Tables

TABLE 3-1. HISTORIC ACCOUNTS OF STREAMFLOW CONDITIONS [1]

STREAM	MAP KEY [2]	DATE	SUMMARY OF ACCOUNT	SOURCE
San Pedro River	1	1855	Intermittent flow within gorge downstream of Tres Alamos Wash	Parke (1857)
	2		Ephemeral or intermittent flow in lower "few" miles above confluence with Gila River [3]	
	3	1858	Intermittent or interrupted perennial flow for 35 miles below Tres Alamos Wash	Hutton (1859) and Leach (1858)
	4	1865-68	Large cienega located at Grijalba Canal supplies water to Archibald and DeLong Canals	Grijalba (1889)
	5	1870-73	Ephemeral flow at confluence with Aravaipa Creek	Bourke (1891)
	6	1873	No flow within Townships 15, 16 and 17 South, Range 20 East	SGO (1873)
	7	1873-89	Entire flow diverted most years by Dunbar and Montgomery (McCormick) Canals	Grijalba (1889)
	8	1877-85	Intermittent flow with water confined to pools during the dry season in Section 34 of Township 11 South, Range 18 East	Caldwell (1887)
	9	1886	Water only in Section 31 of Township 17 South, Range 21 East	SGO (1886)
	10	before 1889	Large cienega from Hughes (Madrid) Canal to Gibson Canal; reach previously had beaver ponds	Grijalba (1889)
	11		Large cienega from the city of Benson to Tres Alamos Wash	
	12		Size of 20-acre cienega and 3 beaver ponds located 0.75 miles upstream of the Narrows reduced considerably by 1889	Hill (1889)
	13	1901	"Fine flow of water" within Township 23 South, Range 22 East	SGO (1901)
	14		"Well watered along river" in Township 21 South, Range 21 East	
	15	1909	Perennial flow (80 miners inches) within Township 21 South, Range 22 East	SGO (1909)
	16	before 1934	Diversions at and downstream of Acton-Clark Canal caused intermittent flow for "several" miles below Mammoth [3]	Bryan and others (1934)
Babocomari River	17	1879	Streamflow for 4 miles within land grant in Township 20 South, Range 20 East	SGO (1879)
	18	1883-89	Intermittent or interrupted perennial flow from 3 miles above Douglas (Harris) Canal to 0.25 miles below	Miller (1900)
	19		Entire flow diverted at Douglas (Harris) Canal	
	20	1883-89	Perennial flow from 11 miles above Miller (Land) Canal to 0.5 miles below; 2- to 3-acre cienega at Miller Canal	Douglas (1898)
	21	before 1889	Intermittent or interrupted perennial flow from large cienega at Babocomari Ranch to Huachuca Siding	Hill (1889)
	22		Perennial from 4 miles above mouth to cienega at railroad crossing	
	23		5- to 10-acre cienega immediately upstream of railroad crossing	
	24		Intermittent streamflow from cienega 1.5 miles to confluence	
	25	1896	Entire flow diverted at Miller (Land) Canal and cienega dried up	Douglas (1898) and Miller (1900)
	26	1909	Perennial flow (10 miners inches) within Township 21 South, Range 19 East	SGO (1909)
	27		Perennial flow (50 miners inches) within Township 20 South, Range 20 East	
Aravaipa Creek	28	1858	Perennial flow from large cienega 5 miles above canyon to canyon mouth	Hutton (1859) and Leach (1858)
	29	1858, 70-73	Ephemeral flow from canyon mouth to confluence	Bourke (1891), Hutton (1859), and SGO (1870)
	30	before 1934	Entire flow diverted at canyon mouth; ephemeral flow downstream to confluence	Bryan and others (1934)

Notes:
[1] Only major streams in the watershed and accounts that could be located on current maps are listed.
[2] Location of streamflow conditions are shown in Figure 3-6.
[3] For purposes of mapping, "few" and "several" were assumed to be approximately 3 miles.

TABLE 3-2. EARLY STREAMFLOW RECORDS FROM GAGING STATIONS [1]

STREAM	USGS GAGE NUMBER (location) [2,3]	PERIOD OF RECORD	NO. OF DAILY MEAN FLOW MEASUREMENTS	TYPICAL FLOW DURATION (% of days each year with flow)[4]	STREAMFLOW REGIME[5]
San Pedro River	9470500 (at Palominas)	1930-33, 35-41	3,485	100%	Perennial
	unnumbered (at Hereford Bridge)	1919-21	711	100%	Perennial
	9471000 (at Charleston)	1904-05, 12-26, 28-33, 35-40	9,756	100%	Perennial
	9471500 (at Fairbank)	1926-28	731	100%	Perennial
	9472500 (near Mammoth)	1931-41	3,708	52%	Intermittent
	unnumbered (at Winkelman Bridge)	1922-27, 29-41[6]	1,648 (plus 319 semi-weekly data)	100%	Perennial
Babocomari River	unnumbered (at Huachuca Siding)	1920-25	1,738	17%	Ephemeral
Aravaipa Creek	9473000 (near Mammoth)	1931-42	4,168	100%	Perennial
	9473020 (near Fieldman)	1919-1921	884	24%	Ephemeral

Notes:

[1] Data sources: Schwalen (various dates) and USGS (2008).

[2] Gage locations are shown in Figure 3-8; only major streams in the watershed were considered.

[3] Records for unnumbered gages collected by Schwalen.

[4] Based on median of daily or weekly flows calculated over period of record.

[5] A stream is considered perennial in this report if its typical flow duration was 100%, and intermittent if its flow duration was less than 100% but seasonal baseflow was measured.

[6] From 1929-41, only semi-weekly data were collected.

TABLE 3-3. EARLY CANAL DIVERSIONS [1]

MONTH/YEAR	1921	1922	1923	1924	1925	1926	1927
St. David Canal Diversions (in acre-feet) [2]							
January	892	1,010	394	984	480	394	467
February	916	566	504	92.2	639	590	523
March	707	683	424	529	535	400	553
April	412	350	197	418	111	523	603
May	197	271	79.9	86.1	61.5	283	756
June	0	43	0	18.4	18.4	43	609
July	0	0	0	0	105	0	not reported
August	0	0	0	0	320	0	
September	0	0	0	0	449	43	
October	0	49.2	98.4	0	443	0	
November	0	135	541	184	590	61.5	
December	228	277	578	338	590	504	
Benson Canal Diversions (in acre-feet) [2]							
January	455	842	719	400	658	0	not reported
February	350	394	739	428	611	344	
March	498	240	984	683	541	406	
April	232	280	440	601	274	589	
May	443	271	271	547	326	301	
June	375	208	226	196	541	173	
July	879	1,180	277	437	793	not reported [3]	
August	0	1,110	0	461	762		
September	1,610	601	333	71	571		
October	1,640	31	750	98	480		
November	1,260	36	732	196	345		
December	1,410	178	80	492	0		

Notes:

[1] Data source: Schwalen (1921-27).

[2] Canal locations are shown in Figure 3-8; only major streams in the watershed were considered.

[3] Although total monthly flows were not recorded, flows were periodically measured during these months and are shown in Figure 3-9.

TABLE 3-4. INSTREAM FLOW CLAIMS[1]

STREAM	MAP KEY [2]	CLAIM INFORMATION					STREAMFLOW DATA SOURCES [4]
		Application No.	Applicant	Filing Date[3]	Status	Average Monthly Flow (in cfs)	
San Pedro River	1	33-90103.1	Bureau of Land Management (BLM)	8/12/1985	Certificated	5.1 to 15.2	USGS Gages 9470500 and 9471000
	2	33-95780.0		1/8/1991	Pending	5.1	USGS Gage 9470500
Babocomari River	3	33-95487.0	BLM	10/2/1990	Pending	4.5	BLM (1991)
Aravaipa Creek	4	33-87114.0	BLM	6/1/1981	Certificated	15	BLM and TNC data (1978-95)
	5	33-95488.0	The Nature Conservancy (TNC)	10/31/1990		17.5	
	6	33-95489.0				18.8	
	7	33-95490.0				15.5	
	8	33-95771.0				14.4	USGS Gage 9473000

cfs = cubic feet per second

Notes:

[1] Based on current query of ADWR's surface water rights registry. Only major streams in the watershed were considered; instream flow claims for floodwater are not listed.

[2] See Figure 3-17 for location of stream reaches with instream flow claims.

[3] The priority date of certificated water rights is the date of filing.

[4] See Figure 3-8 for location of USGS gaging stations.

TABLE 3-5. RECENT STREAMFLOW RECORDS FROM GAGING STATIONS[1,2]

STREAM	USGS GAGE NUMBER (location)[3]	PERIOD OF RECORD	NO. OF DAILY MEAN FLOW MEASUREMENTS	TYPICAL FLOW DURATION (% of days each year with flow)[4]	STREAMFLOW REGIME[5]
San Pedro River	9470500 (at Palominas)	1950-81, 1990-91, 1995-08	16,348	87%	Intermittent [7]
	9471000 (at Charleston)	1940-08	24,519	100%	Perennial
	9471040 (at Charleston Mesquite transect)	2001-02	246	100%	Perennial [8]
	9471070 (at Boquillas-UA transect)	2001-02	195	100%	Perennial [8]
	9471550 (near Tombstone)	1967-86, 1996-08	11,493	86%	Intermittent [7]
	9471560 (St. David Ditch near St. David) [6]	1967-72	1,947	56%	Intermittent
	9471565 (at St. David transect)	2001-02	336	100%	Perennial [8]
	9471590 (Pomerane Canal near St. David) [6]	1967-72	1,936	48%	Intermittent
	9471800 (near Benson)	1966-76, 2005-08	4,958	21%	Ephemeral
	9472000 (near Redington)	1943-47, 1950-98	19,018	69%	Intermittent
	9472050 (at Redington Bridge)	1998-08	3,723	19%	Ephemeral
	9473100 (below Aravaipa Creek)	1979-83	1,461	100%	Perennial
	9473400 (near Winkelman)	1962-65	1,360	100%	Perennial
	9473500 (at Winkelman)	1966-78	4,748	79%	Intermittent
Babocomari River	9471380 (near Huachuca City)	2000-07	2,274	100%	Perennial
	9471400 (near Tombstone)	2000-07	2,752	92%	Intermittent [7]
Aravaipa Creek	9473000 (near Mammoth)	1966-07	18,532	100%	Perennial

Notes:

[1] Data source: USGS (2008).

[2] Does not list 11 temporary USGS gages located within SPRNCA with monthly streamflow data for July 2000 through September 2003. Streamflow regime was perennial or intermittent at all of these gages.

[3] Gage locations, including the temporary gages, are shown in Figure 3-8; only gages on major streams in the watershed were considered.

[4] Based on median of daily flows calculated over period of record; provisional records for active gages were not included.

[5] A stream is considered perennial in this report if its typical flow duration was 100%, and intermittent if its flow duration was less than 100% but seasonal baseflow was regularly measured.

[6] Gage recorded ditch/canal diversions from the river; frequency of diversions used to infer streamflow conditions.

[7] Flow was perennial during some years of record.

[8] Less than one year of record was available at station to evaluate flow frequency; ADWR used available data from temporary USGS gages to extend period of record. See note 2 above.

TABLE 4-1. ARCHEOLOGICAL AGE DATA FOR FLOODPLAIN HOLOCENE ALLUVIUM [1]

AZGS UNIT [2]	NUMBER OF ARCHEOLOGICAL SITES [3]		LOCATION	EVIDENCE OF AGE				APPROXIMATE AGE
	Surface	Subsurface (buried)		Historic Artifacts	Carbon-14	Ceramics	Structures [4]	
Qycr (youngest)	0	0	---					Younger than Qy3r [5]
Qy4r	0	0	---					
Qy3r	5	0	Brandenburg Mountain, Hereford, Lewis Springs, and Lookout Mountain USGS Quad Maps	✓				1890 to 1930 or younger
Qy2r	31	17	Eureka Wash, Fairbank, Galleta Flat East, Hereford, Huachuca City, Land, Lewis Springs, Lookout Mountain, Peppersauce Wash, Redington, St. David, Soza Canyon, and Winkelman USGS Quad Maps	✓	✓	✓	✓	1,000 to 3,500 years before present
Qy1r (oldest)	"several"	0	Not specified	Not specified				Generally older than 3,500 years before present [5]

Notes:

[1] Sources: AZGS (2009) and Pearthree (2009).

[2] These five geologic units were identified by the Arizona Geological Survey (AZGS) and are considered by ADWR to represent the floodplain Holocene alluvium.

[3] Only archeological sites recorded within the floodplain alluvium of the San Pedro and Babocomari Rivers and Aravaipa Creek are summarized in this table; site information was downloaded from the AZSITE database maintained by the Arizona State Musuem.

[4] Includes pithouse villages, masonry/adobe structures, and rock piles.

[5] Based on stratigraphic relationship with other units above or below.

TABLE 4-2. AZGS MAP UNITS USED BY ADWR TO DEFINE GENERALIZED GEOLOGIC UNITS

GENERALIZED GEOLOGIC UNIT	AZGS MAP UNITS [1,2]	GENERALIZED GEOLOGIC UNIT	AZGS MAP UNITS [1,2]
Floodplain Holocene Alluvium	Qycr, Qy1r, Qy2r, Qy3r and Qy4r	Bedrock	Ꞓa, Ꞓal, Ꞓam, Ꞓau, Ꞓb, db, Dm, ds, gru, Jtrm, Jtrms, Ka, Kad, Kai, Kam, Kap, Kb, Kbi, Kdx, Kg, Kgs, KJb, Kl, Kr, Kra, Krd, Krt, Ks, Kt, Ktx, Ku, Kux, Kuxa, Me, Mzs, Pc, Pcn, Pe, **P**hMet, pi, P**P**eht, P**P**et, Ps, py, Qc, Ql, Qt, QTC, Qtc, Ta, Tad, Tar, Taru, Tcb, Tcd, Tcg, Tcv, Tg, Tgm, Tgv, Th, Thh, Thj, TKh, TKm, tl, Tlav, Tro, Trx, Tsc, Tsmm, Tsmv, Ttb, tu, Tuav, Tvm, Tw, Twt, Xdj, Xgj, Yd, Yds, Ydsb, Ym, Yo, Yoa, Yp and Yt
Tributary Holocene Alluvium	Qy, Qyc, Qy1, Qy2, Qyaf [3], and Qy3		
Disturbed	d		
Basin Fill	Qcg, Qcr, Qi, Qi1, Qi1r, Qi2, Qi2a, Qi2b, Qi2r, Qi3, Qi3a, Qi3c, Qi3r, Qir, Qiu, Qo, Qor, Qp, Qs, QTa, QTbf, QTcg, QTcr, QTcs, QTs, QTsc, QTsd, QTsf, QTsl, QTsr, Qy1f, Qyaf [3], Qyi, Qyp, Qys, Tq, Tqa, Tqc, Tqe, Tqf, Tql, Tqm, Tqp, Tqr, Tqs, Tqse, Ts, Tsd, Tsdl, Tsp, and Tsy		

Notes:

[1] Map units are described in a 2009 report by the Arizona Geological Survey (AZGS); see Appendix C-1 of this report.

[2] Several of the AZGS map units are depicted in Figure 4-1.

[3] ADWR considers Qyaf to be Tributary Holocene Alluvium where it borders Floodplain Holocene Alluvium. Elsewhere, ADWR considers Qyaf to be basin fill.