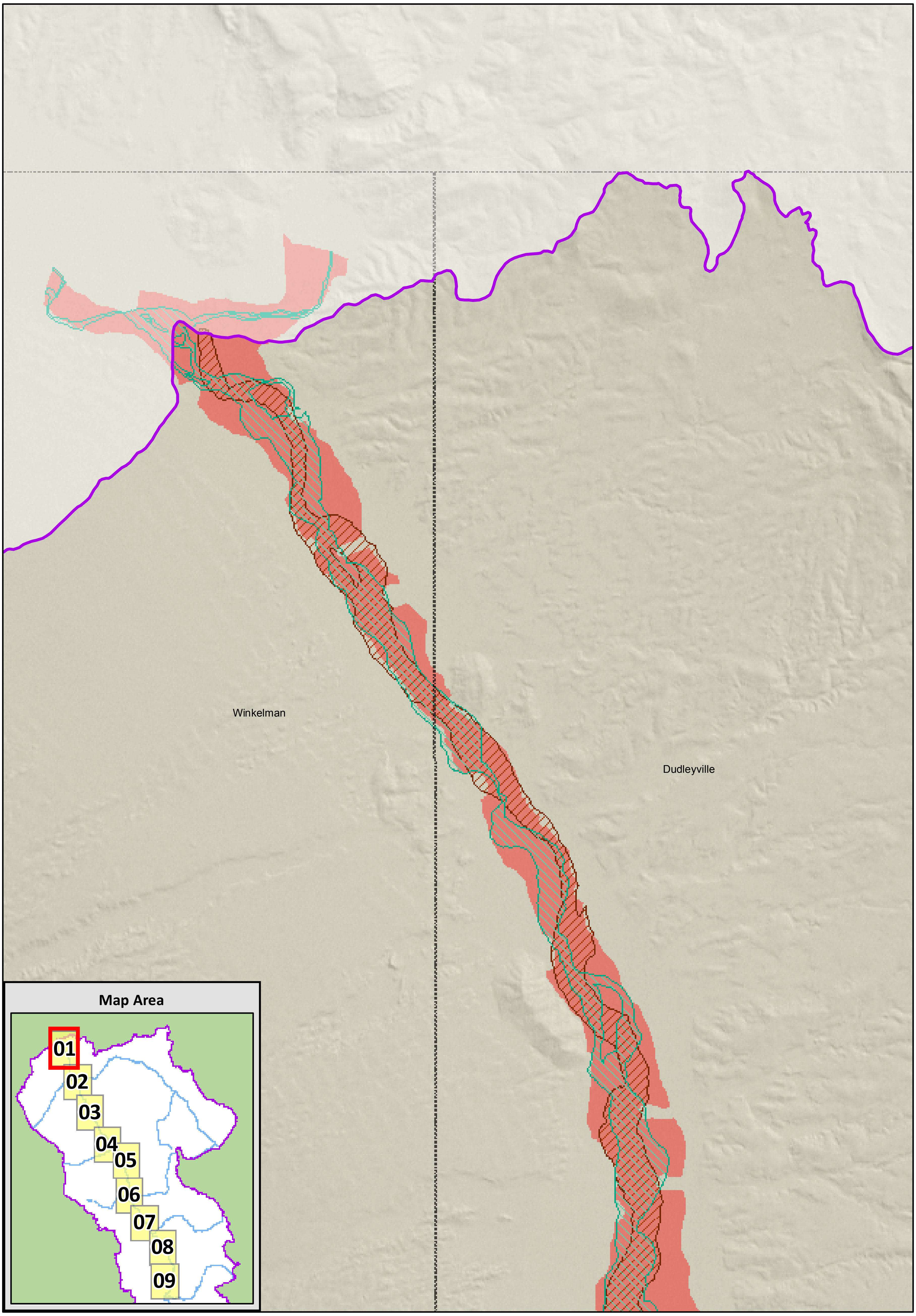
Legend

- Map Book Pages
- USGS Topo (24k) Quad Boundary
- San Pedro River Watershed Boundary

SanPedro_MapIndex3.mxd

Attachment 3

1935 and 2008 River Channels and ADWR Subflow Zone, San Pedro River



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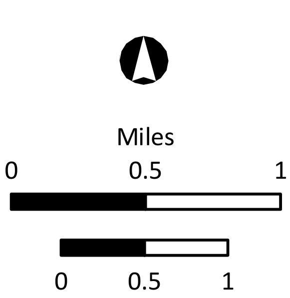


Legend

USGS Topo (24k) Quad Boundary

Watershed Boundary

ADWR Subflow Zone

2008 Stream Channel

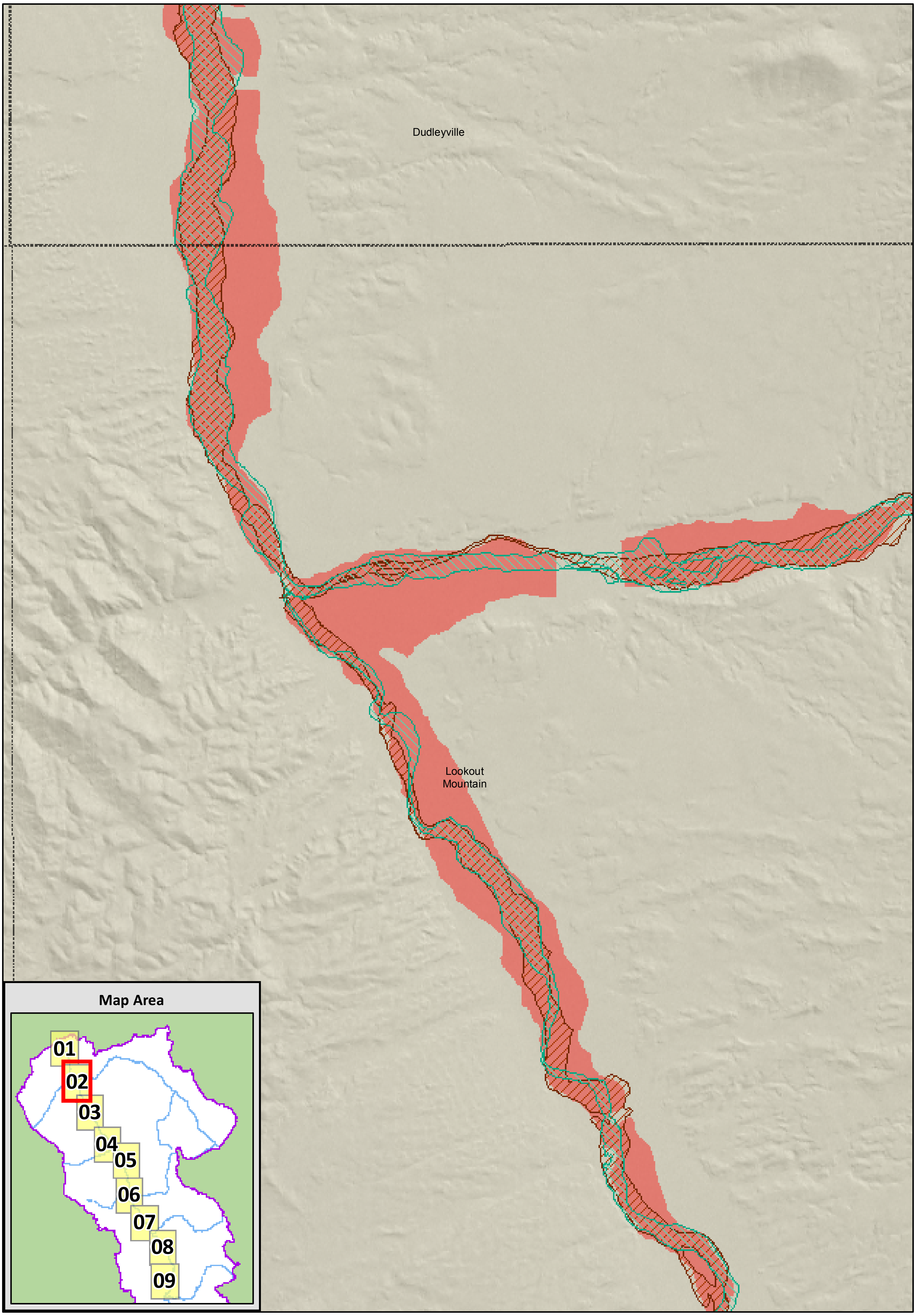
1935 Stream Channel

Data Sources:
ADWR: Subflow Zone
AGS: 2008 Stream Channel
SRP: 1935 Stream Channel
interpreted from and limited to extent of 1935 aerial photography along the main stem San Pedro river and lower Aravaipa Creek

SanPedro_Channels.mxd

Attachment 3

1935 and 2008 River Channels and ADWR Subflow Zone, San Pedro River



Sheet 2

Legend

Miles
0 0.5 1
0 0.5 1
Kilometers

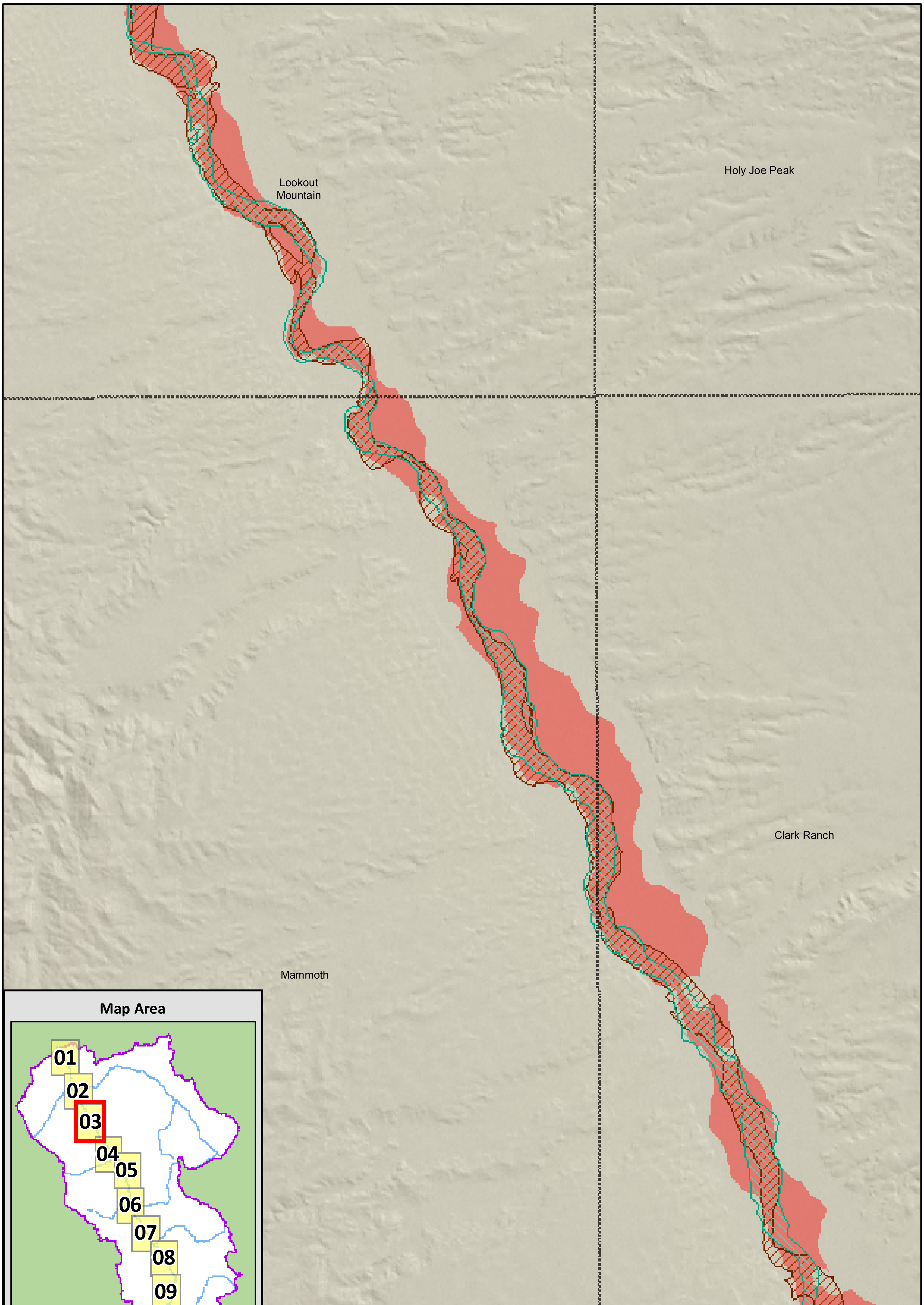
USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
2008 Stream Channel
1935 Stream Channel

Data Sources:
ADWR: Subflow Zone
AGS: 2008 Stream Channel
SRP: 1935 Stream Channel
interpreted from and limited to extent of 1935 aerial photography along the main stem San Pedro river and lower Aravaipa Creek

SanPedro_Channels.mxd

Attachment 3

1935 and 2008 River Channels and ADWR Subflow Zone, San Pedro River



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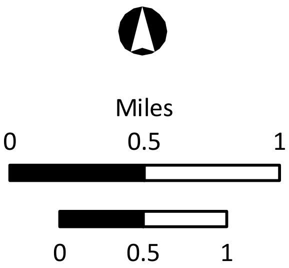

Legend

USGS Topo (24k) Quad Boundary

Watershed Boundary

ADWR Subflow Zone

2008 Stream Channel

1935 Stream Channel

Data Sources:
ADWR: Subflow Zone
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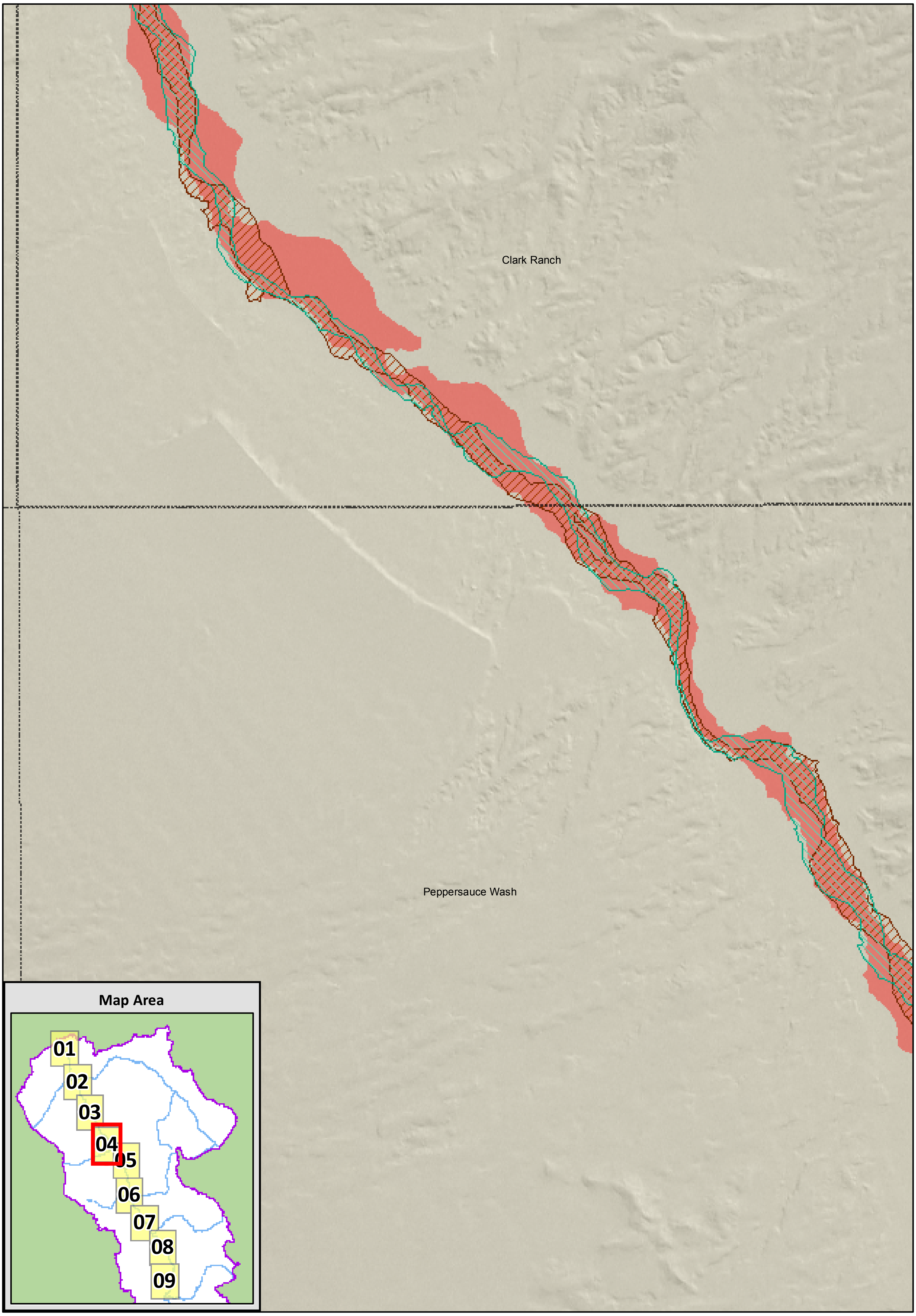
SanPedro_Channels.mxd

Attachment 3

1935 and 2008 River Channels and ADWR Subflow Zone, San Pedro River



Sheet 4

Miles
0 0.5 1

0 0.5 1
Kilometers

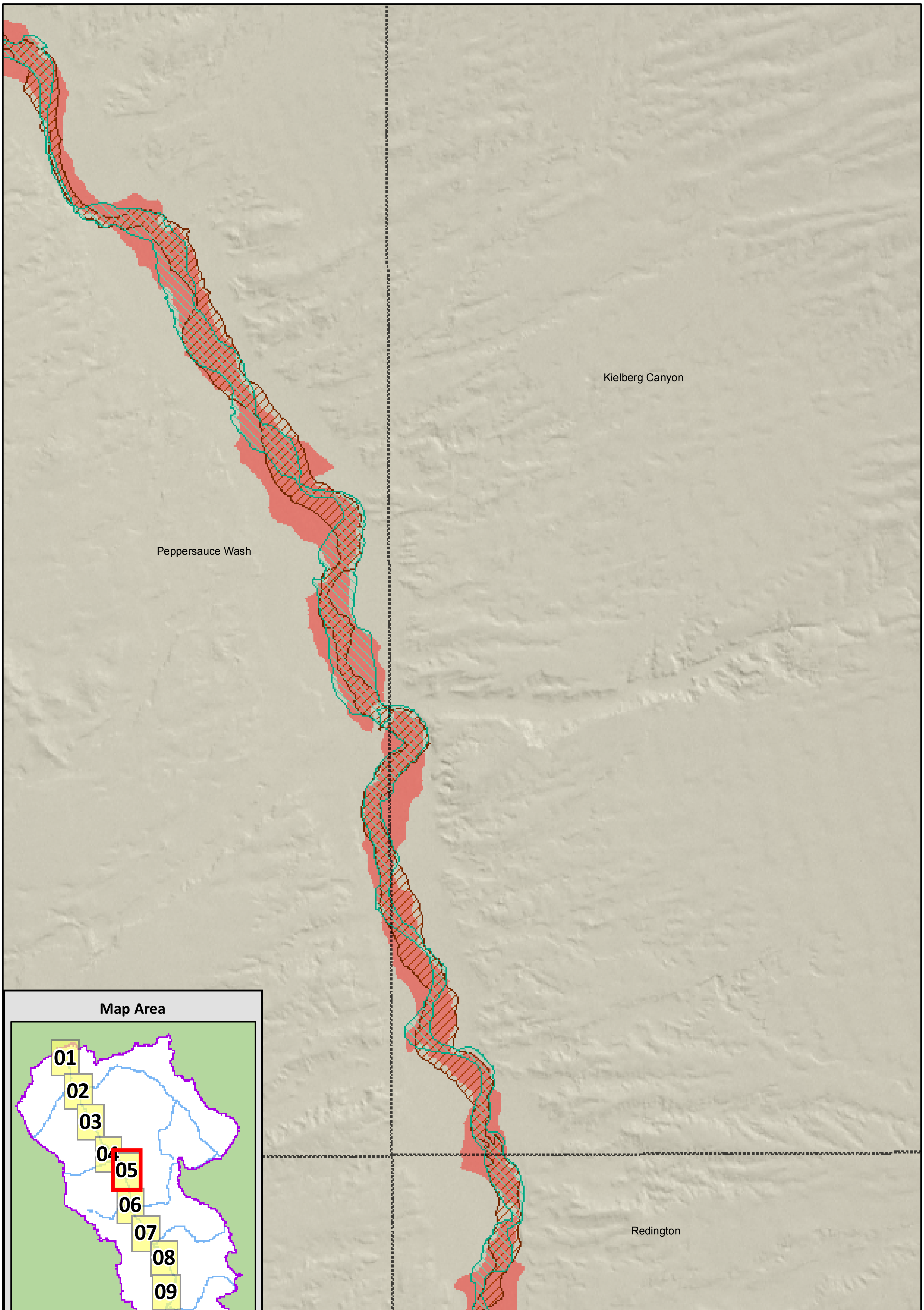
Legend

USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
2008 Stream Channel
1935 Stream Channel

Data Sources:
ADWR: Subflow Zone
AGS: 2008 Stream Channel
SRP: 1935 Stream Channel
interpreted from and limited to
extent of 1935 aerial photography
along the main stem San Pedro river
and lower Aravaipa Creek

SanPedro_Channels.mxd

1935 and 2008 River Channels and ADWR Subflow Zone, San Pedro River



Sheet 5

Legend

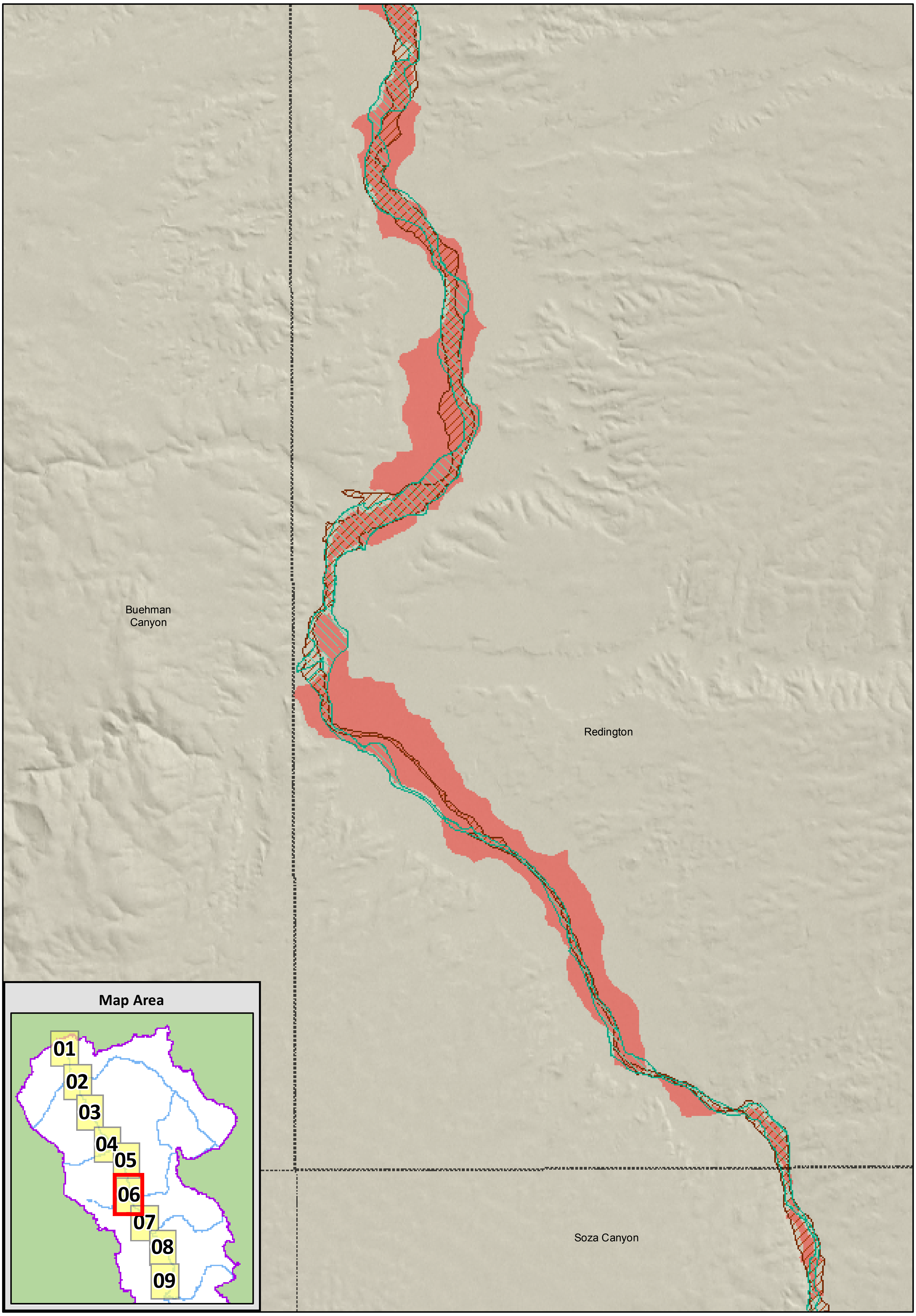
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- 2008 Stream Channel
- 1935 Stream Channel

Data Sources:
ADWR: Subflow Zone
AGS: 2008 Stream Channel
SRP: 1935 Stream Channel
interpreted from and limited to
extent of 1935 aerial photography
along the main stem San Pedro river
and lower Aravaipa Creek

SanPedro_Channels.mxd

Attachment 3

1935 and 2008 River Channels and ADWR Subflow Zone, San Pedro River



Sheet 6

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

USGS Topo (24k) Quad Boundary

Watershed Boundary

ADWR Subflow Zone

2008 Stream Channel

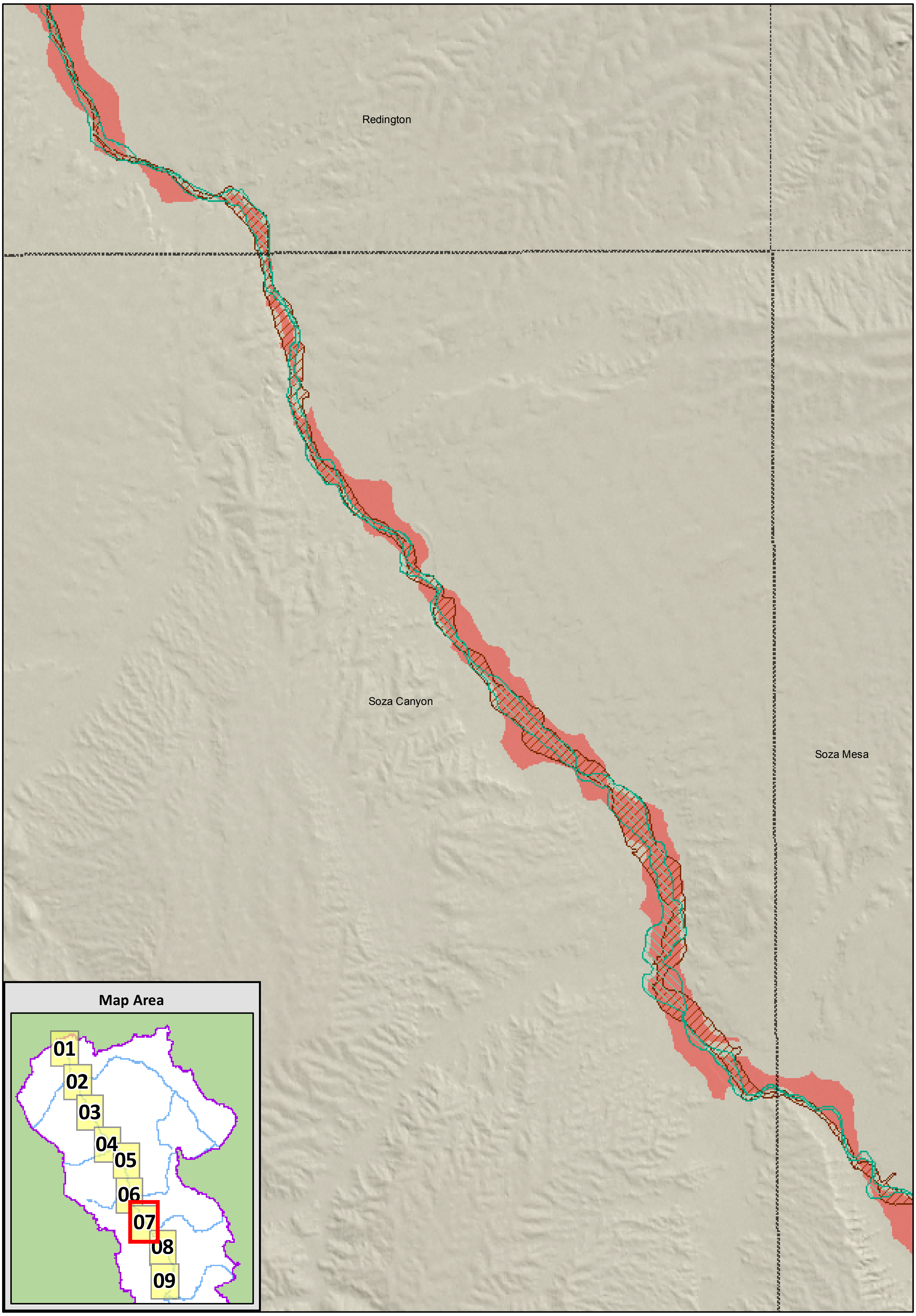
1935 Stream Channel

Data Sources:
ADWR: Subflow Zone
AGS: 2008 Stream Channel
SRP: 1935 Stream Channel
interpreted from and limited to extent of 1935 aerial photography along the main stem San Pedro river and lower Aravaipa Creek

SanPedro_Channels.mxd

Attachment 3

1935 and 2008 River Channels and ADWR Subflow Zone, San Pedro River



Sheet 7

Legend

Miles
0 0.5 1

0 0.5 1
Kilometers

USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
2008 Stream Channel
1935 Stream Channel

Data Sources:
ADWR: Subflow Zone
AGS: 2008 Stream Channel
SRP: 1935 Stream Channel
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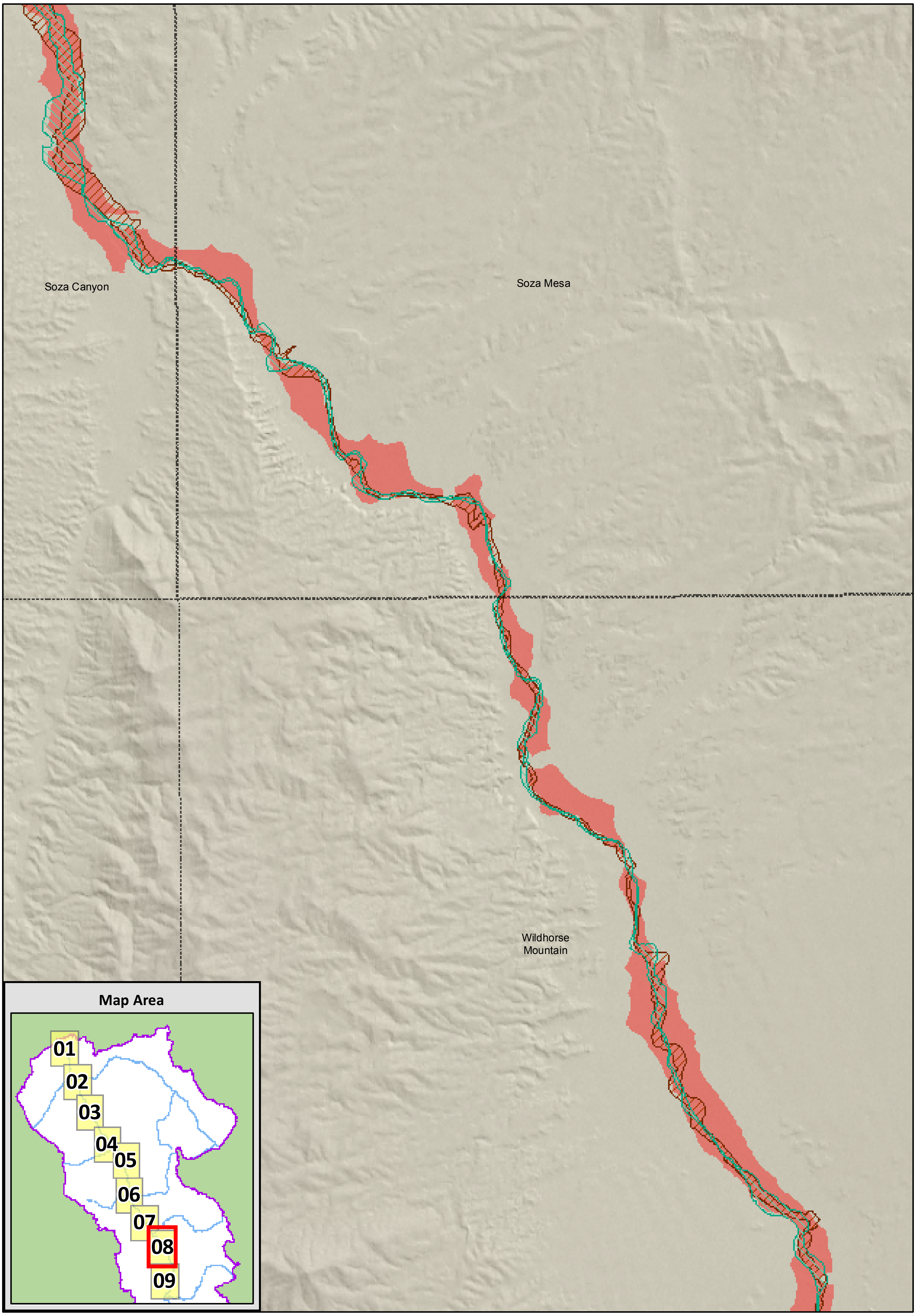
SanPedro_Channels.mxd

Attachment 3

1935 and 2008 River Channels and ADWR Subflow Zone, San Pedro River



Sheet 8

Legend

Miles
0 0.5 1
0 0.5 1
Kilometers

USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
2008 Stream Channel
1935 Stream Channel

Data Sources:
ADWR: Subflow Zone
AGS: 2008 Stream Channel
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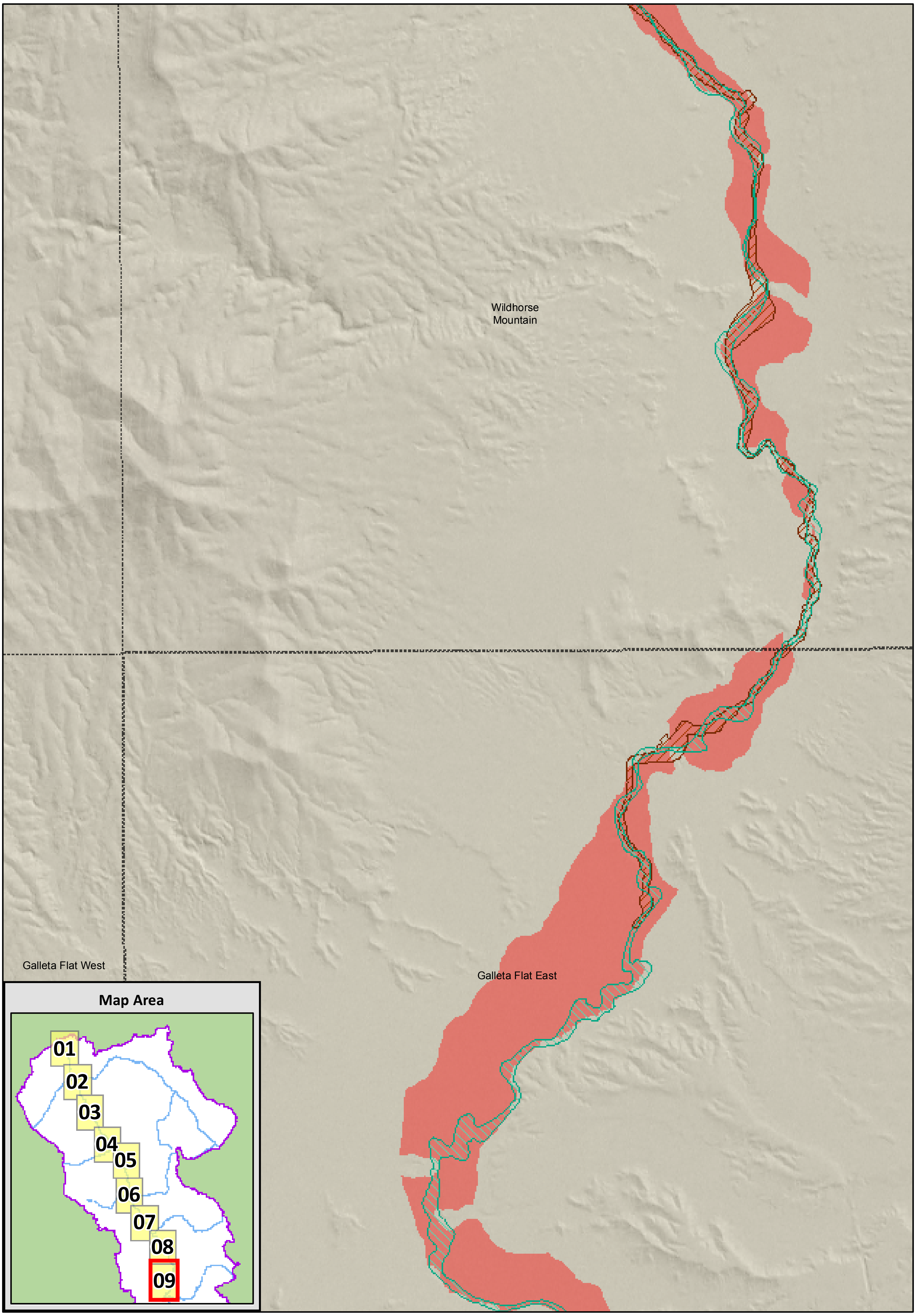
SanPedro_Channels.mxd

Attachment 3

1935 and 2008 River Channels and ADWR Subflow Zone, San Pedro River



Sheet 9

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
2008 Stream Channel
1935 Stream Channel

Data Sources:
ADWR: Subflow Zone
AGS: 2008 Stream Channel
SRP: 1935 Stream Channel
interpreted from and limited to
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along the main stem San Pedro river
and lower Aravaipa Creek

SanPedro_Channels.mxd

<u>Attachment 4</u>

Steve Erb Testimony

Reporter's Transcript of Proceedings, vol. X, pp. 75-85 (February 16, 1994)

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA

IN AND FOR THE COUNTY OF MARICOPA

In re the general adjudication of) all rights to use water in the) Gila River System and Source)	W-1, W-2, W-3, W-4

REPORTER'S TRANSCRIPT OF PROCEEDINGS

Evidentiary Hearing

Volume X

Phoenix, Arizona
February 15, 1994
10:40 a.m.

BEFORE: THE HONORABLE STANLEY Z. GOODFARB,
Judge of the Superior Court

Prepared by Teresa Louis,
Official Court Reporter

Again, to emphasize, all of the technical factors involved in the subflow criteria need to be specified by this Court's criteria if we are going to bring closure on this issue.

THE COURT: That's a hell of a task for a kid who had a tough time with plane geometry.

Let me ask you a couple of questions, Steve. What I want to start with is, if you'll get your sheet, your overhead of Exhibit 266. It's a green, red and yellow one. Let me see if I can utilize this to answer some simple questions that the Supreme Court raised.

First of all, Steve, would I be correct that the two black lines on the outer edge of the drawing are the ridge lines, correct?

THE WITNESS: These lines?

THE COURT: No.

THE WITNESS: This line?

THE COURT: Yes. That's the ridge.

THE WITNESS: Yes.

THE COURT: The other one is the ridge line to the east, ridge line to the west, right?

THE WITNESS: Yes.

THE COURT: On one side they got the Dragoons, on the other side I've got the Winchesters, and the line to the west is the Dragoons and ridge line

Again, to emphasize, all of the technical factors involved in the subflow criteria need to be specified by this Court's criteria if we are going to bring closure on this issue.

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THE COURT: The other one is the ridge line to the east, ridge line to the west, right?

THE WITNESS: Yes.

THE COURT: On one side they got the Dragoons, on the other side I've got the Winchesters, and the line to the west is the Dragoons and ridge line of the Dragoons, the line to the east in this thing is the ridge line of the Whetstones, right?

THE WITNESS: To the west are the Whetstones.

THE COURT: Now, the gray area is hard rock. The yellow is basin fill aquifer, which really represents the debris from the geological erosion of the mountains as they grow up, isn't that correct?

THE WITNESS: That's correct.

THE COURT: It's transported by various streams, and part of it might have been transported by the Ice Age if the glaciers ever got down here, right?

THE WITNESS: Certainly. Over a very long period of time.

THE COURT: Now, in the middle of this there is a green area, and there are also some green areas along where there are probably the remains of ephemeral streams that were arroyos, and that constitutes the younger alluvium, right?

THE WITNESS: The younger alluvium formations. It is younger alluvium.

THE COURT: The younger alluvium formation is that erosive material which was deposited in various layers in the last 8500 or 85,000 years.

THE WITNESS: That's correct.

THE COURT: Now, the younger alluvium does not reach from ridge line to ridge line except where there are thin bands of younger alluvium along where the tributary waterways or arroyos go up almost to the ridge line.

THE WITNESS: That's correct. It occurs in very, very few places.

THE COURT: There's debris in arroyo and a channel that kind of fills it except for the places where you get to the hard rock, but there's always sand and some rock in any of these mountain canyons that are coming down.

THE WITNESS: Sure.

THE COURT: But the younger alluvium we've been talking about is that which fills the center of this valley, and that alluvium does not go from ridge line to ridge line, correct?

THE WITNESS: No, it does not.

THE COURT: According to your diagram here, the younger alluvium here, the solid, the large green area basically consists of the alluvium which is supportive of the stream and also constitutes a portion of the tributary aquifers that feed into the San Pedro, correct?

THE WITNESS: It could be viewed that way.

THE COURT: In fact of the matter, isn't the basin fill also a tributary, a part of the tributary aquifer because there's water there that slowly comes to the center, eventually gets to the center, and then starts drifting down the San Pedro to the Gila, and if it ever gets past Ashurst Dam it keeps on going clear down to the Sea of Cortez, to the Colorado and the Sea of Cortez. Takes a few eons in geologic time, but it does do that, doesn't it?

THE WITNESS: Yes. Conceptually that could occur.

THE COURT: Now, you've been talking about something that you call inliers. The Supreme Court basically talks about something called tributary aquifers. With regard to this exhibit, can we agree that that portion of the tributary aquifers which consists of the younger alluvium is that green which is outside of the red?

THE WITNESS: Within the context of the Supreme Court's order, the guidelines that they put down and the way that I understand that they were trying to separate tributary aquifer ground water from ground water associated with the stream, yes, I think you could say that ground water in these green areas would be associated with their definition of tributary ground water.

THE COURT: Unfortunately, the molecules of water are too stupid to understand the legal distinction between tributary aquifer and the subflow aquifer of the stream, right?

THE WITNESS: Not only are they too stupid, they don't care.

THE COURT: Probably the latter.

MR. SPARKS: They are probably teenagers, Your Honor.

THE COURT: If we were to draw a distinction between the ground water flow in what I call the tributary aquifer and the ground water flow of the aquifer below the San Pedro and shown in red, would it not largely be the direction of flow in that the tributary aquifer is headed toward the stream and the stream aquifer is headed in the direction of the stream?

THE WITNESS: I believe that could occur in many areas. This area of younger alluvium in the Pomerene-St. David area, as you well know, is occupied with extensive cultural development. Cultural development alters the natural course of ground water flow from a lot of different activities, pumpage and recharge incidental to use.

So flow directions can sometimes reverse. They can go one way one season and back again. But I think as a general way of viewing it, if water occurs in this area, if there's, for example, recharge and water levels in the aquifer in this area are higher than water levels at the stream, then naturally it's not going to travel down the basin through these inliers, but rather it's going to go flow more towards the stream. Because inliers, probably what there is there is older alluvium, and it probably has a lower hydraulic conductivity.

THE COURT: Let's take what you've told us and let's see if we can agree. If the areas shown in green in the natural condition, because water comes from high to low and those areas are obviously higher than the stream, in its natural condition before people started farming in there it flowed toward the stream, correct?

THE WITNESS: Yes, I believe it did.

THE COURT: In its subsequent condition, post-development, it may flow toward the stream, it may flow away from the stream, it may flow in circular conditions, it may flow in any one of many different directions.

But the stream only has an effect of having it flow toward the stream, but it flows in many directions and does not have a stream flow direction generally.

THE WITNESS: Well, yes, it's probably highly variable from location to location.

THE COURT: It's highly variable because of development.

THE WITNESS: Yes, because of development and because of the shape of these inliers and so forth.

THE COURT: Now, you've drawn these, and I understand why you've drawn them, and obviously I think we've drawn them because the Supreme Court shot down-- well, the Supreme Court having been told about tributary aquifers, which I never mentioned in my order and someone else raised for them, has shot down tributary aquifers, and therefore what they have said clearly, with no contest, is that you can't include tributary aquifers in the subflow, correct?

THE WITNESS: You can't?

THE COURT: Yes, you can't.

THE WITNESS: According to their--

THE COURT: Yes, according to their hydrologist.

THE WITNESS: That's correct.

THE COURT: Assuming I cannot shut down

tributary aquifers and assuming that the Page definition of subflow is to draw a band based on the closure where the inliers come, how can I be certain that where the inlier meets the stream aquifer, that the direction is sufficiently stream flow that I can draw the lines in that area?

Isn't this right where they meet some confusion of direction until it gets further into the younger alluvium and before I can be certain that its flow has straightened out sufficiently that I can in my mind be certain that flow with its elevation and its gradient is equivalent to the flow elevation and gradient of the stream?

THE WITNESS: You probably have seen with the surface water example, two streams come together. One is muddy and the other one isn't. You can see how the water is comingled. You can see how like the muddy one is the smaller stream, how it turns and goes down with the stream. It's pretty rapid. Things in an aquifer, movement is of course a different situation.

I suppose if you went out a little distance from the inliers, it would probably be a safe assumption that--

THE COURT: How far in from the inliers do you think I would normally have to come to be certain in my own mind that the stream flow has now turned sufficiently in its substance that it's going with the stream?

How far should I pull in those parameters to be certain in my own mind that I've now got subflow going in the same direction as the stream?

THE WITNESS: I don't think it needs to be too far, Your Honor, because as a normal consequence, normal situation with these inliers and younger alluvium associated with the tributary aquifers, the amount of water flowing in the aquifer towards the stream is probably going to be relatively small compared to the amount of water flowing down the stream.

THE COURT: Are you talking about 100 feet or 50 feet or 200 feet?

THE WITNESS: I would think it would be rare if it's more than 100 or 200 feet unless the inlier goes down a shallow slope.

THE COURT: In most instances the slope from the ridge line to the river is pretty good in this area, isn't it?

THE WITNESS: What I mean is, for example, let's say this inlier, if it goes underneath the younger alluvium material here at some shallow angle, it could be still an obstruction there, but I think that would be probably a rare situation.

So I would say than the order of 100 or 200 feet would probably be pretty certain that the general direction of the ground water was with the stream.

THE COURT: If I combined that with elevation, gradient and flow direction, in your opinion, hydrologically speaking, would that be a pretty safe assumption as to what would constitute subflow if we're talking about that saturated geological body which is supportive of and connected to the stream?

THE WITNESS: Yes, I think that would be appropriate.

THE COURT: Let's talk a little bit about post-entrenchment alluvium. You're familiar with the Hereford report, are you not?

THE WITNESS: Somewhat.

THE COURT: I'm going to read you something from an exhibit that was provided for us today, and see if you agree with this. This is page 46 of Exhibit-- do you know the number of this Oxford edition on Southwest Arroyos--

MR. PEARCE: 278.

THE COURT: Let me read you something that is kind of long but I think pretty well spells it out, and tell me whether or not you agree with it.

Page 46. "After about 1880 the possible causes of entrenchment multiplied. Drainage concentration could have been a factor. Climatic change might have played a role. There were several severe floods during the last two decades of the century, and these may have initiated entrenchment.

"Finally, there is a strong possibility that vegetation changes resulting from overgrazing within the watershed, especially south of Benson, cattle damage along the trails and the river, and deforestation of some catchment basins from mining timber may have promoted entrenchment."

Would you agree with that?

THE WITNESS: Yes, I would. I believe that there has been extensive testimony that all three of those factors--

THE COURT: Let me read you the next paragraph, because I think it really spells it out.

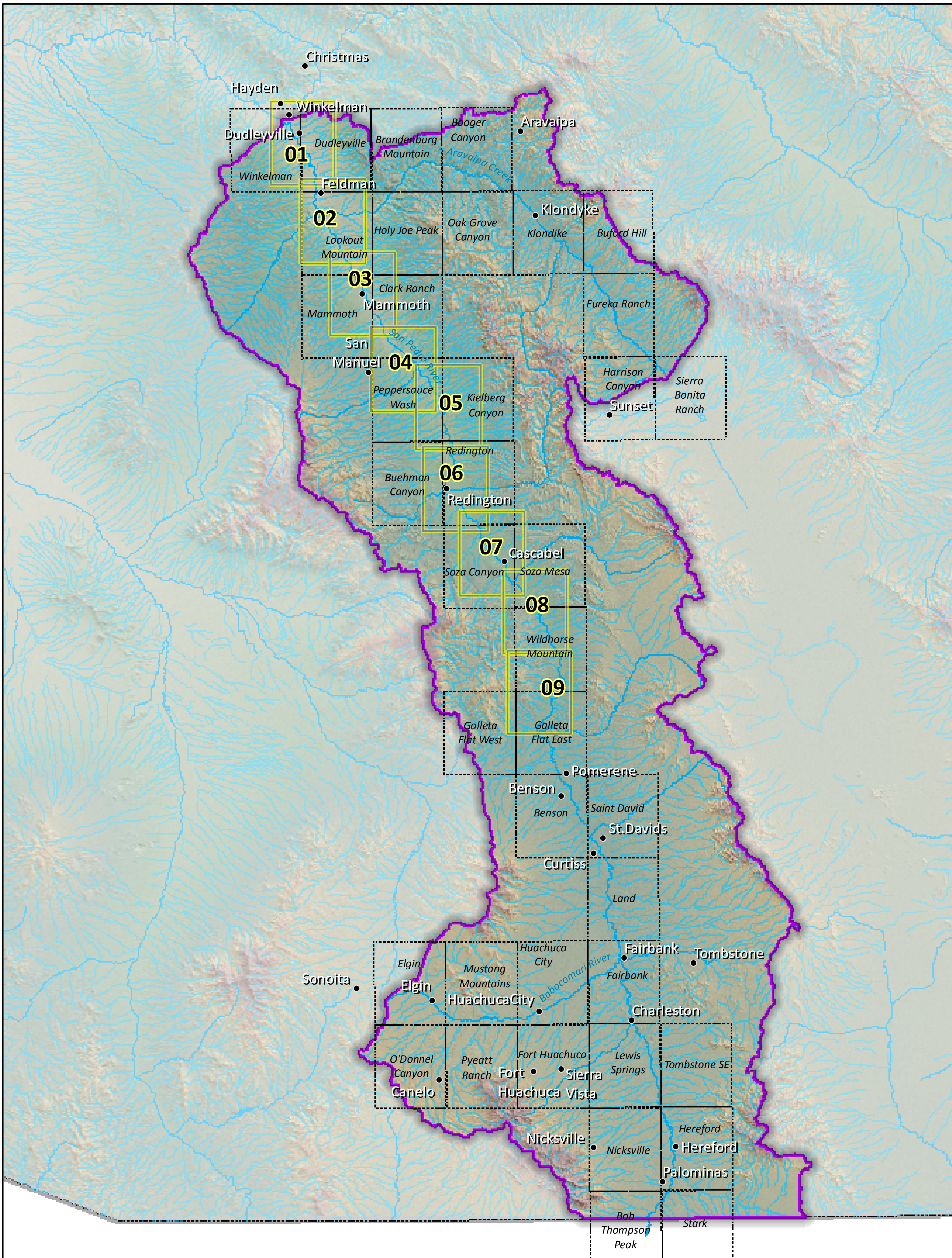
"Evidence of vegetation changes is extensive and conclusive. It is recorded on numerous photographs reproduced in Hastings and Turner's (1965.) Rodgers (1965) reviewed the evidence in this southern San Pedro Valley. He argued that there appears in his view to be

Attachment 5

Riparian Vegetation Maps

Attachment 5

Map Index for SRP San Pedro Attachments 3 & 5



Sheet Index

Miles
0 5 10 20

0 5 10 20
Kilometers

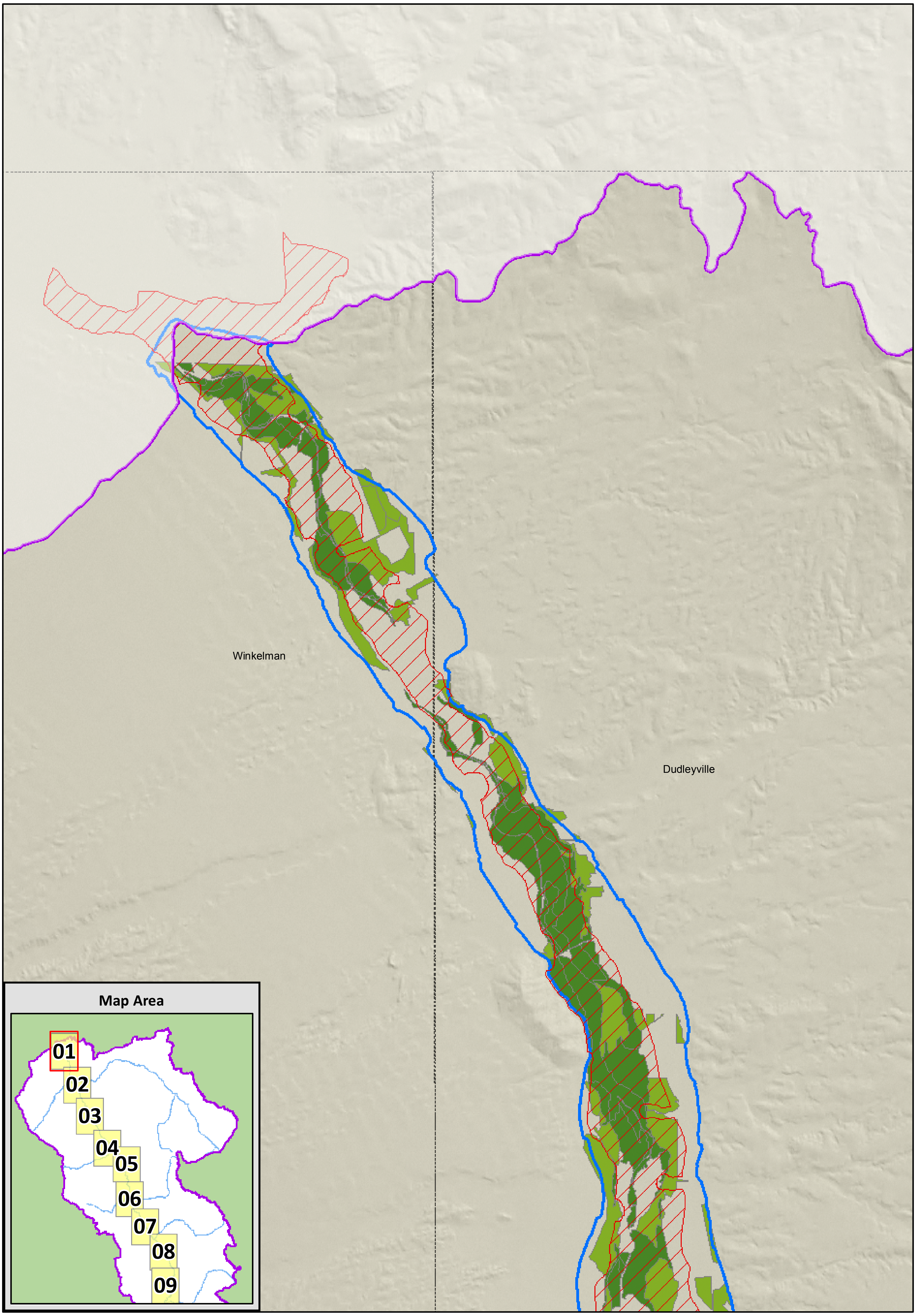
Legend

- Map Book Pages
- USGS Topo (24k) Quad Boundary
- San Pedro River Watershed Boundary

SanPedro_MapIndex5.mxd

Attachment 5

2008 Riparian Vegetation and Subflow Zones, San Pedro River



Sheet 1

Miles
0 0.5 1

0 0.5 1
Kilometers

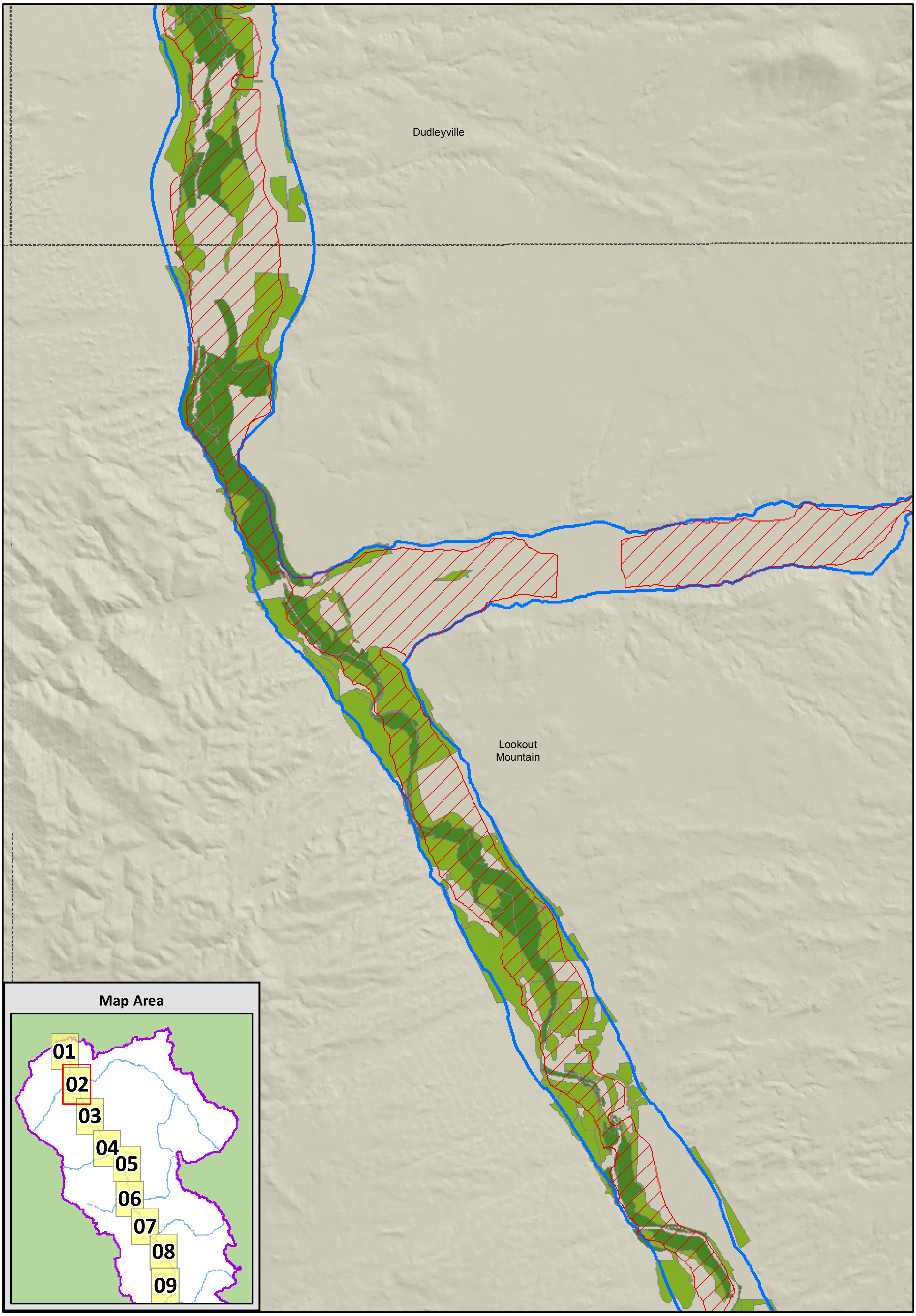
Legend

USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
LRE Subflow Zone
Cottonwood-Willow
Mesquite Woodland

Data Sources:
ADWR: Subflow Zone
SRP: LRE Subflow Zone;
Vegetation interpreted from, and limited to extent of 2008 aerial photography

SanPedro_Vegetation.mxd

2008 Riparian Vegetation and Subflow Zones, San Pedro River



Sheet 2

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

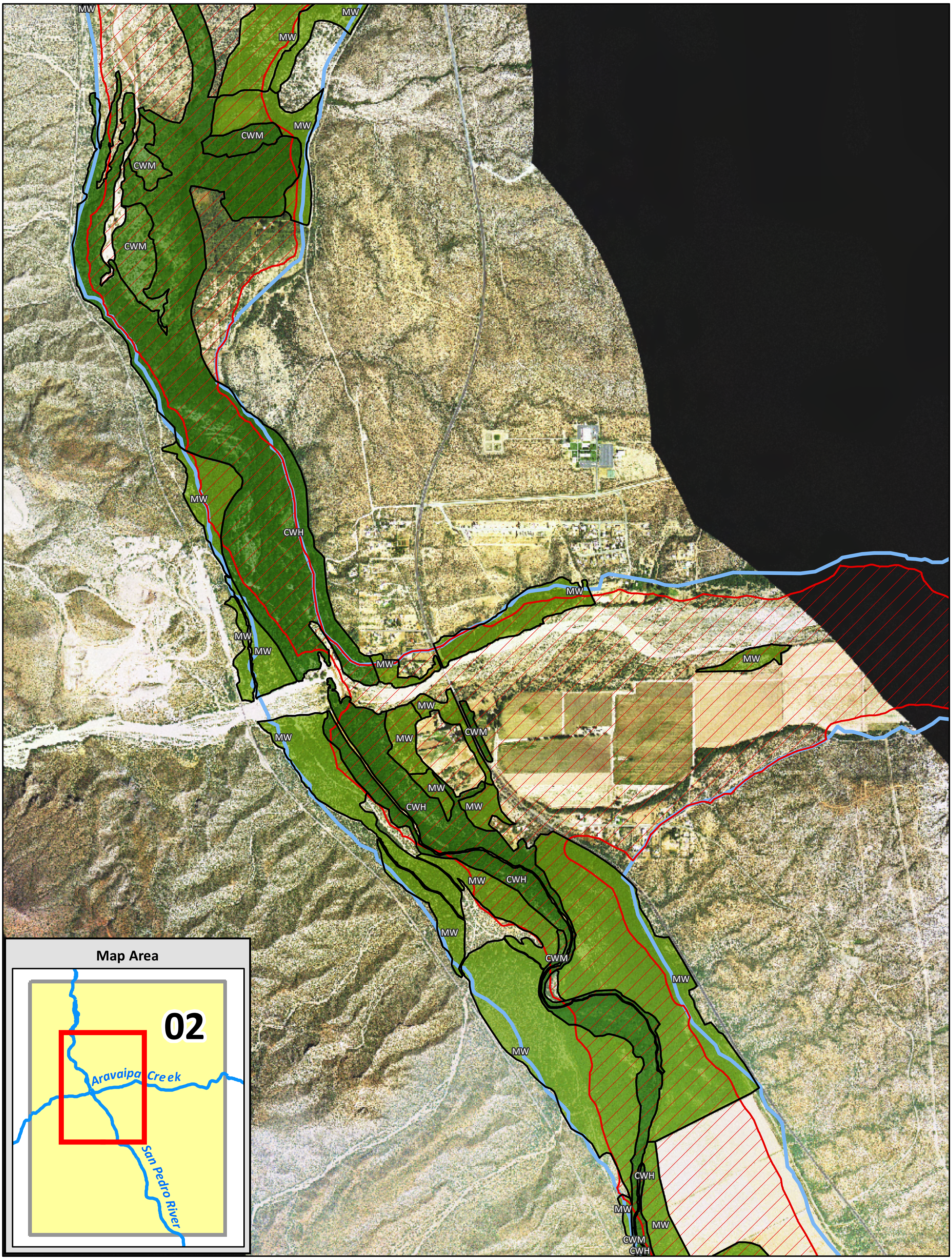
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Cottonwood-Willow
- Mesquite Woodland

Data Sources:
ADWR: Subflow Zone
SRP: LRE Subflow Zone;
Vegetation interpreted from, and limited to extent of 2008 aerial photography

SanPedro_Vegetation.mxd

Attachment 5

2008 Riparian Vegetation Detail, San Pedro River



Sheet 2 Detail

Miles

0 0.25 0.5

0 0.25 0.5

Kilometers

Legend

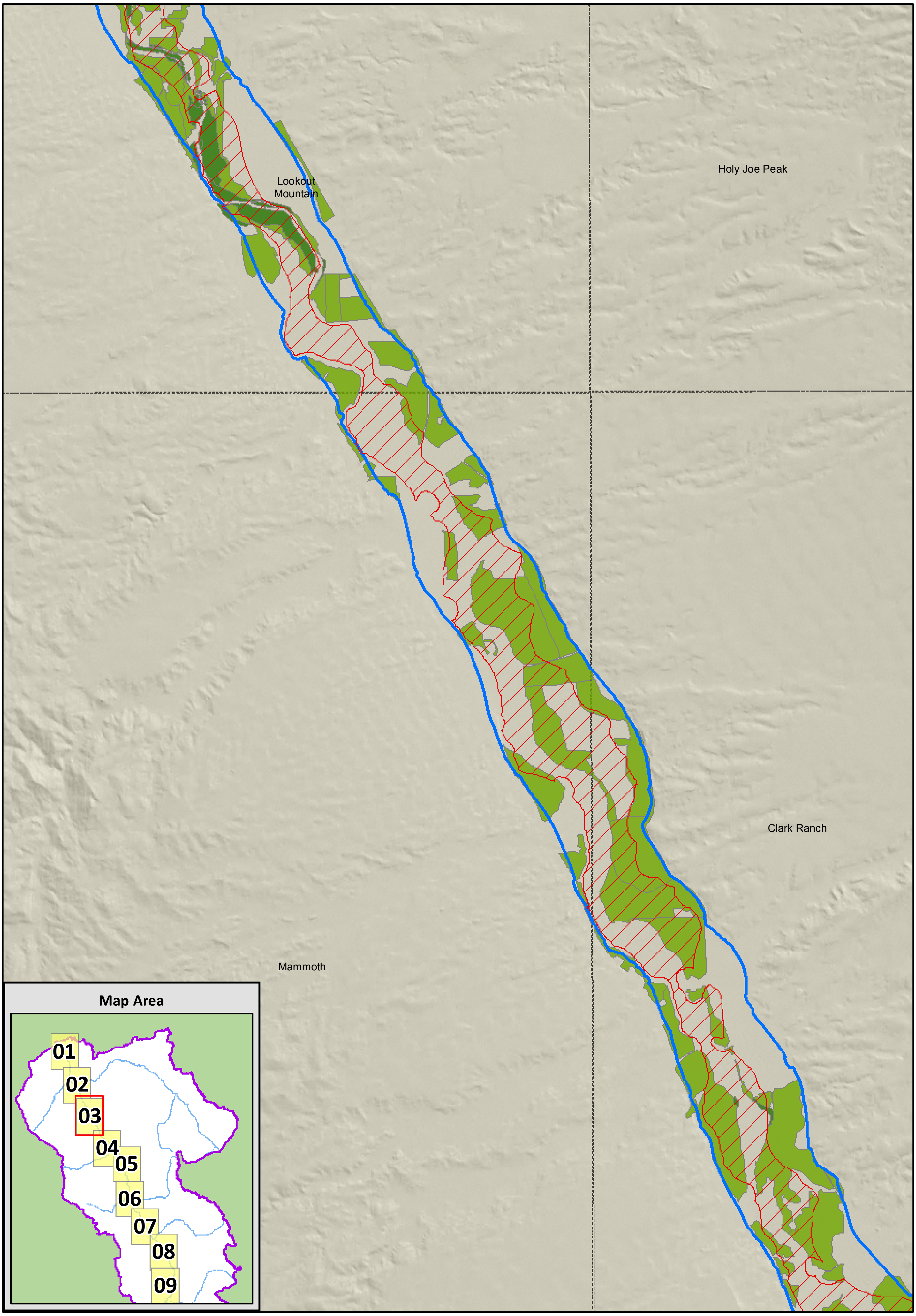
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Cottonwood-Willow (CWH, CWM)
- Mesquite Woodland (MW)

Data Sources:
ADWR: Subflow Zone
SRP: LRE Subflow Zone;
Vegetation interpreted from, and limited to extent of 2008 aerial photography

SanPedro_Vegetation_Details.mxd

Attachment 5

2008 Riparian Vegetation and Subflow Zones, San Pedro River



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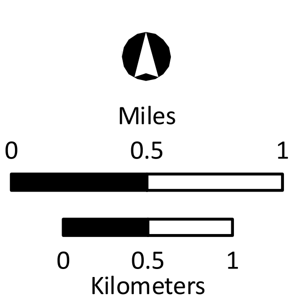


Legend

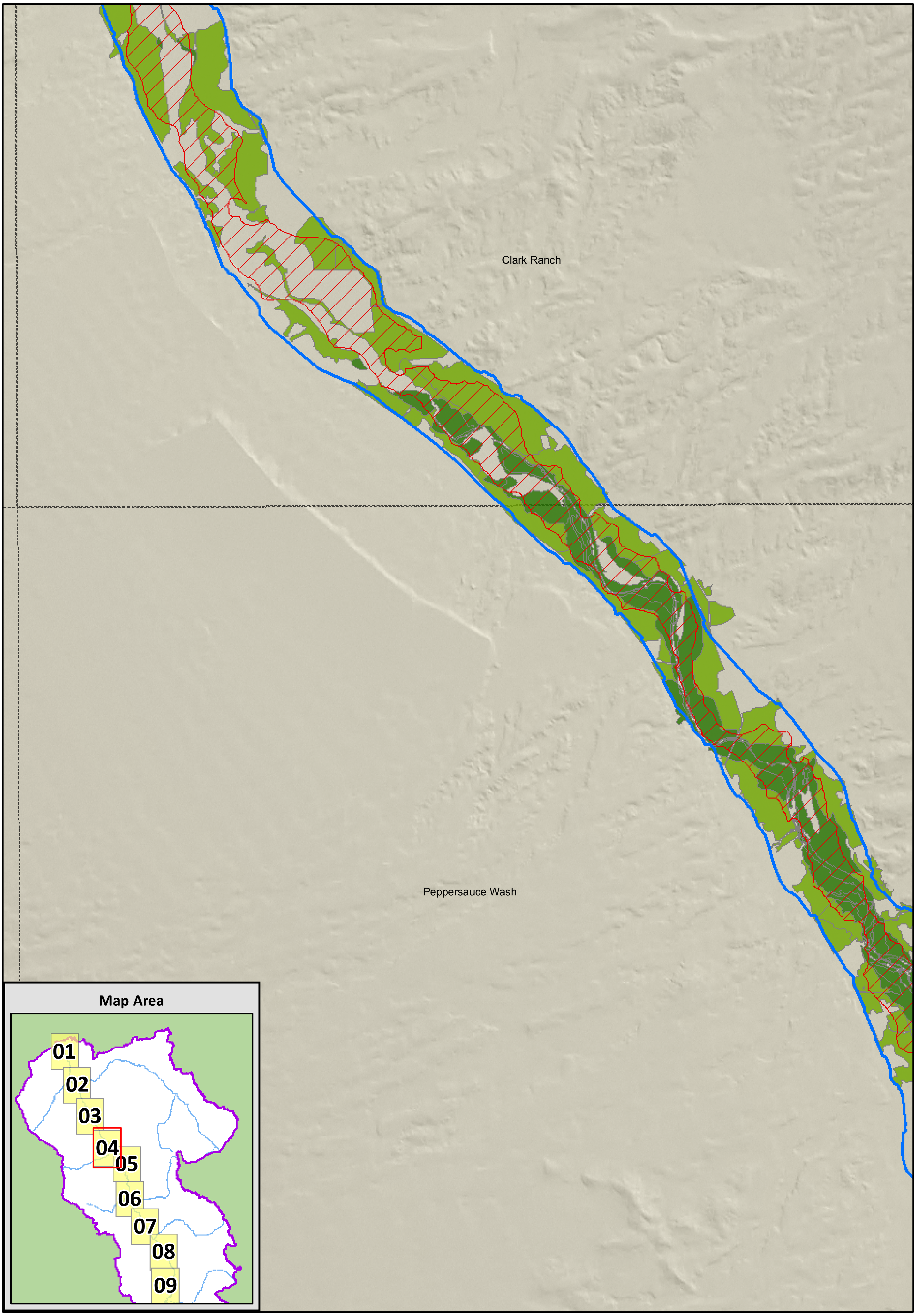
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Cottonwood-Willow
- Mesquite Woodland

Data Sources:
ADWR: Subflow Zone
SRP: LRE Subflow Zone;
Vegetation interpreted from, and limited to extent of 2008 aerial photography

SanPedro_Vegetation.mxd

Attachment 5

2008 Riparian Vegetation and Subflow Zones, San Pedro River



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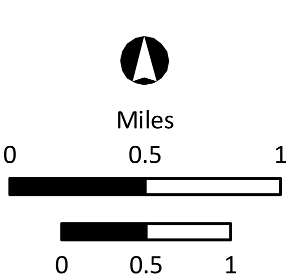


Legend

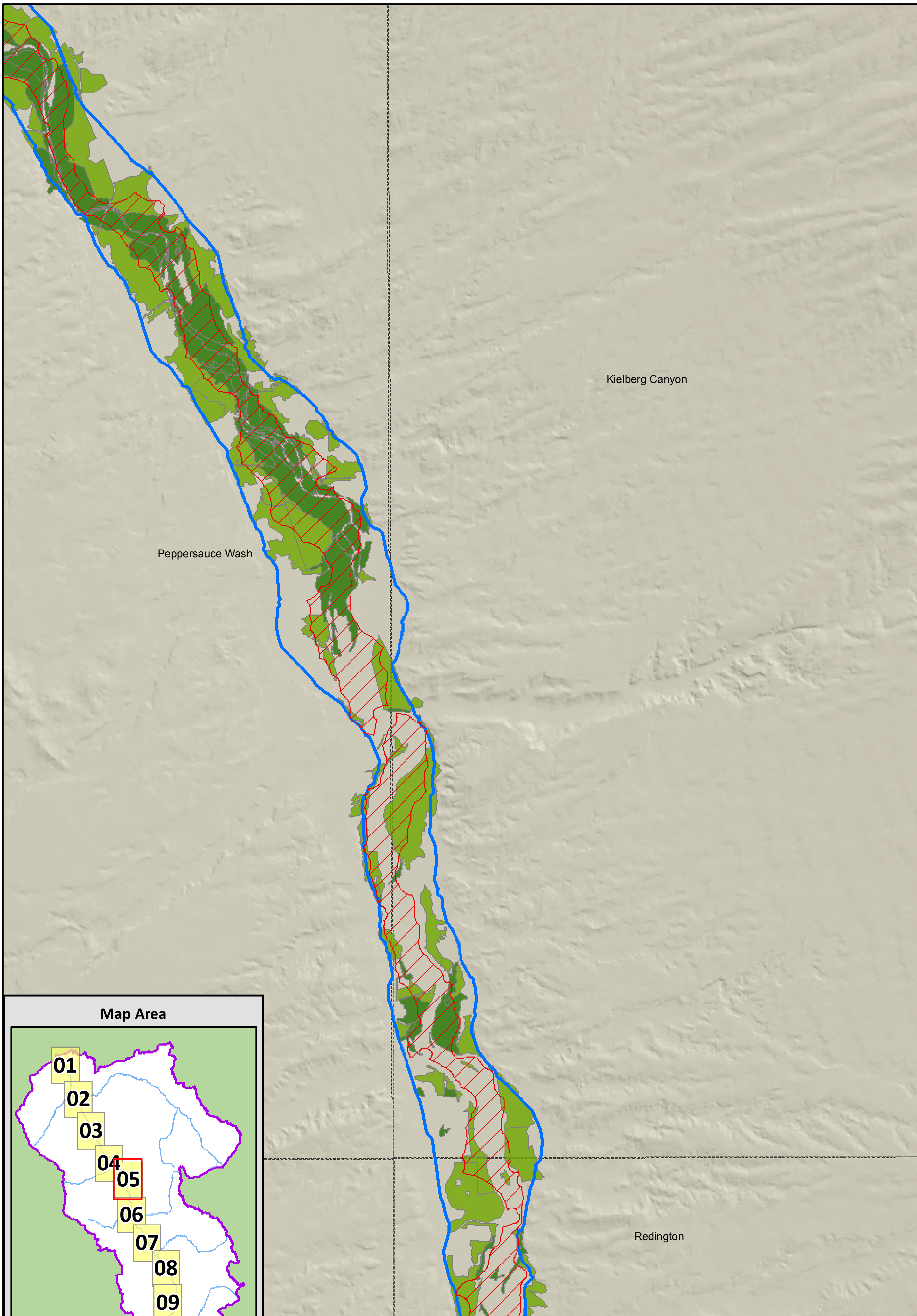
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Cottonwood-Willow
- Mesquite Woodland

Data Sources:
ADWR: Subflow Zone
SRP: LRE Subflow Zone;
Vegetation interpreted from, and limited to extent of 2008 aerial photography

SanPedro_Vegetation.mxd

Attachment 5

2008 Riparian Vegetation and Subflow Zones, San Pedro River



Sheet 5

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

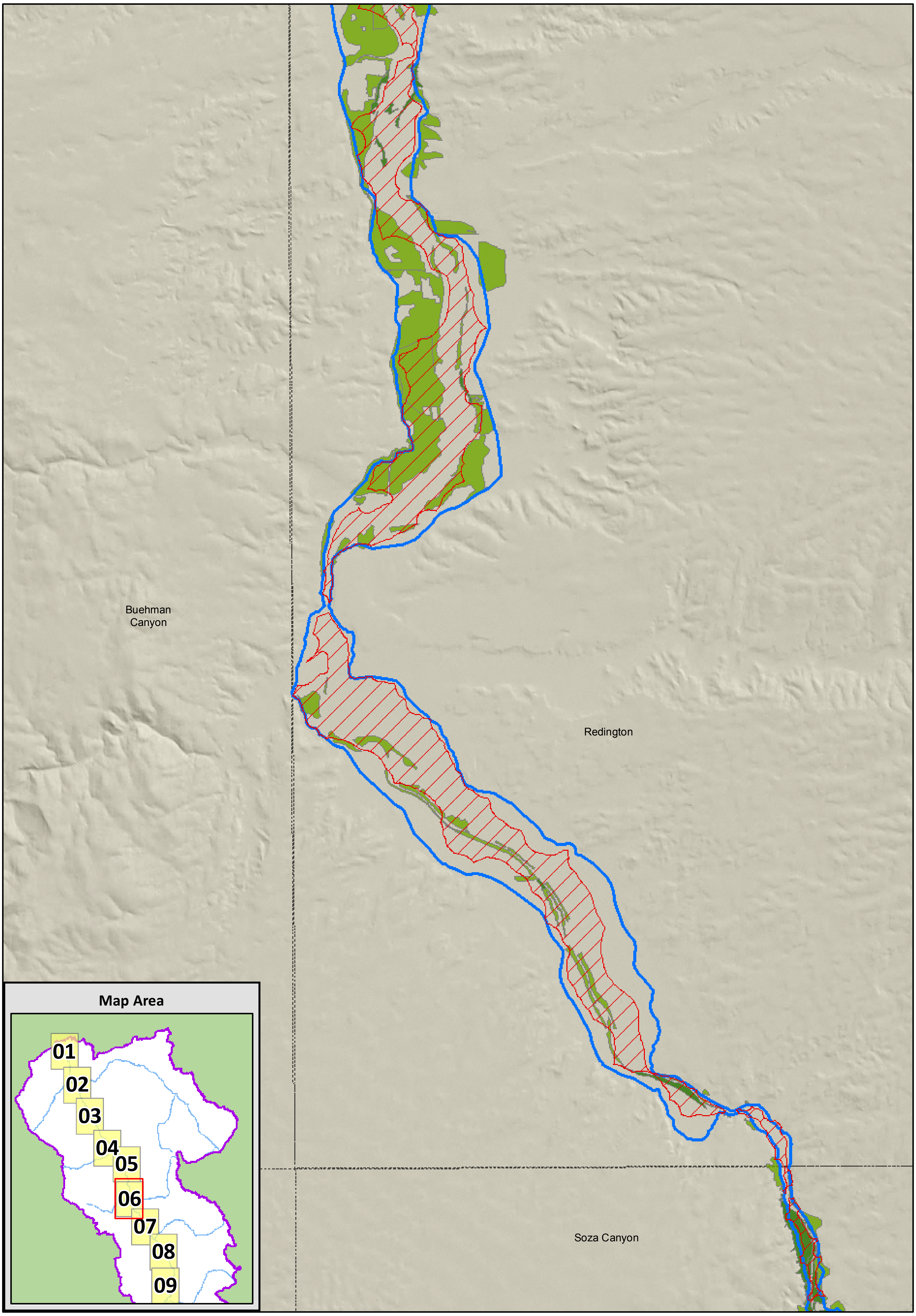
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Cottonwood-Willow
- Mesquite Woodland

Data Sources:
ADWR: Subflow Zone
SRP: LRE Subflow Zone;
Vegetation interpreted from, and limited to extent of 2008 aerial photography

SanPedro_Vegetation.mxd

Attachment 5

2008 Riparian Vegetation and Subflow Zones, San Pedro River



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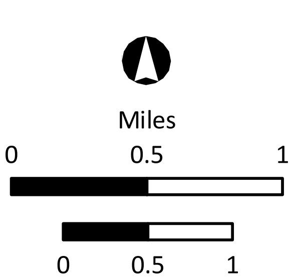


Legend

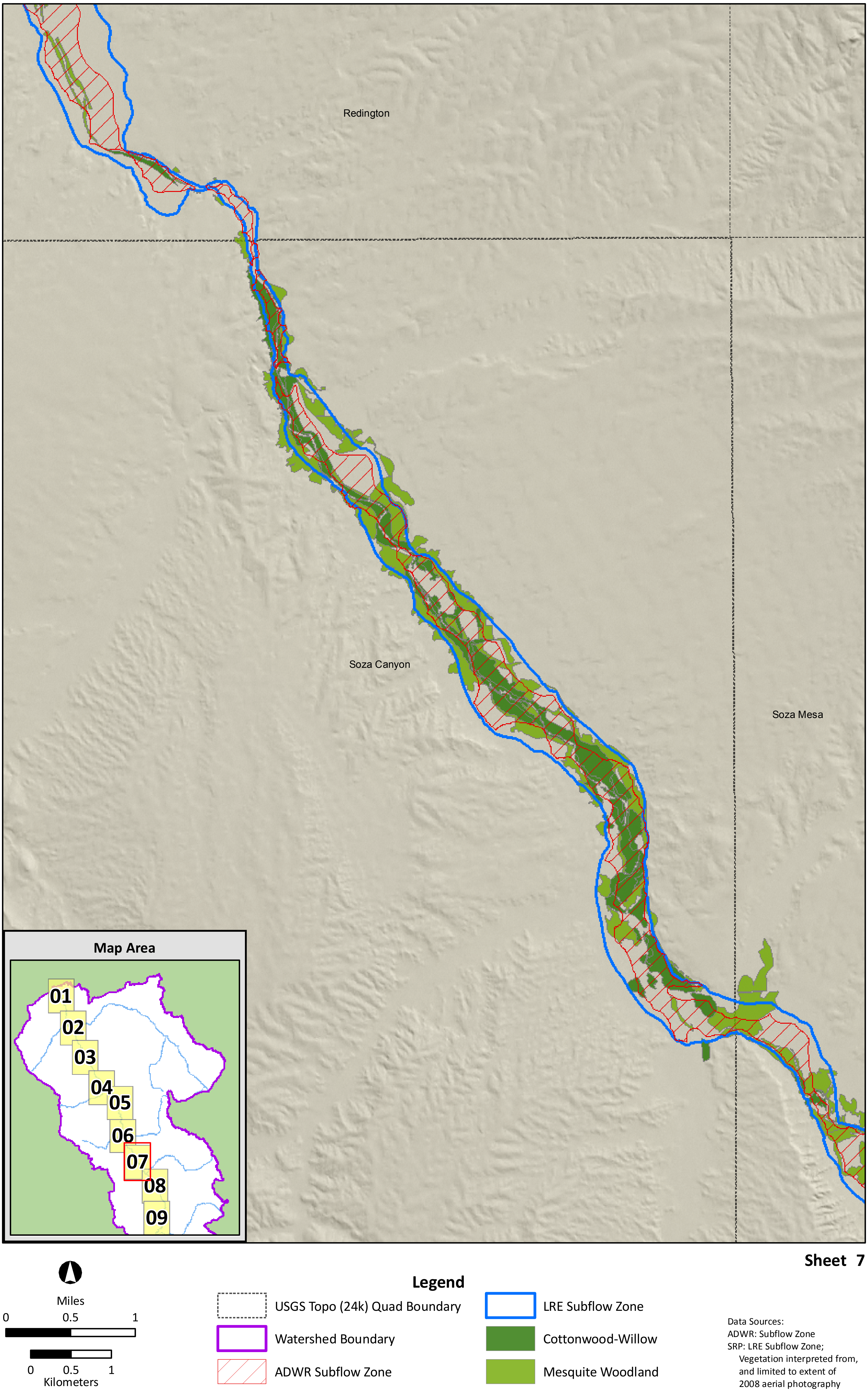
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Cottonwood-Willow
- Mesquite Woodland

Data Sources:
ADWR: Subflow Zone
SRP: LRE Subflow Zone;
Vegetation interpreted from, and limited to extent of 2008 aerial photography

SanPedro_Vegetation.mxd

Attachment 5

2008 Riparian Vegetation and Subflow Zones, San Pedro River



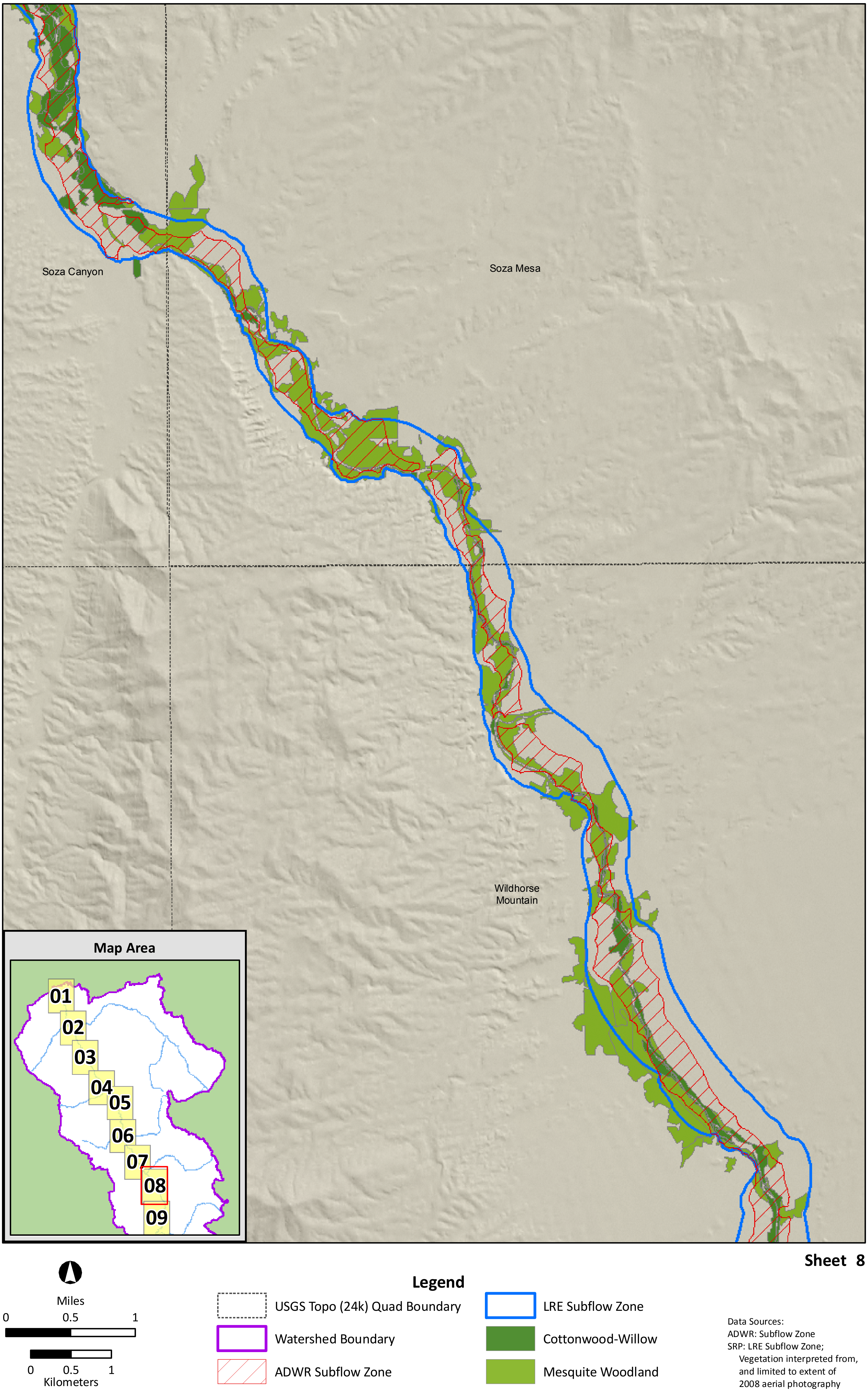
Sheet 7

Data Sources:
ADWR: Subflow Zone
SRP: LRE Subflow Zone;
Vegetation interpreted from, and limited to extent of 2008 aerial photography

SanPedro_Vegetation.mxd

Attachment 5

2008 Riparian Vegetation and Subflow Zones, San Pedro River



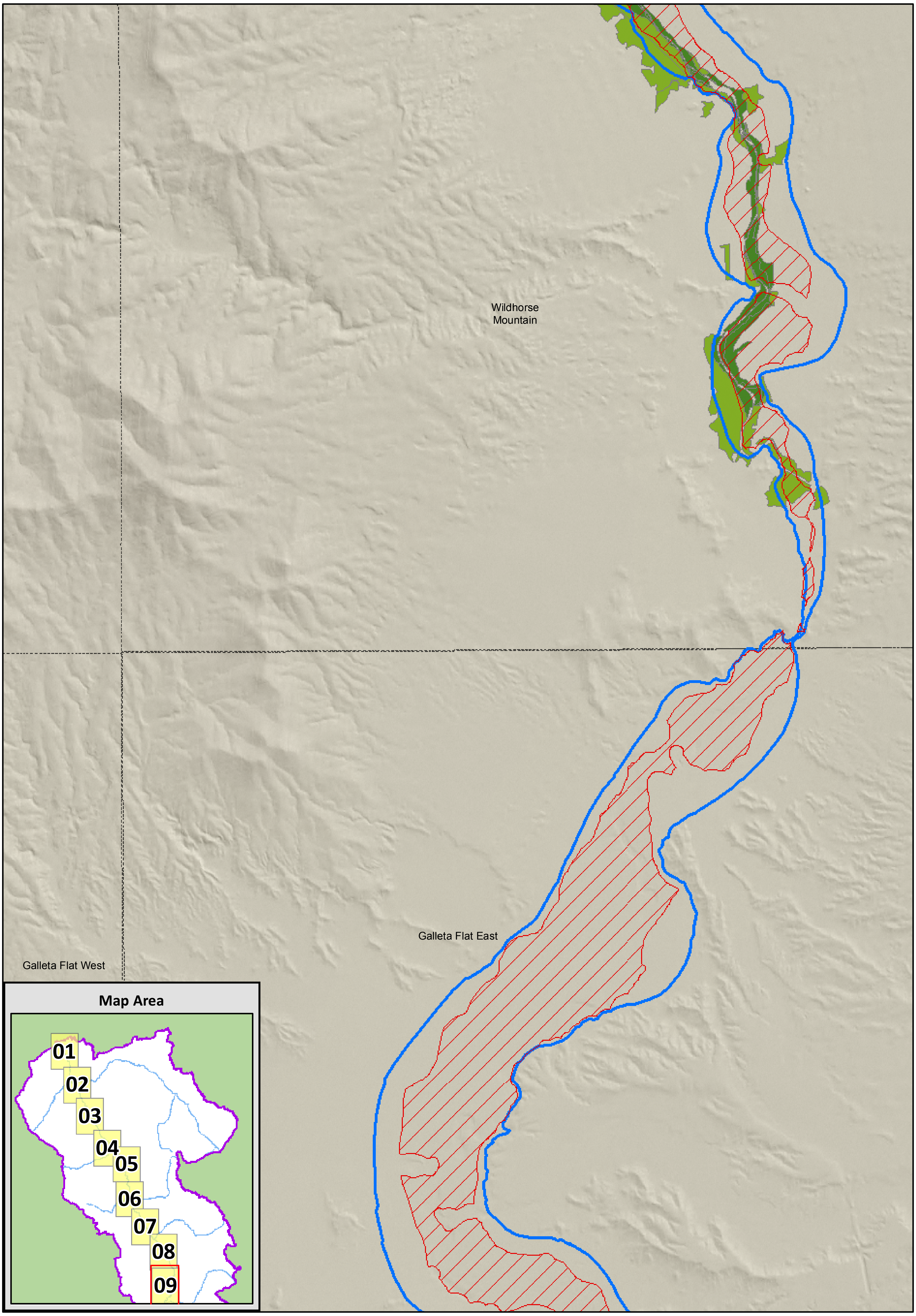
Sheet 8

Data Sources:
ADWR: Subflow Zone
SRP: LRE Subflow Zone;
Vegetation interpreted from, and limited to extent of 2008 aerial photography

SanPedro_Vegetation.mxd

Attachment 5

2008 Riparian Vegetation and Subflow Zones, San Pedro River



Sheet 9

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Cottonwood-Willow
- Mesquite Woodland

Data Sources:
ADWR: Subflow Zone
SRP: LRE Subflow Zone;
Vegetation interpreted from, and limited to extent of 2008 aerial photography

SanPedro_Vegetation.mxd

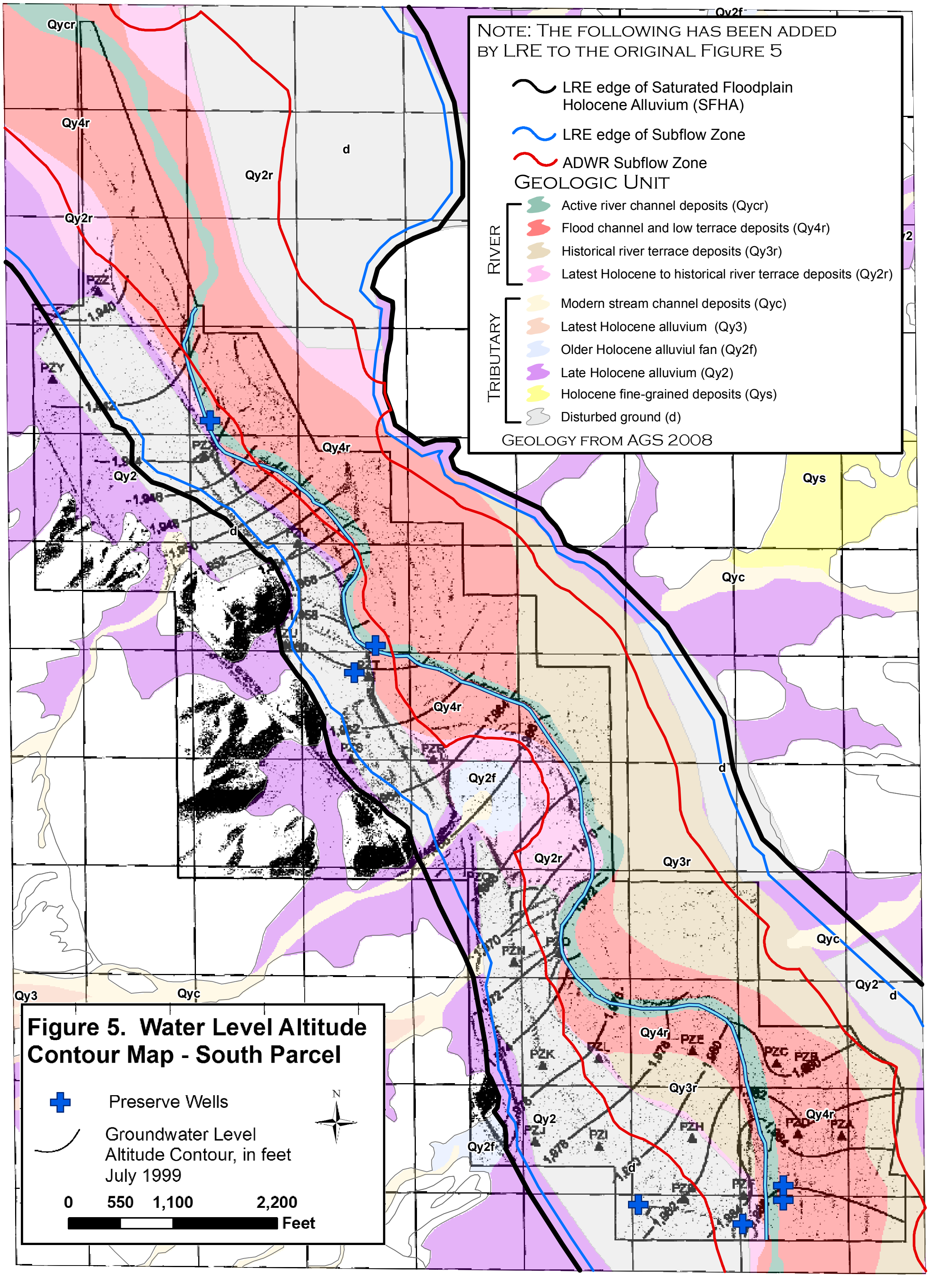
<u>Attachment 6</u>

The Nature Conservancy Water Table Map

Attachment 6

The Nature Conservancy Water Table Map for the San Pedro Preserve

[From the San Pedro River Preserve Hydrogeologic Summary Report; prepared by GeoSystems Analysis, Inc. for The Nature Conservancy; February 9, 2000]



Attachment 7

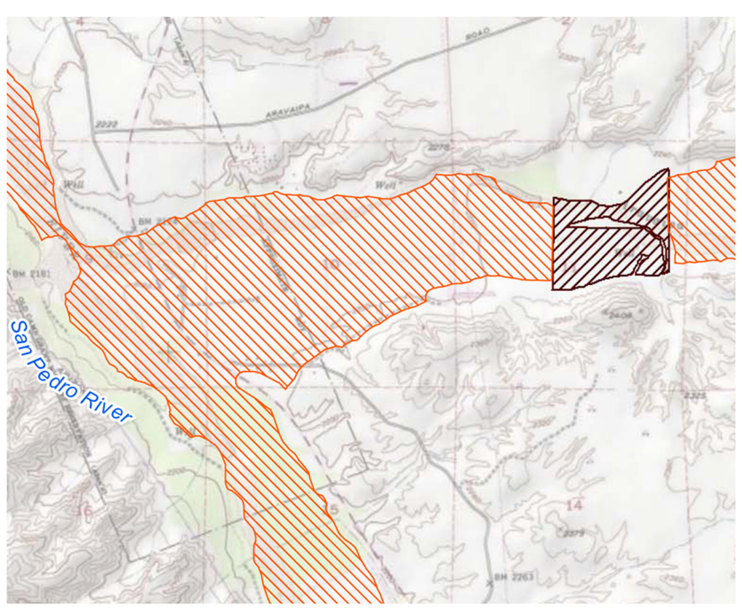
Aravaipa Creek Berm Photos

Aravaipa Creek Berm Panorama A

Approximately 2.5 miles east of confluence with San Pedro River;
looking west-southwest

Photographs taken November 2009

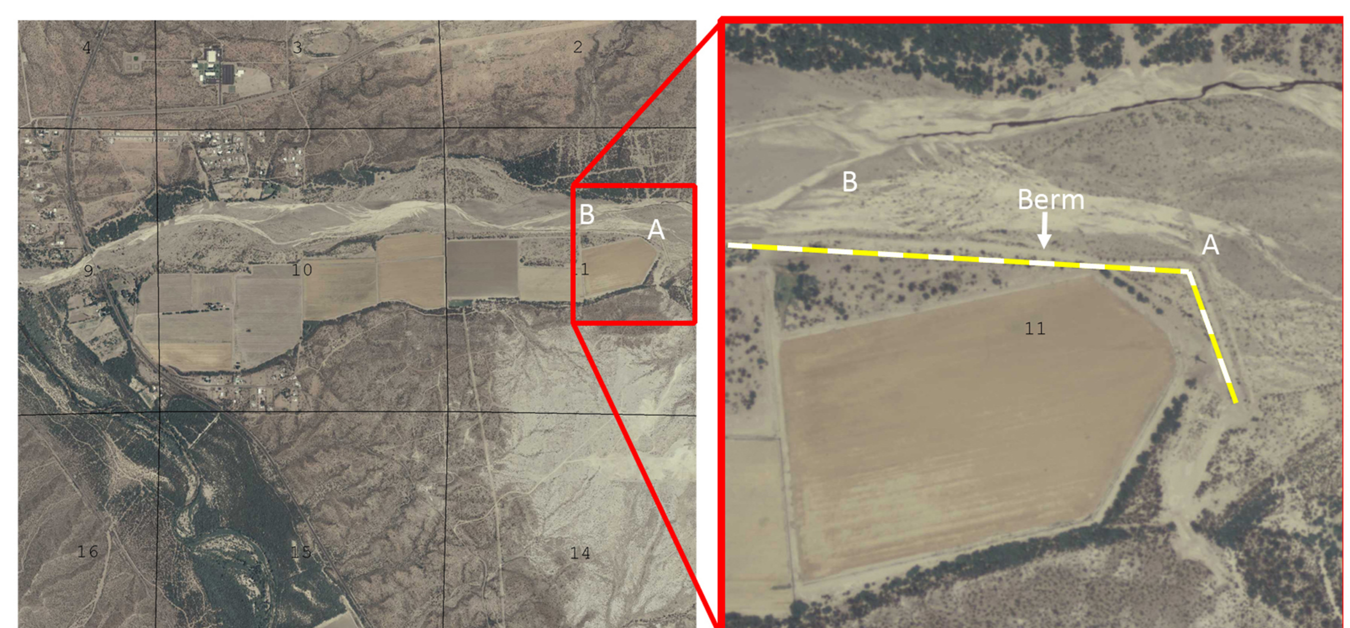
Aerial photographs showing the location of the berm and panoramas.



Excerpt from
ADWR Subflow Zone
Delineation Report
Appendix E, Map 20

Extent of Subflow Zone

Setbacks overlap with other geologic units in floodplain

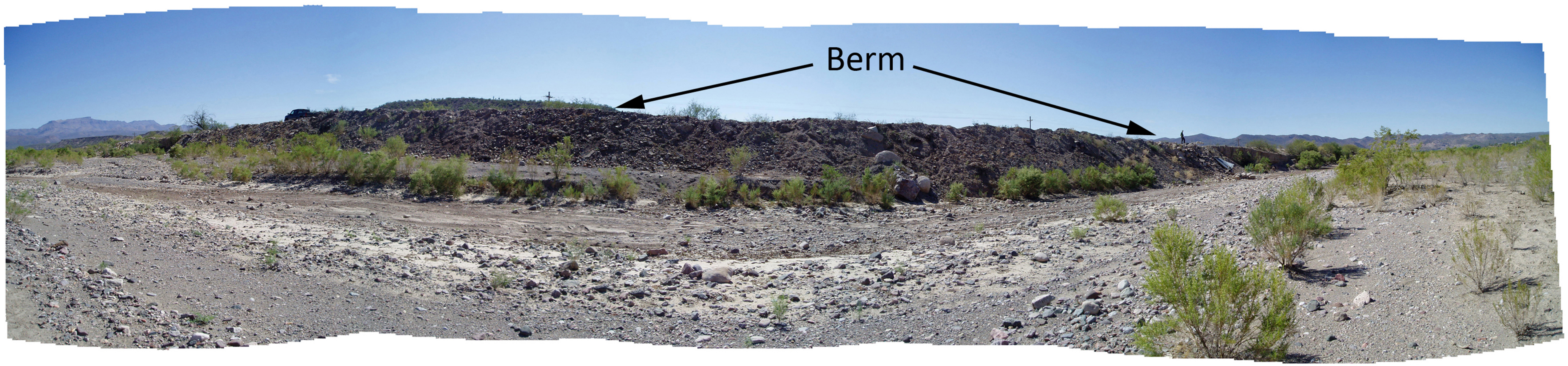


Attachment 7

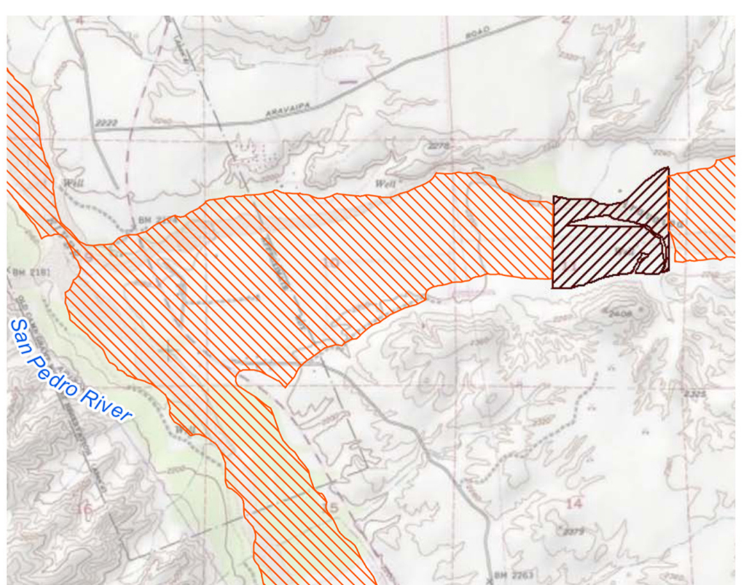
Aravaipa Creek Berm Panorama B

Approximately 2 miles east of confluence with San Pedro River; looking south

Photographs taken November 2009



Aerial photographs showing the location of the berm and panoramas.



Excerpt from
ADWR Subflow Zone
Delineation Report
Appendix E, Map 20

Extent of Subflow Zone

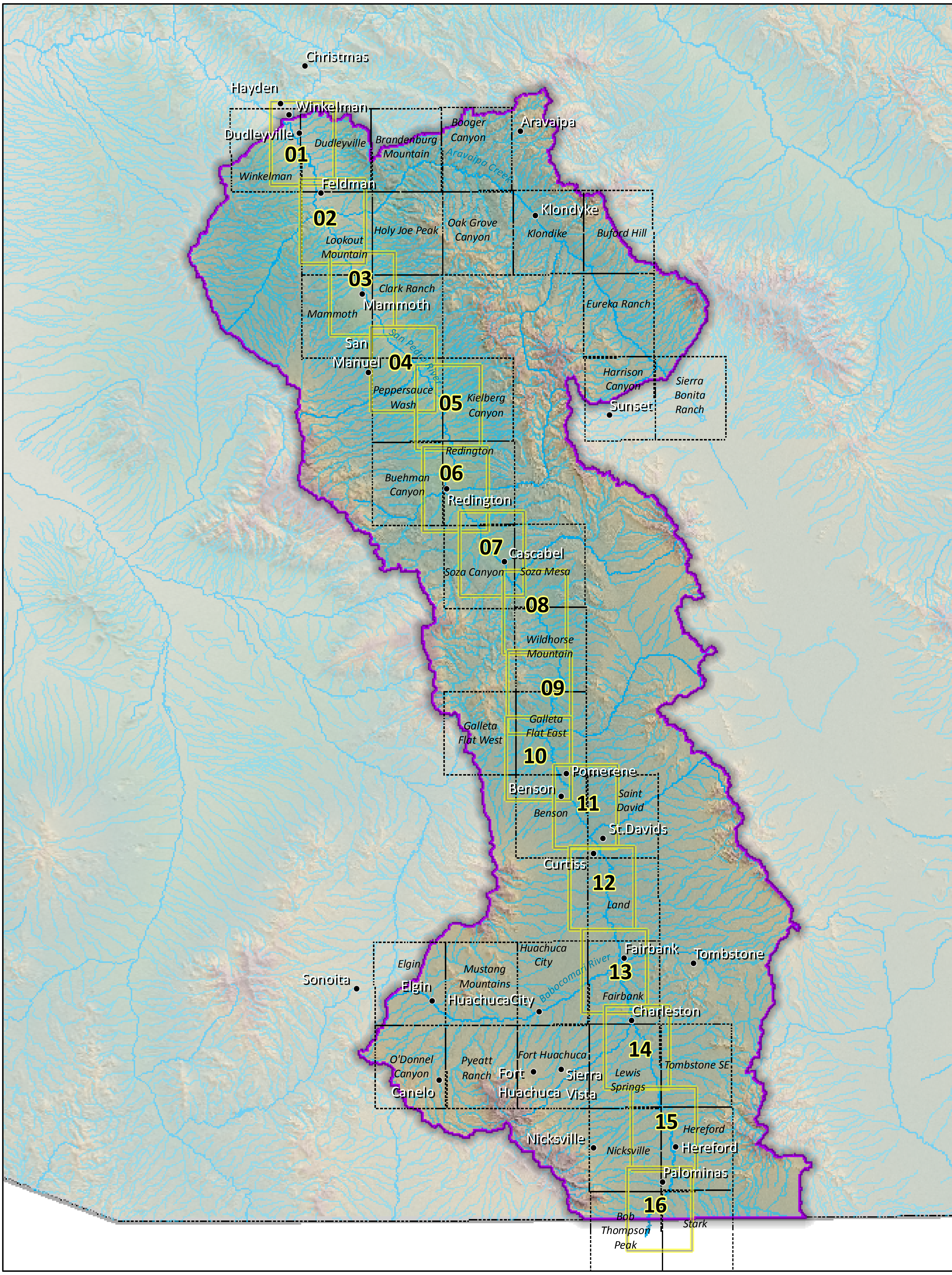
Setbacks overlap with other geologic units in floodplain

<u>Attachment 8</u>

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison Maps

Attachment 8

Map Index for SRP San Pedro Attachment 8



Sheet Index

Miles: 0, 5, 10, 20

Kilometers: 0, 5, 10, 20

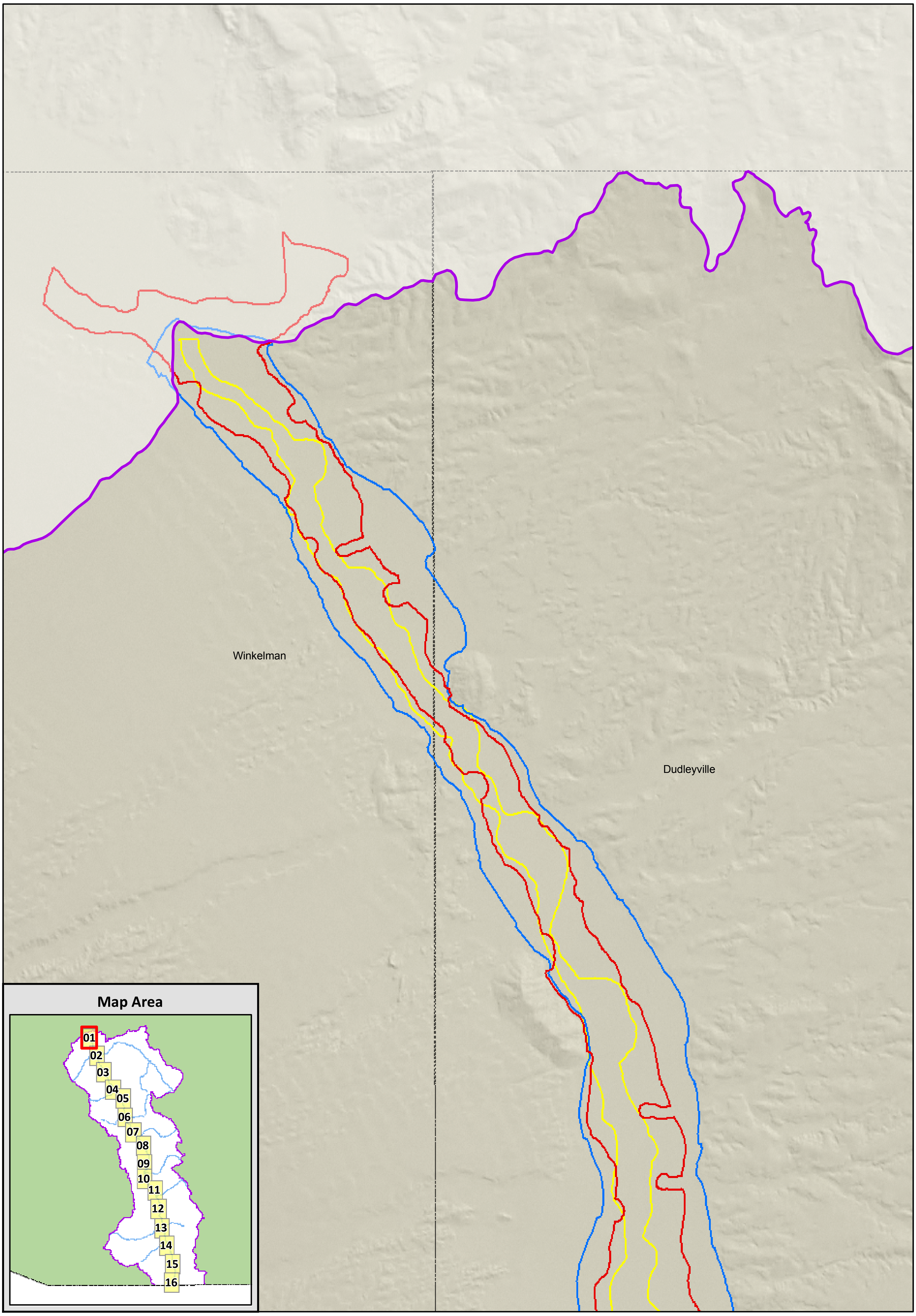
Legend

- Map Book Pages
- USGS Topo (24k) Quad Boundary
- San Pedro River Watershed Boundary

SanPedro_MapIndex8.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 1

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

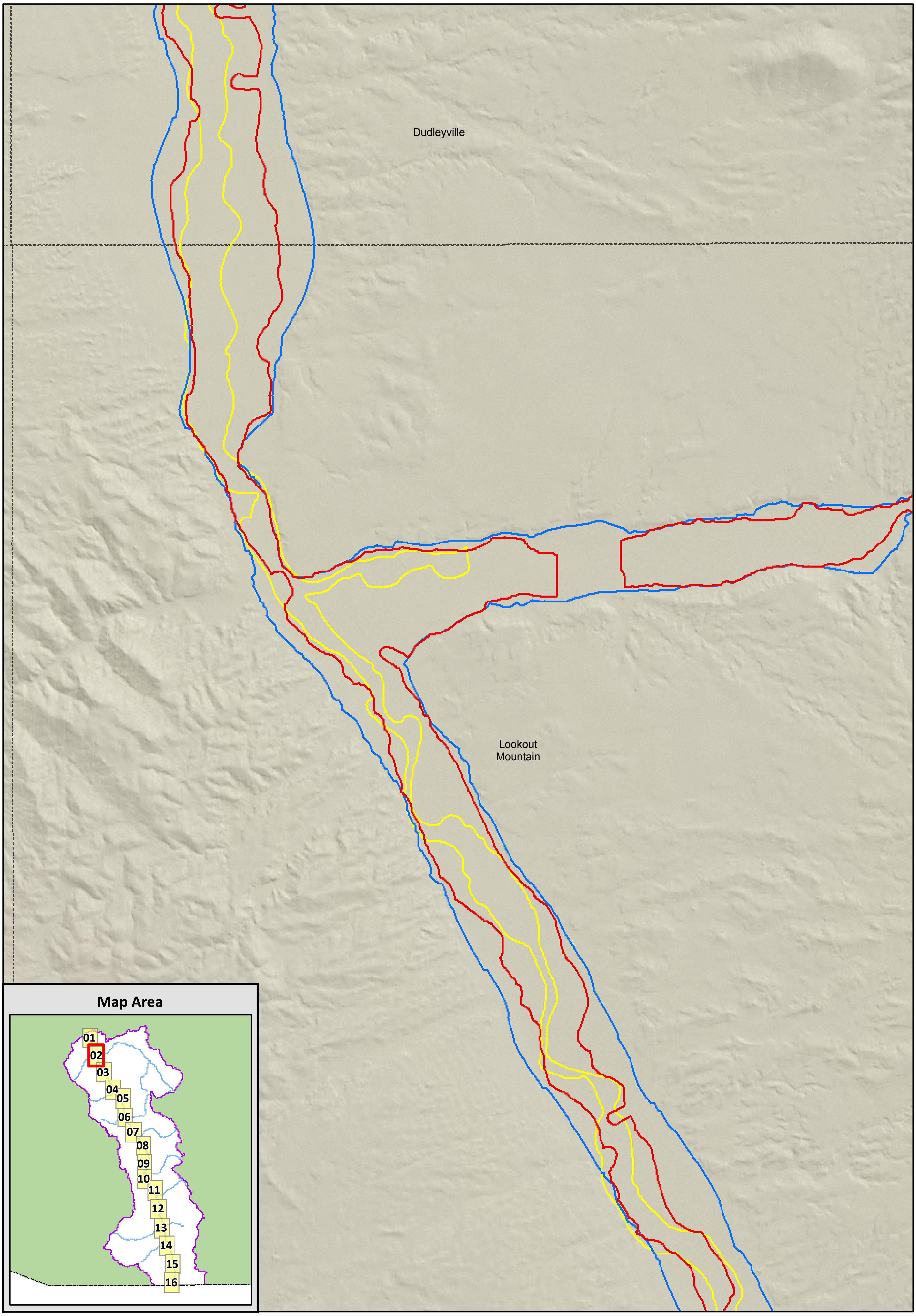
USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
LRE Subflow Zone
Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 2

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

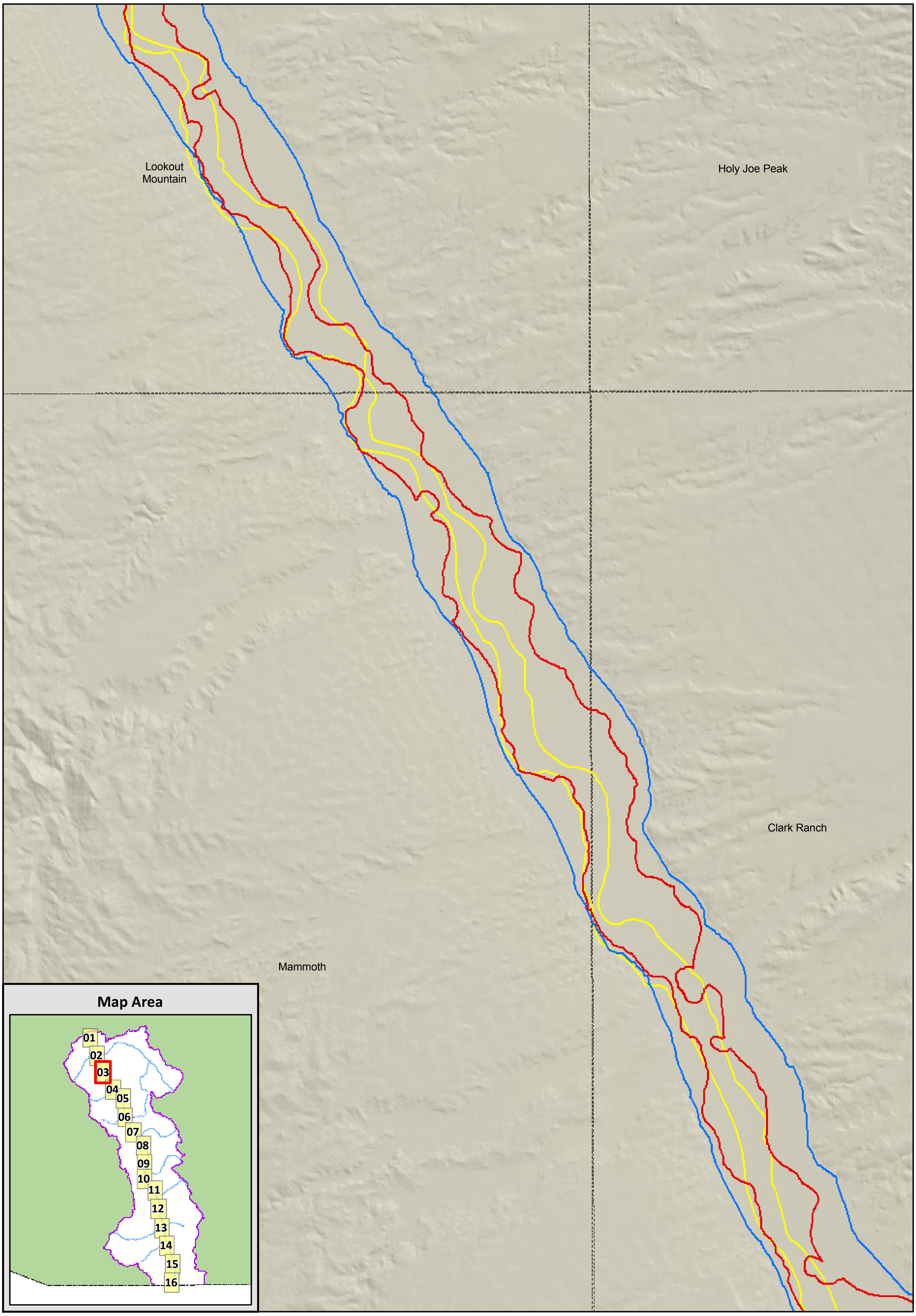
USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
LRE Subflow Zone
Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 3

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

USGS Topo (24k) Quad Boundary

Watershed Boundary

ADWR Subflow Zone

LRE Subflow Zone

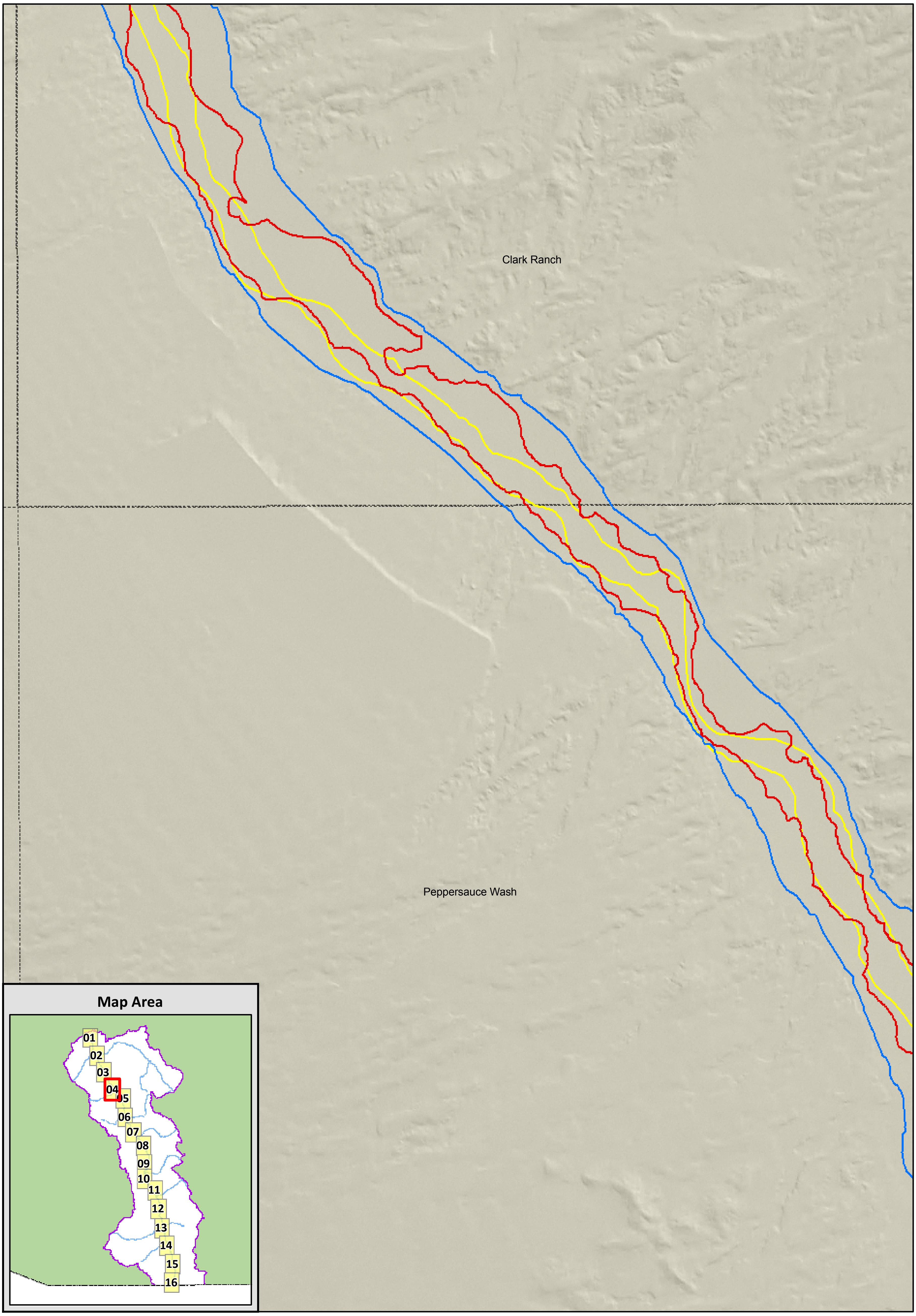
Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 4

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

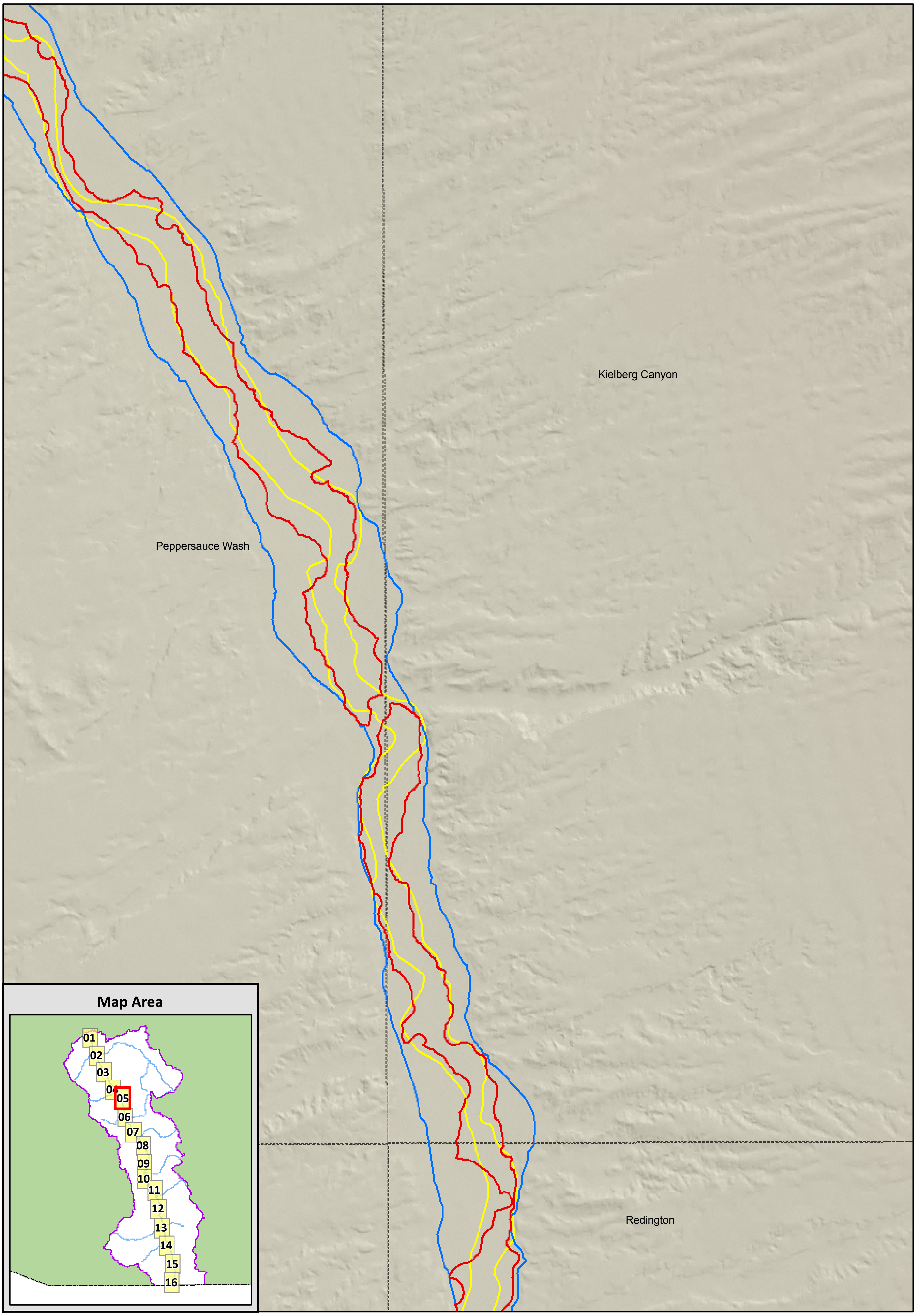
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 5

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

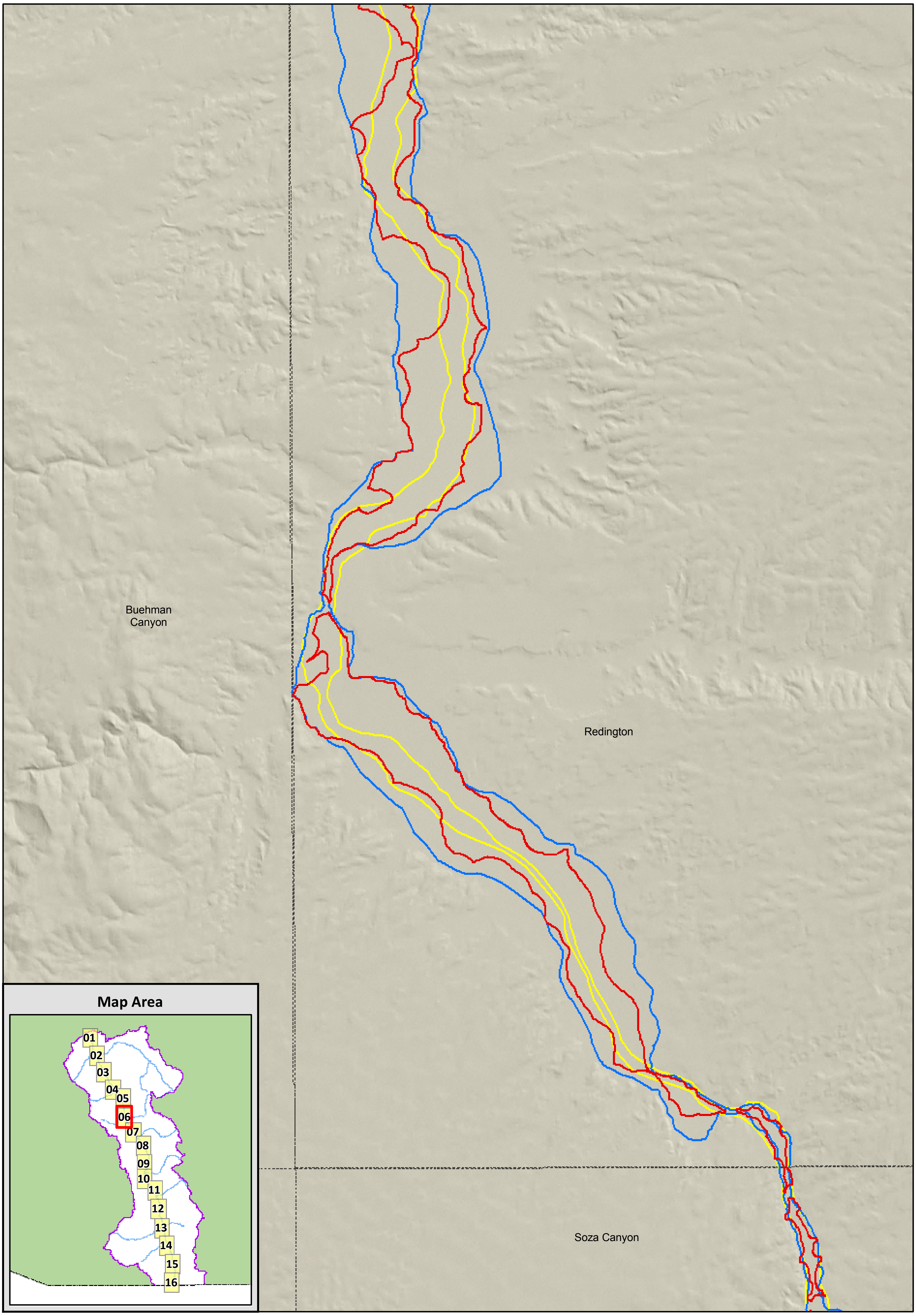
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



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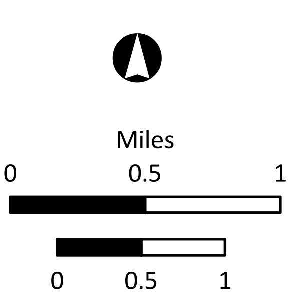


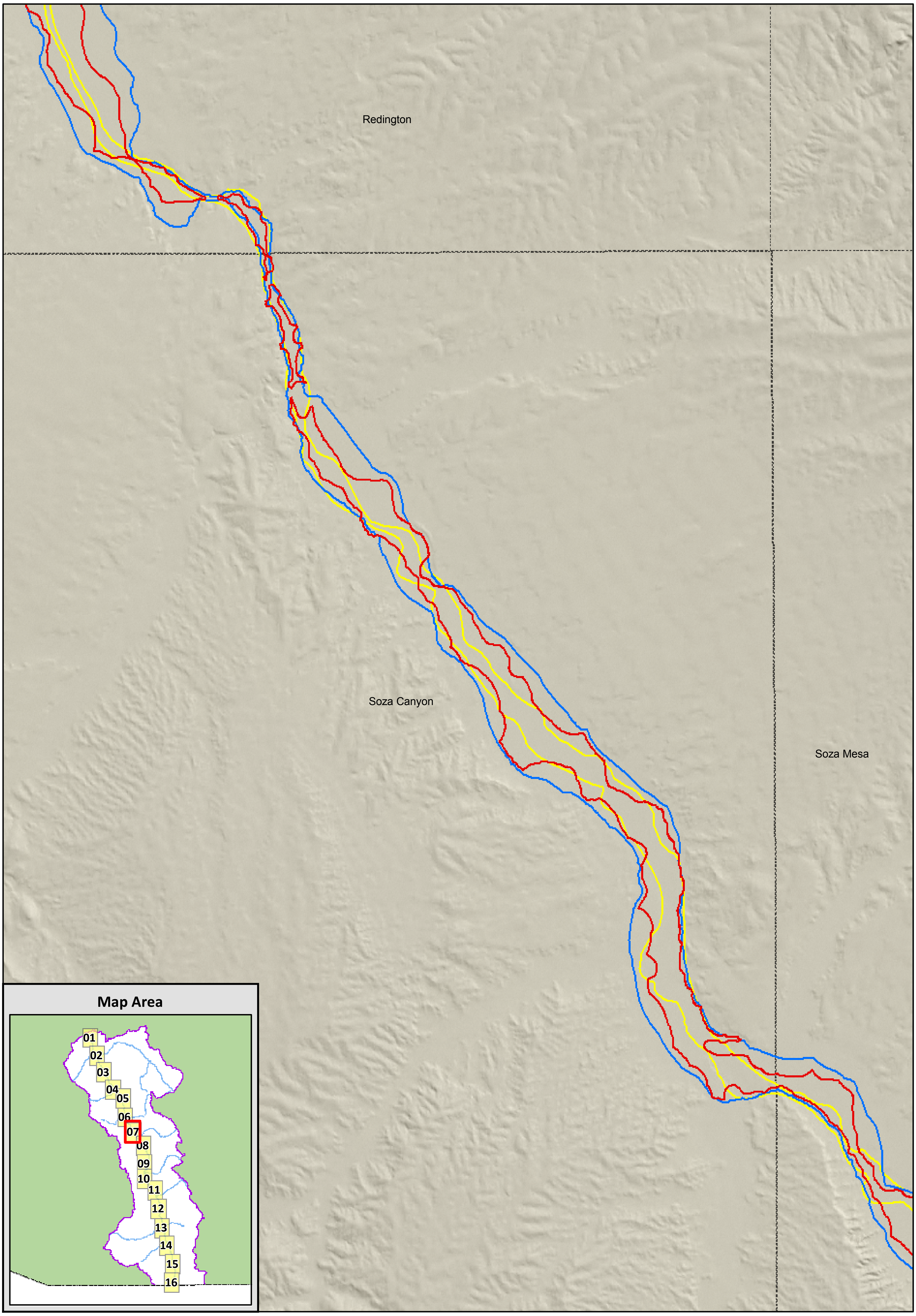
Legend

- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



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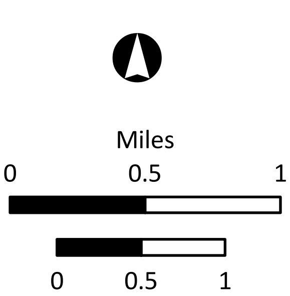


Legend

USGS Topo (24k) Quad Boundary

Watershed Boundary

ADWR Subflow Zone

LRE Subflow Zone

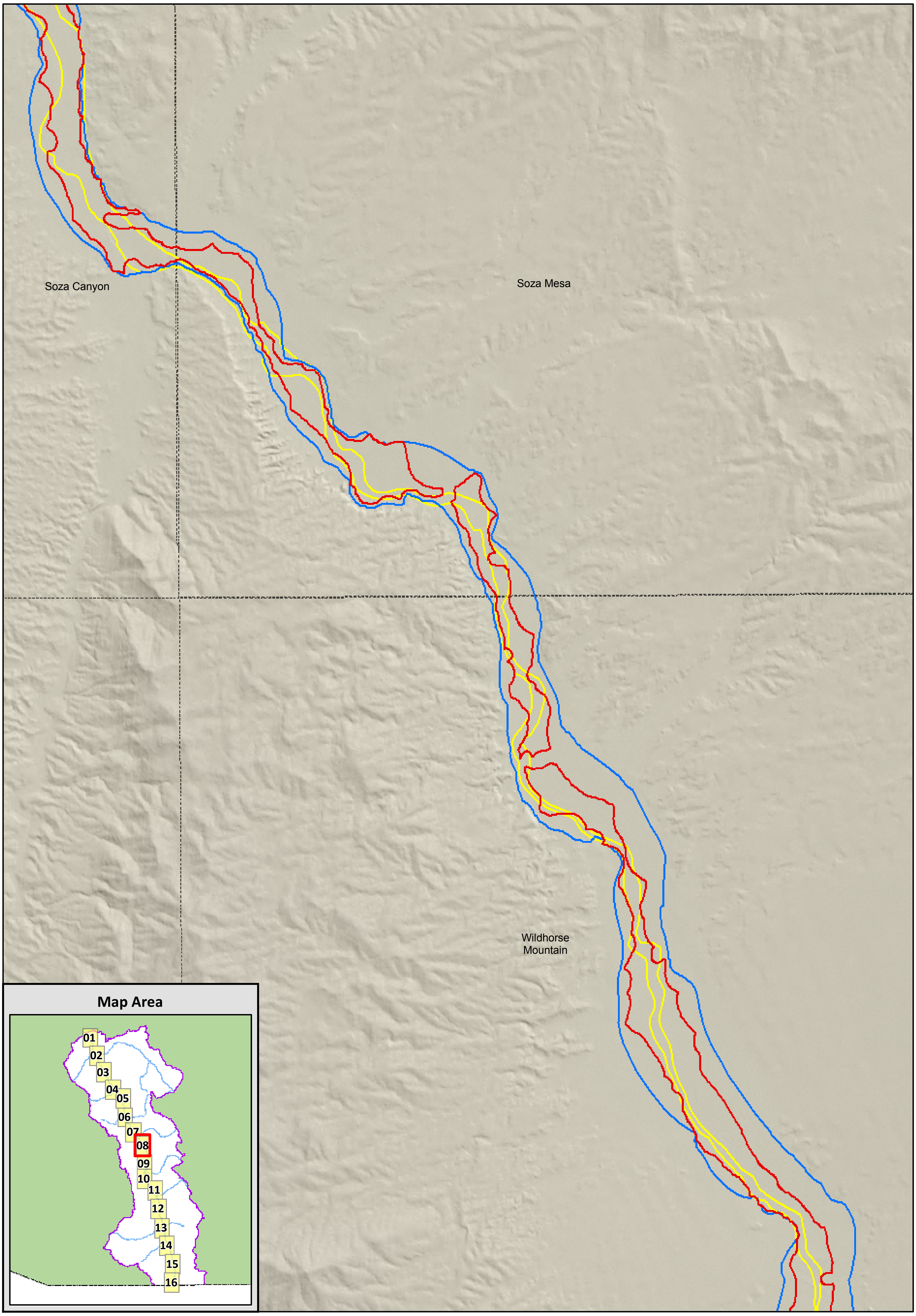
Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 8

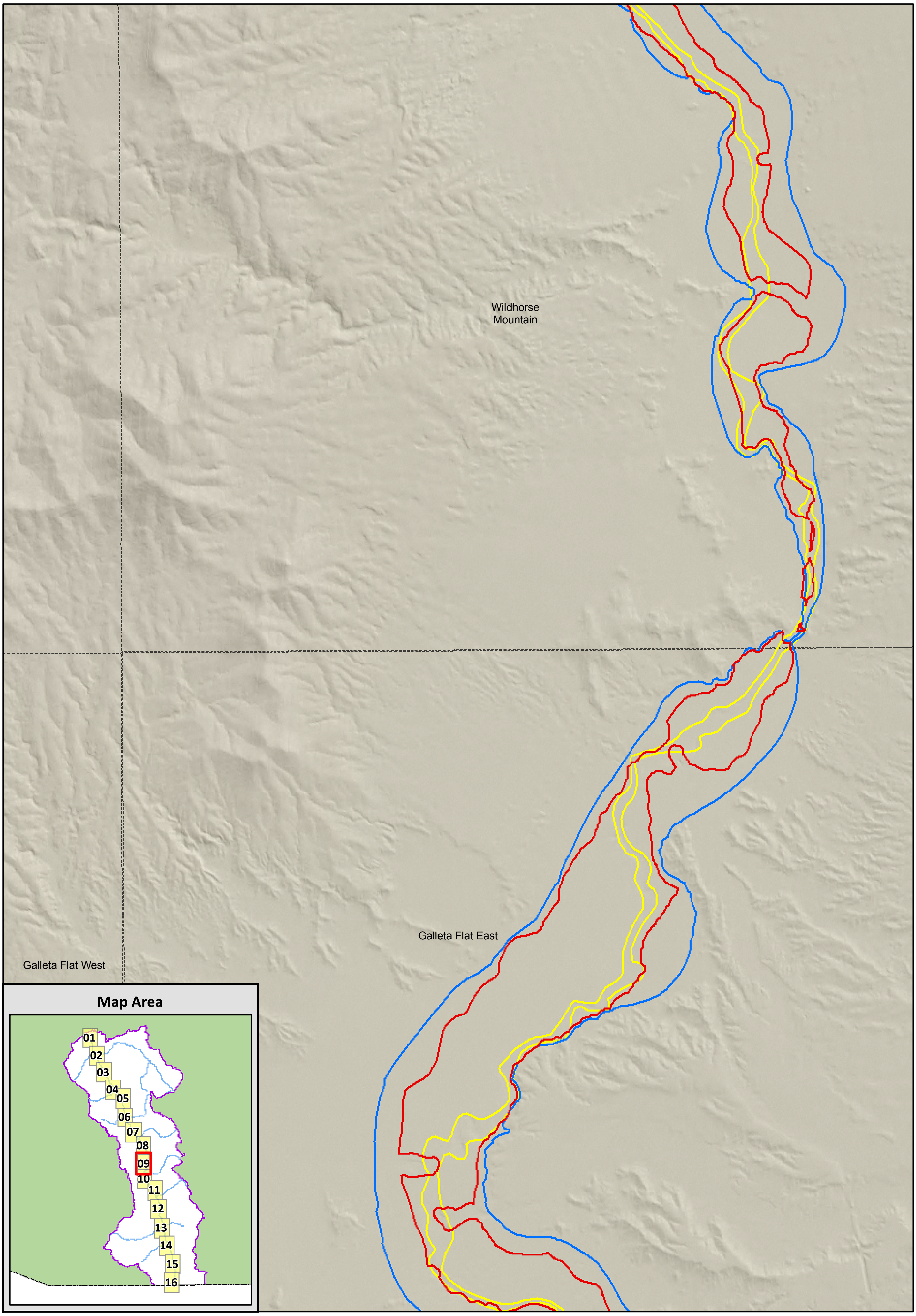
Legend

- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 9

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Montgomery Post-1880 Subflow Zone

Data Sources:
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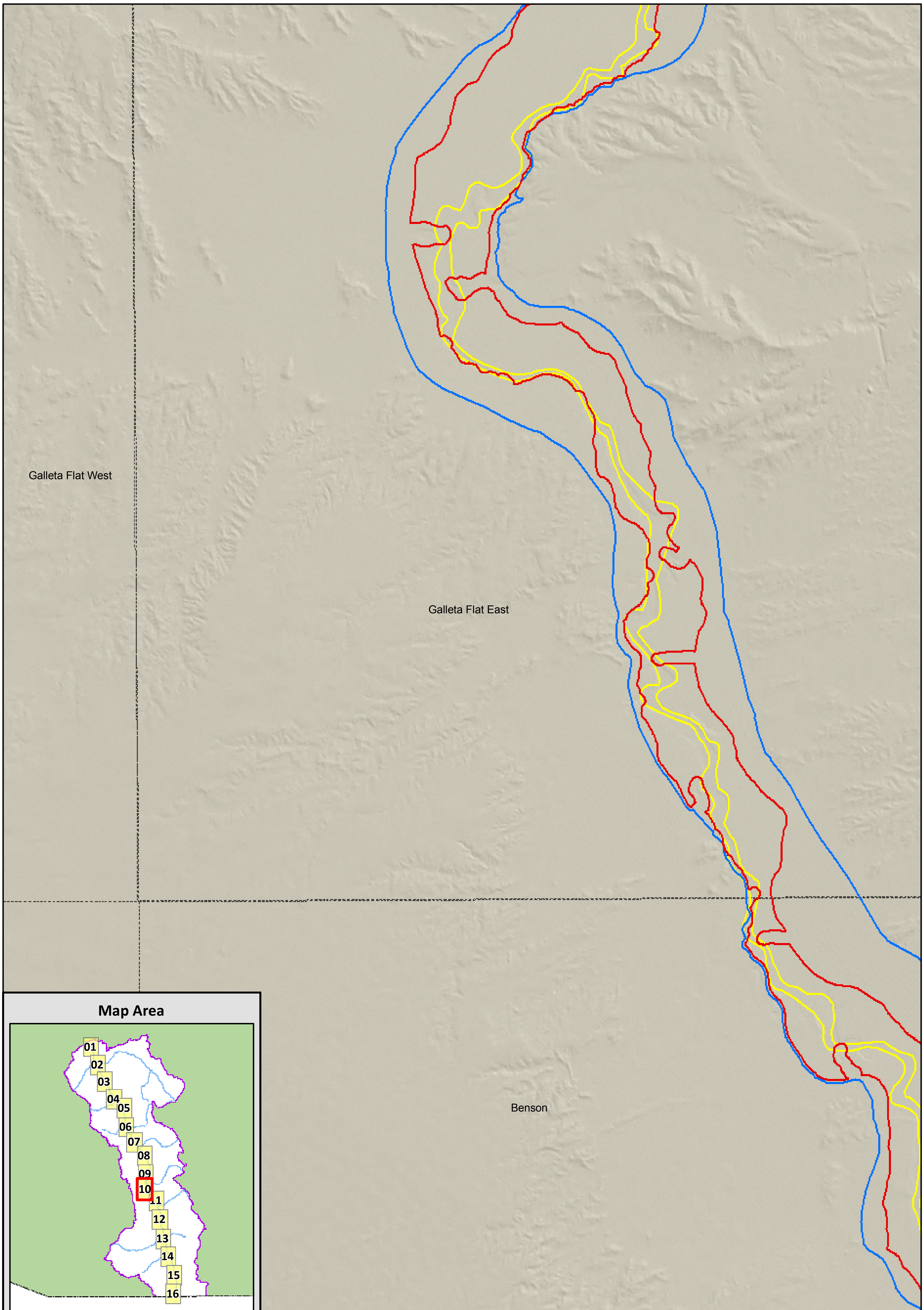
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 10

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

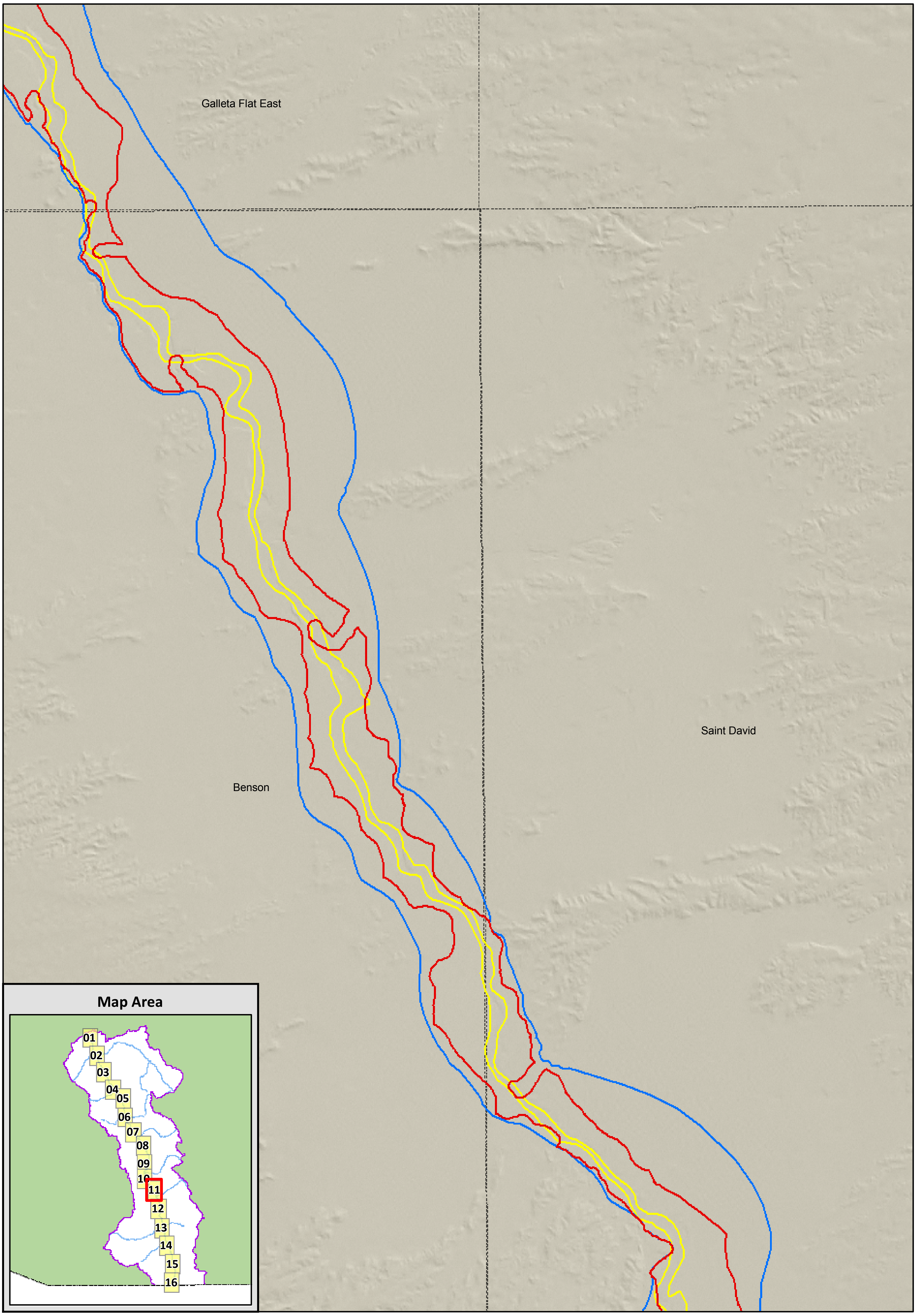
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



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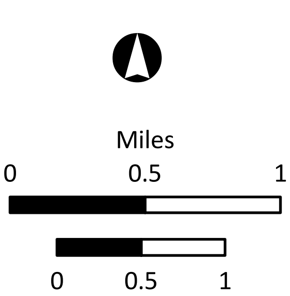

Legend

USGS Topo (24k) Quad Boundary

Watershed Boundary

ADWR Subflow Zone

LRE Subflow Zone

Montgomery Post-1880 Subflow Zone

Data Sources:
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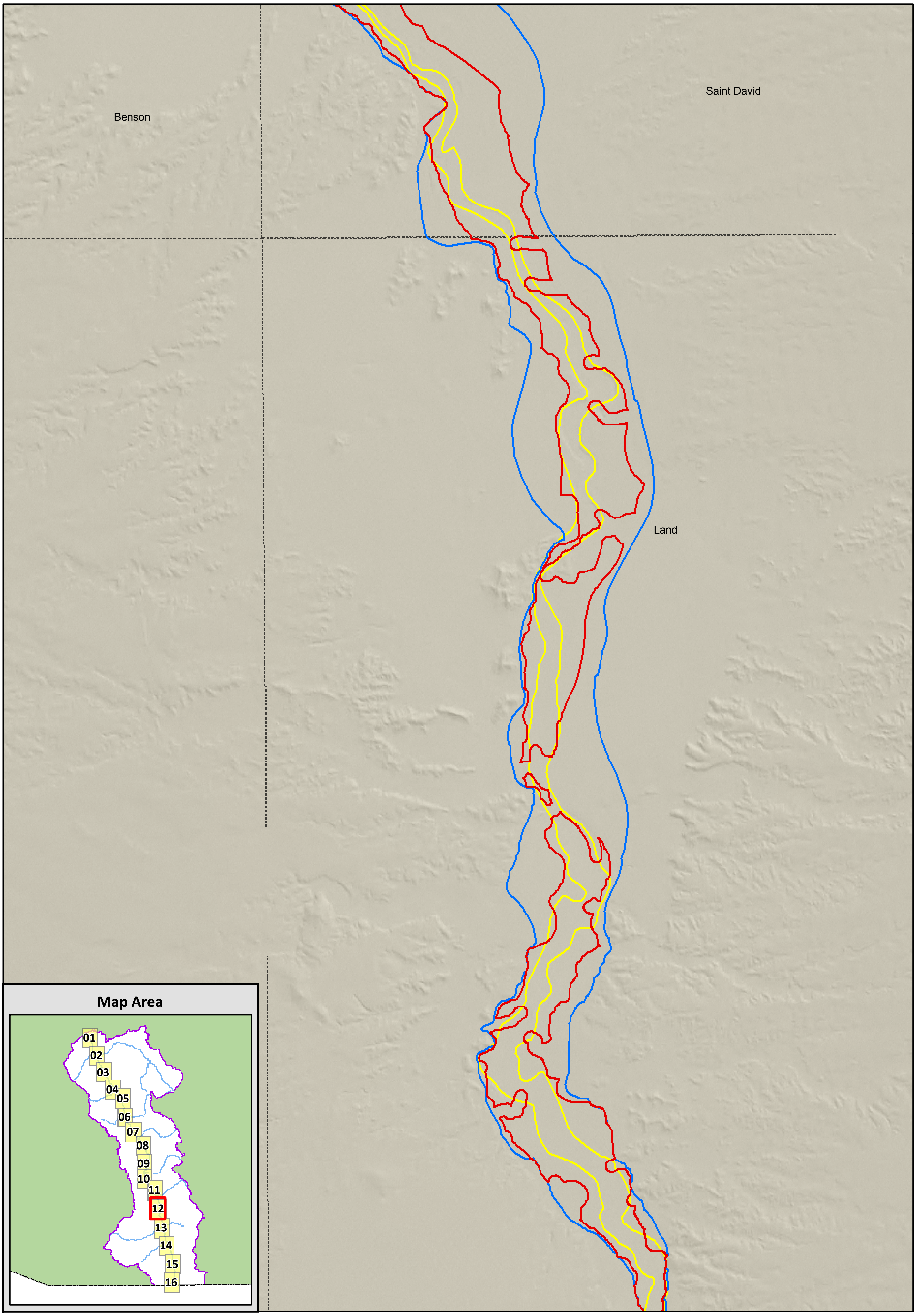
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 12

Legend

USGS Topo (24k) Quad Boundary

Watershed Boundary

ADWR Subflow Zone

LRE Subflow Zone

Montgomery Post-1880 Subflow Zone

Miles
0 0.5 1

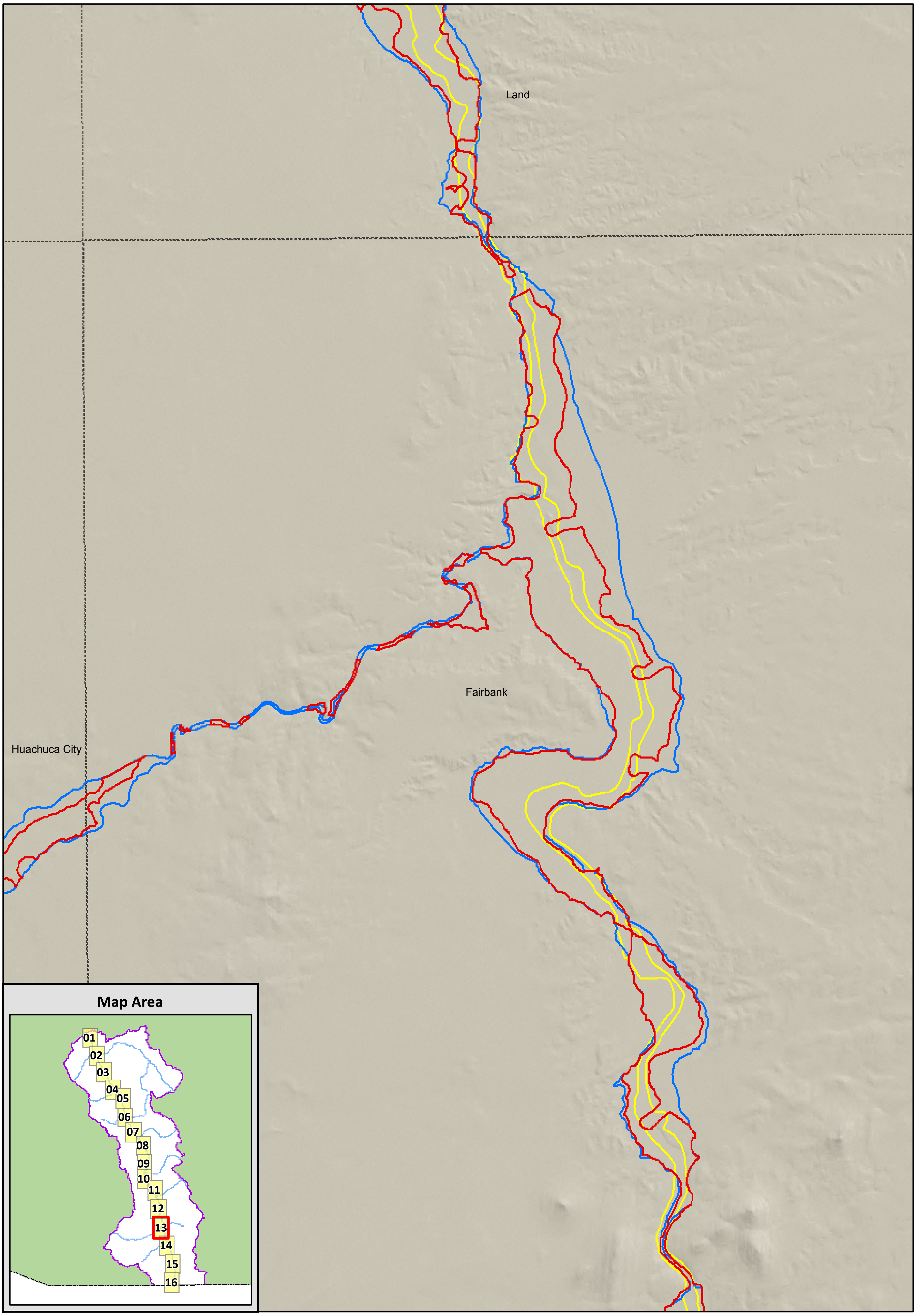
0 0.5 1
Kilometers

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 13

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

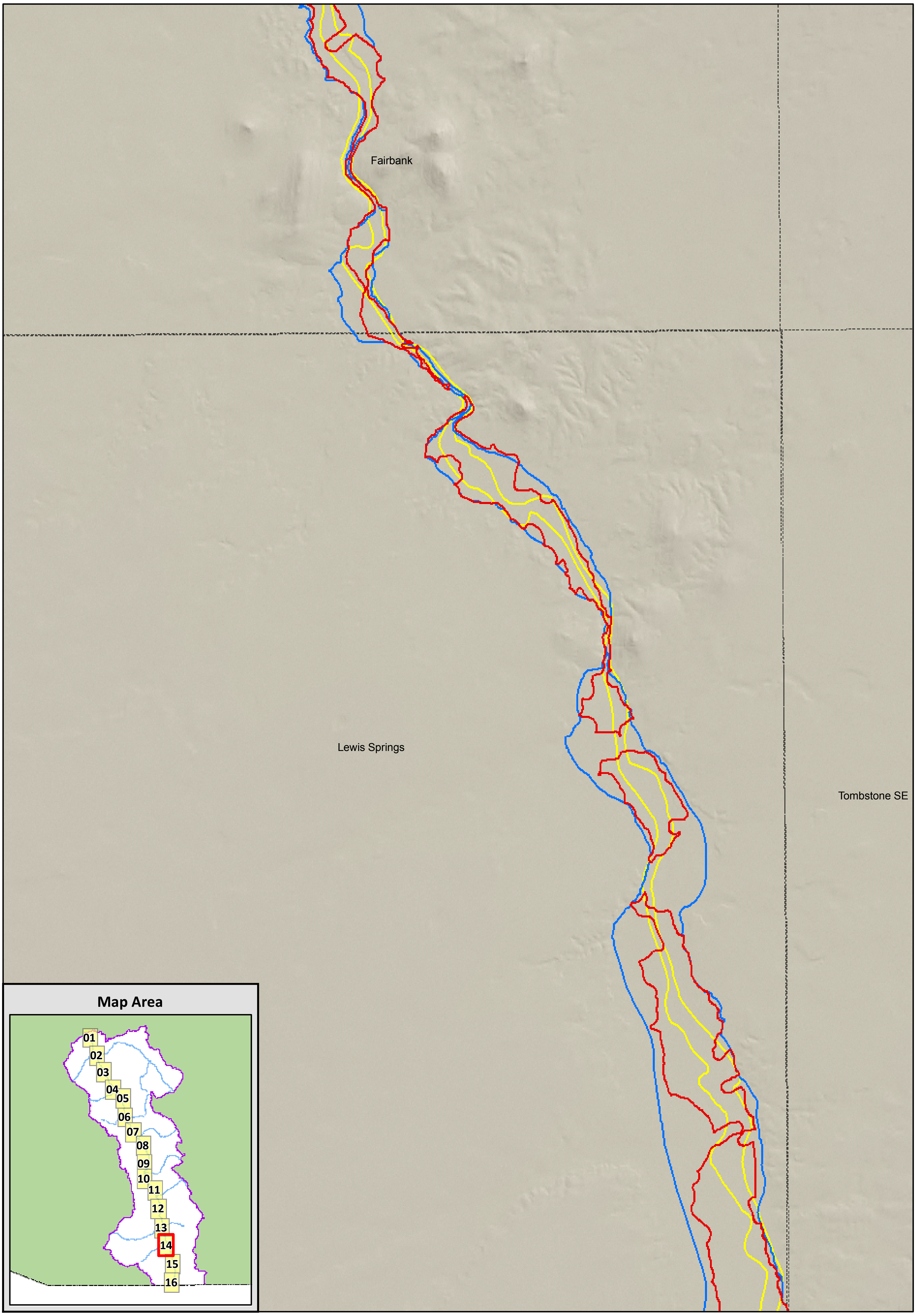
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



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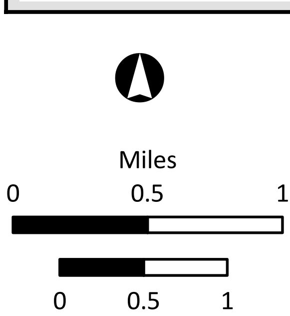

Legend

- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Montgomery Post-1880 Subflow Zone

Data Sources:
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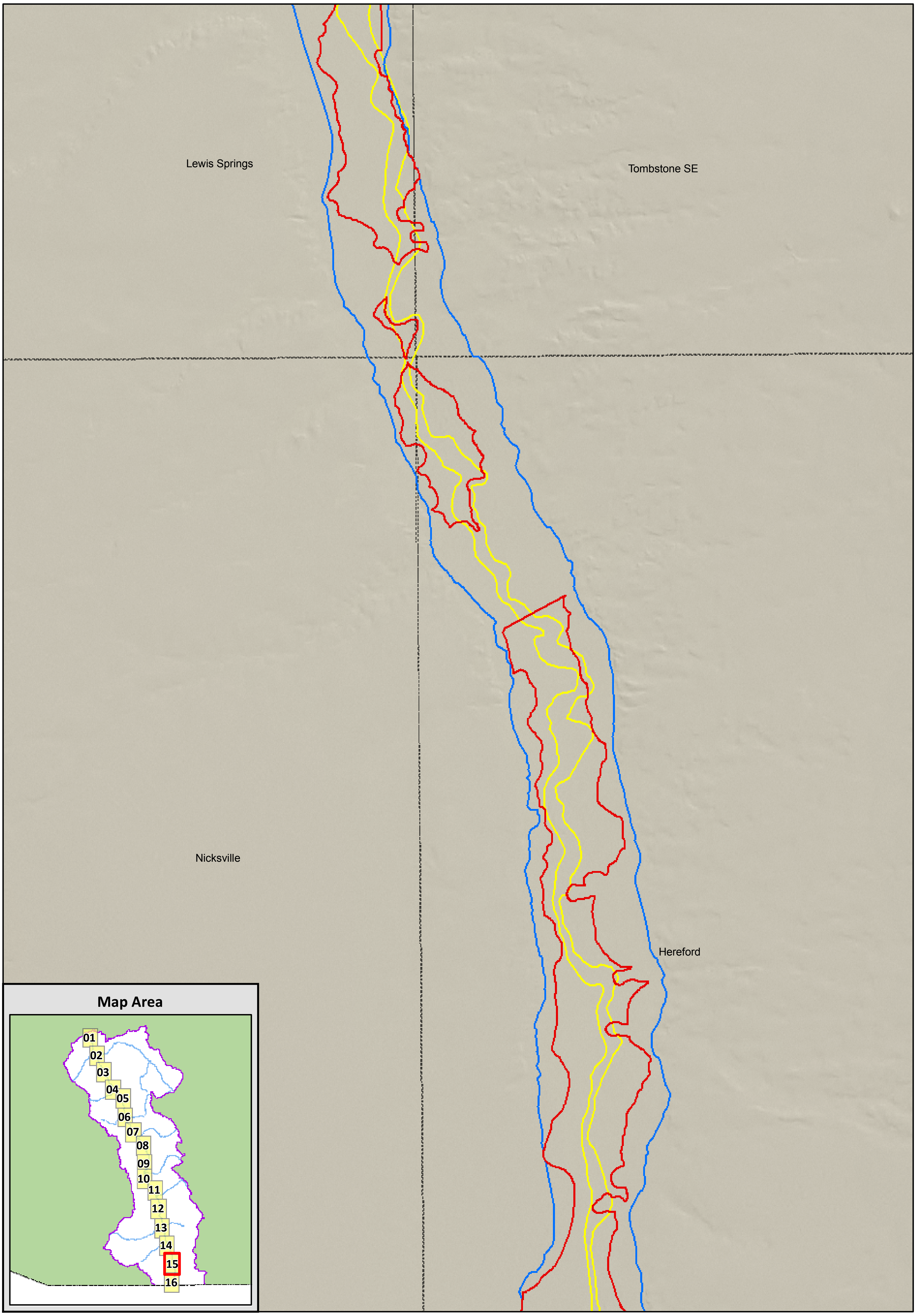
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 15

Legend

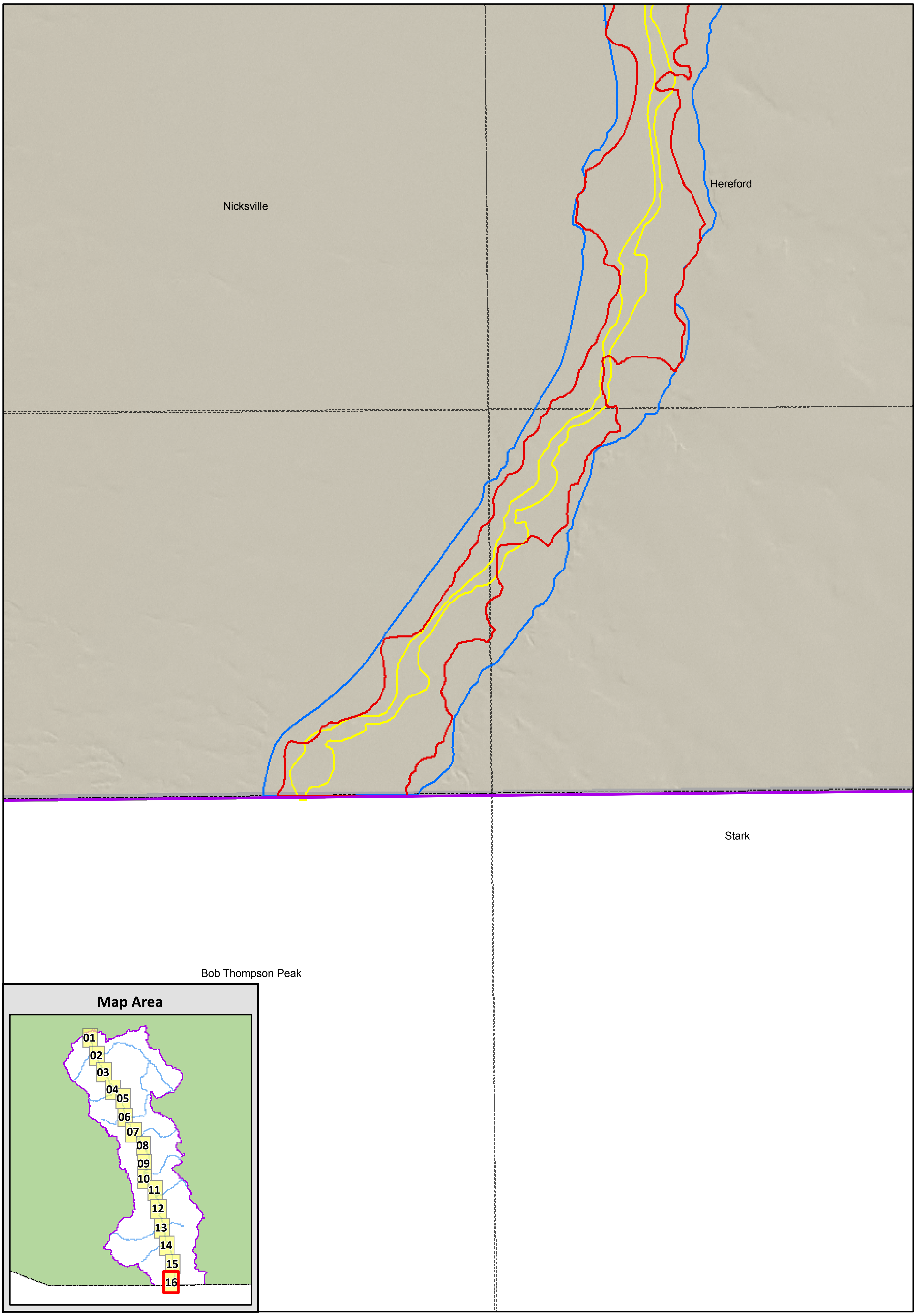
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Montgomery Post-1880 Subflow Zone

Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

Attachment 8

Montgomery Post-1880, ADWR, and LRE Subflow Zone Comparison, San Pedro River



Sheet 16

Miles
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0 0.5 1
Kilometers

Legend

USGS Topo (24k) Quad Boundary

Watershed Boundary

ADWR Subflow Zone

LRE Subflow Zone

Montgomery Post-1880 Subflow Zone

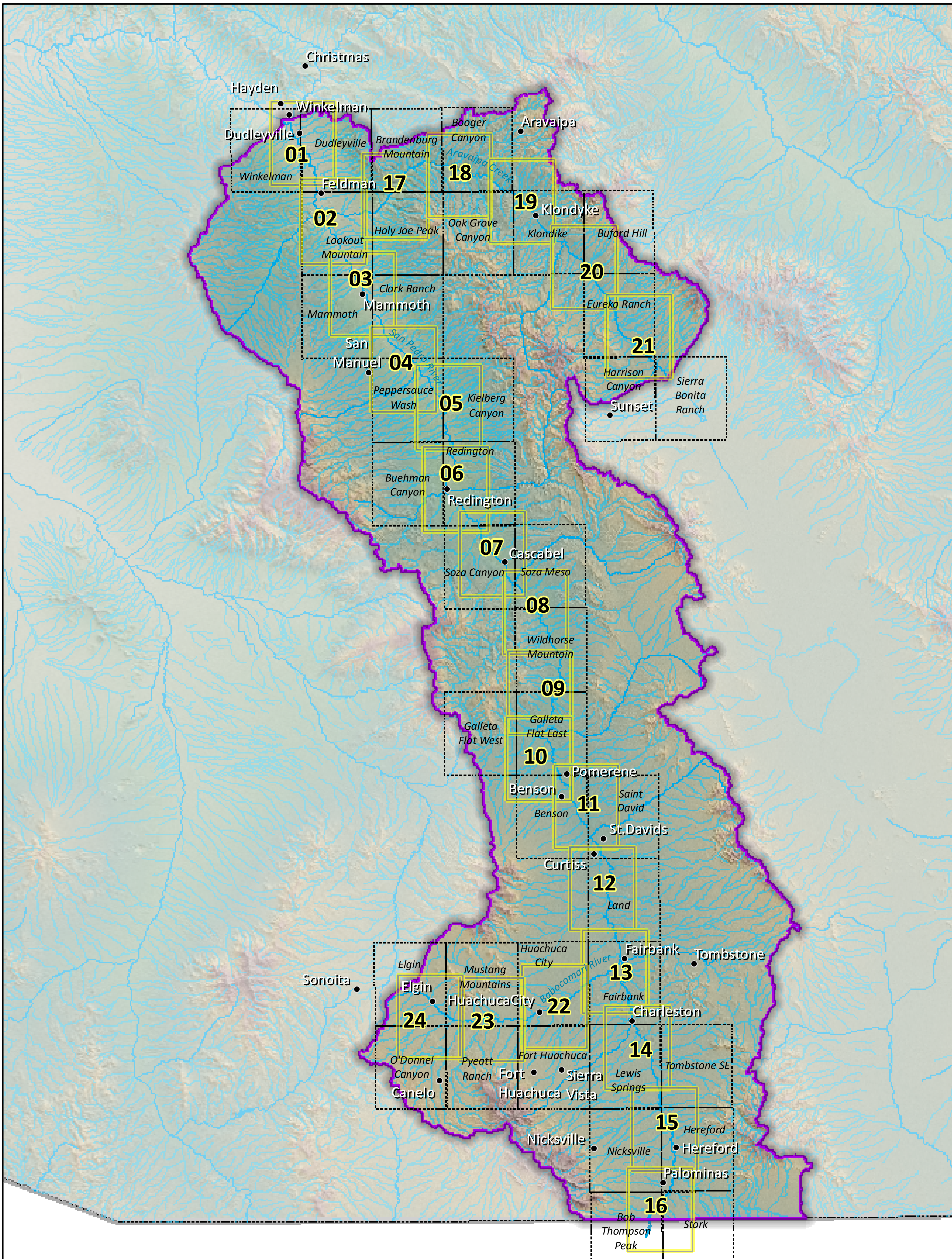
Data Sources:
1994 Exhibits 209-216: Montgomery post-1880 Subflow Zone
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_Montgomery.mxd

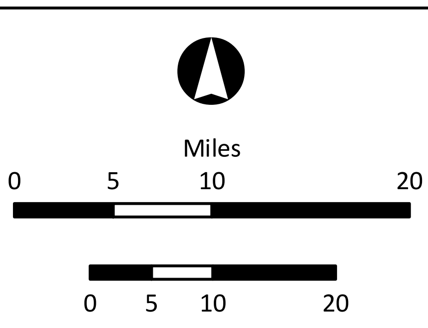
<u>Attachment 9</u>

Large Wells In and Near the Subflow Zone

Map Index for SRP San Pedro Attachments 9 & 11



Sheet Index

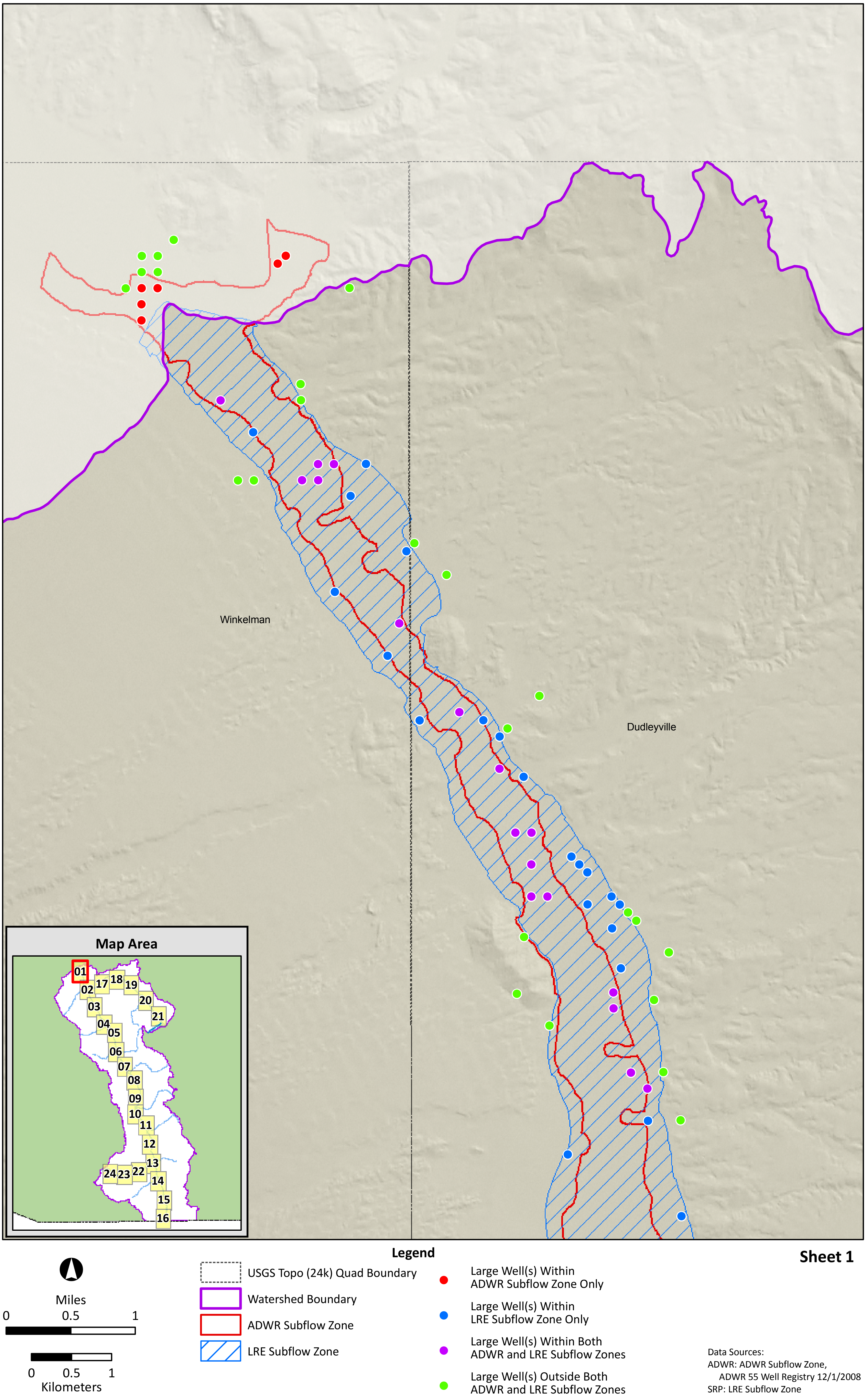


Legend

- Map Book Pages
- USGS Topo (24k) Quad Boundary
- San Pedro River Watershed Boundary

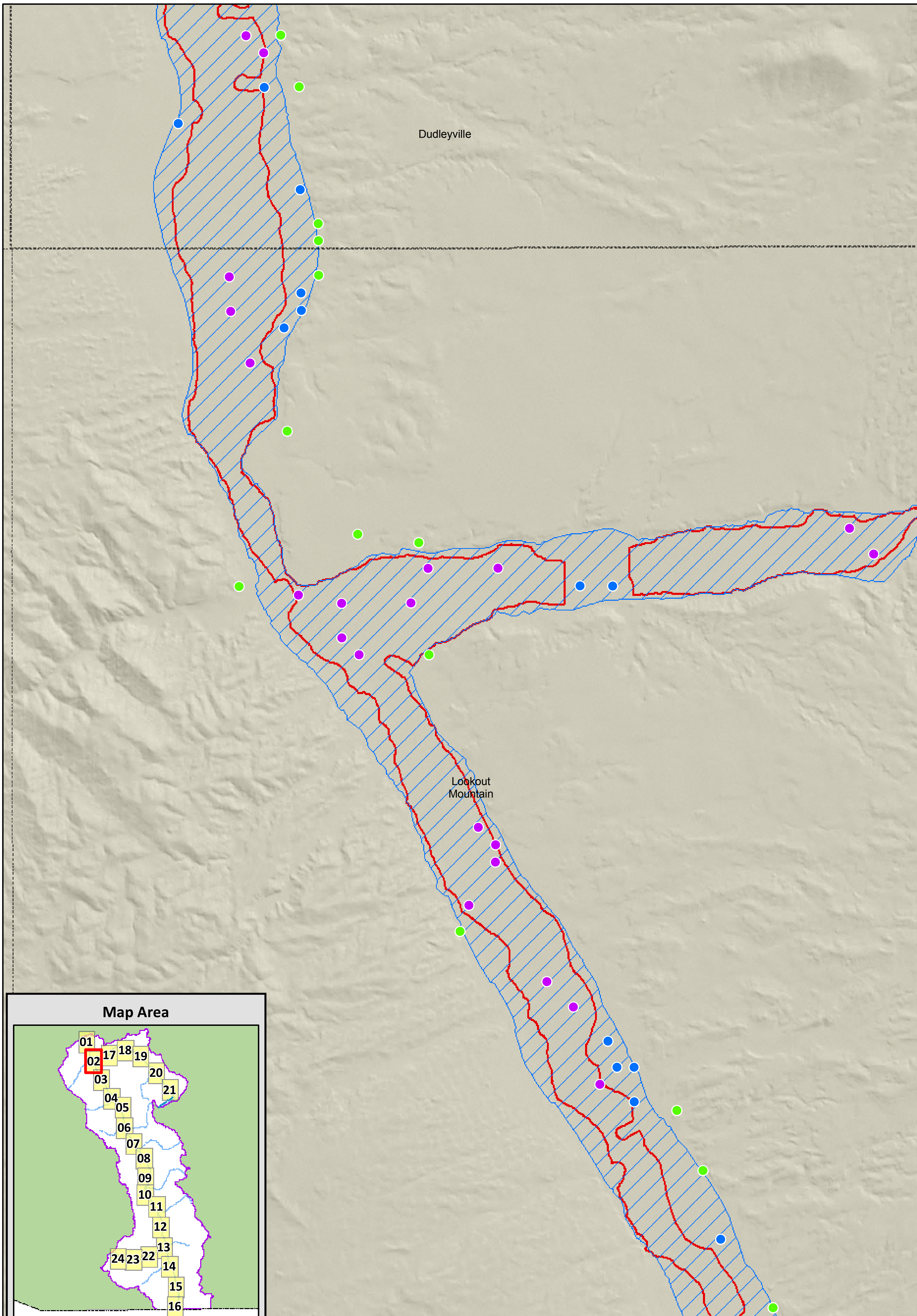
SanPedro_MapIndex9.mxd

Large Wells In and Near the Subflow Zone, San Pedro River



Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Sheet 2

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
LRE Subflow Zone

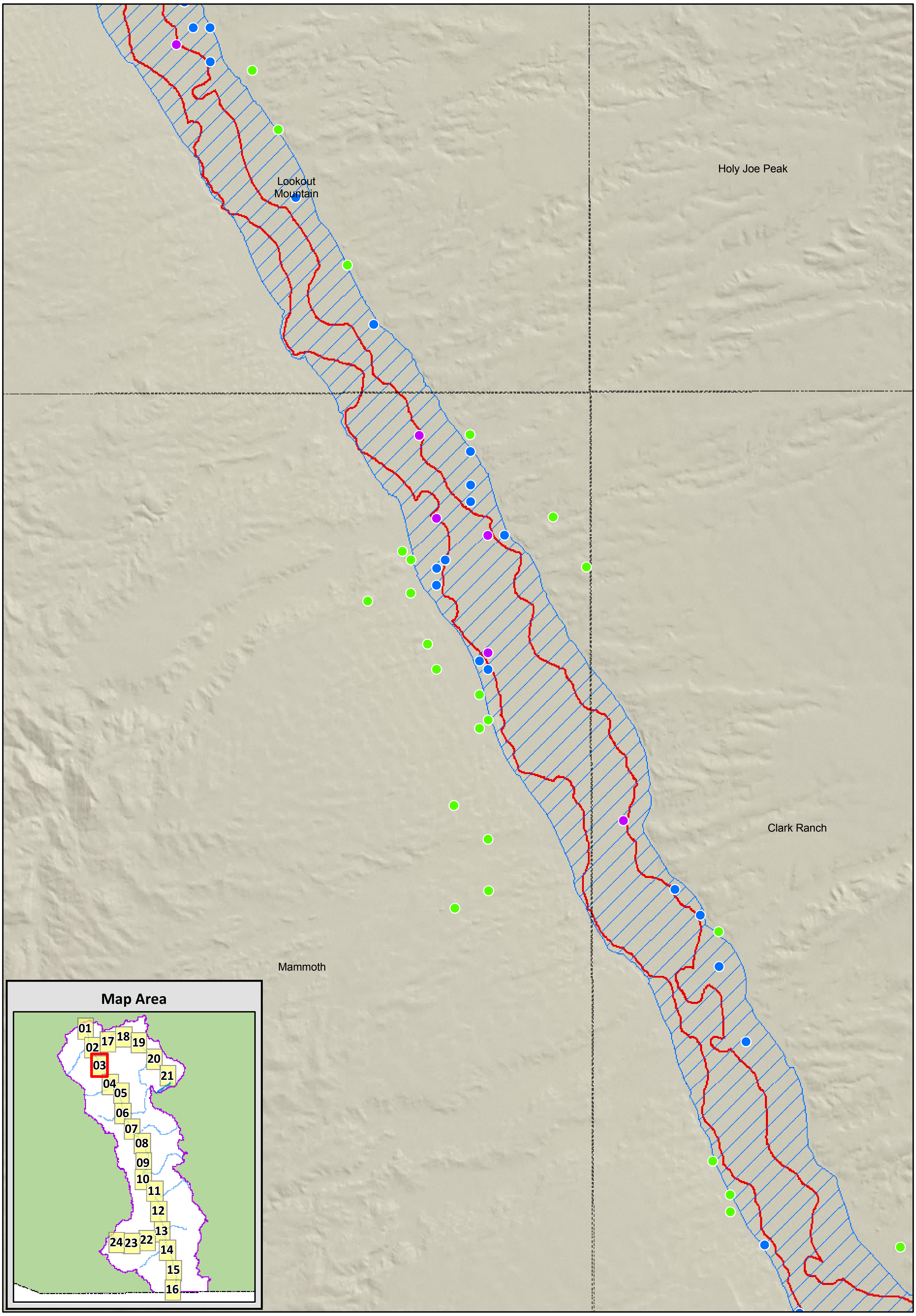
Large Well(s) Within ADWR Subflow Zone Only
Large Well(s) Within LRE Subflow Zone Only
Large Well(s) Within Both ADWR and LRE Subflow Zones
Large Well(s) Outside Both ADWR and LRE Subflow Zones

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Legend

- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Miles
0 0.5 1

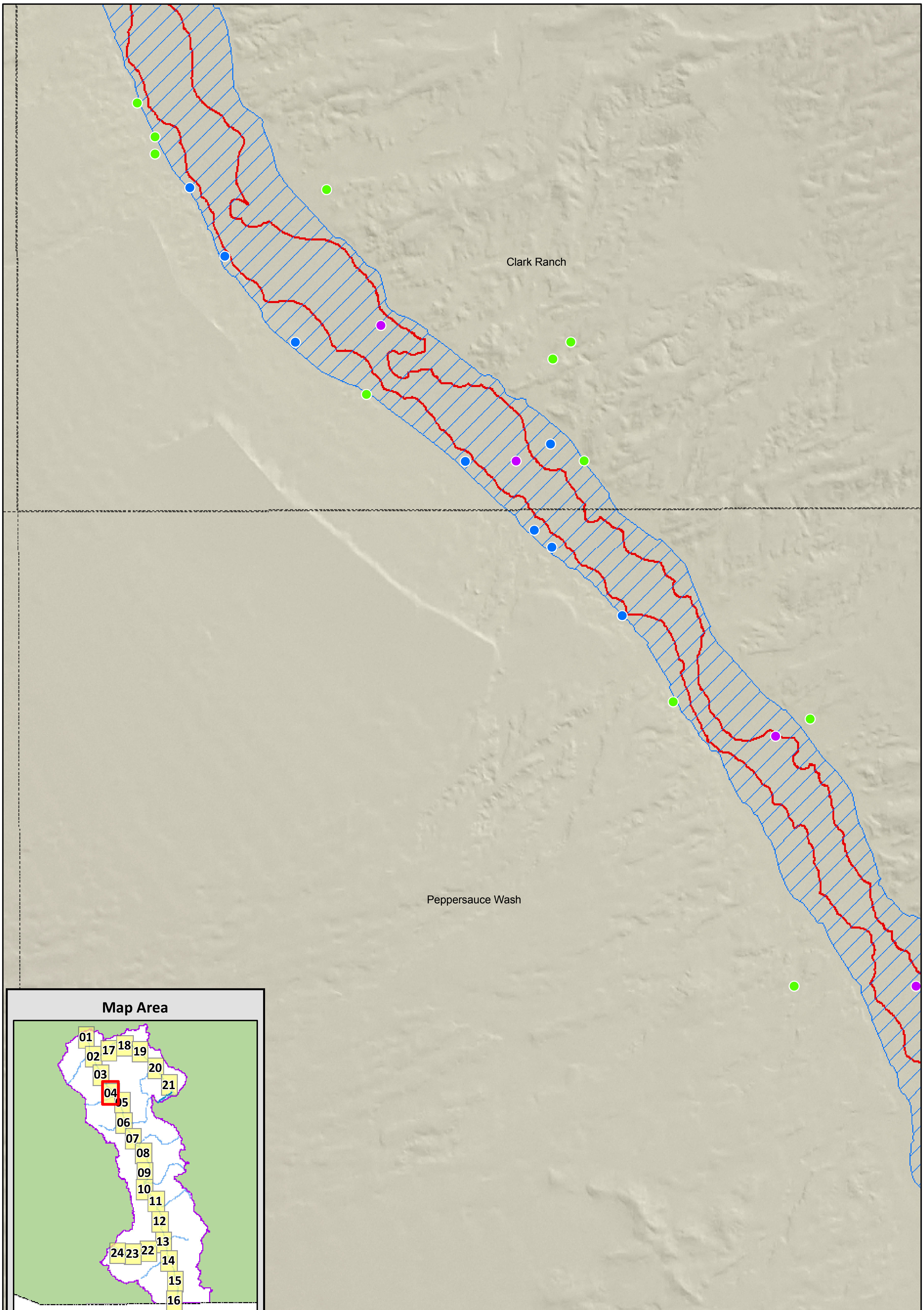
0 0.5 1
Kilometers

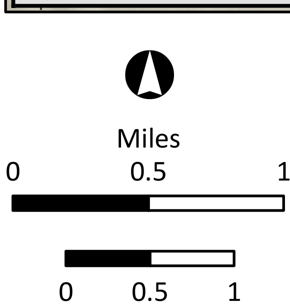
Sheet 3

Data Sources:
ADWR: ADWR Subflow Zone, ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Large Wells In and Near the Subflow Zone, San Pedro River





Legend

USGS Topo (24k) Quad Boundary

Watershed Boundary

ADWR Subflow Zone

LRE Subflow Zone

Large Well(s) Within ADWR Subflow Zone Only

Large Well(s) Within LRE Subflow Zone Only

Large Well(s) Within Both ADWR and LRE Subflow Zones

Large Well(s) Outside Both ADWR and LRE Subflow Zones

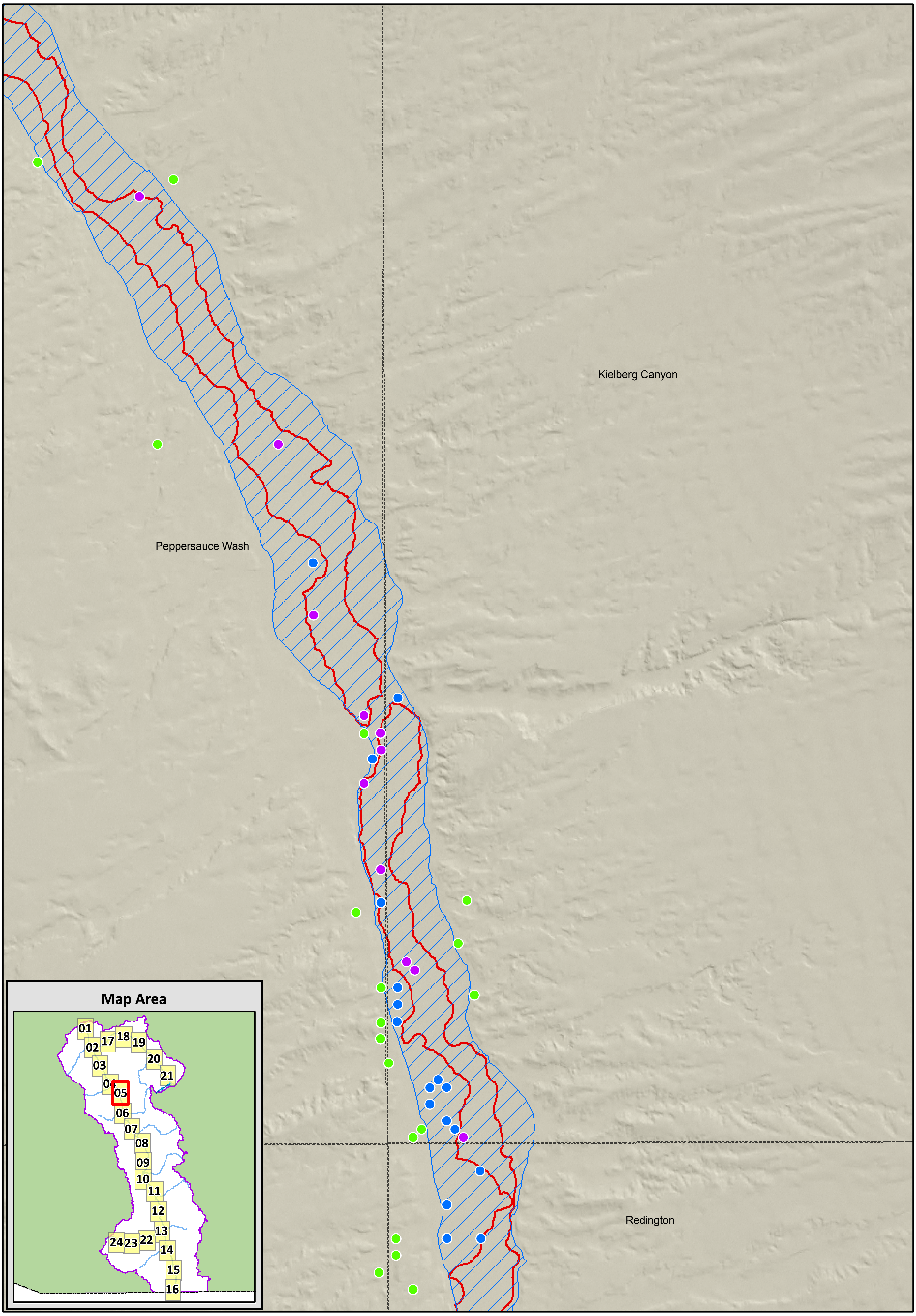
Sheet 4

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Sheet 5

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

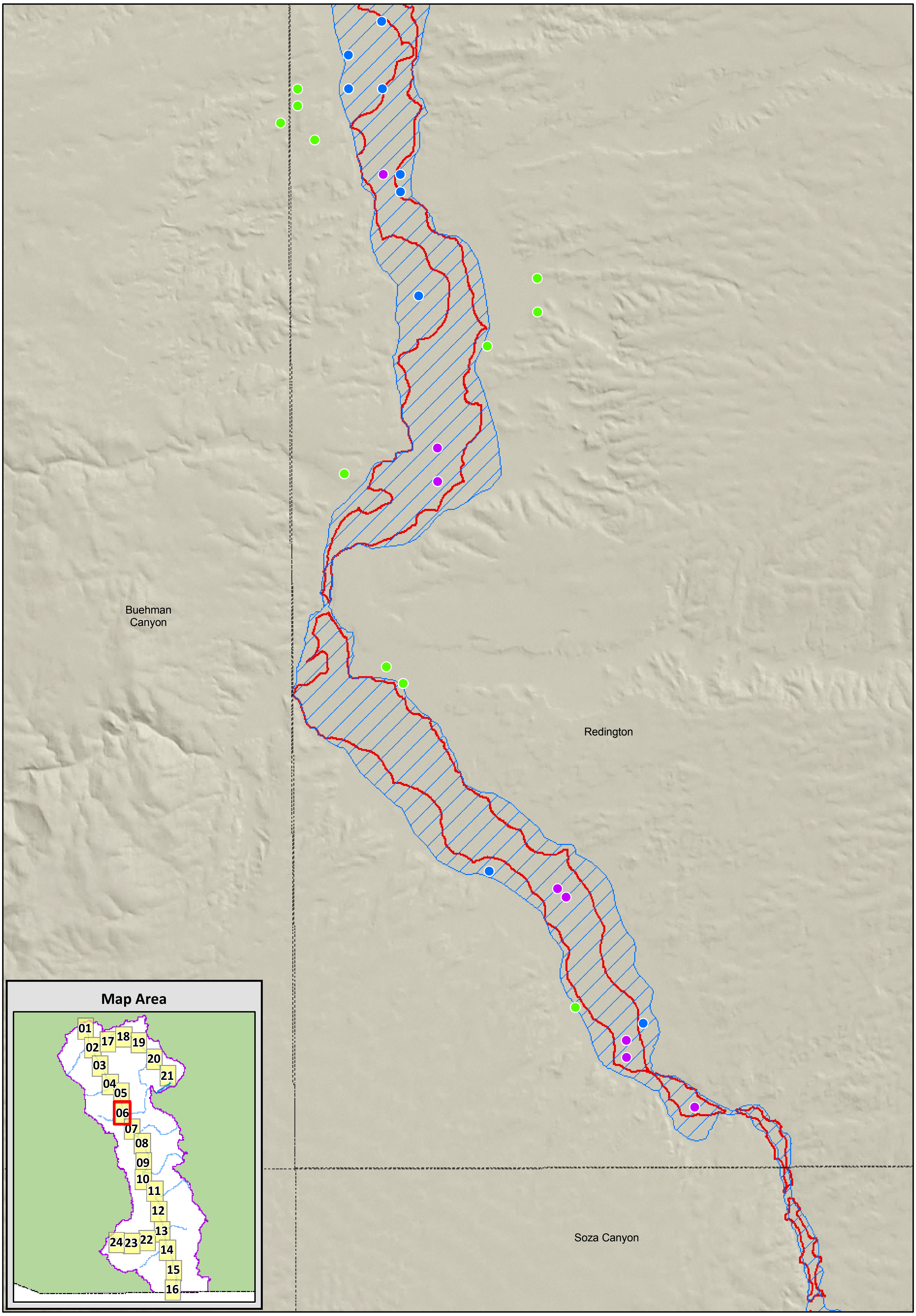
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



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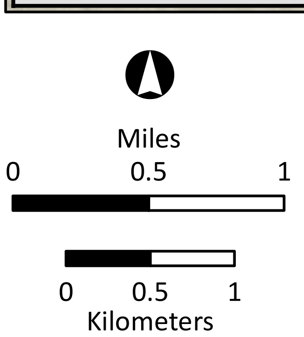


Legend

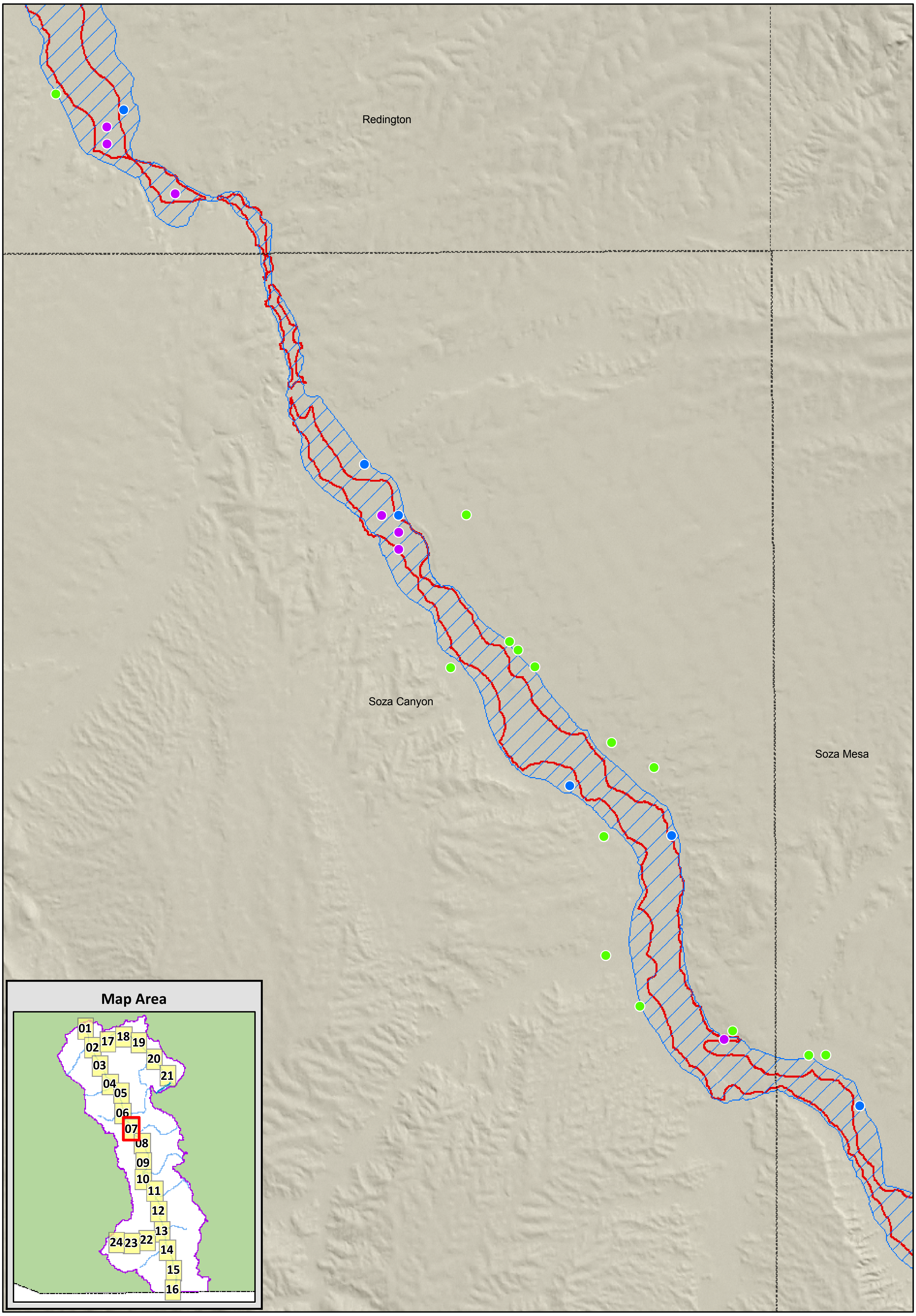
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

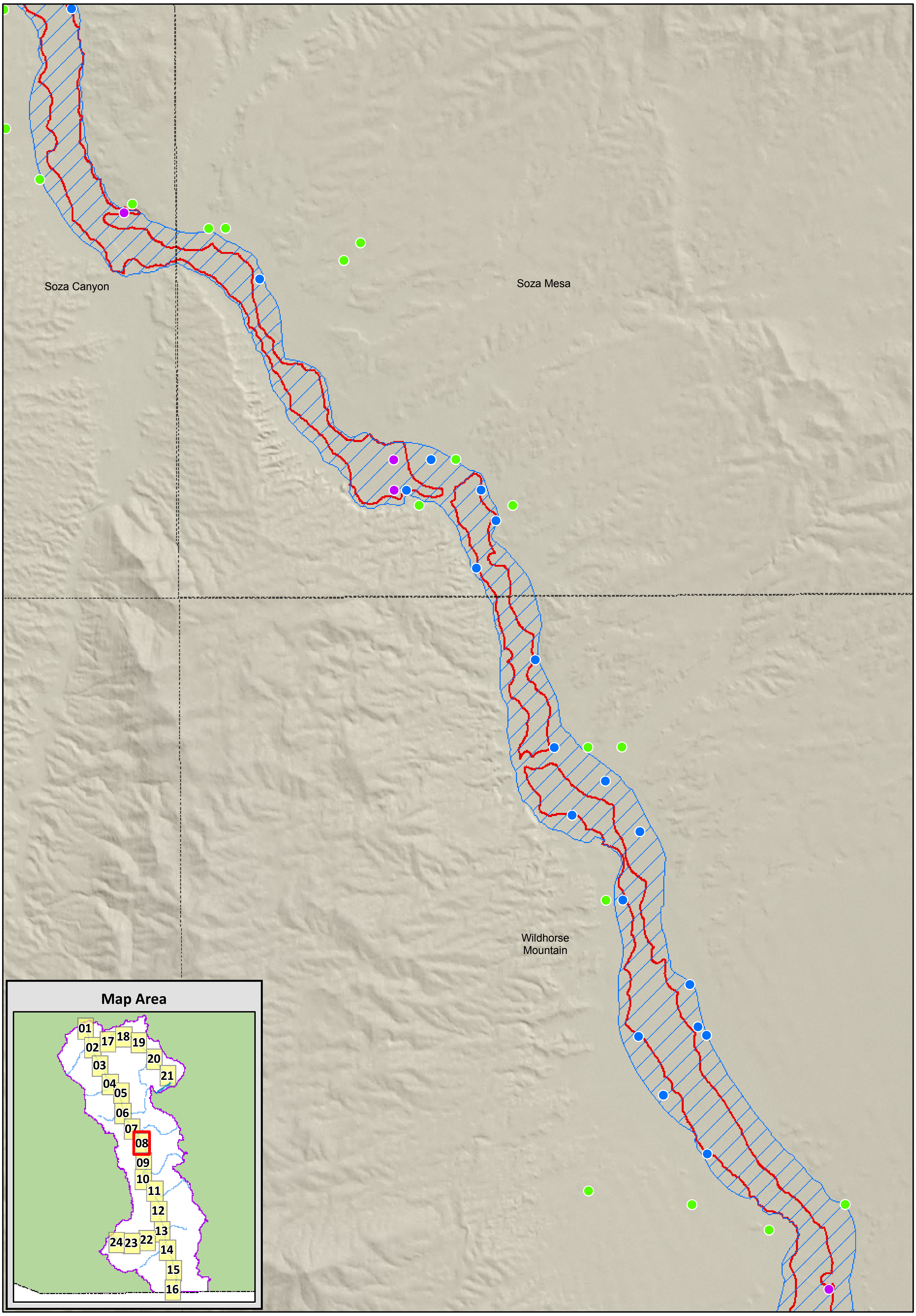
Sheet 7

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Sheet 8

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

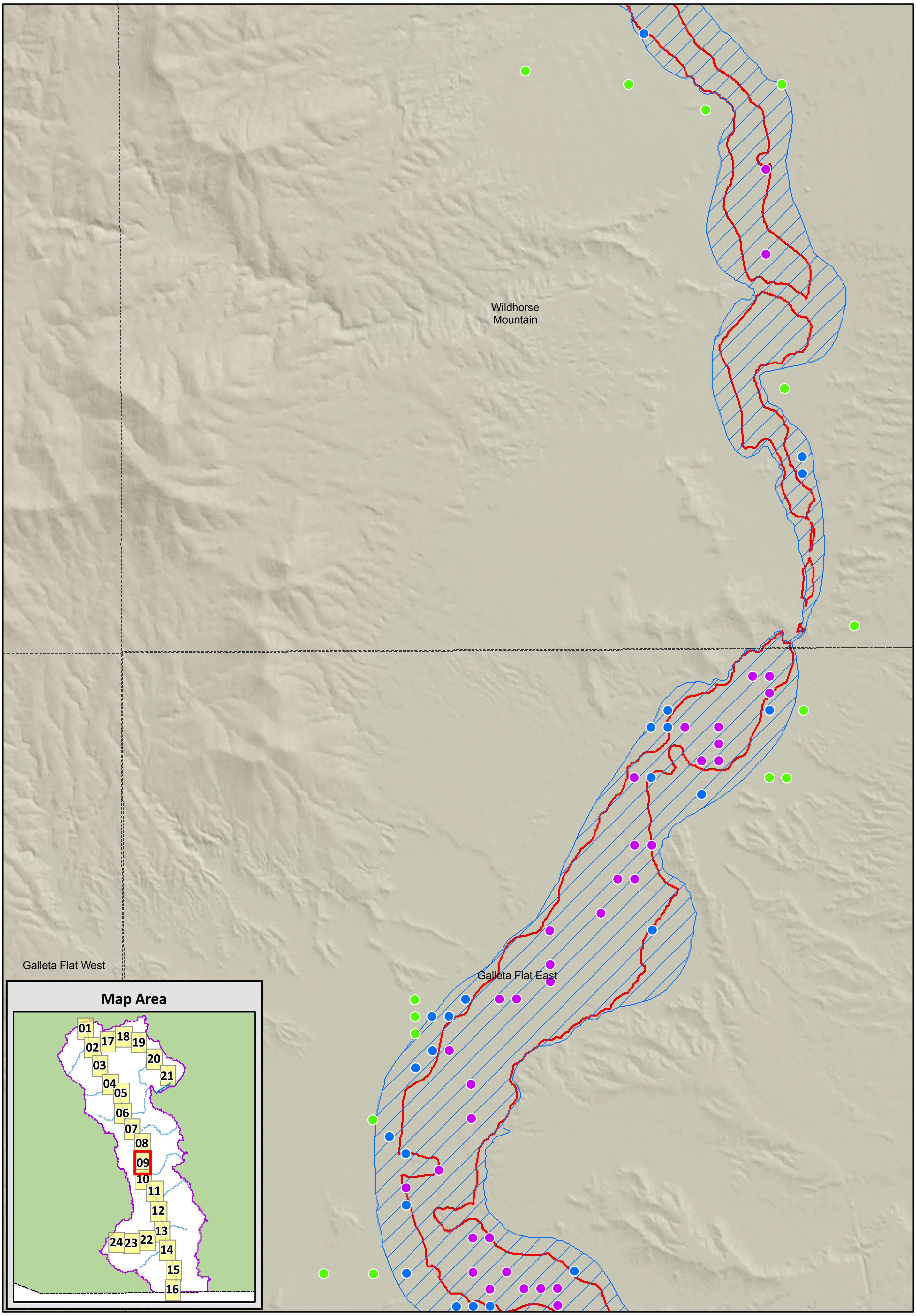
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Sheet 9

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

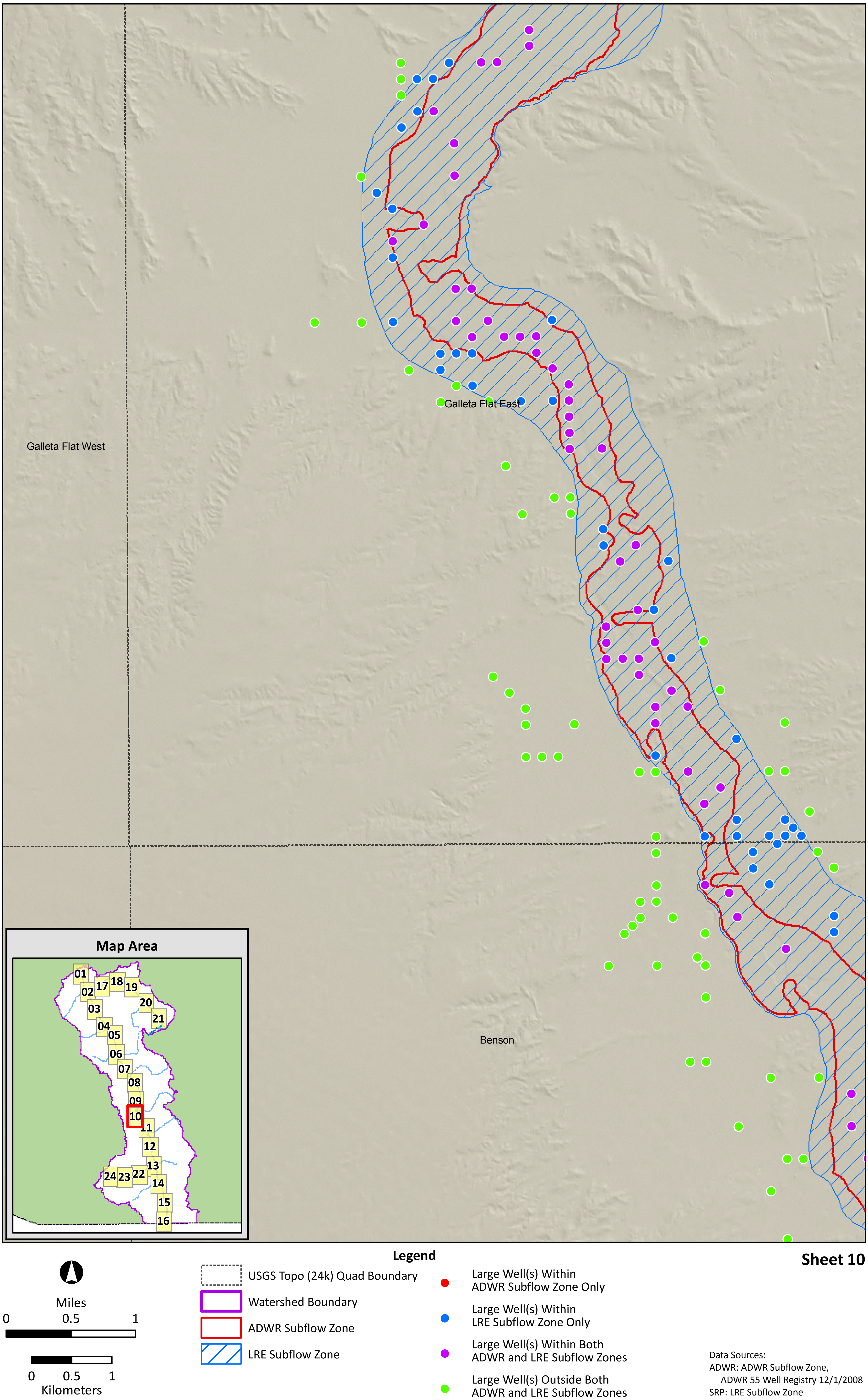
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



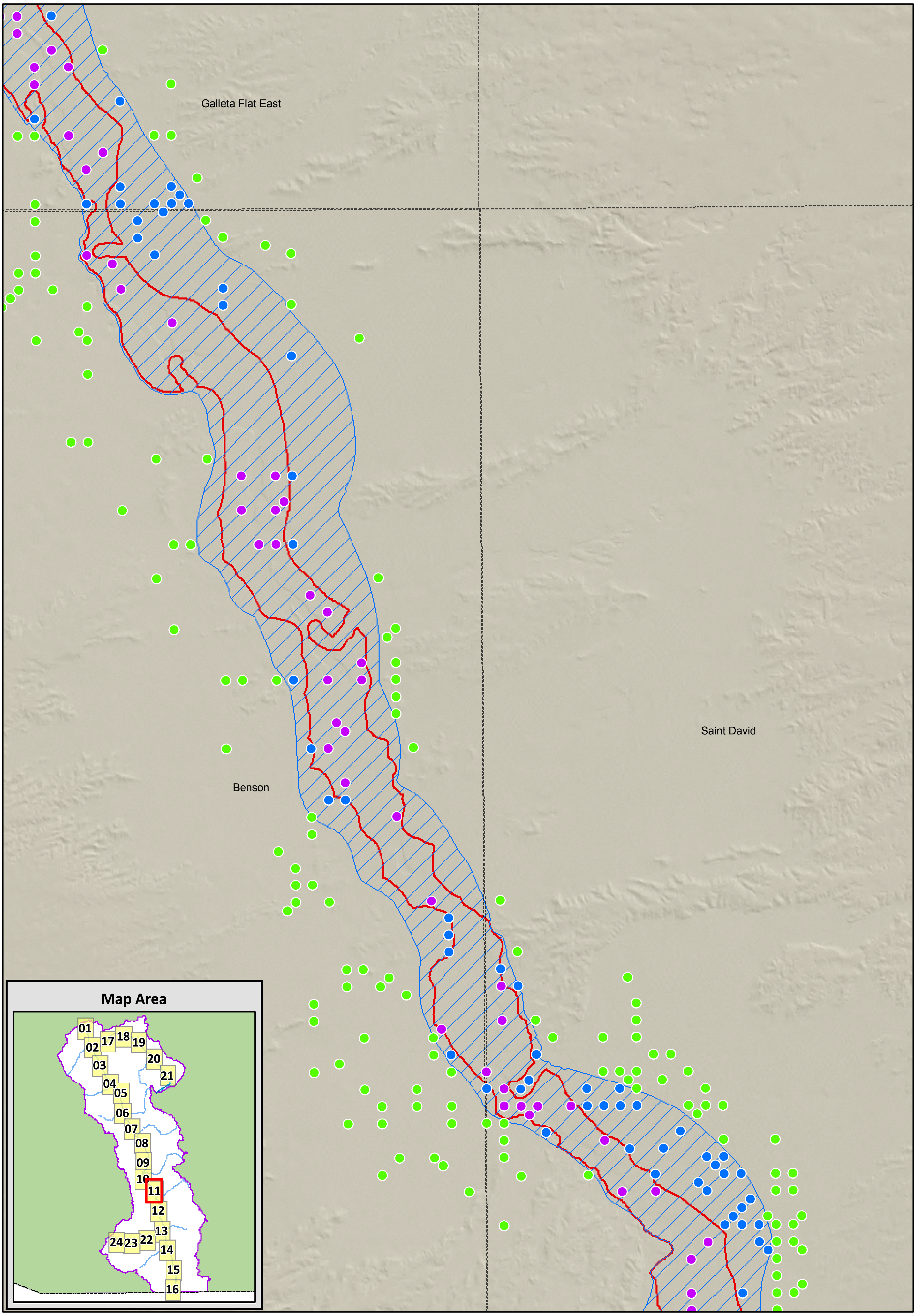
Sheet 10

Data Sources:
ADWR: ADWR Subflow Zone, ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



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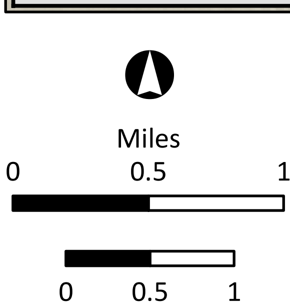


Legend

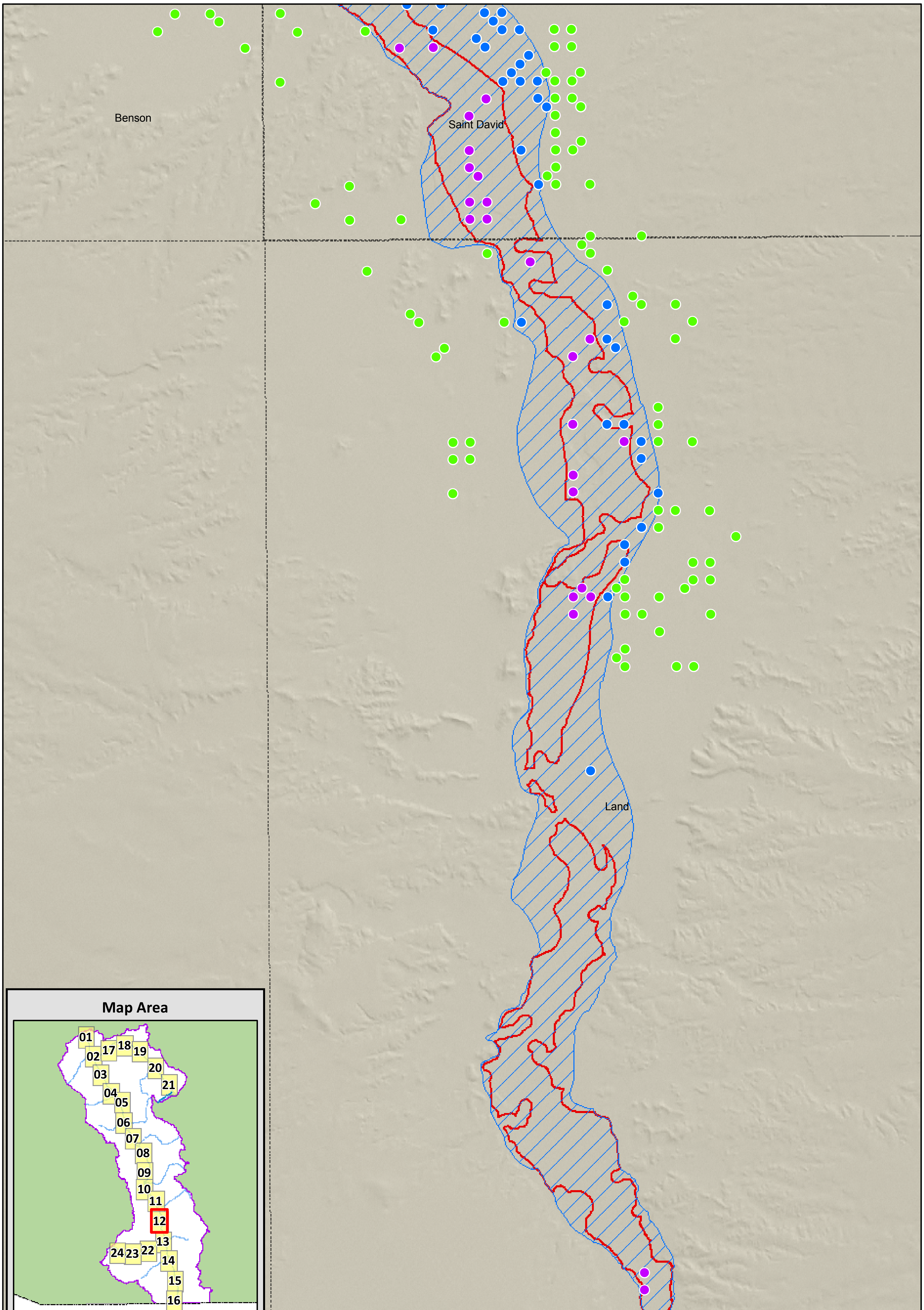
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Legend

- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

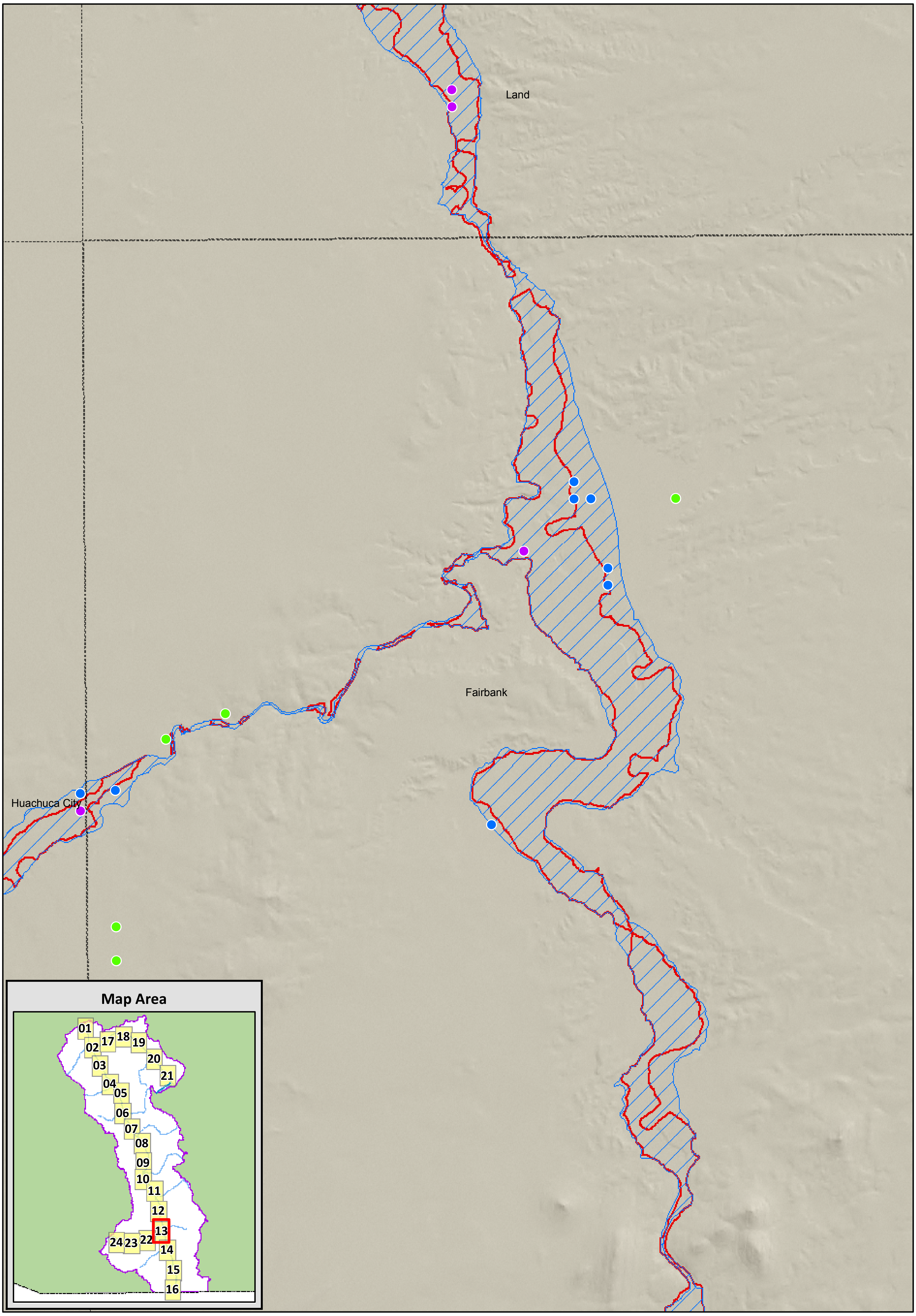
Sheet 12

Data Sources:
ADWR: ADWR Subflow Zone, ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Sheet 13

Legend

- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Miles
0 0.5 1

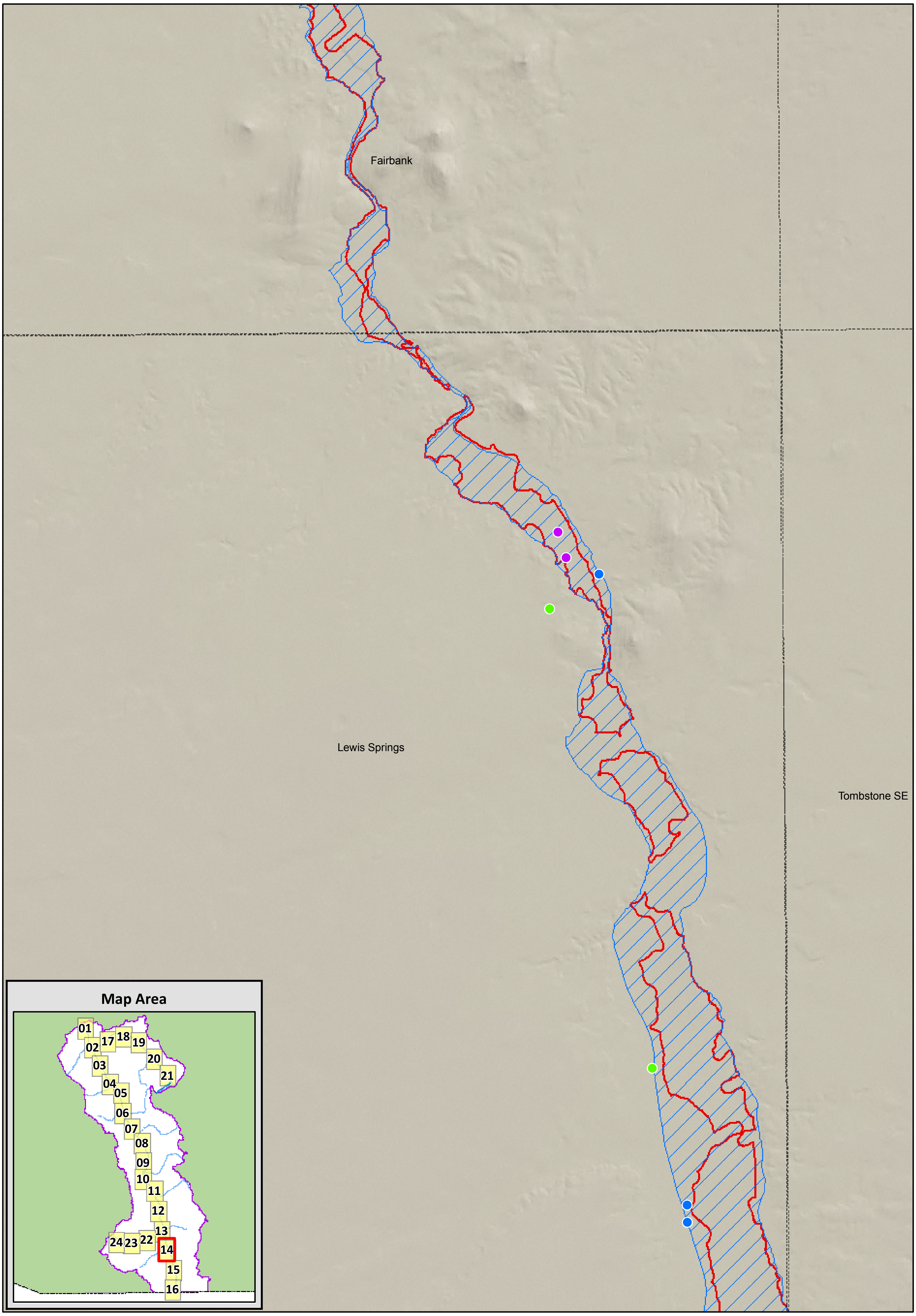
0 0.5 1
Kilometers

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Sheet 14

Miles
0 0.5 1

Kilometers
0 0.5 1

Legend

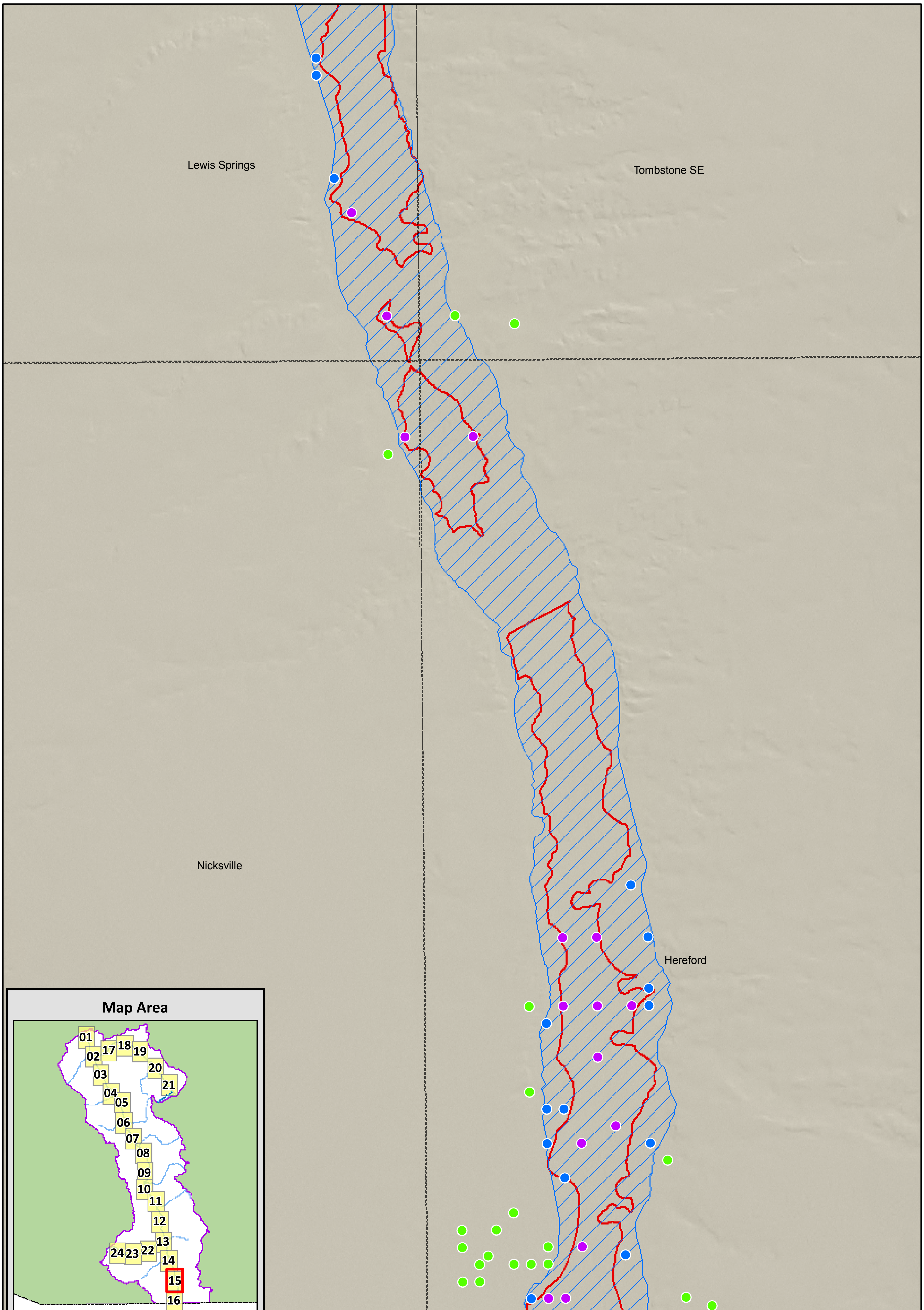
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Sheet 15

Legend

Miles
0 0.5 1

0 0.5 1
Kilometers

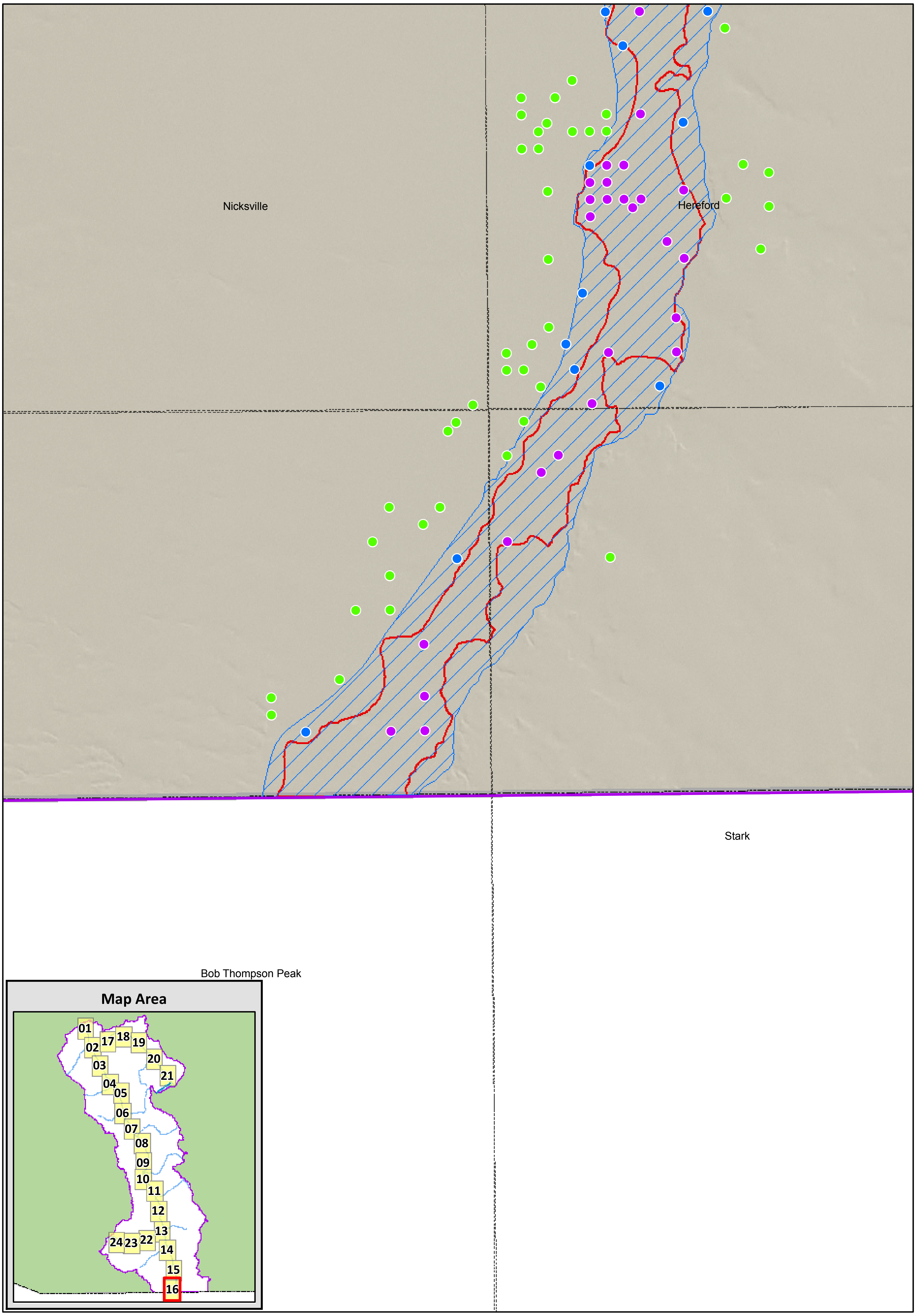
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Sheet 16

Legend

USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
LRE Subflow Zone

Large Well(s) Within ADWR Subflow Zone Only
Large Well(s) Within LRE Subflow Zone Only
Large Well(s) Within Both ADWR and LRE Subflow Zones
Large Well(s) Outside Both ADWR and LRE Subflow Zones

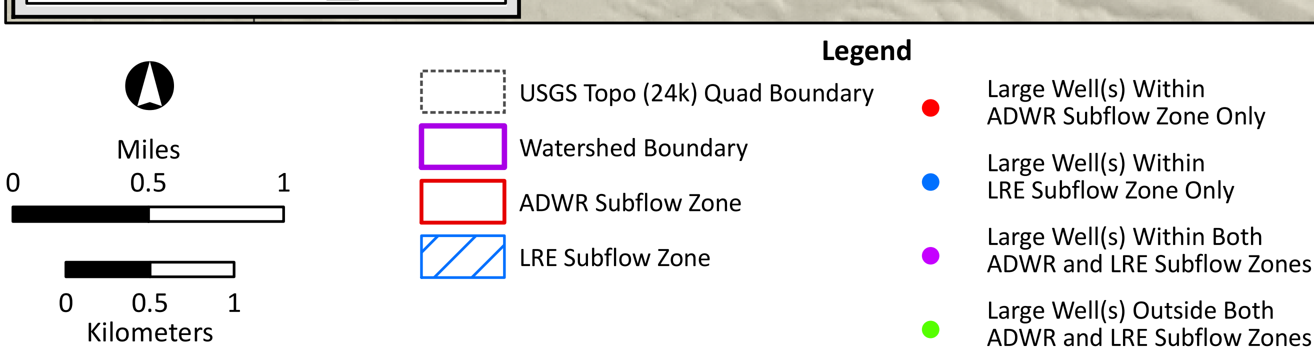
Miles
0 0.5 1

0 0.5 1
Kilometers

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Large Wells In and Near the Subflow Zone, San Pedro River

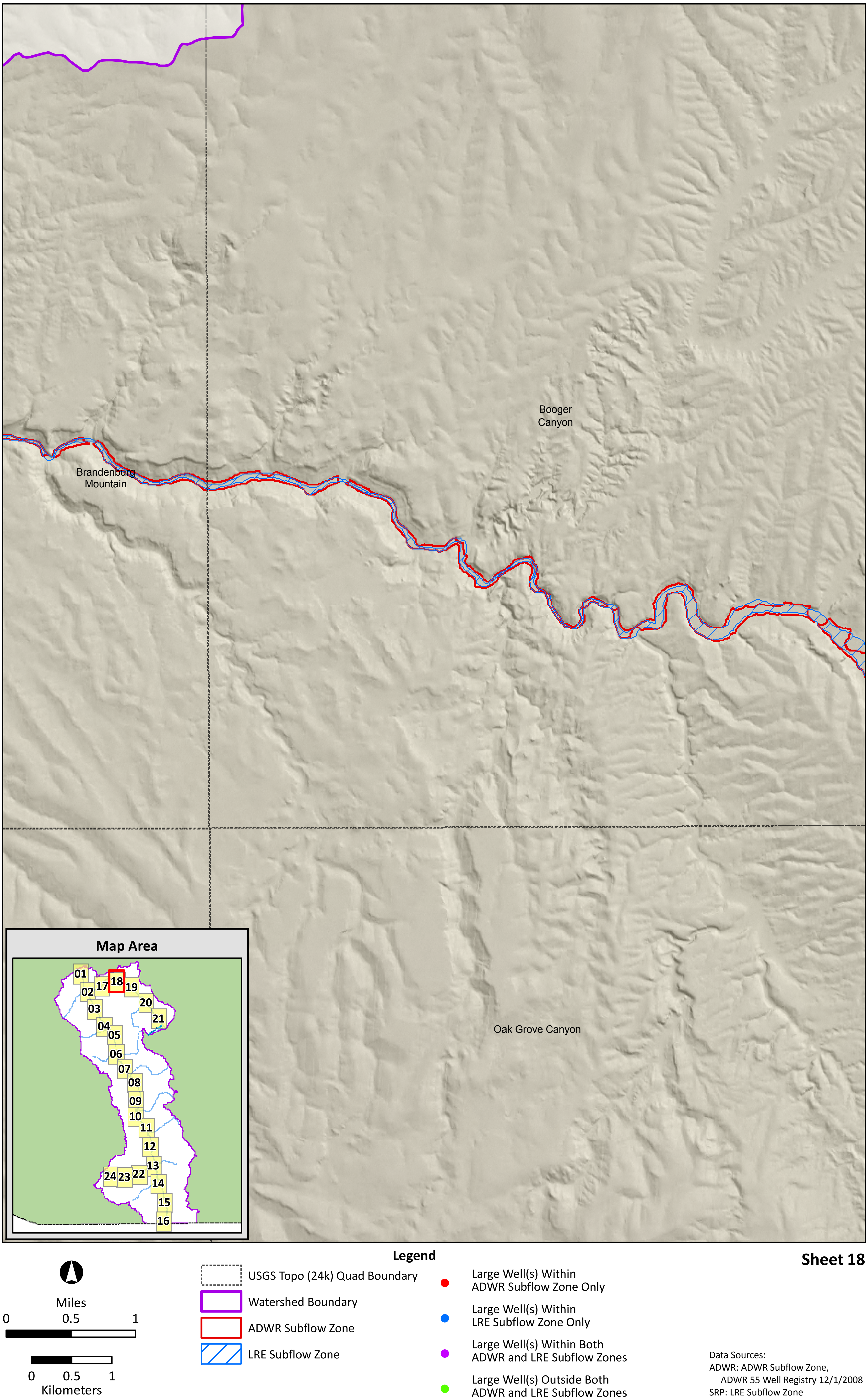


Sheet 17

Data Sources:
ADWR: ADWR Subflow Zone, ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Large Wells In and Near the Subflow Zone, San Pedro River



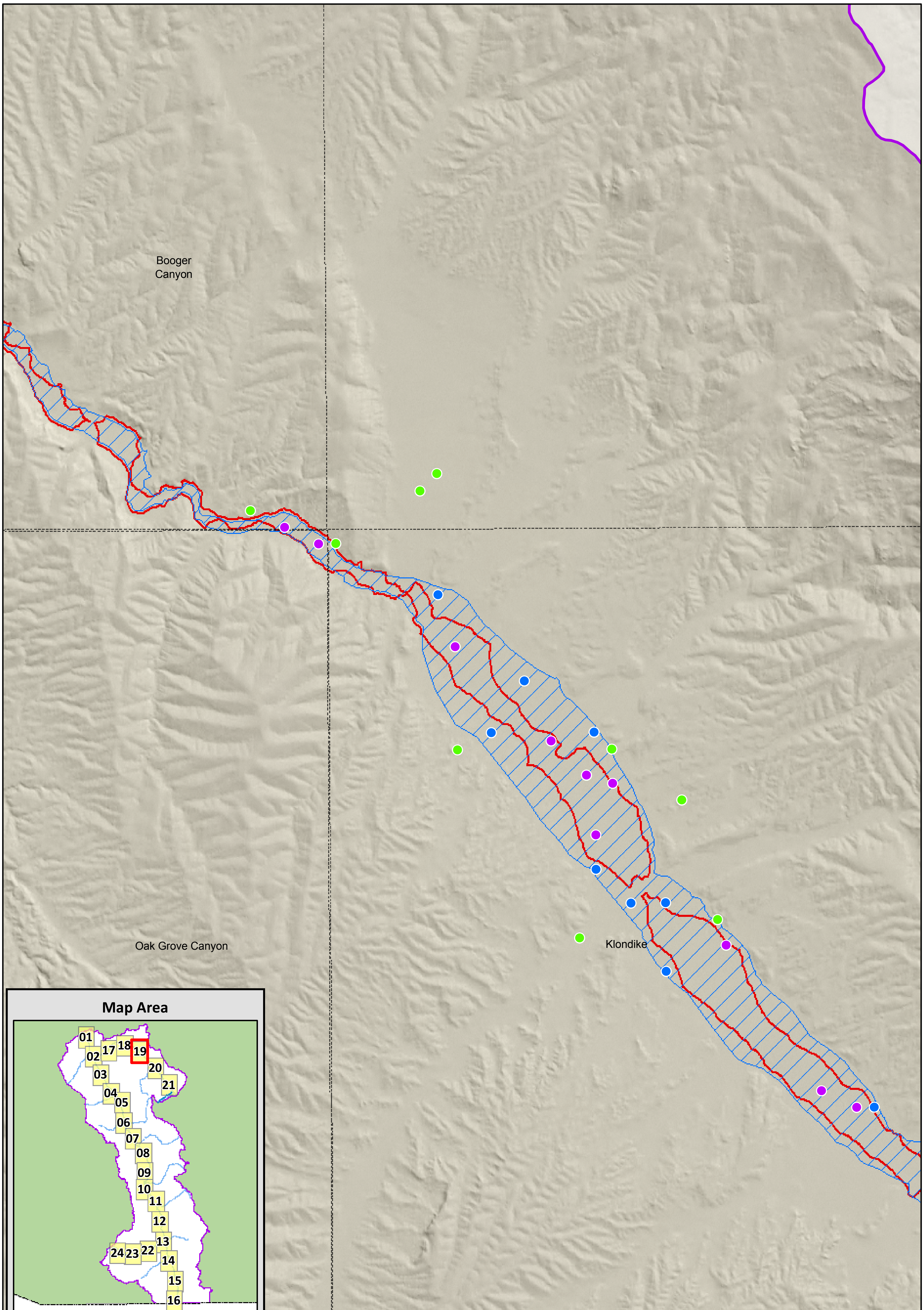
Sheet 18

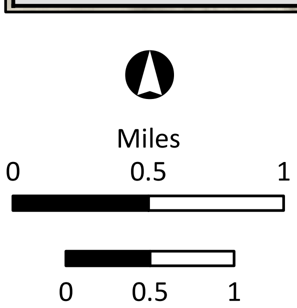
Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River





Legend

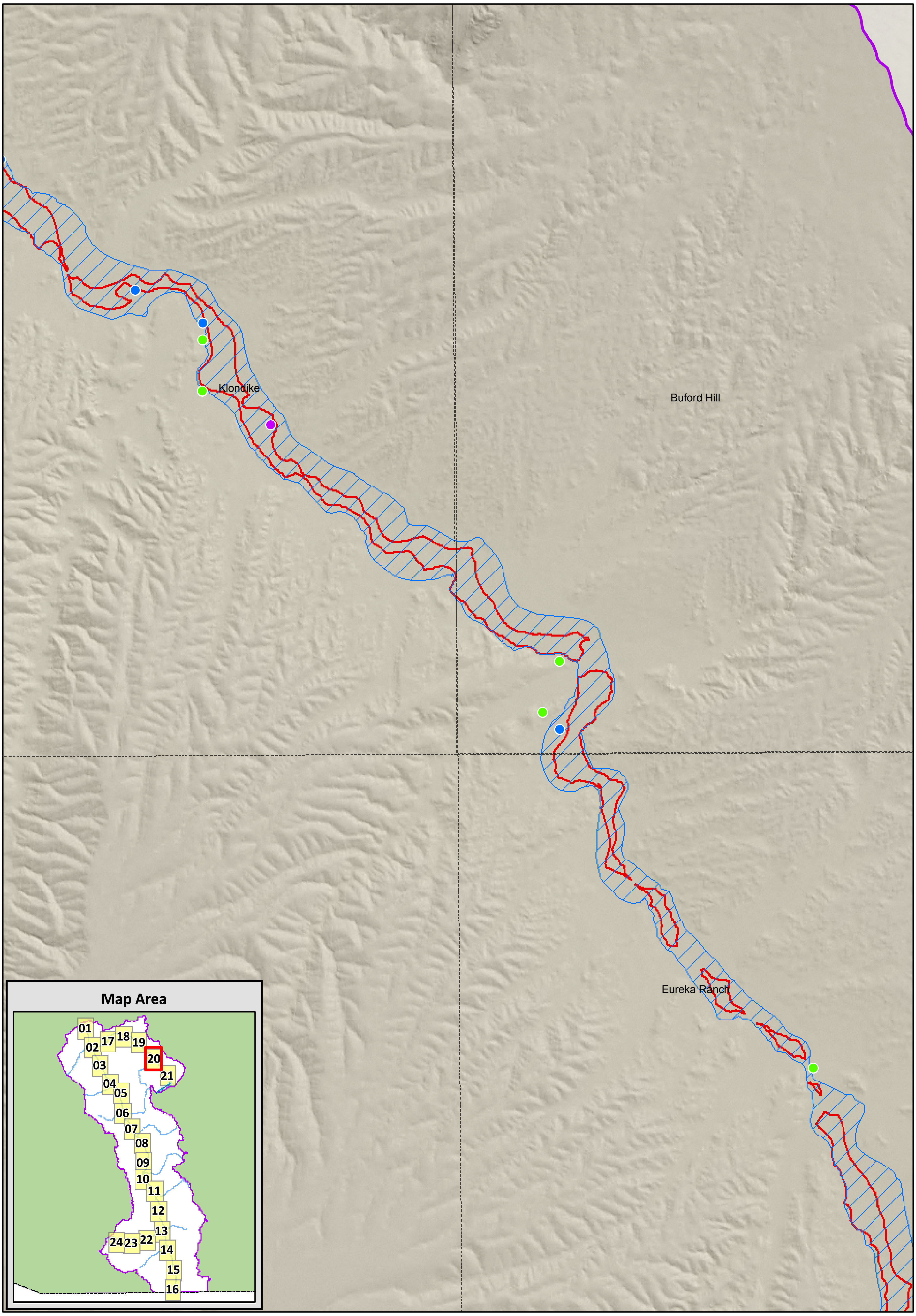
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Sheet 19

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Large Wells In and Near the Subflow Zone, San Pedro River



Sheet 20

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

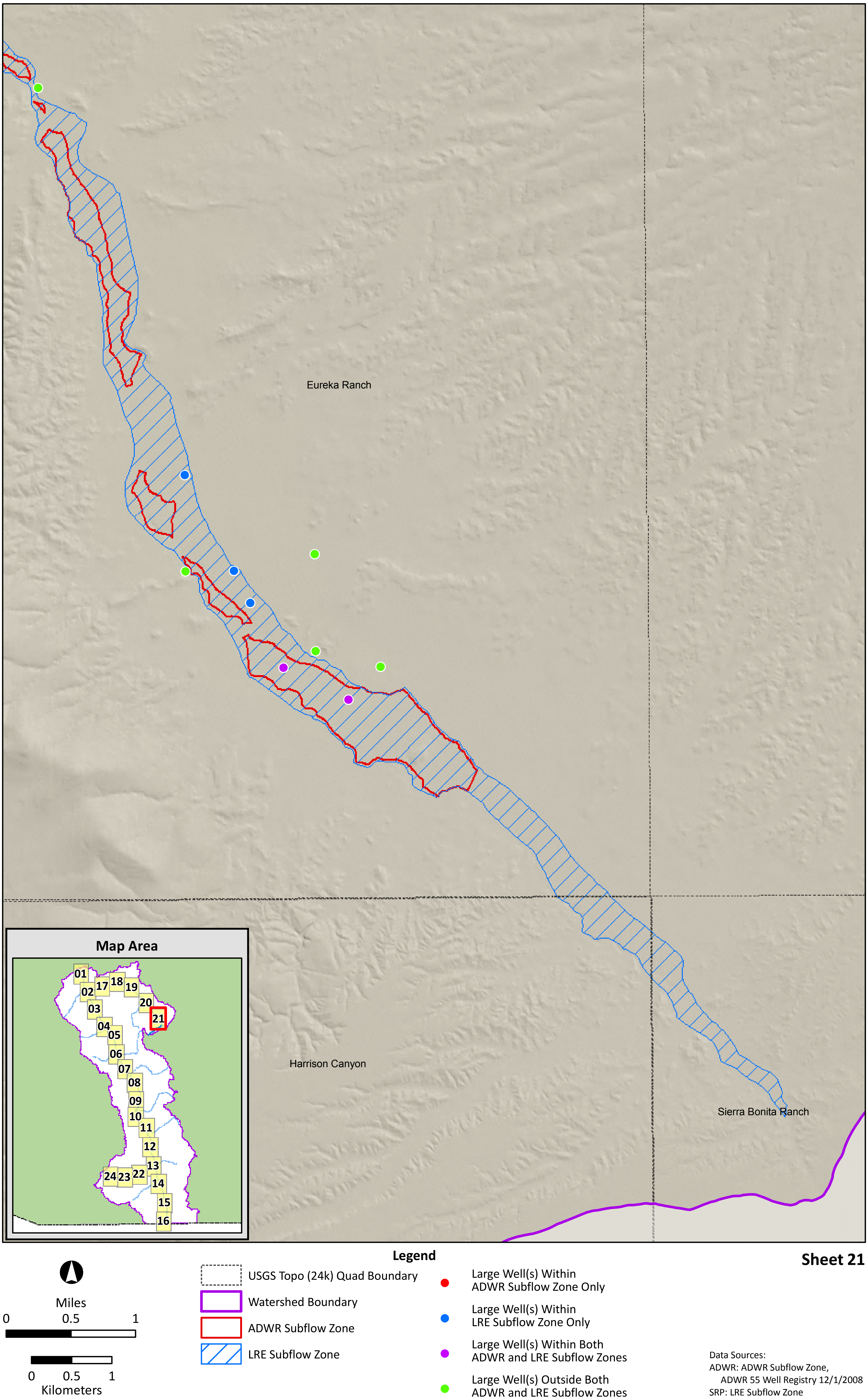
USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
LRE Subflow Zone

Large Well(s) Within ADWR Subflow Zone Only
Large Well(s) Within LRE Subflow Zone Only
Large Well(s) Within Both ADWR and LRE Subflow Zones
Large Well(s) Outside Both ADWR and LRE Subflow Zones

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Large Wells In and Near the Subflow Zone, San Pedro River



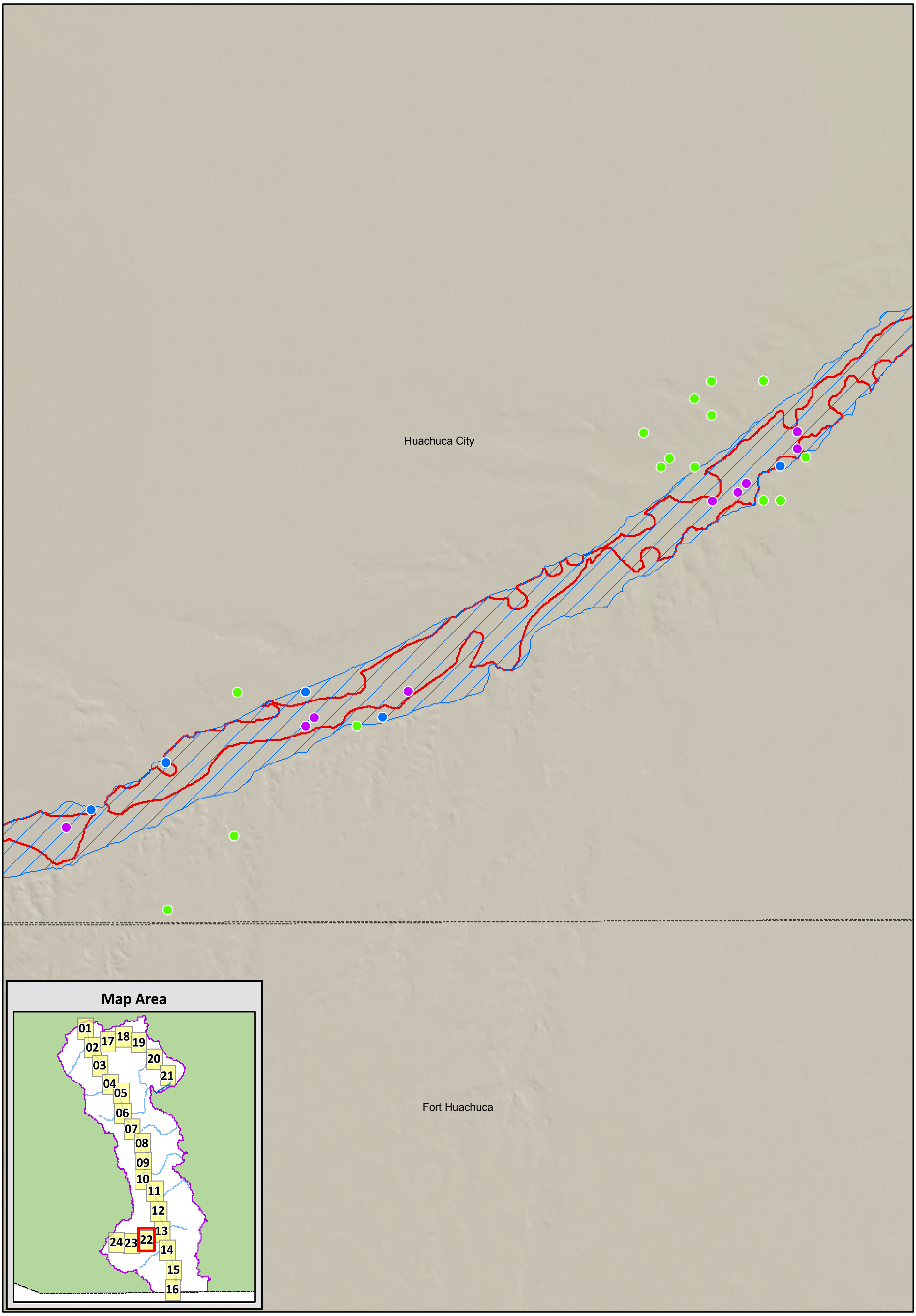
Sheet 21

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Legend

Miles
0 0.5 1

0 0.5 1
Kilometers

USGS Topo (24k) Quad Boundary
Watershed Boundary
ADWR Subflow Zone
LRE Subflow Zone

Large Well(s) Within ADWR Subflow Zone Only
Large Well(s) Within LRE Subflow Zone Only
Large Well(s) Within Both ADWR and LRE Subflow Zones
Large Well(s) Outside Both ADWR and LRE Subflow Zones

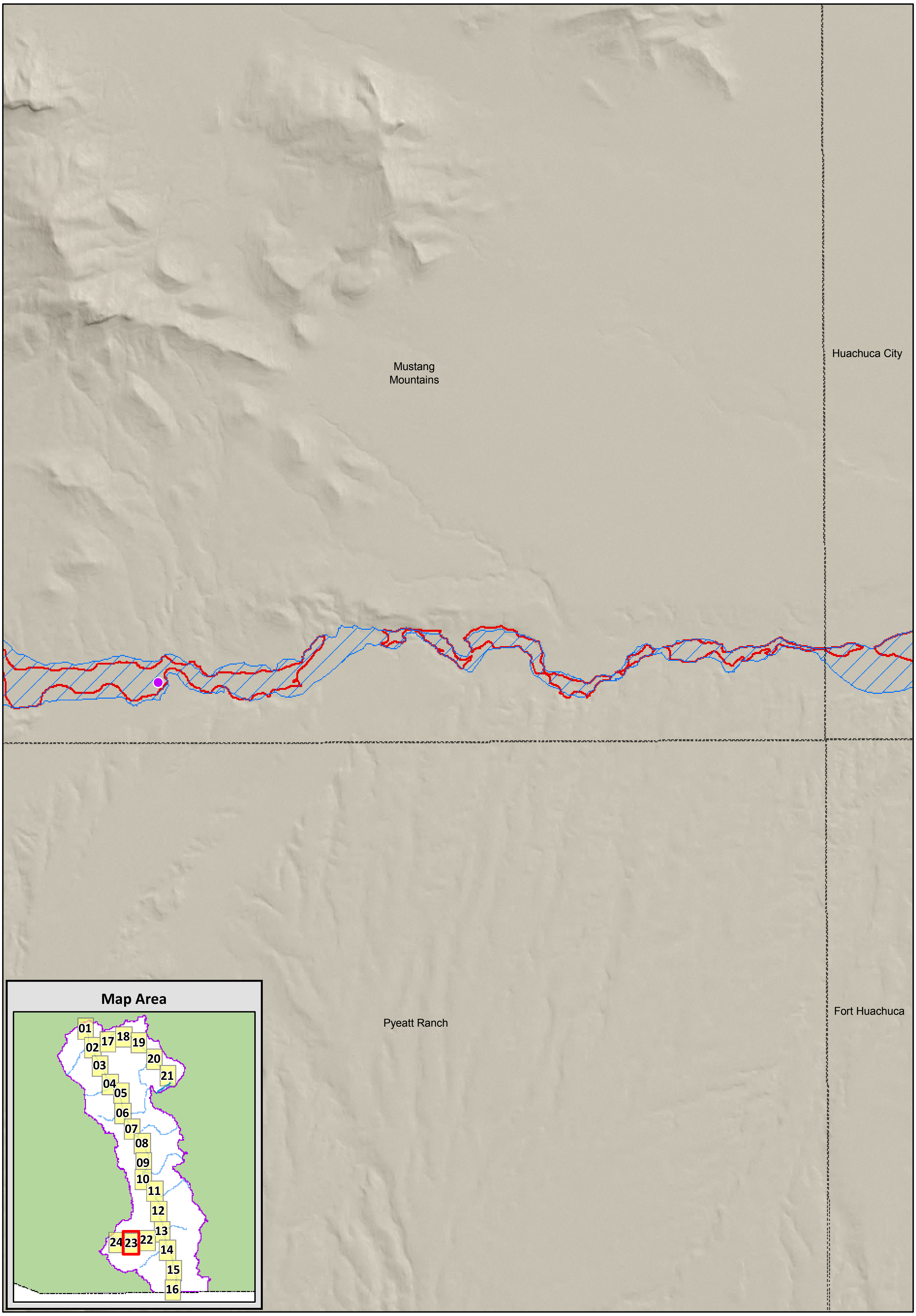
Sheet 22

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 9

Large Wells In and Near the Subflow Zone, San Pedro River



Sheet 23

Miles
0 0.5 1

0 0.5 1
Kilometers

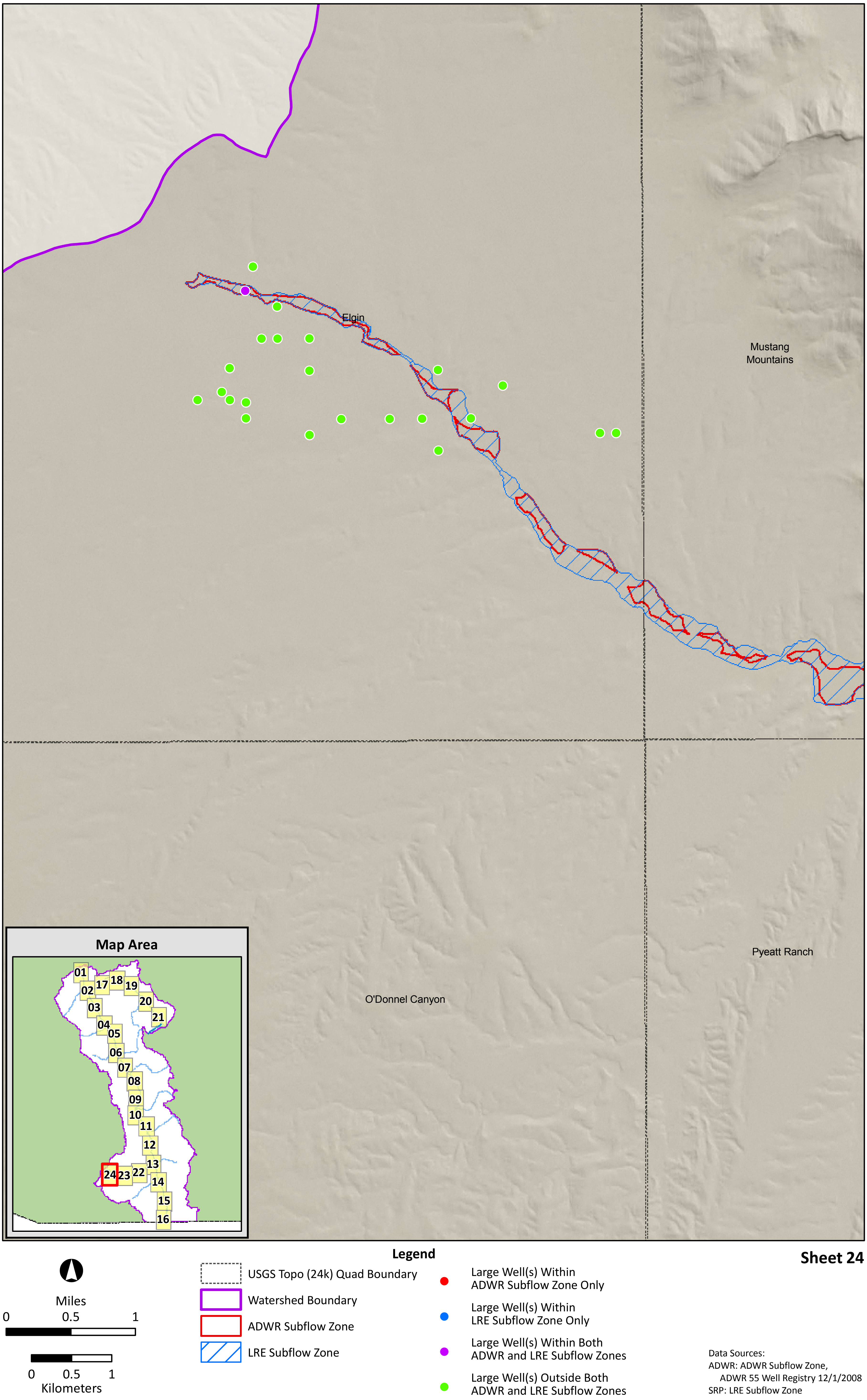
Legend

- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone
- Large Well(s) Within ADWR Subflow Zone Only
- Large Well(s) Within LRE Subflow Zone Only
- Large Well(s) Within Both ADWR and LRE Subflow Zones
- Large Well(s) Outside Both ADWR and LRE Subflow Zones

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Large Wells In and Near the Subflow Zone, San Pedro River



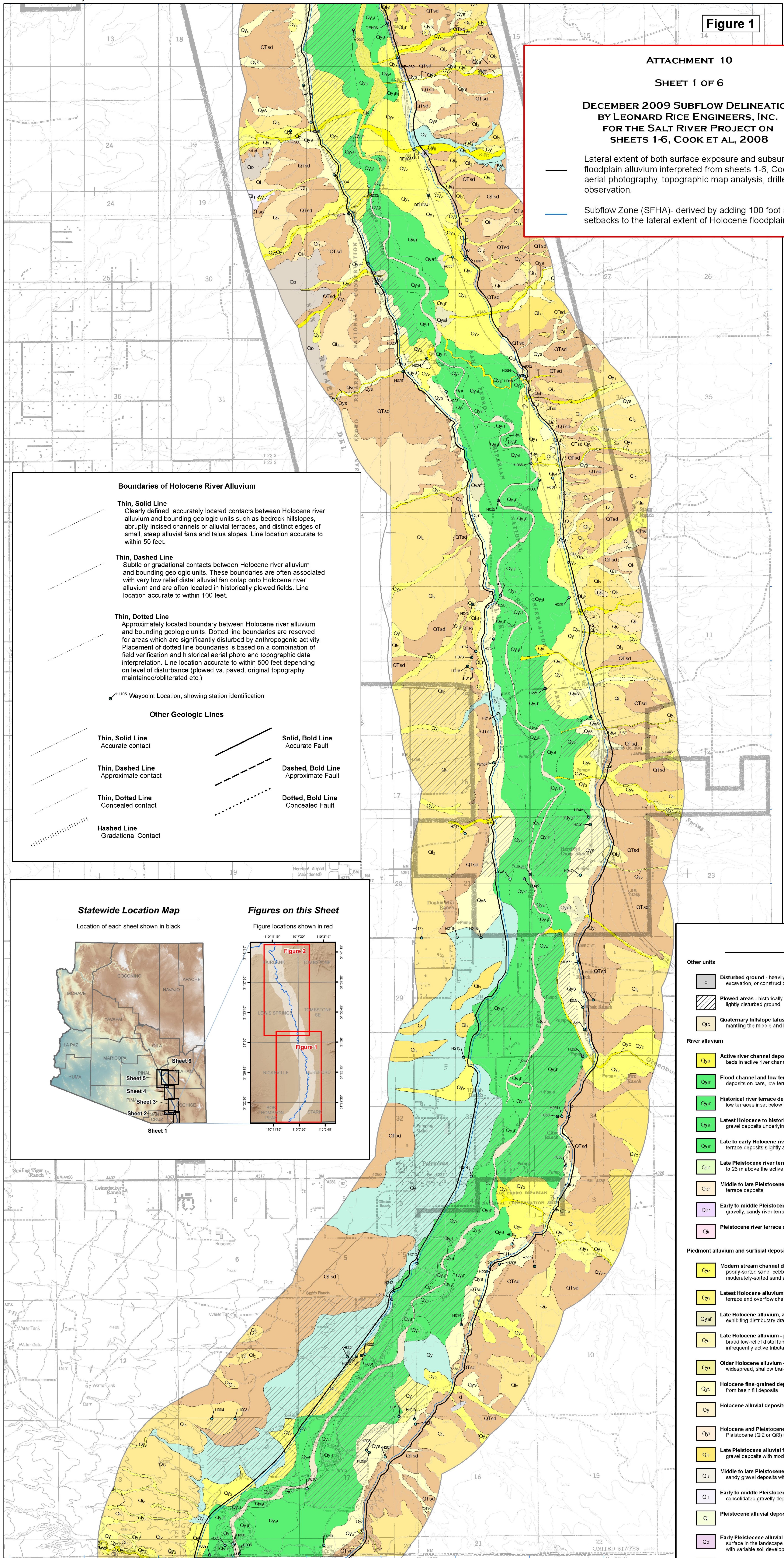
Sheet 24

Data Sources:
ADWR: ADWR Subflow Zone,
ADWR 55 Well Registry 12/1/2008
SRP: LRE Subflow Zone

SanPedro_WellsComp.mxd

Attachment 10

LRE Subflow Zone on AGS Maps



ATTACHMENT 10

SHEET 1 OF 6

DECEMBER 2009 SUBFLOW DELINEATION BY LEONARD RICE ENGINEERS, INC. FOR THE SALT RIVER PROJECT ON SHEETS 1-6, COOK ET AL, 2008

Lateral extent of both surface exposure and subsurface Holocene floodplain alluvium interpreted from sheets 1-6, Cook et al, 2008, aerial photography, topographic map analysis, drillers logs and field observation.

Subflow Zone (SFHA)- derived by adding 100 foot and 200 foot setbacks to the lateral extent of Holocene floodplain alluvium

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

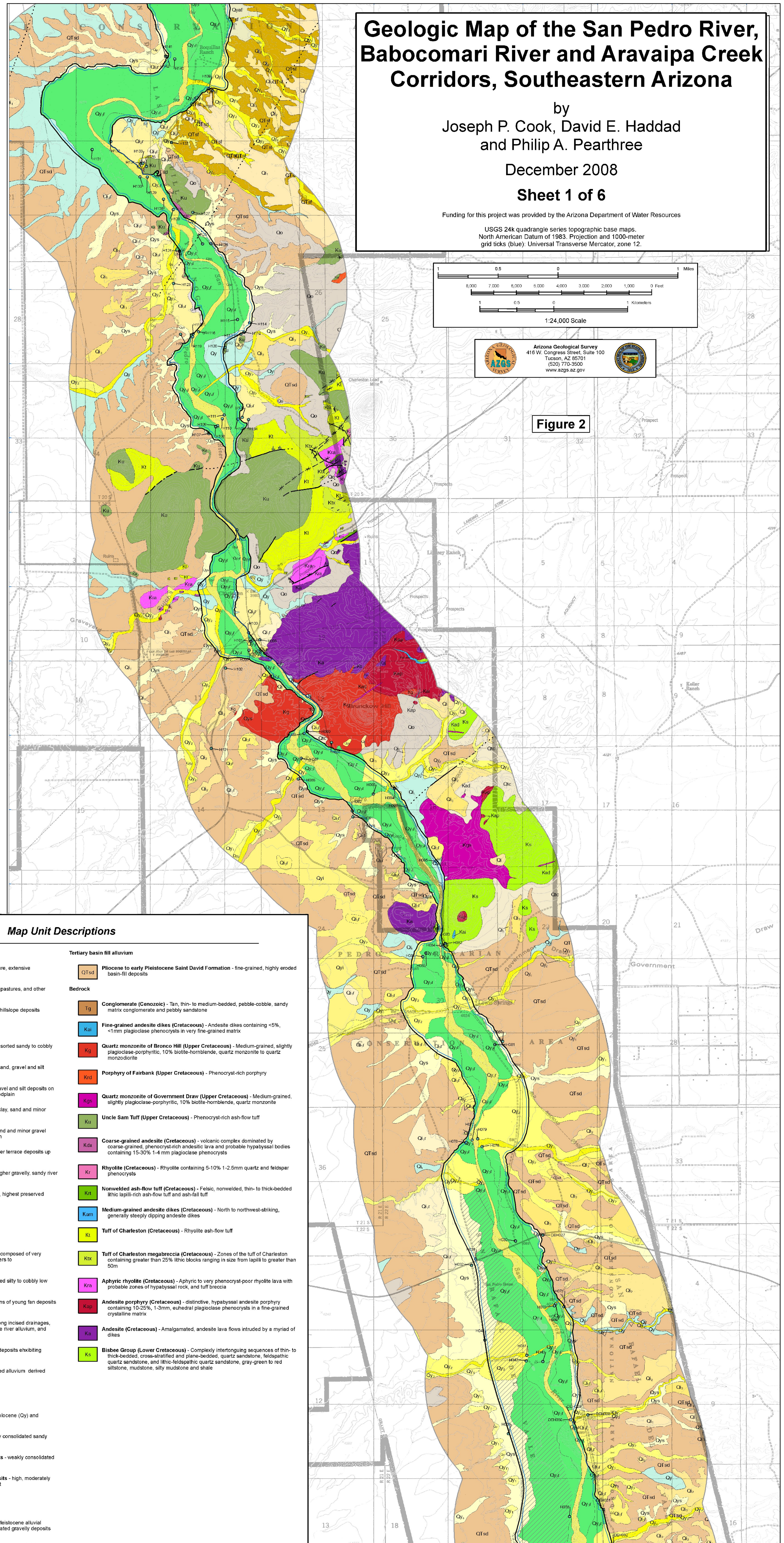
Location of each sheet shown in black

COCONINO
MOHAVE
NAVAJO
APACHE
YAVAPAI
LA PAZ
GILA
MARICOPA
YUMA
PINAL
GRAHAM
PIMA
COCHISE
SANTA CRUZ
Sheet 6
Sheet 5
Sheet 4
Sheet 3
Sheet 2
Sheet 1

Figures on this Sheet

Figure locations shown in red

Figure 2
Figure 1
FAIRBANK
TOMBSTONE
LEWIS SPRINGS
TOMBSTONE SE
NICKSVILLE
HEREFORD
BOB THOMPSON PEAK
STARK
110°11'15"
110°7'30"
110°3'45"
31°41'15"
31°37'30"
31°33'45"
31°30'
31°26'15"
31°22'30"



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

by
Joseph P. Cook, David E. Haddad and Philip A. Pearthree

December 2008

Sheet 1 of 6

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.

1 0.5 0 1 Miles
8,000 7,000 6,000 5,000 4,000 3,000 2,000 1,000 0 Feet
1 0.5 0 1 Kilometers
1:24,000 Scale

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Map Unit Descriptions

Other units

- 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 -** weakly bedded hillslope deposits mantling the middle and lower slopes of bedrock hills

River alluvium

- Qy$_{c}$r — **Active river channel deposits** - unconsolidated, very poorly sorted sandy to cobbly beds in active river channels
- Qy$_{4}$r — **Flood channel and low terrace deposits** - unconsolidated sand, gravel and silt deposits on bars, low terraces and flood channels
- Qy$_{3}$r — **Historical river terrace deposits** - unconsolidated sand, gravel and silt deposits on low terraces inset below the abandoned early historical floodplain
- Qy$_{2}$r — **Latest Holocene to historical river terrace deposits** - silt, clay, sand and minor gravel deposits underlying the early historical floodplain
- Qy$_{1}$r — **Late to early Holocene river terrace deposits** - silt, clay, sand and minor gravel terrace deposits slightly above the early historical floodplain
- Qi$_{3}$r — **Late Pleistocene river terrace deposits** - gravelly, sandy river terrace deposits up to 25 m above the active river channel
- Qi$_{2}$r — **Middle to late Pleistocene river terrace deposits** - older, higher gravelly, sandy river terrace deposits
- Qi$_{1}$r — **Early to middle Pleistocene river terrace deposits** - oldest, highest preserved gravelly, sandy river terrace deposits
- Qi$_{r}$ — **Pleistocene river terrace deposits, undifferentiated**

Piedmont alluvium and surficial deposits

- 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
- Qy — **Holocene alluvial deposits, undifferentiated**
- Qyi — **Holocene and Pleistocene alluvium** - mixed fine-grained Holocene (Qy) and Pleistocene (Qi2 or Qi3) alluvium
- 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
- Qi — **Pleistocene alluvial deposits, undifferentiated**
- Qo — **Early Pleistocene alluvial fan deposits** - highest standing Pleistocene alluvial surface in the landscape composed of moderately consolidated gravelly deposits with variable soil development
- Qcg — **Early Pleistocene cobble conglomerate** - cobble conglomerate cemented by calcium carbonate

Tertiary basin fill alluvium

- QTsd — **Pliocene to early Pleistocene Saint David Formation** - fine-grained, highly eroded basin-fill deposits

Bedrock

- Tg — **Conglomerate (Cenozoic)** - Tan, thin- to medium-bedded, pebble-cobble, sandy matrix conglomerate and pebbly sandstone
- Kai — **Fine-grained andesite dikes (Cretaceous)** - Andesite dikes containing <5%, <1mm plagioclase phenocrysts in very fine-grained matrix
- Kg — **Quartz monzonite of Bronco Hill (Upper Cretaceous)** - Medium-grained, slightly plagioclase-porphyritic, 10% biotite-hornblende, quartz monzonite to quartz monzodiorite
- Krd — **Porphyry of Fairbank (Upper Cretaceous)** - Phenocryst-rich porphyry
- Kgs — **Quartz monzonite of Government Draw (Upper Cretaceous)** - Medium-grained, slightly plagioclase-porphyritic, 10% biotite-hornblende, quartz monzonite
- Ku — **Uncle Sam Tuff (Upper Cretaceous)** - Phenocryst-rich ash-flow tuff
- Kdx — **Coarse-grained andesite (Cretaceous)** - volcanic complex dominated by coarse-grained, phenocryst-rich andesitic lava and probable hypabyssal bodies containing 15-30% 1-4 mm plagioclase phenocrysts
- Kr — **Rhyolite (Cretaceous)** - Rhyolite containing 5-10% 1-2.5mm quartz and feldspar phenocrysts
- Krt — **Nonwelded ash-flow tuff (Cretaceous) -** Felsic, nonwelded, thin- to thick-bedded lithic lapilli-rich ash-flow tuff and ash-fall tuff
- Kam — **Medium-grained andesite dikes (Cretaceous)** - North to northwest-striking, generally steeply dipping andesite dikes
- Kt — **Tuff of Charleston (Cretaceous)** - Rhyolite ash-flow tuff
- Ktx — **Tuff of Charleston megabreccia (Cretaceous)** - Zones of the tuff of Charleston containing greater than 25% lithic blocks ranging in size from lapilli to greater than 50m
- Kra — **Aphyric rhyolite (Cretaceous)** - Aphyric to very phenocryst-poor rhyolite lava with probable zones of hypabyssal rock, and tuff breccia
- Kap — **Andesite porphyry (Cretaceous)** - distinctive, hypabyssal andesite porphyry containing 10-25%, 1-3mm, euhedral plagioclase phenocrysts in a fine-grained crystalline matrix
- 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

Statewide Location Map

Location of each sheet shown in black

Figures on this Sheet

Figure locations shown in red

Map Unit Descriptions

Other units

- d — **Disturbed ground** - heavily disturbed ground due to agriculture, extensive excavation, or construction of earth dams
- **Plowed areas** - historically or actively plowed fields, irrigated pastures, and other lightly disturbed ground
- Qtc — **Quaternary hillslope talus and colluvium** - weakly bedded hillslope deposits mantling the middle and lower slopes of bedrock hills

River alluvium

- 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
- Qor — **Early Pleistocene river terrace deposits** - very high remnant river terrace deposits located 30 to 40 m above the active channel emanating from Babocomari Wash

Piedmont alluvium and surficial deposits

- 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
- Qy — **Holocene alluvial deposits, undifferentiated**
- Qys — **Holocene fine-grained deposits** - unconsolidated alluvium derived predominantly from basin fill deposits
- Qyi — **Holocene and Pleistocene alluvium** - mixed fine-grained Holocene (Qy) and Pleistocene (Qi2 or Qi3) alluvium
- Qi_{3} — **Late Pleistocene alluvial fan and terrace deposits** - weakly consolidated sandy gravel deposits with moderate soil development
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- 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
- Qcg — **Early Pleistocene cobble conglomerate** - cobble conglomerate cemented by calcium carbonate
- QTa — **Late Pliocene to early Pleistocene fan gravel** - coarse, moderately to well-consolidated gravelly deposits capping high rounded ridges

Tertiary basin fill alluvium

- QTbf — **Early Pleistocene fine-grained basin-floor alluvium** - very old relict basin floor deposits forming a minimally dissected surface
- QTsd — **Pliocene to early Pleistocene Saint David Formation** - fine-grained, highly eroded basin-fill deposits
- Tsy — **Pliocene to middle Miocene deposits** - moderately to strongly indurated conglomerate and sandstone basin fill deposits

Bedrock

- Tg — **Conglomerate** - tan, thin- to medium-bedded, pebble-cobble, sandy matrix conglomerate and pebbly sandstone
- Tsc — **Sandstones and conglomerates** - reddish mudstones and sandstones to tan sandstones and conglomerates
- Tgm — **Mafic dikes** - mafic dikes within or adjacent to older deformed gravels, Tg
- Krd — **Porphyry of Fairbank** - phenocryst-rich porphyry
- Ku — **Uncle Sam Tuff** - phenocryst-rich ash-flow tuff
- Kux — **Uncle Sam Tuff megabreccia** - zones of megabreccia within the Uncle Sam Tuff
- Kuxa — **Uncle Sam Tuff andesite megabreccia** - zones of monolithic, andesite lava megabreccia within the Uncle Sam Tuff
- Kdx — **Coarse-grained andesite** - volcanic complex dominated by coarse-grained, phenocryst-rich andesitic lava and probable hypabyssal bodies
- Kt — **Tuff of Charleston** - rhyolite ash-flow tuff
- Kra — **Aphyric rhyolite** - aphyric to very phenocryst-poor rhyolite lava with probable zones of hypabyssal rock, and tuff breccia
- Ka — **Andesite** - amalgamated, andesite lava flows intruded by a myriad of dikes
- Ks — **Bisbee Group** - complexly intertonguing sequences of sandstone, mudstone, shale, and conglomerate
- Jtrm — **Volcanic and sedimentary rocks of Mustang Mountain** - siliceous flows and minor welded tuff
- Jtrms — **Volcanic and sedimentary rocks of Mustang Mountain** - conglomerate, sandstone, siltstone, mudstone, and volcanic rocks
- Pcn — **Concha limestone** - light-gray relatively thick-bedded limestone with abundant distinctive chert nodules
- Ps — **Scherrer Formation** - quartzose sandstone and dolomite
- Pe — **Epitaph dolomite** - dolomite and limestone, marl, siltstone, and gypsum
- Pc — **Colina limestone** - medium-to dark-gray limestone

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

by

Ann Youberg, Philip A. Pearthree, Joe P. Cook, Erica R. Bigio

December 2008

Sheet 2 of 6

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.

1 0.5 0 1 Miles

1 0.5 0 1 Kilometers

0 1000 2000 3000 4000 5000 Feet

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Attachment 10

Sheet 2 of 6

December 2009 Subflow Delineation by Leonard Rice Engineers, Inc. for the Salt River Project on sheets 1-6, Cook et al, 2008

- Lateral extent of both surface exposure and subsurface Holocene floodplain alluvium interpreted from sheets 1-6, Cook et al, 2008, aerial photography, topographic map analysis, drillers logs and field observation.
- Subflow Zone (SFHA)- derived by adding 100 foot and 200 foot setbacks to the lateral extent of Holocene floodplain alluvium

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

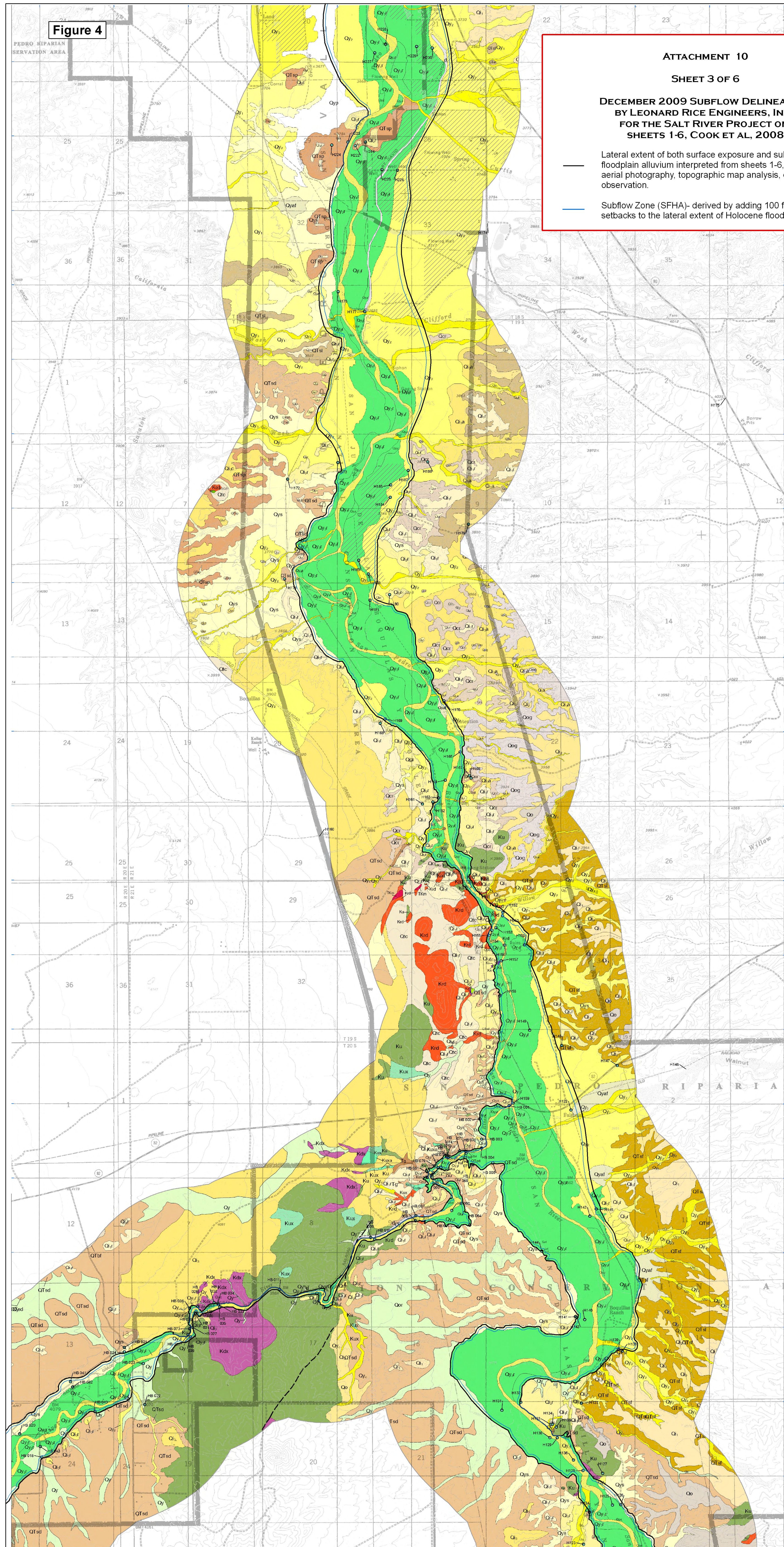
Thin, Dotted Line Concealed contact

Hashed Line Gradational Contact

Solid, Bold Line Accurate Fault

Dashed, Bold Line Approximate Fault

Dotted, Bold Line Concealed Fault



ATTACHMENT 10

SHEET 3 OF 6

DECEMBER 2009 SUBFLOW DELINEATION
BY LEONARD RICE ENGINEERS, INC.
FOR THE SALT RIVER PROJECT ON
SHEETS 1-6, COOK ET AL. 2008

Lateral extent of both surface exposure and subsurface Holocene floodplain alluvium interpreted from sheets 1-6, Cook et al. 2008, aerial photography, topographic map analysis, drillers logs and field observation.

Subflow Zone (SFHA)- derived by adding 100 foot and 200 foot setbacks to the lateral extent of Holocene floodplain alluvium

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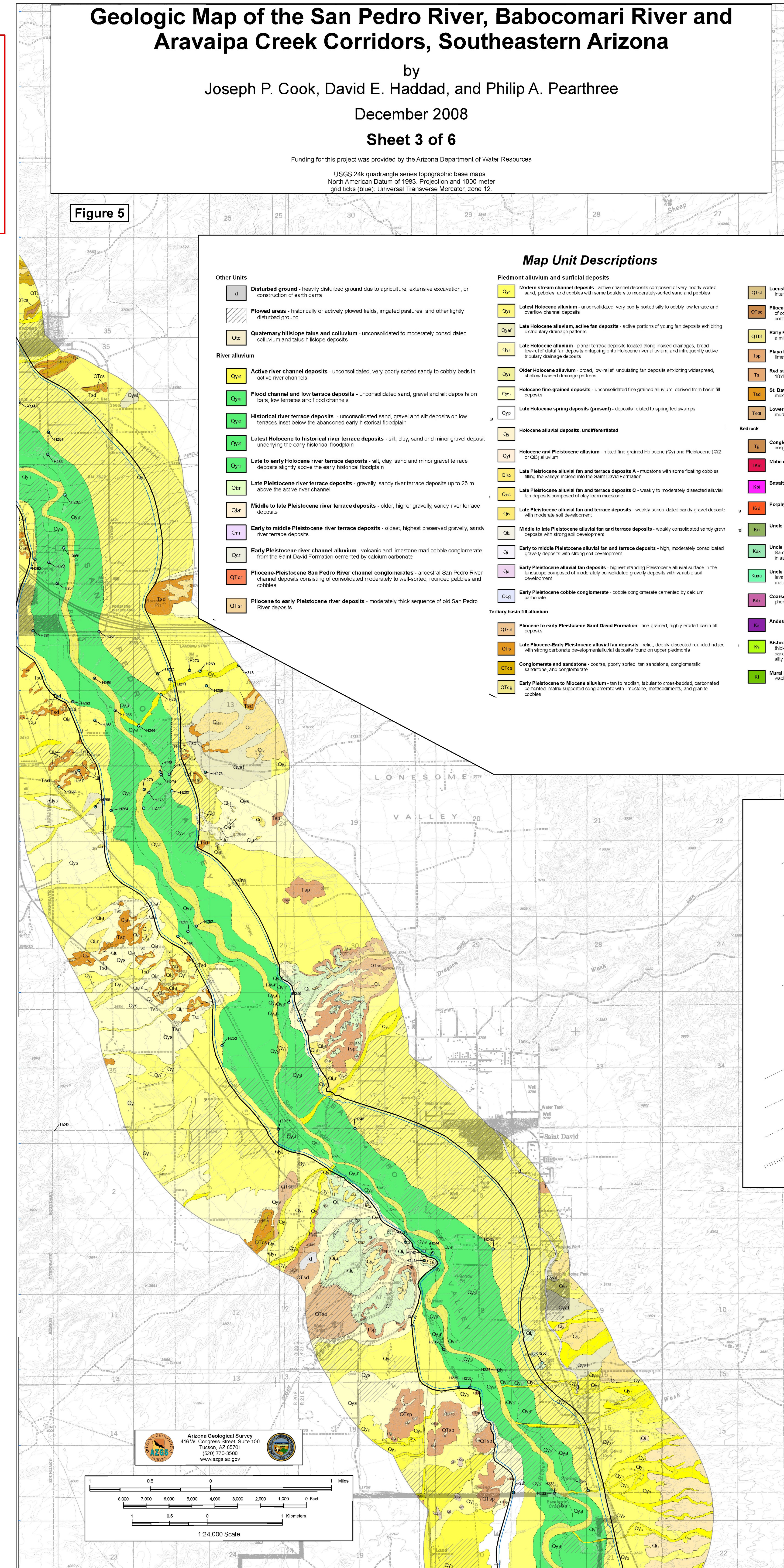

Map Unit Descriptions

Other Units

- d — **Disturbed ground** - heavily disturbed ground due to agriculture, extensive excavation, or construction of earth dams
- **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

- Qycr — **Active river channel deposits** - unconsolidated, very poorly sorted sandy to cobbly beds in active river channels
- Qy4r — **Flood channel and low terrace deposits** - unconsolidated sand, gravel and silt deposits on bars, low terraces and flood channels
- Qy3r — **Historical river terrace deposits** - unconsolidated sand, gravel and silt deposits on low terraces inset below the abandoned early historical floodplain
- Qy2r — **Latest Holocene to historical river terrace deposits** - silt, clay, sand and minor gravel deposit underlying the early historical floodplain
- Qy1r — **Late to early Holocene river terrace deposits** - silt, clay, sand and minor gravel terrace deposits slightly above the early historical floodplain
- Qi3r — **Late Pleistocene river terrace deposits** - gravelly, sandy river terrace deposits up to 25 m above the active river channel
- Qi2r — **Middle to late Pleistocene river terrace deposits** - older, higher gravelly, sandy river terrace deposits
- Qi1r — **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
- QTcr — **Pliocene-Pleistocene San Pedro River channel conglomerates** - ancestral San Pedro River channel deposits consisting of consolidated moderately to well-sorted, rounded pebbles and cobbles
- QTsr — **Pliocene to early Pleistocene river deposits** - moderately thick sequence of old San Pedro River deposits

Piedmont alluvium and surficial deposits

- Qyc — **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
- Qy3 — **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
- Qy2 — **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
- Qy1 — **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
- Qi3a — **Late Pleistocene alluvial fan and terrace deposits A** - mudstone with some floating cobbles filling the valleys incised into the Saint David Formation
- Qi3c — **Late Pleistocene alluvial fan and terrace deposits C** - weakly to moderately dissected alluvial fan deposits composed of clay loam mudstone
- Qi3 — **Late Pleistocene alluvial fan and terrace deposits** - weakly consolidated sandy gravel deposits with moderate soil development
- Qi2 — **Middle to late Pleistocene alluvial fan and terrace deposits** - weakly consolidated sandy gravel deposits with strong soil development
- Qi1 — **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
- Qcg — **Early Pleistocene cobble conglomerate** - cobble conglomerate cemented by calcium carbonate

Tertiary basin fill alluvium

- QTsd — **Pliocene to early Pleistocene Saint David Formation** - fine-grained, highly eroded basin-fill deposits
- QTs — **Late Pliocene-Early Pleistocene alluvial fan deposits** - relict, deeply dissected rounded ridges with strong carbonate developmentalluvial deposits found on upper piedmonts
- QTcs — **Conglomerate and sandstone** - coarse, poorly sorted, tan sandstone, conglomeratic sandstone, and conglomerate
- QTcg — **Early Pleistocene to Miocene alluvium** - tan to reddish, tabular to cross-bedded, carbonated cemented, matrix supported conglomerate with limestone, metasediments, and granite cobbles
- 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
- Tsp — **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

- 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

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.

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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

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1:24,000 Scale

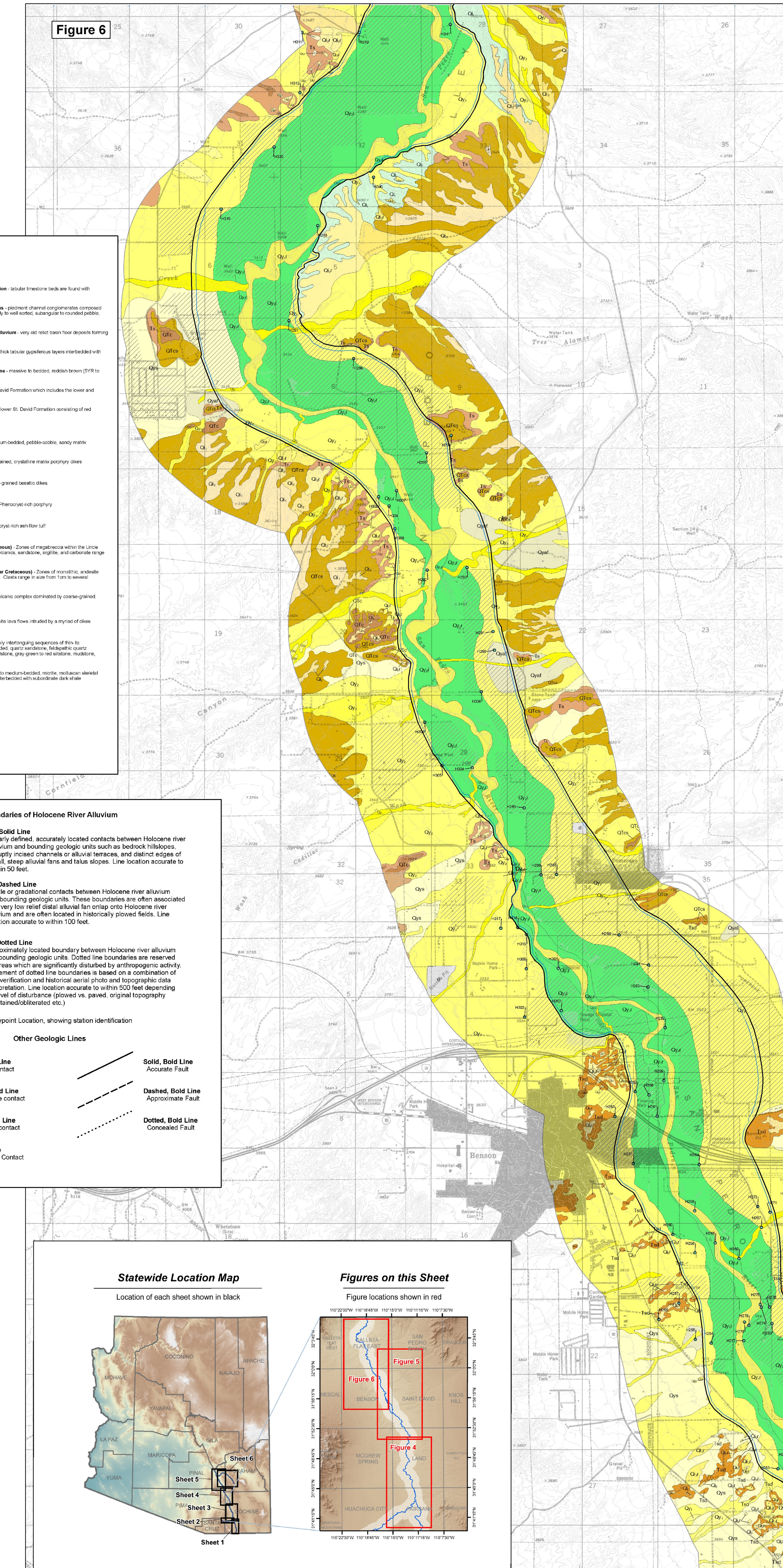
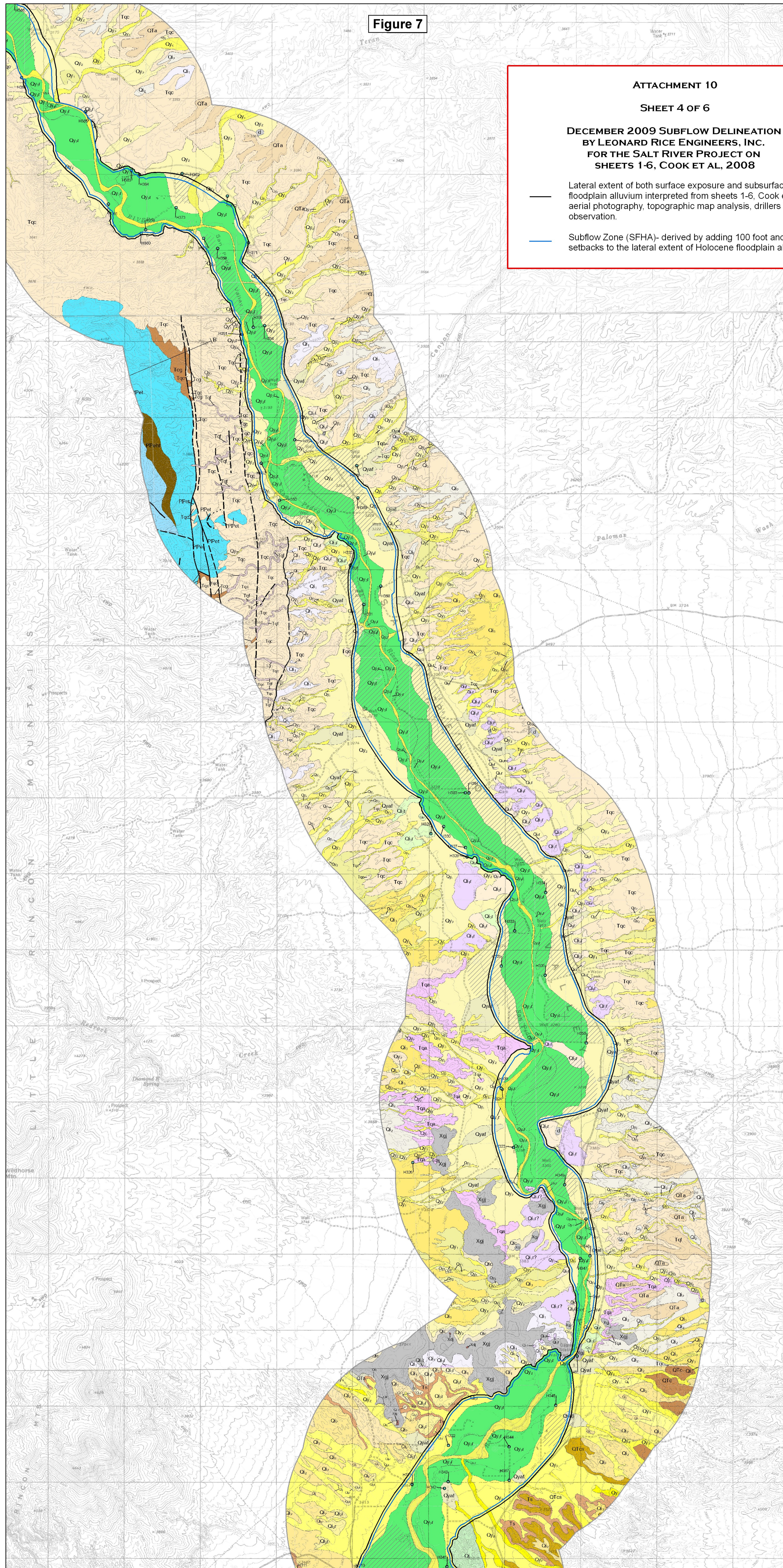


Figure 7



Attachment 10

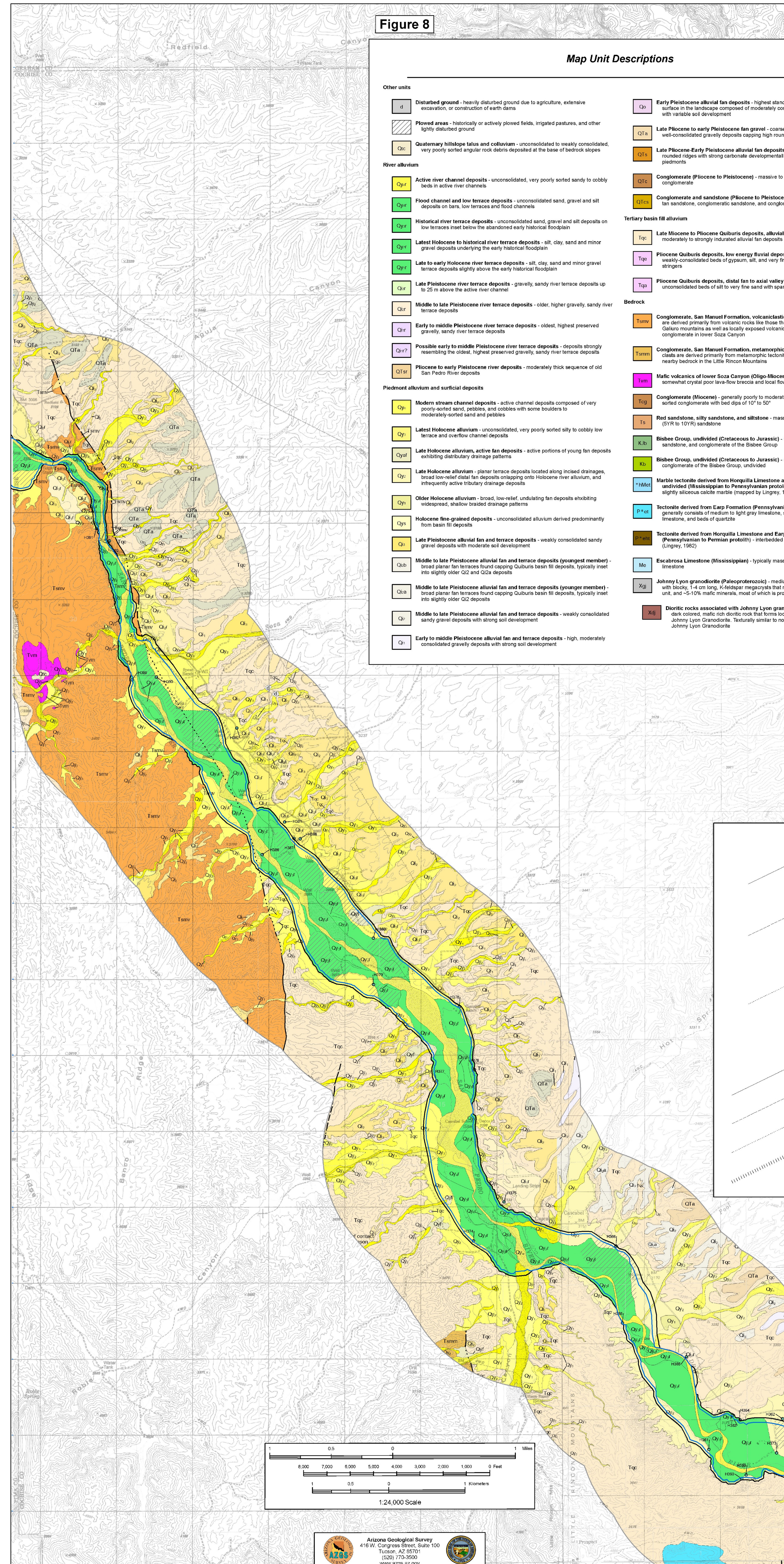
Sheet 4 of 6

December 2009 Subflow Delineation by Leonard Rice Engineers, Inc. for the Salt River Project on sheets 1-6, Cook et al, 2008

Lateral extent of both surface exposure and subsurface Holocene floodplain alluvium interpreted from sheets 1-6, Cook et al, 2008, aerial photography, topographic map analysis, drillers logs and field observation.

Subflow Zone (SFHA)- derived by adding 100 foot and 200 foot setbacks to the lateral extent of Holocene floodplain alluvium

Figure 8



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Other units

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- **Plowed areas** - historically or actively plowed fields, irrigated pastures, and other lightly disturbed ground
- Qtc — **Quaternary hillslope talus and colluvium** - unconsolidated to weakly consolidated, very poorly sorted angular rock debris deposited at the base of bedrock slopes

River alluvium

- Qycr — **Active river channel deposits** - unconsolidated, very poorly sorted sandy to cobbly beds in active river channels
- Qy4r — **Flood channel and low terrace deposits** - unconsolidated sand, gravel and silt deposits on bars, low terraces and flood channels
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- Qi3r — **Late Pleistocene river terrace deposits** - gravelly, sandy river terrace deposits up to 25 m above the active river channel
- Qi2r — **Middle to late Pleistocene river terrace deposits** - older, higher gravelly, sandy river terrace deposits
- Qi1r — **Early to middle Pleistocene river terrace deposits** - oldest, highest preserved gravelly, sandy river terrace deposits
- Qi1r? — **Possible early to middle Pleistocene river terrace deposits** - deposits strongly resembling the oldest, highest preserved gravelly, sandy river terrace deposits
- QTsr — **Pliocene to early Pleistocene river deposits** - moderately thick sequence of old San Pedro River deposits

Piedmont alluvium and surficial deposits

- Qyc — **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
- Qy3 — **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
- Qy2 — **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
- Qy1 — **Older Holocene alluvium** - broad, low-relief, undulating fan deposits ehxibiting widespread, shallow braided drainage patterns
- Qys — **Holocene fine-grained deposits** - unconsolidated alluvium derived predominantly from basin fill deposits
- Qi3 — **Late Pleistocene alluvial fan and terrace deposits** - weakly consolidated sandy gravel deposits with moderate soil development
- Qi2b — **Middle to late Pleistocene alluvial fan and terrace deposits (youngest member)** - broad planar fan terraces found capping Quiburis basin fill deposits, typically inset into slightly older Qi2 and Qi2a deposits
- Qi2a — **Middle to late Pleistocene alluvial fan and terrace deposits (younger member)** - broad planar fan terraces found capping Quiburis basin fill deposits, typically inset into slightly older Qi2 deposits
- Qi2 — **Middle to late Pleistocene alluvial fan and terrace deposits** - weakly consolidated sandy gravel deposits with strong soil development
- Qi1 — **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
- QTa — **Late Pliocene to early Pleistocene fan gravel** - coarse, moderately to well-consolidated gravelly deposits capping high rounded ridges
- QTs — **Late Pliocene-Early Pleistocene alluvial fan deposits** - relict, deeply dissected rounded ridges with strong carbonate developmentalluvial deposits found on upper piedmonts
- QTc — **Conglomerate (Pliocene to Pleistocene)** - massive to crudely stratified conglomerate
- QTcs — **Conglomerate and sandstone (Pliocene to Pleistocene)** - coarse, poorly sorted, tan sandstone, conglomeratic sandstone, and conglomerate

Tertiary basin fill alluvium

- Tqc — **Late Miocene to Pliocene Quiburis deposits, alluvial fan facies** - sandy to gravelly, moderately to strongly indurated alluvial fan deposits
- Tqe — **Pliocene Quiburis deposits, low energy fluvial deposits** - alternating thin weakly-consolidated beds of gypsum, silt, and very fine sand with sparse pebble stringers
- Tqa — **Pliocene Quiburis deposits, distal fan to axial valley deposits** - alternating thin unconsolidated beds of silt to very fine sand with sparse pebble stringers

Bedrock

- Tsmv — **Conglomerate, San Manuel Formation, volcaniclastic Soza Canyon facies** - clasts are derived primarily from volcanic rocks like those that make up most of the Galiuro mountains as well as locally exposed volcanic rocks beneath the conglomerate in lower Soza Canyon
- Tsmm — **Conglomerate, San Manuel Formation, metamorphiclastic Paige Canyon facies** - clasts are derived primarily from metamorphic tectonites like those that form nearby bedrock in the Little Rincon Mountains
- Tvm — **Mafic volcanics of lower Soza Canyon (Oligo-Miocene)** - dark gray to black, somewhat crystal poor lava-flow breccia and local flow cores
- Tcg — **Conglomerate (Miocene)** - generally poorly to moderately bedded and poorly sorted conglomerate with bed dips of 10° to 50°
- Ts — **Red sandstone, silty sandstone, and siltstone** - massive to bedded, reddish brown (5YR to 10YR) sandstone
- KJb — **Bisbee Group, undivided (Cretaceous to Jurassic)** - Carbonate, siltstone, sandstone, and conglomerate of the Bisbee Group
- Kb — **Bisbee Group, undivided (Cretaceous to Jurassic)** - siltstone, sandstone, and conglomerate of the Bisbee Group, undivided
- *hMet — **Marble tectonite derived from Horquilla Limestone and Escabrosa Limestone, undivided (Mississippian to Pennsylvanian protolith)** - typically calcite marble and slightly siliceous calcite marble (mapped by Lingrey, 1982)
- P*et — **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
- P*eht — **Tectonite derived from Horquilla Limestone and Earp Formation, undivided (Pennsylvanian to Permian protolith)** - interbedded marble and calc-silicate gneiss (Lingrey, 1982)
- Me — **Escabrosa Limestone (Mississippian)** - typically massive medium to pale gray limestone
- Xgj — **Johnny Lyon granodiorite (Paleoproterozoic)** - medium-grained biotite granodiorite with blocky, 1-4 cm long, K-feldspar megacrysts that make up 10-25% of the rock unit, and ~5-10% mafic minerals, most of which is probably biotite
- Xdj — **Dioritic rocks associated with Johnny Lyon granodiorite (Paleoproterozoic)** - dark colored, mafic rich dioritic rock that forms local, small irregular bodies in Johnny Lyon Granodiorite. Texturally similar to non-porphyritic parts of Johnny Lyon Granodiorite

1	0.5	0	1 Miles

8,000 7,000 6,000 5,000 4,000 3,000 2,000 1,000 0 Feet

1 0.5 0 1 Kilometers

1:24,000 Scale

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

by

Joseph P. Cook, David E. Haddad, Andrew L. Kowler and Philip A. Pearthree

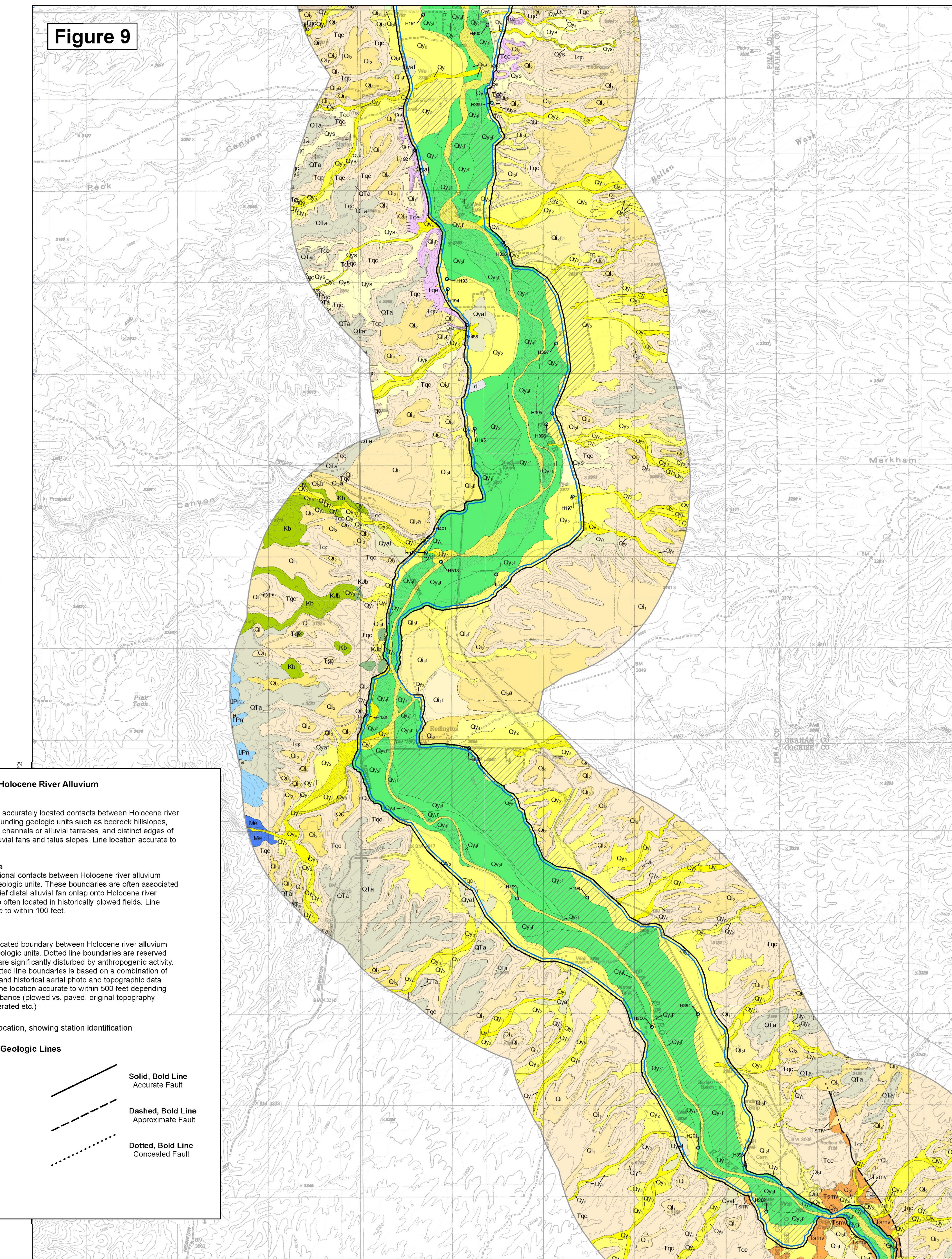
December 2008

Sheet 4 of 6

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 9



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.)

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

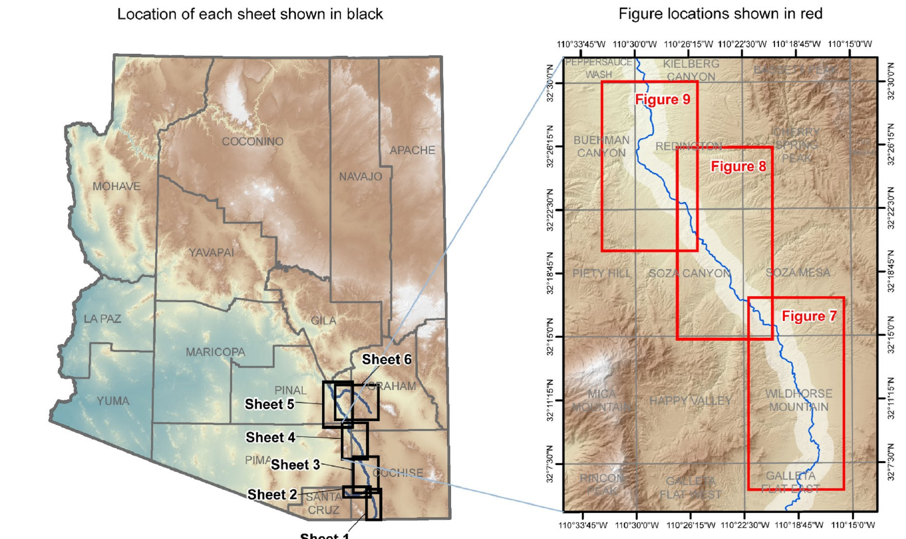


Figure 11

Attachment 10

Sheet 5 of 6

December 2009 Subflow Delineation
by Leonard Rice Engineers, Inc.
for the Salt River Project on
sheets 1-6, Cook et al, 2008

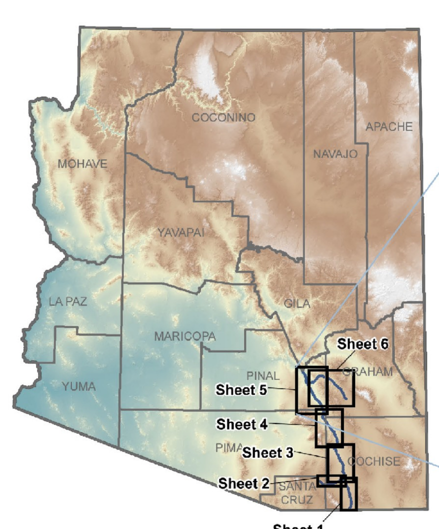
Lateral extent of both surface exposure and subsurface Holocene floodplain alluvium interpreted from sheets 1-6, Cook et al, 2008, aerial photography, topographic map analysis, drillers logs and field observation.

Subflow Zone (SFHA)- derived by adding 100 foot and 200 foot setbacks to the lateral extent of Holocene floodplain alluvium

Figure 10

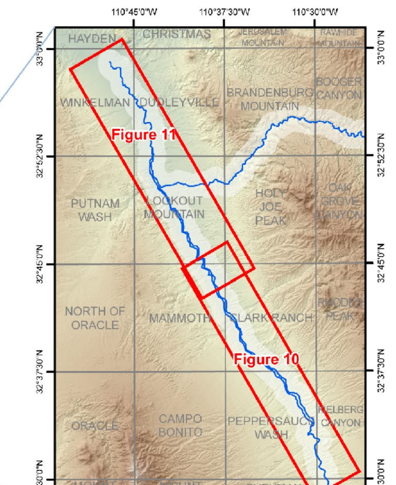
Statewide Location Map

Location of each sheet shown in black



Figures on this Sheet

Figure locations shown in red



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

by
Joseph P. Cook, Bryan J. MacFarlane,
Andrew L. Kowler and Philip A Pearthree

September 2008

Sheet 5 of 6

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.

1:24,000 SCALE

1 0.5 0 1 Miles

1 0.5 0 1 Kilometers

0 1000 2000 3000 4000 5000 Feet

N

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Map Unit Descriptions

Other units

- d — **Disturbed ground** - heavily disturbed ground due to agriculture, extensive excavation, or construction of earth dams.
- **Plowed areas** - historically or actively plowed fields, irrigated pastures, and other lightly disturbed ground.
- Qtc — **Quaternary hillslope talus and colluvium** - unconsolidated to weakly consolidated, very poorly sorted angular rock debris deposited at the base of bedrock slopes

River alluvium

- 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
- Qir — **Pleistocene river terrace deposits, undifferentiated**

Piedmont alluvium and surficial deposits

- 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
- Qy_1f — **Early to late Holocene (?) alluvial fan** - inactive fan deposits at the mouth of Tucson Wash
- Qys — **Holocene fine-grained deposits** - unconsolidated fine grained alluvium derived from basin fill deposits
- Qs — **Surficial deposits, undivided** - includes fine-grained colluvium and alluvium, talus, and some pediment and terrace gravels
- 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
- Qiu — **Pleistocene alluvial terrace - undivided** - coarse clastic alluvial fan and terrace deposits with slightly to moderately reddened soils
- Qo — **Early Pleistocene alluvial fan deposits** - highest standing Pleistocene alluvial surface in the landscape composed of moderately consolidated gravelly deposits with variable soil development
- QTa — **Late Pliocene to early Pleistocene fan gravel** - coarse, moderately to well-consolidated gravelly deposits capping high rounded ridges
- Tqp — **Late Miocene to Pliocene Quiburis deposits, playa facies** - silty, moderately to strongly indurated alluvial playa deposits
- Tqr — **Late Pliocene (?) Quiburis deposits, fluvial facies** - sandstone and conglomerate, fluvial deposits
- Tqs — **Pliocene Quiburis deposits, sandy fan toe facies** - sandy fan-toe, lake-margin, and delta-front sandflat facies
- Tqse — **Pliocene Quiburis deposits, delta front subfacies** - sandstone, locally pebbly with multiple thin mudstone interbeds

Bedrock

- Tgv — **Galiuro Volcanics** - lateral equivalent of Cloudburst Formation
- 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
- Ta — **Basaltic andesite lava (Oligocene to lower Miocene)** - Lava flows and autobreccia with 1-10%, generally <5 mm pyroxene and up to 10%, <6 mm, plagioclase phenocrysts. Matrix commonly contains abundant <0.1 mm plagioclase needles and equant magnetite.
- Mzs — **Clastic sedimentary rocks** - sandstone and siltstone with basal conglomerate and chert-fragment breccia
- Me — **Escabrosa Limestone** - massive, cliff-forming, thick-bedded, mostly coarsegrained limestone
- Dm — **Martin Formation** - slope-forming shale unit with interbedded limestone beds
- _a — **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.
- _b — **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.
- 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.

Tertiary basin fill alluvium

- Tqc — **Late Miocene to Pliocene Quiburis deposits, alluvial fan facies** - sandy to gravelly, moderately to strongly indurated alluvial fan deposits
- Tql — **Pliocene Quiburis deposits, playa-lacustrine facies** - fine-grained, laminated playa and lacustrine deposits
- Tqe — **Pliocene Quiburis deposits, low energy fluvial deposits** - alternating thin weakly-consolidated beds of gypsum, silt, and very fine sand with sparse pebble stringers
- Tqm — **Pliocene Quiburis deposits, prodelta mudstone facies** - massive prodelta mudstone deposited as foredelta facies of "Eskiminzin Delta"
- 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).
- 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).
- Xp — **Pinal Schist** - Faintly laminated, very fine-grained, medium to dark gray, foliated to weakly schistose sandstone to siltstone.

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

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

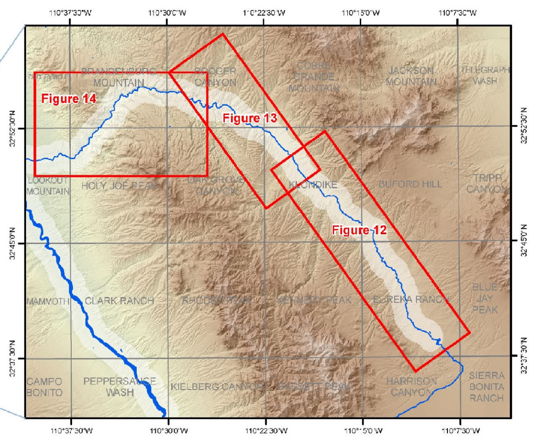
by
Joseph P. Cook, Erica R. Bigio,
Brian J. MacFarlane, Andrew L. Kowler
and Philip A Pearthree

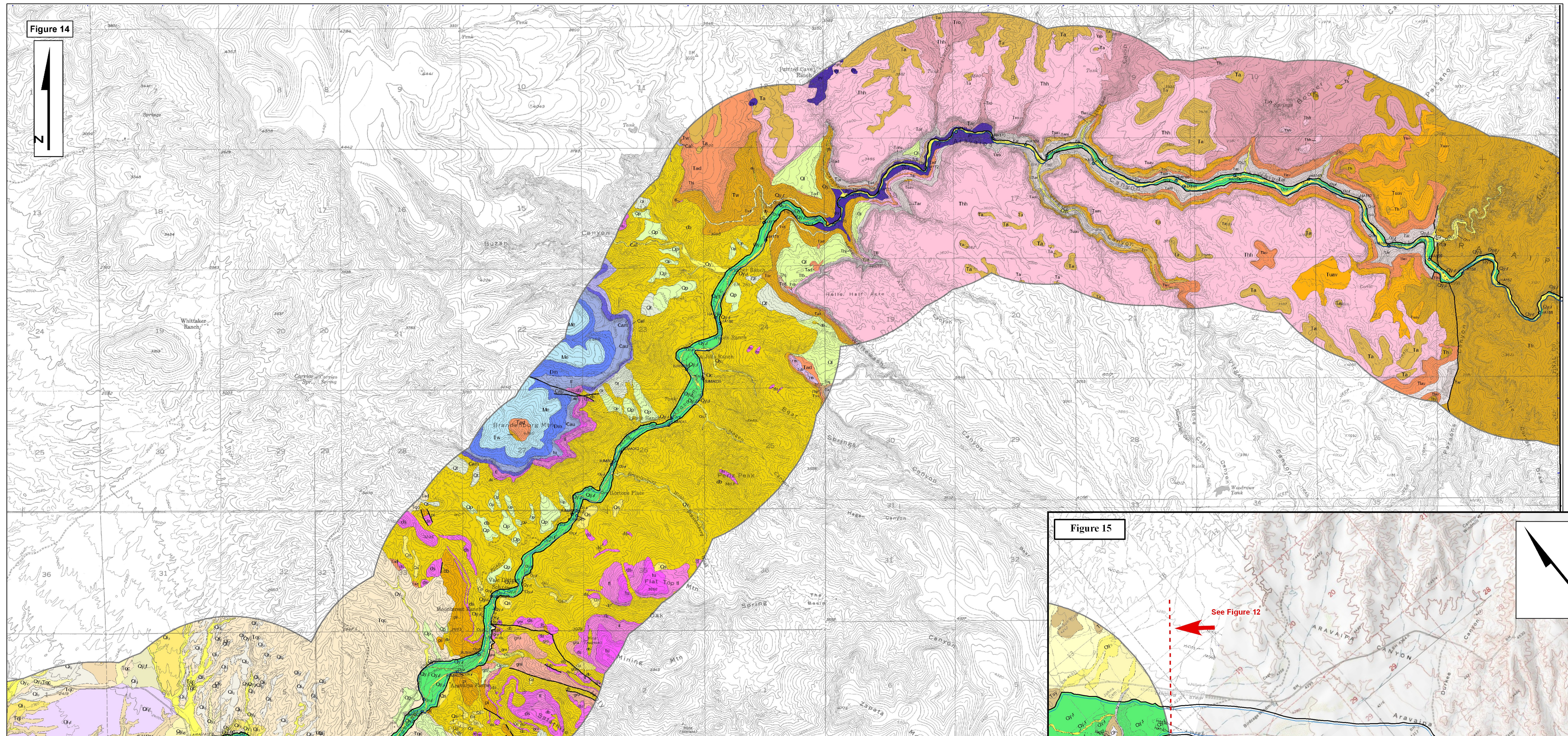
December 2008

Sheet 6 of 6

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.





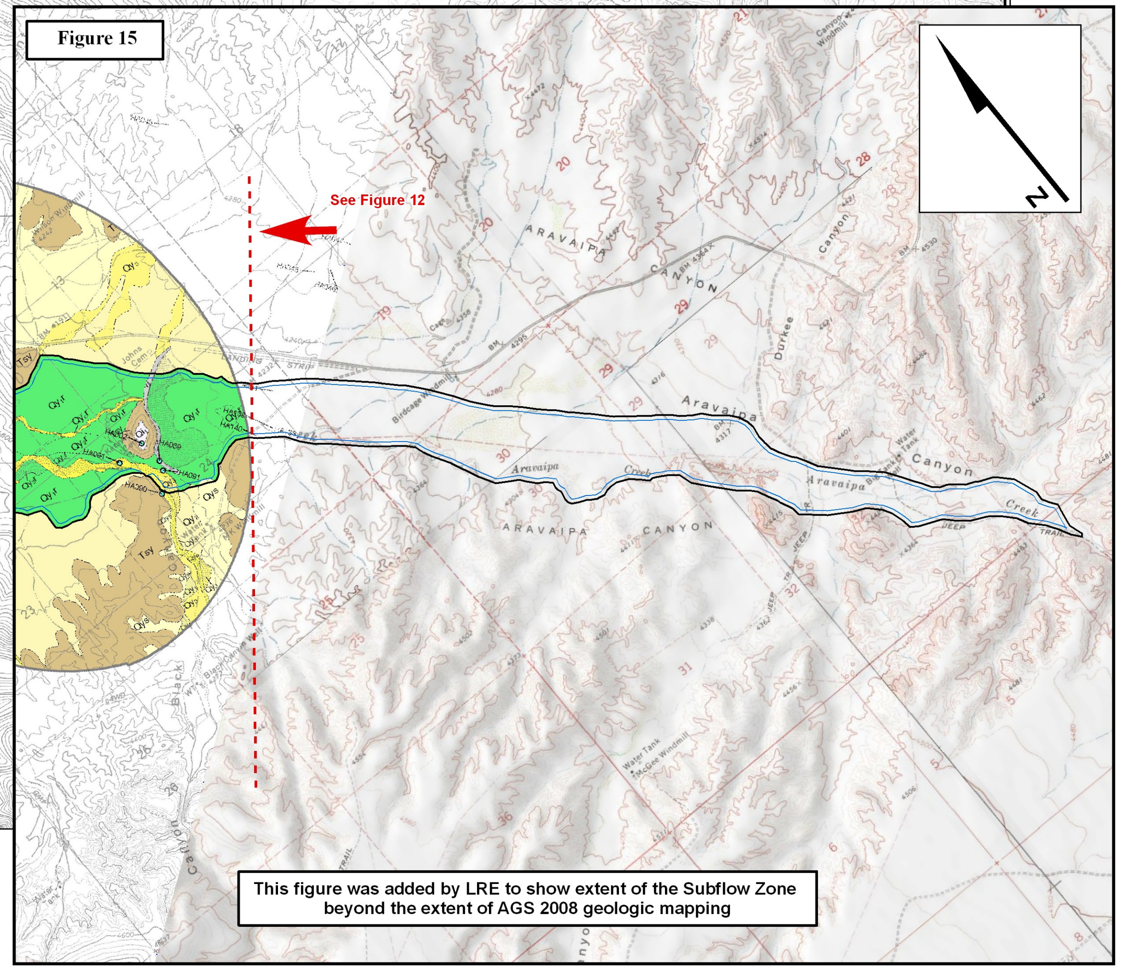
ATTACHMENT 10

SHEET 6 OF 6

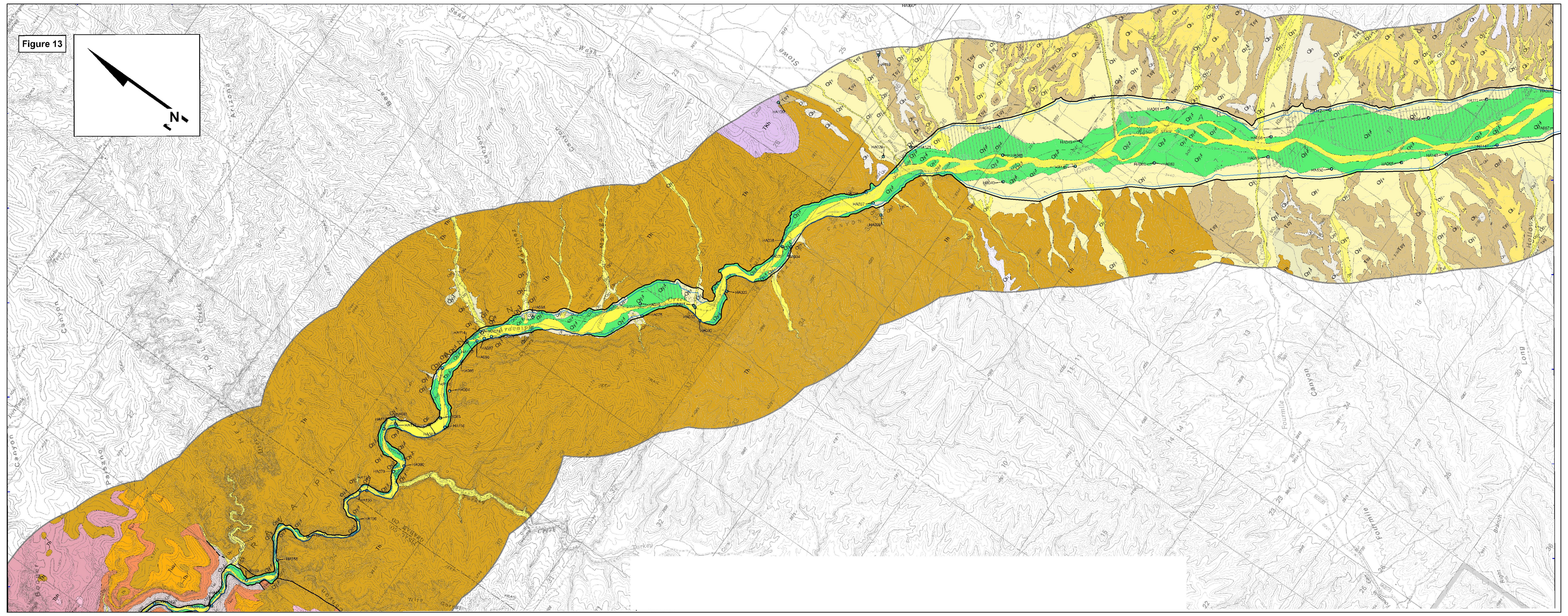
DECEMBER 2009 SUBFLOW DELINEATION
BY LEONARD RICE ENGINEERS, INC.
FOR THE SALT RIVER PROJECT ON
SHEETS 1-6, COOK ET AL, 2008

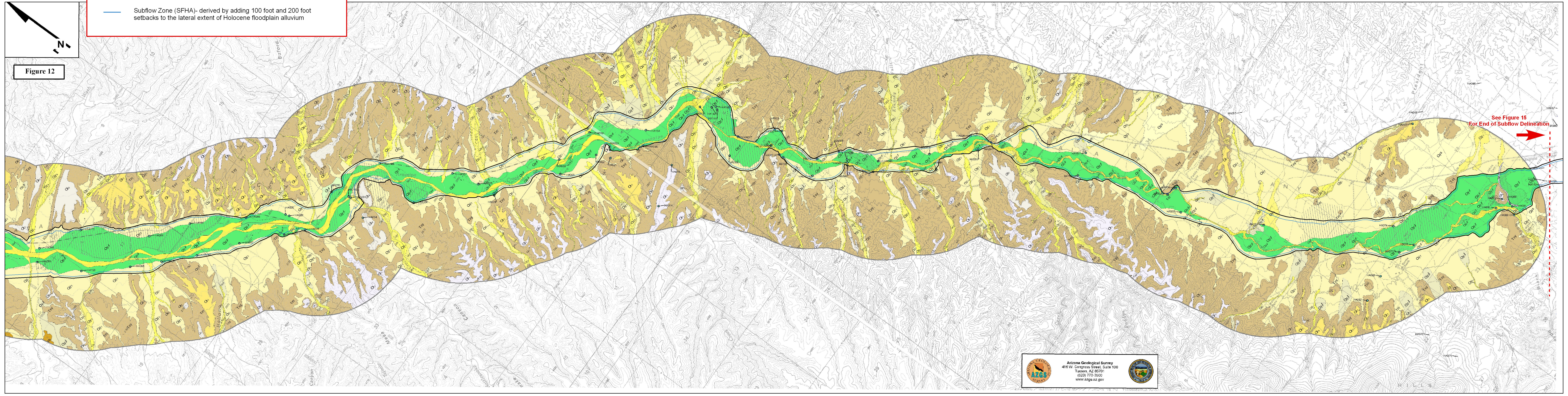
Lateral extent of both surface exposure and subsurface Holocene floodplain alluvium interpreted from sheets 1-6, Cook et al. 2008, aerial photography, topographic map analysis, drillers logs and field observation.

Subflow Zone (SFHA)- derived by adding 100 foot and 200 foot setbacks to the lateral extent of Holocene floodplain alluvium



This figure was added by LRE to show extent of the Subflow Zone beyond the extent of AGS 2008 geologic mapping





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1:24,000 SCALE

1 0.5 0 1 Miles

1 0.5 0 1 Kilometers

0 1000 2000 3000 4000 5000 Feet

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

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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

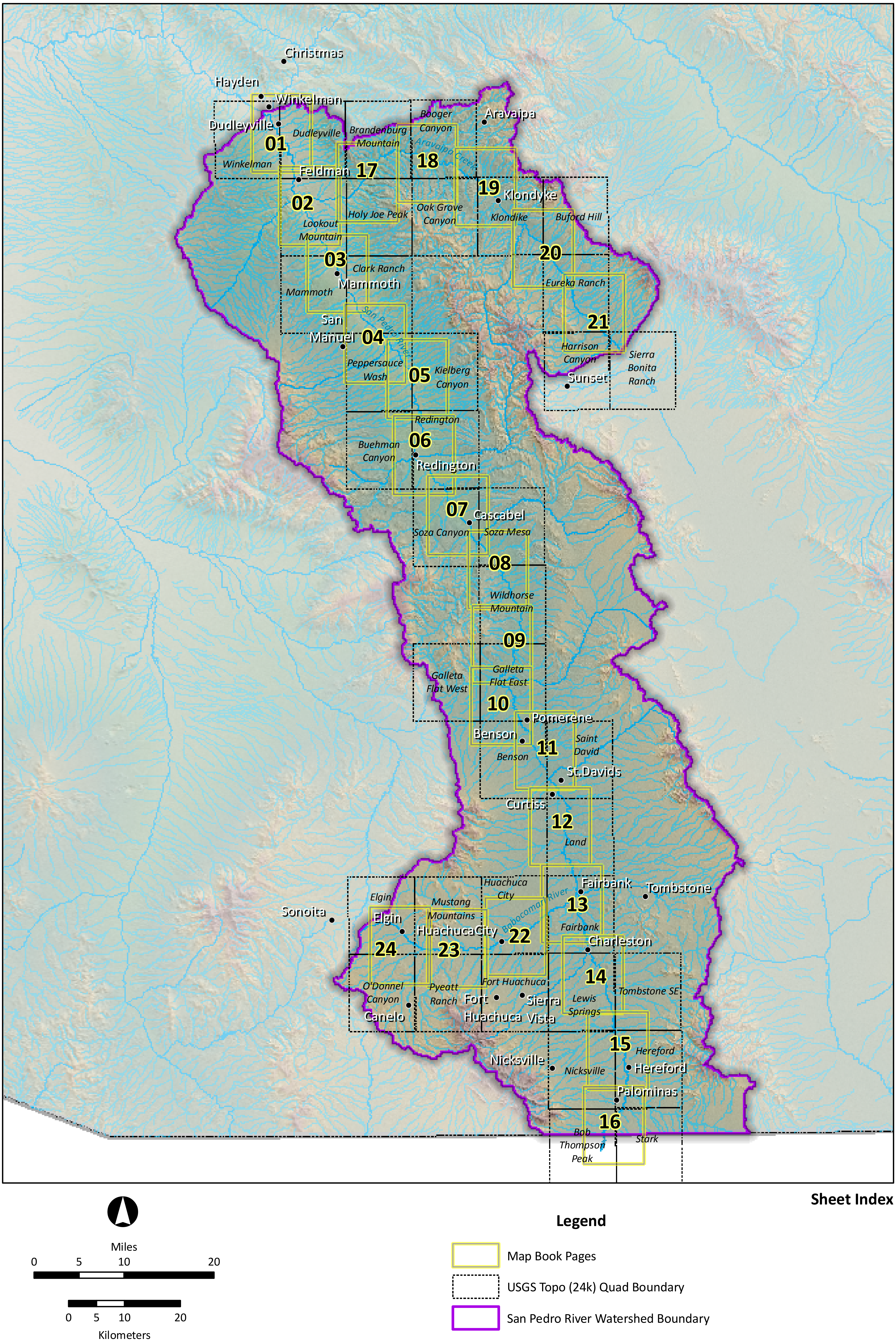
Dashed, Bold Line
Approximate Fault

Dotted, Bold Line
Concealed Fault

<u>Attachment 11</u>

ADWR and LRE Subflow Zone Comparison Maps

Map Index for SRP San Pedro Attachments 9 & 11

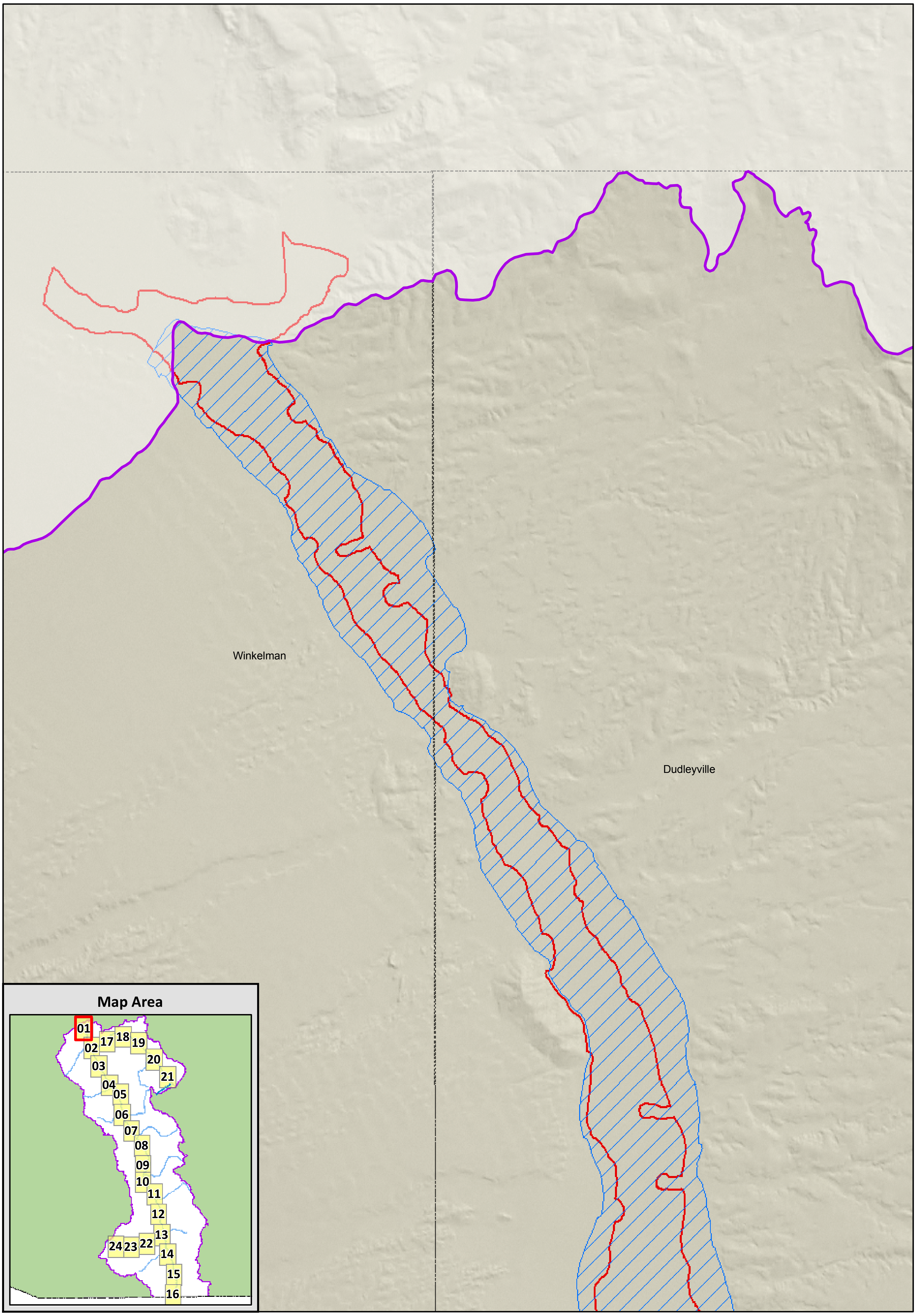


Legend

- Map Book Pages
- USGS Topo (24k) Quad Boundary
- San Pedro River Watershed Boundary

SanPedro_MapIndex11.mxd

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 1

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

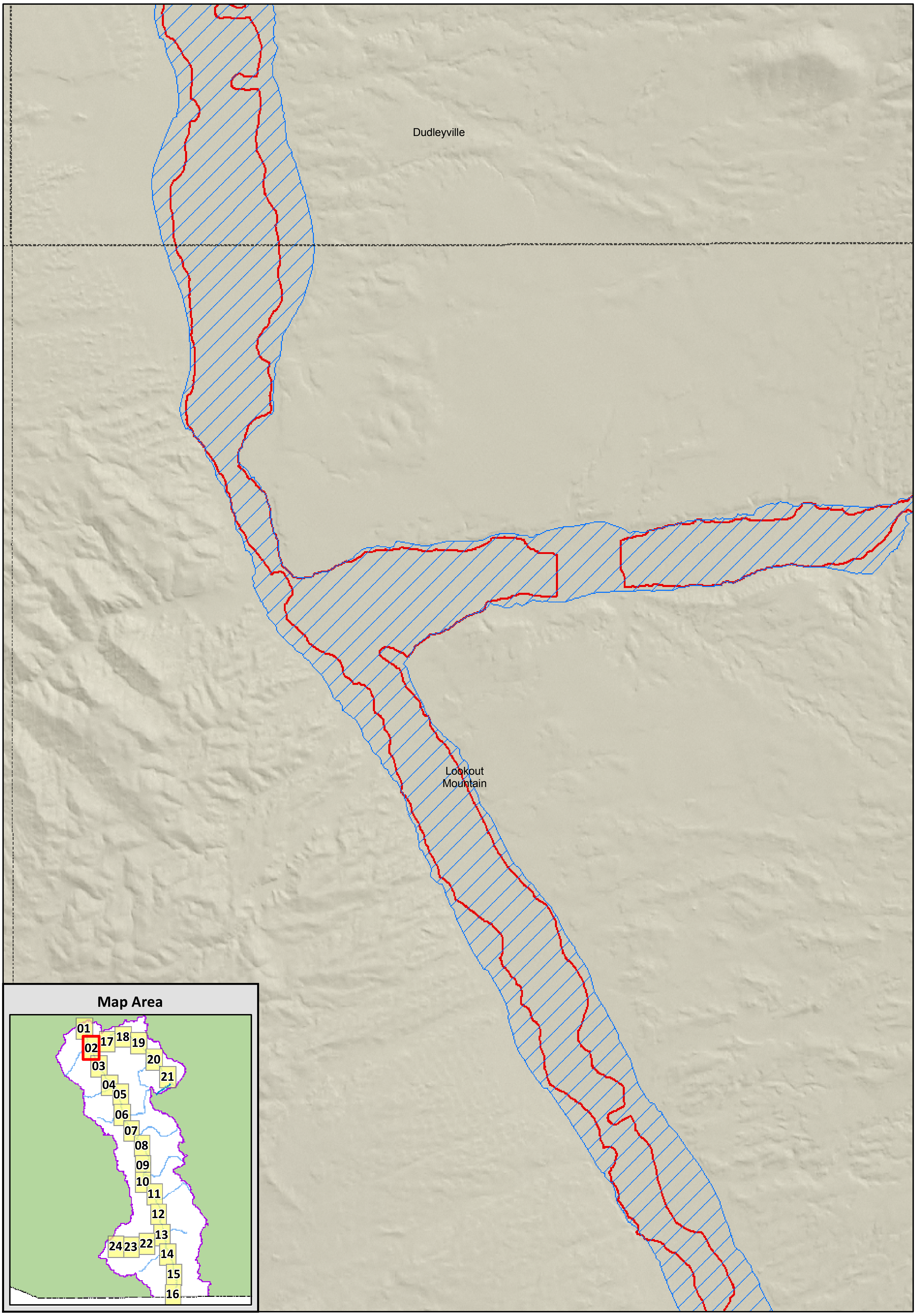
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



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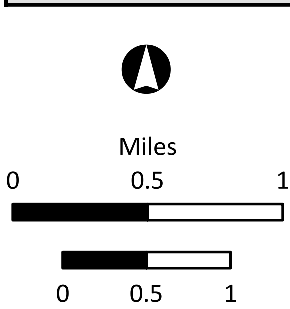


Legend

USGS Topo (24k) Quad Boundary

Watershed Boundary

ADWR Subflow Zone

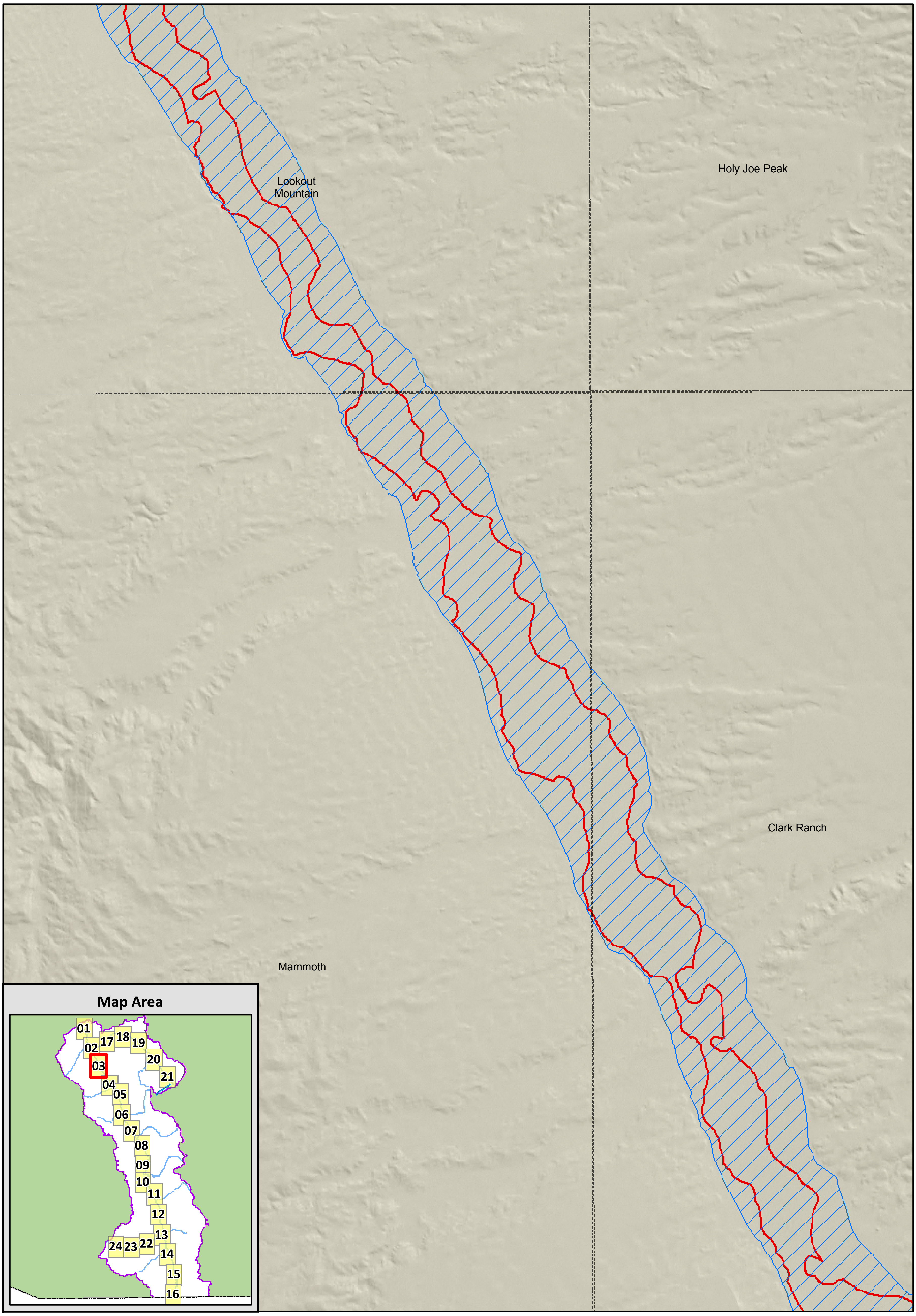
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

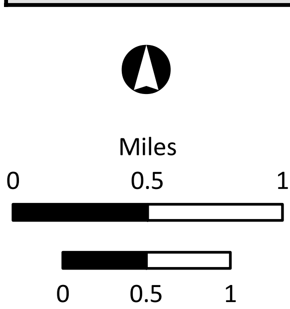
SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 3



Legend

USGS Topo (24k) Quad Boundary

ADWR Subflow Zone

Watershed Boundary

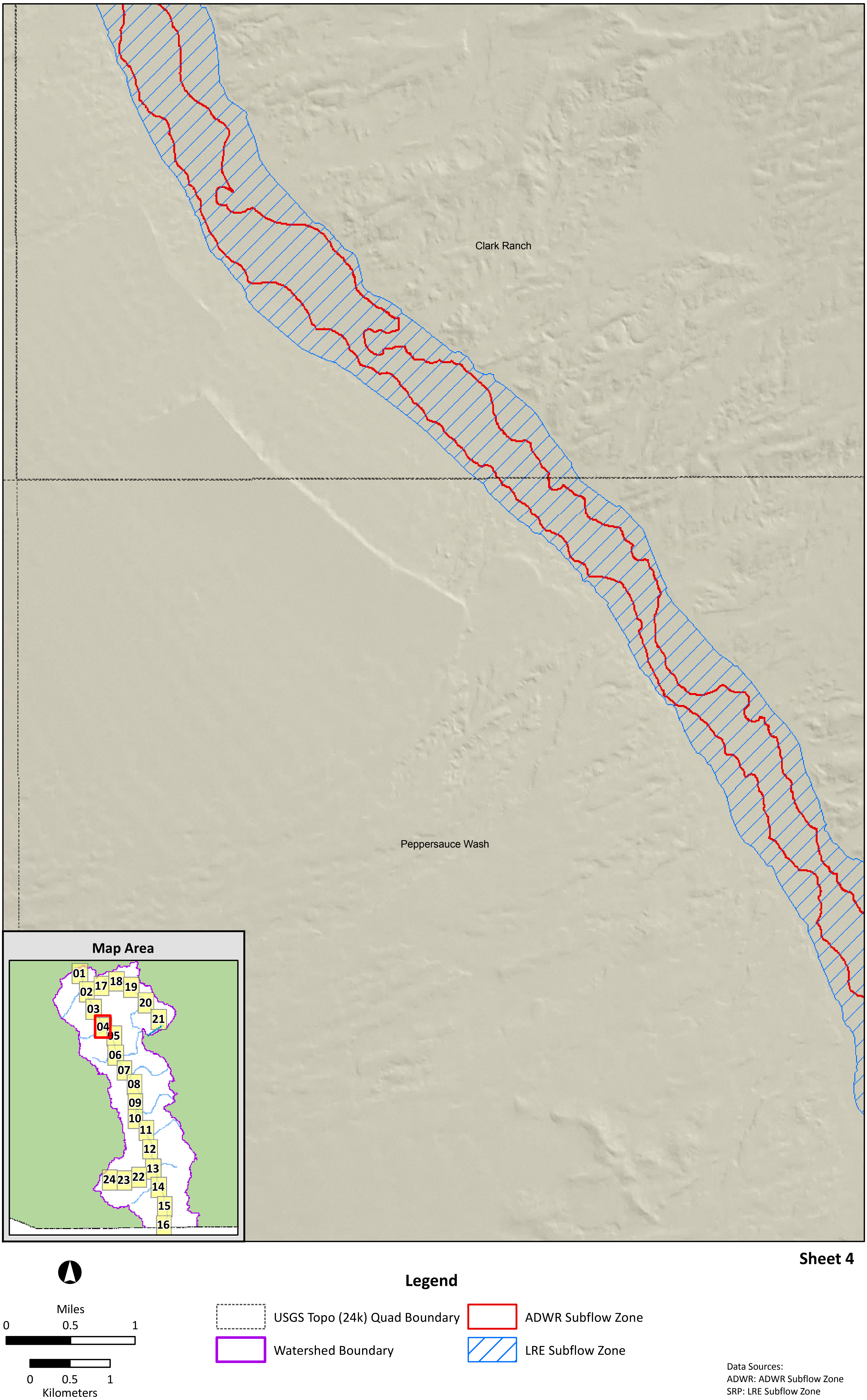
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River

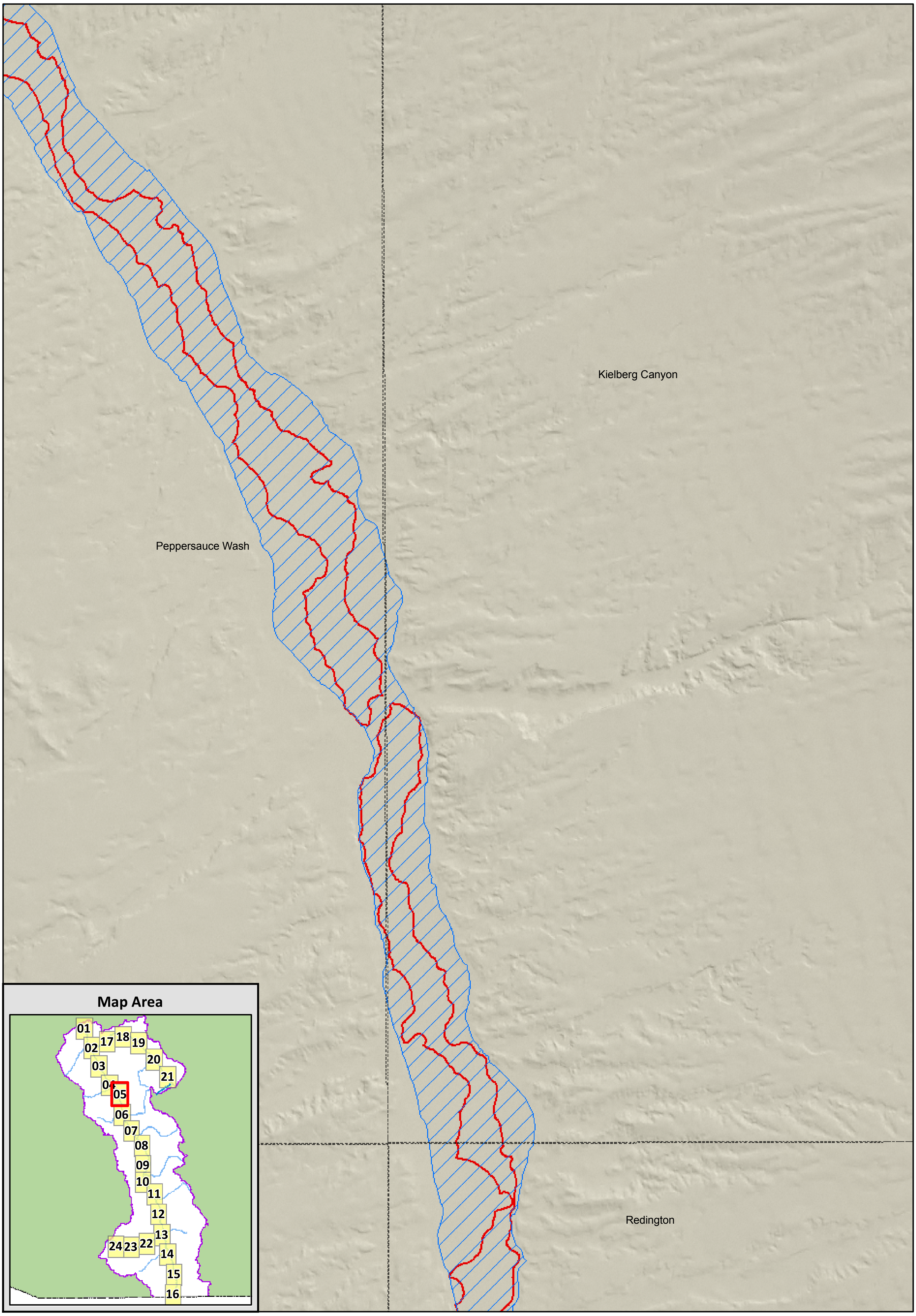


Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 5

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

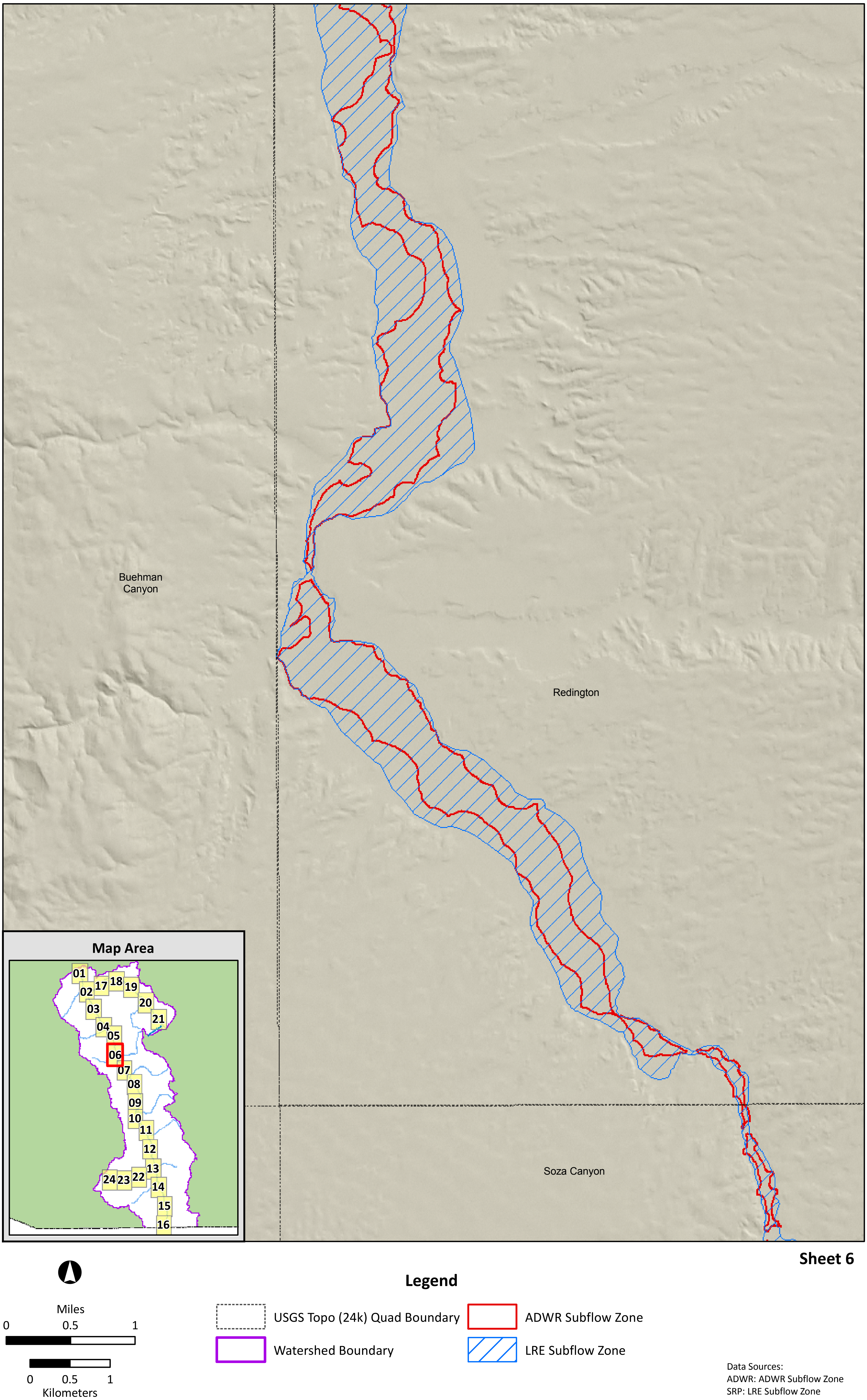
USGS Topo (24k) Quad Boundary
ADWR Subflow Zone
Watershed Boundary
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 6

Legend

USGS Topo (24k) Quad Boundary
ADWR Subflow Zone
Watershed Boundary
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

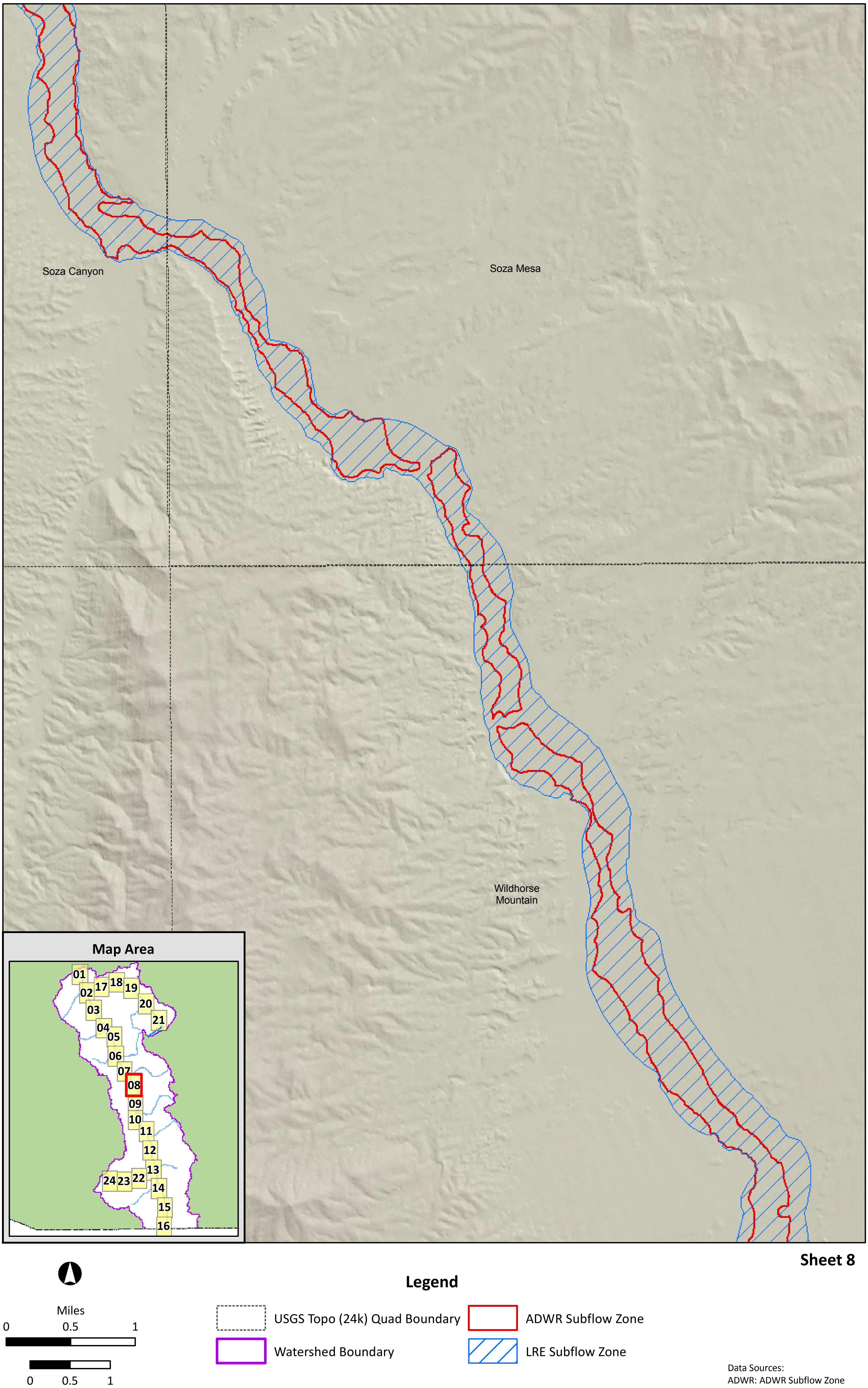
ADWR and LRE Subflow Zone Comparison, San Pedro River

Sheet 7

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

ADWR and LRE Subflow Zone Comparison, San Pedro River



Legend

USGS Topo (24k) Quad Boundary

ADWR Subflow Zone

Watershed Boundary

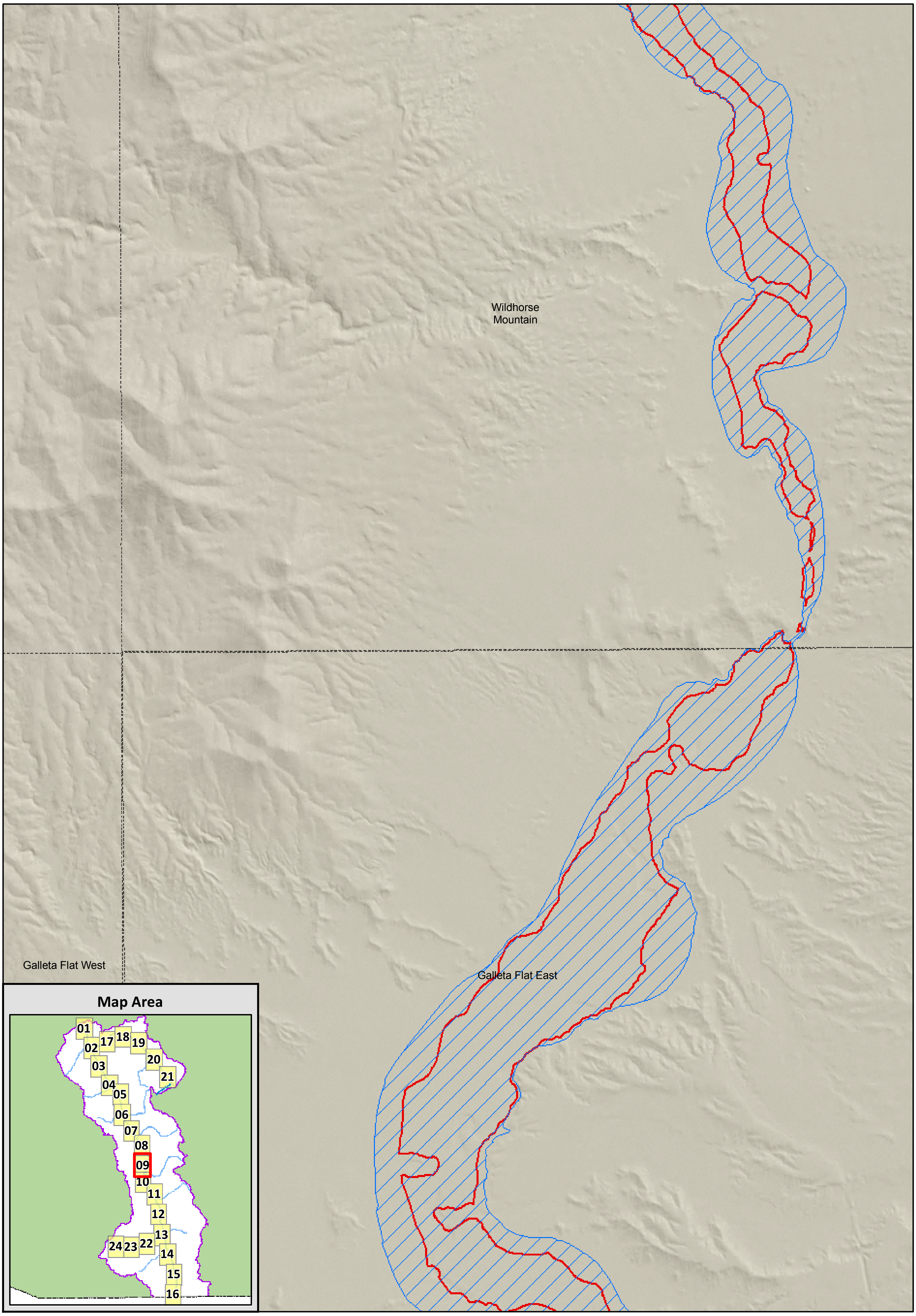
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 9

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

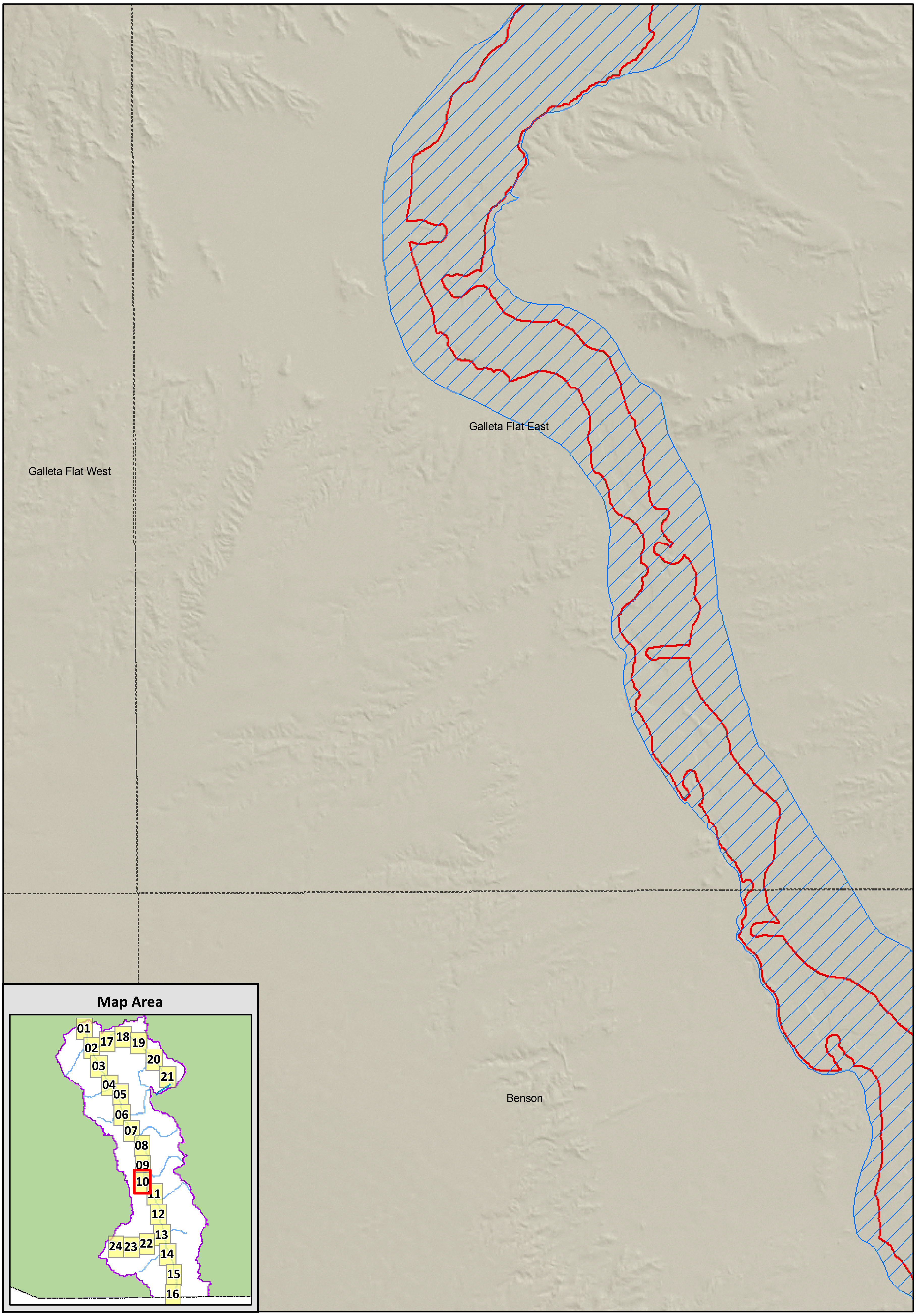
USGS Topo (24k) Quad Boundary
ADWR Subflow Zone
Watershed Boundary
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

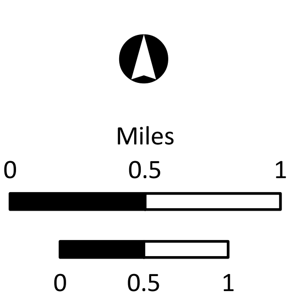
SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 10



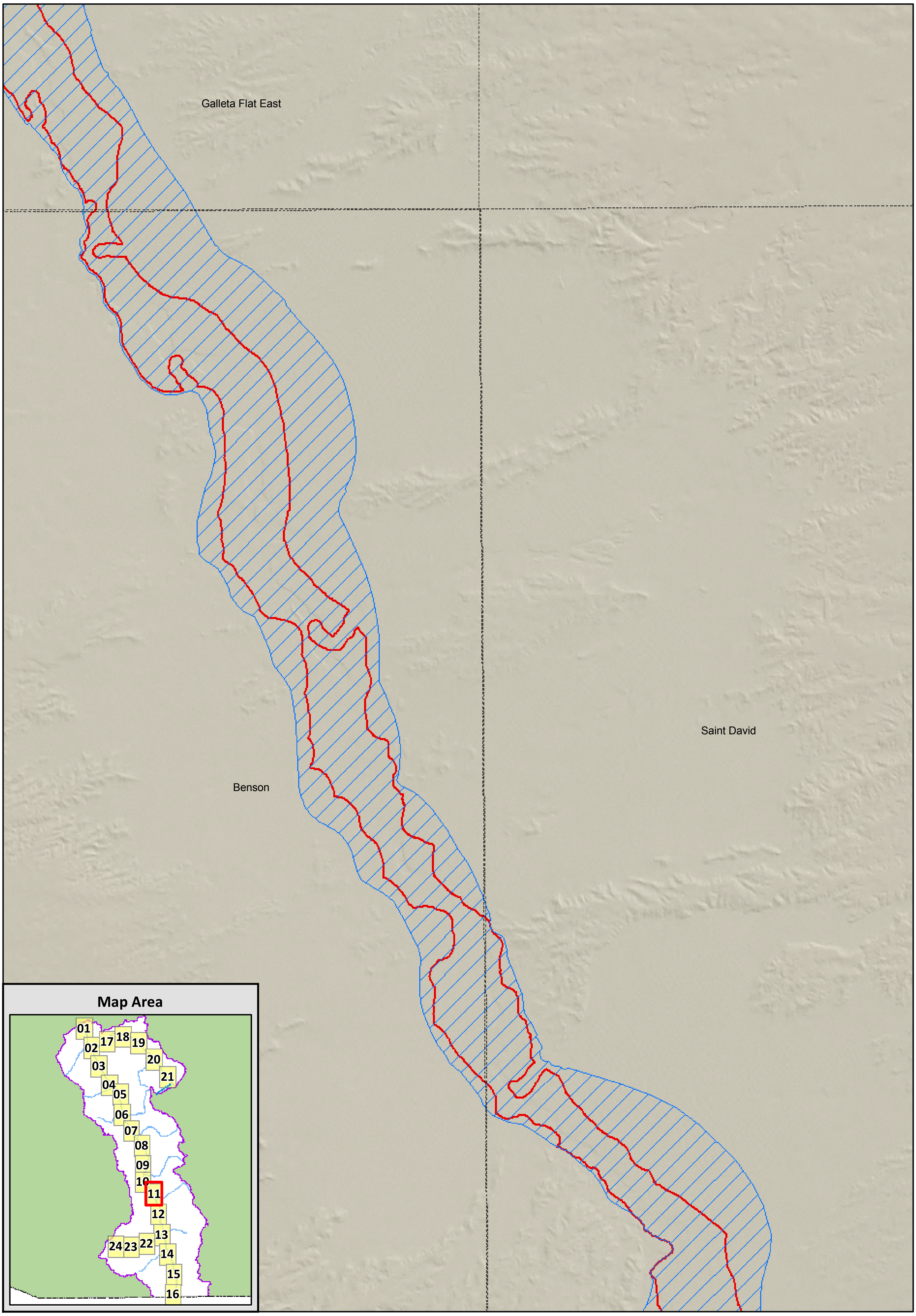
Legend

USGS Topo (24k) Quad Boundary
ADWR Subflow Zone
Watershed Boundary
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 11

Legend

Miles
0 0.5 1

0 0.5 1
Kilometers

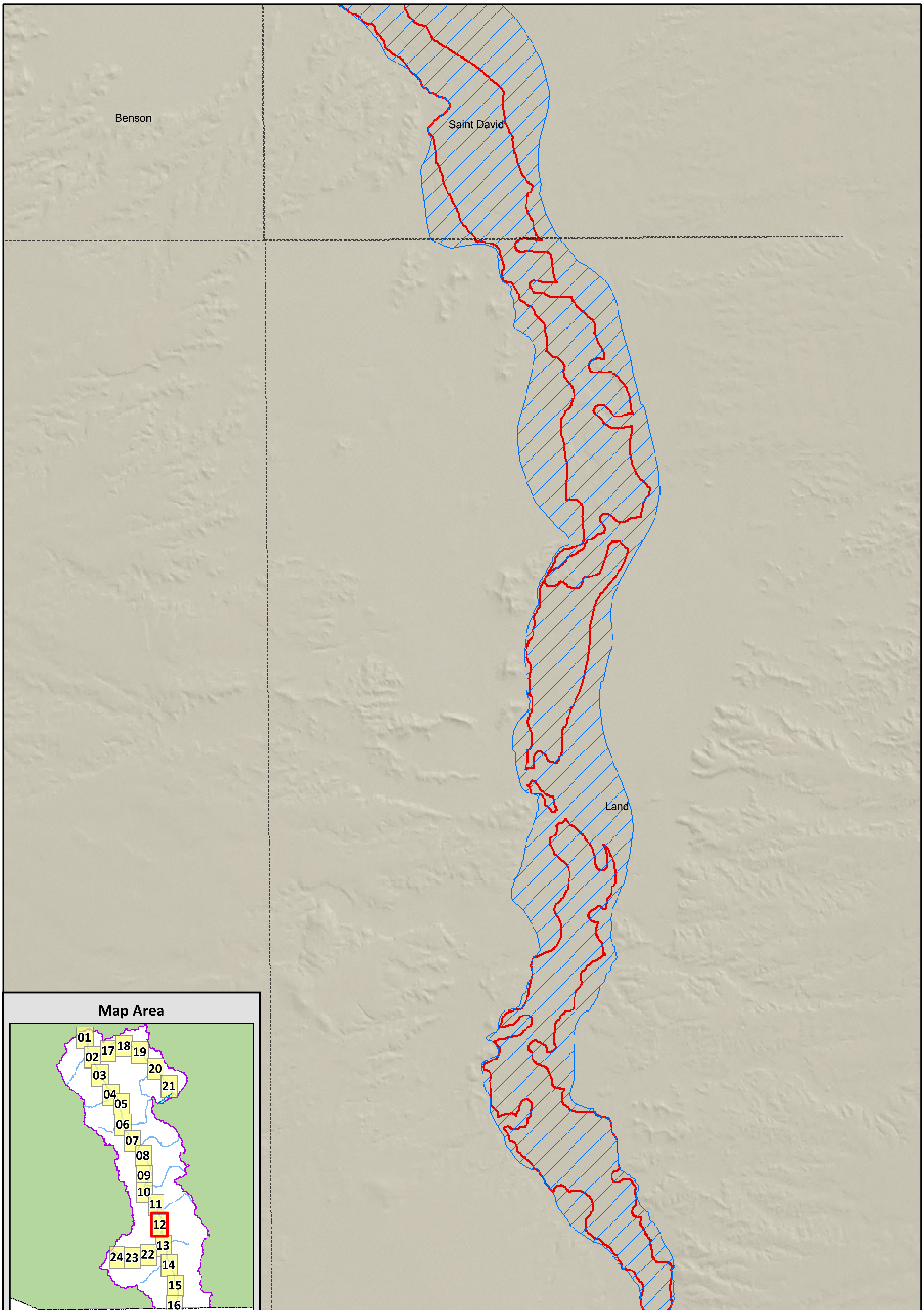
USGS Topo (24k) Quad Boundary
ADWR Subflow Zone
Watershed Boundary
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

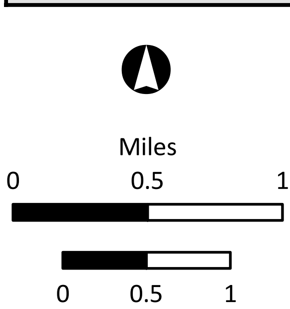
SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 12



Legend

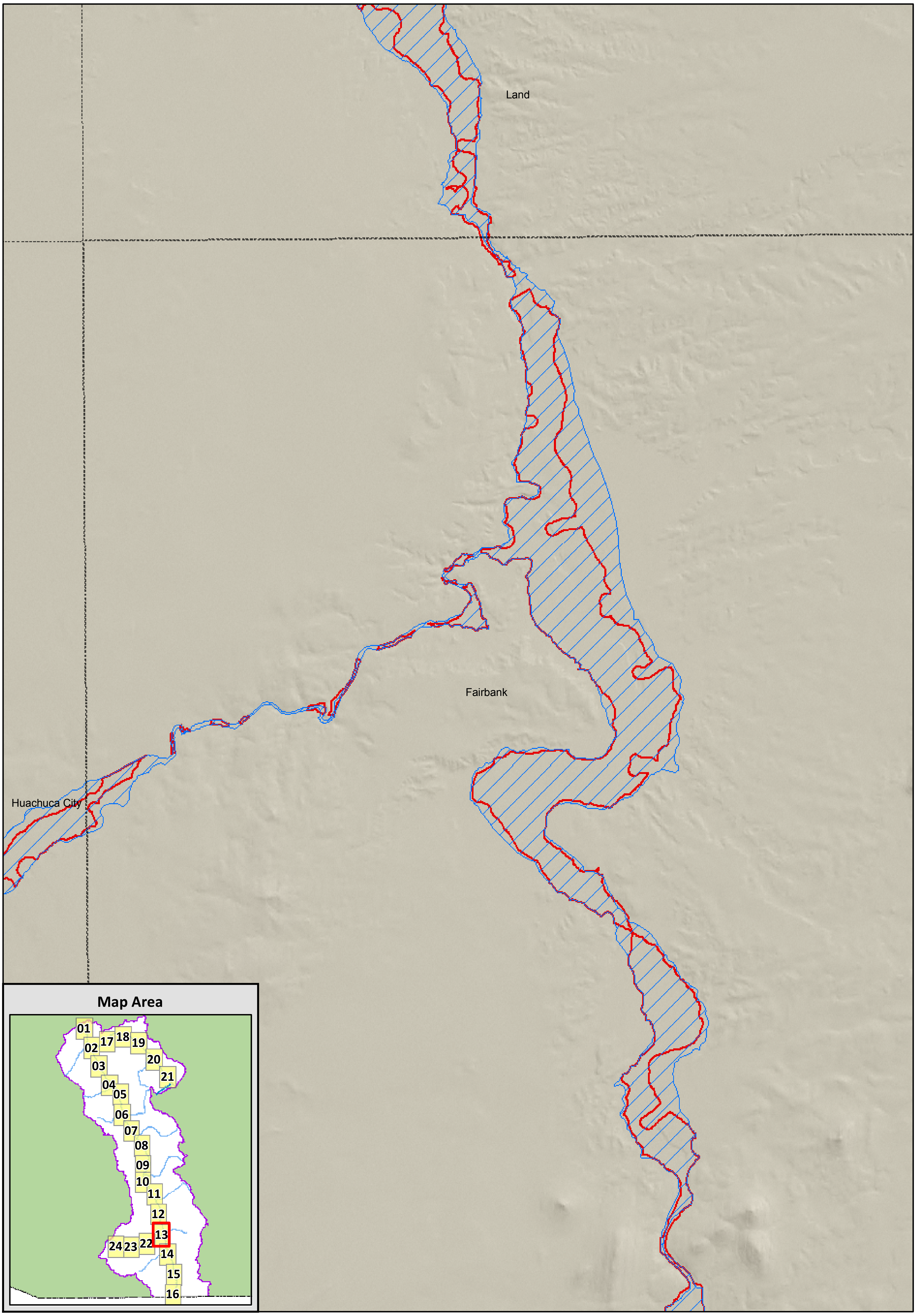
USGS Topo (24k) Quad Boundary
ADWR Subflow Zone
Watershed Boundary
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 13

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

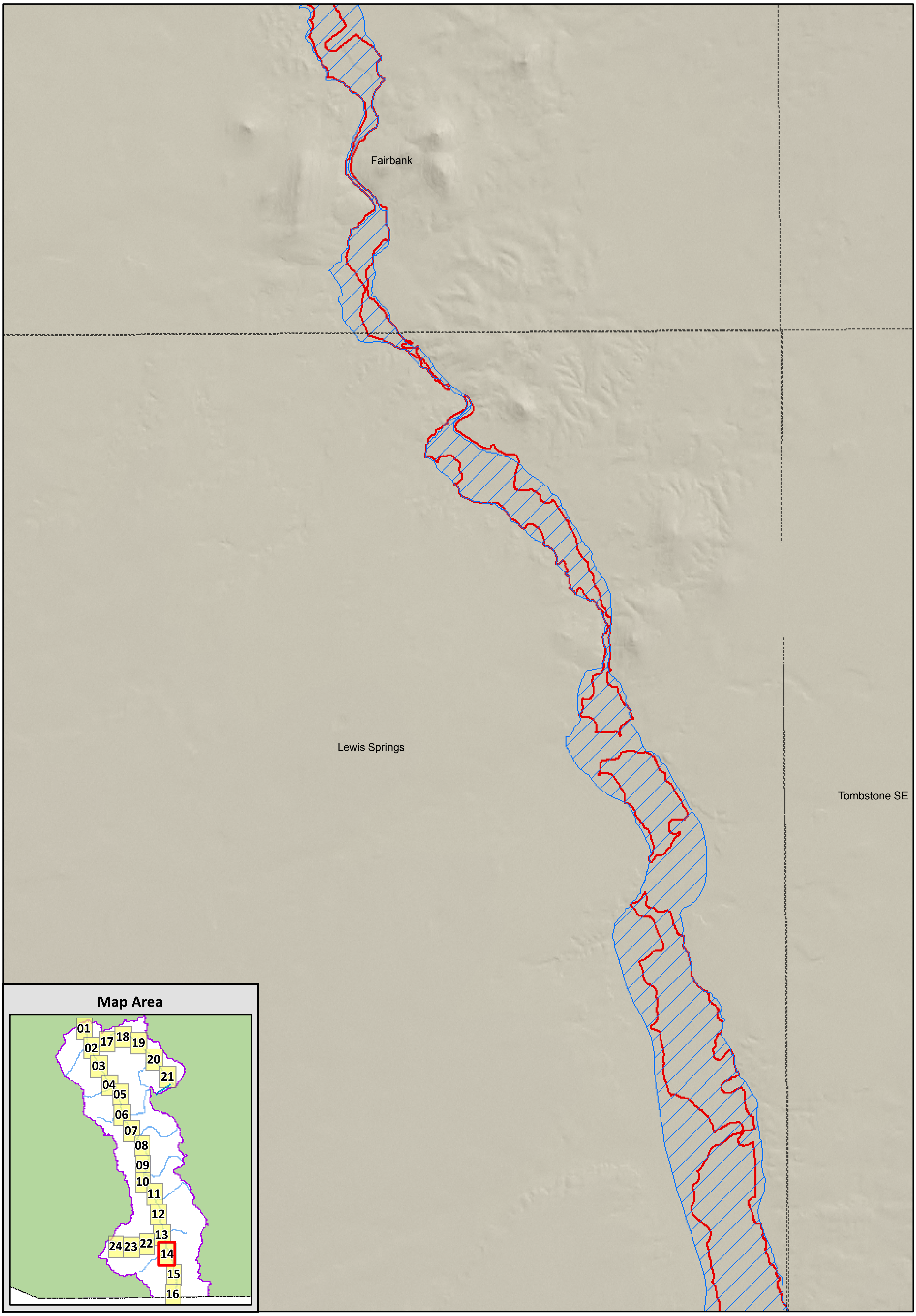
USGS Topo (24k) Quad Boundary
ADWR Subflow Zone
Watershed Boundary
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 14

Legend

USGS Topo (24k) Quad Boundary

ADWR Subflow Zone

Watershed Boundary

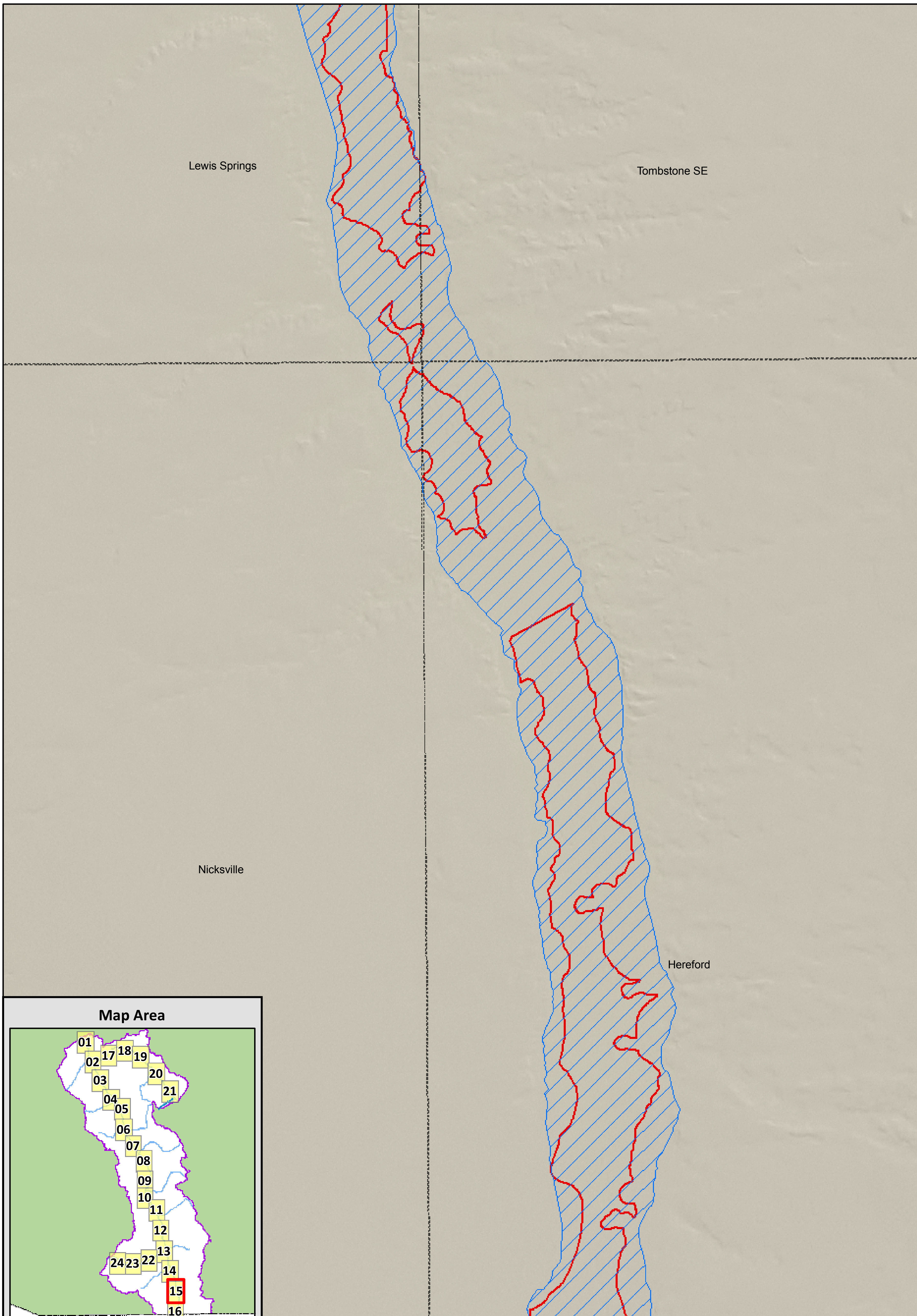
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 15

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

USGS Topo (24k) Quad Boundary

ADWR Subflow Zone

Watershed Boundary

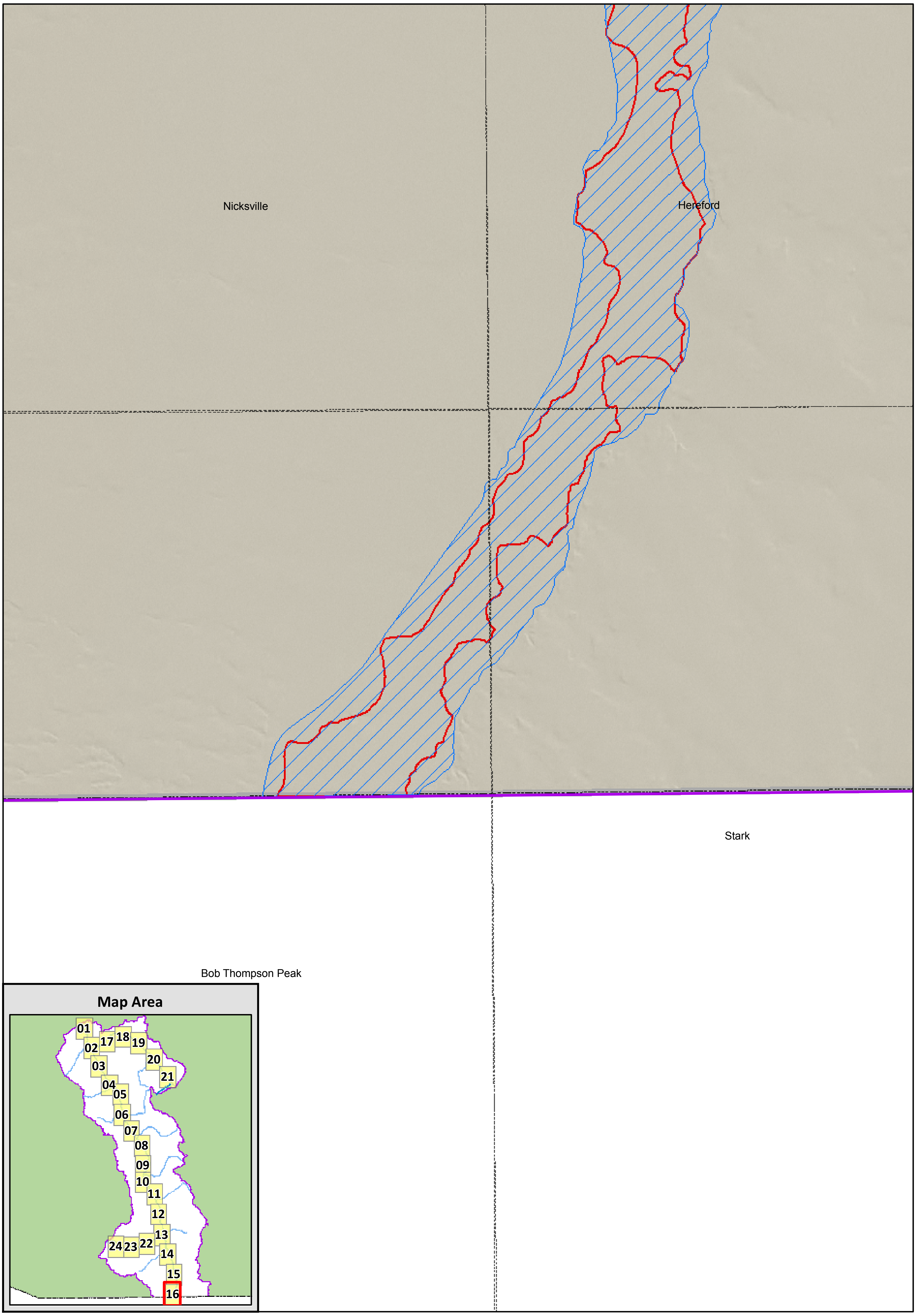
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 16

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

- USGS Topo (24k) Quad Boundary
- ADWR Subflow Zone
- Watershed Boundary
- LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River

Sheet 17

Miles
0 0.5 1

0 0.5 1
Kilometers

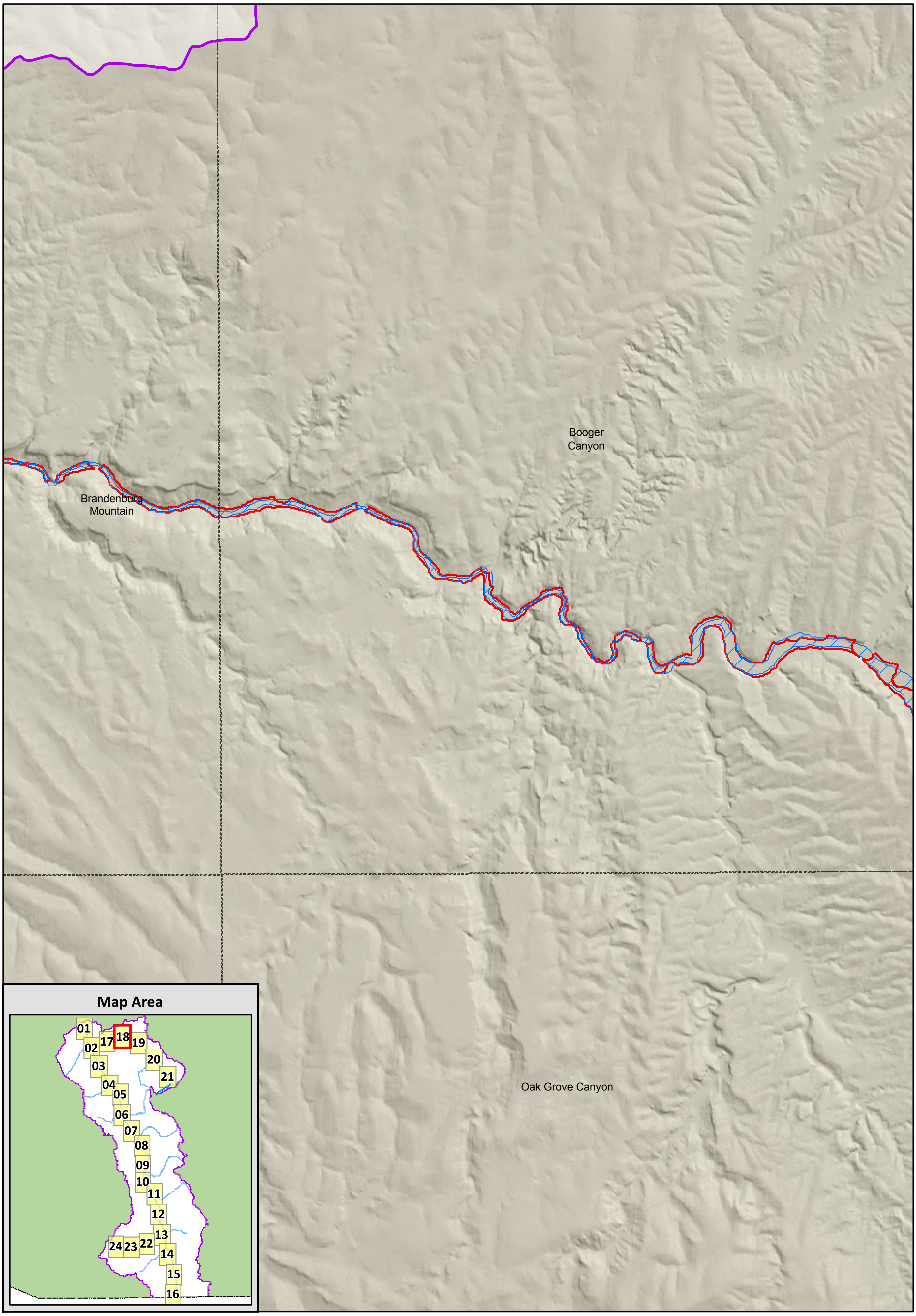
Legend

USGS Topo (24k) Quad Boundary
ADWR Subflow Zone
Watershed Boundary
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 18

Miles
0 0.5 1

0 0.5 1
Kilometers

Legend

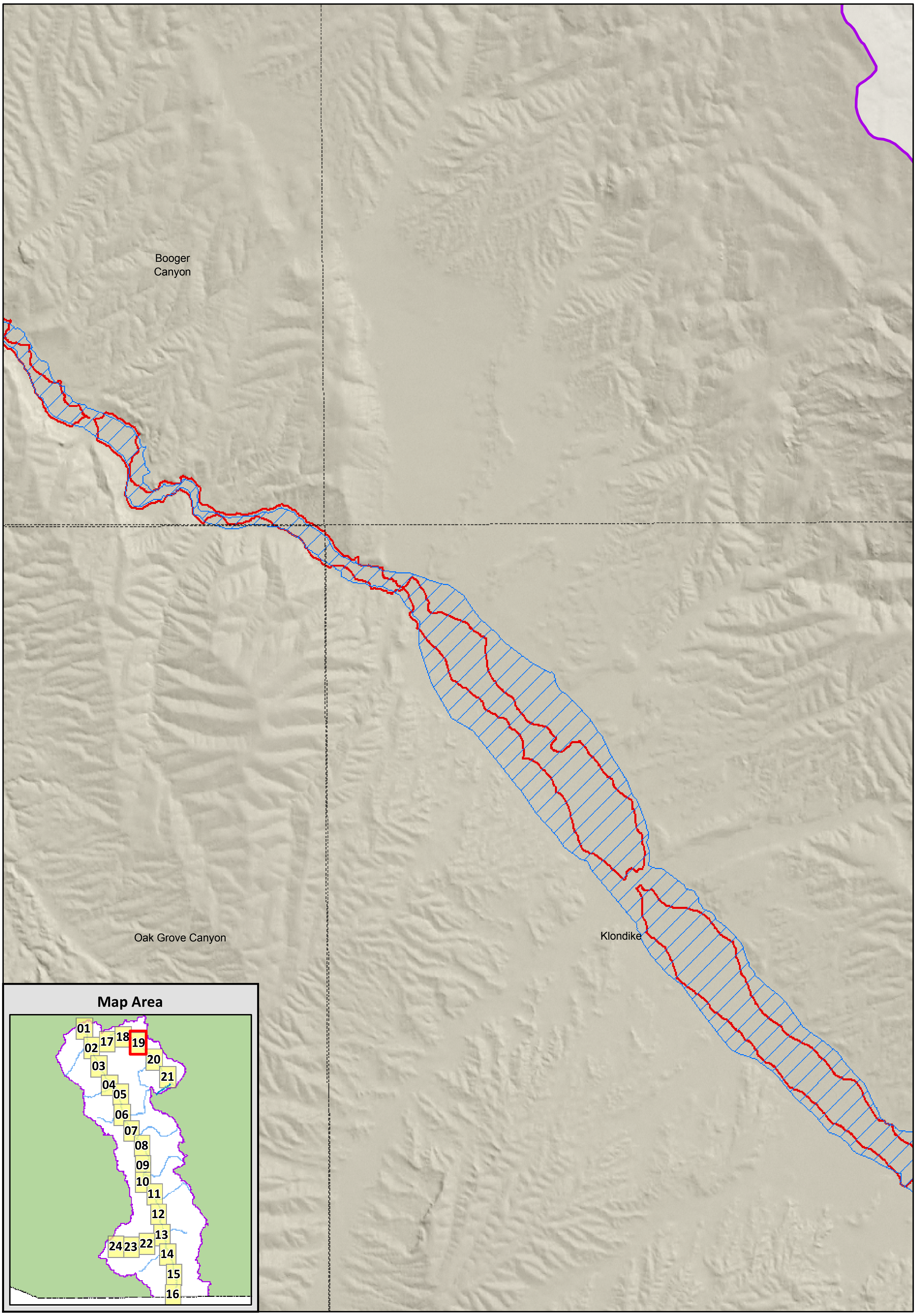
- USGS Topo (24k) Quad Boundary
- Watershed Boundary
- ADWR Subflow Zone
- LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 19

Miles
0 0.5 1
0 0.5 1
Kilometers

Legend

USGS Topo (24k) Quad Boundary

ADWR Subflow Zone

Watershed Boundary

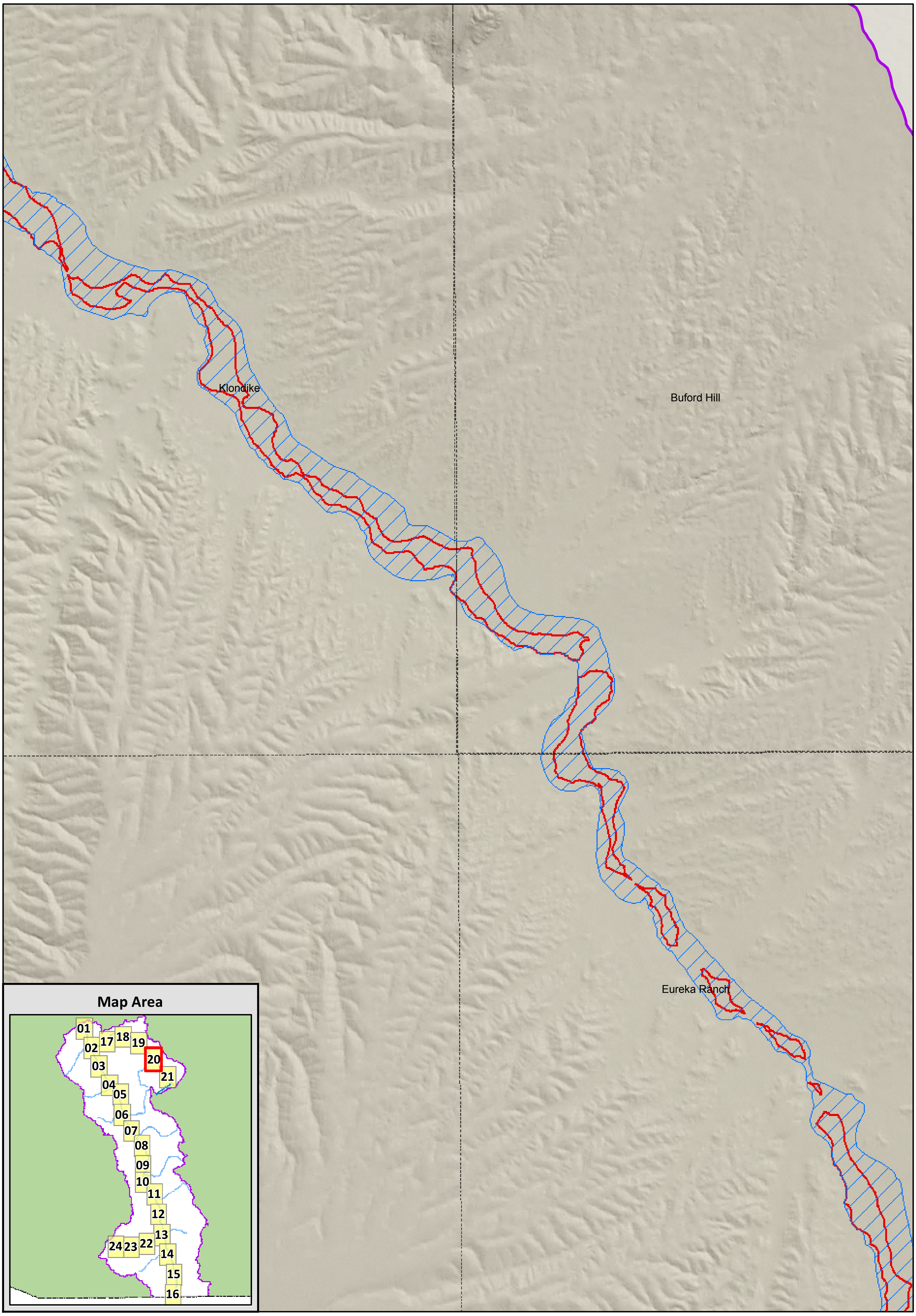
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 20

Legend

USGS Topo (24k) Quad Boundary
ADWR Subflow Zone
Watershed Boundary
LRE Subflow Zone

Miles
0 0.5 1

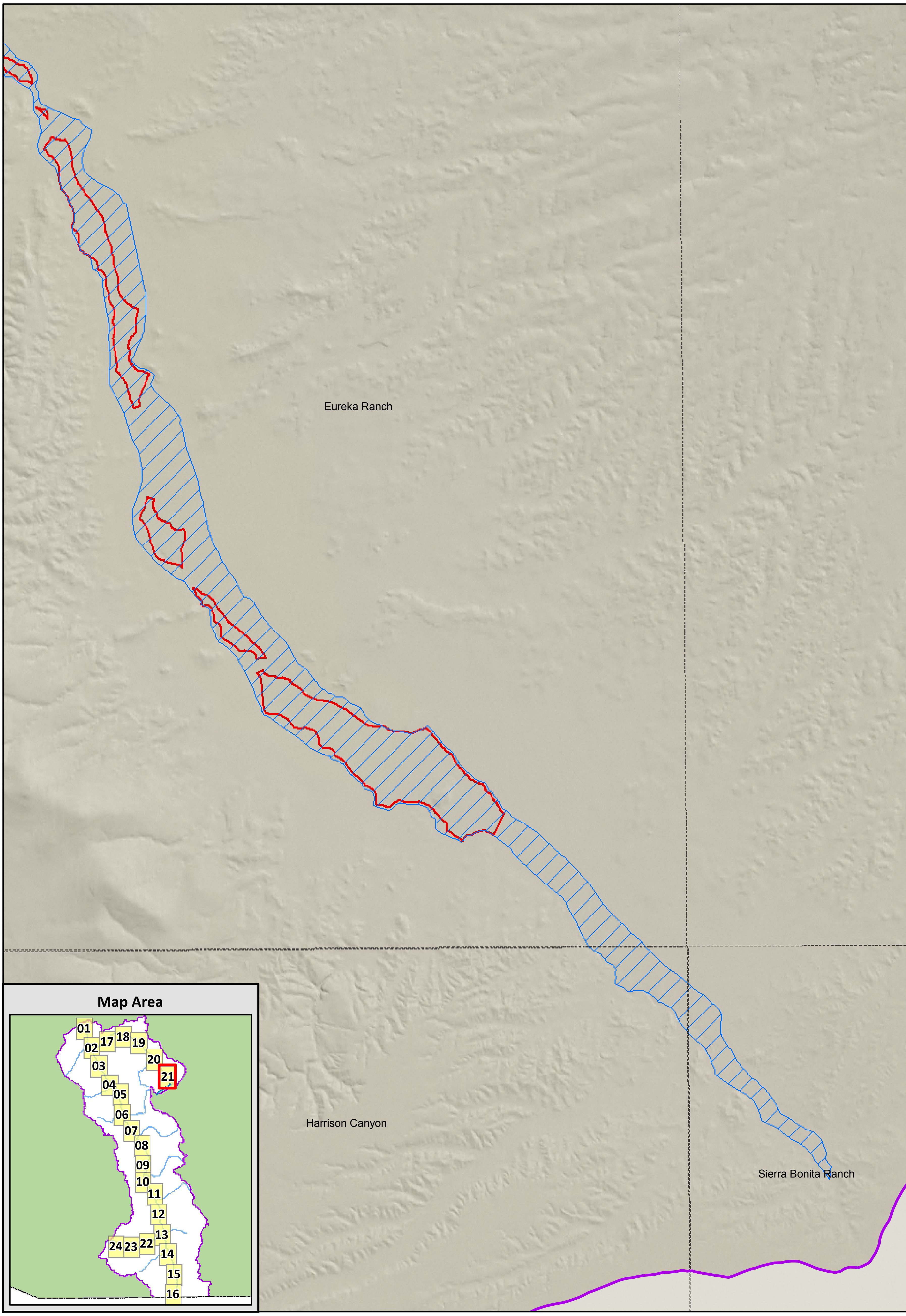
0 0.5 1
Kilometers

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

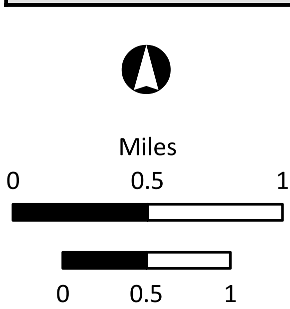
SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 21



Legend

USGS Topo (24k) Quad Boundary

ADWR Subflow Zone

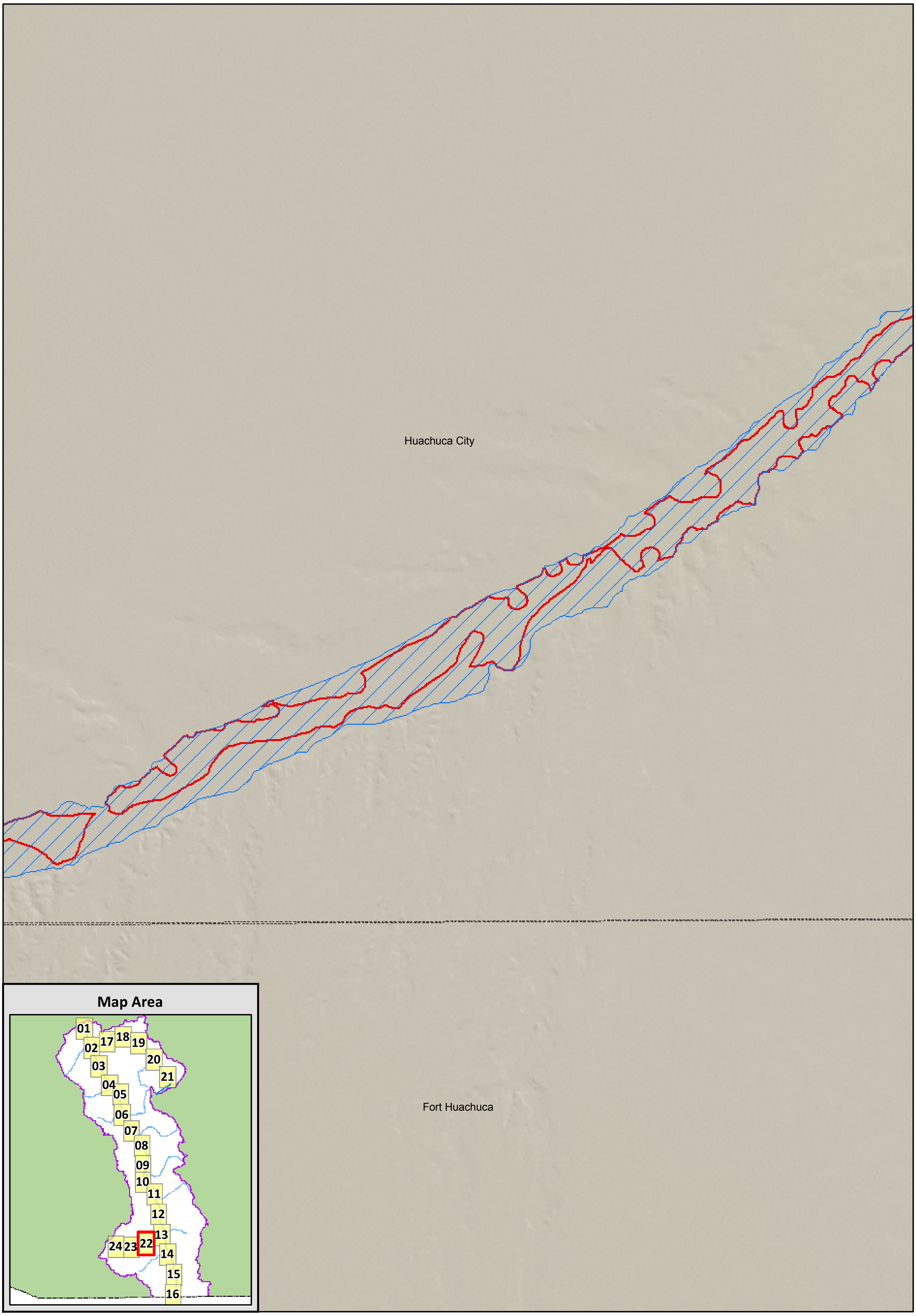
Watershed Boundary

LRE Subflow Zone

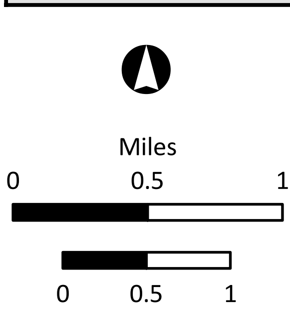
Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 22



Legend

USGS Topo (24k) Quad Boundary

ADWR Subflow Zone

Watershed Boundary

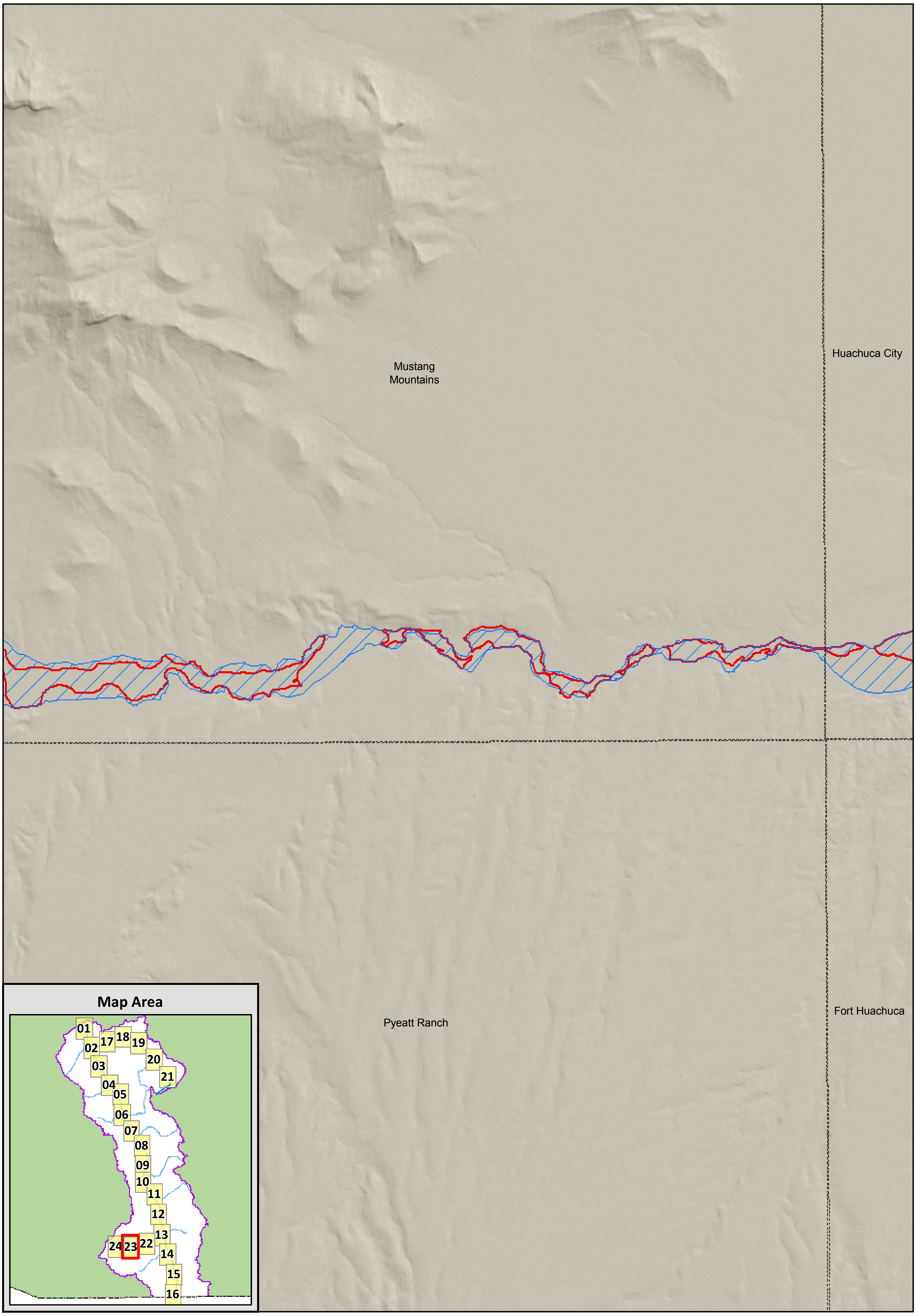
LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 23

Legend

USGS Topo (24k) Quad Boundary

ADWR Subflow Zone

Watershed Boundary

LRE Subflow Zone

Miles

0 0.5 1

0 0.5 1

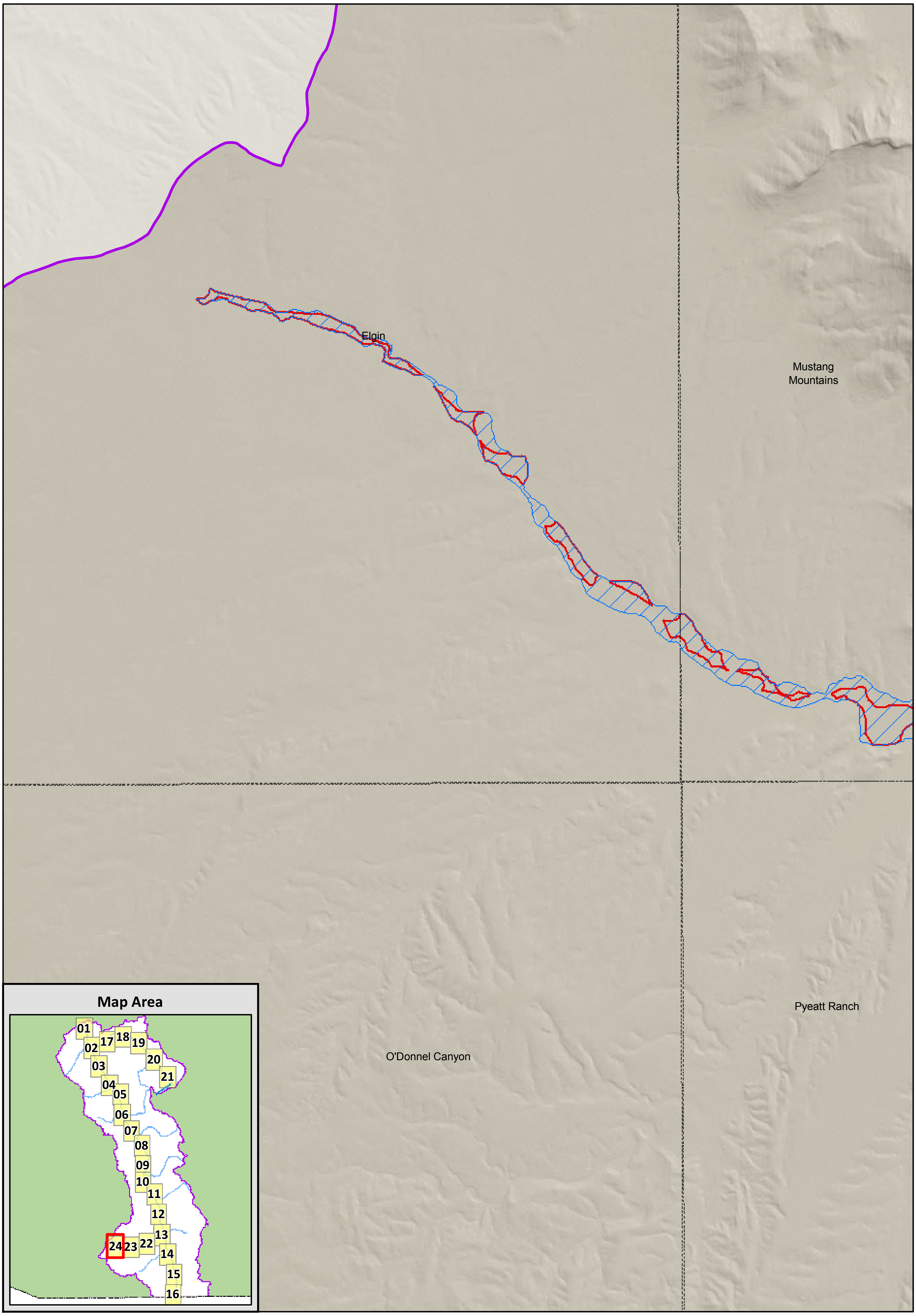
Kilometers

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd

Attachment 11

ADWR and LRE Subflow Zone Comparison, San Pedro River



Sheet 24

Legend

Miles
0 0.5 1

0 0.5 1
Kilometers

USGS Topo (24k) Quad Boundary

ADWR Subflow Zone

Watershed Boundary

LRE Subflow Zone

Data Sources:
ADWR: ADWR Subflow Zone
SRP: LRE Subflow Zone

SanPedro_SubflowComp.mxd