

Appendix B. Isotope data for wells and springs (1986 to 2003), Verde River headwaters, Arizona. Methods and laboratories described in Chapter E, this volume.

[E, estimated; nd, not determined; <, less than]

Local ID (Township, Range, Section)	STAID Station no.	Name(s) used in this report or other reports	Collecting agency	Date (mm/dd/yyyy)	Sample start time	Oxygen-18/ Oxygen-16 ratio, water, unfiltered (per mil)	Deuterium/ Protium ratio, water, unfiltered (per mil)	Carbon-13/ Carbon-12 ratio, water, unfiltered (per mil)	Carbon-14 activity, water, unfiltered (% modern carbon)	Carbon-14 2-sigma uncertainty, water, unfiltered (% modern carbon)	Tritium, water, unfiltered (picocuries/ L)	Tritium 2-sigma combined uncertainty (picocuries/ L)	Tritium, water, unfiltered (TU)	Tritium 2-sigma combined uncertainty (TU)
High-Altitude Springs and Tributaries south and west of Big Chino Valley														
B-13-03 14dcc	342934112322501	Aspen Creek spring	USGS	04/16/2001	1530	-11.1	-75.1							
B-14-03 11cab	343614112324501	Surprise spring	USGS	02/07/2002	1445	-11.1	-77.9			14.4	1.9	4.5	0.6	
B-14-03 11cab	343614112324501	Surprise spring	USGS	06/21/2002	0945	-11.1	-78.5							
B-15-03 36baa		Mint Spring	USGS	05/11/2000	1400	-7.1	-60	-8.2					9.9	0.5
B-15-04 03bcb		LV-2 well	USGS	05/28/2001		-10.6	-75.0	-11.9	79.1	0.7			1.3	0.3
B-16-04 14adb	344618112385901		USGS	01/17/2002	1230	-9.9	-72.4			1.0	1.0	0.3	0.3	
B-16-04 14dcd			ASU	12/1996		-10.6	-75.0							
B-16-04 15acd		LV-1 spring	USGS	05/28/2001	1100	-10.8	-77.0	-12.2	106.5	0.8			3.8	0.3
B-16-05 25cdd	344255112442001	Williamson Valley Wash HW-1	USGS	04/18/2001	1215	-10.0	-71.8							
B-16-05 06sbbc	344709112495501	Cabin Spring	USGS	04/18/2001	1430	-10.5	-74.7	-12.0					3.1	0.5
B-16-05 06sbbc	344709112495501	Cabin Spring	USGS	02/07/2002	1710	-11.2	-77.0			4.2	1.3	1.3	0.4	
B-16-05 06sbbc	344709112495501	Cabin Spring	USGS	06/19/2002	1340	-11.2	-78.6							
B-17-04 14cbd			ASU	05-12/		-10.8	-73.5							
B-17-04 36bcb			USGS	08/30/1987		-11.1	-77.0							
B-18-06 09abb	345759112541601	Pine Spring	USGS	04/20/2001	1315	-11.0	-78.5	-11.0					6.0	0.5
B-18-06 09abb	345759112541601	Pine Spring	USGS	06/19/2002	1305	-10.9	-80.2							
B-18-06 20aac	345605112550901	Lee Spring	USGS	04/20/2001	1015	-10.2	-74.3							
B-18-06 20aac	345605112550901	Lee Spring	USGS	04/20/2001	1015	-10.2	-74.3	-6.4					3.7	0.5
B-18-06 24ddd	345525112503401	Walnut Creek well	USGS	04/19/2001	1430	-10.7	-76.0	-11.2	81.1	0.6				
B-18-06 24ddd		Walnut Creek well	ASU	12/1996		-10.4	-73.0						0.7	0.6
Low-Altitude Springs discharging to upper Verde River														
B-17-02 26ccc	344914112264301	Del Rio Springs (C-3)	USGS	08/25/1991	1245	-9.9	-71.0	-11.5						
B-17-02 26ccc3	344911112264401	Del Rio Springs (C-3)	USGS	06/1993		-9.9	-72.0							
B-17-02 26ccc3	344911112264401	Del Rio Springs (DRS-1)	USGS	06/15/2000	1245	-10.0	-71.0							
B-17-02 26ccc3	344911112264401	Del Rio Springs (DRS-1)	USGS	06/19/2000	1035	-10.1	-72.0							
B-17-02 26ccc3	344911112264401	Del Rio Springs (C-3)	USGS	04/17/2001	1800	-10.0	-71.5	-10.7	66.4	1.0			1.0	0.4
B-17-02 26ccc3	344911112264401	Del Rio Springs (C-3)	USGS	12/19/2002	1330	-9.8	-70.0						1.0	0.4
B-17-02 13ccb	345102112254101	Lower Granite Spring (LGS-1)	USGS	06/17/2000	1115	-9.7	-70.0	-10.4						
B-17-02 13ccb	345102112254101	Lower Granite Spring (LGS-1)	USGS	06/17/2000	1030	-9.6	-69.2							
B-17-02 13ccb	345102112254101	Lower Granite Spring (LGS-1)	USGS	05/30/2001	1900	-9.7	-69.0	-11.3	81.5	0.4			1.8	0.9
B-17-02 13ccb	345102112254101	Lower Granite Spring (LGS-1)	USGS	12/19/2001	1200	-9.6	-70.3						1.3	1.0
B-17-02 13cbc	345103112254501	Stillman Lake	USGS	12/19/2002	1130	-9.4	-68.9							
B-17-02 10cdd		Stillman Lake (SLS-1)	USGS	05/07/2000	0930	-8.7	-66.0	-7.6					0.7	0.3
B-17-02 11cdd		Stillman Lake (SLS-2)	USGS	06/17/2000	1400	-8.3	-65.0	-5.6						
B-17-02 10cdd		Stillman Lake (SLS-1)	USGS	06/17/2000	1300	-7.9	-62.3			7.4	1.9	2.3	0.6	
B-17-02 13cbc	345103112254501	Stillman Lake	USGS	01/16/2002	1040	-8.5	-67.9							
B-17-02 12ccb	345155112254801	Upper Verde River spring (BC-1)	USGS	06/15/2000	1350	-10.1	-73.2							
B-17-02 12cca	345155112253601	Upper Verde River spring (BC-1)	USGS	01/16/2002	1500	-10.1	-73.8						1.6	0.7
B-17-02 12cca	345155112253601	Upper Verde River spring (BC-1)	USGS	12/19/2002	1030	-9.9	-73.2						0.5	0.2
B-17-02 12ccb	345155112254801	Upper Verde River spring G (SP1700)	USGS	06/17/2000	1610	-10.3	-75.0	-7.0					0.7	
B-17-02 12ccb	345155112254801	Upper Verde River spring (BC-1)	USGS	04/20/2001	1600	-10.3	-75.0	-3.6	42.1	0.3			0.7	0.9
B-17-02 12ccb	345155112254801	Upper Verde River spring (BC-1)	USGS	02/08/2002	1010	-10.1	-73.7			2.2	1.3	0.7	0.7	0.4
B-17-02 12ccb	345155112254801	Upper Verde River spring (SP2300)	USGS	12/19/2002	1030	-10.1	-73.8							
B-17-02 12ccb	34523311212701	Unnamed spring near Muldoon Canyon	USGS	05/16/2003	0200	-10.3	-75.0	-7.0	49.9	0.2				

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Low-Altitude Springs discharging to upper Verde River (continued)														
B-17-02 12		SP2625	USGS	06/18/2000	1050	-10.4	-75.0						1.1	0.4
B-17-02 12		SP2650	USGS	06/18/2000	1100	-10.4	-75.0						0.8	0.4
B-17-02 12		SP2915	USGS	06/18/2000	1110	-10.3	-74.0						<0.4	
B-17-02 12		SP4610	USGS	06/18/2000	1030	-10.4	-75.0			0.3	0.6		0.1	0.2
B-17-01 03cca	345243112212701	Unnamed spring at Muldoon Canyon	USGS	05/16/2003		-10.0	-74.0	-7.0						
A-17-01 07aaa														
UNS	345235112172501	Duff Spring	USGS	07/04/1991	1145	-9.2	-67.0	-8.2						
A-17-01 07aaa														
UNS	345235112172501	Duff Spring	USGS	06/13/2000	1200	-9.2	-68.1							
A-17-01 07aaa														
UNS	345235112172501	Duff Spring	USGS	12/18/2002	1640	-9.3	-70.5							
Carbonate Aquifer north of upper Verde River (Mississippian-Devonian sequence)														
B-19-02 19bdd	350107112305601	Storm Seep	USGS	05/07/2000	1700	-11.6	-83.0	-6.0					5.2	0.4
B-19-02 19bdd	350107112305601	Storm Seep	USGS	04/19/2001	1130	-11.4	-81.0							
B-19-02 19bdd	350107112305601	Storm Seep	USGS	06/20/2002	1045	-10.8	-77.1							
B-19-03 26adb	350022112324001	Pool Seep	USGS	04/19/2001	1345	-11.0	-80.8						10.3	
B-20-02 35baa	350535112263601	Meath Spring	USGS	04/17/2001	1630	3.06	-16.5	-15.2					5.6	0.6
B-20-04 02cdb		Tucker Canyon Spring	USGS	05/11/2000	1030	-1.3	-40.0	-6.7						0.4
B-18-01 06abb	345843112240201	Hell well (BBM-04)	USGS	07/04/1987		-10.1	-73.5							
B-18-01 27aac		Glidden well (BBM-111)	ASU	09/1996		-10.5	-78.0							
B-18-01 27aac		Glidden well (BBM-111)	ASU	05/1996		-10.4	-70.0							0.3
B-18-01 17aaa	345653112223701	Gipe well	USGS	05/31/2001	1300	-11.2	-78.0	-7.7	34.2	0.6			0.5	
B-19-01 16aca	350154112220001	Bean well, well M	USGS	05/26/2002	0940	-10.9	-80.0	-2.0	18.6	0.2			0.6	0.6
A-19-01 33bbd	345905112174401	Bar Hart Ranch well	USGS	05/24/2002	1830	-12.0	-85.0	-6.2	24.9	0.2			0.5	0.4
A-18-01 18bbb	345644112193601	King Spring	USGS	05/05/2000	1630	-9.5	-73.0	-1.9					3.8	
		King Spring	USGS	06/15/2000	Surface	-8.8	-70.0							0.6
		King Spring	USGS	02/08/2002	Surface	-10.2	-76.3				7.4	1.9	2.3	0.6
A-17-01 02bba		Mormon Pocket spring	USGS	05/21/2002	0830	-12.0	-85.0	-7.0	25.6	0.2			0.6	0.3
A-17-03 05caa		Summers Spring	USGS	05/20/2002	1500	-12.0	-84.0	-7.1	36.4	0.3			1.1	
Little Chino Basin-fill Aquifer														
B-15-02 23cbd	343938112263201	LC-10	USGS	07/04/1987		-10.3	-73.0							
B-15-02 23cba			ASU	05-09/		-10.1	-68.0							
B-16-01 17ccb	344540112234301	Schaible well	USGS	05/27/2001	1100	-11.2	-78.0	-7.3	73.1	1.6			2.7	0.3
B-16-02 04cbb			ASU	12/1996		-10.0	-74.0							
B-16-02 14bcc			ASU	09/1996		-10.1	-73.0							
B-16-02 15ada			ASU	05-09/		-8.9	-66.5							
B-17-02 14ada			ASU	12/1996		-10.7	-70.0							
B-17-02 15acc		Arnold well	USGS	04/17/2001	1430	-9.8	-70.0	-11.7	87.2	0.9				
B-17-02 15caa	345122112272601		USGS	05/07/2003	1100	-9.7	-69.6						1.2	0.5

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Little Chino Basin-fill Aquifer (Continued)														
B-17-02 15cad2	345115112273101		USGS	05/06/2003	1140	-9.6	-69.6							
B-17-02 15cdd			ASU	12/1996		-9.8	-72.0							
B-17-02 17aad			ASU	12/1996		-10.2	-72.0							
B-17-02 34aca			ASU	05-12/		-9.8	-67.5							
B-17-02 N34acc			USGS	07/04/1987		-10.2	-72.0							
B-17-02 35cda			ASU	12/1996		-9.4	-61.0							
Big Chino Basin-fill Aquifer														
B-17-02 S03cbb1			ASU	12/1996		-10.0	-69.0							
B-17-02 04aaa	345342112281501	C-7	USGS	09/08/1991	1130	-9.4	-71.5	-9.4						
B-17-02 04aaa		C-7	ASU	12/1996		-10.4	-69.0							
B-17-02 04aaa	345342112281501	C-7	USGS	03/05/2003	1140	-10.1	-72.0							
B-17-02 06aba			ASU	12/1996		-9.5	-65.0							
B-17-02 04ddc		Smith/Texaco, well E	USGS	06/01/2001	0900	-10.3	-73.0	-8.2	54.7	0.8		1.2	0.5	
B-17-02 09bbc			ASU	M-S-D-M		-10.1	-68.5							
B-17-02 09ccb			ASU	S-D-M		-9.6	-74.0							
B-17-02 09ccd			ASU	12/1996		-9.6	-71.0							
B-17-02 09dba	345220112282501		USGS	03/04/2003	1130	-10.1	-71.0							
B-17-02 09ddd2	345157112280701	C-2	USGS	09/08/1991	1330	-9.5	-69.5	-11.8						
B-17-02 10cac	345209112274001		USGS	03/07/2003	1220	-8.8	-66.3							
B-17-02 22bca4	345041112274501	C-1	USGS	09/08/1991	1245	-9.9	-71.0	-11.9						
B-17-02 N34acc	344846112271401		USGS	07/04/1987		-10.2	-72.0							
B-17-02 S34bba	344822112274301	C-5	USGS	09/08/1991	0915	-10.1	-71.5	-10.3						
B-18-02 31cdc		Prucha well, well D	USGS	04/17/2001	1430	-10.2	-75.0	-5.5	29.8	0.6		1.1	0.4	
B-18-02 27dda			ASU	05-09/1996		-10.2	-70.5							
B-18-03 26baa			ASU	05-09/		-10.3	-76.0							
B-18-03 03aaa			ASU	05/1996		-9.6	-65.0							
B-18-03 04ccc			ASU	05-09/		-10.1	-72.0							
B-18-03 25ada			ASU	05-09/		-10.5	-78.0							
B-18-03 25cda	345442112315801	C-4	USGS	09/09/1991	0945	-9.7	-72.0	-11.3						
B-19-03 18ccc	350138112374101	C-9	USGS	09/09/1991	1030	-10.0	-72.5	-8.0						
B-19-03 28dac	350002112344201	T2 windmill, well C	USGS	05/24/2002	1600	-9.7	-73.0	-6.7	21.0	0.2		0.5	0.6	
B-18-03 30bcb		T2, well B	USGS	05/30/2001	1600	-9.6	-70.0	-8.5	24.1	0.5		1.3	0.6	
B-19-04 04bdb		RWK, well A	USGS	05/30/2001	1100	-10.0	-72.0	-9.1	55.0	0.6		0.5	0.6	
B-19-04 04cac	350332112413701	C-8	USGS	08/26/1991	1230	nd	nd	-9.1						
B-19-04 09abd			ASU	09-03/		-9.4	-69.5							
B-19-04 15aac			ASU	05-09/		-10.1	-72.0							
B-20-04 32bba			ASU	05/1996		-9.8	-67.0							
B-21-02 14bcc	351207112283701	AF-06	USGS	08/31/1987		-10.1	-75.5							
B-21-02 14bcc	351207112283701		USGS	08/26/1991	0930	-10.1	-76.0	-7.1						
B-21-05 35aba			ASU	05/1996		-10.0	-71.0							
B-21-06 14ccd	351145112540001		USGS	07/06/1987		-9.9	-74.5							
B-22-07 25adb	351554112574001		USGS	07/04/1987		-10.4	-74.5							
B-23-07 1ccc	352410112581001	BC-19	USGS	07/05/1987		-9.6	-69.0							
B-23-07 26dda	352045112583401	BC-10	USGS	07/04/1987		-9.9	-72.5							

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Carbonate Aquifer underlying Big Chino Basin-fill Aquifer (Devonian-Cambrian zone)														
B-18-02 21acb		Reeves well, well H	USGS	05/27/2001	1700	-10.7	-77.0	-5.6	18.0	0.3				
B-18-02 27cba	345459112275601	C-11	USGS	09/09/1991	0830	-10.3	-75.5	-6.6					0.9	0.3
B-18-02 27cda	345440112274101	LS-12	USGS	08/31/1987		-10.5	-74.0							
B-18-02 27cda	345440112274101	LS-12	USGS	08/29/1991	0930	-10.5	-76.0	-6.4						
B-18-02 28bab	345525112285201		USGS	05/08/2003	0955	-10.1	-74.0							
B-17-02 02cac	345302112264701	C-6/Wagner, well F	USGS	08/29/1991	0800	-10.0	-71.5	-9.6						
B-17-02 02cac	345302112264701	C-6/Wagner, well F	USGS	03/06/2003	1200	-9.9	-72.2							
B-17-02 02cac	345302112264701	C-6/Wagner, well F	USGS	05/31/2001	1500	-10.2	-73.0	-8.8	55.4	0.6			0.8	