

Section 7.1

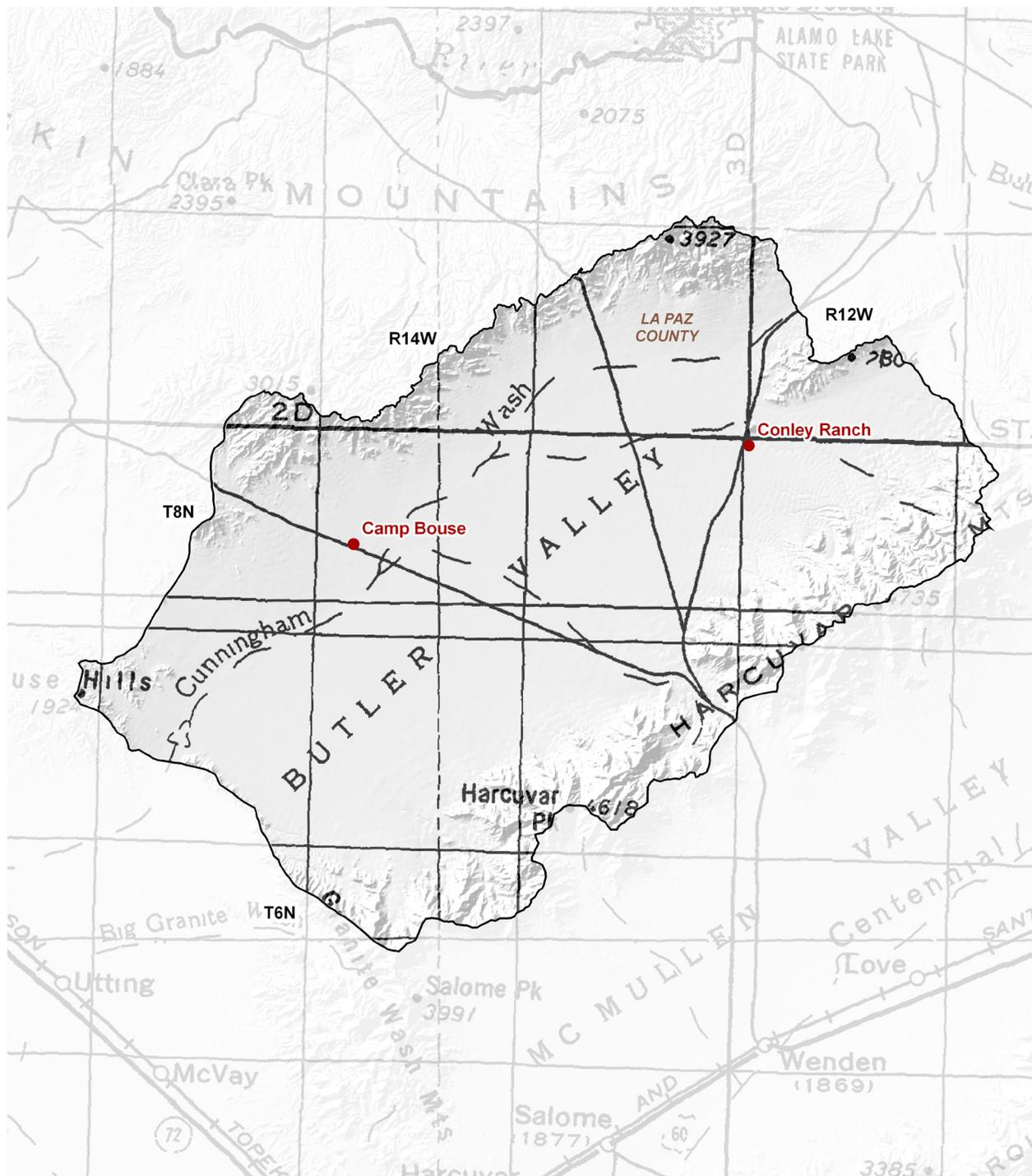
Butler Valley Basin



7.1.1 Geography of the Butler Valley Basin

The Butler Valley Basin, located in the northern part of the planning area, is 288 square miles in area. Geographic features and principal places are shown on Figure 7.1-1. The basin is characterized by a valley bordered by two mountain ranges. Vegetation types include Lower Colorado River and Arizona uplands Sonoran desertscrub and a small amount of interior chaparral on the eastern basin boundary. (See Figure 7.0-9)

- Principal geographic features shown on Figure 7.1-1 are:
 - Cunningham Wash running northeast to southwest in the northern portion of the basin
 - Butler Valley bordered by the Harcuvar Mountains on the eastern basin boundary and the Buckskin Mountains on the northwestern basin boundary
 - Harcuvar Peak at 4,618 feet, the highest point in the basin
 - The lowest point in the basin at 1,345 feet at “The Narrows” where Cunningham Wash exits the basin.



Base Map: USGS 1:500,000, 1981

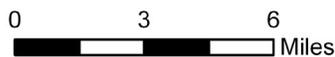


Figure 7.1-1
Butler Valley Basin
Geographic Features

City, Town or Place ●

7.1.2 Land Ownership in the Butler Valley Basin

Land ownership, including the percentage of ownership by category, for the Butler Valley Basin is shown in Figure 7.1-2. Principal features of land ownership in this basin are the large blocks of U.S. Bureau of Land Management and State Trust lands. 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)

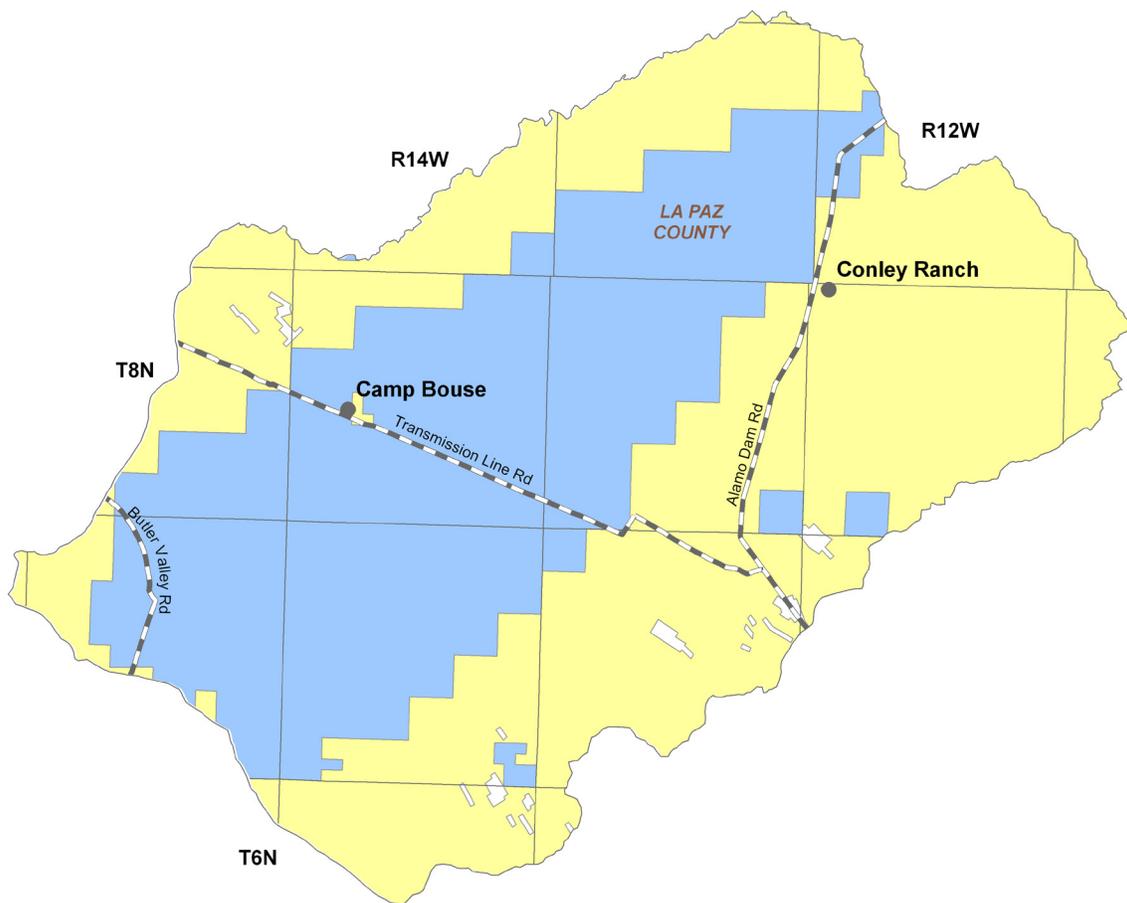
- 55.5% of the land is federally owned and managed by the Yuma Field Office of the Bureau of Land Management.
- BLM land in this basin includes 4,900 acres of the 38,000 acre Rawhide Mountains Wilderness and 11,000 acres of the 25,000 acre Harcuvar Mountains Wilderness. (see Figure 7.0-12)
- Land uses include grazing, resource conservation and recreation.

State Trust Land

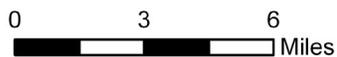
- 43.9% of the land is held in trust for the public schools, the Pioneer Home and both the Dept of Corrections and Juvenile Corrections and county bonds under the State Trust Land system.
- Primary land use is grazing.

Private

- 0.6% of the land is private.
- Small parcels of private land are found surrounded by BLM land in the northern and southern portions of the basin.
- Land uses include domestic and ranching.



Source: ALRIS, 2004



**Figure 7.1-2
Butler Valley Basin
Land Ownership**

**Land Ownership
(Percentage in Basin)**

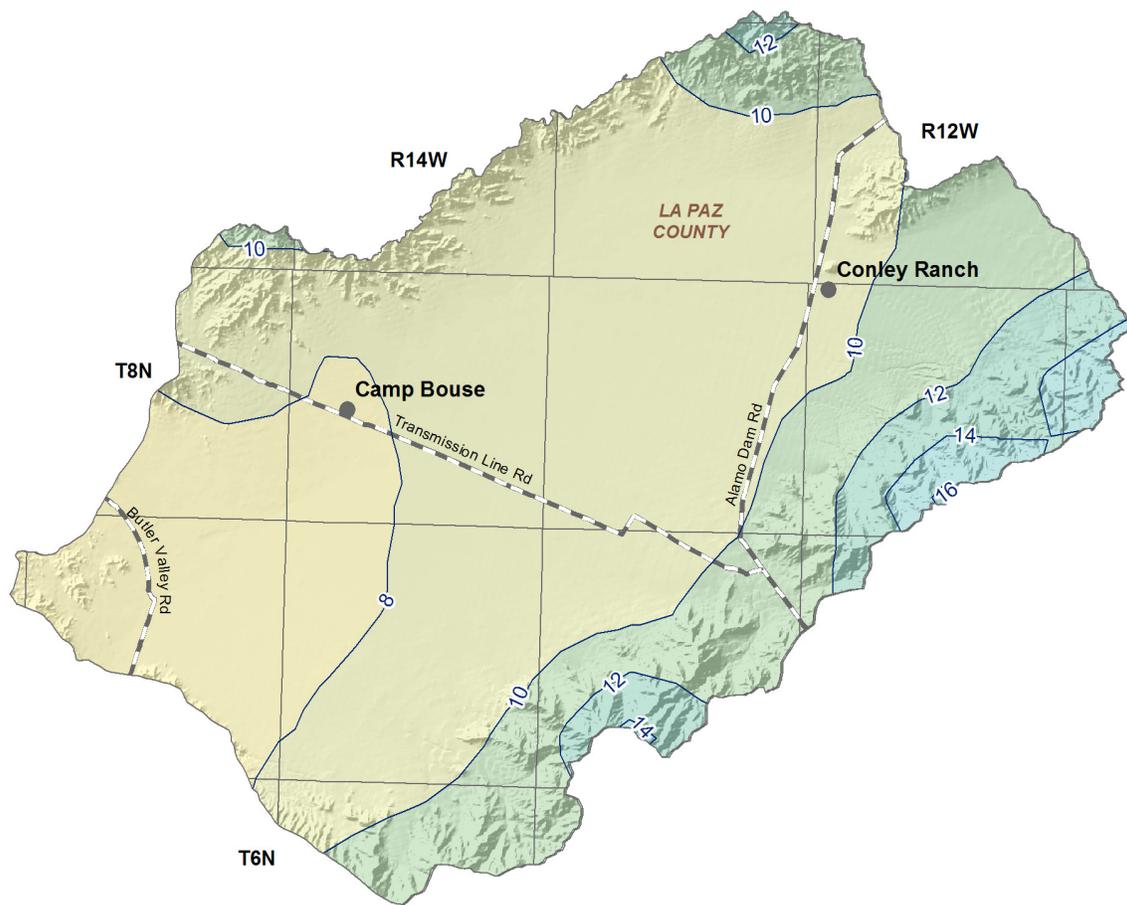
- U.S. Bureau of Land Management (55.5%) 
- State Trust (43.9%) 
- Private (0.6%) 
- Major Road 
- City, Town or Place 

7.1.3 Climate of the Butler Valley Basin

The Butler Valley Basin does not contain NOAA/NWS, Evaporation Pan, AZMET or SNOTEL/Snowcourse stations. Figure 7.1-3 shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. More detailed information on climate in the planning area is found in Section 7.0.3. A description of climate data sources and methods is found in Volume 1, Appendix A.

SCAS Precipitation Data

- See Figure 7.1-3
- Average annual rainfall is as high as 18 inches along the central eastern basin boundary and as low as six inches in the western portion of the basin.



**Average Annual
Precipitation
(1961-1990)**
inches per year

- 6-8
- 8-10
- 10-12
- 12-14
- 14-16
- 16-18

- Precipitation Contour
- Major Road
- City, Town or Place

0 3 6
Miles



**Figure 7.1-3
Butler Valley Basin
Meteorological Stations and
Annual Precipitation**



Precipitation Data Source: Oregon State University, 1998

7.1.4 Surface Water Conditions in the Butler Valley Basin

There are no streamflow data, flood ALERT equipment or USGS runoff contour data available for this basin. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 7.1-1. The location of large reservoirs is shown on Figure 7.1-4. Descriptions of stream, reservoir and stockpond data sources and methods are found in Volume 1, Appendix A.

Reservoirs and Stockponds

- Refer to Table 7.1-1.
- The basin contains one large reservoir, Cunningham Wash, with a maximum surface area of 143 acres. Its use was not available.
- There are no small reservoirs and seven registered stockponds in this basin.

Table 7.1-1 Reservoirs and Stockponds in the Butler Valley 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)¹

MAP KEY	RESERVOIR/LAKE NAME (Name of dam, if different)	OWNER/OPERATOR	MAXIMUM SURFACE AREA (acres)	USE	JURISDICTION
1	Cunningham Wash	NA	143	NA	Private

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)

Total number: 0

Total surface area: 0 acres

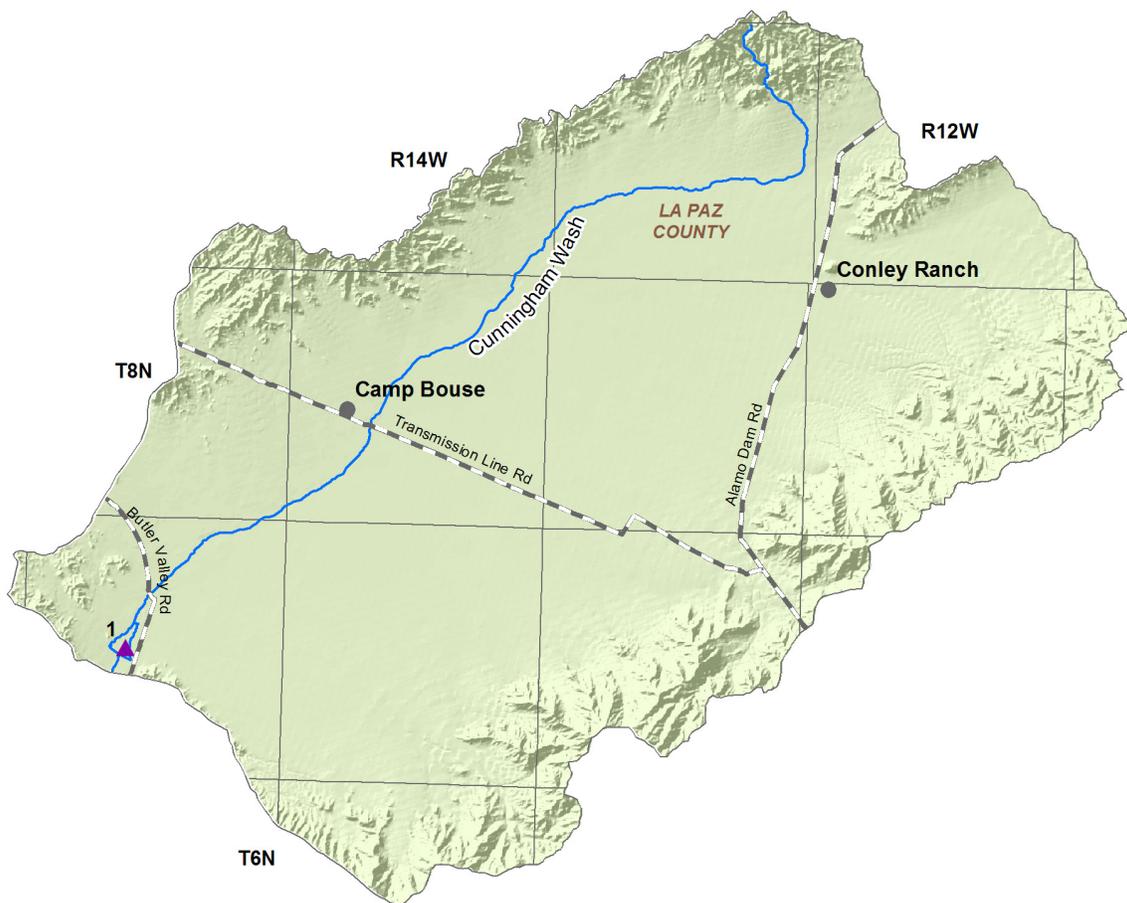
E. Stockponds (up to 15 acre-feet capacity)

Total number: 7

Notes:

¹Capacity data is not available to ADWR

NA = Information is not available to ADWR



Stream Data Source: ALRIS, 2005b

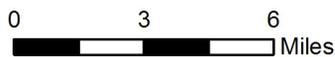


Figure 7.1-4
Butler Valley Basin
Surface Water Conditions

- Large Reservoir 
- Stream Channel (width of line reflects stream order) 
- Major Road 
- City, Town or Place 

7.1.5 Perennial/Intermittent Streams and Major Springs in the Butler Valley Basin

The total number of springs in the basin are shown in Table 7.1-2. There are no perennial or intermittent streams and no major or minor springs in the Butler Valley 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 is one.

Table 7.1-2 Springs in the Butler Valley 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): 1

7.1.6 Groundwater Conditions of the Butler Valley Basin

Major aquifers, well yields, estimated water in storage, number of index wells and date of last water-level sweep are shown in Table 7.1-3. Figure 7.1-5 shows aquifer flow direction and water-level change between 1990-1991 and 2003-2004. Figure 7.1-6 contains hydrographs for selected wells shown on Figure 7.1-5. Figure 7.1-7 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 7.1-3 and Figure 7.1-5.
- The major aquifer is basin fill.
- Flow direction is from northeast to southwest generally following Cunningham Wash.

Well Yields

- Refer to Table 7.1-3 and Figure 7.1-7.
- As shown on Figure 7.1-7, well yields generally range from 1,000 gallons per minute (gpm) to greater than 2,000 gpm.
- One source of well yield information, based on 17 reported wells, indicates that the median well yield is 2,200 gpm.

Natural Recharge

- Refer to Table 7.1-3.
- Natural recharge estimates range from less than 1,000 acre-feet per year (AFA) to 1,060 AFA.

Water in Storage

- Refer to Table 7.1-3.
- Storage estimates for this basin range from 2.0 million acre-feet (maf) at a depth of 1,200 feet to 20 maf at a depth of 1,000 feet.

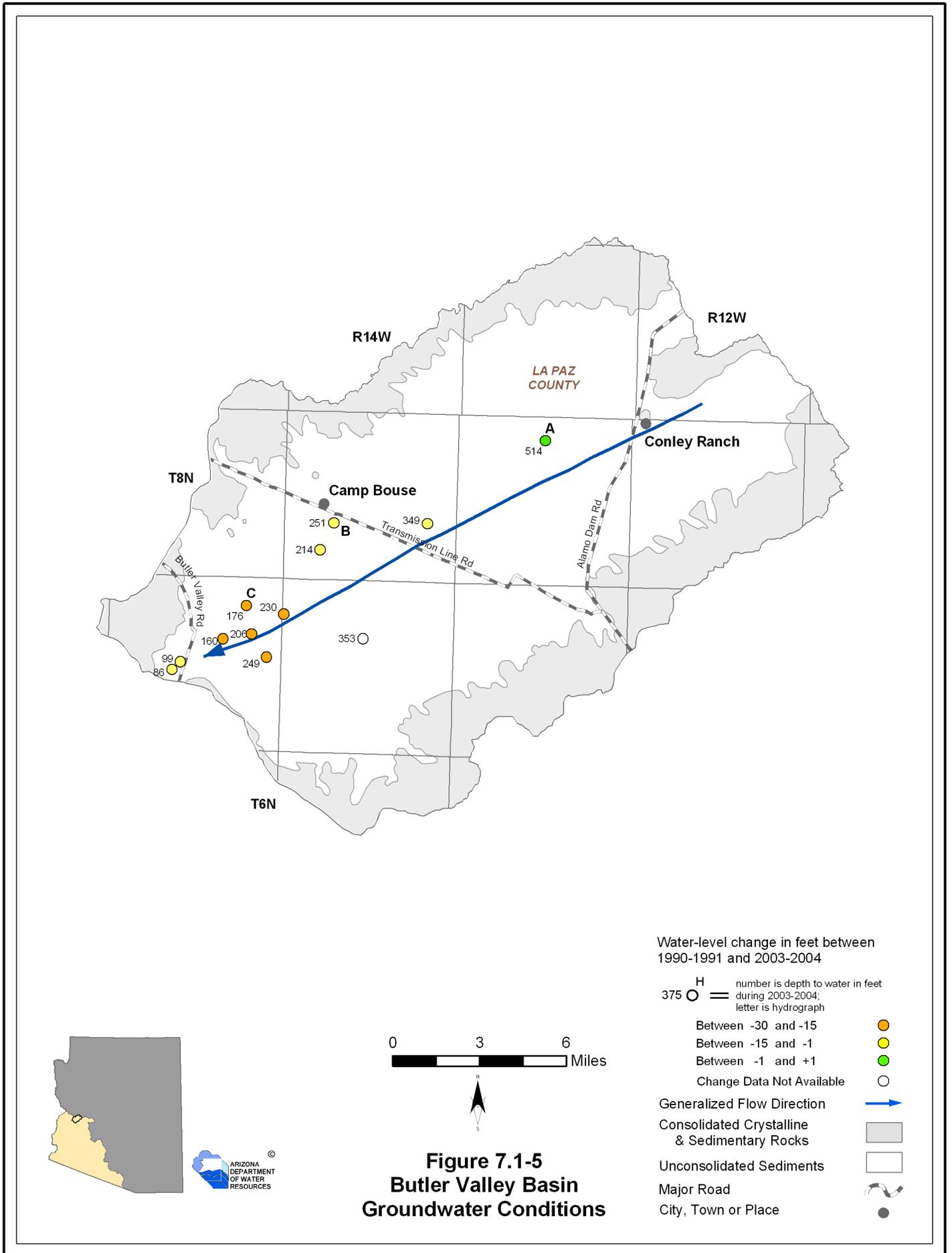
Water Level

- Refer to Figure 7.1-5. Water levels are shown for wells measured in 2003-2004.
- The Department annually measures eleven index wells in this basin. Hydrographs for three index wells are shown on Figure 7.1-6.
- The deepest water level shown on the map is 514 feet west of Conley Ranch and the shallowest water level shown on the map is 86 feet near the southwestern basin boundary.

Table 7.1-3 Groundwater Data for the Butler Valley Basin

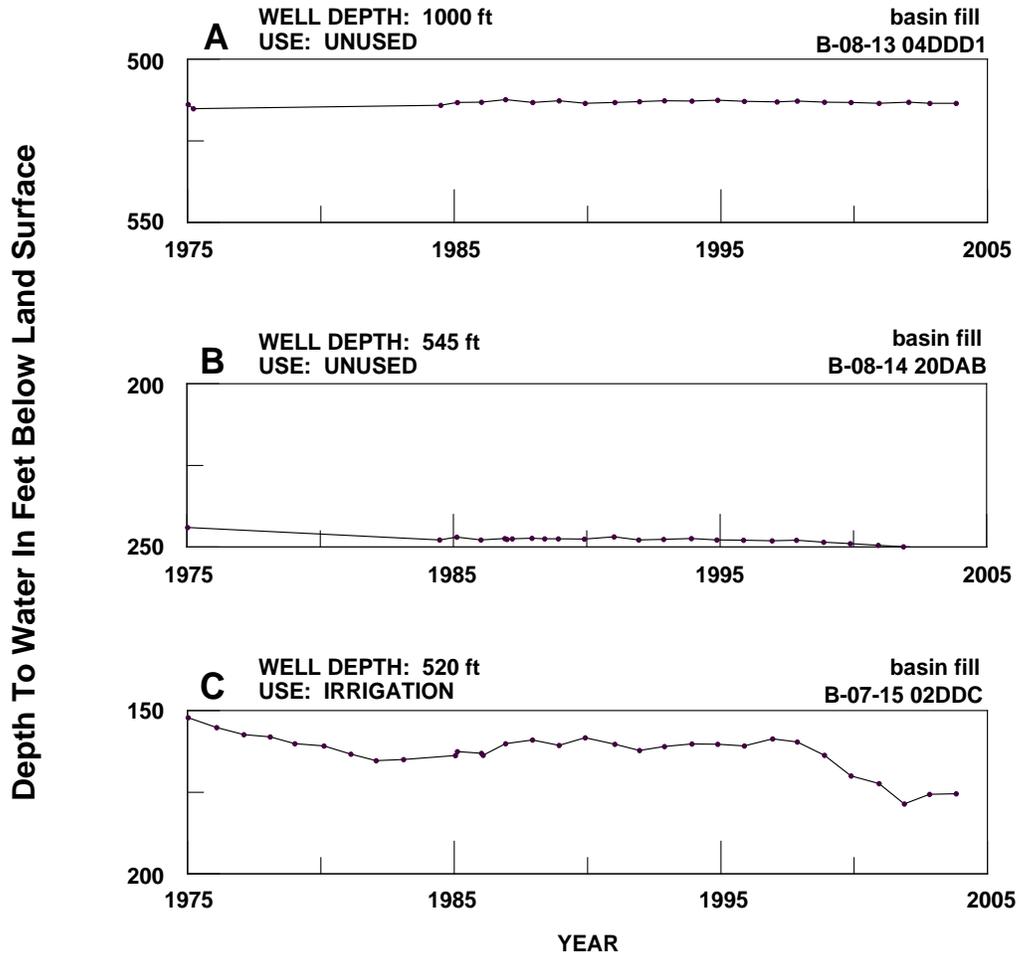
Basin Area, in square miles:	288	
Major Aquifer(s):	Name and/or Geologic Units	
	Basin Fill	
Well Yields, in gal/min:	Range 15.6-2,910 Median 1590 (5 wells measured)	Measured by ADWR (GWSI) and/or USGS
	Range 100-3,200 Median 2,200 (17 wells reported)	Reported on registration forms for large (>10-inch) diameter wells (Wells55)
	Range 300-1,000	ADWR (1990)
	Range 0-2,500	Anning and Duet (1994)
Estimated Natural Recharge, in acre-feet/year:	<1,000	Freethey and Anderson (1986)
	1,060	Herndon (1985)
Estimated Water Currently in Storage, in acre-feet:	6,400,000 - 6,500,000 (to 1,200 ft)	ADWR (1990 and 1994b)
	2,000,000 ¹ (to 1,200 ft)	Freethey and Anderson (1986)
	5,000,000 (to 1,200 ft)	Arizona Water Commission (1975)
	12,000,000 (to 700 ft)	Herndon (1985)
	20,000,000 (to 1,000 ft)	USBOR (1979)
Current Number of Index Wells:	13	
Date of Last Water-level Sweep:	2004 (24 wells measured)	

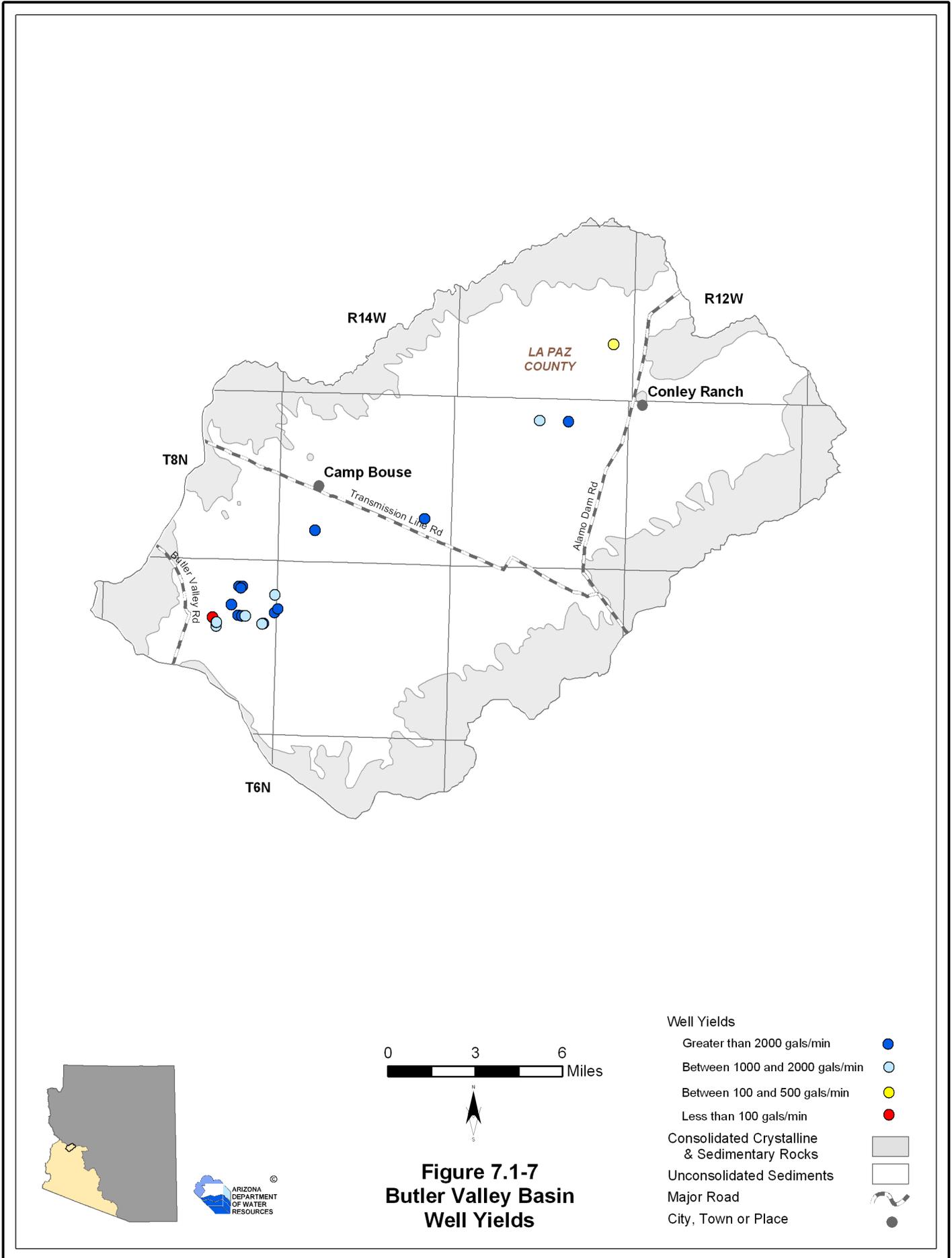
¹Predevelopment Estimate



**Figure 7.1-5
Butler Valley Basin
Groundwater Conditions**

**Figure 7.1-6
Butler Valley Basin
Hydrographs Showing Depth to Water in Selected Wells**





7.1.7 Water Quality of the Butler Valley 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 7.1-4A. There are no impaired lakes or streams in this basin. Figure 7.1-8 shows the location of water quality occurrences keyed to Table 7.1-4. 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 7.1-4A.
- Eight 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 and nitrates.

Table 7.1-4 Water Quality Exceedences in the Butler Valley Basin¹

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	8 North	14 West	20	As, F
2	Well	8 North	14 West	29	As, F, Pb
3	Well	7 North	15 West	2	F
4	Well	7 North	15 West	10	F
5	Well	7 North	15 West	12	As
6	Well	7 North	15 West	13	As
7	Well	7 North	15 West	15	F
8	Well	7 North	15 West	15	F, NO3

Source: Compilation of databases from ADWR & others

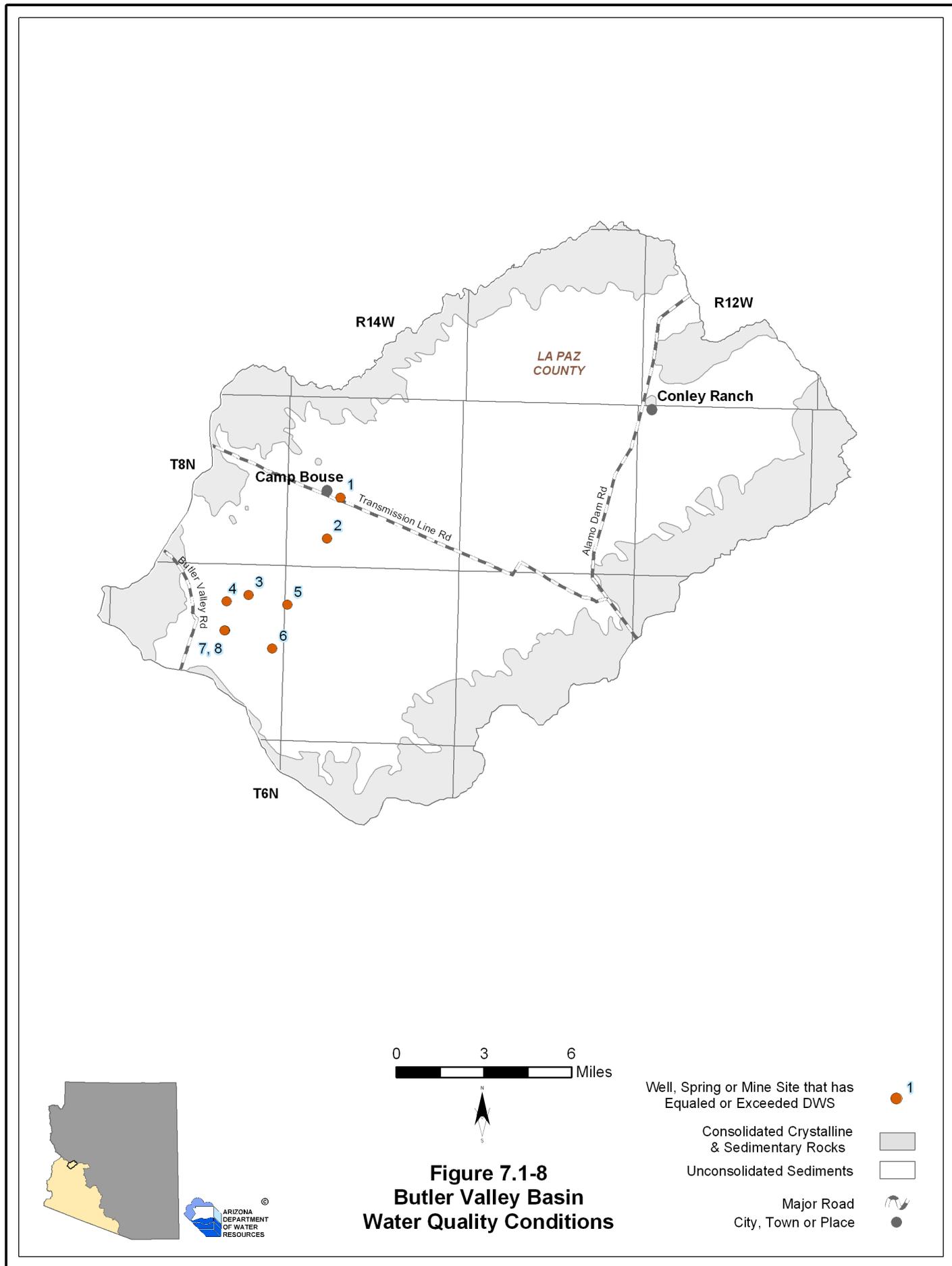
B. Lakes and Streams

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 1979 and 1998.

² As = Arsenic
NO3 = Nitrate
F = Fluoride
Pb = Lead



7.1.8 Cultural Water Demands in the Butler Valley 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 7.1-5. Figure 7.1-9 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 7.1-5 and Figure 7.1-9.
- Population in this basin is very small, with 15 residents in 2000.
- There are no surface water diversions in this basin. Most cultural water use is for irrigation east of Butler Valley Road in the southwestern portion of the basin. Agricultural water use increased 185% from 1991-2005 with 9,700 acre-feet of demand per year on average from 2001 to 2005.
- Municipal water demand is minimal and did not increase from 1991 to 2005.
- As of 2005 there were 18 registered wells with a pumping capacity of less than or equal to 35 gpm and 21 wells with a pumping capacity of more than 35 gpm.

Table 7.1-5 Cultural Water Demand in the Butler Valley Basin¹

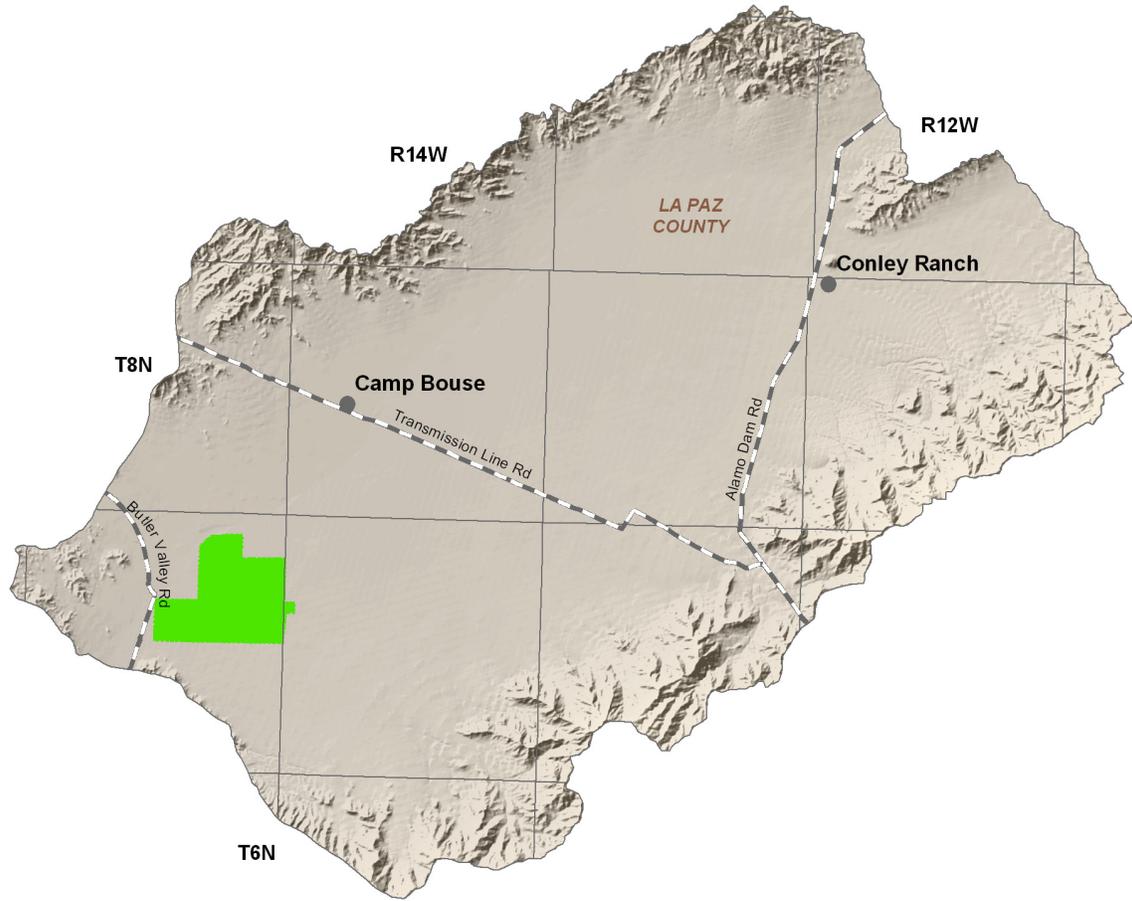
Year	Estimated and Projected Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)						Data Source
				Well Pumpage			Surface-Water Diversions			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Agricultural	Municipal	Industrial	Agricultural	
1971										
1972										
1973						4,000			NR	
1974										
1975		12 ²	19 ²							
1976										
1977						4,000			NR	
1978										
1979										
1980	5									
1981	6									
1982	6									
1983	7	1	0			4,000			NR	
1984	7									
1985	8									
1986	8									
1987	9									
1988	9	2	0			4,000			NR	
1989	10									
1990	10									
1991	11									
1992	11									
1993	12	2	0	<300	NR	3,400 ³			NR	
1994	12									
1995	13									
1996	13									
1997	14									
1998	14	1	2	<300	NR	8,300			NR	
1999	15									
2000	15									
2001	15									
2002	15									
2003	15	0	0	<300	NR	9,700			NR	
2004	15									
2005	15									
2010	15									
2020	15									
2030	16									
WELL TOTALS:		18	21							

¹ Does not include effluent or evaporation losses from stockponds and reservoirs.

² Includes all wells through 1980.

³ Data not available for 1991-1993, average shown is 1994-1995

NR - Not reported



Primary Data Source: USGS National Gap Analysis Program, 2004

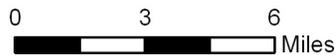


Figure 7.1-9
Butler Valley Basin
Cultural Water Demand

Demand Centers

- Agriculture 
- Major Road 
- City, Town or Place 

7.1.9 Water Adequacy Determinations in the Butler Valley 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 7.1-6. Figure 7.1-10 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 La Paz County. One water adequacy determination for 76 lots has been made in this basin through December 2008; all lots were inadequate.
- The reason for the inadequacy was because the applicant chose not to submit necessary information and/or available hydrologic data were insufficient to make a determination.

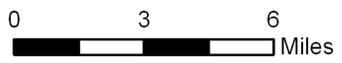
Table 7.1-6 Adequacy Determinations in the Butler Valley Basin¹

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	Saguaro Acres	La Paz	7 North	13 West	7	76	53-402268	Inadequate	A1	9/6/2006	Dry Lot Subdivision

Source: ADWR 2008

Notes:

- ¹Each 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 unavaible; 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 = Data not currently available to ADWR



Adequacy Determinations

- Inadequate
- Consolidated Crystalline & Sedimentary Rocks
- Unconsolidated Sediments
- Major Road
- City, Town or Place

Figure 7.1-10
Butler Valley Basin
Adequacy Determinations



Butler Valley Basin

References and Supplemental Reading

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