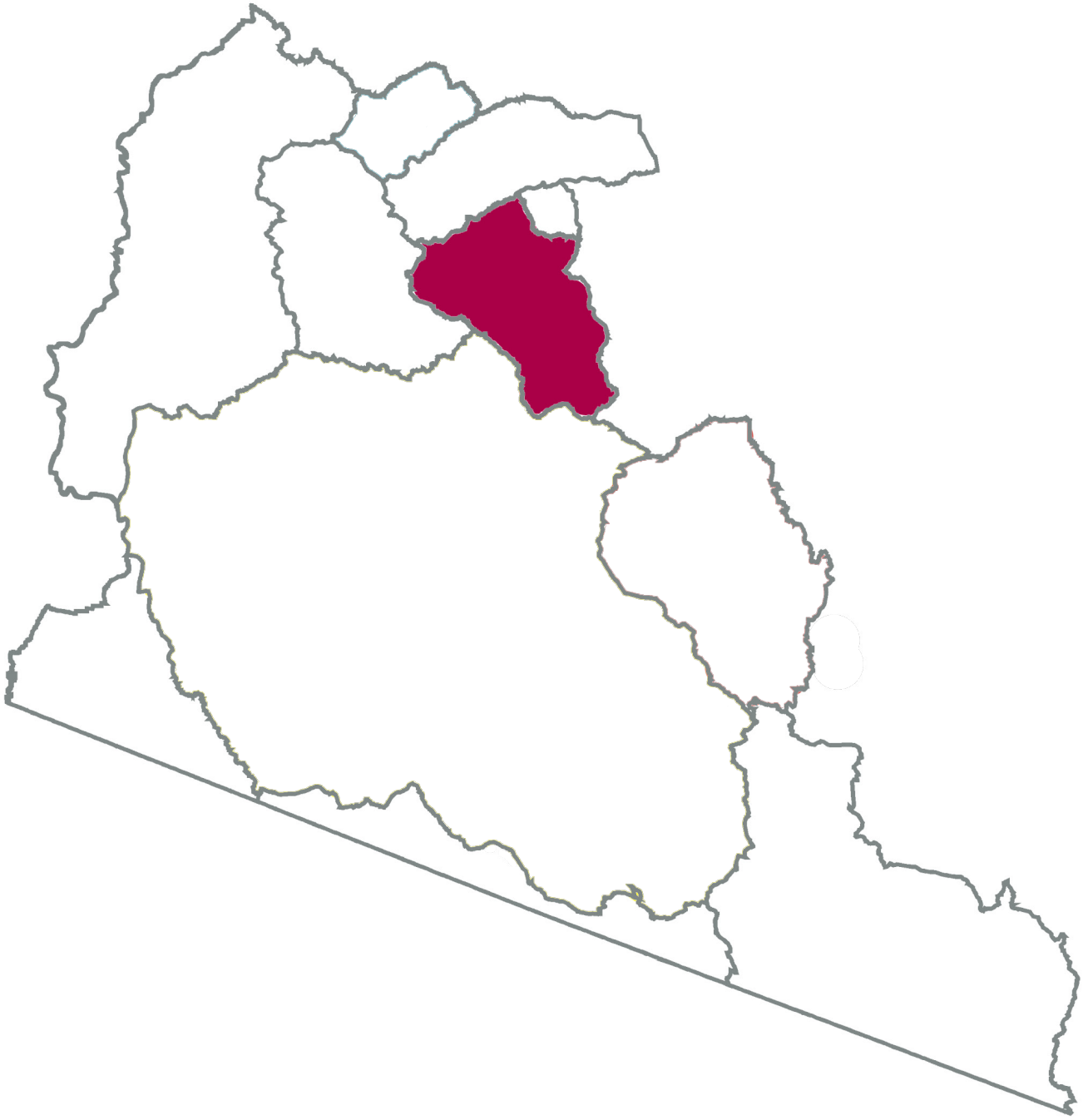
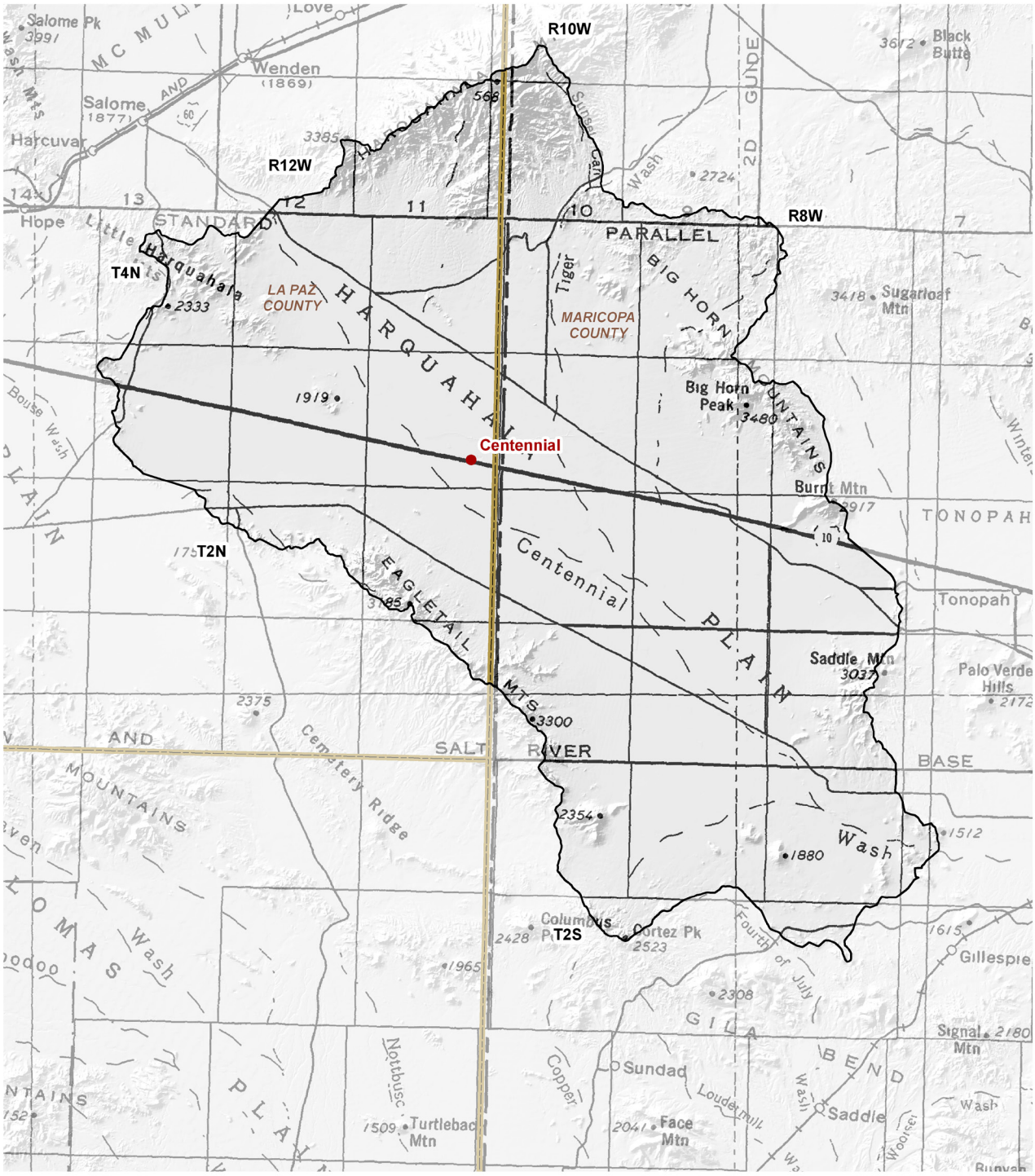
# Section 7.3
# Harquahala Basin



### 7.3.1 Geography of the Harquahala Basin

The Harquahala Basin, located in the northeastern part of the planning area, is 766 square miles in area. Geographic features and principal places are shown on Figure 7.3-1. The basin is characterized by a plain bordered by mountain ranges. Vegetation types include Lower Colorado River Valley and Arizona uplands Sonoran desertscrub and a small amount of interior chaparral on the northern basin boundary. (See Figure 7.0-9)

- Principal geographic features shown on Figure 7.3-1 are:
    - Centennial Wash running through the center of the basin
    - The Harquahala Plain in the center of the basin bordered by the Big Horn Mountains in the east, the Little Harquahala Mountains in the north and the Eagletail Mountains in the west
    - The highest point in the basin, Big Horn Peak, at 3,480 feet in the Big Horn Mountains
    - The lowest point in the basin at 1,000 feet where Centennial Wash exits the basin in T4N R12W.




Base Map: USGS 1:500,000, 1981

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**Figure 7.3-1**
**Harquahala Basin**
**Geographic Features**

COUNTY
City, Town or Place

### 7.3.2 Land Ownership in the Harquahala Basin

Land ownership, including the percentage of ownership by category, for the Harquahala Basin is shown in Figure 7.3-2. The principal feature of land ownership in this basin is the large amount of U.S. Bureau of Land Management 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 7.0.4. Land ownership categories are discussed below in the order of largest to smallest percentage in the basin.

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

- 62.2% of the land is federally owned and managed by the Lower Sonoran Field Office of the Bureau of Land Management.
- This basin contains 52,800 acres of wilderness. This includes 24,000 acres of the 100,000 acre Eagletail Mountains Wilderness, 18,000 acres of the 21,000 acre Big Horn Mountains Wilderness, 5,500 acres of the 31,000 acre Hummingbird Springs Wilderness and 5,300 acres of the 23,000 acre Harquahala Mountains Wilderness. (see Figure 7.0-11)
- Land uses include resource conservation, recreation and grazing.

**Private**

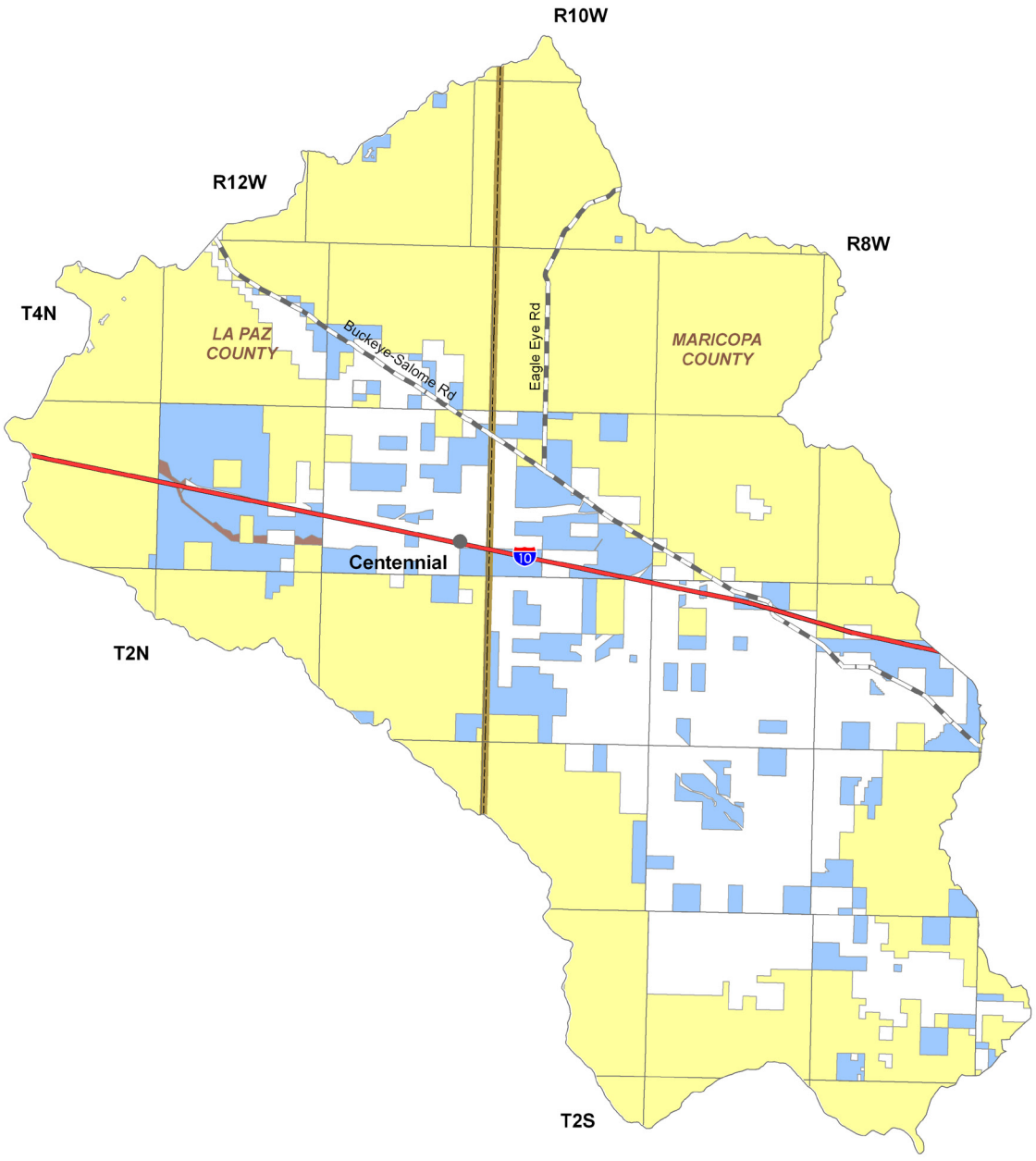
- 25.1% of the land is private.
- Land uses include domestic, commercial and grazing.

**State Trust Land**

- 12.6% of the land is held in trust for the public schools, the Pioneer Home and both the Dept of Corrections and Juvenile Corrections and county bonds under the State Trust Land system.
- Primary land use is grazing.

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

- 0.1% of the land is federally owned by the U.S. Bureau of Reclamation (USBOR)
- USBOR lands are located in the western portion of the basin in the vicinity of Interstate 10 where they surround the Central Arizona Project aqueduct.




Source: ALRIS, 2004

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0 3 6 Miles

N

S

**Land Ownership (Percentage in Basin)**

- U.S. Bureau of Land Management (62.2%)
- Private (25.1%)
- State Trust (12.6%)
- Other (0.1%)
- COUNTY
- Interstate Highway
- Major Road
- City, Town or Place

**Figure 7.3-2**
**Harquahala Basin**
**Land Ownership**

### 7.3.3 Climate of the Harquahala Basin

Climate data from NOAA/NWS Co-op Network and AZMET stations are complied in Table 7.3-1 and the locations are shown on Figure 7.3-3. Figure 7.3-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Harquahala Basin does not contain Evaporation Pan or SNOTEL/ Snowcourse stations. More detailed information on climate in the planning area is found in Section 7.0.3. A description of the climate data sources and methods is found in Volume 1, Appendix A.

**NOAA/NWS Co-op Network**

- Refer to Table 7.3-1A
- Temperatures at the two NOAA/NWS Co-op Network stations in the basin range from a maximum monthly temperature of 91.0°F at Salome 17 SE in July to a minimum monthly temperatuer of 48.0°F at Harquahala Plains in January.
- Average seasonal rainfall follows a bi-modal pattern with approximately one-third of the average seasonal rainfall occurring in the winter (January-March) season and one-third in the summer (July-September) season. The highest average annual rainfall in the basin is 6.36 inches at the Salome 17 SE station.

**AZMET**

- Refer to Table 7.3-1C
- There is one AZMET station in the basin, Harquahala. This station is at 1,150 feet and has an annual reference evaportranspiration rate of 82.13 inches.

**SCAS Precipitation Data**

- See Figure 7.3-3
- Additional precipitation data shows average annual rainfall as high as 18 inches in the Harquahala Mountains at the northern tip of the basin and as low as four inches in the southern and western portions of the basin.

## Table 7.3-1 Climate Data for the Harquahala Basin

### A. NOAA/NWS Co-op Network:

| Station Name | Elevation (in feet) | Period of Record Used for Averages | Average Temperature Range (in F) | | Average Precipitation (in inches) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Max/Month | Min/Month | Winter | Spring | Summer | Fall | Annual |
| Harquahala Plains | 1220 | 1952 - 1979[1] | 89.5/Jul | 48.0/Jan | 2.03 | 0.31 | 2.10 | 1.71 | 6.14 |
| Salome 17 SE | 1600 | 1987 - 1998[1] | 91.0/Jul | 49.1/Dec | 2.49 | 0.43 | 2.06 | 1.38 | 6.36 |

Source: WRCC, 2005

**Notes:**
[1]Average temperature data for period of record shown; precipitation data 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*) |
|---|---|---|---|
| Harquahala | 1,150 | 1999 - current | 81.55 *(9)* |

Source: Arizona Meteorological Network, 2007

### 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 7.3-3**
**Harquahala Basin**
**Meteorological Stations**
**and Annual Precipitation**

**Precipitation Data Source: Oregon State University, 1998**

### 7.3.4 Surface Water Conditions in the Harquahala Basin

Flood ALERT equipment in the basin is shown in Table 7.3-2. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 7.3-3. The location of flood ALERT equipment and large reservoirs are shown on Figure 7.3-4. There are no USGS streamflow gages or runoff contour data available for this basin. Descriptions of stream, reservoir and stockpond data sources and methods are found in Volume 1, Appendix A.

**Flood ALERT Equipment**

- Refer to Table 7.3-2.
- As of October 2005 there were 10 stations in this basin.

**Reservoirs and Stockponds**

- Refer to Table 7.3-3.
- There are 42 registered stockponds in this basin.

**Table 7.3-2 Flood ALERT Equipment in the Harquahala Basin**

| Station ID | Station Name | Station Type | Install Date | Responsibility |
|---|---|---|---|---|
| 5065 | Eagle Eye Rd. @ CAP | Precipitation | 6/17/2003 | Maricopa County FCD |
| 5080 | Buckeye @ 547th Ave. | Precipitation | 6/13/2000 | Maricopa County FCD |
| 5085 | Baseline @ 547th Ave. | Precipitation | 5/24/2000 | Maricopa County FCD |
| 5110 | Saddleback FRS | Precipitation/Stage | 12/16/1988 | Maricopa County FCD |
| 5120 | Centennial Levee | Precipitation/Stage | 3/7/1994 | Maricopa County FCD |
| 5125 | Harquahala FRS | Precipitation/Stage | 9/15/1993 | Maricopa County FCD |
| 5140 | Tiger Wash Fan | Weather Station | 9/21/1994 | Maricopa County FCD |
| 5150 | Narrows Damsite | Precipitation | 9/1/1994 | Maricopa County FCD |
| 5160 | Tiger Wash | Precipitation/Stage | 9/15/1999 | Maricopa County FCD |
| 5185 | Harquahala Mtn. Repeater | Repeater/Precipitation | 2/11/1994 | Maricopa County FCD |

Source: ADWR 2005a

**Notes:**
FCD = Flood Control District
FRS = Flood Retention Structure

## Table 7.3-3 Reservoirs and Stockponds in the Harquahala 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: 0**
**Total maximum storage: 0 acre-feet**

### D. Other Small Reservoirs (between 5 and 50 acres surface area)[1]

**Total number: 1**
**Total surface area: 17 acres**

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

**Total number: 42**

**Notes:**
[1]Capacity data is not available to ADWR


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Stream Data Source: ALRIS, 2005

0 3 6 Miles

Stream Channel (width of line reflects stream order)
Flood ALERT Equip. & Station ID 9999
COUNTY
Interstate Highway
Major Road
City, Town or Place

**Figure 7.3-4**
**Harquahala Basin**
**Surface Water Conditions**

### 7.3.5 Perennial/Intermittent Streams and Major Springs in the Harquahala Basin

The total number of springs in the basin are shown in Table 7.3-4. There are no perennial or intermittent streams and no major or minor springs in the Harquahala Basin. Descriptions of data sources and methods for intermittent and perennial reaches and springs are found in Volume 1, Appendix A.

- The total number of springs, regardless of discharge, identified by the USGS varies from zero to one, depending on the database reference.

**Table 7.3-4 Springs in the Harquahala 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): 0 to 1**

### 7.3.6 Groundwater Conditions of the Harquahala Basin

Major aquifers, well yields, estimated water in storage, number of index wells and date of last water-level sweep are shown in Table 7.3-5. Figure 7.3-5 shows aquifer flow direction and water-level change between 1990-1991 and 2003-2004. Figure 7.3-6 contains hydrographs for selected wells shown on Figure 7.3-5. Figure 7.3-7 shows well yields in six 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 7.3-5 and Figure 7.3-5.
- The major aquifer in this basin is basin fill.
- Flow direction is generally from northwest to southeast and to a cone of depression in the central portion of the basin.
- As shown on Figure 7.3-5, the water level in the area of the cone of depression has risen by at least one foot and as much as 30+ feet between 1990-1991 and 2003-2004 due to use of Central Arizona Project (CAP) water in place of groundwater and CAP recharge at the Vidler Recharge Facility west of Centennial.

**Well Yields**

- Refer to Table 7.3-5 and Figure 7.3-7
- As shown on Figure 7.3-7, well yields are generally between 1,000 gallons per minute (gpm) to greater than 2,000 gpm.
- One source of well yield information, based on 157 reported wells, indicates that the median well yield is 1,620 gpm.

**Natural Recharge**

- Refer to Table 7.3-5
- Natural recharge estimates range from less than 1,000 acre-feet per year (AFA) to less than 1,200 AFA.
- The largest source of natural recharge is runoff infiltration through the Centennial Wash alluvium (ADWR 1994b).

**Water in Storage**

- Refer to Table 7.3-5
- Storage estimates for this basin range from 13 million acre-feet (maf) to 27 maf to a depth of 1,200 feet.

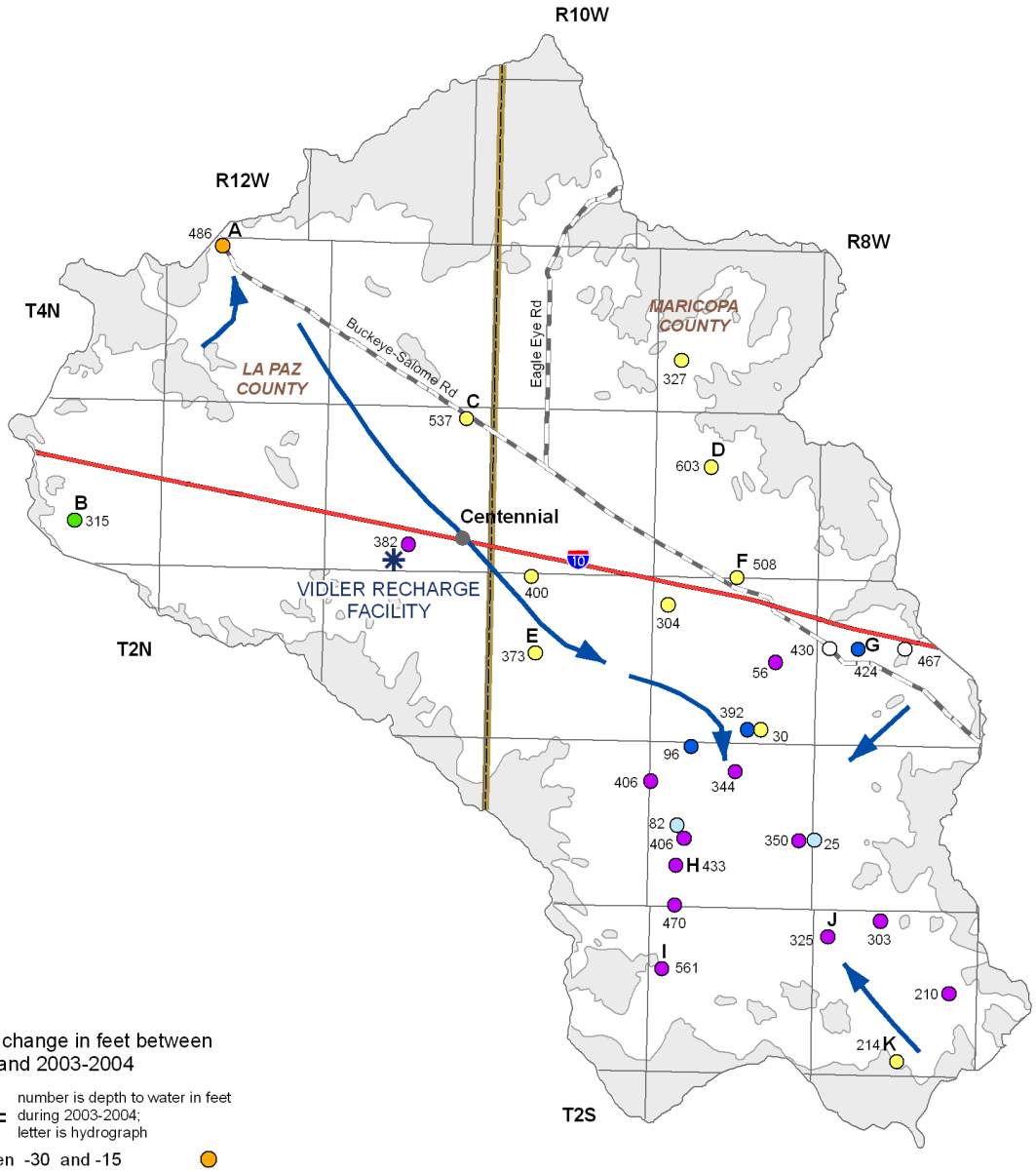
**Water Level**

- Refer to Figure 7.3-5. Water levels are shown for wells measured in 2003-2004.
- The Department annually measures 34 index wells in this basin. Hydrographs for 11 index wells are shown on Figure 7.3-6.
- The deepest water level shown on the map is 561 feet in the southwestern portion of the basin and the shallowest is 25 feet in T1N R8W.

**Table 7.3-5 Groundwater Data for the Harquahala Basin**

| | | |
|---|---|---|
| **Basin Area, in square miles:** | 766 | |
| **Major Aquifer(s):** | **Name and/or Geologic Units** | |
| | Basin Fill | |
| **Well Yields, in gal/min:** | Range 207-3,007<br>Median 1,613.5<br>(84 wells measured) | Measured by ADWR (GWSI) and/or USGS |
| | Range 7-3,500<br>Median 1,620<br>(157 wells reported) | Reported on registration forms for large (>10-inch) diameter wells (Wells55) |
| | Range 300-3,000 | ADWR (1990 and 1994b) |
| | Range 0-2,500 | Anning and Duet (1994) |
| **Estimated Natural Recharge, in acre-feet/year:** | <1,200[1] | Anderson and Freethey (1995) |
| | 1,000 | Freethey and Anderson (1986) |
| | <1,000[1] | Arizona Water Commission (1975) |
| **Estimated Water Currently in Storage, in acre-feet:** | 15,500,000 (to 1,200 ft) | ADWR (1994b) |
| | 13,000,000[2] (to 1,200 ft) | Freethey and Anderson (1986) |
| | 27,000,000 (to 1,200 ft) | Arizona Water Commission (1975) |
| **Current Number of Index Wells:** | 34 | |
| **Date of Last Water-level Sweep:** | 2004 (115 wells measured) | |

[1]Includes Tiger Wash Basin
[2]Predevelopment Estimate




Water-level change in feet between 1990-1991 and 2003-2004

375 H = number is depth to water in feet during 2003-2004; letter is hydrograph

- Between -30 and -15
- Between -15 and -1
- Between -1 and +1
- Between +1 and +15
- Between +15 and +30
- Greater than +30
- Change Data Not Available
- Permitted Recharge Facility
- Generalized Flow Direction
- Consolidated Crystalline & Sedimentary Rocks
- Unconsolidated Sediments
- COUNTY
- Interstate Highway
- Major Road
- City, Town or Place

0 3 6 Miles

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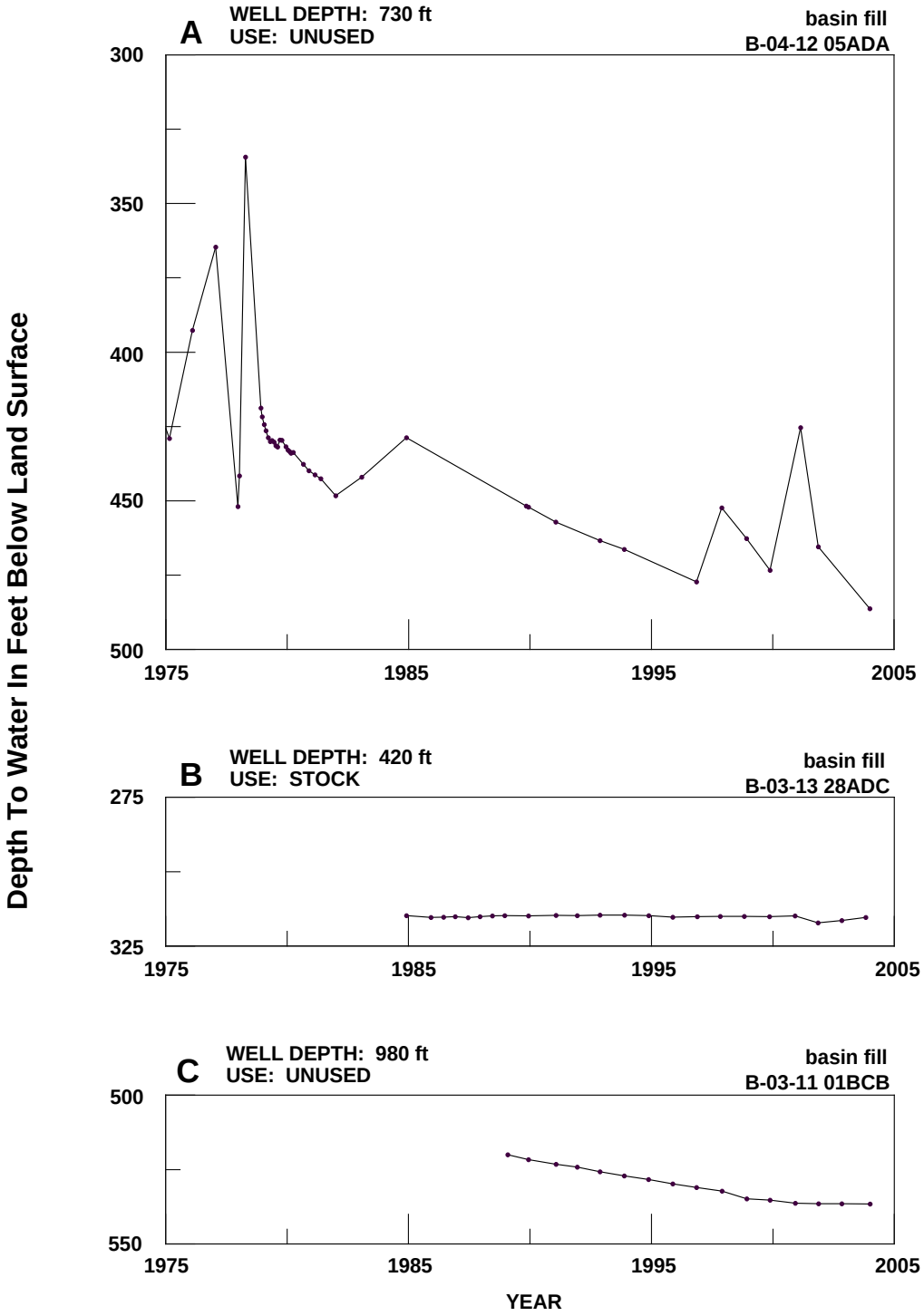
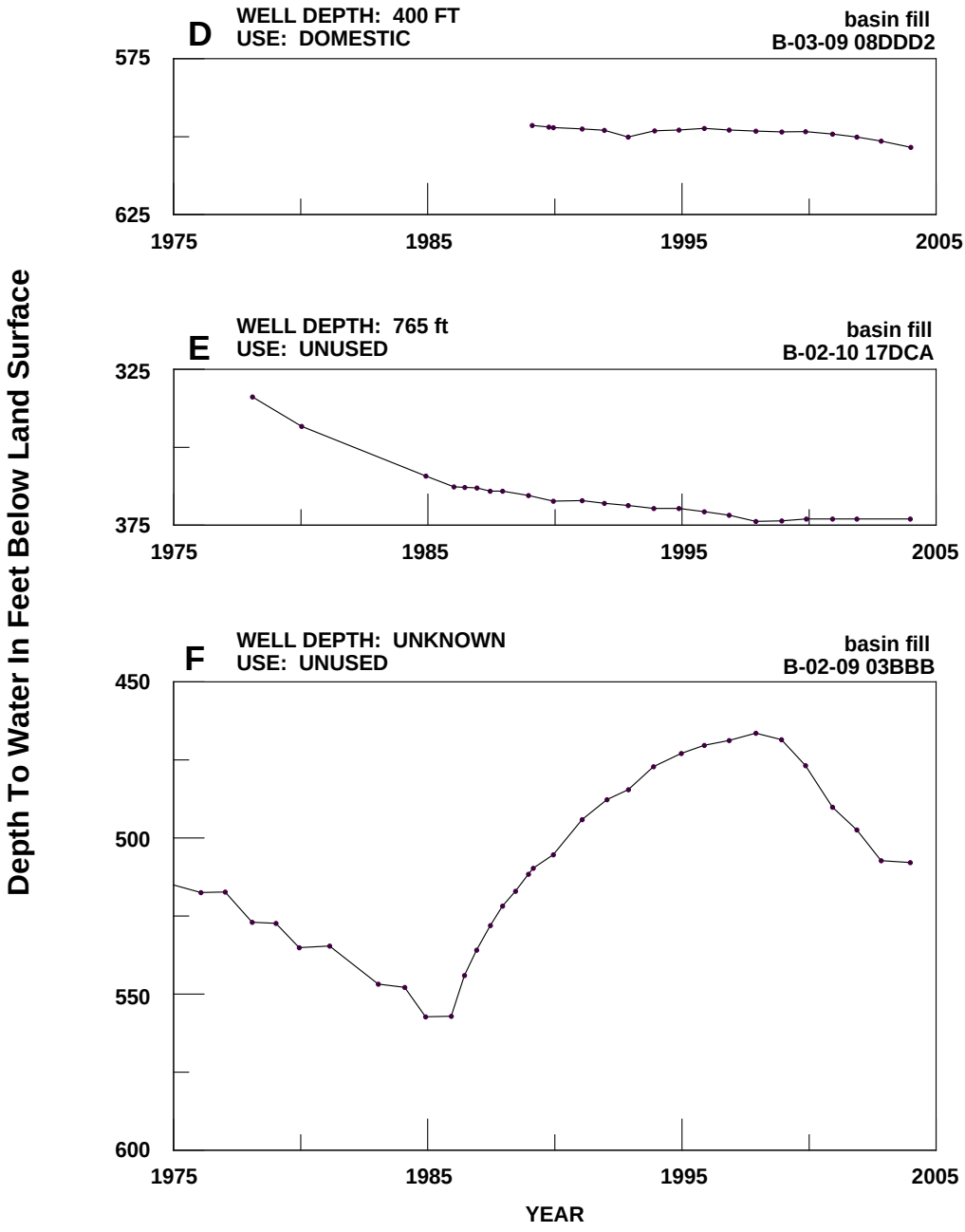
**Figure 7.3-5**
**Harquahala Basin**
**Groundwater Conditions**

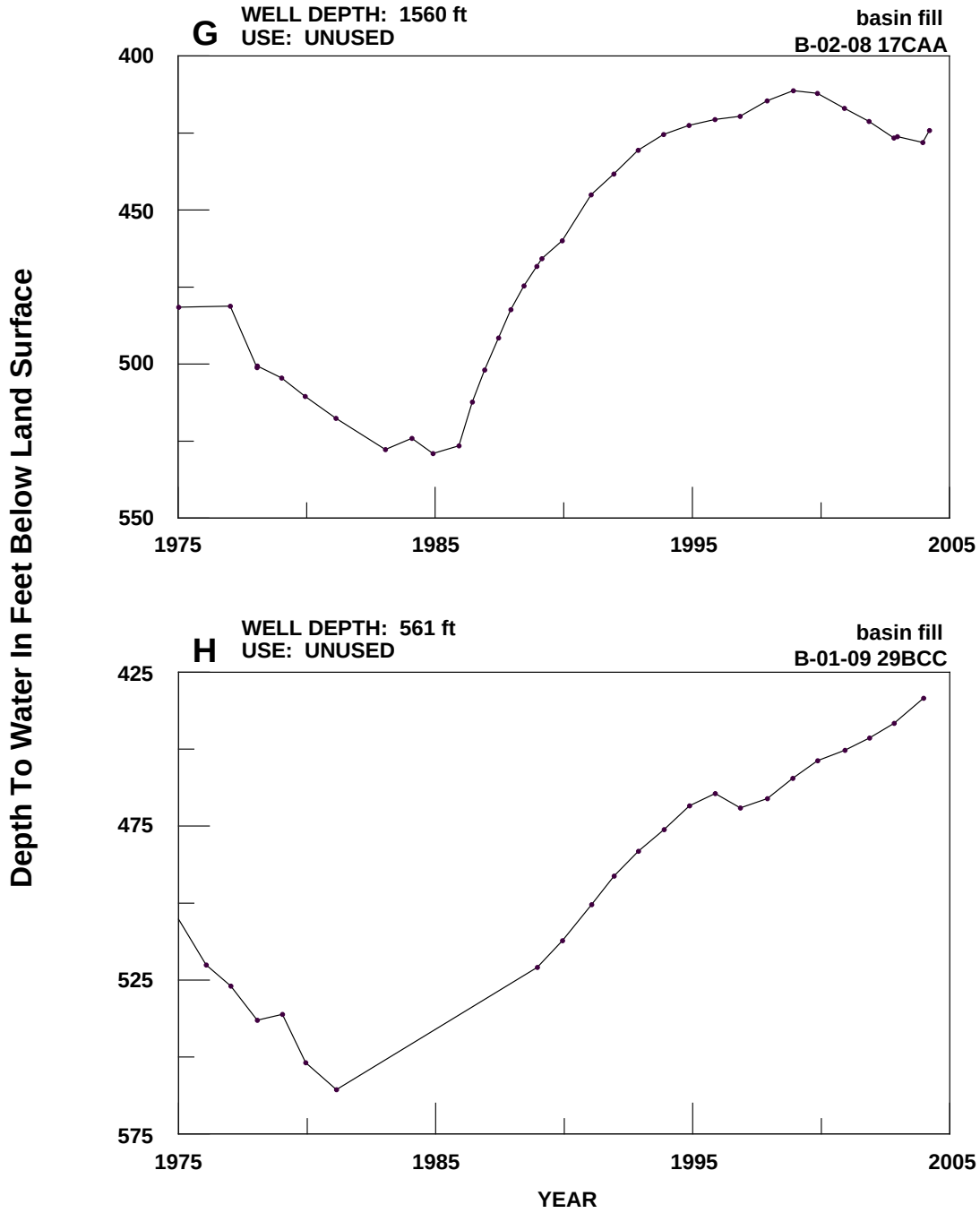
# Figure 7.3-6
# Harquahala Basin
# Hydrographs Showing Depth to Water in Selected Wells



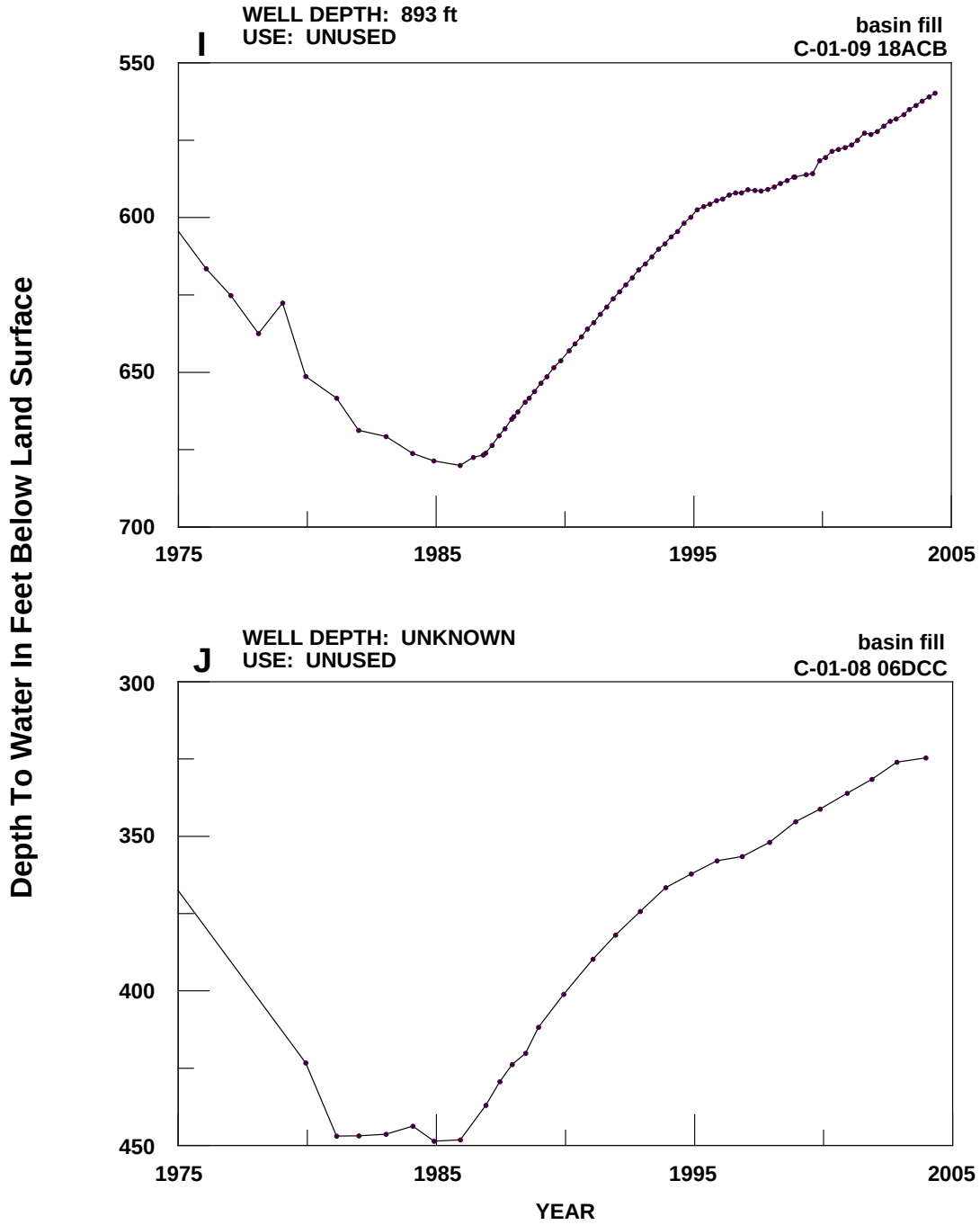
## Figure 7.3-6 (cont'd)
## Harquahala Basin
## Hydrographs Showing Depth to Water in Selected Wells



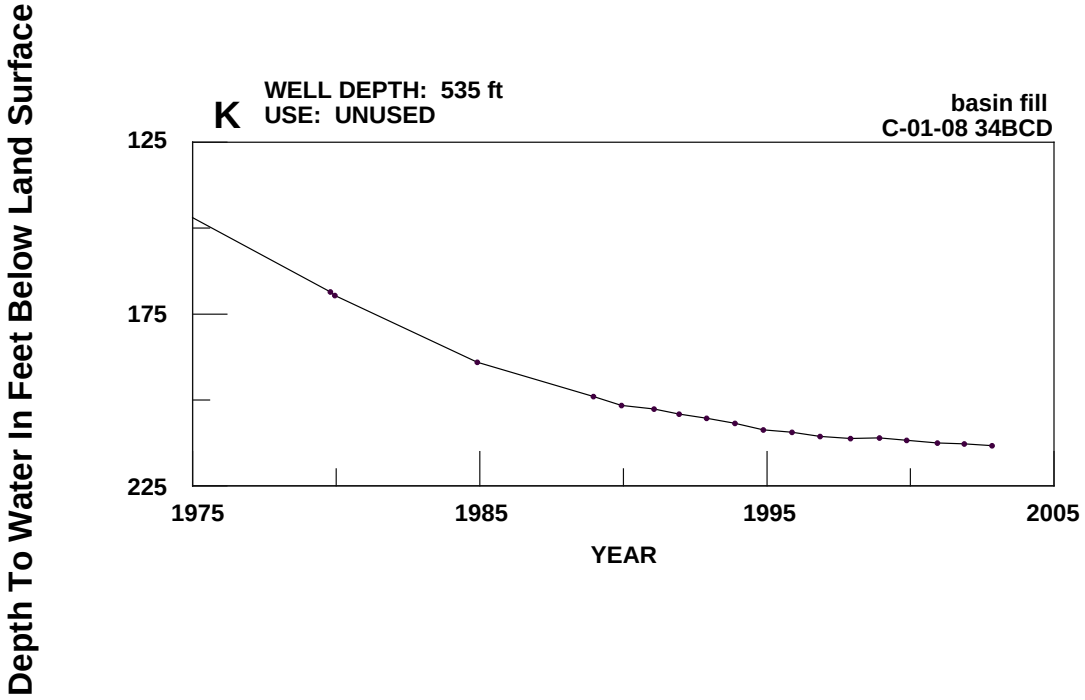
## Figure 7.3-6 (cont'd)
## Harquahala Basin
## Hydrographs Showing Depth to Water in Selected Wells

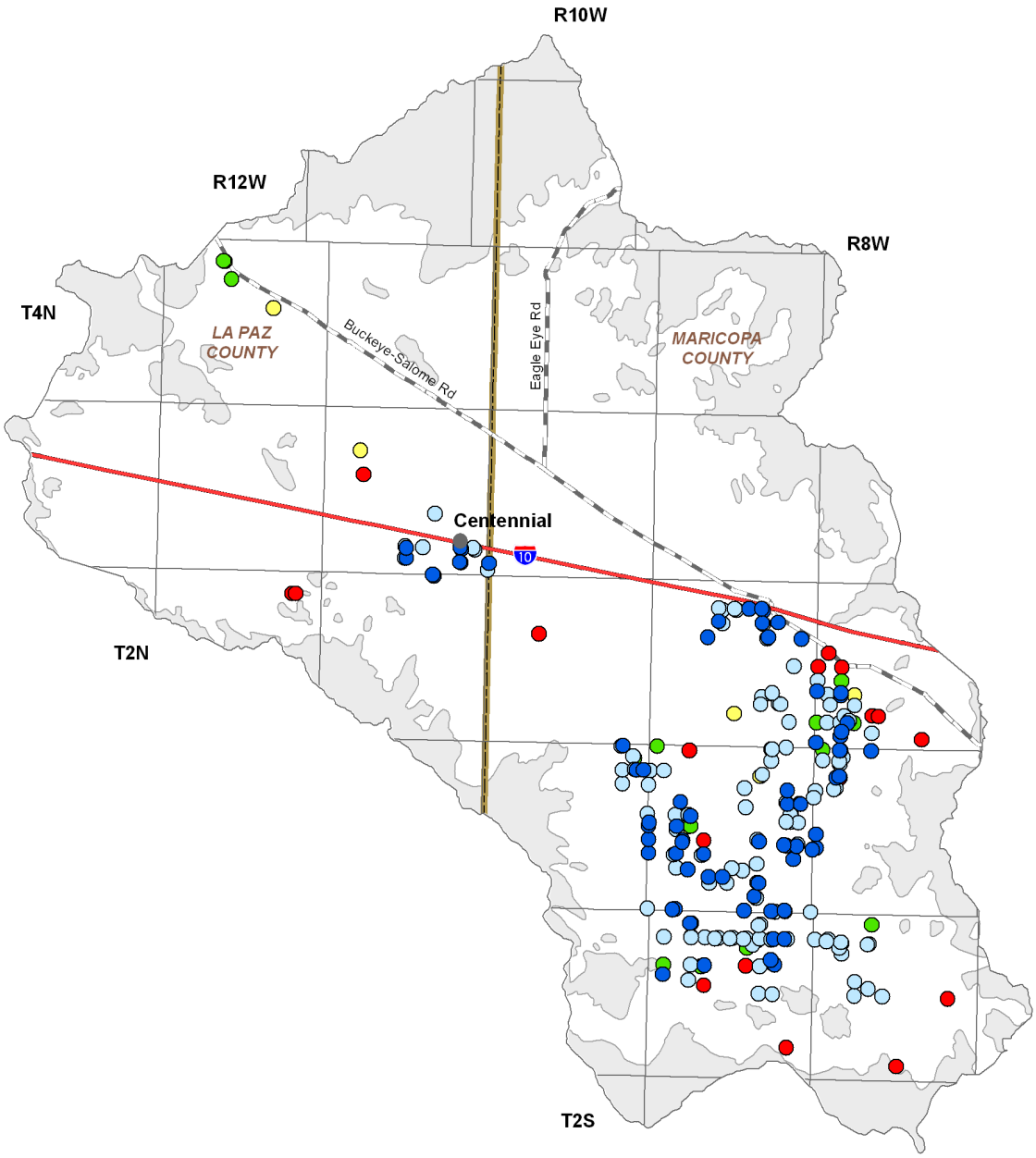


## Figure 7.3-6 (cont'd)
## Harquahala Basin
## Hydrographs Showing Depth to Water in Selected Wells



## Figure 7.3-6 (cont'd)
## Harquahala Basin
## Hydrographs Showing Depth to Water in Selected Wells



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0 3 6
Miles

N
S

**Figure 7.3-7**
**Harquahala Basin**
**Well Yields**

Well Yields
- Greater than 2000 gals/min
- Between 1000 and 2000 gals/min
- Between 500 and 1000 gals/min
- Between 100 and 500 gals/min
- Less than 100 gals/min

Consolidated Crystalline & Sedimentary Rocks
Unconsolidated Sediments
COUNTY
Interstate Highway
Major Road
City, Town or Place

### 7.3.7 Water Quality of the Harquahala 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 7.3-6A. There are no impaired lakes or streams in this basin. Figure 7.3-8 shows the location of water quality occurrences keyed to Table 7.3-6. 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 7.3-6A.
- Eighty-two wells have parameter concentrations that have equaled or exceeded drinking water standards.
- The parameter most frequently equaled or exceeded was fluoride.
- Other parameters equaled or exceeded include arsenic, lead, chromium, total dissolved solids and nitrates.

## Table 7.3-6 Water Quality Exceedences in the Harquahala 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 | 4 North | 9 West | 30 | F |
| 2 | Well | 4 North | 12 West | 9 | F |
| 3 | Well | 4 North | 12 West | 14 | NO3 |
| 4 | Well | 3 North | 9 West | 8 | F |
| 5 | Well | 3 North | 10 West | 31 | F |
| 6 | Well | 3 North | 11 West | 8 | F, Hg |
| 7 | Well | 3 North | 11 West | 13 | F |
| 8 | Well | 3 North | 12 West | 19 | F |
| 9 | Well | 2 North | 8 West | 17 | F |
| 10 | Well | 2 North | 8 West | 19 | As |
| 11 | Well | 2 North | 8 West | 28 | F |
| 12 | Well | 2 North | 8 West | 30 | As, NO3 |
| 13 | Well | 2 North | 9 West | 3 | F |
| 14 | Well | 2 North | 9 West | 11 | As |
| 15 | Well | 2 North | 9 West | 11 | NO3 |
| 16 | Well | 2 North | 9 West | 13 | F |
| 17 | Well | 2 North | 9 West | 14 | As, F, NO3, TDS |
| 18 | Well | 2 North | 9 West | 16 | F |
| 19 | Well | 2 North | 9 West | 24 | As |
| 20 | Well | 2 North | 9 West | 26 | F |
| 21 | Well | 2 North | 9 West | 26 | As |
| 22 | Well | 2 North | 9 West | 26 | F, TDS |
| 23 | Well | 2 North | 9 West | 35 | F |
| 24 | Well | 2 North | 10 West | 17 | F |
| 25 | Well | 2 North | 10 West | 26 | F |
| 26 | Well | 2 North | 10 West | 26 | F |
| 27 | Well | 2 North | 11 West | 2 | F |
| 28 | Well | 1 North | 8 West | 6 | F, NO3 |
| 29 | Well | 1 North | 8 West | 7 | F |
| 30 | Well | 1 North | 8 West | 19 | F, NO3, TDS |
| 31 | Well | 1 North | 8 West | 19 | As, F, NO3 |
| 32 | Well | 1 North | 9 West | 4 | F |
| 33 | Well | 1 North | 9 West | 5 | NO3 |
| 34 | Well | 1 North | 9 West | 6 | F |
| 35 | Well | 1 North | 9 West | 11 | F |
| 36 | Well | 1 North | 9 West | 12 | F, NO3 |
| 37 | Well | 1 North | 9 West | 12 | F |
| 38 | Well | 1 North | 9 West | 13 | F |
| 39 | Well | 1 North | 9 West | 16 | F |
| 40 | Well | 1 North | 9 West | 17 | TDS |
| 41 | Well | 1 North | 9 West | 17 | F |
| 42 | Well | 1 North | 9 West | 17 | F |
| 43 | Well | 1 North | 9 West | 17 | F, Pb |
| 44 | Well | 1 North | 9 West | 18 | F |
| 45 | Well | 1 North | 9 West | 20 | F, NO3 |
| 46 | Well | 1 North | 9 West | 21 | F |
| 47 | Well | 1 North | 9 West | 21 | F |
| 48 | Well | 1 North | 9 West | 22 | F |
| 49 | Well | 1 North | 9 West | 22 | F |
| 50 | Well | 1 North | 9 West | 23 | F, NO3 |
| 51 | Well | 1 North | 9 West | 24 | F |

## Table 7.3-6 Water Quality Exceedences in the Harquahala Basin (Cont)[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 | |
| 52 | Well | 1 North | 9 West | 26 | F |
| 53 | Well | 1 North | 9 West | 31 | As, F |
| 54 | Well | 1 North | 9 West | 36 | F |
| 55 | Well | 1 North | 10 West | 1 | F |
| 56 | Well | 1 North | 10 West | 1 | F |
| 57 | Well | 1 North | 10 West | 12 | F |
| 58 | Well | 1 South | 7 West | 19 | F |
| 59 | Well | 1 South | 8 West | 4 | F |
| 60 | Well | 1 South | 8 West | 6 | As, Pb |
| 61 | Well | 1 South | 8 West | 6 | As, F |
| 62 | Well | 1 South | 8 West | 6 | F |
| 63 | Well | 1 South | 8 West | 8 | Cr, F |
| 64 | Well | 1 South | 8 West | 8 | F |
| 65 | Well | 1 South | 8 West | 9 | As, F, Pb |
| 66 | Well | 1 South | 8 West | 14 | F |
| 67 | Well | 1 South | 8 West | 14 | As |
| 68 | Well | 1 South | 8 West | 20 | F |
| 69 | Well | 1 South | 8 West | 22 | F |
| 70 | Well | 1 South | 8 West | 27 | F |
| 71 | Well | 1 South | 8 West | 27 | F |
| 72 | Well | 1 South | 8 West | 27 | F |
| 73 | Well | 1 South | 9 West | 1 | F |
| 74 | Well | 1 South | 9 West | 2 | F |
| 75 | Well | 1 South | 9 West | 2 | NO3 |
| 76 | Well | 1 South | 9 West | 3 | Pb, NO3 |
| 77 | Well | 1 South | 9 West | 5 | F |
| 78 | Well | 1 South | 9 West | 7 | F |
| 79 | Well | 1 South | 9 West | 10 | F |
| 80 | Well | 1 South | 9 West | 11 | F |
| 81 | Well | 1 South | 9 West | 11 | F |
| 82 | Well | 1 South | 9 West | 11 | F |

Source: Compilation of databases from ADWR & others

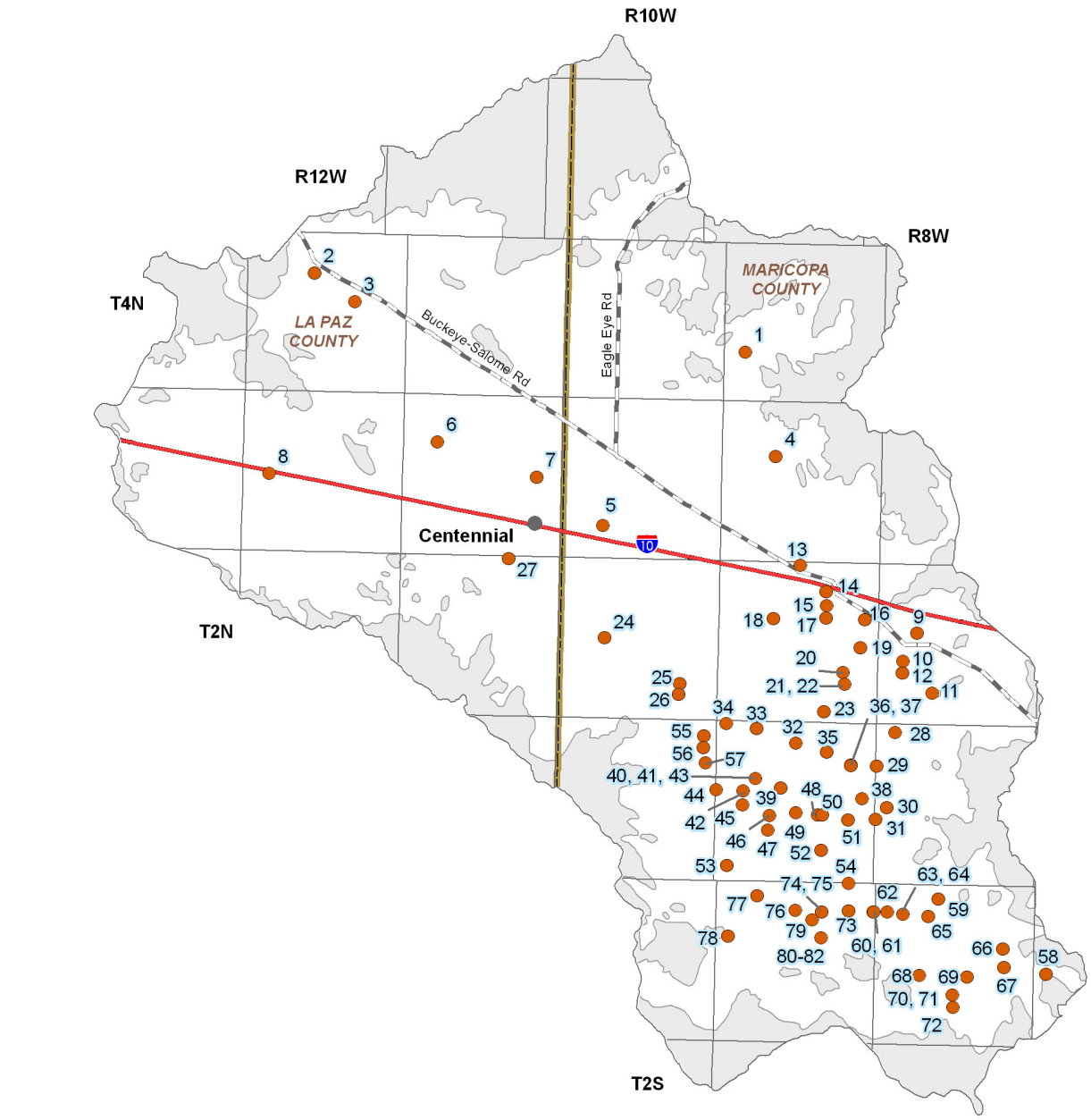
### B. Lakes and Streams

| Map Key | Site Type | Site Name | Length of Impaired Stream Reach (in miles) | Area of Impaired Lake (in acres) | Designated Use Standard | Parameter(s) Exceeding Use Standard |
|---|---|---|---|---|---|---|
| None identified by ADWR at this time | | | | | | |

**Notes:**

[1] Water quality samples collected between 1978 and 1991. Listed TDS exceedences indicate "mineralized water" that contains over 3000 milligrams per liter (mg/l) of TDS and would require special well construction procedures (A.A.C. R12-15-812(B)). The secondary drinking water standard for TDS is 500 mg/l.

[2] As = Arsenic
Cr = Chromium
NO3 = Nitrate
F = Fluoride
Pb = Lead
TDS = Total Dissolved Solids




ARIZONA DEPARTMENT OF WATER RESOURCES ©

0 3 6 Miles

N S

Well, Spring or Mine Site that has Equaled or Exceeded DWS 1
Consolidated Crystalline & Sedimentary Rocks
Unconsolidated Sediments

COUNTY
Interstate Highway
Major Road
City, Town or Place

**Figure 7.3-8**
**Harquahala Basin**
**Water Quality Conditions**

### 7.3.8 Cultural Water Demands in the Harquahala 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 7.3-7. Figure 7.3-9 shows the location of demand centers. There is no recorded effluent generation in this basin. A description of cultural water demand data sources and methods is found in Volume 1, Appendix A. More detailed information on cultural water demands is found in Section 7.0.7.

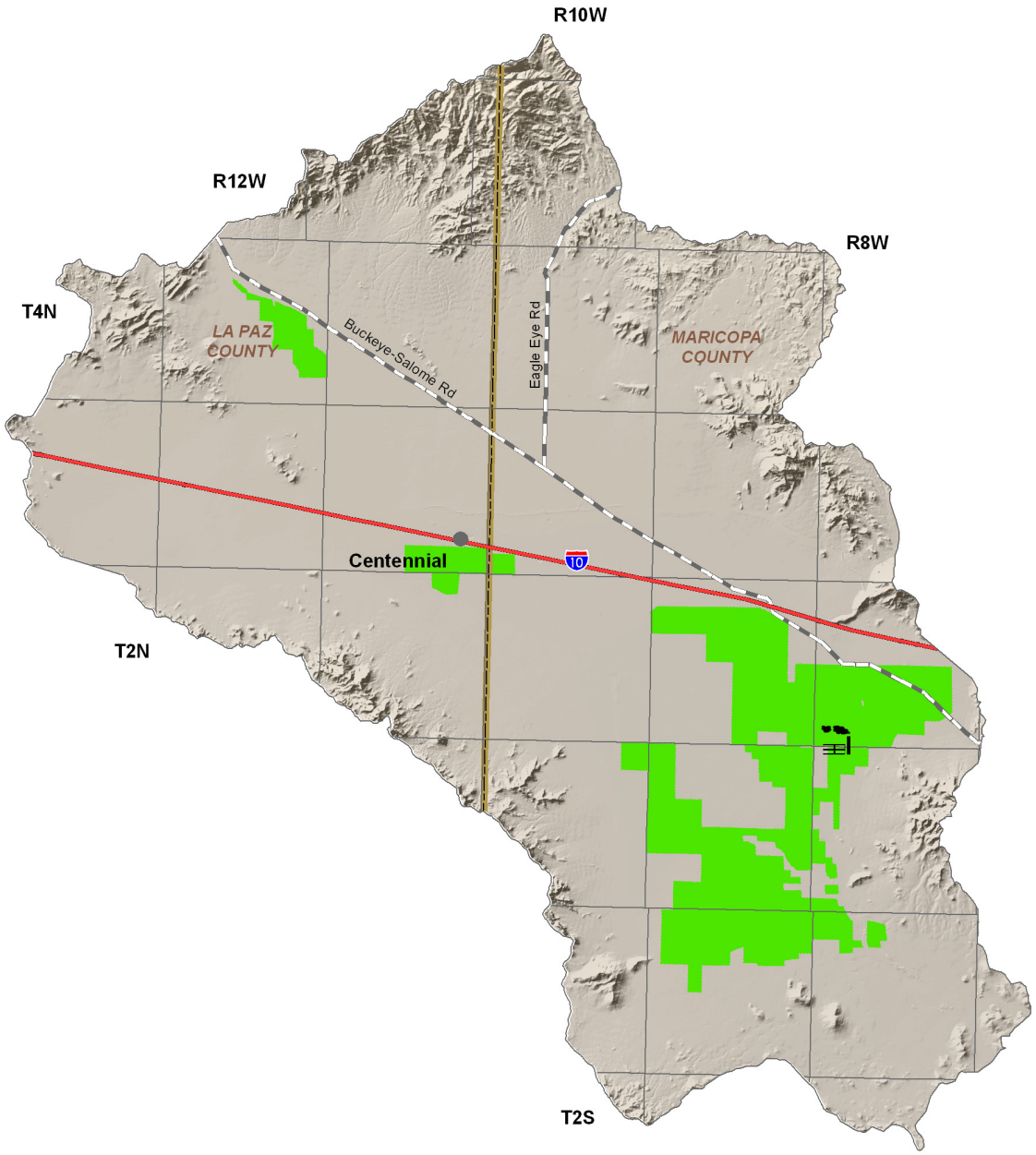
**Cultural Water Demands**

- Refer to Table 7.3-7 and Figure 7.3-9.
- Population in this basin increased from 359 in 1980 to 608 in 2000.
- Most cultural water use is for irrigation in the southern and northwestern portions of the basin.
- Groundwater use for agriculture increased from 9,500 AFA between 1991-1995 to 36,500 between 2001-2005; however, long-term agricultural groundwater use declined 68% from 1971 to 2005. The entire Harquahala Basin is within an Irrigation Non-Expansion Area (INA). The Harquahala INA was created in 1981; no new agricultural lands can be irrigated with groundwater in an INA.
- Surface water use for irrigation began in 1986 with deliveries of Central Arizona Project water to the basin. Agricultural surface water demand increased from 79,000 AFA between 1986-1990 to 85,000 AFA between 1996-2000; but decreased to 69,600 AFA in 2001-2005.
- There was no reported industrial groundwater demand prior to 2001-2005. The Harquahala Generating Project began operating in 2001. This plant used an average of 2,500 AFA from 2001 to 2005.
- As of 2005 there were 196 registered wells with a pumping capacity of less than or equal to 35 gpm and 212 wells with a pumping capacity of more than 35 gpm.

**Table 7.3-7 Cultural Water Demand in the Harquahala 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** | | 111[2] | 179[2] | 117,000 | | | NR | | | ADWR (1994a) USGS (2007) |
| **1972** | | | | | | | | | | |
| **1973** | | | | | | | | | | |
| **1974** | | | | | | | | | | |
| **1975** | | | | | | | | | | |
| **1976** | | | | 111,000 | | | NR | | | |
| **1977** | | | | | | | | | | |
| **1978** | | | | | | | | | | |
| **1979** | | | | | | | | | | |
| **1980** | 359 | | | | | | | | | |
| **1981** | 405 | 13 | 8 | 79,000 | | | NR | | | |
| **1982** | 451 | | | | | | | | | |
| **1983** | 498 | | | | | | | | | |
| **1984** | 544 | | | | | | | | | |
| **1985** | 590 | | | | | | | | | |
| **1986** | 636 | 10 | 6 | 6,000 | | | 79,000 | | | |
| **1987** | 682 | | | | | | | | | |
| **1988** | 729 | | | | | | | | | |
| **1989** | 775 | | | | | | | | | |
| **1990** | 821 | | | | | | | | | |
| **1991** | 800 | 5 | 3 | <300 | NR | 9,500 | NR | NR | 47,500 | USGS (2007) ADWR (2008b) |
| **1992** | 779 | | | | | | | | | |
| **1993** | 757 | | | | | | | | | |
| **1994** | 736 | | | | | | | | | |
| **1995** | 715 | | | | | | | | | |
| **1996** | 694 | 19 | 9 | <300 | NR | 23,500 | NR | NR | 85,000 | |
| **1997** | 673 | | | | | | | | | |
| **1998** | 651 | | | | | | | | | |
| **1999** | 630 | | | | | | | | | |
| **2000** | 608 | | | | | | | | | |
| **2001** | 642 | 38 | 7 | <300 | 2,500 | 36,500 | NR | NR | 69,600 | |
| **2002** | 677 | | | | | | | | | |
| **2003** | 711 | | | | | | | | | |
| **2004** | 745 | | | | | | | | | |
| **2005** | 780 | | | | | | | | | |
| **2010** | 951 | | | | | | | | | |
| **2020** | 1,697 | | | | | | | | | |
| **2030** | 2,443 | | | | | | | | | |
| | ***WELL TOTALS:*** | **196** | **212** | | | | | | | |

[1] Does not include effluent or evaporation losses from stockponds and reservoirs.
[2] Includes all wells through 1980.
[3] Industrial demand 1971-1990 includes a small amount of well pumpage in the Tiger Wash Basin.
NR - Not reported




Primary Data Source: USGS National Gap Analysis Program, 2004

**Figure 7.3-9**
**Harquahala Basin**
**Cultural Water Demand**

### 7.3.9 Water Adequacy Determinations in the Harquahala Basin

Water adequacy determination information including the subdivision name, location, number of lots, adequacy determination, reason for an inadequacy determination, date of determination and subdivision water provider are shown in Table 7.3-8. Figure 7.3-10 shows the general locations of subdivisions (to the section level) 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 Maricopa County. Four water adequacy determinations for 301 lots have been made in this basin through December 2008. Two hundred and one lots in two subdivision, or 67% of lots, were determined to be adequate.
- One subdivision received a determination of inadequacy because of an insufficient supply and the other because the applicant did not submit the necessary information and/or the available hydrologic data was insufficient to make a determination.
- There are three Analysis of Adequate Water Supply applications for a total of 8,901 lots.

## Table 7.3-8 Adequacy Determinations in the Harquahala 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 | Big Horn Farms | Maricopa | 1 North | 9 West | 11 | 32 | 53-300288 | Inadequate | A2 | 5/12/1997 | NA |
| 4 | Harquahala Ranches Unit I, II, III | Maricopa | 1 South | 9 East | 5, 6, 7 | 68 | 53-700461 | Inadequate | A1 | 1/15/2008 | Eagletail Water Co. |
| 5 | Harquahala Ranchitos Units 1 & 2 | Maricopa | 2 North | 8 West | 22 | 19 | 53-300114 | Adequate | | 2/26/1996 | Dry Lot Subdivision |
| 7 | Rose View Estates | Maricopa | 1 North | 8 West | 4 | 182 | 53-501343 | Adequate | | 4/6/1995 | Water Utility of Greater Tonopah |

### 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 | | | | |
| 2 | Centennial Complex | La Paz | 3 North | 10 West | 25 | 770 | 43-700451 | 12/5/2007 | Centennial Community Facilities District |
| | | | 3 North | 11 West | 24, 30 | | | | |
| 3 | Centennial Interchange Development | La Paz | 3 North | 11 West | 26 | 31 | 43-402080 | 9/21/2006 | NA |
| 6 | La Paz - K Lazy B Ranch | La Paz | 4 North | 12 West | 9 | 8,100 | 43-402253 | 11/13/2007 | NA |

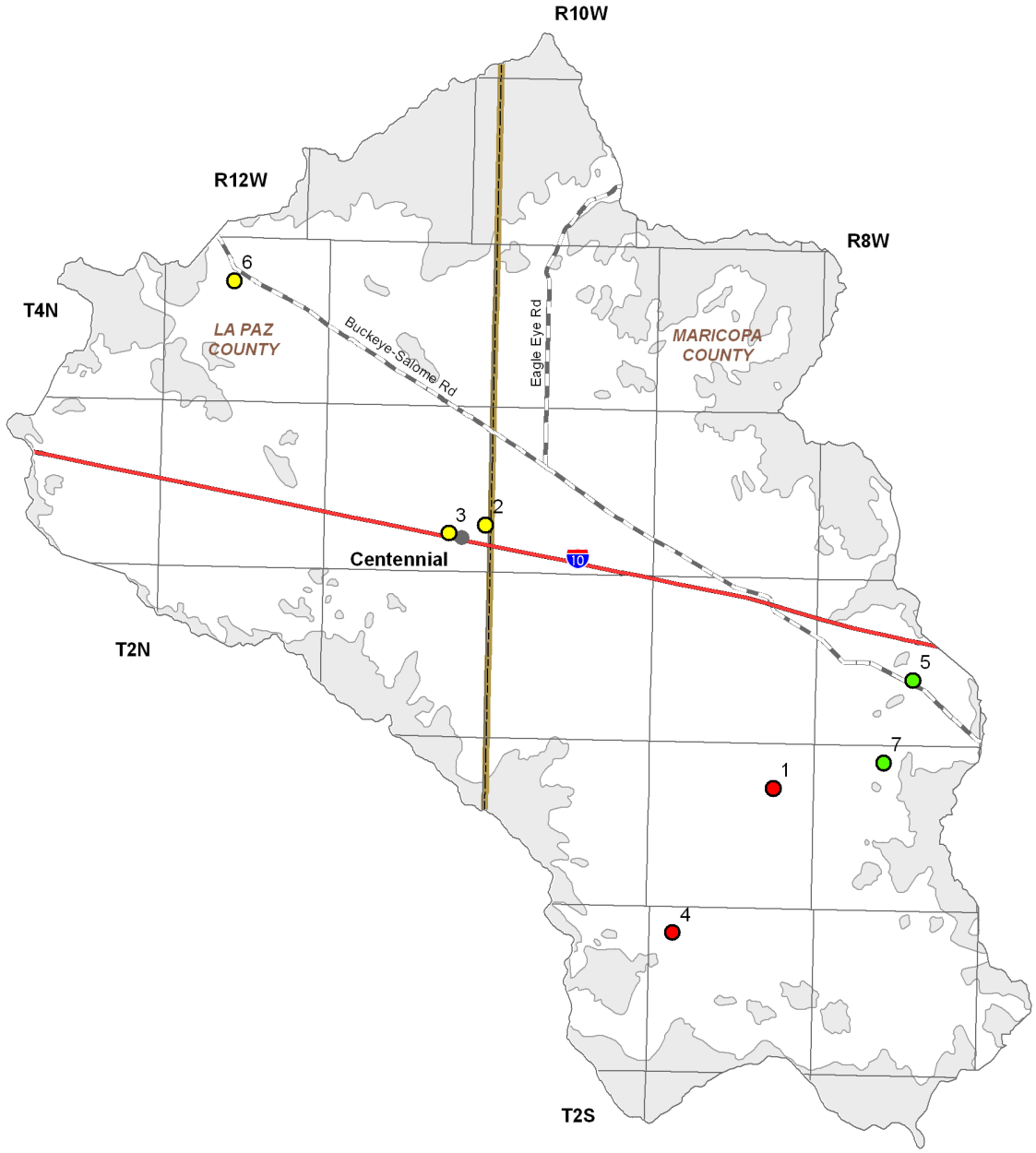
Source: ADWR 2008a

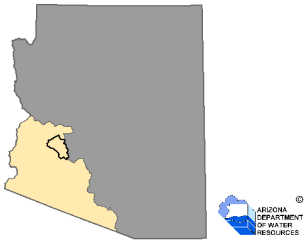
**Notes:**

[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



0 3 6 Miles

N
S

**Adequacy Determinations**

- Adequate
- Inadequate
- Analysis of Adequate Water Supply
- Consolidated Crystalline & Sedimentary Rocks
- Unconsolidated Sediments
- COUNTY
- Interstate Highway
- Major Road
- City, Town or Place

**Figure 7.3-10**
**Harquahala Basin**
**Adequacy Determinations**

# Harquahala Basin
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