

Lower San Pedro Planning Area

Background

The Lower San Pedro Planning Area is contained within portions of Cochise, Pima, Pinal and Graham counties, in the southeast portion of the State. The Planning Area encompasses the majority of the Lower San Pedro Groundwater Basin, all of the Donnelly Wash and Aravaipa Canyon Basins, and those portions of the Dripping Springs Wash Groundwater Basin that are not within the boundaries of the San Carlos Apache Reservation (Apache Panning Area). Communities within the Planning Area include Oracle, Reddington, San Manuel, Mammoth, Dudleyville, Winkelman, Kearny, and Ray.



Land ownership within the Lower San Pedro Planning Area is diverse, including State, federal, and private lands (see *Figure P.A. 13-1*). Approximately 48 percent of land in this Planning Area is held as State Trust Lands. The majority of these State Trust Lands are in contiguous blocks with livestock grazing as the principal land use.

Federal land ownership is significant in the Planning Area. The USDA Forest Service (Forest Service) manages approximately 15 percent of land. These discontinuous holdings are largely comprised of the mountain ranges that form the periphery of each groundwater basin. Livestock grazing, recreation and timber production are the primary land uses on these portions of the Coronado National Forest. Additionally, a small portion of the Tonto National Forest is located in the northern portion of the Planning Area. The US Bureau of Land Management (BLM) manages roughly 17 percent of land in the Lower San Pedro Planning Area. Primary land uses on these lands are wildlife habitat, recreation and livestock grazing. The National Park Service (NPS) owns and manages a small portion of the Saguaro National Park in the southern extent of the Planning Area.

Approximately 17 percent of the land in the Lower San Pedro Planning Area is privately owned. Private lands are largely fragmented within the Planning Area with continuous strips running along highways and within populated communities. There are some private land in-holdings in the Coronado National Forest and amidst the BLM lands. Primary land uses are private domestic, municipal, mining, livestock grazing and agriculture.

Water Supply Conditions

Groundwater

The Lower San Pedro Planning Area is located in the Basin and Range Physiographic Province. This province is characterized by long broad alluvial valleys separated by mountain ranges, with thick productive regional alluvial aquifers, which may be suitable for artificial underground storage and recovery of renewable water supplies.

The groundwater system in the Lower San Pedro Planning Area is largely housed in the basin-fill sediments and the stream alluvium that has been deposited atop the older basin-fill deposits. Depth to groundwater varies significantly across the Lower San Pedro Planning Area (see *Figure P.A. 13-2*). Shallow groundwater, approaching the land surface, is encountered in the floodplain

aquifers along the San Pedro and Gila rivers and the lower portion of Aravaipa Creek. Water levels in this shallow system respond to water supply conditions along these water courses and have remained relatively stable.

The principal sources of natural recharge in the Planning Area are underflow from the Upper San Pedro Groundwater Basin, mountain-front recharge and streambed infiltration. Estimates of natural recharge for the Lower San Pedro Basin range from 24,000 to 29,000 acre-feet per year. Estimated natural recharge for the Aravaipa Canyons Basin is estimated to average between 7,000 and just less than 17,000 acre-feet per year. Estimates for Donnelly Wash and Dripping Springs Wash¹ basin are 3,000 and between 3,000 and 9,000 acre-feet per year, respectively. Artesian conditions exist in the center of the Planning Area south of Mammoth. Groundwater in storage estimates for the Lower San Pedro Basin range from 11 to 27 MAF to a depth of 1,200 feet. The Aravaipa Canyons Basin has an estimated 5.0 MAF in storage. Estimates for Donnelly Wash range from 140,000 acre-feet to 2.0 MAF and storage in the Dripping Springs Wash Basin is estimated to be between 150,000 acre-feet and 1.0 MAF.

Surface Water

The San Pedro River flows from south to north in the center of the Planning Area entering from the Upper San Pedro Planning Area, serving as the predominant hydrologic feature of the Planning Area (see *Figure P.A. 13-3*). The San Pedro River is joined by its tributary, Aravaipa Creek south of Dudleyville, and continues north joining the Gila River at Winkelman. The Gila River then flows northwest to west, bisecting the Donnelly Wash Basin. There are both perennial and intermittent reaches of the San Pedro River in the Planning Area. Other perennial waters include portions of Aravaipa Creek through and downstream of the Aravaipa Wilderness. Additional perennial stream reaches, including Redfield Canyon, emanate from the headwaters of the Galiuro Mountains.

Reclaimed Water

There are limited population centers in the Lower San Pedro Planning Area. No facilities directly recharging reclaimed water to the regional aquifer are located within the Planning Area. The wastewater treatment plant at Winkelman discharges directly to the Gila River following treatment. The limited population in the Lower San Pedro is largely reliant upon septic systems for wastewater treatment and disposal, although a few smaller wastewater treatment plants are located within the Planning Area.

Ecological Resources

Important ecological features located within the Planning Area include Aravaipa Canyon Wilderness Area and a portion of the Redfield Canyon Wilderness, managed by the BLM, and portions of the Galiuro, Santa Teresa, and the Rincon Mountain Wilderness Areas, managed by the Forest Service. Significant portions of the Lower San Pedro Planning Area have been designated as critical habitat under the Endangered Species Act (see *Figure P.A. 13-3*). These areas include all but the southernmost reach of the San Pedro River, all of the Gila River, those portions of Aravaipa Creek through and downstream of the Aravaipa Wilderness, portions of

¹ Estimates include a portion of the Basin within the Apache Planning Area.

headwater streams tributary to the Gila and San Pedro Rivers, and portions of the mountain ranges that form the periphery of the Planning Area.

Water Demands

Table P.A. 13-1 below presents the baseline and projected water demands for the Lower San Pedro Planning Area. Mining is the single largest water using sector in the Planning Area, estimated to use 15,790 acre-feet in 2010. These uses are projected to grow to as much as 27,000 acre-feet by 2035. Agricultural water use is estimated at 4,700 acre-feet and is projected to remain stable through 2060. These uses are generally located along the San Pedro and Gila Rivers and Aravaipa Creek immediately above the confluence with the San Pedro River. Municipal uses are limited and distributed in the population centers throughout the Planning Area. Municipal demand in the Planning Area is projected to decline from the 3,200 acre-feet in 2010 to less than 2,900 acre-feet in 2035 and then is projected to increase to just under 4,800 acre-feet in 2060.

Table P.A. 13-1. Projected Demands (in acre feet) – Lower San Pedro Planning Area

Sector	2010	2035	2060
Agriculture	4,700	4,700	4,700
Dairy	0	0	0
Feedlot	0	0	0
Municipal	3,234	2,963	4,786
Other Industrial	0	0	0
Mining	15,790		
High		27,000	27,000
Low		6,900	12,600
Power Plants	0		
High		0	0
Low		0	0
Rock Production	423		
High		243	392
Low		102	163
Turf			
High	0	0	0
Low	211	211	343
Total (High)	24,147	34,906	36,878
Total (Low)	24,358	14,876	22,592

Characteristics Affecting Future Demands and Water Supply Availability

Projected Demands

The relatively limited current and projected agricultural and municipal water uses in the Lower San Pedro Planning Area are largely served by local groundwater supplies without appreciable impacts, such as the development of cones of depression. By their nature, mining uses are located in regions of hard rock geology and do not typically enjoy close proximity to productive regional aquifer systems. Mines commonly import water supplies to meet their on-site needs. Many of the mines in the region have been closed, including Mammoth and San Manuel. The future of these, and other potential, mining operations are projected to have the most significant water supply influence in the future for the Planning Area.

General Stream Adjudication

The general stream adjudications are judicial proceedings to determine or establish the extent and priority of water rights in the Gila and Little Colorado River systems. Over 84,000 claimants and water users are joined in the Gila River Adjudication that will result in the Superior Court issuing a comprehensive final decree of water rights. Until that process is complete, uncertainty regarding the extent and priority of water rights in this Planning Area will make it difficult to identify strategies for meeting the projected water demands.

Unresolved Indian Water Rights Claims - San Carlos Apache Gila River Claims

A portion of the water rights claims of the San Carlos Apache Tribe were settled through congressional enactment of the San Carlos Apache Tribe Settlement Act of 1992. The water right claims of the San Carlos Apache Tribe to portion of the reservation within the Upper Gila River watershed will be the subject of separate negotiations or litigation. Indian settlements are related to the General Stream Adjudication and quantification of these rights is a key element in resolving the Gila River Adjudication. Until these claims are quantified and settled, uncertainty regarding the extent and priority of water rights in this Planning Area will make it difficult to identify strategies for meeting the projected water demands.

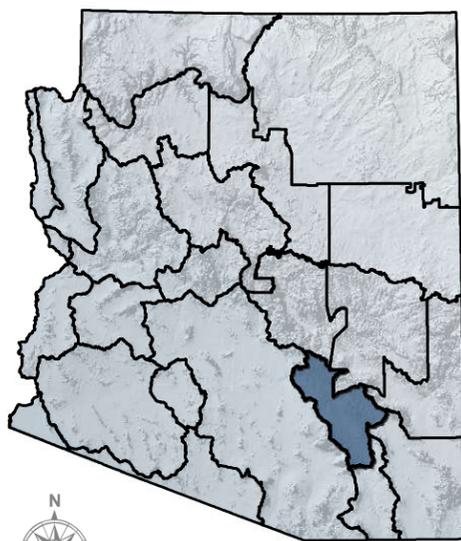
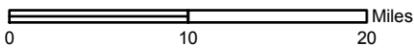
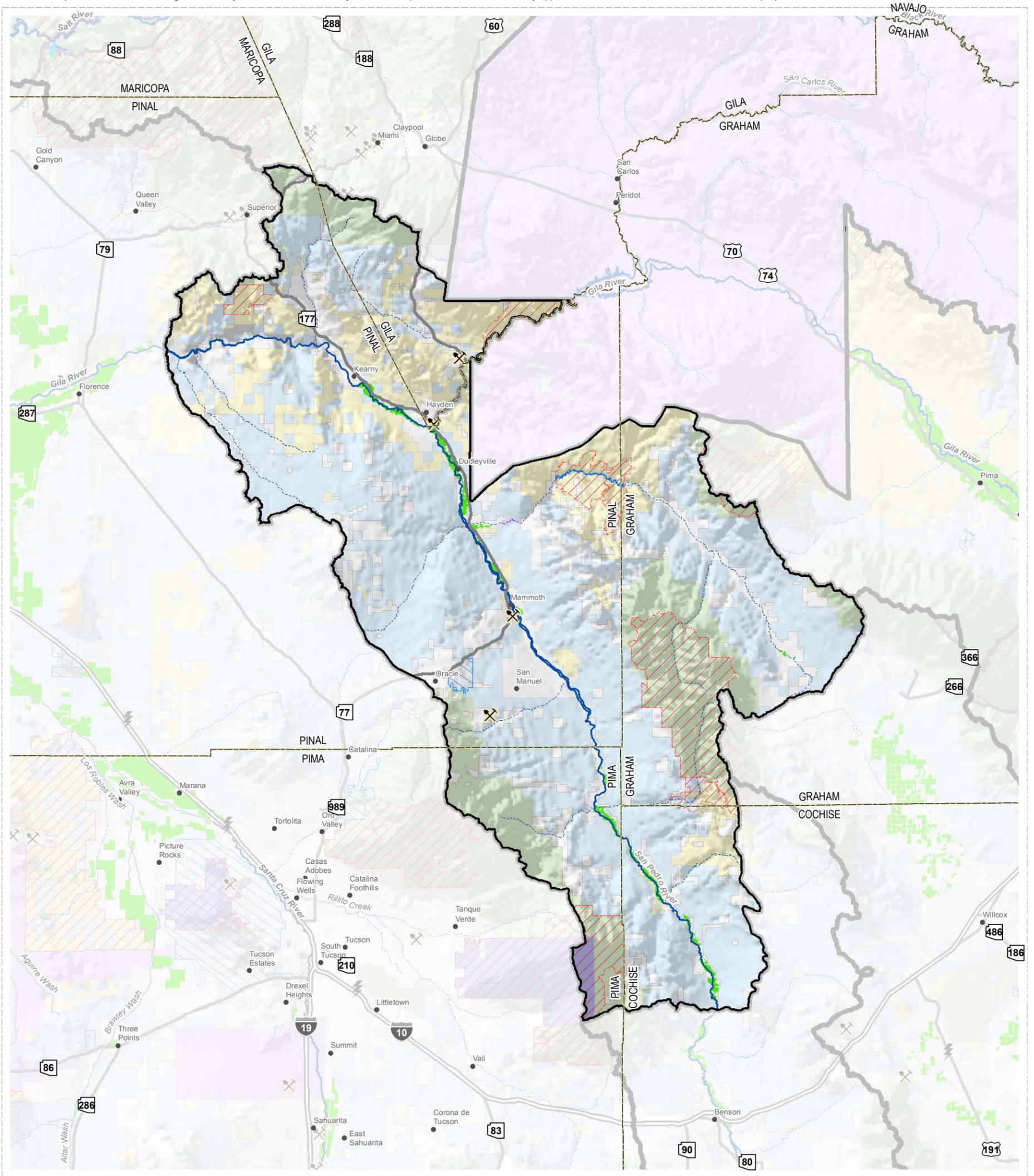
Protected Species and Habitat

The presence of a listed species may be a critical consideration in water resource management and supply development in a particular area. This Planning Area has significant land holdings under federal ownership, almost exclusively BLM and National Forest, including Wilderness Areas. These designations have the potential to significantly limit water supply development and growth in this Planning Area.

Strategies for Meeting Future Water Demands

Groundwater supplies are expected to be available to meet the projected growth in the Lower San Pedro Planning Area and thus no additional strategies are needed at this time. However, resolution of Indian water claims and the Gila River General Stream Adjudication are essential for ensuring long-term certainty of water supply availability to water users in this Planning Area.

NOTE: Because GIS data for this project were acquired from multiple sources employing different land base grids and varying accuracy standards, some inconsistencies were encountered. The user is responsible for understanding the accuracy limitations of GIS data layers and is responsible for the results of any application of the data for other than their intended purpose.



MAP LOCATION
(Planning Area Boundaries)

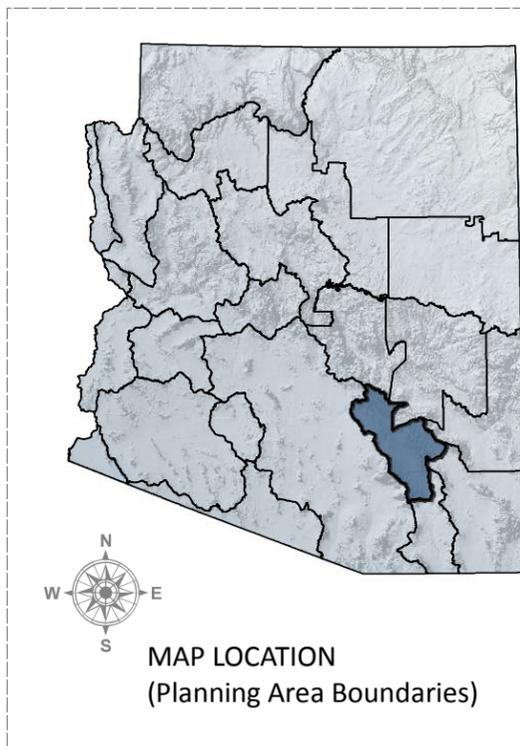
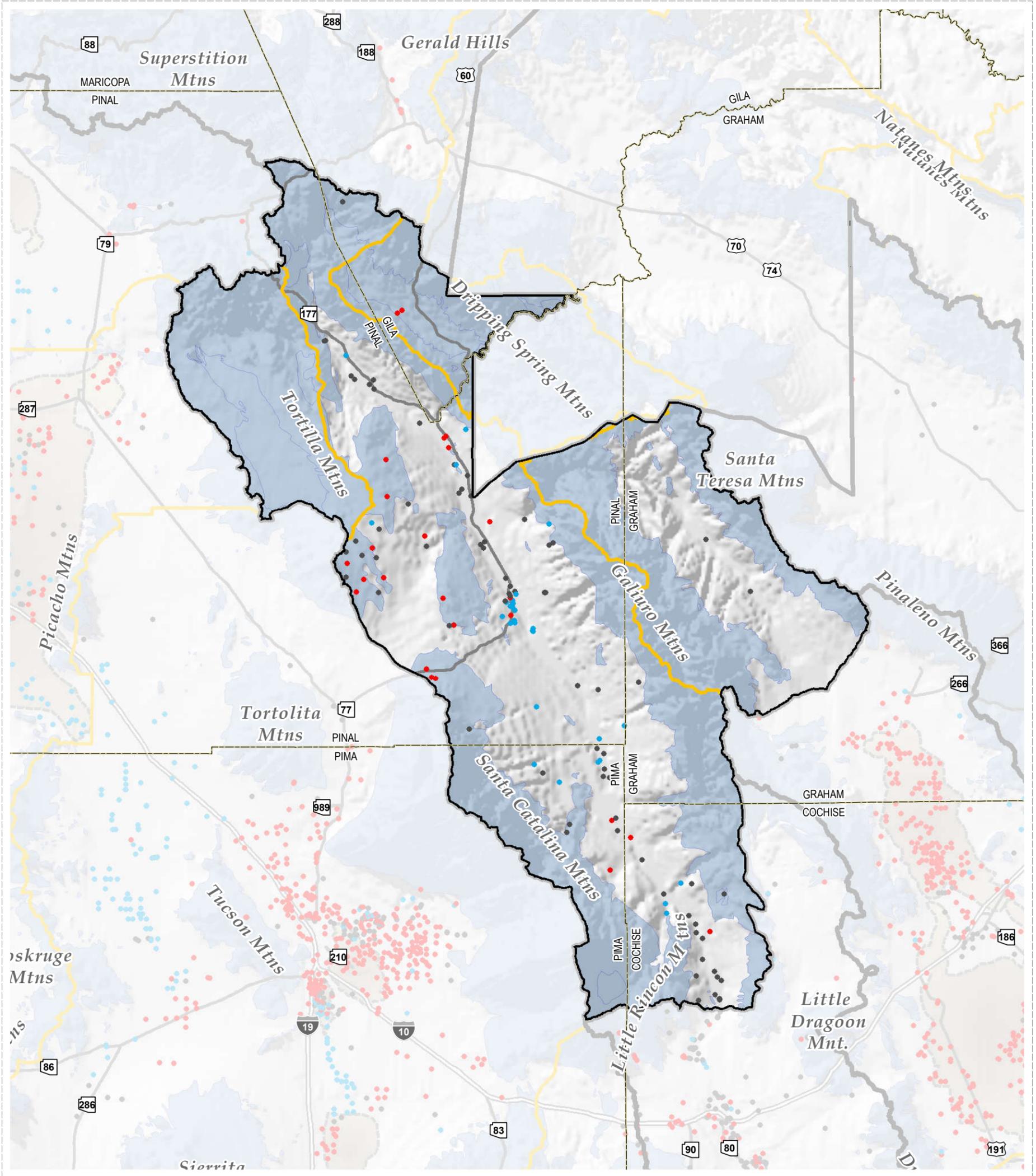
- Planning Area (ADWR)
- State (ALRIS)
- County (ALRIS)
- River or Stream (ASLD)
- Interstate (ADOT)
- Population Center (GNIS)
- Mine (ADMMR, ADWR)
- Hydroelectric Power Plant (ADEQ, ADWR)
- Thermoelectric Power Plant (ADEQ, ADWR)
- Agriculture (SWReGAP, 2004)
- Federal Conservation Land (USFS, BLM, NPS)
- State Managed Conservation Land (AZGFD, AZSP)
- BLM Land
- National Forest
- National Park
- Military Reserve
- Private and Other Land
- State Trust Land
- Tribal Land



Lower San Pedro Land Ownership

Figure P.A.13-1

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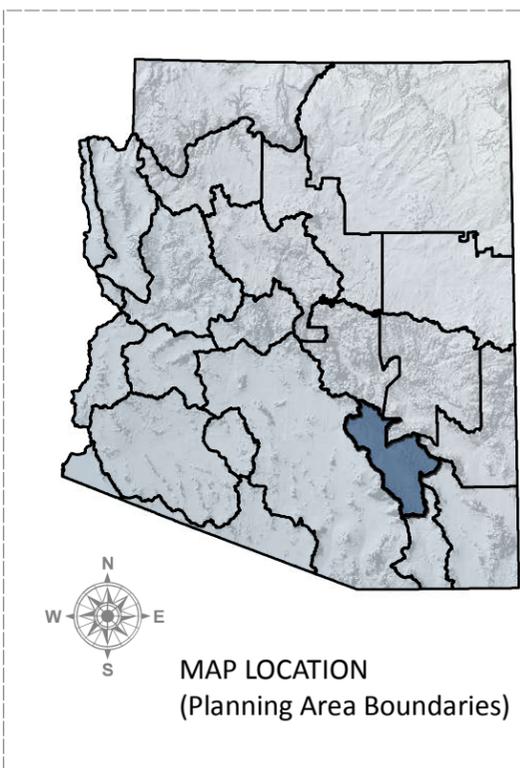
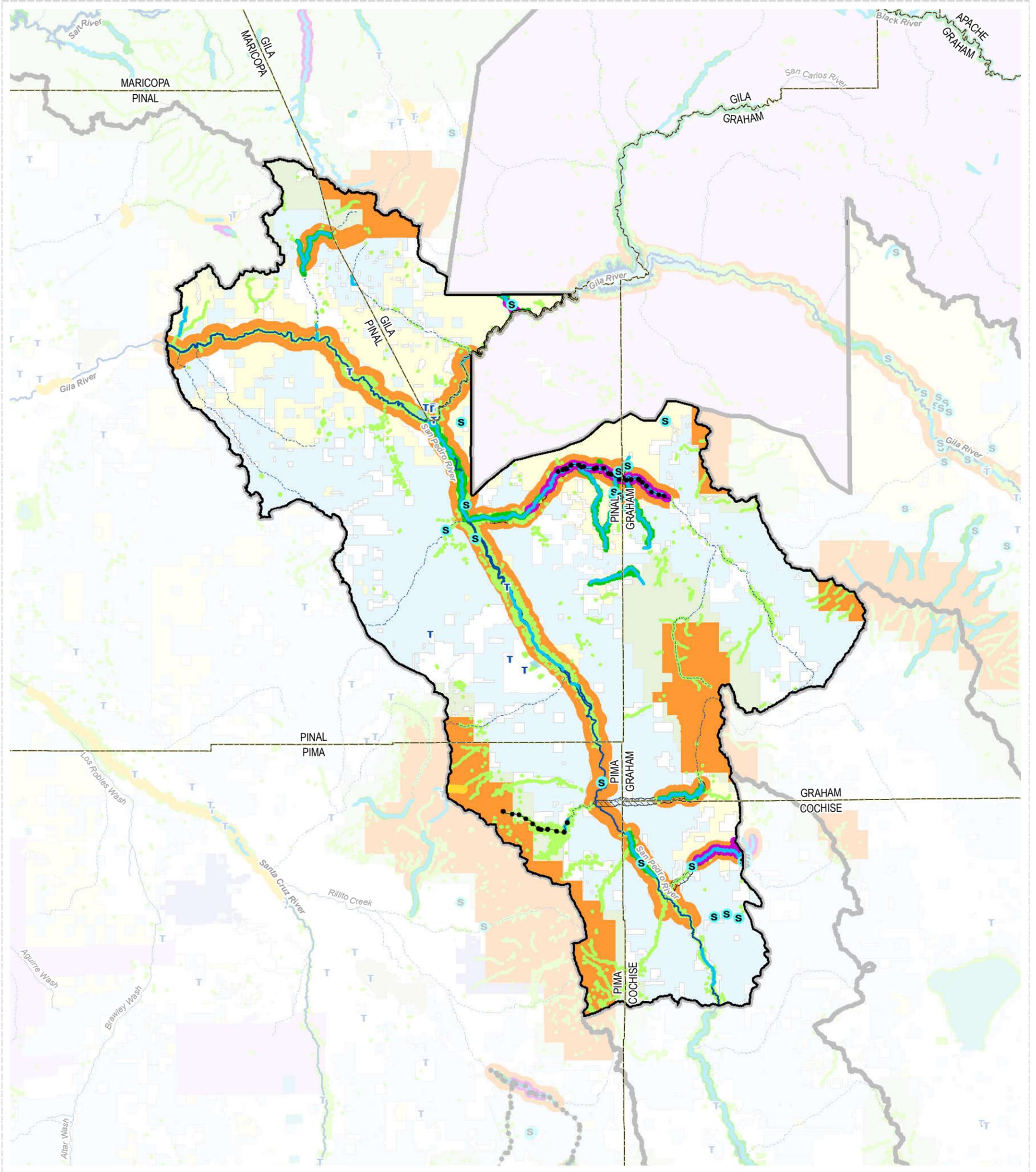


- Planning Area (ADWR)
 - State (ALRIS)
 - County (ALRIS)
 - Groundwater Basin (ADWR)
 - Area of Active Land Subsidence (ADWR)
 - Hard Rock Geology (AZ Bureau of Mines, UofA)
 - Interstate (ADOT)
- Recent Water Level Change * (1990's through 2000's)
 - Minor WL Change +5' to -5'
 - Negative
 - Positive
- * Data provided by ADWR



Figure P.A.13-2 Lower San Pedro Groundwater Hydrology

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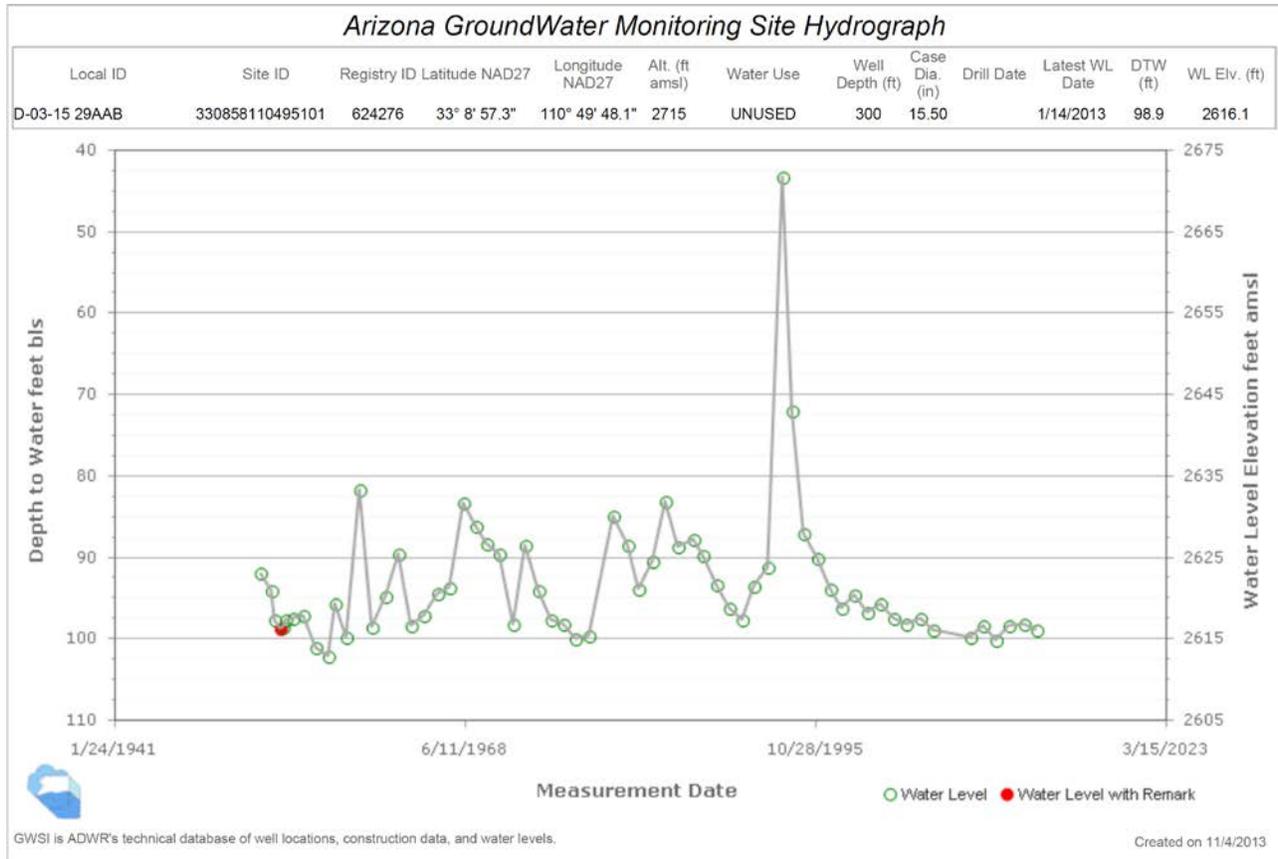


-  Planning Area (ADWR)
-  State (ALRIS)
-  County (ALRIS)
-  Reservoir or Lake (NHD)
-  Waste Water Treatment Plant (ADEQ)
-  Major Spring (ADWR, Pima County)
-  Perennial Flow (ADEQ, USGS)
-  River or Stream (ASLD)
-  Outstanding Arizona Water (ADEQ)
-  Effluent Dependent Stream (ADWR, NEMO)
-  Instream Flow Certificate (ADWR)
-  1993 Riparian Inventory (AZGFD)
-  Modeled Riparian Habitat (AZGFD)
-  Designated ESA Critical Habitat (USFWS)
-  Proposed ESA Critical Habitat (USFWS)
-  Federally Designated Wild and Scenic River (USFS)
-  BLM Land
-  National Forest
-  National Park
-  Military Reserve
-  Private and Other Land
-  State Trust Land
-  Tribal Land



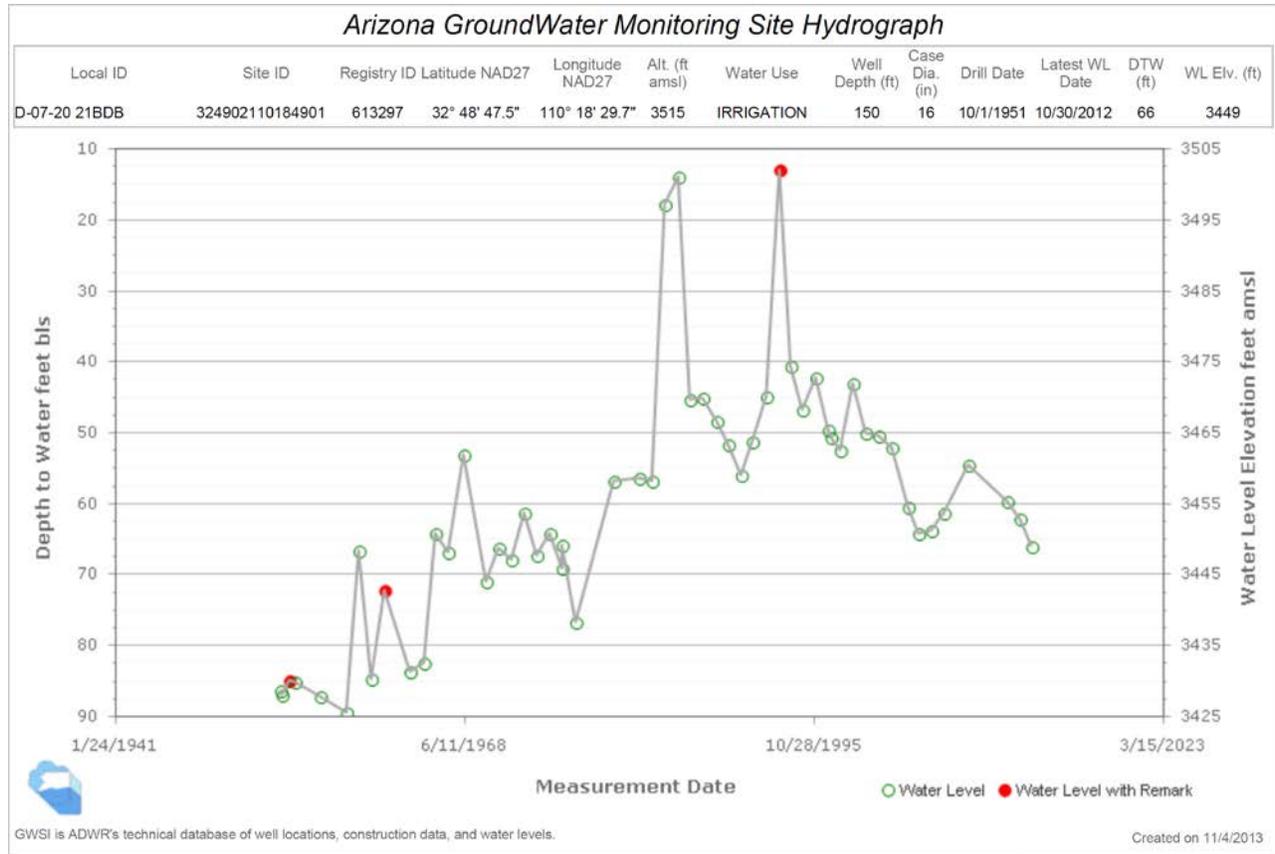
Figure P.A.13-3 Lower San Pedro Surface Water and Natural Features

Dripping Springs Basin – Lower San Pedro Planning Area



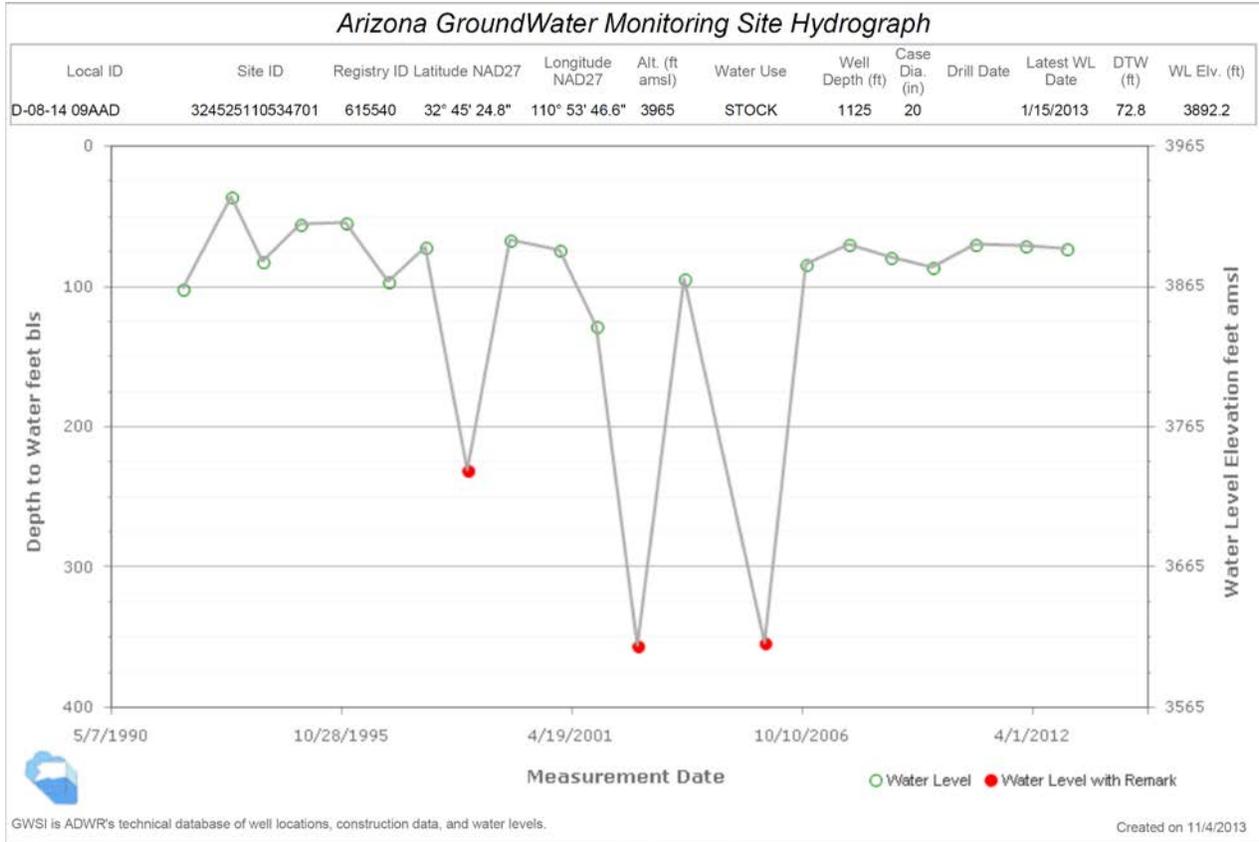
D-03-15 29AAB –Dripping Springs Wash basin about 7 miles NE of Kelvin.

Aravaipa Canyon Basin – Lower San Pedro Planning Area

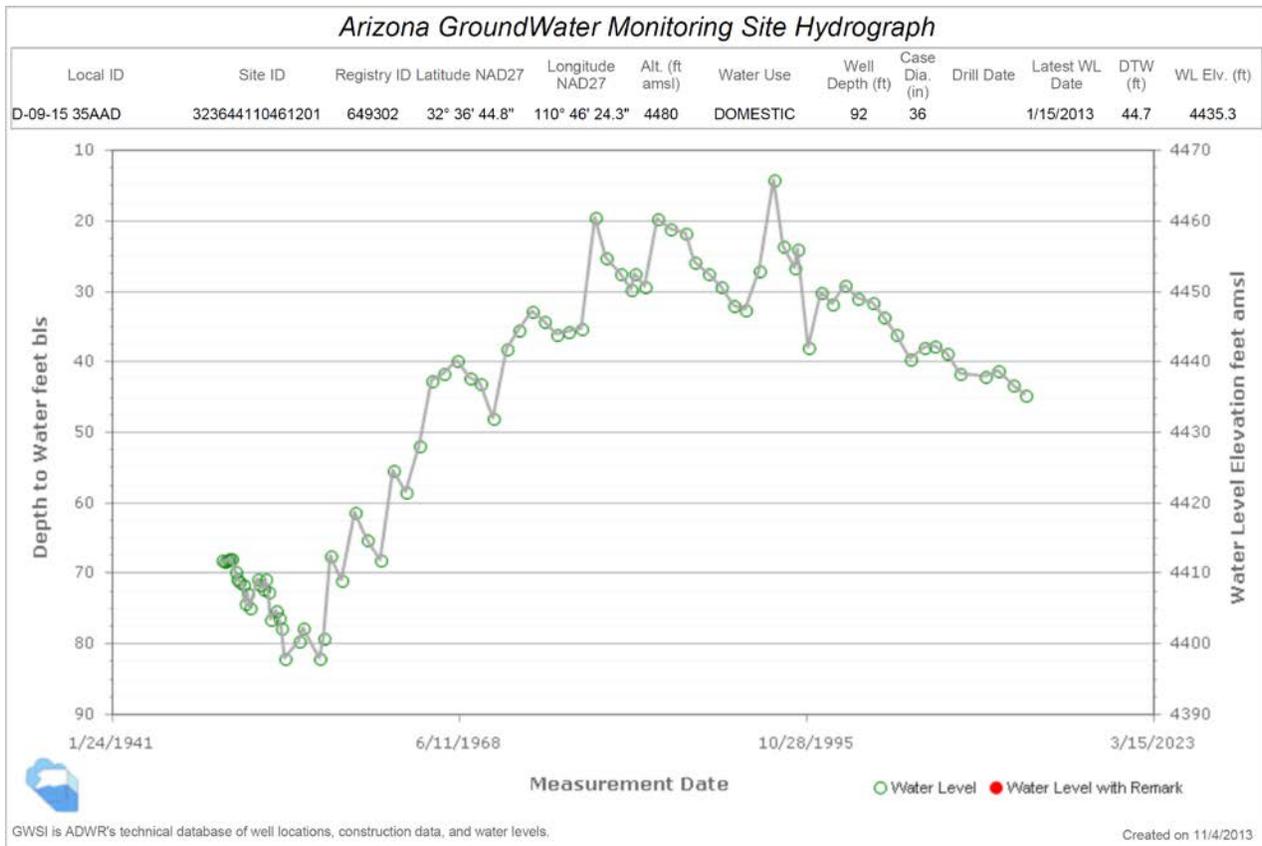


D-07-20 21BDB – Aravaipa basin – about 2 miles SE of Klondyke along Aravaipa Creek.

Lower San Pedro Basin – Lower San Pedro Planning Area



D-08-14 09AAD Lower San Pedro basin – Camp Grant sub-basin about 3 miles NE of Oak Wells.



D-09-15 35AAD – Lower San Pedro basin – Mammoth sub-basin Oracle area.