

Roosevelt Planning Area

Background

The Roosevelt Planning Area is located within portions of Gila, Maricopa, and Pinal counties in the central portion of the State, immediately adjacent to the eastern extent of the Phoenix AMA Basin. The Roosevelt Planning Area contains portions of three watersheds, the Salt, Verde, and a small portion of the Upper Gila. The Planning Area includes portions of four groundwater basins: Salt River, Tonto Creek, Verde River, and a small portion of the Safford Basin. There is limited population in the Planning Area, largely residing in several moderately populated communities. The primary communities within the Planning Area are Payson, Star Valley, Globe, Miami, Strawberry, Pine, and Young. The Town of Payson is the largest community in the Planning Area.



Nearly all of the land within this Planning Area is federally owned and managed by the USDA Forest Service (Forest Service) as part of the Tonto National Forest (*see Figure P.A. 16-1*). Land uses on the Tonto include resource conservation, recreation, livestock grazing, watershed management and timber production. A small portion of the federal land includes the Tonto Apache Indian Reservation just south of Payson. The Tonto Apache Indian Reservation is the smallest land base reservation in Arizona at 85 acres. Principal water demands are associated with the Mazatzal Casino and restaurant, and tribal offices. The largest private land holdings in the Planning Area are in the vicinity of Payson and Globe. There are also numerous small private land in-holdings within the boundaries of the Tonto National Forest. Land uses include mining, domestic, commercial, livestock grazing, and limited irrigated agriculture. A small amount of land in the vicinity of Globe is owned and operated by the US Bureau of Land Management (BLM) and used for mining and livestock grazing.

Water Supply Conditions

Groundwater

The Roosevelt Planning Area is located in the Central Highlands Transition Zone Physiographic Province. The groundwater system within this mountainous terrain includes relatively thin alluvial aquifers, and limited volumes of groundwater flowing in fractured crystalline, sedimentary, and volcanic rock. A unique geographic feature of the Planning Area is the Mogollon Rim, the escarpment that defines the northern boundary of the Planning Area and the southern boundary of the Colorado Plateau within Arizona.

In 2012, there were 21 municipal wells serving the communities of Globe, Miami and Claypool in the southeast part of the Planning Area. Total groundwater withdrawals from these wells in 2012 totaled approximately 2,450 acre-feet. Wells in the Globe, Miami and Pinal Creek areas in the western portion of the Salt River basin showed significant declines along Pinal Creek due to groundwater remediation pumping for the Pinal Creek Water Quality Revolving Fund (WQARF) site (*see Figure P.A. 16-2*).

Water levels have risen or remained constant in most of the wells located in the Tonto Creek Basin (*see Figure P.A. 16-2*), with the exception of the northern portion of the Basin in the Star Valley/Payson area where water levels have generally declined in areas where municipal and industrial pumping exceeded natural recharge.

In the Payson area of the Verde River Basin, groundwater levels declined in six of the seven wells measured over the period from 1990 to approximately 2009 (see *Figure P.A. 16-2*). Payson's groundwater supply comes from a fractured rock aquifer and yields only small volumes of water to wells; therefore the supply is drought sensitive. The overall water level declines in the Payson area wells measured by ADWR were in excess of 2 feet/year over this period. However, recent short-term water level trends show some wells with recovering or stabilized water levels. The more recent recovery or stabilization trend observed in some Payson area wells is believed to be mainly a result of distributing municipal pumping over a broader area and adding well capacity.

There are several water quality issues within the Planning Area. The Pinal Creek WQARF Site has groundwater and surface water contamination, a consequence of the mining and mineral processing in the area since 1878. There are two WQARF sites in the Payson area, the Payson PCE site and the Tonto & Cherry site, being monitored for tetrachloroethene (PCE) and trichloroethene (TCE). Additionally, many of the wells monitored in the Payson area equaled or exceeded the standards for arsenic, beryllium, cadmium, lead, semi-volatile organic compounds and selenium.

Surface Water

The major surface water features in the Salt River Watershed in the Planning Area includes the Salt River, which flows toward the southwest (see *Figure P.A. 16-3*). The Salt River is the largest tributary of the Gila River with a drainage area of about 5,980 square miles. The headwaters of the Salt River include the White and Black rivers, originating in the high elevations of the Salt River Basin in the White Mountains where winter snow accumulation is critical to downstream water supplies. Tonto Creek is tributary to the Salt River in the Planning Area. Surface water from both the Salt and Tonto Creek watersheds are impounded in Roosevelt Lake behind Theodore Roosevelt Dam and subsequently released to a series of downstream reservoirs operated by SRP along the Salt River outside of the Planning Area. Annual streamflow of the Salt River fluctuates widely. The minimum and maximum annual flow in the Salt River upstream of Roosevelt Lake was 152,798 acre-feet (2002) and 2,422,315 acre-feet (1916), respectively. The minimum and maximum annual flow in Tonto Creek upstream of Roosevelt Lake was 2,852.4 acre-feet (2002) and, 455,665 acre-feet (1993), respectively.

The East Verde River drains the northwest portion of the Roosevelt Planning Area (see *Figure P.A. 16-3*). It flows to the Verde River which flows from north to south in the western portion of the Planning Area near the southern extent of the Verde River Watershed. There are two impoundments on the Verde River in the Planning Area upstream of its confluence with the Salt River, Horseshoe and Bartlett reservoirs operated by SRP. The Verde River is perennial throughout its length. The minimum and maximum annual flow in the Verde River upstream of Horseshoe Lake was 131,073 acre-feet (2002) and 1,583,014 acre-feet (1993), respectively.

Reclaimed Water

The majority of the reclaimed water produced in the Planning Area is generated at several municipal wastewater treatment facilities serving Globe, Miami, Strawberry/Pine, Payson, and Star Valley. Principal reclaimed water disposal methods include turf irrigation, discharge to a watercourse, and golf course irrigation. The residents of the Town of Payson have made substantial investment in reclaimed water infrastructure for a variety of turf irrigation projects and groundwater recharge, including the Green Valley Lake project. The 48-acre Green Valley Park was developed jointly by the Town of Payson Water Department and the Northern Gila County Sanitary District. Treated reclaimed water from the

district's water treatment plant fills a 10.5-acre lake used for adjacent irrigated areas and recreational facilities¹.

Ecological Resources

There are multiple environmental and recreational resources within the Planning Area in the Salt River and Verde River watersheds (see *Figure P.A. 16-3*). Along Fossil Creek, two hydroelectric power plants were decommissioned, natural water flows restored, and native fish species were reestablished. Fossil Creek has been designated as a Wild and Scenic River. There are numerous riparian corridors along the two major rivers and their tributaries. Critical habitat has been designated for numerous species throughout the Planning Area. The watercourses, lakes, and National Forests within the Planning Area are used extensively for outdoor recreation.

Water Demands

Table P.A. 16-1, below, presents the baseline and projected water demands for the Roosevelt Planning Area. Mining is the largest water demand sector and it is projected to increase during the planning period, specifically at an underground block cave mine proposed by Resolution Copper Mining on lands within the Tonto National Forest, located approximately four miles east of Superior. Mining would take place 7,000 feet below ground and is estimated to extract one cubic mile of copper ore. Increased production and water use are also anticipated at other operating mines within the Planning Area. Municipal use is currently projected to increase and almost double by the year 2060. Population growth is expected within the limited lands surrounding the existing population centers within the Planning Area, such as Payson, are popular second home and retirement locations. Agricultural water use in the Planning Area is not expected to increase over the planning period.

Characteristics Affecting Projected Water Demands and Supply Availability

Resolution of Indian and Non-Indian Water Rights Claims

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. Additionally, claims of the Tonto Apache Tribe have yet to be resolved. Until the adjudication process and settlement of tribal claims are 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.

Land Ownership

This Planning Area is almost entirely under federal ownership, almost exclusively Forest Service including all or portions of seven Wilderness Areas, including all of the Salome, Hellsgate, Sierra Ancha and Four Peaks Wilderness Areas and significant portions of the Superstition, Matagal and Salt River Canyon Wilderness Areas. Wilderness areas are designated under the 1964 Wilderness Act to preserve and protect the designated area in its natural condition. These designations have the potential to significantly limit water supply development and growth in this Planning Area.

¹ Payson Regional Economic Development Corporation, 2006

TABLE P.A. 16-1 Projected Water Demands (in acre feet) – Roosevelt Planning Area

Sector	2010	2035	2060
Agriculture	2,685	2,685	2,685
Dairy	0	0	0
Feedlot	0	0	0
Municipal	7,105	11,333	13,681
Other Industrial	0	0	0
Mining	15,457		
High		48,400	48,400
Low		28,000	28,000
Power Plants	0		
High		0	0
Low		0	0
Rock Production	355		
High		724	869
Low		302	362
Turf	587		
High		831	853
Low		551	643
Total (High)	26,189	63,973	66,489
Total (Low)	26,189	42,871	45,372

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. In the Salt River watershed, SRP has developed the Roosevelt Habitat Conservation Plan (HCP) to minimize and mitigate the impacts of operation of Roosevelt Dam to the southwestern willow flycatcher, bald eagle, and other listed and candidate species. Under the HCP, SRP will acquire and protect at least 1,500 acres of riparian habitat in perpetuity along the San Pedro, Verde, and Gila rivers, or other river systems in Arizona, and implement other conservation measures to protect up to 750 additional acres of habitat. The Plan also includes rescue of bald eagle eggs and nestlings whose nests are threatened by inundation and monitoring of the species and habitat at Roosevelt Lake and in the mitigation areas.

An HCP has also been adopted for Horseshoe and Bartlett reservoirs on the Verde River. Low reservoir levels from drought conditions resulted in establishment of riparian species in the Horseshoe storage space that became colonized by a population of southwestern willow flycatchers and other covered species that may be adversely impacted by refilling the reservoir. The HCP will minimize and mitigate for take of the covered species by actions including, but not limited to, operating Horseshoe to maintain the riparian forest and acquiring 200 acres of replacement habitat.

Downstream Water Demands

This Planning Area lies within a portion of the watershed that is essential to the Phoenix area - through the Salt River Project. Management of this watershed for forest health and water supply development is important to ensuring a secure water supply for the Phoenix area, while at the same time balancing the needs of the water users in the Roosevelt Planning Area. Certain legal agreements and settlements that operate within the Planning Area allow for the movement of surface water to other Planning Areas. For example, surface water stored in the Salt and Verde reservoirs is primarily allocated for downstream use outside of the Planning Area. The C.C. Cragin Reservoir, located north of Payson outside of the Planning Area in Coconino County, was acquired by SRP as part of the Arizona Water Settlement Act. Water from this reservoir is used to satisfy obligations to the Gila River Indian Community, supplements SRP's supplies, and, upon completion of water delivery and treatment infrastructure, will improve the water supply availability in northern Gila County and Payson. The majority of the pipeline is located on federal lands. The Town of Payson has a 3,000 acre-foot allocation for water from the reservoir that will supply the town's foreseeable future water demands.

Wildfire

There were several major wildfires either within or nearby this Planning Area that have impacted local water supplies. The Rodeo-Chediski Fire in 2002 consumed about 462,600 acres, much of it in the north-central part of the Salt River Basin. The Willow Fire (2004) burned almost 120,000 acres southwest of Payson in the Tonto Creek and Verde River basins and, most recently, the Wallow Fire burned 538,049 acres in the Apache-Sitgreaves National Forests east of the Planning Area in 2011, becoming Arizona's largest wildfire in recorded history.

In the Southwest, fire can be among the most significant watershed disturbance agents, particularly to peak stream flows. For example, in areas severely burned by the Rodeo-Chediski Fire, peak flows were as much as 2,350 times greater than previously measured - the highest known post-fire peak flow in the Southwest. Increased peak flows can degrade stream channels and make them unstable, increase sediment production and cause flood damage. Wildfire and drought can result in vegetative changes in the Planning Area with implications for runoff, infiltration and watershed yield.

Strategies for Meeting Future Water Demands

Resolution of Indian and Non-Indian Water Rights Claims

Efforts to complete the Gila River General Stream Adjudication are critical to provide long-term certainty for water users in Arizona dependent on water supplies from the Gila River and its tributaries. A comprehensive focus on what is needed to complete the Adjudication is essential and could help provide guidance to ADWR so adequate funding can be identified and obtained to complete the necessary technical work to support completion of this process.

Watershed/Forest Management

Watershed management practices aimed at increasing watershed yield have been evaluated in Arizona showing opportunities for success. Due to the significant acreage of forested lands in this area, continuation of this process and implementation of safe and effective strategies are important to water users within and outside of this Planning Area. Combining efforts with other management initiatives (such as the Four Forest Restoration Initiative) may be a cost-effective way to advance this option and provide multiple benefits to this Planning Area and those dependent on its resources. The Four Forest

Restoration Initiative (4FRI) is a collaborative effort to restore forest ecosystems on portions of four National Forests - Coconino, Kaibab, Apache-Sitgreaves, and Tonto - along the Mogollon Rim in northern Arizona. The vision of 4FRI is restored forest ecosystems that support natural fire regimes, functioning populations of native plants and animals, and forests that pose little threat of destructive wildfire to thriving forest communities, as well as support sustainable forest industries that strengthen local economies while conserving natural resources and aesthetic values².

Weather Modification

Weather modification, or cloud seeding, is a potential strategy to either augment local water supplies or mitigate the impacts of groundwater development and should be explored in this Planning Area.

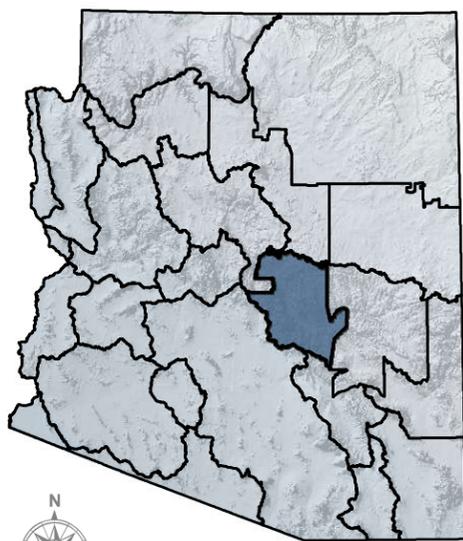
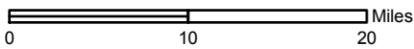
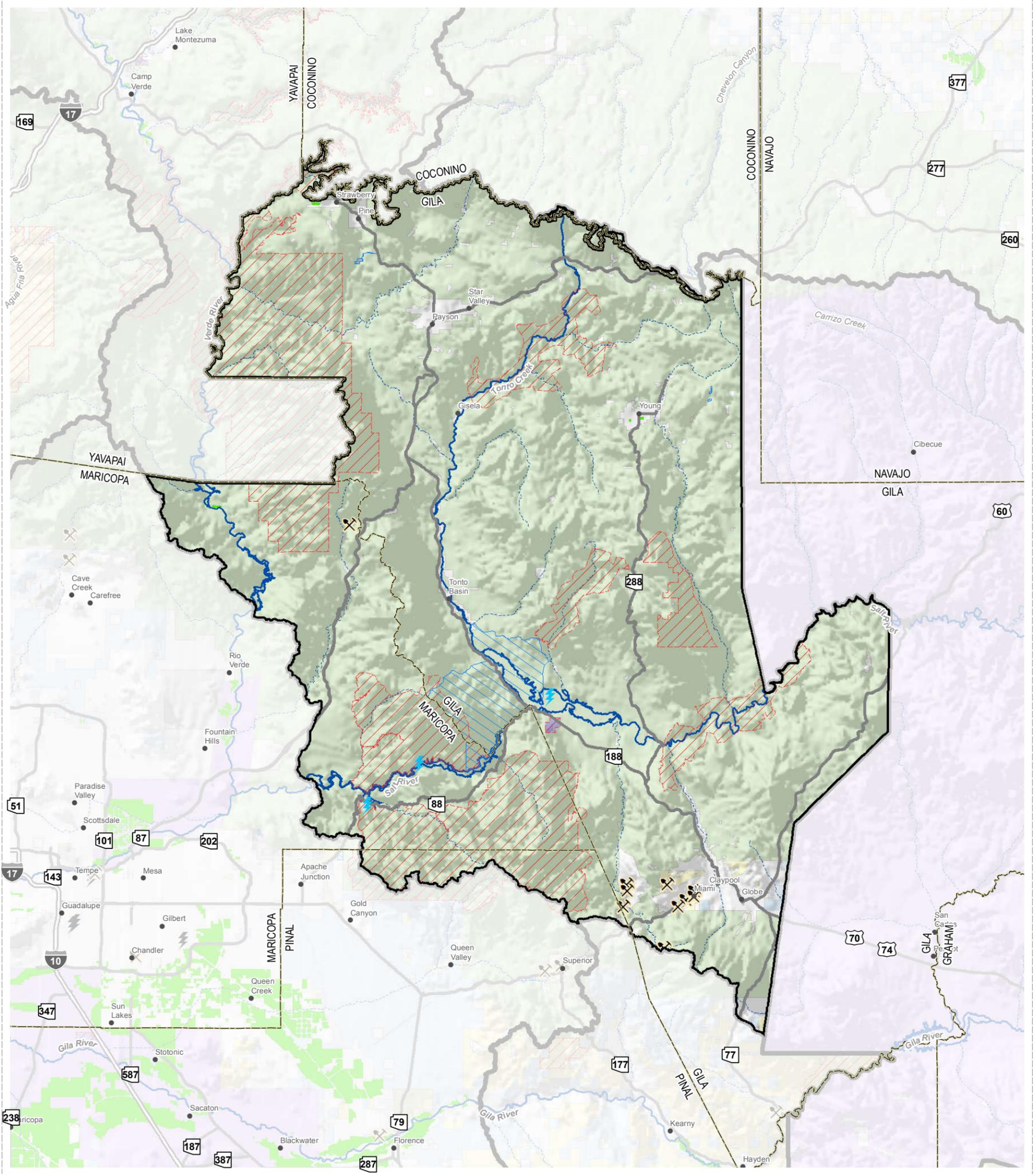
Payson – C.C. Cragin Pipeline Project

The Town of Payson currently relies solely on groundwater as its source of drinking water. Payson has adopted a policy of maintaining a long-term sustainable water supply, the addition of a surface water source is an important component towards meeting that objective. Due to concerns about the long-term viability of locally available groundwater to meet the current and future needs of the community, Payson has entered into an agreement with SRP to acquire a new surface water source from the C.C. Cragin Reservoir. The proposed pipeline will extend 14.5 miles to deliver 3,000 acre-feet of water annually to Payson³. Gila County has also agreed to participate in the project for an additional 500 acre-feet of water for other parts of northern Gila County, including Star Valley. Ensuring that Payson (the largest municipal demand in this Planning Area) has the economic resources to complete this project will significantly reduce the impact on groundwater supplies in this location of the Planning Area.

² <http://www.4fri.org/>

³ http://www.egovlink.com/public_documents300/payson/published_documents/Water%20Department/Informational%20Brochures/Blue%20Ridge_Fact%20Sheet.pdf

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)

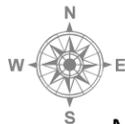
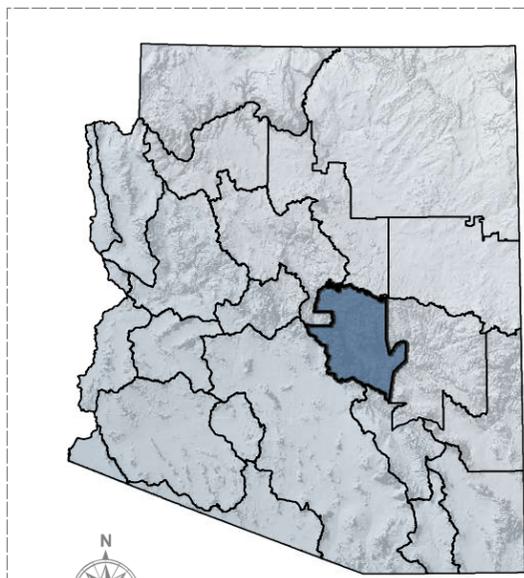
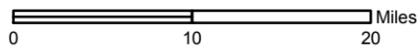
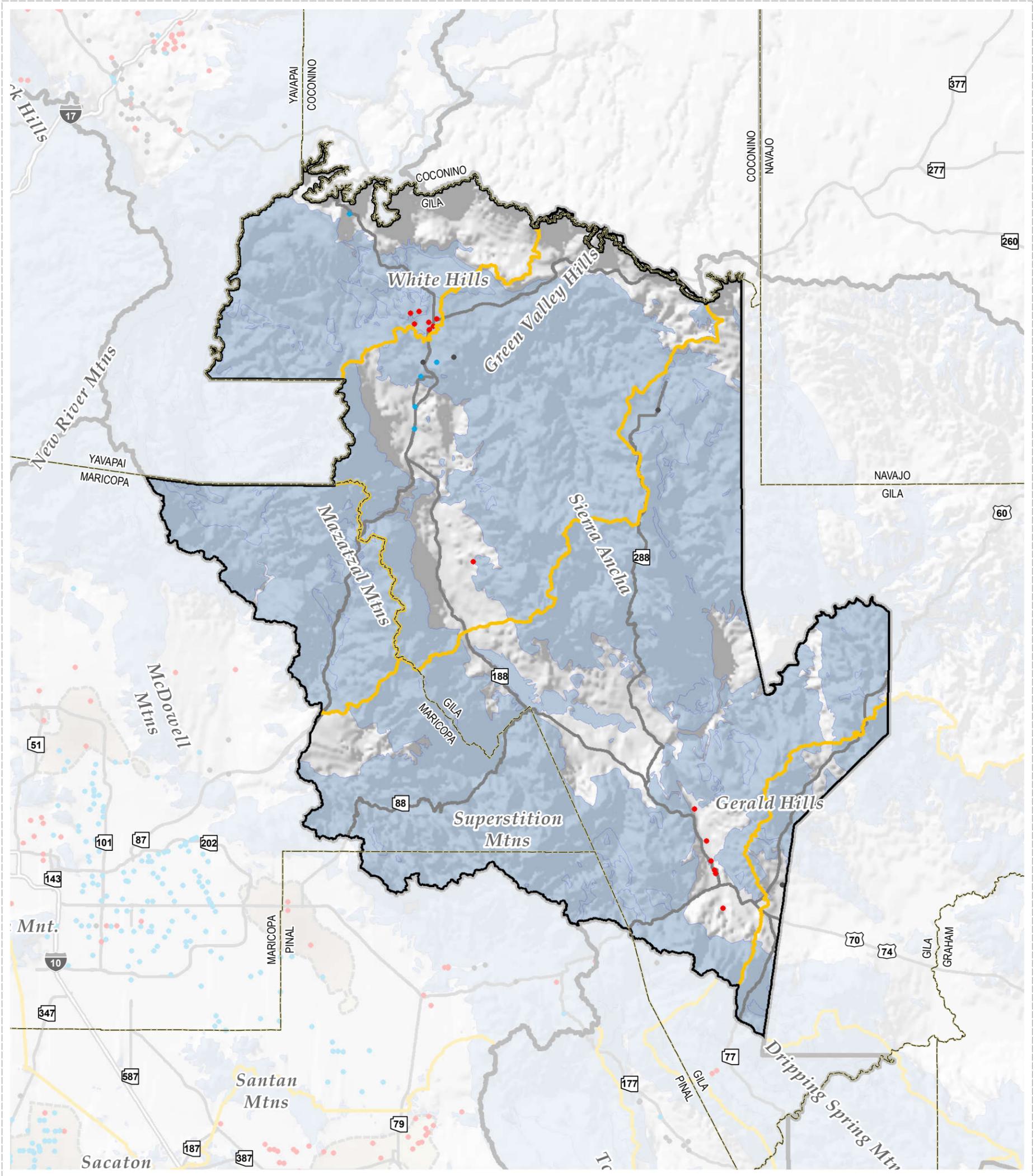
- Planning Area (ADWR)
- State (ALRIS)
- County (ALRIS)
- River or Stream (ASLD)
- Interstate (ADOT)
- Population Center (GNIS)
- Mine (ADMMR, ADWR)
- Hydroelectric Power Plant (ADEQ, ADWR)
- Thermoelectric Power Plant (ADEQ, ADWR)
- Agriculture (SWReGAP, 2004)
- Federal Conservation Land (USFS, BLM,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



Roosevelt Land Ownership

Figure P.A.16-1

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)
- 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

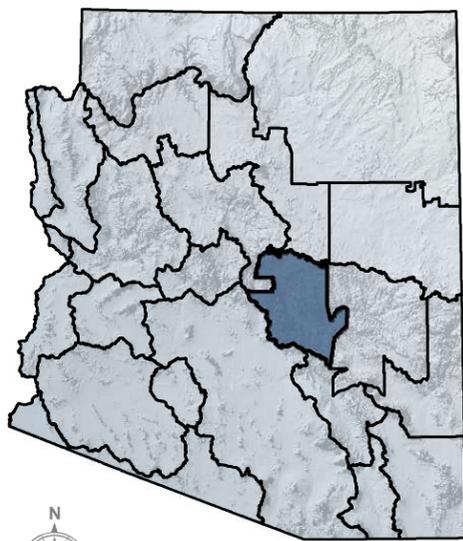
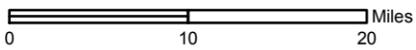
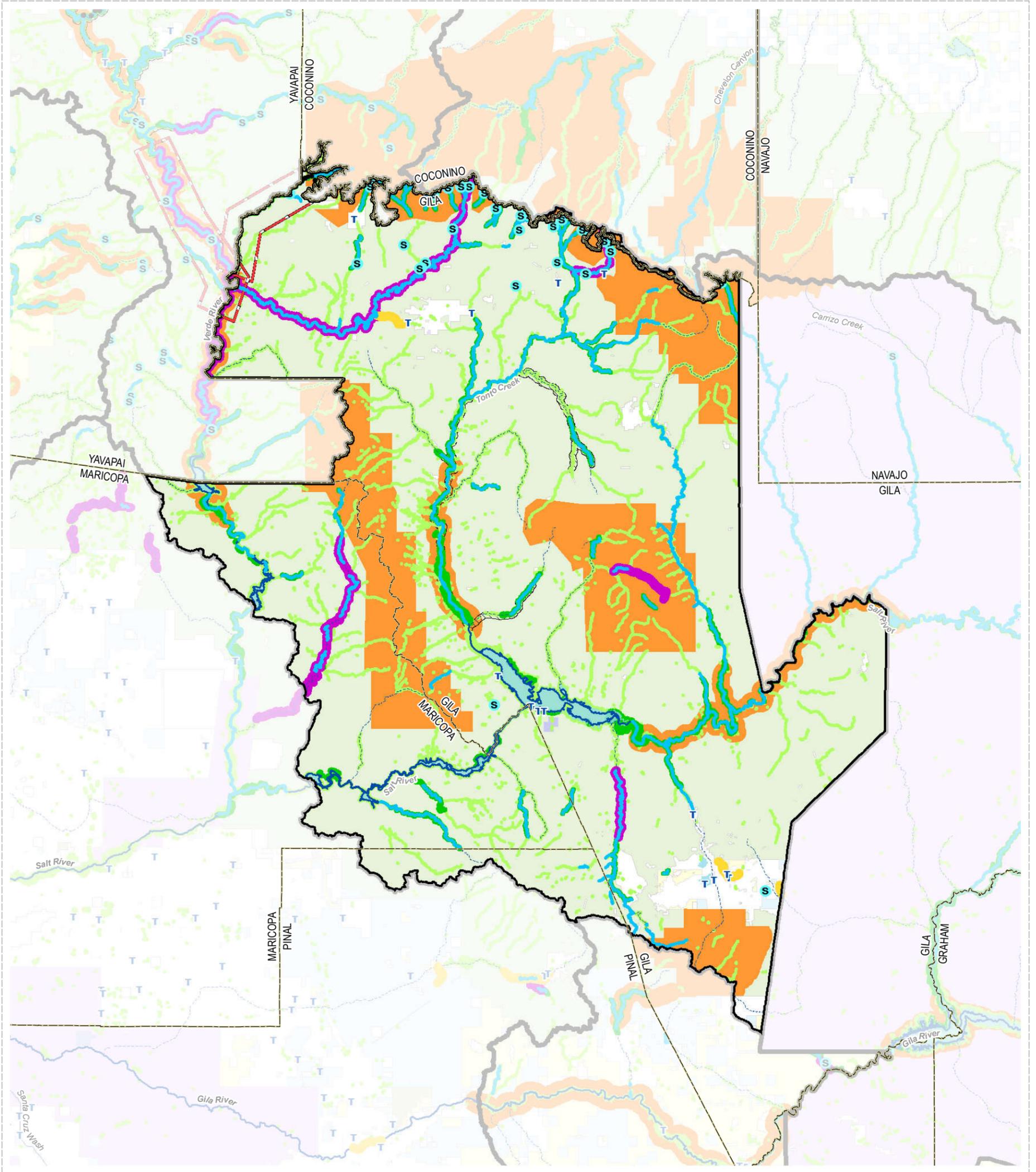
* Data provided by ADWR



Roosevelt Groundwater Hydrology

Figure P.A.16-2

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)

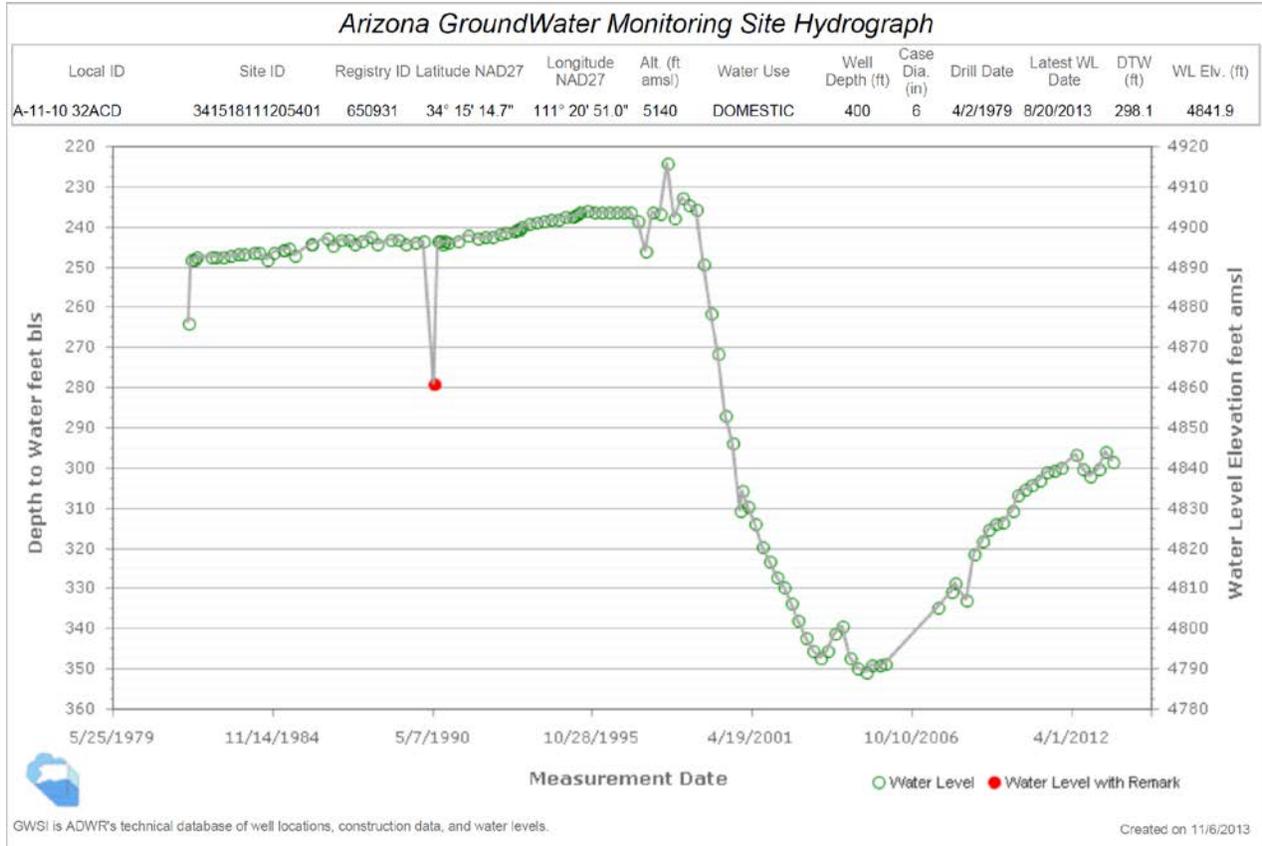
- | | |
|--|---|
| Planning Area (ADWR) | 1993 Riparian Inventory (AZGFD) |
| State (ALRIS) | Modeled Riparian Habitat (AZGFD) |
| County (ALRIS) | Designated ESA Critical Habitat (USFWS) |
| Reservoir or Lake (NHD) | Proposed ESA Critical Habitat (USFWS) |
| Waste Water Treatment Plant (ADEQ) | Federally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



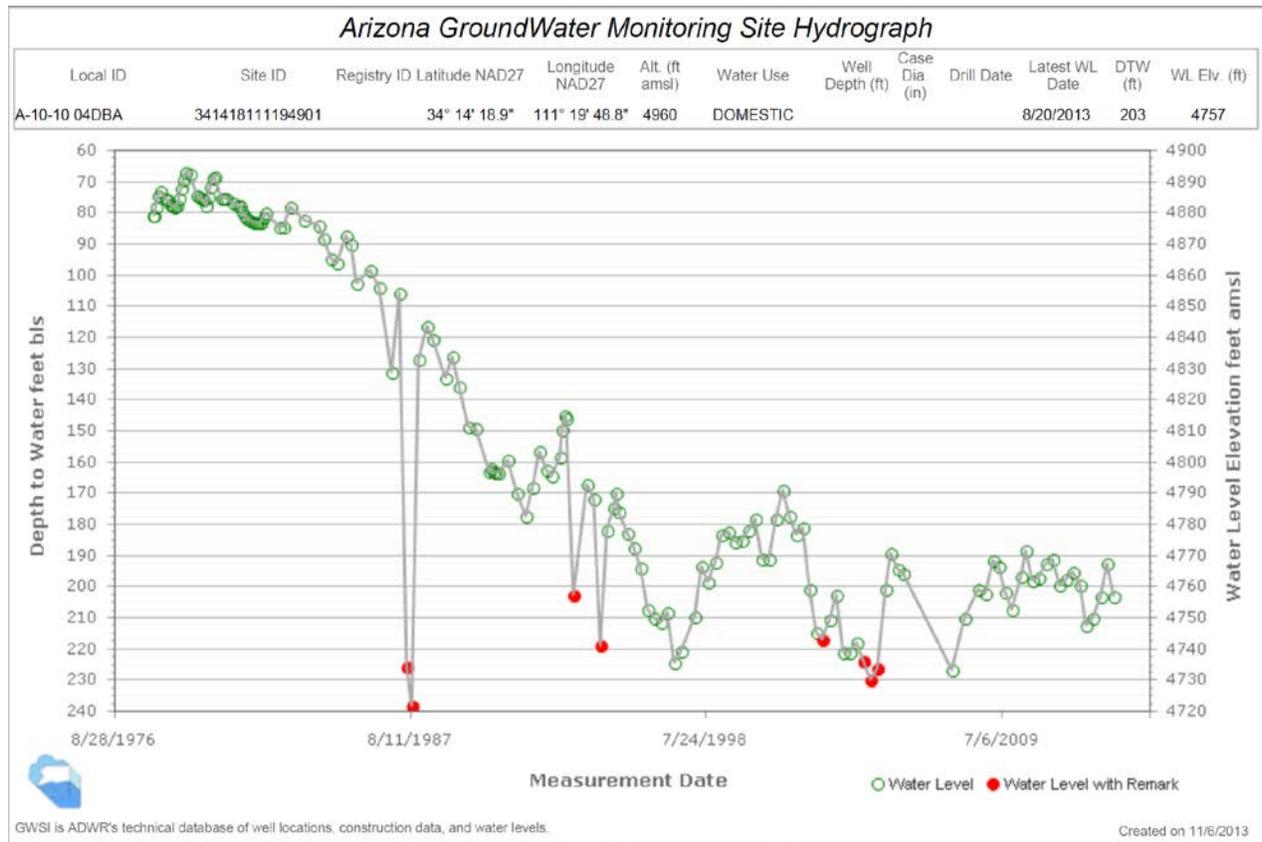
Figure P.A.16-3

Roosevelt Surface Water and Natural Features

Verde River Basin – Roosevelt Planning Area

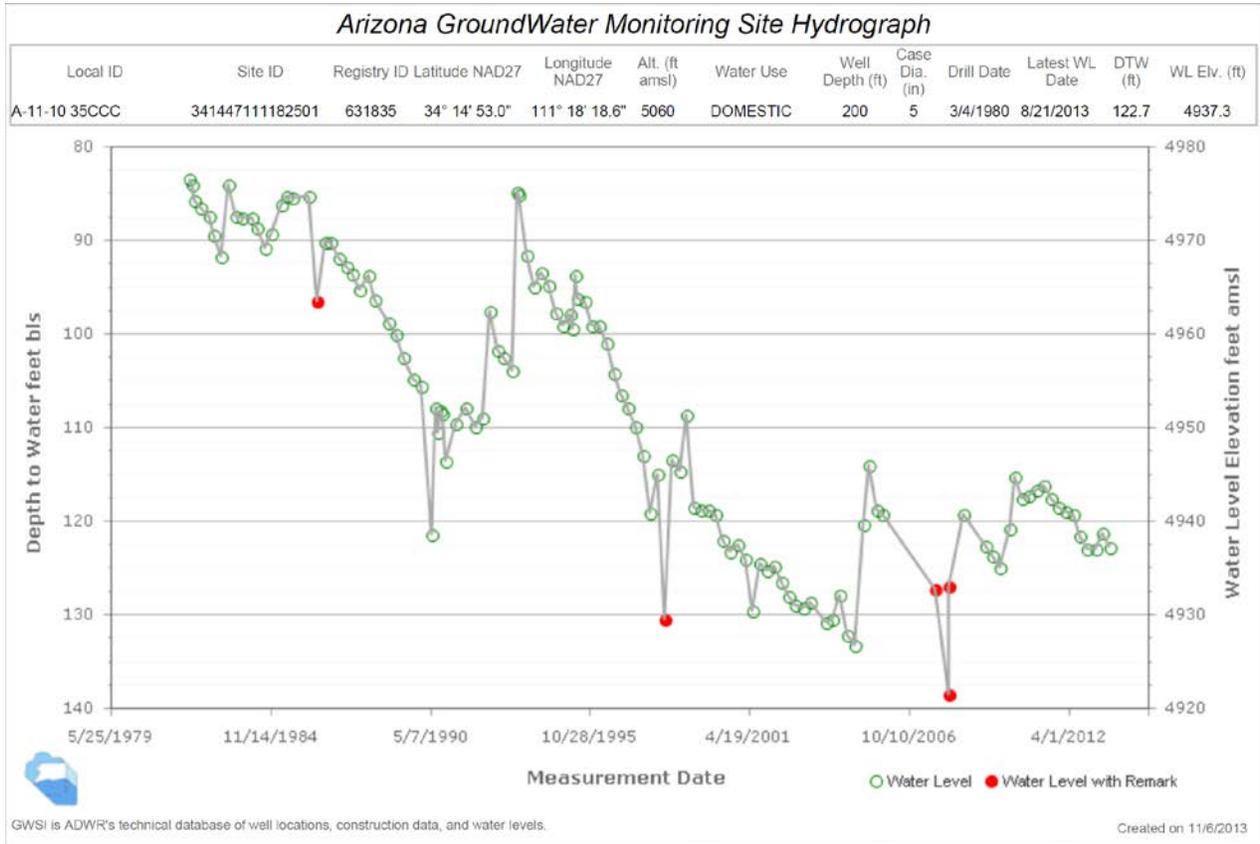


A-11-10 32ACD Verde River basin - Verde Canyon sub-basin NW Payson Airport area.

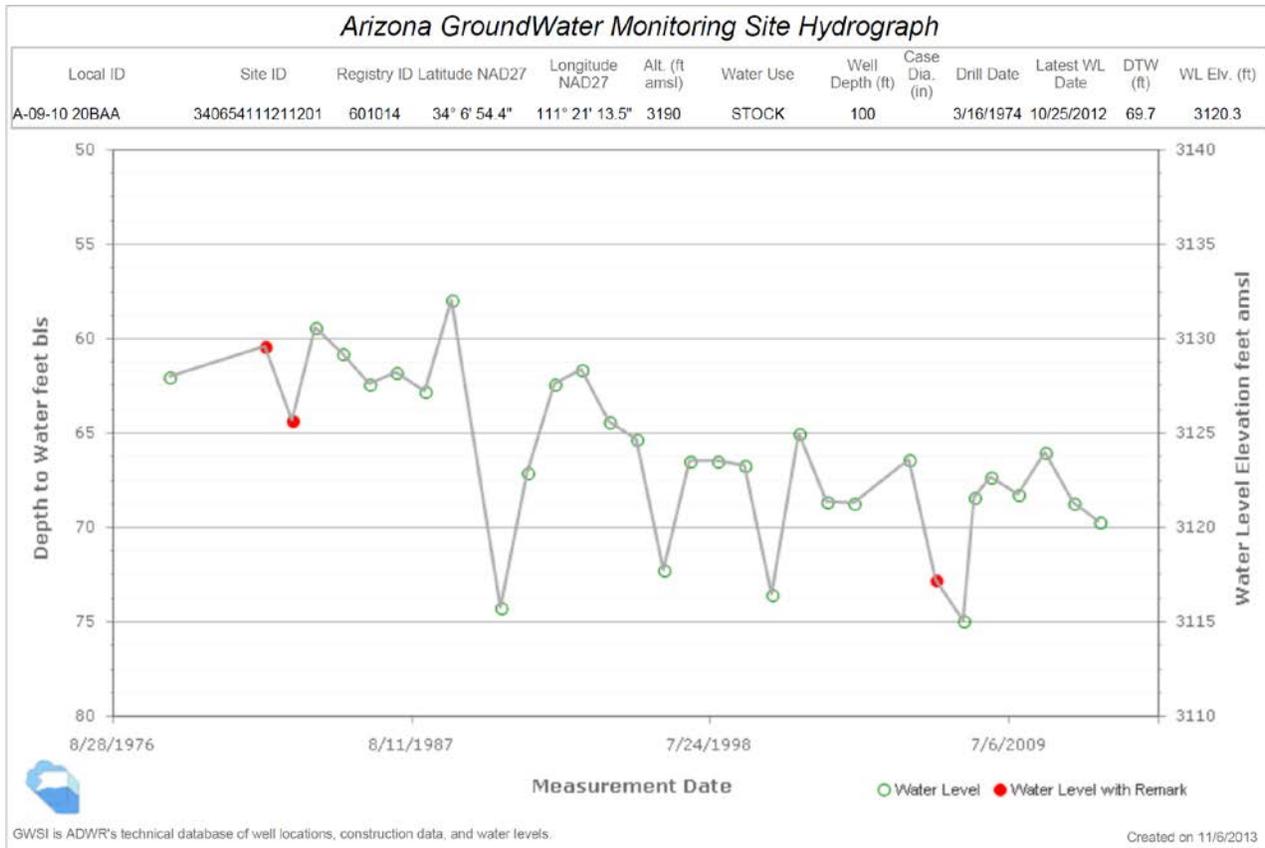


A10-10 04DBA Verde River basin – Verde Canyon sub-basin central Payson area.

Tonto Creek Basin – Roosevelt Planning Area

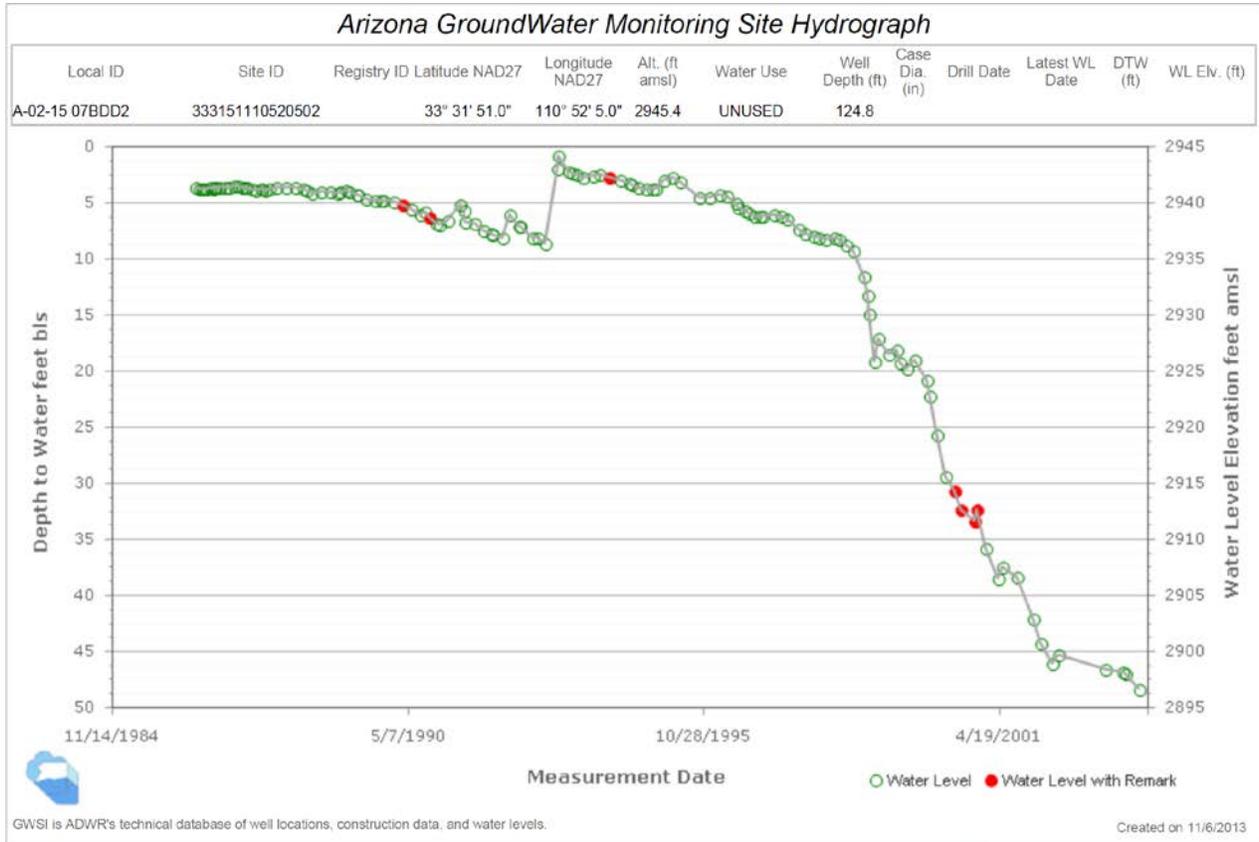


A-11-10 35CCC Tonto Creek basin, east Payson area.

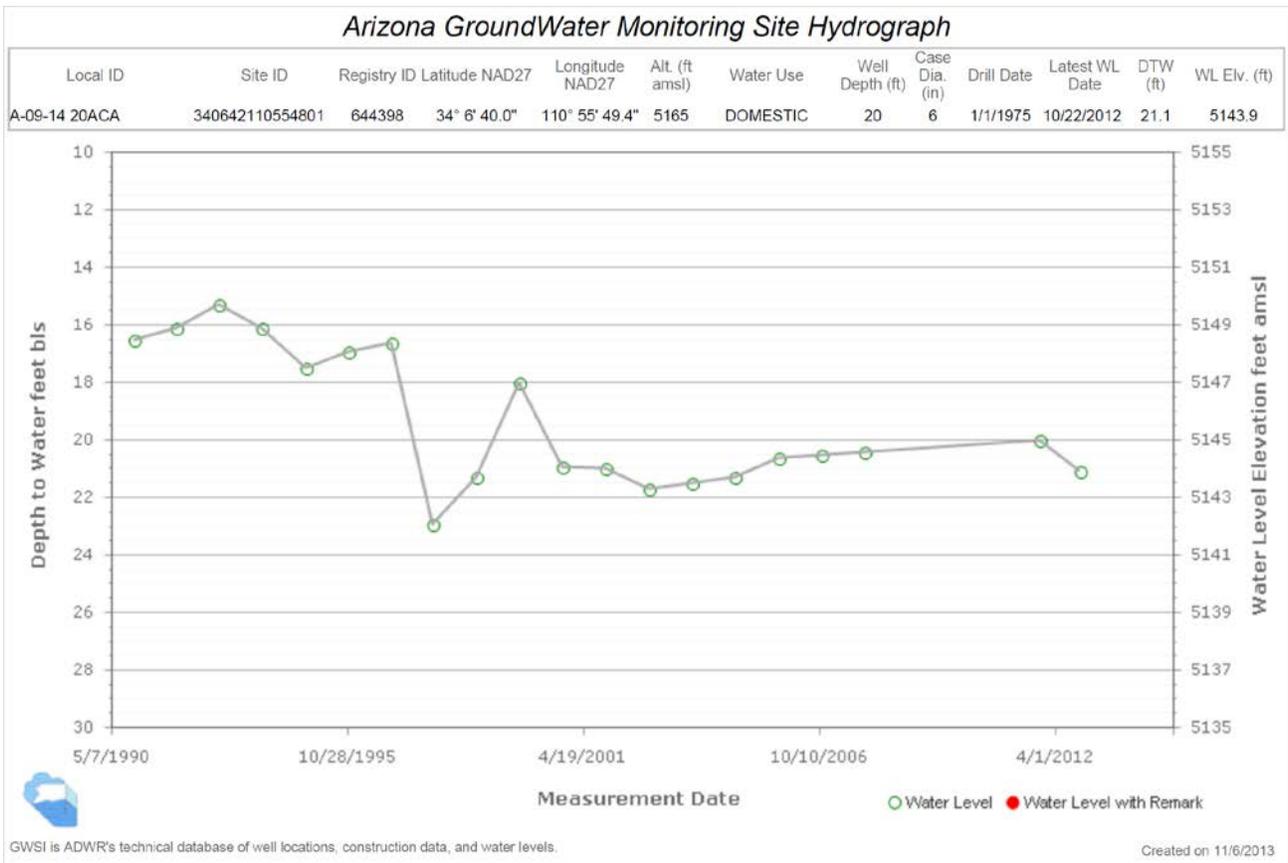


A-09-10 20BAA Tonto Creek basin at Rye.

Salt River Basin – Roosevelt Planning Area



A-02-15 07BDD2 Salt River Lakes basin located on Pinal Creek 8 miles north of Claypool.



A-09-14 20ACA Salt River Canyon basin 2 miles northeast of Young.

Safford Basin – Roosevelt Planning Area

Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-01-16 09CBC	UNSURV332128110432101	526251	33° 21' 27.5"	110° 43' 25.2"	3510	PUBLIC SUPPLY	1142	20	4/2/1990	11/2/2012	678.4	2831.6



GWIS is ADWR's technical database of well locations, construction data, and water levels.

Created on 11/6/2013

D-01-16 09CBCUNSURV – Safford basin -- San Carlos Valley sub-basin about 4 miles west of Cutter.