

Compilation of Records of Surface Waters of the United States through September 1950

Part 9. Colorado River Basin

Prepared under the direction of J. V. B. WELLS, Chief, Surface Water Branch

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1313



784. Verde River above Bartlett Reservoir, near Cave Creek, Ariz.

Location.--Lat 33°57', long. 111°41', in SE¼ sec. 13, T. 7 N., R. 6 E., unsurveyed, 4.5 miles downstream from Horseshoe Dam, 16 miles upstream from Bartlett Dam, and 17 miles northeast of Cave Creek.

Drainage area.--6,040 sq mi, approximately.

Gage.--Water-stage recorder. After November 1942, also an automatic radio transmitter. Datum of gage is 1,829.5 ft above mean sea level, datum of 1929.

Average discharge.--7 years (1938-45), 601 cfs.

Extremes.--1938-45: Maximum discharge, 43,800 cfs Mar. 14, 1941 (gage height, 17.85 ft); minimum, 4.9 cfs Nov. 23, 1945 (gage height, 2.30 ft), regulated at Horseshoe Dam.

Maximum discharge since 1924, 100,000 cfs Mar. 3, 1938 (gage height, 25.0 ft, from floodmarks), based on comparison of peak discharge at other stations on Verde River.

Remarks.--Diversions for irrigation above station of about 12,500 acres in 1947, about 3,000 acres of which were supplied by pumping from ground water. Regulation at Horseshoe Dam began Nov. 15, 1945, although there was slight regulation prior to that during construction.

Monthly and yearly mean discharge, in second-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1939	167	205	375	291	336	861	322	124	89.4	89.0	309	1,391	379
1940	207	232	253	333	930	386	267	152	133	106	356	321	304
1941	735	430	2,167	1,372	3,387	4,873	4,671	665	207	239	268	328	1,599
1942	525	392	429	540	371	990	654	246	124	132	173	148	395
1943	186	230	274	429	640	1,757	253	136	103	97.8	430	197	395
1944	230	212	308	298	773	2,621	1,717	347	126	122	140	201	591
1945	216	275	283	315	546	2,150	1,735	239	117	150	362	129	543
1946	221	171	307	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1939	10,250	12,190	23,050	17,920	18,640	52,970	19,180	7,620	5,320	5,470	18,970	82,770	274,400
1940	12,720	13,800	15,560	20,460	53,470	23,720	15,890	9,330	7,910	6,500	21,860	19,140	220,300
1941	45,200	25,560	133,200	84,340	188,100	299,600	277,900	40,880	12,310	14,670	16,460	19,530	1,158,000
1942	32,290	23,330	26,370	33,210	20,630	60,890	38,900	15,150	7,360	8,090	10,660	8,820	285,700
1943	11,450	13,670	16,860	26,380	35,550	108,000	15,070	8,370	6,130	6,010	26,440	11,700	285,600
1944	14,140	12,630	18,960	18,340	44,490	161,100	102,200	21,310	7,500	7,500	8,640	11,970	428,800
1945	13,270	16,340	17,380	19,350	30,300	132,200	103,200	14,690	6,970	9,250	22,260	7,690	392,900
1946	13,570	10,160	18,890	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in second-feet

Year	W. S. P. no.	Water year ending Sept. 30				Calendar year		
		Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
		Discharge	Date					
1939	879	17,700	Sept. 14, 1939	61	379	274,400	374	270,900
1940	899	5,020	Feb. 27, 1940	68	304	220,300	527	382,200
1941	929	43,800	Mar. 14, 1941	131	1,599	1,158,000	1,431	1,036,000
1942	959	3,510	Oct. 14, 1941	98	395	285,700	339	245,700
1943	979	16,600	Aug. 14, 1943	77	395	285,600	400	289,400
1944	1009	7,530	Mar. 14, 1944	85	591	428,800	592	430,000
1945	1039	9,710	Mar. 16, 1945	91	543	392,900	537	388,500
1946	1059	-	-	-	-	-	-	-

785. Verde River below Bartlett Dam, Ariz. 1/

Location.--Lat 33°48'30", long. 111°40'00", in NE¼ sec. 6, T. 5 N., R. 7 E., 2¼ miles downstream from Bartlett Dam and 3¼ miles upstream from Camp Creek.

Drainage area.--6,160 sq mi, approximately, at site used since January 1942; 6,180 sq mi, approximately, at sites used February 1925 to December 1941; 6,620 sq mi, approximately, at sites used prior to February 1925.

Gage.--Water-stage recorder at present site since Jan. 1, 1942. Datum of gage is 1,572.34 ft above mean sea level, datum of 1929. Prior to Feb. 17, 1925, staff gages at several sites about 20 miles downstream and from 0.7 to 1.4 miles above mouth, at different datums. Feb. 17, 1925, to Dec. 31, 1941, water-stage recorder about 3¼ miles downstream, at two sites, 500 feet and half a mile, respectively, above Camp Creek, at different datums.

Average discharge.--62 years (1888-1950), 726 cfs (revised), adjusted for storage in Bartlett and Horseshoe Reservoirs.

1/ Published as "near Fort McDowell" in 11th Annual Report, as "1 mile above Salt River" in 12th Annual Report, as "at mouth" in 18th Annual Report, as "above Salt River" in Bulletin 140, as "at McDowell" in Water-Supply Paper 73, as "at McDowell, near Lehi" in Water-Supply Paper 100, as "near McDowell" for November 1913 to February 1925, and as "above Camp Creek, near McDowell" for February 1925 to December 1941.

Extremes,--1888-1939: Maximum discharge not determined but probably exceeded 150,000 cfs Feb. 24, 1891 (date corrected); minimum daily, 29 cfs July 11, 13, 1901.
 1939-50: Maximum discharge, 45,800 cfs Mar. 15, 1941 (gage height, 17.5 ft, present site and datum, from floodmarks); no flow at Bartlett Dam at times in several years when gates were closed.

Remarks,--Diversions for irrigation above station of about 12,500 acres (in 1950), some of which is by pumping from ground water. Flow completely regulated by Bartlett Dam since Feb. 5, 1939, and by Horseshoe Dam (see Reservoir system on Verde River elsewhere in this report) since Nov. 15, 1945, except during periods of spill. Records at sites used before and after 1925 are comparable; difference in flow is probably well under 5 percent, as the intervening area contributes little runoff except during infrequent storms.

Cooperation,--Records of monthly discharge for Salt River at Arizona Dam, used in computing estimates for Verde River for 1888-94 and 1900, furnished by Arizona Canal Company. Records of monthly discharge for 1895-96 furnished by Hudson Reservoir Company, and for 1910-12 by Bureau of Reclamation. Records of daily discharge for 1907-9 and 1913-17 furnished by Bureau of Reclamation and for 1918 to April 1934 by Salt River Valley Water Users' Association.

Monthly and yearly mean discharge, in second-feet, of Verde River below Bartlett Dam, Ariz.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1888	-	-	-	-	-	-	-	-	-	-	172	168	-
1889	166	421	3,349	2,498	1,172	3,411	795	197	141	208	204	250	1,074
1890	220	288	2,843	2,092	4,544	2,504	368	174	153	220	1,904	1,123	1,353
1891	1,384	2,359	3,130	1,435	17,470	1,928	534	458	401	314	278	395	2,401
1892	258	256	328	284	192	160	87.6	91.2	52.2	152	198	164	186
1893	223	257	282	231	672	1,196	290	150	68	225	802	530	410
1894	376	296	315	244	259	530	171	68	79	119	439	292	266
1895	242	230	442	4,037	1,688	3,720	750	258	153	145	359	176	1,019
1896	475	463	391	325	307	283	220	172	117	862	849	557	420
1897	452	492	352	2,138	873	1,504	189	269	150	130	439	992	748
1898	305	262	267	253	494	639	319	184	139	323	400	338	326
1899	169	195	303	350	344	260	205	152	152	365	434	357	274
1900	549	222	217	189	199	160	87.6	91.2	52.2	51.6	150	121	175
1901	183	430	224	351	1,859	895	185	140	105	210	627	92.7	433
1902	134	245	268	226	249	246	220	184	117	86	478	1,057	292
1903	144	208	441	250	362	1,475	745	141	136	232	329	513	580
1904	318	207	227	237	226	184	119	126	62.9	729	1,624	482	381
1905	188	210	241	1,419	7,709	8,780	227	832	283	245	567	771	2,167
1906	544	3,432	875	812	1,202	5,461	1,029	247	150	234	743	211	1,246
1907	181	312	2,640	2,429	2,619	3,767	838	251	209	217	430	404	1,188
1908	614	375	323	306	1,973	1,395	301	443	146	462	880	356	628
1909	265	281	3,129	1,760	1,459	2,029	258	200	135	379	1,254	475	1,054
1910	160	221	354	3,563	513	1,288	839	140	64.6	125	313	221	655
1911	194	327	304	2,904	2,514	2,372	430	480	284	444	245	552	918
1912	681	510	590	300	300	1,465	1,114	263	229	311	487	202	621
1913	688	256	246	229	682	1,801	411	115	134	153	220	361	523
1914	204	339	306	957	3,045	717	251	154	114	204	234	230	546
1915	327	270	652	1,241	2,448	*3,591	*2,180	*2,663	207	332	349	173	*1,202
1916	177	248	393	*8231	*3,766	*5,184	696	232	159	201	508	1,296	*1,759
1917	726	327	340	1,222	1,496	1,760	1,005	1,253	234	417	727	389	1,234
1918	247	243	266	394	904	4,613	355	160	137	191	545	190	690
1919	193	346	458	345	953	1,560	330	173	118	2,126	906	471	749
1920	741	2,850	2,230	2,235	8,956	1,883	1,041	305	209	180	456	228	1,744
1921	241	463	342	315	335	522	236	167	126	296	1,695	367	428
1922	442	288	1,437	2,594	2,749	3,279	1,070	256	163	209	333	240	1,082
1923	185	283	1,229	347	1,222	2,207	794	193	116	199	254	1,929	742
1924	270	968	3,500	994	358	523	646	172	99.2	187	105	202	754
1925	228	212	433	298	329	413	45?	204	124	204	354	1,128	364
1926	779	341	368	298	293	720	42?	408	117	193	248	347	708
1927	246	215	432	320	7,080	2,029	809	195	202	259	474	1,828	1,130
1928	279	297	424	480	1,422	995	241	169	112	133	482	189	432
1929	263	275	303	320	412	1,368	143	149	116	164	581	390	539
1930	175	217	234	291	443	1,341	545	175	98.8	312	624	283	396
1931	225	514	356	229	3,019	639	252	246	97.0	161	779	376	557
1932	213	600	948	478	6,454	3,640	777	199	137	224	247	134	1,150
1933	292	208	294	382	364	726	299	344	148	182	164	231	303
1934	233	206	253	260	269	226	257	120	106	124	452	215	227
1935	166	267	317	1,046	2,236	1,971	1,000	183	114	120	592	485	698
1936	238	246	278	265	866	969	692	150	92.5	223	434	318	396
1937	211	312	291	461	6,333	4,076	1,420	188	142	216	163	187	1,131
1938	205	215	262	272	406	4,715	223	128	98.7	138	290	203	602
1939	163	202	389	297	338	806	396	129	86.1	82.5	297	968	345
1940	422	275	388	297	546	668	343	154	90.6	146	281	343	329
1941	531	447	302	466	3,370	4,902	4,827	645	986	813	794	1,182	1,588
1942	229	242	105	58.9	173	799	814	720	862	550	178	133	406
1943	144	215	172	322	449	950	972	727	114	96.8	62.9	473	391
1944	298	219	33.6	303	233	969	716	714	901	561	780	527	604
1945	186	28.2	443	280	466	886	1,175	768	774	380	432	754	547
1946	217	170	229	254	315	259	607	319	140	67.4	122	471	263
1947	96.9	124	464	210	465	577	381	225	139	130	60.1	321	265
1948	366	217	426	185	112	673	928	259	242	96.8	131	293	328
1949	225	117	150	88.8	544	1,662	610	1,340	710	530	597	935	711
1950	331	27.3	222	321	542	512	483	132	364	265	465	312	330

* Revised.

Yearly discharge, in second-feet, of Verde River below Bartlett Dam, Ariz.--Continued

Year	W.S.P. no.	Water year ending Sept. 30				Calendar year		
		Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
		Discharge	Date					
1901	73,75	-	-	29	433	313,200	417	301,800
1902	73,1049	-	-	-	292	211,100	304	220,200
1903	100,1049	-	-	-	580	419,900	576	417,400
1904	133	-	-	32	381	276,700	371	269,700
1905	175	-	-	119	2,167	1,569,000	2,516	1,821,000
1906	211	96,000	Nov. 27, 1905	105	1,246	901,700	1,108	802,300
1907	249	-	-	144	1,188	860,000	1,033	740,000
1908	249	-	-	98	628	455,700	828	601,200
1909	269	-	-	116	1,054	763,400	805	582,700
1910	289	-	-	-	655	474,100	662	479,300
1911	309	-	-	-	918	664,400	999	724,200
1912	329	-	-	-	621	452,200	572	415,100
1913	359,1049	-	-	46	523	378,800	494	357,700
1914	389	-	-	78	546	395,400	580	420,100
1915	409,1213	-	-	95	*1,202	*870,400	*1,166	*844,000
1916	(b)	-	-	115	*1,759	*1,277,000	*1,808	*1,312,000
1917	459,1049	-	-	128	1,234	893,200	1,180	854,200
1918	479,1049	-	-	112	690	499,800	711	514,400
1919	509	-	-	80	749	542,100	1,152	833,800
1920	509	-	-	117	1,744	1,266,000	1,346	977,400
1921	529	-	-	80	428	309,600	523	378,900
1922	549	-	-	120	1,082	783,200	1,042	754,300
1923	569	-	-	88	742	537,300	999	722,900
1924	589	-	-	72	754	547,500	429	311,400
1925	609,1049	120,000	Sept. 17, 1925	111	364	263,500	416	301,000
1926	629,1049	132,000	Apr. 6, 1926	96	708	512,700	658	476,400
1927	649,1049	170,000	Feb. 17, 1927	108	1,130	818,200	1,139	824,500
1928	669	114,000	Feb. 5, 1928	85	432	313,900	419	304,100
1929	689,1049	126,000	Apr. 5, 1929	88	539	390,400	521	377,300
1930	704	18,100	Aug. 9, 1930	60	396	286,600	435	314,800
1931	719	134,000	Feb. 14, 1931	77	557	403,400	614	444,200
1932	734	153,000	Feb. 9, 1932	100	1,150	835,000	1,070	776,400
1933	749	11,660	Mar. 13, 1933	74	303	219,700	295	213,400
1934	764	3,300	Aug. 25, 1934	69	227	164,200	232	167,600
1935	789	14,300	Feb. 7, 1935	79	698	505,500	699	506,400
1936	809	12,000	Feb. 24, 1936	64	396	287,400	400	290,400
1937	829	63,000	Feb. 7, 1937	92	1,131	819,200	1,121	811,300
1938	859	95,000	Mar. 4, 1938	84	602	436,000	608	440,500
1939	879	2,120	Sept. 11, 1939	58	345	250,100	373	270,300
1940	899	2,120	Mar. 9, 1940	3	329	238,900	345	250,500
1941	929	45,800	Mar. 15, 1941	5	1,588	1,150,000	1,529	1,107,000
1942	959	1,920	Apr. 3, 1942	2	406	293,900	402	291,300
1943	979	1,780	Mar. 17, 1943	0	391	282,800	392	284,000
1944	1009	2,940	Mar. 29, 1944	4	604	438,500	614	445,400
1945	1039	1,860	Sept. 10, 1945	.4	547	395,900	543	393,100
1946	1059	1,990	Dec. 29, 1945	2	263	190,400	269	194,700
1947	1089	1,050	Mar. 15, 1947	6	265	191,700	292	211,500
1948	1119	2,200	Dec. 28, 1947	2	328	237,800	284	206,200
1949	1149	2,910	Mar. 24, 1949	3	711	515,100	719	520,700
1950	1179	1,640	Feb. 23, 1950	7	330	239,000	-	-

* Revised.

† Not previously published.

b Water-Supply Papers 439,1049,1213.

786. Diversion for city of Phoenix from Verde River, at McDowell, Ariz.

Location.--Lat 33°33', long. 111°40', in SE¼ sec. 6, T. 2 N., R. 7 E., near mouth of Verde River, 1 mile downstream from pump on river, 6 miles downstream from infiltration galleries, and 6.1 miles south of McDowell.

Determination of discharge.--Computed from records of Sparling meter on pipeline since May 1950.

February 1922 to December 1928 and April to May 1929, computed on basis of records of water consumption and pumpage.

January 1929 to May 1950, except for April and May 1929, computed on basis of water-stage recorder and weir 2 miles upstream.

Remarks.--Water is pumped from infiltration galleries and shallow wells, and since May 1950, also directly from Verde River. Infiltration galleries and shallow wells are on right bank in SE¼ sec. 6, T. 3 N., R. 7 E., three-quarters of a mile downstream from McDowell and 6¼ miles upstream from mouth of river; pump taking water directly from river is located in SE¼ sec. 31, T. 3 N., R. 7 E., 6 miles downstream from McDowell and 1 mile upstream from mouth. Water is carried 29 miles by pipe line for municipal supply of Phoenix. Waste below point of measurement is negligible.

Cooperation.--Records collected by city of Phoenix and furnished by Salt River Valley Water Users' Association.