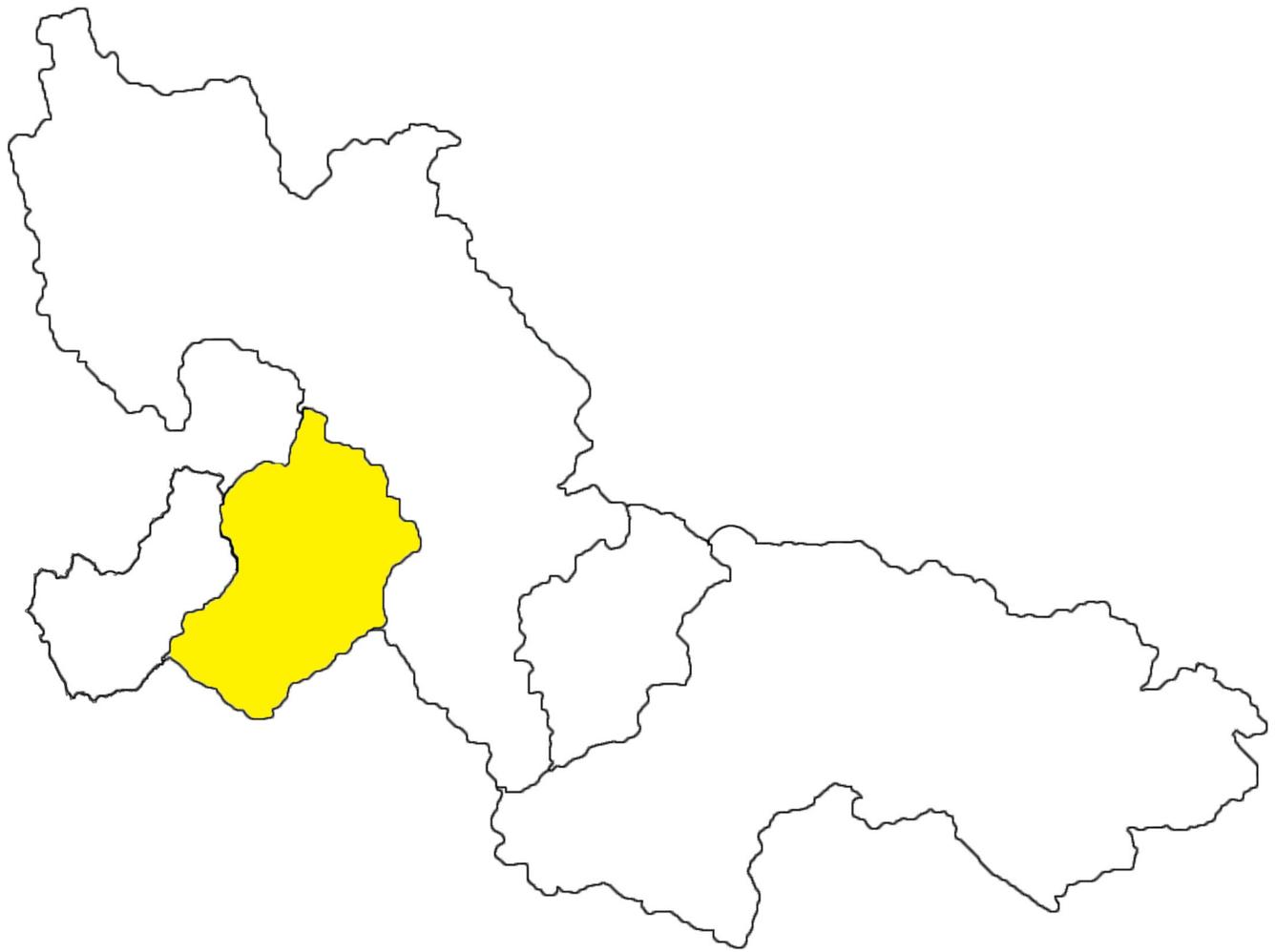


# Section 5.4

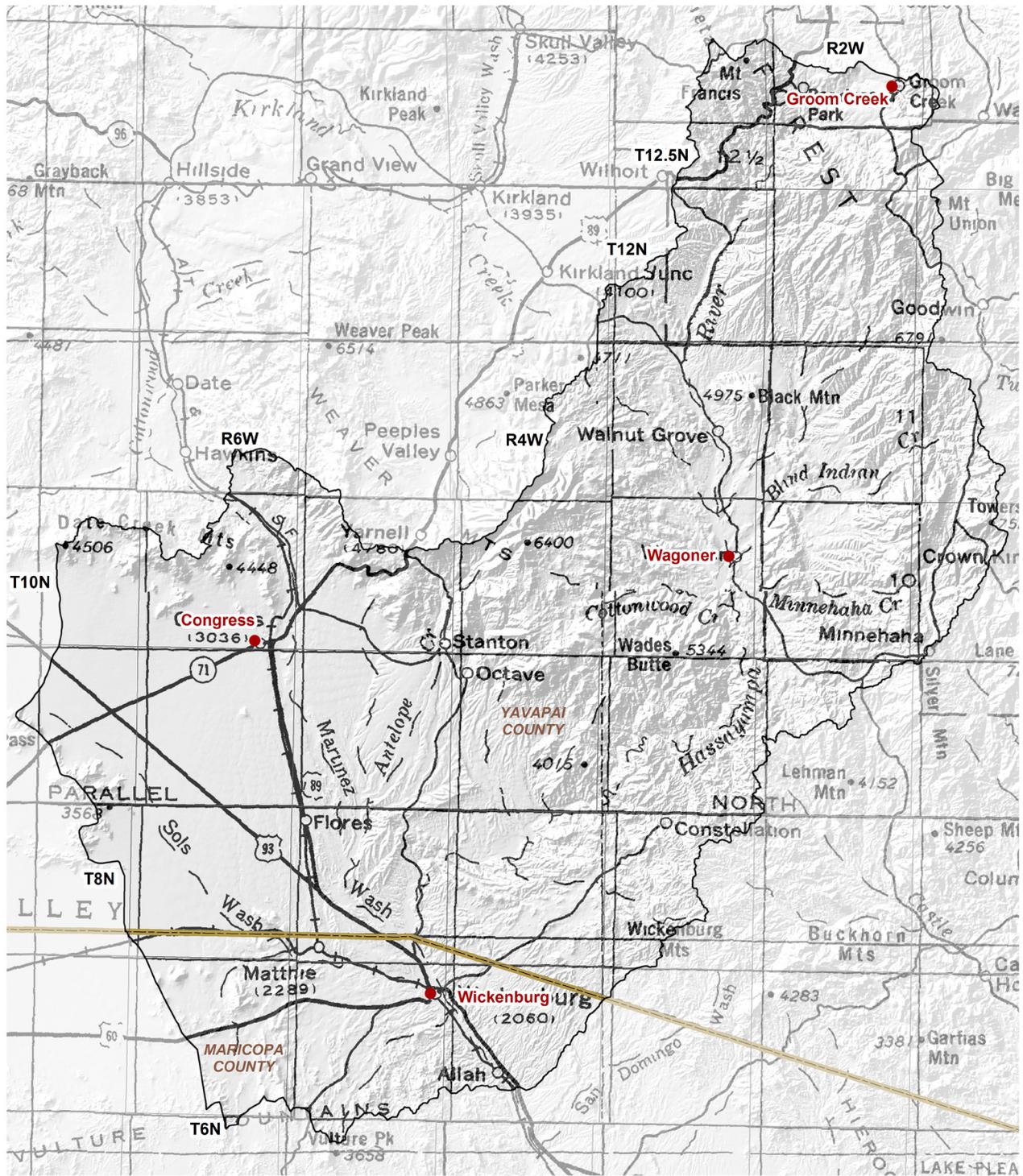
## Upper Hassayampa Basin



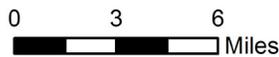
### 5.4.1 Geography of the Upper Hassayampa Basin

The Upper Hassayampa Basin, located in the eastern part of the planning area is the smallest basin in the planning area at 787 square miles. Geographic features and principal communities are shown on Figure 5.4-1. The basin is characterized by mid-elevation mountains and valleys. Vegetation types include Arizona upland Sonoran and Mohave desertscrub, semi-desert grassland, interior chaparral and small areas of montane conifer forest. (see Figure 5.0-10) Riparian vegetation including mesquite and cottonwood/willow is found along the perennial portions of the Hassayampa River.

- Principal geographic features shown on Figure 5.4-1 are:
  - Hassayampa River running north to south through the center of the basin and Wickenburg
  - Martinez Wash and Antelope Creek in the center of the basin
  - Weaver Mountains northeast of Congress, the Bradshaw Mountains along the eastern basin boundary and the Date Creek Mountains north of Congress.
  - The highest point in the basin is about 7,000 feet in the Bradshaw Mountains east of Wagoner
  - The lowest point in the basin at 1,900 feet at Allah where the Hassayampa River exits the basin



Base Map: USGS 1:500,000, 1981



**Figure 5.4-1**  
**Upper Hassayampa Basin**  
**Geographic Features**

COUNTY   
City, Town or Place 

## 5.4.2 Land Ownership in the Upper Hassayampa Basin

Land ownership, including the percentage of ownership by category, for the Upper Hassayampa River Basin is shown in Figure 5.4-2. The principal feature of land ownership in this basin is the relatively large portion of state trust land. A description of land ownership data sources and methods is found in Volume 1, Section 1.3.8. 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.

### State Trust Land

- 38.3% of the land in this basin is held in trust for the public schools and three other beneficiaries under the State Trust Land system.
- State land is located throughout most of the basin. In the western portion of the basin state land is contiguous and in the remainder of the basin it is interspersed with private and Bureau of Land Management (BLM) lands.
- Primary land use is grazing.

### National Forest

- 24.7% of the land is federally owned and managed by the United States Forest Service (USFS).
- Forest lands in the basin are part of the Prescott National Forest.
- The basin contains one National Forest wilderness area, the 25,536-acre Castle Creek Wilderness. (see Figure 5.0-13)
- All forest lands are in the northern portion of the basin and contain numerous private in-holdings.
- Land uses include recreation, grazing and timber production.

### U.S. Bureau of Land Management (BLM)

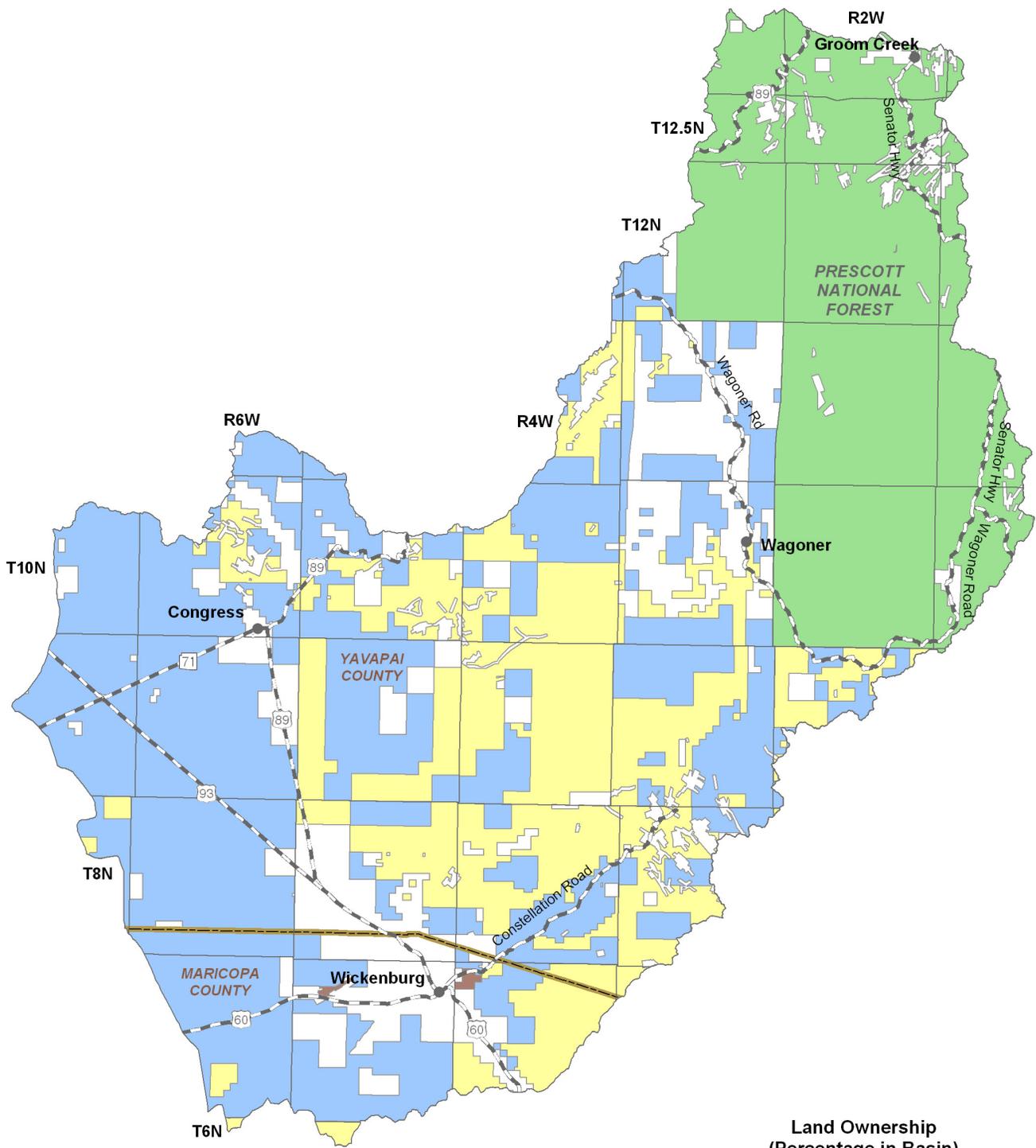
- 20.7% of the land is federally owned and managed by the Hassayampa Field office of the BLM.
- Large, contiguous parcels of BLM lands are located in the center of the basin.
- The basin includes the 11,840-acre Hassayampa River Canyon Wilderness Area. (see Figure 5.0-13)
- Land uses include recreation and grazing.

### Private

- 16.2% of the land is private.
- Private land is located throughout the basin interspersed with state, BLM and National Forest lands. Larger portions of private land are located in the vicinity of Wickenburg and along Wagoner Road.
- Land uses include domestic, commercial and ranching.

### Other (Game and Fish, County and Bureau of Reclamation Lands)

- 0.1% of the land is owned and managed by the City of Wickenburg as local parks.
- Primary land use is recreation.

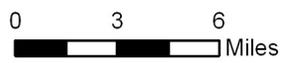


**Land Ownership  
(Percentage in Basin)**

- State Trust (38.3%)
- National Forest (24.7%)
- U.S. Bureau of Land Management (20.7%)
- Private (16.2%)
- Other (0.1%)

**COUNTY**

- Major Road
- City, Town or Place



**Figure 5.4-2  
Upper Hassayampa Basin  
Land Ownership**



Source: ALRIS, 2004

### 5.4.3 Climate of the Upper Hassayampa Basin

Climate data from NOAA/NWS Co-op stations are compiled in Table 5.4-1 and the locations are shown on Figure 5.4-3. Figure 5.4-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Upper Hassayampa Basin does not contain Evaporation Pan, AZMET or SNOTEL/Snowcourse 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 5.4-1A
- 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 68.9°F at Groom Creek and 87.2°F at Wickenburg. The average monthly minimum temperature occurs in January or December and ranges between 49.4°F at Wickenburg to 34.2°F at Groom Creek.
- Highest average seasonal rainfall occurs in the winter (January – March) and summer (July-September). For the period of record used, the highest annual rainfall is 22.08 inches at Groom Creek and the lowest is 12.25 inches at Wickenburg.

#### SCAS Precipitation Data

- See Figure 5.4-3
- Additional precipitation data shows rainfall as high as 32 inches on the east central basin boundary and as low as 10 inches in the southern portion of the basin around Wickenburg.

**Table 5.4-1 Climate Data for the Upper Hassayampa 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
Groom Creek	6,110	1948-1976 <sup>1</sup>	68.9/Jul	34.2/Jan	5.15	3.12	8.79	5.02	22.08
Wickenburg	2,050	1971-2000	87.2/Jul	49.4/Dec	4.48	0.86	4.36	2.55	12.25
Stanton	3,480	1948-1969	83.5/Jul	48.0/Jan	4.27	1.35	6.09	3.65	15.35

Source: WRCC, 2005

**Notes:**

<sup>1</sup>Average temperature for period of record shown; average precipitation from 1971-2000

**B. Evaporation Pan:**

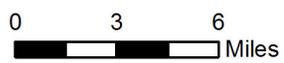
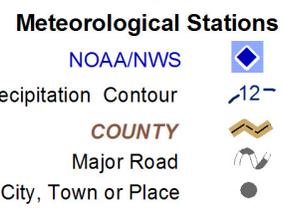
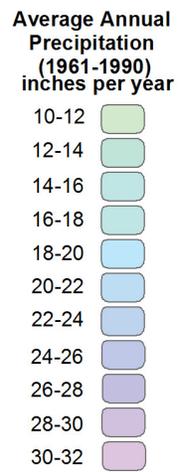
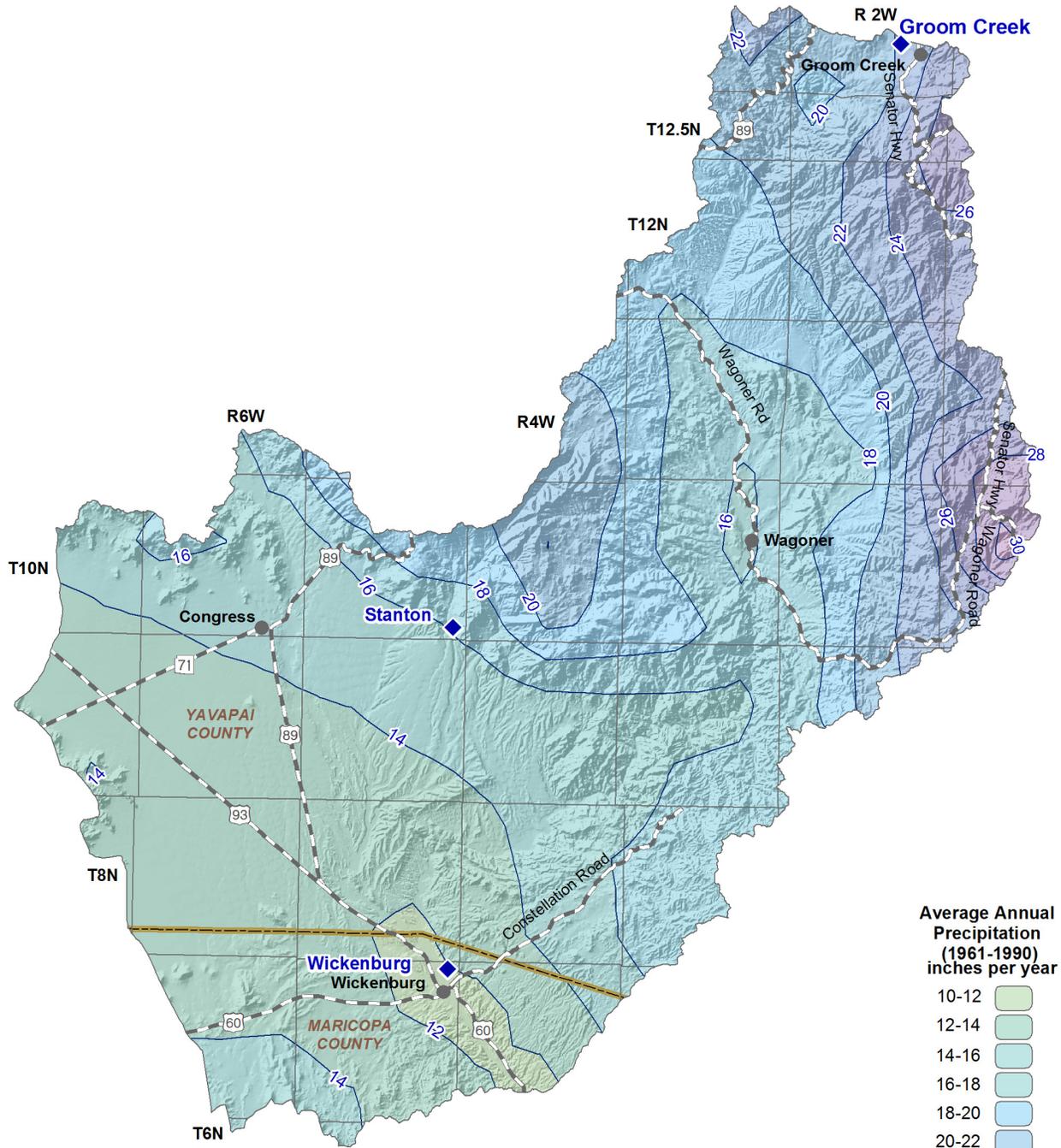
Station Name	Elevation (in feet)	Period of Record Used for Averages	Avg. Annual Evap (in inches)
None			

**C. AZMET:**

Station Name	Elevation (in feet)	Period of Record	Average Annual Reference Evapotranspiration, 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
None								



**Figure 5.4-3**  
**Upper Hassayampa Basin**  
**Meteorological Stations**  
**and Annual Precipitation**



Precipitation Data Source: Oregon State University, 1998



#### 5.4.4 Surface Water Conditions in the Upper Hassayampa Basin

Streamflow data, including average seasonal flow, average annual flow and other information is shown in Table 5.4-2. Flood ALERT equipment in the basin is shown in Table 5.4-3. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 5.4-4. The location of streamflow gages identified by USGS number, flood ALERT equipment and USGS runoff contours are shown on Figure 5.4-4. Descriptions of stream, reservoir and stockpond data sources and methods are found in Volume 1, Appendix A.

##### Streamflow Data

- Refer to Table 5.4-2.
- Data from three stations located at the Hassayampa River are shown in the table and on Figure 5.4-4. All of the stations have been discontinued.
- The average seasonal flow at most stations is highest in the winter (January-March) and the average seasonal flow is lowest at all stations in the fall (October-December).
- The highest annual flow recorded in the basin is 123,076 acre-feet in 1980 at the Hassayampa River at Box Damsite near Wickenburg station. The minimum annual flow was 731 acre-feet in 1981 at the Hassayampa River at Walnut Grove near Wagoneer station.

##### Flood ALERT Equipment

- Refer to Table 5.4-3.
- As of October 2005 there were 34 stations in the basin.

##### Reservoirs and Stockponds

- Refer to Table 5.4-4.
- The basin does not contain any large reservoirs.
- Surface water is stored or could be stored in seven small reservoirs.
- There are 266 registered stockponds in this basin.

##### Runoff Contour

- Refer to Figure 5.4-4.
- Average annual runoff is 0.5 inches per year, or 26.5 acre-feet per square mile, in most of the basin with one inch of runoff, or 53.3 acre-feet per square mile, in a small area along the west central basin boundary. There is a small portion on the southwest tip of the basin where the average annual runoff is 0.2 inches per year, or 10.66 acre-feet per square mile.

**Table 5.4-2 Streamflow Data for the Upper Hassayampa Basin**

Station Number	USGS Station Name	Drainage Area (in mi <sup>2</sup> )	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	
9514500	Hassayampa River near Wagoner	79	3,742	1/1940-9/1946 (discontinued)	41	41	9	8	1,499 (1940)	3,015	6,552	23,022 (1941)	6
9515000	Hassayampa River at Walnut Grove near Wagoner	107	NA	11/1912-10/1983 (discontinued)	55	23	14	9	731 (1981)	2,907	3,989	9,412 (1982)	4
9515500	Hassayampa River at Box Damsite near Wickenburg	417	2,236	1/1938-9/1982 (discontinued)	59	15	14	11	883 (1962)	7,457	17,585	123,076 (1980)	35

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 = Not available

**Table 5.4-3 Flood ALERT Equipment in the Upper Hassayampa Basin**

Station ID	Station Name	Station Type	Install Date	Responsibility
320	Saw Mountain	Precipitation	11/8/90	Yavapai County FCD
358	Mt. Union Repeater	Repeater/Weather Station	4/28/92	Maricopa County FCD
5225	Hassayampa River @ US 60	Precipitation/Stage	3/14/94	Maricopa County FCD
5230	Sunset FRS	Precipitation/Stage	5/11/89	Maricopa County FCD
5245	Sunnycove FRS	Precipitation/Stage	7/1/86	Maricopa County FCD
5260	Vulture Mine Road	Precipitation	10/14/81	Maricopa County FCD
5275	Sols Wash @ SR 71	Precipitation/Stage	9/24/81	Maricopa County FCD
5290	Yarnell Hill	Repeater/Precipitation	7/13/81	Maricopa County FCD
5305	Hassayampa River @ Box Canyon	Precipitation/Stage	11/17/83	Maricopa County FCD
5320	O'Brien Gulch	Precipitation	9/1/81	Maricopa County FCD
5340	Towers Mountain Repeater	Repeater/Precipitation	5/1/92	Maricopa County FCD
5350	Hassayampa River @ Wagoner Rd.	Precipitation/Stage	12/19/83	Maricopa County FCD
7000	Stanton	Precipitation	6/16/94	Maricopa County FCD
7005	Mid-Martinez Creek	Precipitation	4/27/95	Maricopa County FCD
7010	Martinez Creek	Precipitation/Stage	11/23/94	Maricopa County FCD
7020	Congress	Precipitation	6/16/94	Maricopa County FCD
7025	Sols Tributary @ US 93	Precipitation/Stage	5/2/05	Maricopa County FCD
7030	Sols Tank	Precipitation	7/25/95	Maricopa County FCD
7035	Black Hill	Precipitation	6/15/95	Maricopa County FCD
7040	Sols Wash near Matthie	Precipitation/Stage	8/4/95	Maricopa County FCD
7050	Black Mountain	Precipitation	7/6/94	Maricopa County FCD
7060	Hartman Wash	Precipitation/Stage	7/6/94	Maricopa County FCD
7070	Flying E Tank	Precipitation	5/9/95	Maricopa County FCD
7080	Flying E Wash	Precipitation/Stage	7/12/94	Maricopa County FCD
7090	Casandro Wash	Precipitation/Stage	7/12/94	Maricopa County FCD
7100	Constellation Road	Precipitation	8/3/94	Maricopa County FCD
7110	Powder House Wash	Precipitation/Stage	5/18/95	Maricopa County FCD
7120	Wickenburg Airport	Weather Station	8/3/94	Maricopa County FCD
7130	Casandro Dam	Precipitation/Stage	3/26/91	Maricopa County FCD
7135	Centennial Divide	Precipitation	8/21/01	Maricopa County FCD
7155	Burton Tank	Precipitation	3/19/02	Maricopa County FCD
7160	Bucks Well	Precipitation	12/11/02	Maricopa County FCD
7165	Antelope Creek	Precipitation/Stage	7/9/03	Maricopa County FCD
7170	Upper Martinez Creek	Precipitation	2/26/02	Maricopa County FCD

Source: ADWR 2005b

**Notes:**

FCD = Flood Control District  
FRS = Flood Retarding Structure

**Table 5.4-4 Reservoirs and Stockponds in the Upper Hassayampa 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: 7

Total maximum storage: 1,684 acre-feet

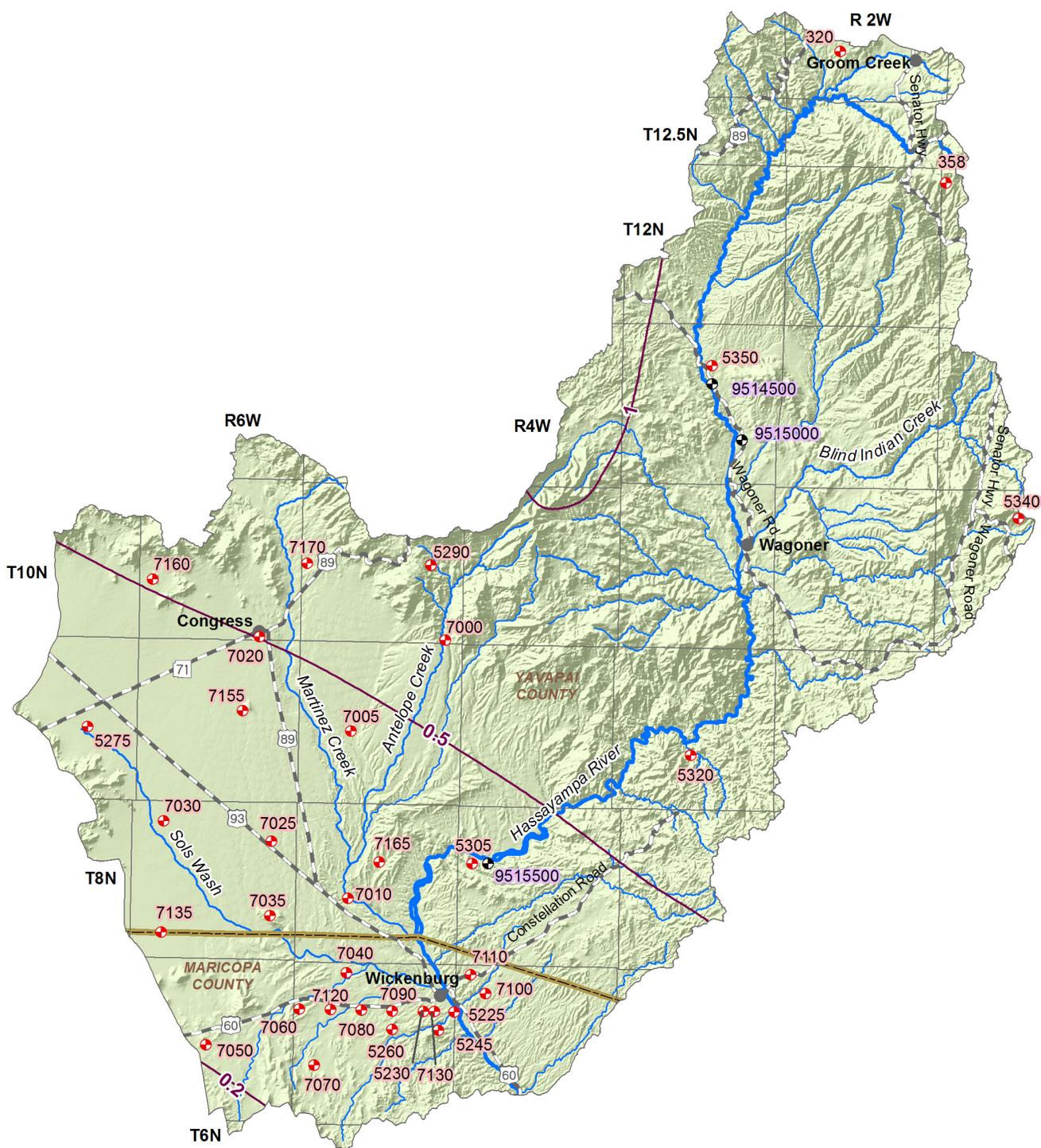
**D. Other Small Reservoirs (between 5 and 50 acres surface area)**

Total number: 0

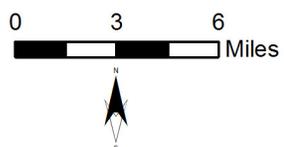
Total surface area: 0 acres

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

Total number: 266 (from water right filings)



Stream Data Source: ALRIS, 2005b



- USGS Annual Runoff Contour for 1951-1980 (in inches) 0.2
- Stream Channel (width of line reflects stream order) [blue line symbol]
- USGS Gage & Station ID 9999999
- Flood ALERT Equip. & Station ID 9999
- COUNTY [yellow and brown symbols]
- Major Road [dashed line symbol]
- City, Town or Place [black dot symbol]

**Figure 5.4-4**  
**Upper Hassayampa Basin**  
**Surface Water Conditions**

### 5.4.5 Perennial/Intermittent Streams and Major Springs in the Upper Hassayampa Basin

There are no data on major or minor springs in this basin (Table 5.4-5). The locations of perennial and intermittent streams are shown on Figure 5.4-5. Descriptions of data sources and methods for intermittent and perennial reaches and springs are found in Volume 1, Appendix A.

- Perennial reaches in this basin include portions of the Hassayampa River, Ash Creek, Weaver Creek, Minnehaha Creek and Antelope Creek.
- Intermittent streams are located predominantly in the northern portion of the basin.
- All perennial streams are intermittent for most of their length.
- The total number of springs with discharges of less than one gpm identified by the USGS ranges from 164 to 166, depending on the database reference.

**Table 5.4-5 Springs in the Upper Hassayampa Basin**

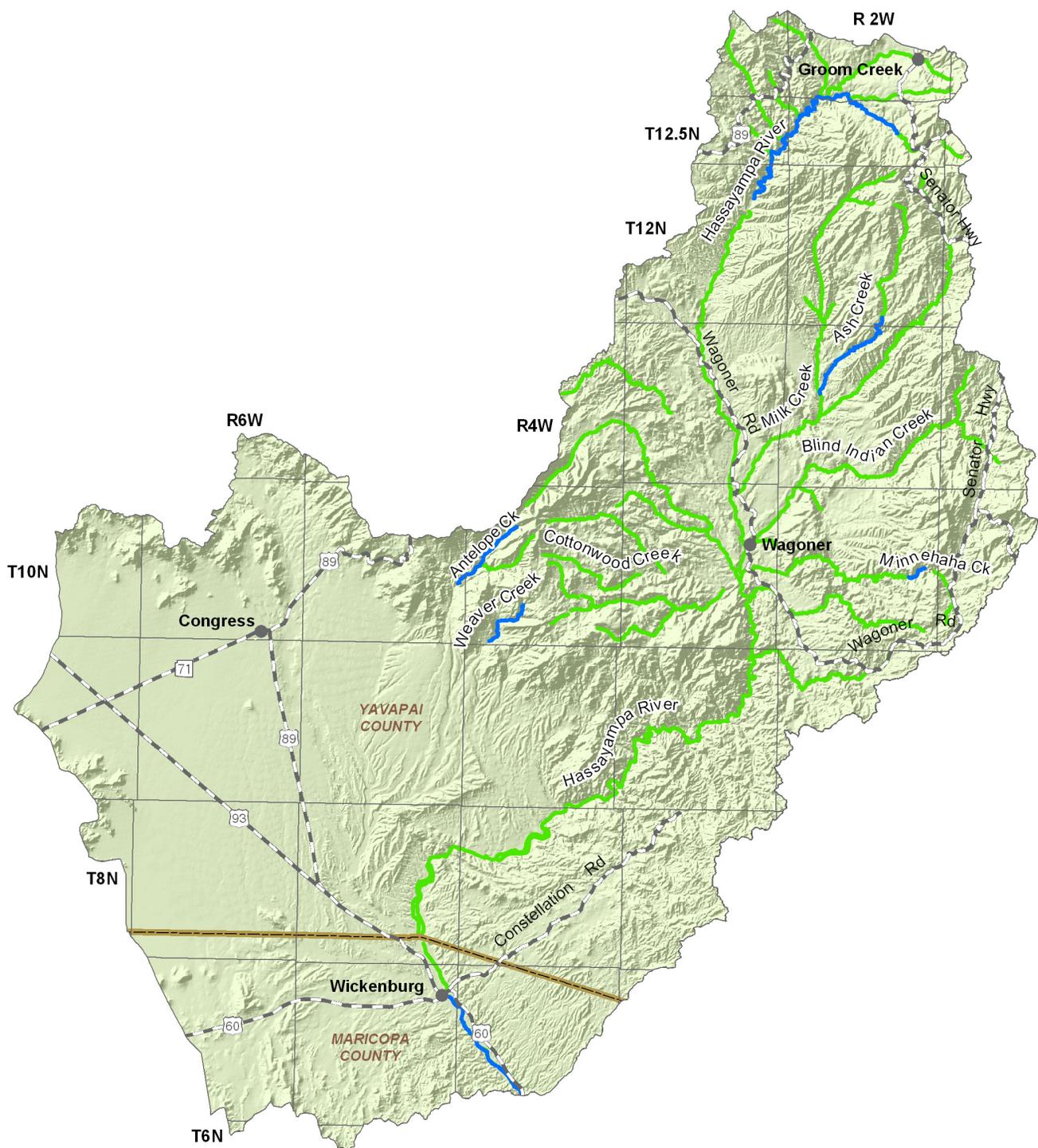
**A. Major Springs (10 gpm or greater):**

Map Key	Name	Location		Discharge (in gpm)	Date Discharge Measured
		Latitude	Longitude		
None identified by ADWR at this time					

**B. Minor Springs (1 to 10 gpm):**

Name	Location		Discharge (in gpm)	Date Discharge Measured
	Latitude	Longitude		
None identified by ADWR at this time				

**C. Total number of springs, regardless of discharge, identified by USGS  
(see ALRIS, 2005a and USGS, 2006a): 164 to 166**



Stream Data Source: AGFD, 1993 & 1997



**Figure 5.4-5**  
**Upper Hassayampa Basin**  
**Perennial/Intermittent Streams**  
**and Major (>10 gpm) Springs**

- Intermittent Streams
- Perennial Streams
- COUNTY
- Major Road
- City, Town or Place

### 5.4.6 Groundwater Conditions of the Upper Hassayampa 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 5.4-6. Figure 5.4-6 shows aquifer flow direction and water-level change between 1990-1991 and 2003-2004. Figure 5.4-7 contains hydrographs for selected wells shown on Figure 5.4-6. Figure 5.4-8 shows well yields in four 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 5.4-6 and Figure 5.4-6.
- The major aquifer in the basin is basin fill.
- Flow direction is generally from the north to the south.

#### Well Yields

- Refer to Table 5.4-6 and Figure 5.4-8.
- As shown on Figure 5.4-8 well yields in this basin range from less than 100 gallons per minute (gpm) to 2,000 gpm.
- One source of well yield information, based on 61 reported wells, indicates that the median well yield in this basin is 125 gpm.

#### Natural Recharge

- Refer to Table 5.4-6.
- The natural recharge estimates for this basin is 8,000 acre-feet per year (AFA).

#### Water in Storage

- Refer to Table 5.4-6.
- Storage estimates for this basin range from 1.0 million acre-feet (maf) to 1.1 maf to a depth of 1,200 feet.

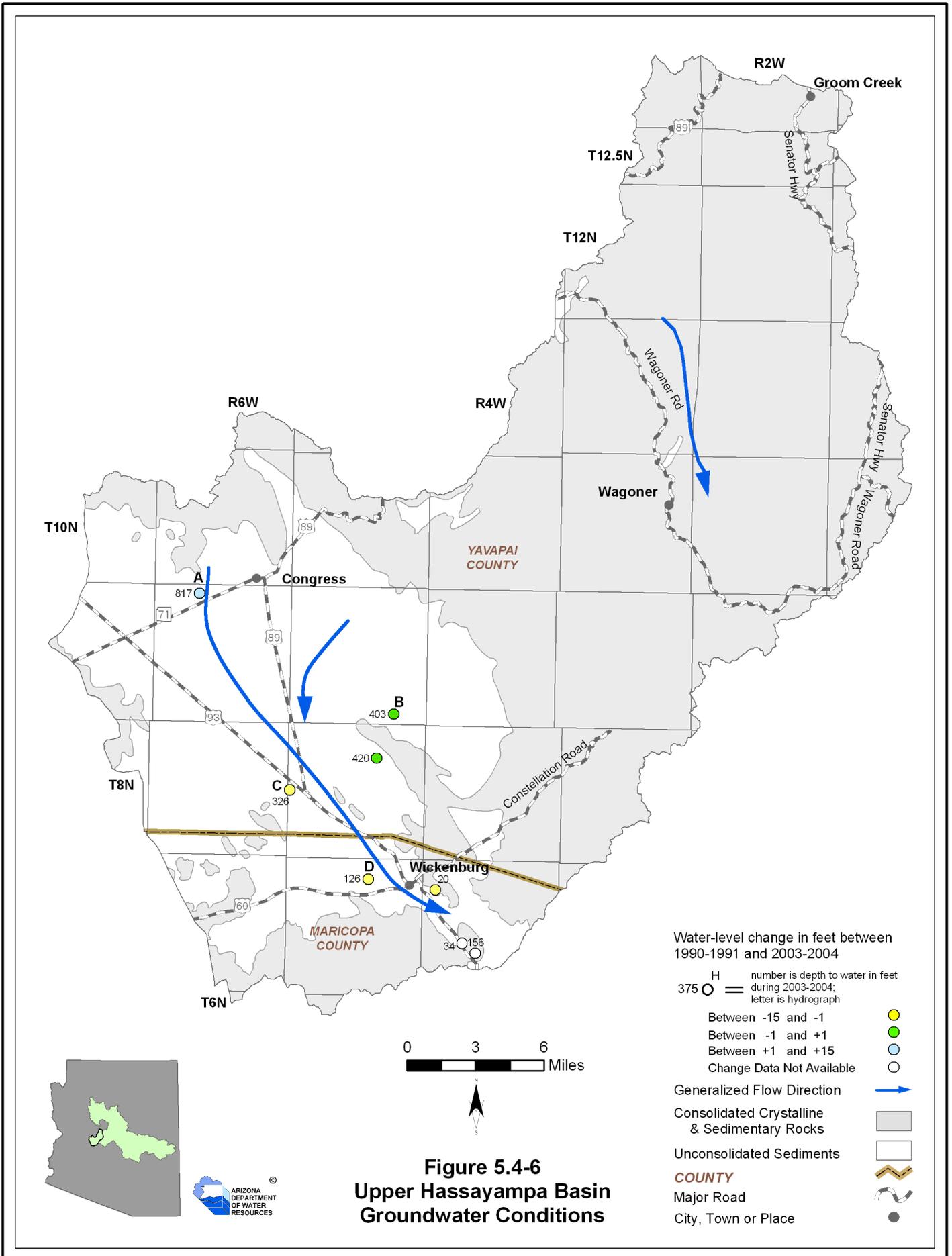
#### Water Level

- Refer to Figure 5.4-6. Water levels are shown for wells measured in 2003-2004.
- The Department annually measures five index wells in this basin. Hydrographs for three index wells (B-D) and one other well are shown in Figure 5.4-7.
- There is one ADWR automated groundwater level monitoring device located near Congress.
- These data show the deepest recorded water level is 817 feet west of Congress and the shallowest is 20 feet in the vicinity of Wickenburg.

**Table 5.4-6 Groundwater Data for the Upper Hassayampa Basin**

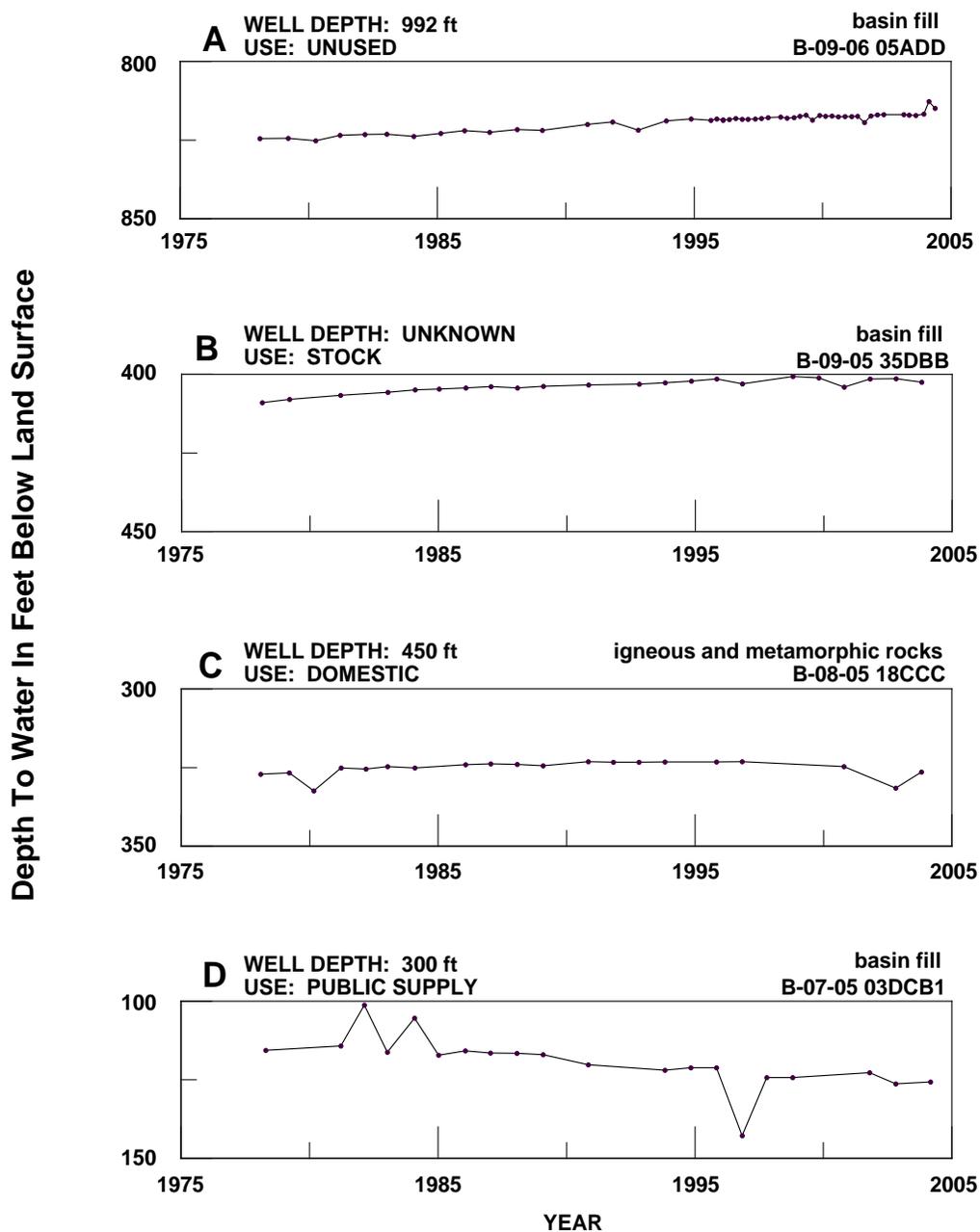
<b>Basin Area, in square miles:</b>	787	
<b>Major Aquifer(s):</b>	<b>Name and/or Geologic Units</b>	
	Basin Fill	
<b>Well Yields, in gal/min:</b>	Range 1-1,324 Median 125 (61 wells reported)	Reported on registration forms for large (>10-inch) diameter wells (Wells55)
	Range 100-500	ADWR (1990)
	Range 0-500	Anning and Duet (1994)
<b>Estimated Natural Recharge, in acre-feet/year:</b>	8,000	Freethy and Anderson (1986)
<b>Estimated Water Currently in Storage, in acre-feet:</b>	1,100,000 (to 1,200 feet)	ADWR (1994b)
	1,000,000 <sup>1</sup> (to 1,200 feet)	Freethy and Anderson (1986)
<b>Current Number of Index Wells:</b>	5	
<b>Date of Last Water-level Sweep:</b>	2004 (101 wells measured)	

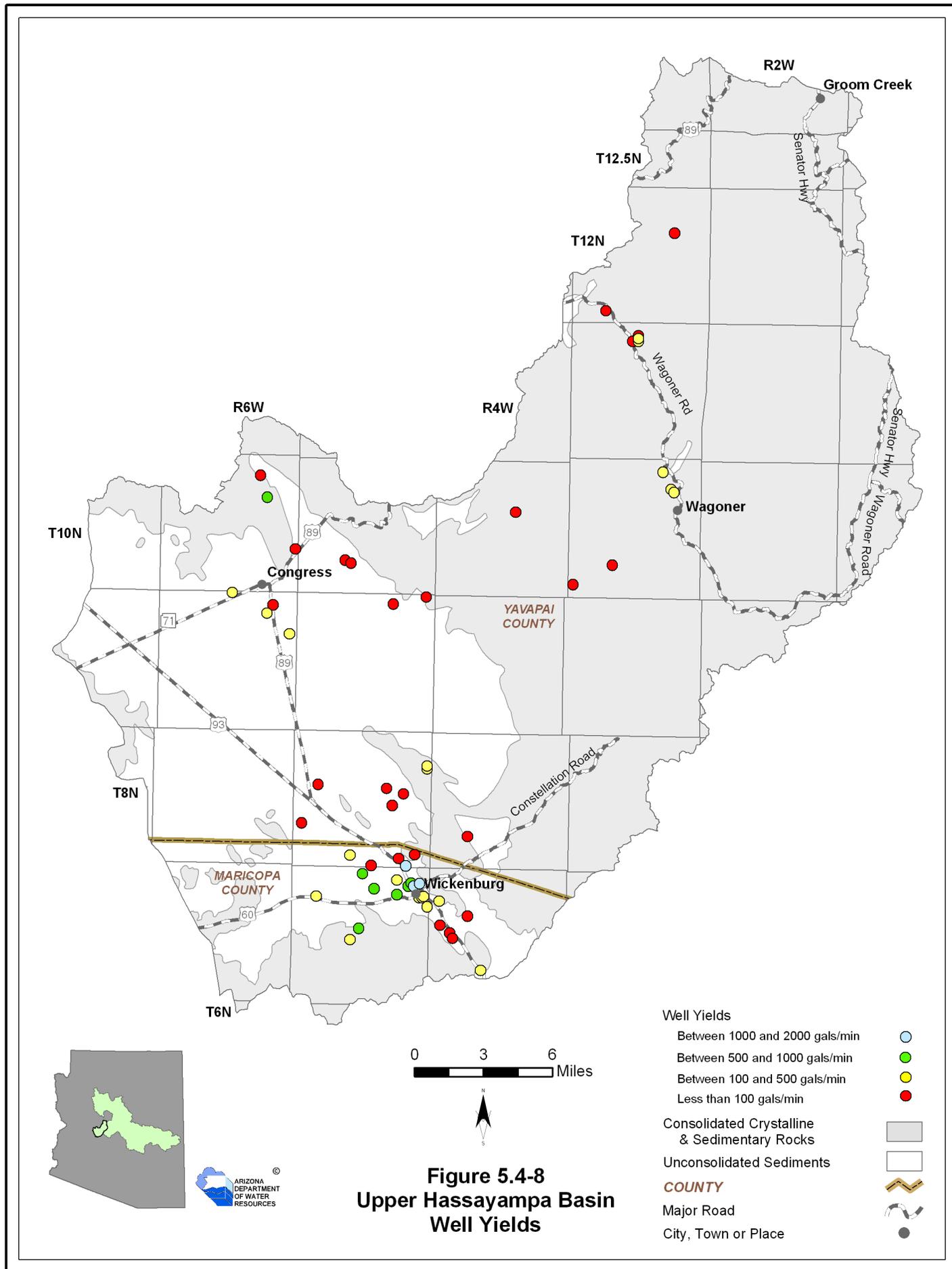
<sup>1</sup> Predevelopment Estimate



**Figure 5.4-6**  
**Upper Hassayampa Basin**  
**Groundwater Conditions**

**Figure 5.4-7**  
**Upper Hassayampa Basin**  
**Hydrographs Showing Depth to Water in Selected Wells**





### 5.4.7 Water Quality of the Upper Hassayampa 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 5.4-7A. 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 5.4-7B. Figure 5.4-9 shows the location of water quality occurrences keyed to Table 5.4-7. A description of water quality data sources and methods is found in Volume 1, Appendix A. Not all parameters were measured at all sites; selective sampling for particular constituents is common.

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

- Refer to Table 5.4-7A.
- Forty-five sites have parameter concentrations that have equaled or exceeded drinking water standards. The majority of the sites are in the vicinity of Wickenburg.
- The most commonly equaled or exceeded standard was arsenic. Other standards equaled or exceeded include cadmium, lead, radionuclides, barium, beryllium, nitrate, copper and mercury.

#### **Lakes and Streams with impaired waters**

- Refer to Table 5.4-7B.
- Water quality standards were exceeded in four stream reaches on three streams in the basin.
- All reaches exceeded standards for copper and zinc. Other standards exceeded were cadmium and pH.
- The French Gulch and Hassayampa River impaired reaches are part of the ADEQ water quality improvement effort called the Total Maximum Daily Load (TMDL) program. The final reports have been completed for these reaches.
- Impaired reaches on Cash Mine Creek are not part of the TMDL program at this time.

**Table 5.4-7 Water Quality Exceedences in the Upper Hassayampa Basin<sup>1</sup>**

**A. Wells, Springs and Mines**

Map Key	Site Type	Site Location			Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS) <sup>2</sup>
		Township	Range	Section	
1	Well	13 North	2 West	26	Cd
2	Well	13 North	2 West	26	Pb
3	Well	12.5 North	3 West	35	Rad
4	Well	11 North	4 West	12	Cd
5	Spring	10 North	1 West	21	As
6	Well	10 North	3 West	14	NO3
7	Well	10 North	5 West	28	NO3, Rad
8	Well	10 North	6 West	25	NO3
9	Well	10 North	7 West	23	Rad
10	Well	9 North	5 West	1	As
11	Well	8 North	3 West	30	Rad
12	Well	8 North	4 West	27	NO3
13	Well	8 North	4 West	27	As
14	Well	8 North	5 West	16	NO3
15	Well	8 North	5 West	17	NO3
16	Well	7 North	4 West	18	NO3
17	Well	7 North	4 West	18	NO3
18	Well	7 North	5 West	1	As, Ba, Be, Cd, Cu, Pb
19	Well	7 North	5 West	1	As, Ba, Be, Cu, Pb
20	Well	7 North	5 West	1	As, Ba, Be, Pb
21	Well	7 North	5 West	1	As, Ba, Be, Pb, Hg
22	Well	7 North	5 West	1	As, Ba, Be, Cd, Pb
23	Well	7 North	5 West	1	As, Ba, Be, Cu
24	Well	7 North	5 West	1	As, Be, Pb
25	Well	7 North	5 West	1	As, Ba, Be, Pb
26	Well	7 North	5 West	1	As, Ba, Be, Cu, Pb
27	Well	7 North	5 West	1	As, Pb
28	Well	7 North	5 West	1	As, Pb
29	Well	7 North	5 West	1	Ba, Be
30	Well	7 North	5 West	1	As, Pb
31	Well	7 North	5 West	1	As, Pb
32	Well	7 North	5 West	1	As, Ba, Be, Cu, Pb
33	Well	7 North	5 West	1	As, Pb
34	Well	7 North	5 West	1	As, Ba, Be, Cd, Cu, Pb
35	Well	7 North	5 West	1	As, Ba, Be, Cu, Pb
36	Well	7 North	5 West	1	As, Ba, Be, Pb
37	Well	7 North	5 West	1	As, Ba, Pb
38	Well	7 North	5 West	1	Pb
39	Well	7 North	5 West	1	As, Ba, Be, Pb
40	Well	7 North	5 West	1	As, Cd, Pb, Hg
41	Well	7 North	5 West	2	As, Pb
42	Well	7 North	5 West	2	Pb
43	Well	7 North	5 West	12	As, Ba, Be, Pb
44	Well	7 North	5 West	12	As, Ba, Be, Pb
45	Well	7 North	5 West	12	As, Ba, Be, Pb

Source: Compilation of databases from ADWR & others

**Table 5.4-7 Water Quality Exceedences in the Upper Hassayampa Basin (Cont)<sup>1</sup>**

**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 <sup>3</sup>	Parameter(s) Exceeding Use Standard <sup>2</sup>
a	Stream	Cash Mine Creek (headwaters to Hassayampa River)	1	NA	A&W, FBC	Cu, Zn
b	Stream	Cash Mine Creek (unnamed tributary to headwaters of Cash Mine Creek)	1	NA	A&W	Cd, Cu, Zn
c	Stream	French Gulch (headwaters to Hassayampa River)	10	NA	A&W	Cd, Cu, Zn
d	Stream	Hassayampa River (headwaters to Copper Creek)	11	NA	A&W, FC, FBC, AgL, AgI	Cd, Cu, pH, Zn

Source: ADEQ 2005d

**Notes:**

<sup>1</sup> Water quality samples collected between 1993 and 2003.

<sup>2</sup>As = Arsenic

Ba = Barium

Be = Beryllium

Cd = Cadmium

Cu = Copper

Pb = Lead

Hg = Mercury

NO<sub>3</sub> = Nitrate

pH = Measurement of acidity or alkalinity

Rad = One or more of the following radionuclides - Gross Alpha, Gross Beta, Radium, and Uranium

Zn = Zinc

<sup>3</sup>A&W = Aquatic and Wildlife

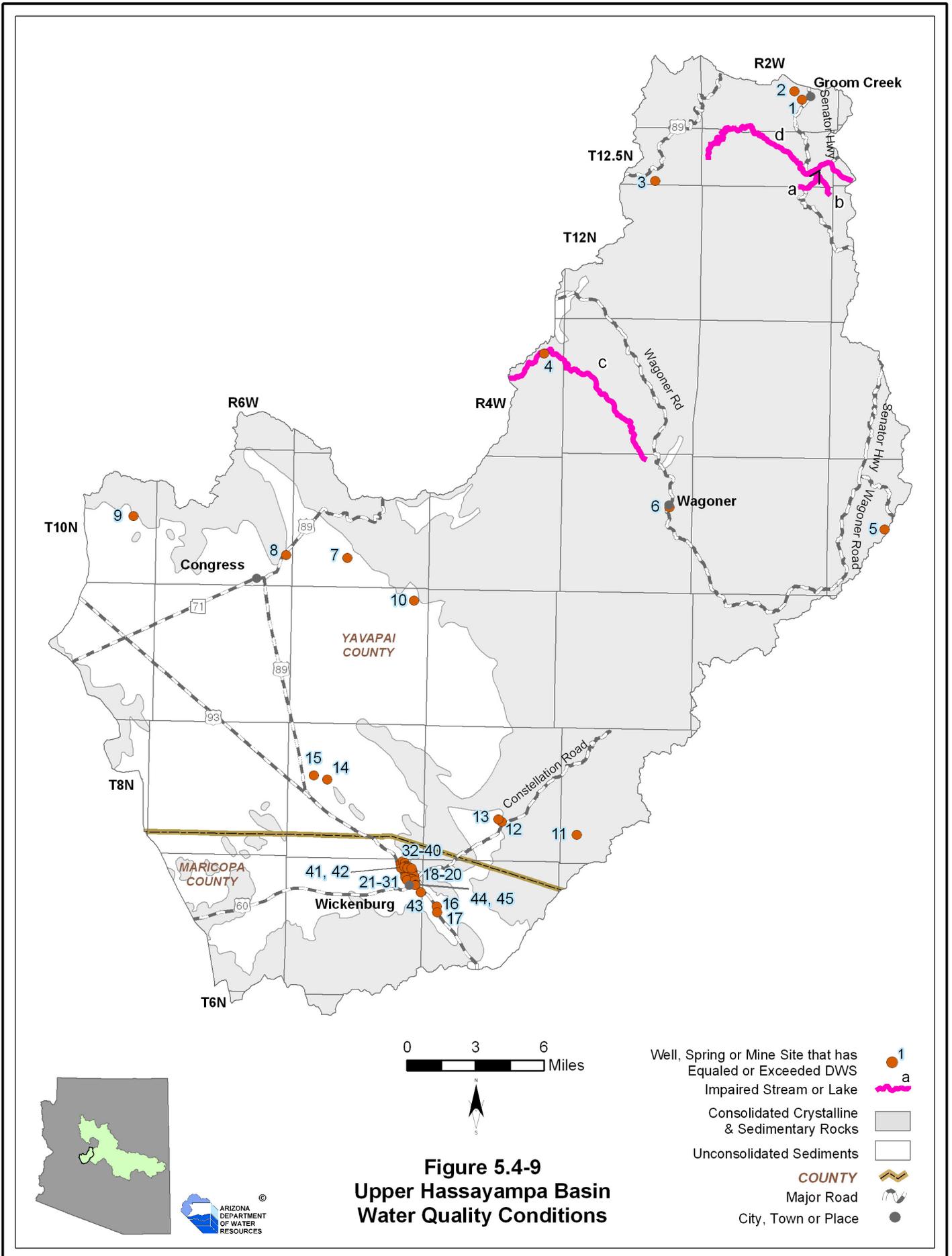
FBC = Full Body Contact

FC = Fish Consumption

AgL = Agricultural - livestock watering

AgI = Agricultural - irrigation

NA = Not applicable



## 5.4.8 Cultural Water Demand in the Upper Hassayampa 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 5.4-8. Effluent generation including facility ownership, location, population served and not served, volume treated, disposal method and treatment level is shown in Table 5.4-9. Figure 5.4-10 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 5.4-8 and Figure 5.4-10.
- Population in this basin has increased from 6,050 in 1980 to 10,479 in 2000.
- There are no recorded surface water diversions in this basin. Total groundwater use has increased in this basin since 1971, with an average of 3,000 AFA during 1971-1975 to an average of about 3,900 AFA in 2001-2005.
- Municipal groundwater use has increased slightly from an average of 2,200 AFA in 1991-1995 to 2,600 AFA in 2001-2005.
- Industrial use of groundwater has remained a constant 800 AFA from 1991-2005, primarily due to dairy use.
- Groundwater use for irrigation located north of Wagoner was less than 1,000 AFA during 1991-2005.
- The only demand centers identified by USGS Gap in the basin are in the vicinity of Wickenburg, north of Congress and near Groom Creek, however low intensity M&I is also found in the vicinity of Congress.
- The basin contains a large, currently inactive copper mine, the Zonia Property, and three small mines or quarries near Wagoner Road. Two small mines or quarries are located north of Congress.
- As of 2005 there were 1,890 registered wells with a pumping capacity of less than or equal to 35 gpm and 312 wells with a pumping capacity of more than 35 gpm.

### Effluent Generation

- Refer to Table 5.4-9.
- There are two treatment facilities in this basin serving over 5,800 people that generate almost 600 acre-feet of effluent per year.
- Information on disposal method is only available for the Wickenburg facility. Effluent at this facility is discharged to unlined impoundments that recharge the aquifer.

Table 5.4-8 Cultural Water Demand in the Upper Hassayampa Basin<sup>1</sup>

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		747 <sup>2</sup>	133 <sup>2</sup>	3,000			NR			ADWR (1994a)			
1972													
1973													
1974													
1975													
1976													
1977													
1978				3,000			NR						
1979													
1980	6,050	171	51	3,000			NR						
1981	6,251												
1982	6,452												
1983	6,653												
1984	6,855												
1985	7,056												
1986	7,257												
1987	7,458			3,000			NR						
1988	7,659												
1989	7,860	232	66	3,000			NR						
1990	8,062												
1991	8,303			190	29	2,200	800	<1,000	NR				
1992	8,545												
1993	8,787												
1994	9,029												
1995	9,270												
1996	9,512												
1997	9,754	2,600				800			<1,000			USGS (2007) ADWR (2008b)	
1998	9,996												
1999	10,237	281	19	2,600			800			<1,000			
2000	10,479												
2001	10,666												
2002	10,853												
2003	11,040												
2004	11,227												
2005	11,414												
2010	12,348			269	14	2,600			800			<1,000	
2020	15,072												
2030	18,362												
<b>WELL TOTALS:</b>		<b>1,890</b>	<b>312</b>										

**Notes:**

NR - Not reported

<sup>1</sup> Does not include effluent or evaporation losses from stockponds and reservoirs.

<sup>2</sup> Includes all wells through 1980.

**Table 5.4-9 Effluent Generation in the Upper Hassayampa 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	Discharged to Another Facility	Infiltration Basins			
Escapes at North Ranch	Private	Congress	378	17	NA							Secondary	NA	2007
Wickenburg WWTP	Wickenburg	Wickenburg	5,500	560							X	Adv. Trt. I & Nutrient Removal	3,837	2004
<b>Totals</b>			<b>5,878</b>	<b>577</b>										

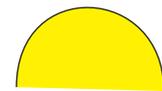
Source: Compilation of databases from ADWR & others

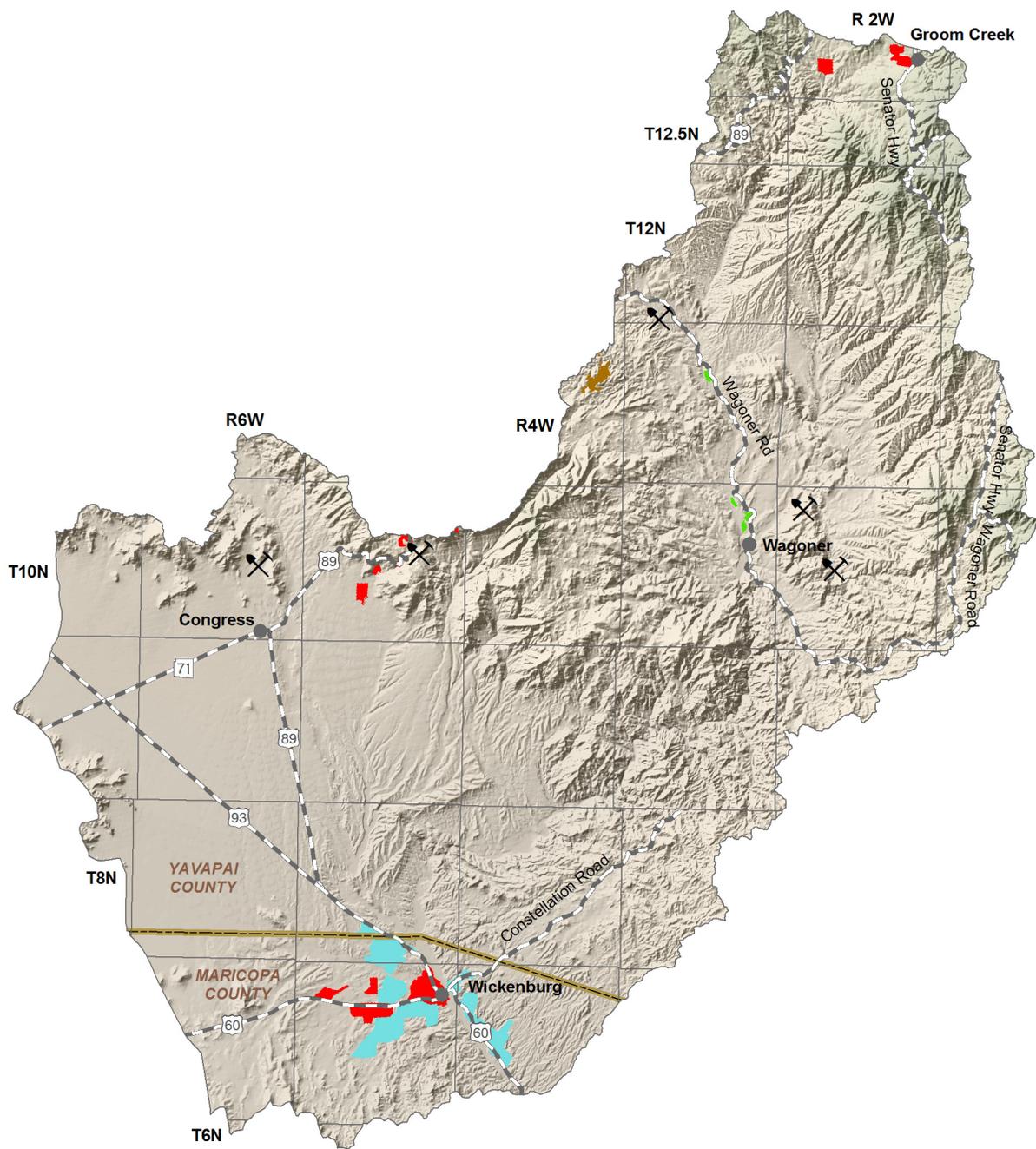
**Notes:**

Year of Record is for the volume of effluent treated/generated

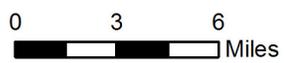
NA: Data not currently available to ADWR

WWTP: Waste Water Treatment Plant





Primary Data Source: USGS National Gap Analysis Program, 2004



**Figure 5.4-10**  
**Upper Hassayampa Basin**  
**Cultural Water Demand**

**Demand Centers**

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

### 5.4.9 Water Adequacy Determinations in the Upper Hassayampa 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 5.4-10A and B for water reports and analysis of adequate water supply. Designated water provider information is shown in Table 5.4-10C with date of application, date the designation was issued and projected or annual estimated demand. Figure 5.4-11 shows the locations of subdivisions and designated providers 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 Yavapai County. Twenty-eight water adequacy determinations for 2,235 lots have been made in this basin through December 2008. One thousand eight hundred and ninety-six lots in 19 subdivisions, or 85% of lots, were determined to be adequate.
- All determinations of inadequacy were because the applicant did not submit the necessary information and/or the available hydrologic data was insufficient to make a determination. Two subdivisions receiving inadequate determinations also had existing supplies that were unreliable or physically unavailable or the groundwater exceeded the depth-to-water criteria.
- One Analysis of Adequate Water Supply application for 2,324 lots has been approved in this basin.
- There are two designated water providers, CDC Wickenburg Water and Town of Wickenburg. The total projected or annual estimated demand for CDC Wickenburg Water is 1,224 acre-feet. The Town of Wickenburg does not have a projected or annual estimated demand.

Table 5.4-10 Adequacy Determinations in the Upper Hassayampa Basin<sup>1</sup>

A. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No. <sup>2</sup>	ADWR Adequacy Determination	Reason(s) for Inadequacy Determination <sup>3</sup>	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section						
1	Antelope Creek	Yavapai	9 North	6 West	13, 24	194	53-401863	Adequate		3/6/2006	Congress Domestic Water Company
2	Berry's-Groom Creek, The	Yavapai	13 North	2 West	26	1	53-500328	Adequate		8/6/1975	Spring
3	Bird's Eye View	Yavapai	8 North	5 West	27	11	53-300086	Adequate		5/1/1996	Dry Lot Subdivision
4	Black Mountain Ranches	Maricopa	7 North	5 West	7	40	53-400862	Inadequate	A1	12/24/2002	Dry Lot Subdivision
5	Brough Subdivision #1	Yavapai	10 North	6 West	35	24	53-500362	Inadequate	A1	5/7/1979	Congress Water Company
6	Chaparral Estates #1	Yavapai	10 North	6 West	35	86	53-500439	Inadequate	A1	5/7/1979	Congress Water Company
7	Congress Ranches	Yavapai	9 North	6 West	3	106	53-700283	Adequate		10/11/2007	Congress Water Company
8	Congress Village	Yavapai	9 North	6 West	3	36	53-500500	Adequate		8/28/1990	Congress Water Company
9	Congress Village #2	Yavapai	9 North	6 West	3	36	53-300110	Adequate		3/7/1996	Congress Water Company
10	Escapees at North Ranch	Yavapai	9 North	6 West	24	436	53-400004	Adequate		2/10/1999	Rainbow Parks
11	Gold Dollar Estates	Yavapai	10 North	6 West	26, 27	21	53-500708	Adequate		10/18/1982	Congress Water Company
12	Groom Creek Pines Plat B	Yavapai	13 North	2 West	26	5	53-500766	Inadequate	A1	6/1/1987	Groom Creek Water Users Association
13	Hacienda Heights	Yavapai	10 North	6 West	35	24	53-500769	Inadequate	A1	5/7/1979	Congress Water Company
14	High Desert One Unit One and Unit Two	Yavapai	9 North	6 West	12, 13, 24	51	53-400656	Adequate		9/24/2002	Congress Domestic Water Improvement District
15	High Desert One, Unit One and Two	Yavapai	9 North	6 West	12, 13	50	53-400434	Adequate		12/14/2000	Dry Lot Subdivision
16	Loma Estates	Yavapai	13 North	2 West	26	47	53-500911	Adequate		12/4/1973	Loma Estate Water Company
17	Millsite Village	Yavapai	13 North	2 West	36	35	53-500976	Inadequate	A1	6/24/1986	Millsite Water Users, Inc.
18	Mira Monte Vistas	Yavapai	9 North	6 West	2	57	53-500985	Adequate		10/29/1990	Congress Water Company
19	Quail Village Unit 1	Yavapai	9 North	6 West	3	25	53-300516	Adequate		9/10/1999	Congress Water Company
20	Rancho de los Caballeros #2	Maricopa	7 North	5 West	21	15	53-501255	Inadequate	A1, A2	10/20/1994	Caballeros Water Company
21	Ranchos de Los Caballeros, #3	Maricopa	7 North	5 West	15, 16, 21	100	53-501282	Inadequate	A1, A2	2/1/1983	Caballeros Water Company
22	S J Claims	Yavapai	12 North	2 West	36	10	53-300404	Inadequate	A1	1/20/1998	Homeowners Association Wells
23	Smoke Tree Ranch #1	Yavapai	11 North	3 West	26	61	53-501420	Adequate		3/6/1989	Dry Lot Subdivision
24	Vista Royale	Yavapai	8 North	6 West	13	138	53-300141	Adequate		6/3/1996	Dry Lot Subdivision
25	Vista Royale Phase 1-B	Yavapai	8 North	6 West	13	61	53-300499	Adequate		9/9/1998	Dry Lot Subdivision
26	Vista Royale Phase II	Yavapai	8 North	6 West	13	61	53-400378	Adequate		8/15/2000	Dry Lot Subdivision
27	Weaver Mountain Estates	Yavapai	10 North	6 West	35	171	53-400493	Adequate		2/26/2001	Congress Water Company
28	Wickenburg Inn, The	Yavapai	8 North	5 West	7, 8, 16, 17, 18, 19, 20, 21	333	53-501682	Adequate		7/1/1986	Yavapai Hills Water Company

**Table 5.4-10 Adequacy Determinations in the Upper Hassayampa Basin<sup>1</sup> (Cont)**

**B. Analysis of Adequate Water Supply**

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No. <sup>2</sup>	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section				
29	Wickenburg Ranch Estates	Yavapai	8 North	5 West	8, 17, 18, 19, 20	2,324	43-402011	5/18/2006	CDC Wickenburg Water LLC.

**C. Designated Adequate Water Supply**

Map Key	Basin	County	Designation No.	Projected or Annual Estimated Demand (af/yr)	Date Application Received	Date Application Issued	Year of Projected or Annual Demand
a	CDC Wickenburg Water, LLC	Yavapai	40-700417	1,224	9/25/2007	2/11/2008	2013
b	Town of Wickenburg	Maricopa	40-900016	No amount designated	NA	5/17/1973	No data, hydrologic study needed

Source: ADWR 2008a

**Notes:**

<sup>1</sup>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.

<sup>2</sup> 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.

<sup>3</sup> A. Physical/Continuous

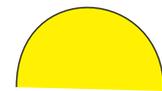
- 1) Insufficient Data (applicant chose not to submit necessary information, and/or available hydrologic data insufficient to make determination)
- 2) Insufficient Supply (existing water supply unreliable or physically unavailable; for groundwater, depth-to-water exceeds criteria)
- 3) Insufficient Infrastructure (distribution system is insufficient to meet demands or applicant proposed water hauling)

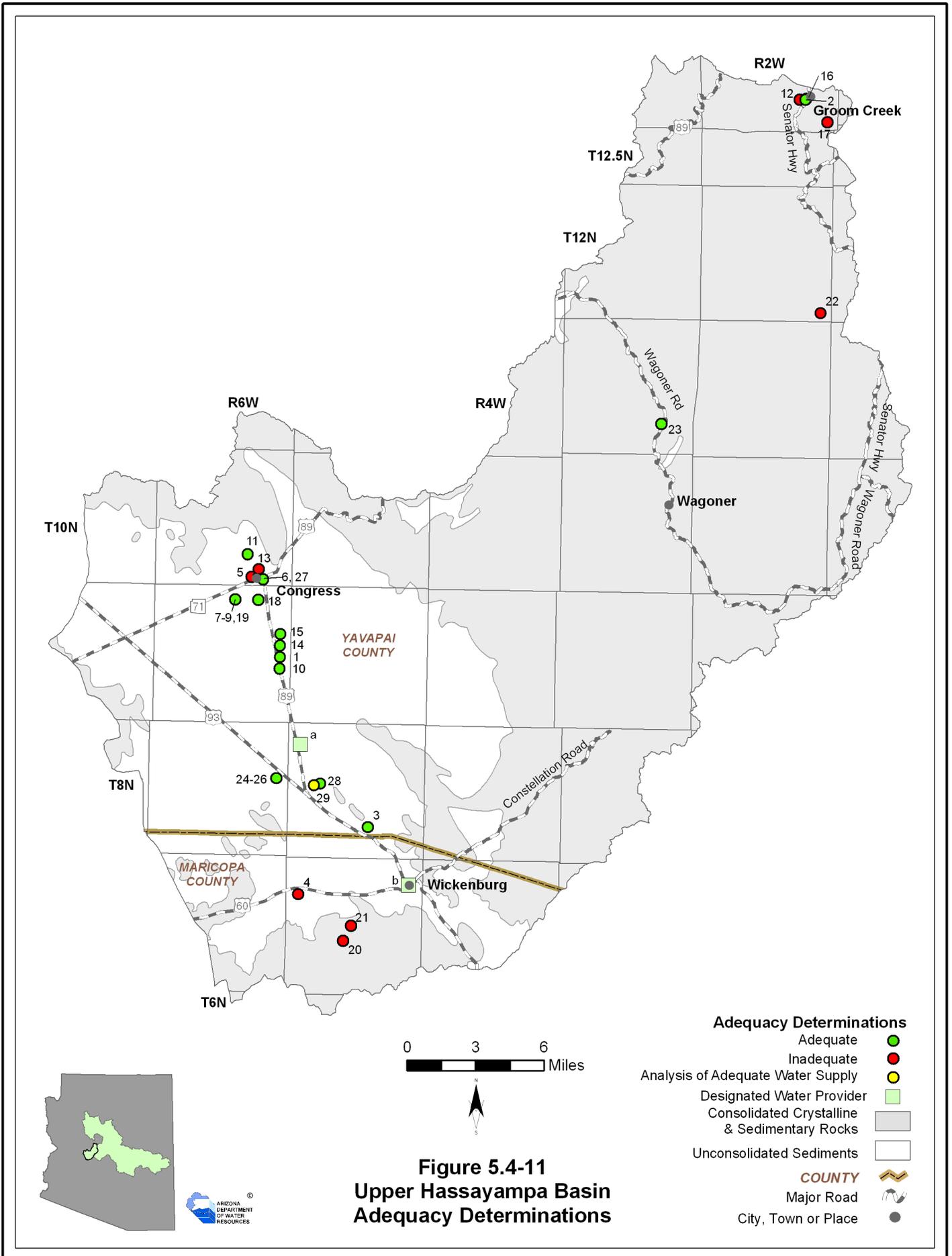
B. Legal (applicant failed to demonstrate a legal right to use the water or failed to demonstrate the provider's legal authority to serve the subdivision)

C. Water Quality

D. Unable to locate records

NA = Not available





# Upper Hassayampa Basin

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