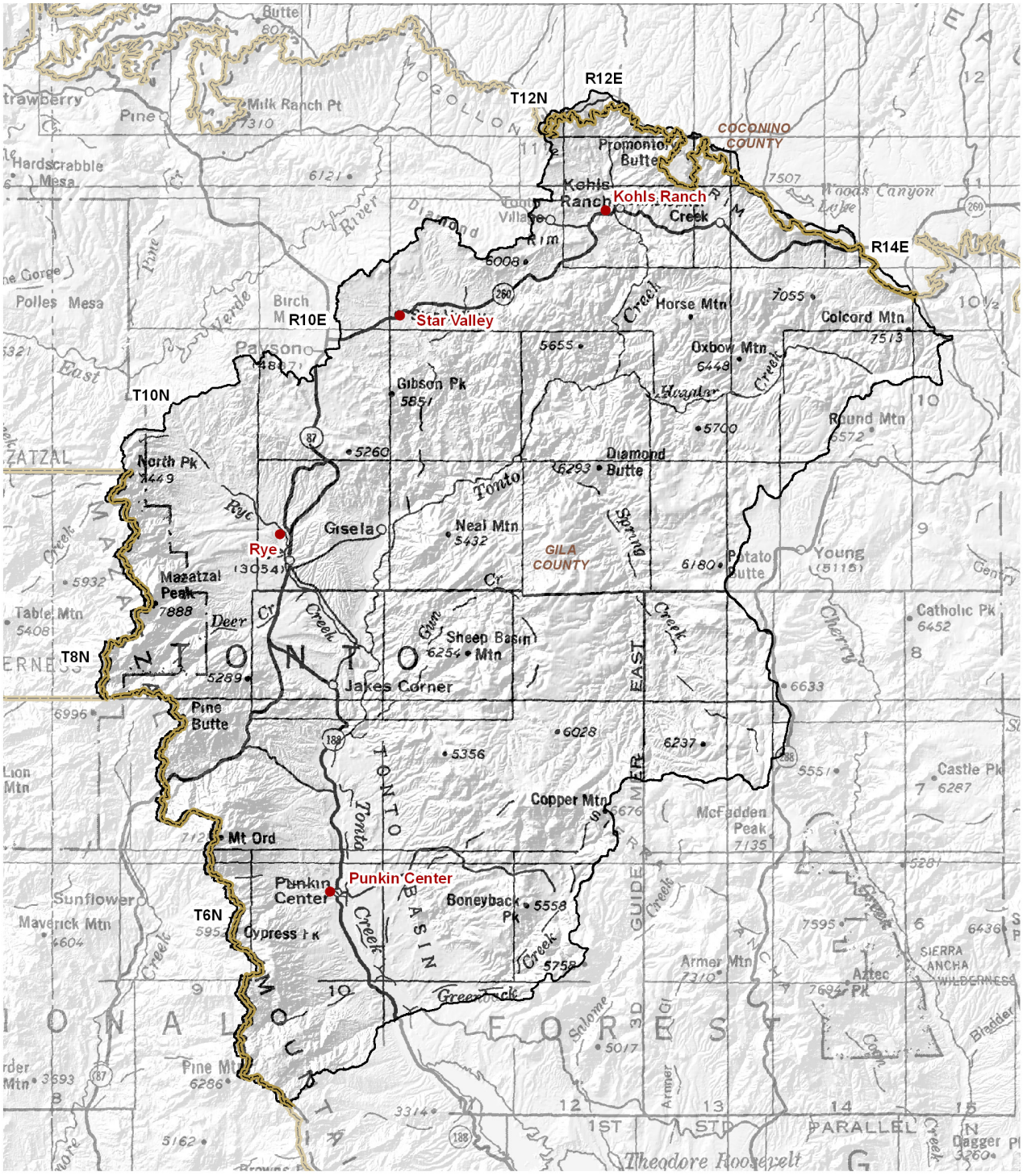
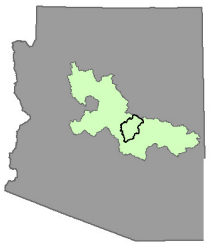
Section 5.3
Tonto Creek Basin

5.3.1 Geography of the Tonto Creek Basin

The Tonto Creek Basin, located in the east central part of the planning area is 955 square miles in area. Geographic features and principal communities are shown on Figure 5.3-1. The basin is characterized by mid-elevation mountain ranges. Vegetation types include Arizona uplands Sonoran desertscrub, semi-desert grassland, interior chaparral, Great Basin conifer and madrean evergreen woodlands and montane conifer forests. (see Figure 5.0-10) Riparian vegetation is found along streams including mixed broadleaf, tamarisk and mesquite along Tonto Creek.

- Principal geographic features shown on Figure 5.3-1 are:
    - Tonto Creek running north to south through the center of the basin from Kohls Ranch and exiting the basin about eight miles south of Punkin Center
    - Rye Creek flowing through Rye in the western portion of the basin
    - Spring Creek and Hayler Creek flowing from the eastern basin boundary to Tonto Creek
    - Tonto Basin located in the south central part of the basin along Tonto Creek
    - Mogollon Rim along the northern basin boundary and the Sierra Ancha Mountains (not labeled on the map) along the eastern boundary
    - Mazatzal Mountains along the western boundary, which contain the highest point in the basin, Mazatzal Peak at 7,888 feet
    - The lowest point in the basin is about 5,000 feet along Tonto Creek where it exits the basin





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Base Map: USGS 1:500,000, 1981

Figure 5.3-1
Tonto Creek Basin
Geographic Features

COUNTY
City, Town or Place

5.3.2 Land Ownership in the Tonto Creek Basin

Land ownership, including the percentage of ownership by category, for the Tonto Creek Basin is shown in Figure 5.3-2. The principal feature of land ownership in this basin is the large amount of forest service land. A description of land ownership data sources and methods is found in Volume 1, Appendix A. More detailed information on protected areas is found in Section 5.0.4. Land ownership categories are discussed below in the order from largest to smallest percentage in the basin.

National Forest

- 97.5% of the land is federally owned and managed by the United States Forest Service (USFS); the largest percentage of any basin in the planning area.
- Forest lands in the basin are part of the Tonto National Forest.
- The basin contains two wilderness areas, a portion of the 250,053-acre Mazatzal Wilderness and the entire 37,399-acre Hellsgate Wilderness. (see Figure 5.0-13)
- There are numerous small private in-holdings.
- Land uses include recreation, grazing and timber production.

Private

- 2.4% of the land is private.
- Small in-holdings of private land are scattered throughout the basin with a number of larger parcels in the vicinity of Punkin Center and Star Valley.
- Land uses include domestic, commercial and ranching.

Indian Reservation

- 0.1% of the land is under ownership of the Tonto Apache tribe, located southwest of Star Valley.
- Land use includes domestic and ranching.

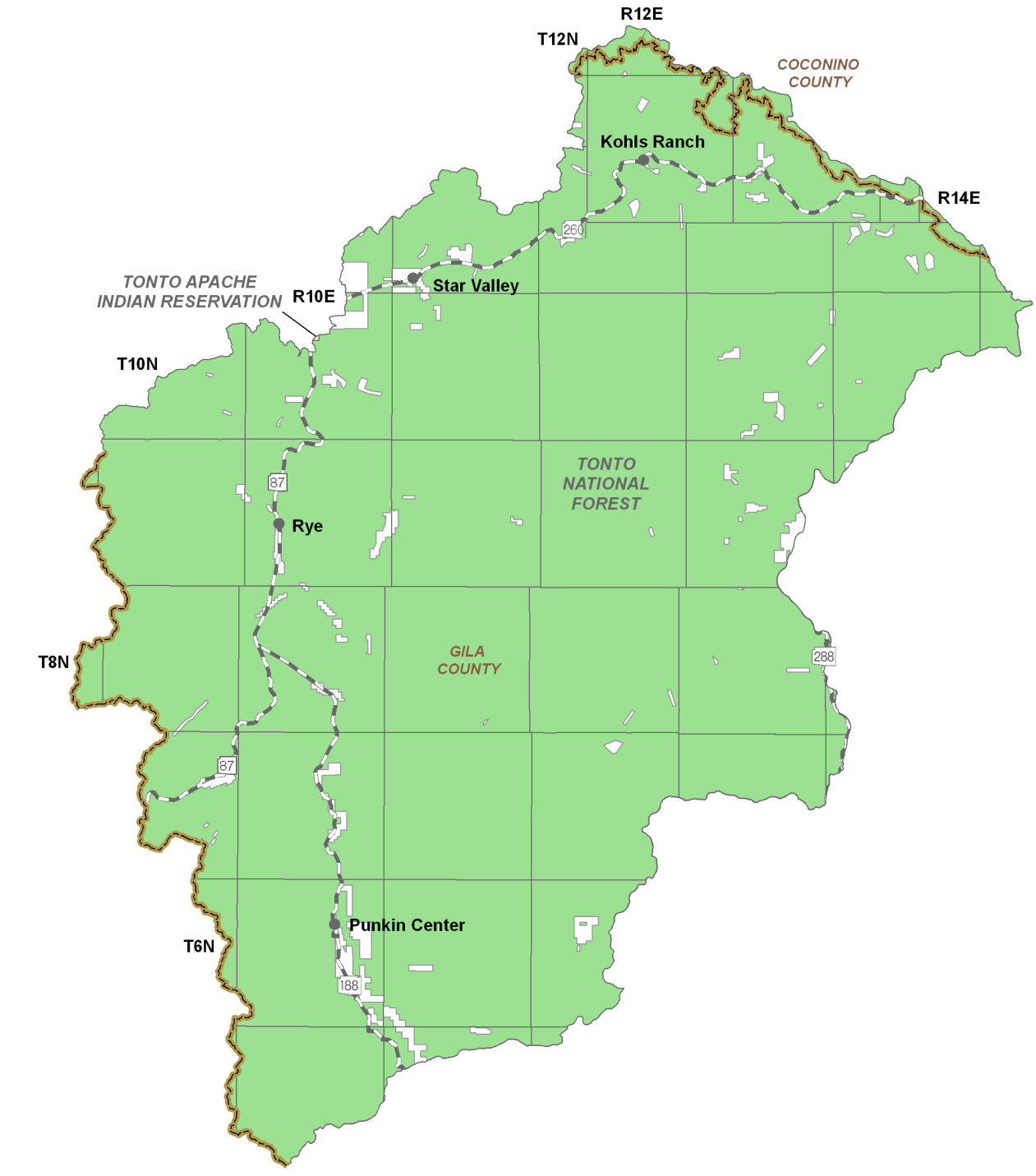


Figure 5.3-2
Tonto Creek Basin
Land Ownership

5.3.3 Climate of the Tonto Creek Basin

Climate data from NOAA/NWS Co-op Network and SNOTEL/Snowcourse stations are compiled in Table 5.3-1 and the locations are shown on Figure 5.3-3. Figure 5.3-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Tonto Creek Basin does not contain Evaporation Pan or AZMET stations. More detailed information on climate in the planning area is found in Section 5.0.3. A description of the climate data sources and methods is found in Volume 1, Appendix A.

NOAA/NWS Co-op Network

- Refer to Table 5.3-1A
- There are three NOAA/NWS Co-op network climate stations in the basin. The average monthly maximum temperature occurs in July at all stations and ranges between 86.8°F at Reno R.S. and 81.9°F at Gisela. The average monthly minimum temperature occurs in January or December and ranges between 40.8°F at Gisela and 45.3°F at Punkin Center.
- Highest average seasonal rainfall occurs in the winter (January – March) and fall (October-December). For the period of record used, the highest annual rainfall is 19.77 inches at Reno R.S. and the lowest is 18.23 inches at Punkin Center.

SNOTEL/Snowcourse

- Refer to Table 5.3-1D
- There are two stations in this basin, Promontory Butte and Promontory (SNOTEL). The Promontory Butte station was discontinued in 1989.
- Both stations are at an elevation of 7,930 feet and record highest average snowpack in April.
- The highest average snowpack at Promontory Butte is 15.1 inches and at Promontory (SNOTEL) is 13.8 inches.

SCAS Precipitation Data

- See Figure 5.3-3
- Additional precipitation data shows rainfall as high as 38 inches on the northern basin boundary at the Mogollon Rim and as low as 14 inches on the southern basin boundary south of Punkin Center.

Table 5.3-1 Climate Data for the Tonto Creek Basin

A. NOAA/NWS Co-op Network:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Temperature Range (in F)		Average Total Precipitation (in inches)				
			Max/Month	Min/Month	Winter	Spring	Summer	Fall	Annual
Gisela	2,900	1895-2004[1]	81.9/Jul	40.8/Dec	6.53	1.39	6.10	4.89	18.91
Reno R.S.	2,420	1915-1973[1]	86.8/Jul	45.1/Jan	3.51	1.05	6.58	8.61	19.77
Punkin Center	2,360	1971-2000	85.9/Jul	45.3/Dec	6.92	1.23	4.83	5.24	18.23

Source: WRCC, 2005

Notes:
[1]Average temperature for period of record shown; average precipitation from 1971-2000

B. Evaporation Pan:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Avg. Annual Evap (in inches)
None			

C. AZMET:

Station Name	Elevation (in feet)	Period of Record	Average Annual Reference Evaportranspiration, in inches *(Number of years to calculate averages)*
None			

D. SNOTEL/Snowcourse:

Station Name	Elevation (in feet)	Period of Record	Average Snowpack, at Beginning of the Month, as Inches Snow Water Content *(Number of measurements to calculate average)*					
			Jan.	Feb.	March	April	May	June
Promontory Butte	7,930	1973 - 1989 (discontinued)	4.2 *(10)*	8.4 *(13)*	13.7 *(16)*	15.1 *(15)*	11.3 *(1)*	0 *(0)*
Promontory SNOTEL	7,930	1973 - current	3.7 *(27)*	8.0 *(30)*	13.4 *(33)*	13.8 *(32)*	2.1 *(24)*	0 *(23)*

Source: Natural Resources Conservation Service, 2006

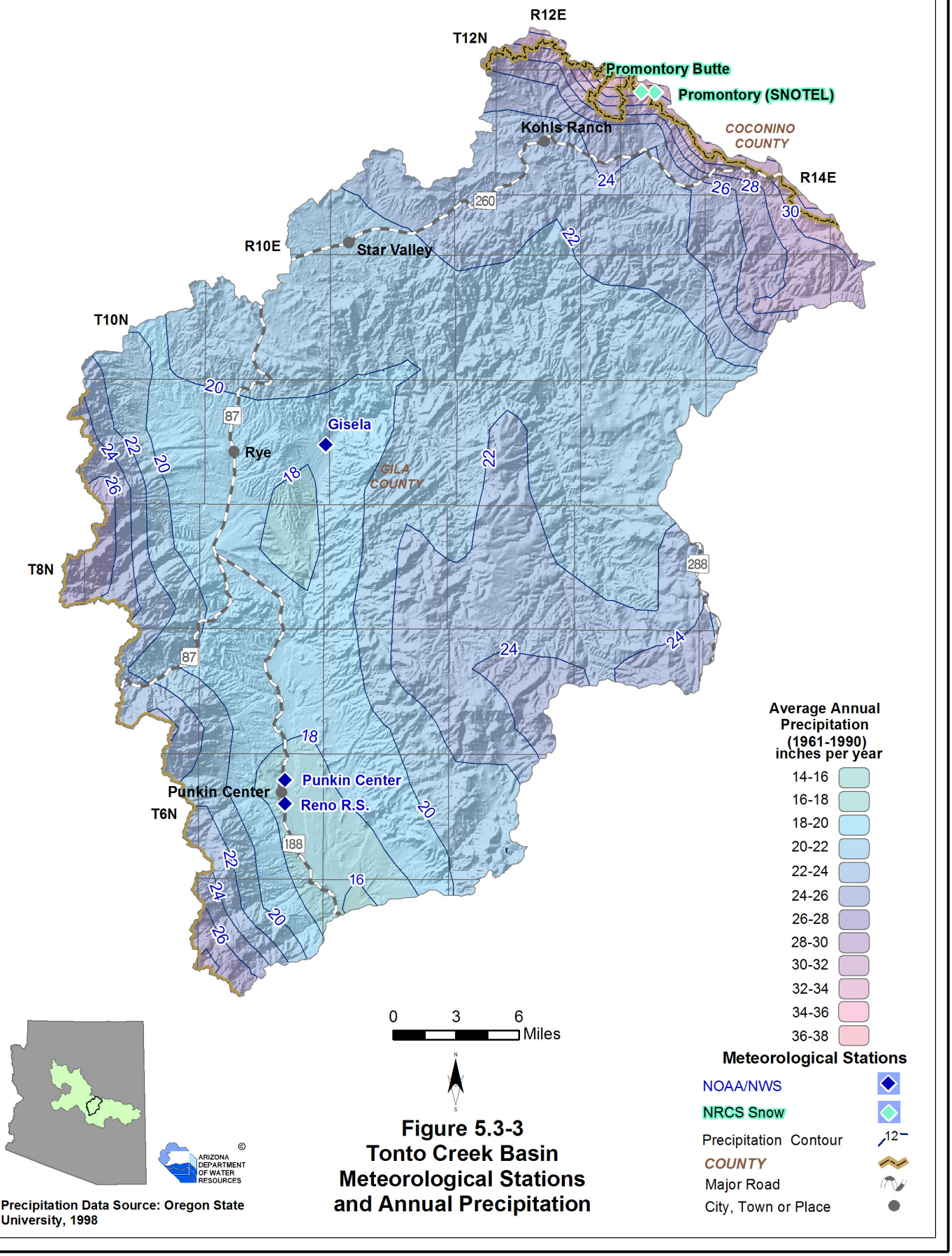


Figure 5.3-3
Tonto Creek Basin
Meteorological Stations
and Annual Precipitation

5.3.4 Surface Water Conditions in the Tonto Creek Basin

Streamflow data, including average seasonal flow, average annual flow and other information is shown in Table 5.3-2. Flood ALERT equipment in the basin is shown in Table 5.3-3. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 5.3-4. The location of streamflow gages identified by USGS number, flood ALERT equipment and USGS runoff contours are shown on Figure 5.3-5. Descriptions of stream, reservoir and stockpond data sources and methods are found in Volume 1, Appendix A.

Streamflow Data

- Refer to Table 5.3-2.
- Data from four stations located on two watercourses are shown in the table and on Figure 5.3-5.
- The average seasonal flow at all stations is highest in the winter (January-March) and lowest in the summer (July-September).
- The largest annual flow recorded is 469,256 acre-feet in 1978 at the Tonto Creek above Gun Creek near Roosevelt station and the smallest is 1,245 acre-feet in 1971 at the Rye Creek near Gisela station. For a hydrograph of Tonto Creek above Gun Creek near Roosevelt station from 1941-2008 see Figure 5.3-4.

Flood ALERT Equipment

- Refer to Table 5.3-3.
- As of October 2005 there were nine stations in the basin.

Reservoirs and Stockponds

- Refer to Table 5.3-4.
- The basin does not contain any large reservoirs.
- Surface water is stored or could be stored in one small reservoir in the basin.
- There are 389 registered stockponds in this basin.

Runoff Contour

- Refer to Figure 5.3-5.
- Average annual runoff is two inches per year, or 106.6 acre-feet per square mile, in the southern tip of the basin and increases to five inches per year, or 266.5 acre-feet per square mile, in the northern portion of the basin.

Figure 5.3-4 Annual Flows (acre-feet) at Tonto Creek above Gun Creek near Roosevelt, water years 1941-2008 (Station #9499000)

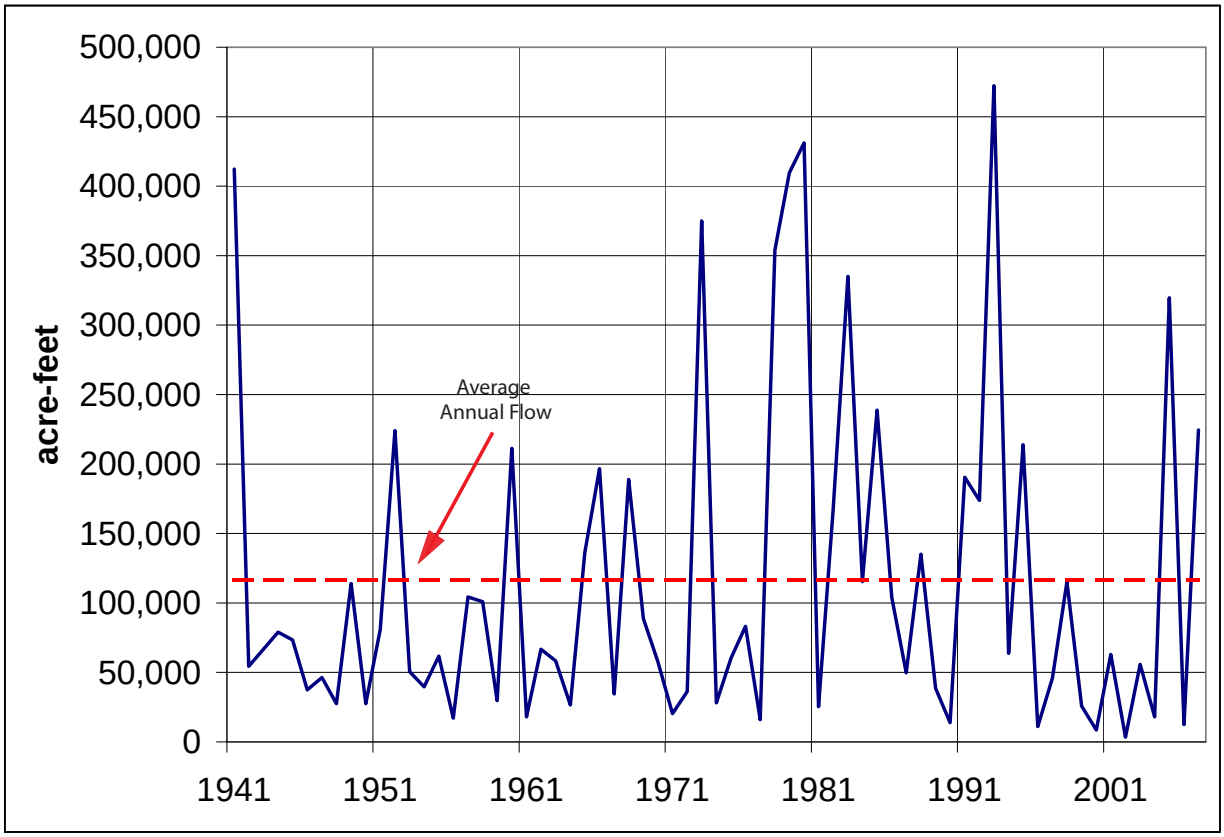


Table 5.3-2 Streamflow Data for the Tonto Creek Basin

Station Number	USGS Station Name	Drainage Area (in mi^2)	Gage Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow (in acre-feet/year)				Years of Annual Flow Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9498800	Tonto Creek near Gisela	430	2,940	12/1964-9/1975 (discontinued)	43	15	8	33	32,796 (1974)	68,705	93,147	236,741 (1965)	10
9498870	Rye Creek near Gisela	122	2,730	12/1965-9/1985 (discontinued)	65	10	7	18	1,245 (1971)	9,267	19,030	64,289 (1978)	19
9499000	Tonto Creek above Gun Creek near Roosevelt	675	2,523	12/1940-current (real-time)	61	12	8	19	2,853 (2002)	66,297	113,232	469,256 (1978)	62
9499500	Tonto Creek near Roosevelt	841	NA	10/1913-12/1940 (discontinued)	59	17	10	15	17,452 (1934)	89,796	104,292	225,214 (1916)	27

Source: USGS (NWIS) 2005 & 2008

Notes:
Statistics based on Calendar Year
Annual Flow statistics based on monthly values
Summation of Average Annual Flows may not equal 100 due to rounding
Period of record may not equal Year of Record used for annual Flow/Year statistics due to only using years with a 12 month record
In Period of Record, current equals November 2008
Seasonal and annual flow data used for the statistics was retrieved in 2005
NA = Data not currently available to ADWR

Table 5.3-3 Flood ALERT Equipment in the Tonto Creek Basin

Station ID	Station Name	Station Type	Install Date	Responsibility
51	Upper Deer Creek	Precipitation	NA	Gila County FCD
54	Christopher Creek	Precipitation	5/1/2005	Gila County FCD
67	Rock Creek (Rye Tributary)	Precipitation	NA	Gila County FCD
80	Hardt Creek @ SR 87	Precipitation/Stage	NA	Gila County FCD
92	Little Pine Flat	Precipitation	8/29/2005	Gila County FCD
930	Deer Creek Shake Ridge (Bar T Bar North)	Precipitation	NA	Gila County FCD
931	Upper Rye Creek	Precipitation	NA	Gila County FCD
3900	Houston Creek	Precipitation/Stage	10/26/2005	Gila County FCD
5960	Mt. Ord Repeater	Repeater/Precipitation	10/28/1982	Maricopa County FCD

Source: ADWR 2005b

Notes:
FCD = Flood Control District
NA = Data not currently available to ADWR

Table 5.3-4 Reservoirs and Stockponds in the Tonto Creek Basin

A. Large Reservoirs (500 acre-feet capacity and greater)

MAP KEY	RESERVOIR/LAKE NAME (Name of dam, if different)	OWNER/OPERATOR	MAXIMUM STORAGE (AF)	USE	JURISDICTION
None identified by ADWR at this time					

B. Other Large Reservoirs (50 acre surface area or greater)

MAP KEY	RESERVOIR/LAKE NAME (Name of dam, if different)	OWNER/OPERATOR	MAXIMUM SURFACE AREA (acres)	USE	JURISDICTION
None identified by ADWR at this time					

Source: Compilation of databases from ADWR & others

C. Small Reservoirs (greater than 15 acre-feet and less than 500 acre-feet capacity)

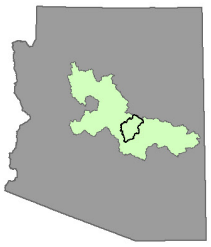
Total number: 1
Total maximum storage: 20 acre-feet

D. Other Small Reservoirs (between 5 and 50 acres surface area)

Total number: 0
Total surface area: 0 acres

E. Stockponds (up to 15 acre-feet capacity)

Total number: 389 (from water right filings)



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Stream Data Source: ALRIS, 2005b

0 3 6 Miles

N

S

Figure 5.3-5
Tonto Creek Basin
Surface Water Conditions

USGS Annual Runoff Contour for 1951-1980 (in inches) — 2

Stream Channel (width of line reflects stream order)

USGS Gage & Station ID — 9999999

Flood ALERT Equip. & Station ID — 9999

COUNTY

Major Road

City, Town or Place

5.3.5 Perennial/Intermittent Streams and Major Springs in the Tonto Creek Basin

Major and minor springs with discharge rates and date of measurement, and the total number of springs in the basin are shown in Table 5.3-5. The locations of major springs and perennial and intermittent streams are shown on Figure 5.3-6. Descriptions of data sources and methods for intermittent and perennial reaches and springs are found in Volume 1, Appendix A.

- Perennial streams in this basin include Tonto Creek, Haigler Creek, Spring Creek, Dell Shay Creek, Houston Creek, Christopher Creek and Greenback Creek.
- There are numerous intermittent streams located throughout the basin.
- There are 10 major springs with a measured discharge of 10 gallons per minute (gpm) or greater at any time. The largest discharge rate is 1,291 gpm at Tonto spring.
- Springs with measured discharge of 1 to 10 gpm are not mapped but coordinates are given in Table 5.3-5B. There are seven minor springs identified in this basin.
- Listed discharge rates may not be indicative of current conditions. Only six springs have measured discharges in the past decade.
- The total number of springs, regardless of discharge, identified by the USGS varies from 169 to 175, depending on the database reference.

Table 5.3-5 Springs in the Tonto Creek Basin

A. Major Springs (10 gpm or greater):

Map Key	Name	Location		Discharge (in gpm)[1]	Date Discharge Measured
		Latitude	Longitude		
1	Tonto	342312	1110541	1,291	During or prior to 2001
2	R-C	341827	1110311	800	5/14/1952
3	Horton	342217	1110333	392	10/2/2002
4	See	342108	1110039	84	During or prior to 2002
5	Nappa	342118	1110111	70	8/17/1966
6	Henturkey[2]	342037	1110541	60	10/17/1952
7	Wildcat/Arsenic	341726	1111031	59	10/20/1952
8	Indian Gardens	341926	1110610	26	During or prior to 2002
9	Winters # 3	342235	1110633	20	5/16/1952
10	Unnamed[2]	342043	1110054	15	8/17/1966

B. Minor Springs (1 to 10 gpm):

Name	Location		Discharge (in gpm)[1]	Date Discharge Measured
	Latitude	Longitude		
Bootleg	341852	1110358	8	During or prior to 2001
Allenbaugh	341620	1105353	8[3]	4/19/2001
Turkey-south	341356	1111752	5[4]	5/14/1952
Blue-south	341007	1111943	4	5/14/1952
Bear Flat/ Columbine	341716	1110357	4	7/16/1975
Winters # 1	342233	1110634	1	5/16/1952
Winters # 2	342233	1110634	1	During or prior to 1952

Source: Compilation of databases from ADWR & others

C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005a and USGS, 2006a): 169 to 175

Notes:
[1]Most recent measurement identified by ADWR
[2]Spring is not displayed on current USGS topo maps
[3]Discharge measurements vary. Shown is greatest measured discharge; most recent measurement < 1 gpm
[4]Average gpm

Stream Data Source: AGFD, 1993 & 1997

Figure 5.3-6
Tonto Creek Basin
Perennial/Intermittent Streams and Major (>10 gpm) Springs

5.3.6 Groundwater Conditions of the Tonto Creek Basin

Major aquifers, well yields, estimated natural recharge, estimated water in storage, number of index wells and date of last water-level sweep are shown in Table 5.3-6. Figure 5.3-7 shows aquifer flow direction and water-level change between 1990-1991 and 2003-2004. Figure 5.3-8 contains hydrographs for selected wells shown on Figure 5.3-7. Figure 5.3-9 shows well yields in five yield categories. A description of aquifer data sources and methods as well as well data sources and methods, including water-level changes and well yields are found in Volume 1, Appendix A.

Major Aquifers

- Refer to Table 5.3-6 and Figure 5.3-7.
- The major aquifers in the basin are basin fill and sedimentary rock (C and R aquifers).
- Most of the basin geology consists of consolidated crystalline and sedimentary rocks.
- Flow direction is generally from the north to the south.

Well Yields

- Refer to Table 5.3-6 and Figure 5.3-9.
- As shown on Figure 5.3-9, well yields in this basin range from less than 100 gallons per minute (gpm) to greater than 2,000 gpm.
- One source of well yield information, based on 51 reported wells, indicates that the median well yield in this basin is 120 gpm.
- The highest well yields in the basin are located along Highway 188 north of Punkin Center.

Natural Recharge

- Refer to Table 5.3-6.
- Natural recharge estimates for this basin range from 17,000 acre-feet per year (AFA) to 37,000 AFA.

Recharge Sites

- Refer to Figure 5.3-7.
- There is one permitted recharge facility in this basin, ADOT-Payson (permit no. 71-579155.0001), that recharges surface water to the aquifer.
- Under the permit the facility's maximum annual storage is 150 acre-feet.

Water in Storage

- Refer to Table 5.3-6.
- Storage estimates for this basin range from 2.0 million acre-feet (maf) to 9.4 maf to a depth of 1,200 feet.

Water Level

- Refer to Figure 5.3-7. Water levels are shown for wells measured in 2003-2004.
- The Department annually measures 13 index wells in this basin. Hydrographs for three of these wells are shown in Figure 5.3-8.
- There is one ADWR automated water-level recording device in this basin located near Star

Valley.

- These data show the deepest recorded water level in the basin is 106 feet east of Kohls Ranch and the shallowest is 14 feet near Punkin Center.

Table 5.3-6 Groundwater Data for the Tonto Creek Basin

Basin Area, in square miles:	955	
Major Aquifer(s):	**Name and/or Geologic Units**	
	Basin Fill	
	Sedimentary Rock (C and R Aquifers)	
Well Yields, in gal/min:	N/A	Measured by ADWR (GWSI) and/or USGS
	Range 5-2,200 Median 120 (51 wells reported)	Reported on registration forms for large (>10-inch) diameter wells (Wells55)
	Range 10-50	ADWR (1990)
	Range 0-500	Anning and Duet (1994)
Estimated Natural Recharge, in acre-feet/year:	17,000	ADWR (1994b)
	37,000	Freethey and Anderson (1986)
Estimated Water Currently in Storage, in acre-feet:	3,000,000 (to 1,200 feet)	ADWR (1994b)
	9,400,000 (to 1,200 feet)	ADWR (1992)
	2,000,000[1] (to 1,200 feet)	Freethey and Anderson (1986)
Current Number of Index Wells:	13	
Date of Last Water-level Sweep:	2008 (216 wells measured)	

[1] Predevelopment Estimate
N/A = not available

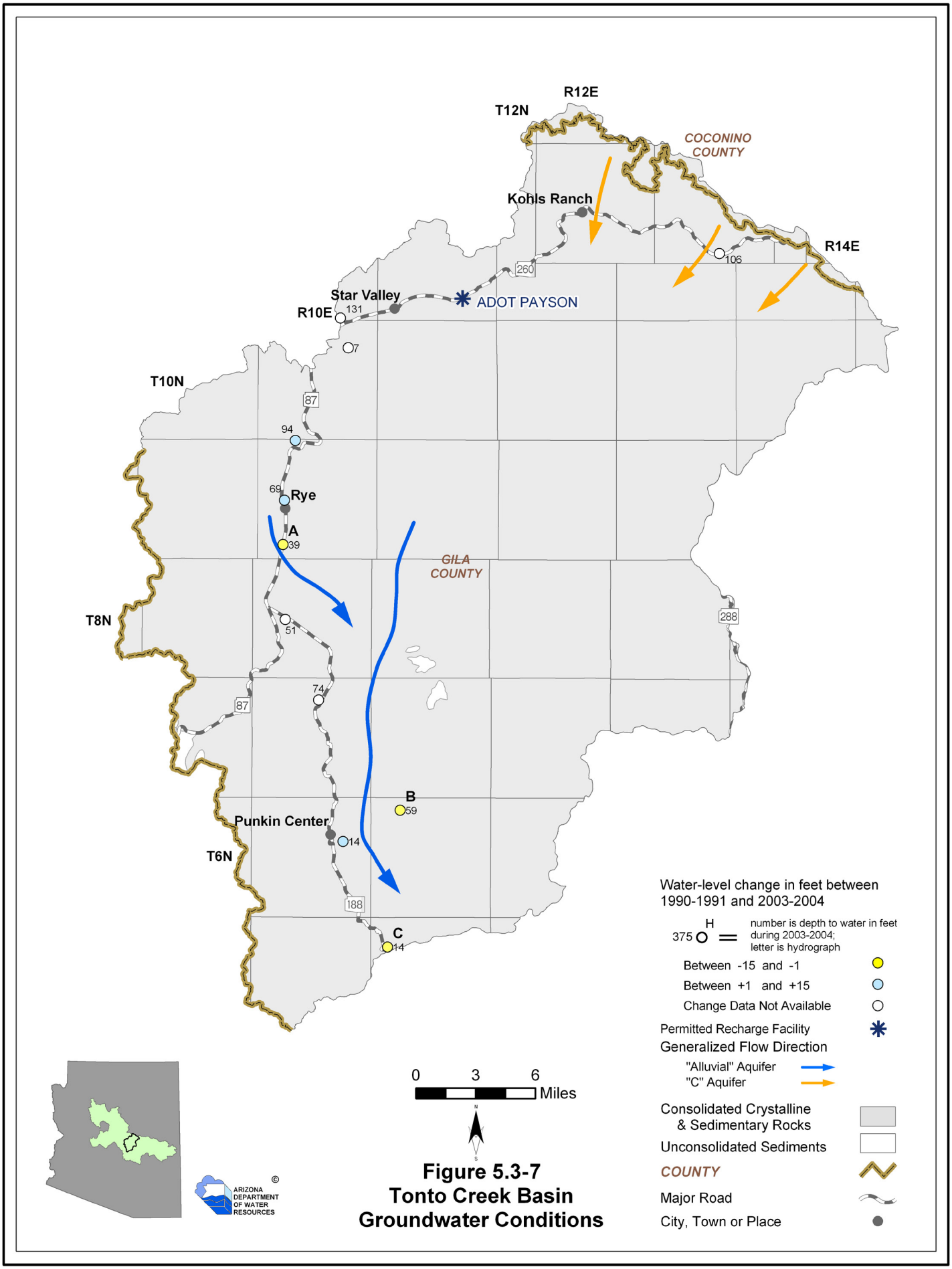
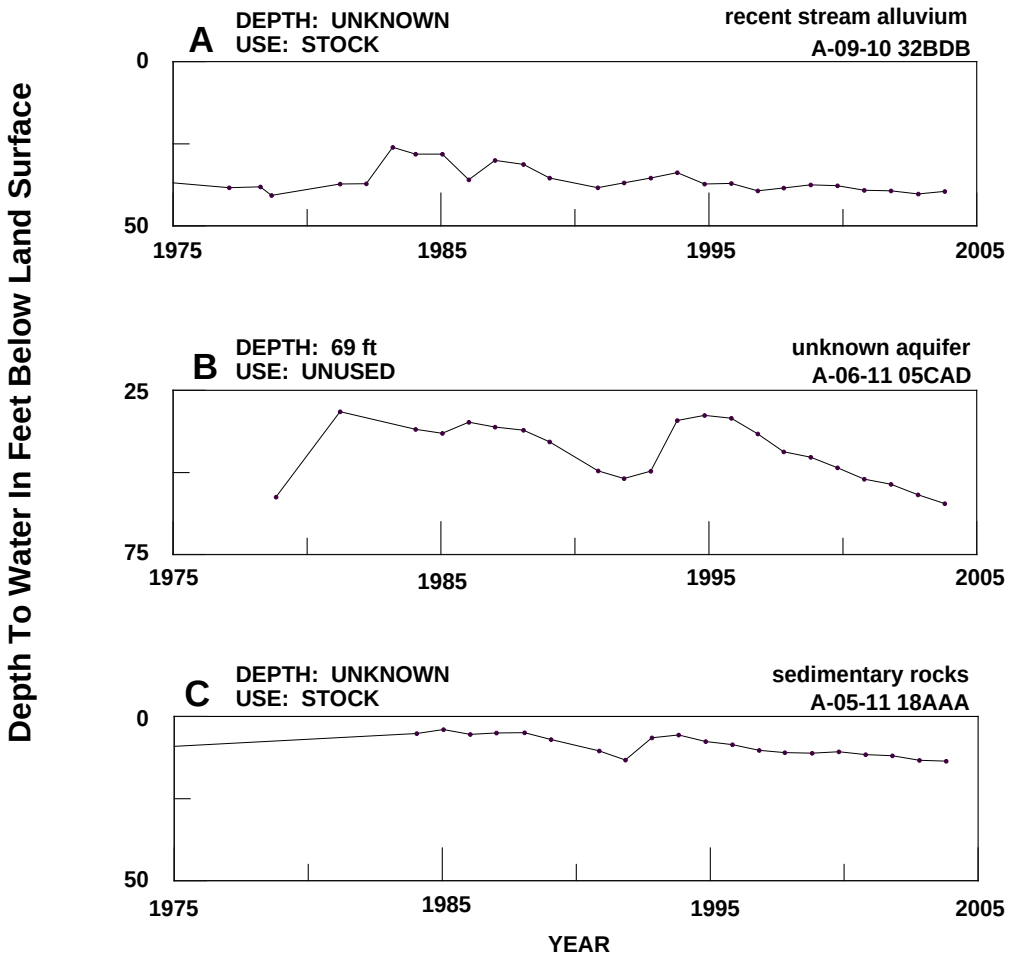


Figure 5.3-7
Tonto Creek Basin
Groundwater Conditions

Figure 5.3-8
Tonto Creek Basin
Hydrographs Showing Depth to Water in Selected Wells



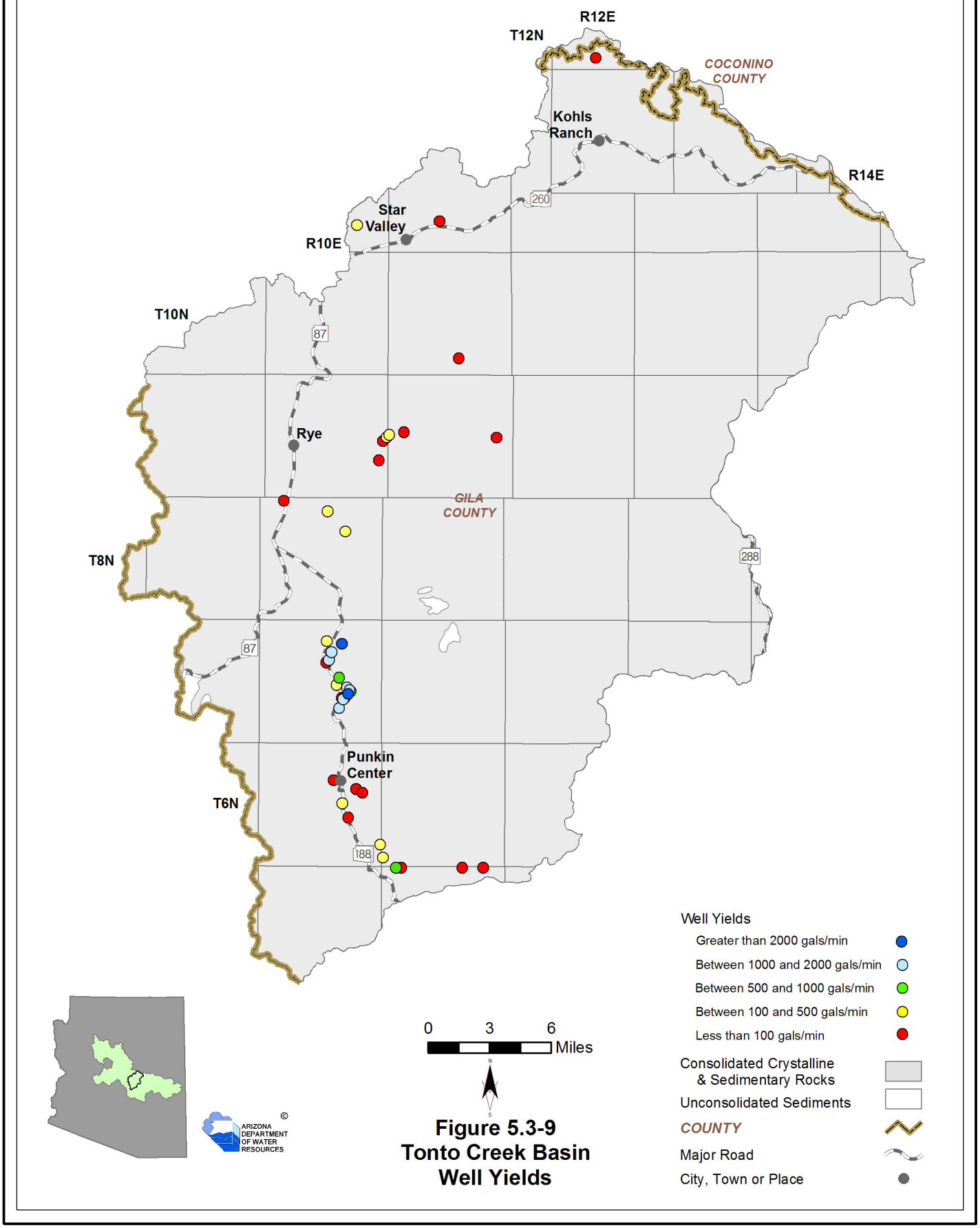


Figure 5.3-9
Tonto Creek Basin
Well Yields

5.3.7 Water Quality of the Tonto Creek Basin

Wells, springs and mine sites with parameter concentrations that have equaled or exceeded drinking water standard(s), including location and parameter(s) are shown in Table 5.3-7A. Impaired lakes and streams with site type, name, length of impaired reach, area of impaired lake, designated use standard and parameter(s) exceeded is shown in Table 5.3-7B. Figure 5.3-10 shows the location of water quality occurrences keyed to Table 5.3-7. All community water systems are regulated under the Safe Drinking Water Act and treat water supplies to meet drinking water standards. Not all parameters were measured at all sites; selective sampling for particular constituents is common. A description of water quality data sources and methods is found in Volume 1, Appendix A.

Well, Mine or Spring sites that have equaled or exceeded drinking water standards (DWS)

- Refer to Table 5.3-7A.
- Nine sites have parameter concentrations that have equaled or exceeded drinking water standards
- Standards equaled or exceeded in this basin include arsenic, nitrate, beryllium, radionuclides and organic compounds.

Lakes and Streams with impaired waters

- Refer to Table 5.3-7B.
- Water quality standards were equaled or exceeded in three stream reaches on two streams.
- The standard exceeded in all reaches was E. coli. The two reaches on Tonto Creek also exceeded the standard for nitrogen.
- All three impaired reaches are part of the ADEQ water quality improvement effort called the Total Maximum Daily Load (TMDL) program. The final TMDL reports for the streams have been completed and draft implementation plans are available for the two reaches on Tonto Creek.

Table 5.3-7 Water Quality Exceedences in the Tonto Creek Basin[1]

A. Wells, Springs and Mines

Map Key	Site Type	Site Location			Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
		Township	Range	Section	
1	Well	11 North	12 East	34	Rad
2	Well	9 North	10 East	25	As
3	Well	9 North	11 East	18	Rad
4	Well	9 North	12 East	23	As, NO3
5	Well	8 North	10 East	13	NO3
6	Well	8 North	10 East	26	Be
7	Well	8 North	10 East	26	As
8	Well	8 North	10 East	27	As
9	Well	5 North	11 East	8	Organics

Source: Compilation of databases from ADWR & others

B. Lakes and Streams

Map Key	Site Type	Site Name	Length of Impaired Stream Reach (in miles)	Area of Impaired Lake (in acres)	Designated Use Standard[3]	Parameter(s) Exceeding Use Standard[2]
a	Stream	Christopher Creek (headwaters to Tonto Creek)	8	NA	FBC	E. coli
b	Stream	Tonto Creek (headwaters to unnamed tributary latitude 341810, longitude -1110414)	8	NA	A&W, FBC	E. coli, N, DO
c	Stream	Tonto Creek (unnamed tributary latitude 341810, longitude -1110414 to Haigler Creek)	9	NA	A&W, FBC	E. coli, N

Source: ADEQ 2005d

Notes:

[1] Water quality samples taken from 1979 to 2002

[2] As = Arsenic
Be = Beryllium
DO = Dissolved Oxygen
N = Nitrogen
NO3 = Nitrate
Organics = One or more of several volatile and semi-volatile organic compounds and pesticides
Rad = One or more of the following radionuclides - Gross Alpha, Gross Beta, Radium, and Uranium

[3] A&W = Aquatic and Wildlife
FBC = Full Body Contact
NA = Not Applicable

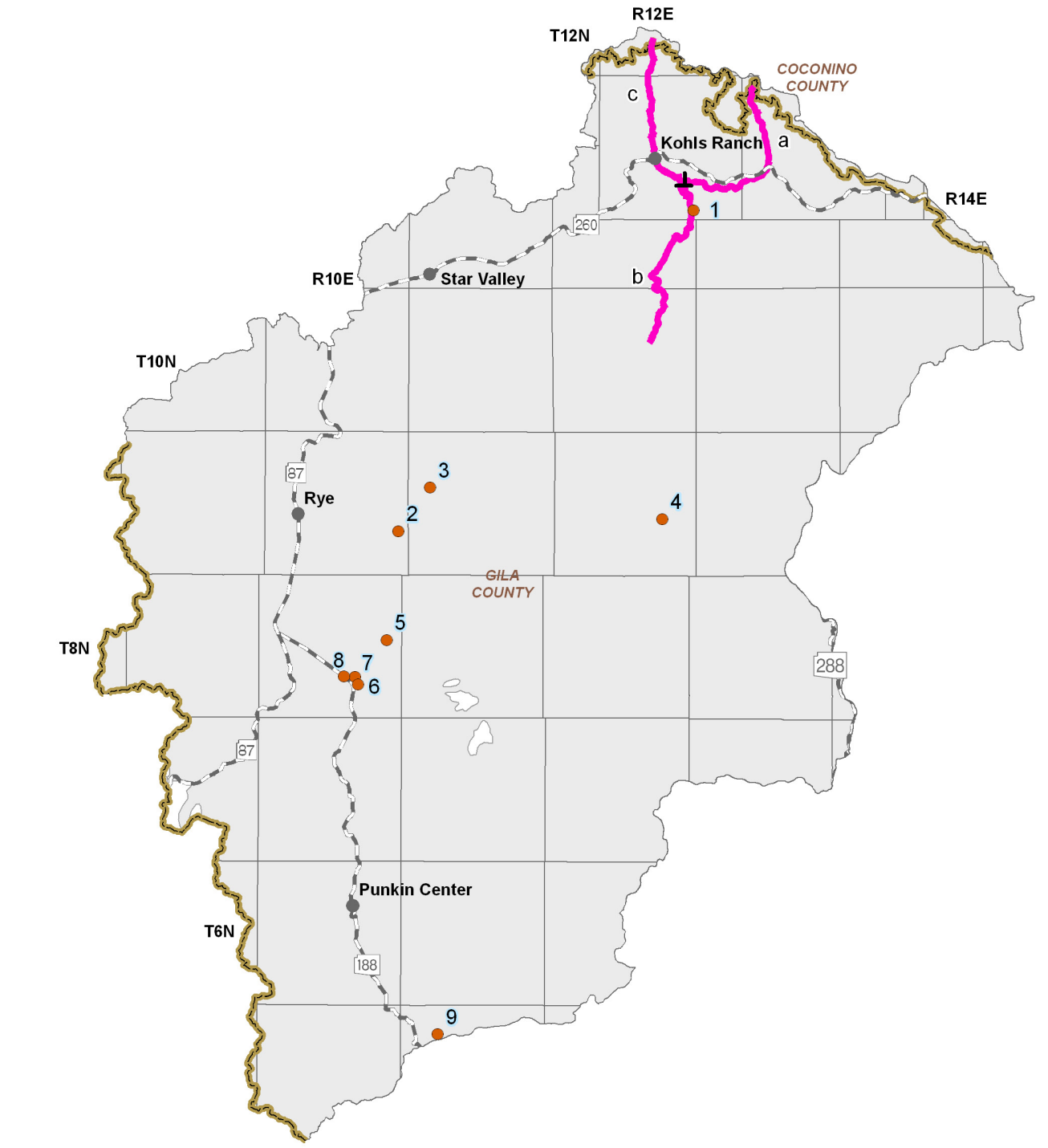


Figure 5.3-10
Tonto Creek Basin
Water Quality Conditions

5.3.8 Cultural Water Demand in the Tonto Creek Basin

Cultural water demand data including population, number of wells and the average well pumpage and surface water diversions by the municipal, industrial and agricultural sectors are shown in Table 5.3-8. Effluent generation including facility ownership, location, population served and not served, volume treated, disposal method and treatment level is shown in Table 5.3-9. Figure 5.3-11 shows the location of demand centers. A description of cultural water demand data sources and methods is found in Volume 1, Appendix A. More detailed information on cultural water demand is found in Section 5.0.7.

Cultural Water Demand

- Refer to Table 5.3-8 and Figure 5.3-11.
- Population in this basin has increased from 1,934 in 1980 to 7,975 in 2000.
- Groundwater use has fluctuated from a low of 2,000 AFA in the 1970s to an average of 4,000 AFA from 1986-1990. During 2001-2005 the average annual groundwater demand was 3,050 AFA.
- Municipal groundwater use has increased from an average of 1,600 AFA in 1991-1995 to 2,400 AFA in 2001-2005.
- There was no reported industrial groundwater use in 1991-1995. In 2001-2005, industrial demand was less than 300 AFA.
- Groundwater demand for irrigation was less than 1,000 AFA during 1991-2005.
- Information on surface water diversions is not available from 1971-1990. From 1991-2005, 1,000 AFA was used for irrigation.
- Municipal and industrial demand is principally found in the vicinity of Payson and Star Valley with smaller demand centers scattered along State Highways 188 and 260 as well as east of Rye.
- A small amount of agriculture is located east of Rye and in T9N, R10E.
- There is one small mine or quarry in this basin along Highway 87 south of Payson.
- As of 2005 there were 1,948 registered wells with a pumping capacity of less than or equal to 35 gpm and 280 wells with a pumping capacity of more than 35 gpm.

Effluent Generation

- Refer to Table 5.3-9.
- There are three wastewater treatment facilities in this basin. Data on population served, volume treated and disposal method was only available for one facility. This facility serves approximately 100 people, generates 13 acre-feet of effluent each year and discharges to Houston Creek.

Table 5.3-8 Cultural Water Demand in the Tonto Creek Basin[1]

Year	Estimated and Projected Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)						Data Source
				Well Pumpage			Surface-Water Diversions			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Agricultural	Municipal	Industrial	Agricultural	
1971		724[2]	102[2]	2,000			NR			ADWR (1994a)
1972										
1973										
1974										
1975										
1976				2,000			NR			
1977										
1978										
1979										
1980	1,934									
1981	2,202	237	33	3,000			NR			
1982	2,470									
1983	2,738									
1984	3,006									
1985	3,275									
1986	3,543	283	28	4,000			NR			
1987	3,811									
1988	4,079									
1989	4,347									
1990	4,615									
1991	4,951	191	25	1,600	NR	<1,000	NR	NR	1,000	USGS (2007) ADWR (2008b) ADWR (2005a) ADWR (1992)
1992	5,287									
1993	5,623									
1994	5,959									
1995	6,295									
1996	6,631	300	62	1,900	<300	<1,000	NR	NR	1,000	
1997	6,967									
1998	7,303									
1999	7,639									
2000	7,975									
2001	8,186	213	30	2,400	<300	<1,000	NR	NR	1,000	
2002	8,398									
2003	8,609									
2004	8,820									
2005	9,032									
2010	10,088									
2020	12,641									
2030	14,538									
	WELL TOTALS:	**1,948**	**280**							

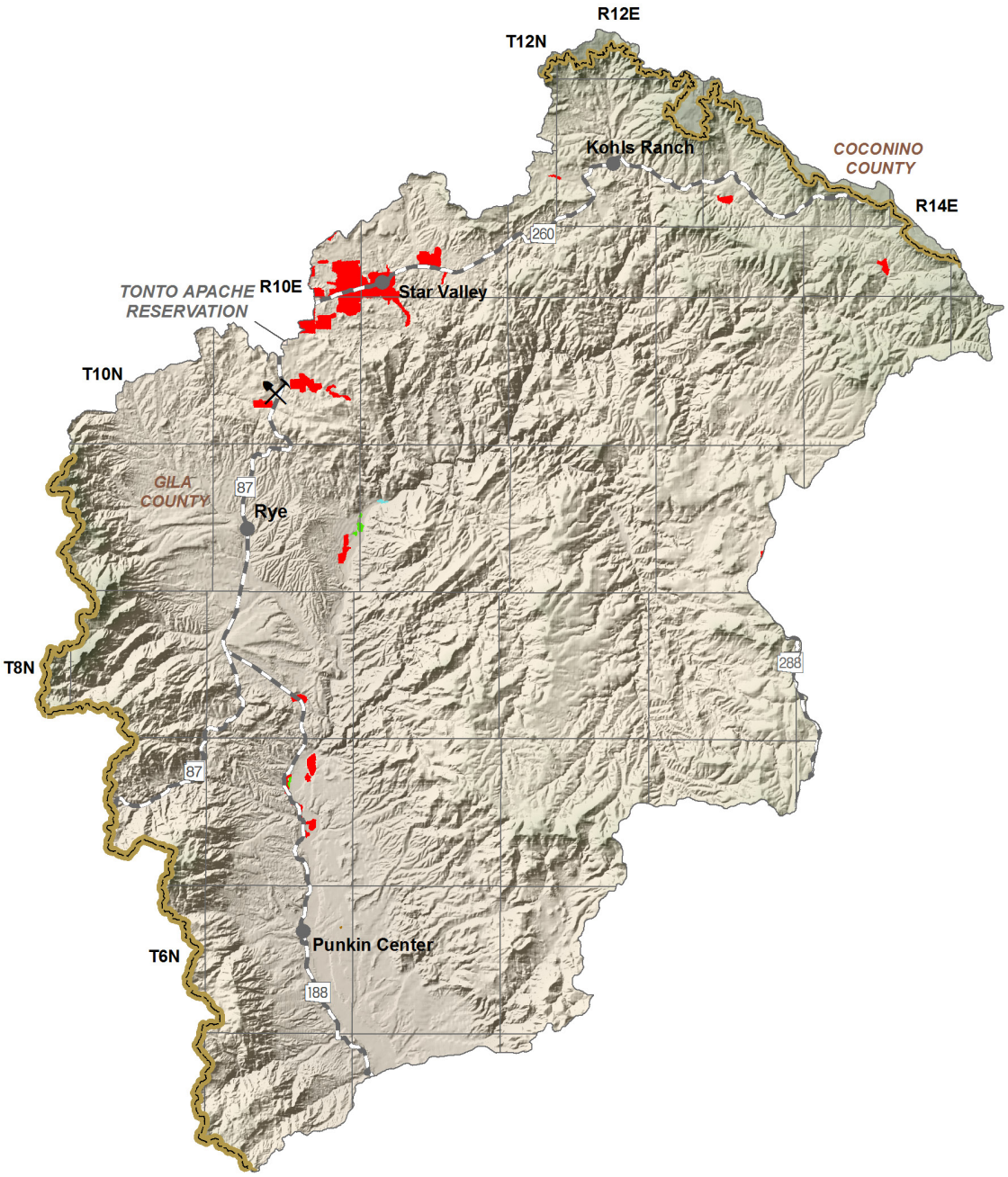
Notes:
NR - Not reported
[1] Does not include effluent or evaporation losses from stockponds and reservoirs.
[2] Includes all wells through 1980.

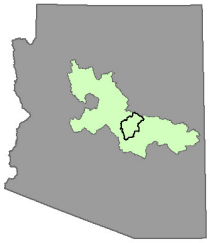
Table 5.3-9 Effluent Generation in the Tonto Creek Basin

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet/year)	Disposal Method							Current Treatment Level	Population Not Served	Year of Record
					Water-course	Evaporation Pond	Irrigation	Golf Course/Turf/ Landscape	Wildlife Area	Discharge to another Facility	Infiltration Basins			
Houston Creek Landing WWTP	NA	Star Valley	NA											
Hunter Creek WWTP	Private	Hunter Creek	NA											
Pine Meadows WWTP	Private	Star Valley	108[1]	13	Houston Creek							Tertiery	NA	2007

Source: Compilation of databases from ADWR & others

Notes:
NA: Data not currently available to ADWR
WWTP: Waste Water Treatment Plant
[1]Population increases in the summer





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Primary Data Source: USGS National Gap Analysis Program, 2004

0 3 6 Miles

N
S

Figure 5.3-11
Tonto Creek Basin
Cultural Water Demand

Demand Centers

- Agriculture
- M&I - High Intensity
- M&I - Low Intensity
- Small Mine / Quarry
- Indian Reservation
- COUNTY
- Major Road
- City, Town or Place

5.3.9 Water Adequacy Determinations in the Tonto Creek Basin

Water adequacy determination information including the subdivision name, location, number of lots, adequacy determination, reason for the inadequacy determination, date of determination and subdivision water provider are shown in Table 5.3-10A and B for water reports and analysis of adequate water supply. Figure 5.3-12 shows the locations of subdivisions keyed to the Table. A description of the Water Adequacy Program is found in Volume 1, Appendix C. Adequacy determination data sources and methods are found in Volume 1, Appendix A.

- All subdivisions receiving an adequacy determination are in Gila County. Sixty-two water adequacy determinations for 4,184 lots have been made in this basin through December 2008. Four hundred and forty-one lots in eight subdivisions, or 13% of lots, were determined to be adequate.
- The most common reason for an inadequate determination was because the applicant did not submit the necessary information and/or available hydrologic data were insufficient to make a determination.
- One Analysis of Adequate Water Supply application for 34 lots has been approved for this basin.

Table 5.3-10 Adequacy Determinations in the Tonto Creek Basin[1]

A. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.[2]	ADWR Adequacy Determination	Reason(s) for Inadequacy Determination[3]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section						
1	Alpine Heights	Gila	11 North	10 East	26,27,34,35	257	NA	Inadequate	A1,A2	7/11/1978	United Utilities Company
2	Boulder Creek	Gila	10 North	10 East	11	20	53-401552	Inadequate	A1	11/18/2004	Town of Payson
4	Chaparral Estates	Gila	11 North	10 East	35	88	53-400536	Inadequate	A1	6/29/2001	Town of Payson
5	Chaparral Highlands	Gila	11 North	10 East	26	19	53-500026	Inadequate	A1	11/20/2006	Town of Payson
6	Chaparral Pines #1	Gila	11 North	10 East	25, 35, 36	475	53-300080	Inadequate	A1, A2	4/26/1996	Town of Payson
7	Chaparral Pines #2	Gila	11 North	10 East	25, 35, 36	281	53-300281	Inadequate	A1	4/3/1997	Town of Payson
8	Chaparral Ranch	Gila	11 North	10 East	25, 26	14	53-500442	Inadequate	A2, C	2/23/1995	Town of Payson
9	Collins Ranch	Gila	12 North	12 East	32	36	53-500484	Inadequate	A1	1/15/1980	Dry Lot Subdivision
10	Deer Creek Village	Gila	8 North	10 East	5	154	53-500545	Inadequate	A1 ,A2	4/9/1982	NA
11	East Gateway	Gila	10 North	10 East	2	19	53-401982	Inadequate	A1	2/9/2006	Town of Payson
12	East Gateway Phase 2, Lots 20 thru 25	Gila	10 North	10 East	2	6	53-500025	Inadequate	A1	1/18/2007	Town of Payson
13	Elk Ridge	Gila	10 North	10 East	10	108	53-300056	Inadequate	A2, C	10/5/1995	Town of Payson
14	Evergreen Meadows	Gila	10 North	11 East	5, 8	63	53-500626	Inadequate	B	8/11/1975	Dry Lot Subdivision
15	Foothills East	Gila	11 North	10 East	35	6	53-300599	Inadequate	A1	10/19/1998	Town of Payson
16	Forest Edge	Gila	10 North	10 East	11	31	53-700366	Inadequate	A1	7/5/2007	Town of Payson
17	Gisela Heights	Gila	9 North	10 East	24, 25	47	53-500705	Adequate		3/30/1977	Dry Lot Subdivision
18	Golden Frontier #1	Gila	10 North	10 East	10	112	53-500715	Inadequate	A1, A2	1/17/1980	United Utilities Company
19	Golden Frontier #2	Gila	10 North	10 East	10	87	53-500716	Inadequate	A1, A2	8/15/1984	Town of Payson
20	Gordon Canyon Creek	Gila	10.5 North 11 North	14 East 13 East	20 36	7	53-500722	Inadequate	A1, A2	8/10/1976	Dry Lot Subdivision
21	Granite Dells Estates	Gila	10 North	10 East	2, 11	20	53-500725	Inadequate	A1, A2	1/19/1977	Dry Lot Subdivision
22	Greenback Vista Estates	Gila	6 North	10 East	14	35	53-300392	Adequate		9/22/1998	United Utilities Company
23	Green Valley Estates	Gila	10 North	31 East	NA	53	NA	Inadequate	A1	4/26/1994	Town of Payson
24	Haigler Creek Haciendas	Gila	10 North	13 East	13	29	53-500770	Inadequate	A1, B	4/11/1983	Dry Lot Subdivision
25	Highlands at the Rim	Gila	10 North	10 East	2	130	53-400671	Inadequate	A1	2/12/2002	Town of Payson
26	Houston Creek Landing	Gila	11 North	11 East	32	91	53-400372	Inadequate	A1	8/25/2000	Brooke Utilities
27	Hunter Creek Ranch	Gila	11 North	13 East	29, 30, 31, 32	118	53-500811	Adequate		2/27/1990	Hunter Creek Ranch HOA
28	Juniper Ridge	Gila	11 North	10 East	26	6	53-400015	Inadequate	A1	2/9/1999	Town of Payson
29	Knolls, The #01	Gila	11 North	11 East	31	34	53-500845	Inadequate	A1, A2	8/24/1993	United Utilities Company
30	Knolls, The #02	Gila	11 North	11 East	31	22	53-500846	Inadequate	A1, A2	3/28/1994	United Utilities Company
31	Knolls, The #03	Gila	11 North	11 East	31	27	53-300048	Inadequate	A2	1/11/1996	United Utilities Company
32	Kohl's Ranch	Gila	11 North	12 East	21	123	53-300010	Inadequate	A1, A2	5/16/1995	Kohl's Ranch Water Company
33	Kohl's Tonto Creek Ranch	Gila	11 North	12 East	21	20	53-500848	Adequate		7/8/1977	Kohl's Ranch Water Company
34	Oak Ridge Hills	Gila	11 North	10 East	26	9	53-300168	Inadequate	A2	7/1/1996	Town of Payson
35	Pine Gate	Gila	11 North	10 East	36	11	53-300435	Inadequate	A1	4/21/1998	Town of Payson
36	Pine Island at Chaparral Pines	Gila	11 North	10 East	36	43	53-300081	Inadequate	A1, A2	4/26/1996	Town of Payson
37	Pine Ridge	Gila	11 North	11 East	32	36	53-300600	Inadequate	A1, A2	2/2/1999	Brooke Utilities
38	Pinon Ridge #1	Gila	10 North	10 East	10	41	53-300286	Inadequate	A1	5/14/1997	Town of Payson
39	Pinon Ridge Unit Two	Gila	10 North	10 East	10	39	53-300433	Inadequate	A1	3/20/1998	Town of Payson

Table 5.3-10 Adequacy Determinations in the Tonto Creek Basin (Cont)[1]

A. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.2	ADWR Adequacy Determination	Reason(s) for Inadequacy Determination3	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section						
40	Ponderosa Springs (Colcord Sps)	Gila	11 North	14 East	26, 27, 34, 35	28	53-501205	Adequate		1/2/1980	Dry Lot Subdivision
41	Preserve, The, on Haigler Creek	Gila	10 North	13 East	13	29	53-501212	Inadequate	A1	1/13/1986	Dry Lot Subdivision
42	Punkin Center Village	Gila	6 North	10 East	13, 14	91	53-501228	Inadequate	A1	10/15/1984	Sheer Speed Water Company
43	Quail Valley	Gila	11 North	11 East	34	160	53-501239	Inadequate	A1, A2	4/30/1982	United Utilities Company
44	Quail Valley #2	Gila	11 North	11 East	32	9	53-501240	Inadequate	A1, A2	3/17/1987	United Utilities Company
45	Ridge at Hunter Creek	Gila	11 North	13 East	29	19	53-300505	Adequate		8/10/1998	Hunter Creek Ranch HOA
46	Rim Club Cabins, Unit One	Gila	10 North	10 East	1	9	53-401384	Inadequate	D	9/2/2004	Town of Payson
47	Rim Golf Club	Gila	11 North	10 East	36,1	317	53-300426	Inadequate	A1	4/21/1998	Town of Payson
48	Rim View Heights Estates	Gila	10 North	10 East	10, 11	101	53-501299	Inadequate	A1, A2	3/21/1988	Town of Payson
49	San Gianni Hills	Gila	11 North	10 East	26	15	53-401759	Inadequate	A1	5/31/2005	Town of Payson
50	Settle in at Pine Meadows	Gila	11 North	12 East	32, 33	210	53-400482	Inadequate	A1	4/6/2001	Pine Meadows Domestic Water System
51	Siena Creek	Gila	11 North	10 East	36	25	53-400859	Inadequate	A1	12/23/2002	Town of Payson
52	Star Valley Vista	Gila	11 North	11 East	31, 32	12	53-501450	Inadequate	A1, A2	3/18/1987	United Utilities Company
53	Tonto Creek Shores	Gila	9 North	10 East	25	8	53-300532	Inadequate	A1	9/9/1998	United Utilities Company
54	Tonto Creek Shores B	Gila	9 North	10 East	25	13	53-400392	Inadequate	A1	9/18/2000	NA
55	Tonto Rim Ranch	Gila	11 North	12 East	4, 9	12	53-300557	Inadequate	A1	11/13/1998	Tonto Creek Utility Co.
56	Tonto Village #3	Gila	11 North	12 East	5, 8	89	53-501565	Adequate		7/17/1978	Tonto Village Water Co.
57	Walnut Springs	Gila	6 North	10 East	26	85	53-501664	Adequate		1/6/1998	United Utilities Company
58	Whisper Ridge	Gila	10 North	10 East	2	20	53-400774	Inadequate	A1	8/8/2002	Town of Payson
59	Wilderness Rim	Gila	11 North	10 East	36	6	53-700531	Inadequate		6/17/2008	NA
60	Wildflower Ridge	Gila	11 North	10 East	35	50	53-401559	Inadequate	A1	11/17/2004	Town of Payson
61	Wood Canyon Ranch	Gila	11 North	12 East	32	320	53-401556	Inadequate		3/16/2005	NA
62	Woods of Payson, The	Gila	11 North	10 East	26	8	53-300372	Inadequate	A1	10/8/1997	Town of Payson
63	Zane Grey Ranch	Gila	12 North	12 East	32	5	53-501717	Inadequate	A1	8/5/1993	Zane Grey Ranch Homeowners

B. Analysis of Adequate Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.[2]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section				
3	Boulder Ridge	Gila	11 North	10 East	35	34	53-700562	9/8/2008	Town of Payson

Source: ADWR 2008a

Notes:

[1]Each determination of the adequacy of water supplies available to a subdivision is based on the information available to ADWR and the standards of review and policies in effect at the time the determination was made. In some cases, ADWR might make a different determination if a similar application were submitted today, based on the hydrologic data and other information currently available, as well as current rules and policies.

[2] Prior to February 1995, ADWR did not assign file numbers to applications for adequacy. Between 1995-2006 all applications for adequacy were given a file number with a 22 prefix. In 2006 a 53 prefix was assigned to all water adequacy reports and applications regardless of their issue date.

[3] A. Physical/Continuous
1) Insufficient Data (applicant chose not to submit necessary information, and/or available hydrologic data insufficient to make determination)
2) Insufficient Supply (existing water supply unreliable or physically unavailable; for groundwater, depth-to-water exceeds criteria)
3) Insufficient Infrastructure (distribution system is insufficient to meet demands or applicant proposed water hauling)
B. Legal (applicant failed to demonstrate a legal right to use the water or failed to demonstrate the provider's legal authority to serve the subdivision)
C. Water Quality
D. Unable to locate records

NA = Not Available

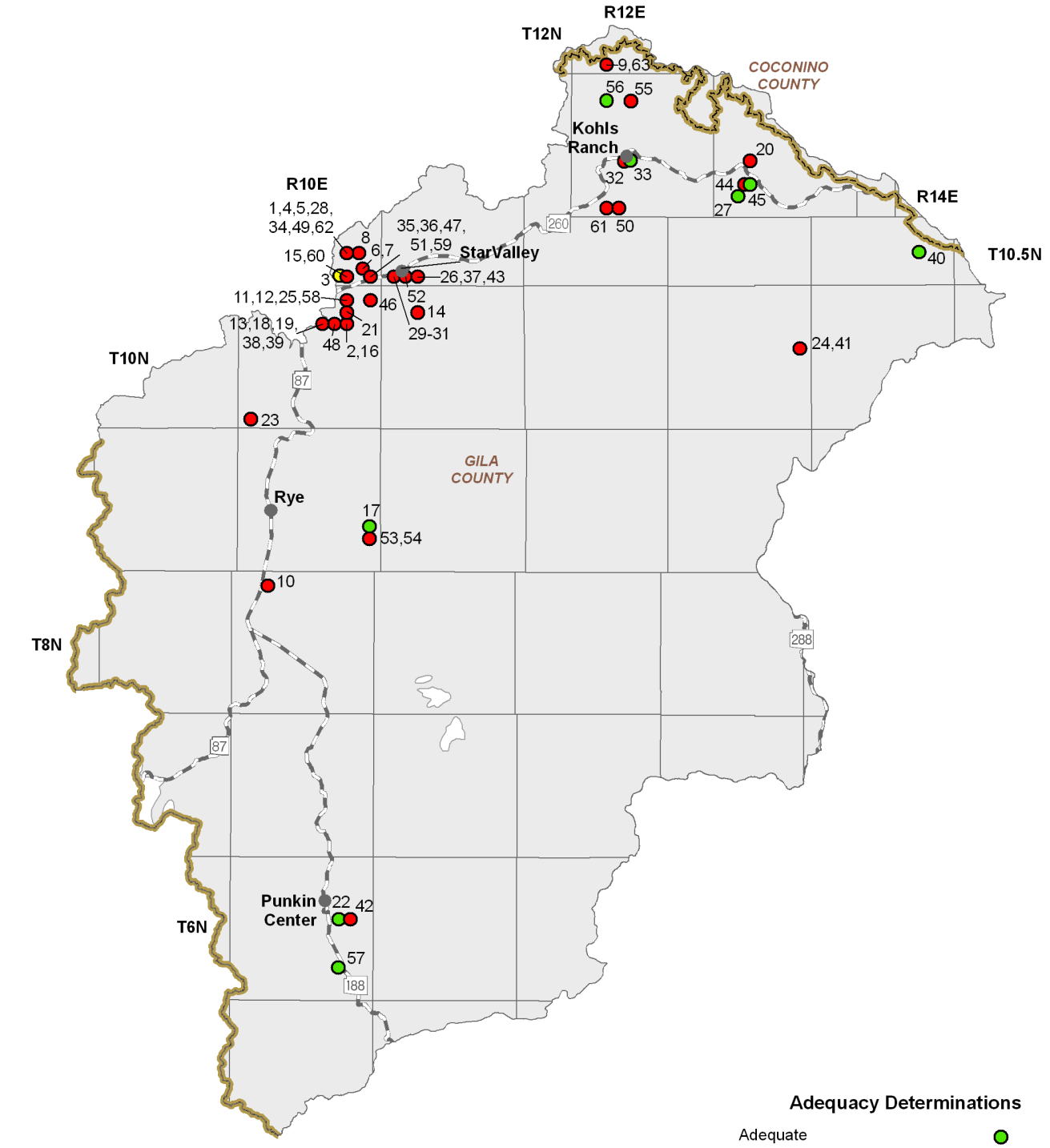

Figure 5.3-12
Tonto Creek Basin
Adequacy Determinations

Tonto Creek Basin
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