Summary of Water Level Changes

Introduction

Depth to water (DTW) measurements were taken at 294 wells in the Verde Valley sub-basin by personnel of the Arizona Department of Water Resources (ADWR) in at least 2 of the last 3 basin sweeps conducted in 1999, 2004, and 2009 (measurements were taken between March and May of each year). DTW below land surface ranged from less than one foot to more than 900 feet for wells in the Verde Valley sub-basin. Location and water level change for these wells are shown on Sheet 1 (1999 to 2009) and Sheet 2 (1999 to 2004 and 2004 to 2009). Sheet 3 includes DTW information for each well and hydrographs for 16 wells throughout the sub-basin measured in all three years. Only 112 of the 294 wells had DTW measurements taken during all three basin sweep years. In several areas of the sub-basin, water levels show an overall decline from 1999 to 2004 and an overall rise in water levels from 2004 to 2009 resulting in relatively unchanged water levels from 1999 to 2009 in most areas of the sub-basin. The Cottonwood area and a few select wells in various other areas have continuous declines between 1999 to 2009. Table 1 (Sheet 3) shows data obtained from the ADWR Groundwater Sites Inventory (GWSI) database (Arizona Department of Water Resources, 2009) for the measured wells for each time period.

1999 - 2004

Between 1999 and 2004, DTW increased (> 2 feet water level decline) in 112 wells, remained unchanged (+/- 2 feet) in 93 wells, and decreased (> 2 feet water level rise) in 30 wells (Sheet 2). The water level changes ranged from a decline of approximately 58 feet on the plateau area of the sub-basin along I-17 just south of Flagstaff to a rise of approximately 46 feet at a well along the upper stretch of Oak Creek in the Sedona area. The average water level change for all wells within the Verde Valley sub-basin was a decline of about 4 feet with the greatest water level declines located within the Cottonwood and Sedona areas as well as other wells throughout the plateau area.

2004 – 2009

Between 2004 and 2009, DTW increased (> 2 feet water level decline) in 42 wells, remained unchanged (+/- 2 feet) in 81 wells, and decreased (> 2 feet water level rise) in 48 wells (Sheet 2). The water level changes ranged from a decline of approximately 58 feet in the Cottonwood area to a rise of approximately 64 feet located east of the Camp Verde area. The average water level change for all wells within the Verde Valley sub-basin was +/- 1 foot.

1999 – 2009

Between 1999 and 2009, DTW increased (> 2 feet water level decline) in 53 wells, remained unchanged (+/- 2 feet) in 42 wells, and decreased (> 2 feet water level rise) in 17 wells (Sheet 1). The water level changes ranged from a decline of approximately 68 feet in the Cottonwood area to a rise of approximately 60 feet in the upper stretch of Oak Creek in the Sedona area. The majority of the remaining areas within the sub-basin show relatively unchanged water levels with some water level declines concentrated in the Cottonwood and Sedona areas. The average water level change for all wells within the Verde Valley sub-basin was - 5 feet from 1999 to 2009.

Cottonwood area

The Cottonwood area typically has shallow wells located within the alluvial deposits and Verde Formation (Owen-Joyce and Bell, 1983) of the sub-basin near or along the Verde River and had the greatest concentration of wells with declining water levels. Water levels in the majority of wells in this area declined between 1999 and 2004 (Sheet 2) and continued to decline by a smaller amount or remain unchanged between 2004 and 2009 (Sheet 2). From 1999 to 2009 (Sheet 1) over half of the wells in this area had water level declines greater than 20 feet (Hydrograph I) with the majority of the remaining wells having small to moderate water level declines (Hydrograph K). Hydrograph J shows seasonal fluctuations in water levels but still exhibits an overall declining trend in water levels from 1999 to 2009.

Camp Verde area

The majority of wells in the Camp Verde area are shallow and located along the Verde River within alluvial deposits and Verde Formation. Water levels within the Camp Verde area remained unchanged (+/- 2 feet) from 1999 to 2009. Northeast of Camp Verde along portions of Beaver Creek there are a few wells that had a large water level rise (Hydrograph M) located within 3 miles of wells with a large water level decline (Hydrograph L). These wells are listed as Public Supply and Irrigation wells which may induce large fluctuations in water levels as observed within local hydrographs.

Sedona area

The majority of wells in the Sedona area show moderate water level declines between 3 and 20 feet from 1999 to 2004 (Sheet 2) and essentially unchanged water levels (+/- 2 feet) or small rises in water levels from 2004 to 2009 (Sheet 2). Overall from 1999 to 2009, several of the deeper wells to the west of Sedona (Hydrograph F) and just east of Sedona (Hydrograph G) show small water level declines and are typically located in regional aquifers (Levings, 1980). The majority of the remaining wells in this area are located along various portions of Oak Creek and have relatively unchanged water levels from 1999 to 2009 (sheet 1). In the lower portions of Oak Creek most of the water levels had little to no change from 1999 and 2009 (Hydrograph H) for shallow wells located in the alluvial deposits and Verde Formation. In the upper portions of Oak Creek water levels fluctuated (Hydrograph D) but had little to no overall water level change for deeper wells with the exception of only one well.

Higher Elevation areas

Most of the wells located in higher elevation mountainous regions in upper parts of the watershed are typically located in shallow perched aquifers or deep regional aquifers (Blasch, et al., 2006). Wells in these areas are mostly concentrated to west and south of Flagstaff along Interstate 40 and Interstate 17, respectively. Some of these wells exhibit highly variable water level changes (Hydrograph A and E) while other wells have relatively stable water levels with little to no change (Hydrograph B) between 1999 and 2009 (Sheet 1) and may be dependent on use and depth of the well. Most of the other higher elevation areas within the Verde Valley sub-basin have limited water level data available and the few wells show only small declines in water levels near Hell Canyon in the western portion of the sub-basin (Hydrograph C) and near Clint's Well in the southeastern portion of the sub-basin (Hydrograph O).

Conclusions

Limited water level data are available for the Verde Valley sub-basin prior to 1999. However, available data show significant overall water level declines in saturated alluvial deposits and Verde Formation in the Cottonwood area and moderate water level declines in the Sedona area where the greatest amount of development and groundwater withdrawal occurs from alluvial deposits and the Verde Formation (Arizona Department of Water Resources, 2000 and 2006). Other areas of the Verde Valley (Camp Verde and lower Oak Creek) show only small or no overall declines in water levels between 1999 and 2009. Some of the groundwater declines in all areas may be due to statewide and regional drought conditions in addition to the effects of any groundwater withdrawals from the aquifer. Discharge measurements from United States Geological Survey (USGS) stream flow gages (United States Geological Survey, 2009) along the Verde River, Oak Creek, and Wet Beaver Creek are shown on select hydrographs for nearby wells to compare variations in stream flow and groundwater (Sheet 3). Wells located in the higher elevation regions in the northern and eastern portions of the sub-basin show variable groundwater change trends. Many of the wells in these areas show small declines and rises in water levels with a few exceptions exhibiting far greater water level fluctuations. The Hell Canyon area has limited water level data and the few wells located in this area with data show minimal change in water levels.

References

Arizona Department of Water Resources, 2009, Groundwater Sites Inventory (GWSI) database, accessed October 9, 2009, at: https://gisweb.azwater.gov/waterresourcedata/GWSI.aspx

Arizona Department of Water Resources, 2006, Arizona Water Atlas, volume 5, section 5.5, accessed November 13, 2009, at: http://www.azwater.gov/AzDWR/StatewidePlanning/WaterAtlas/default.htm

Arizona Department of Water Resources, Verde River Watershed Study, April 2000.

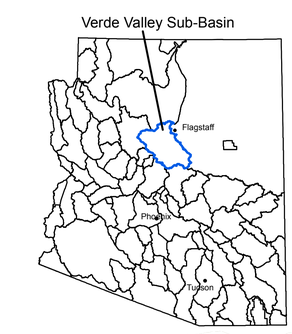
Blasch K.W., Hoffman, J.P., Graser, L.F., Bryson, J.R., and Flint, A.L., 2006, Hydrogeology of the Upper and Middle Verde River Watersheds, Central Arizona; U.S. Geological Survey, Scientific Investigations Report 2005-5198, p. 102.

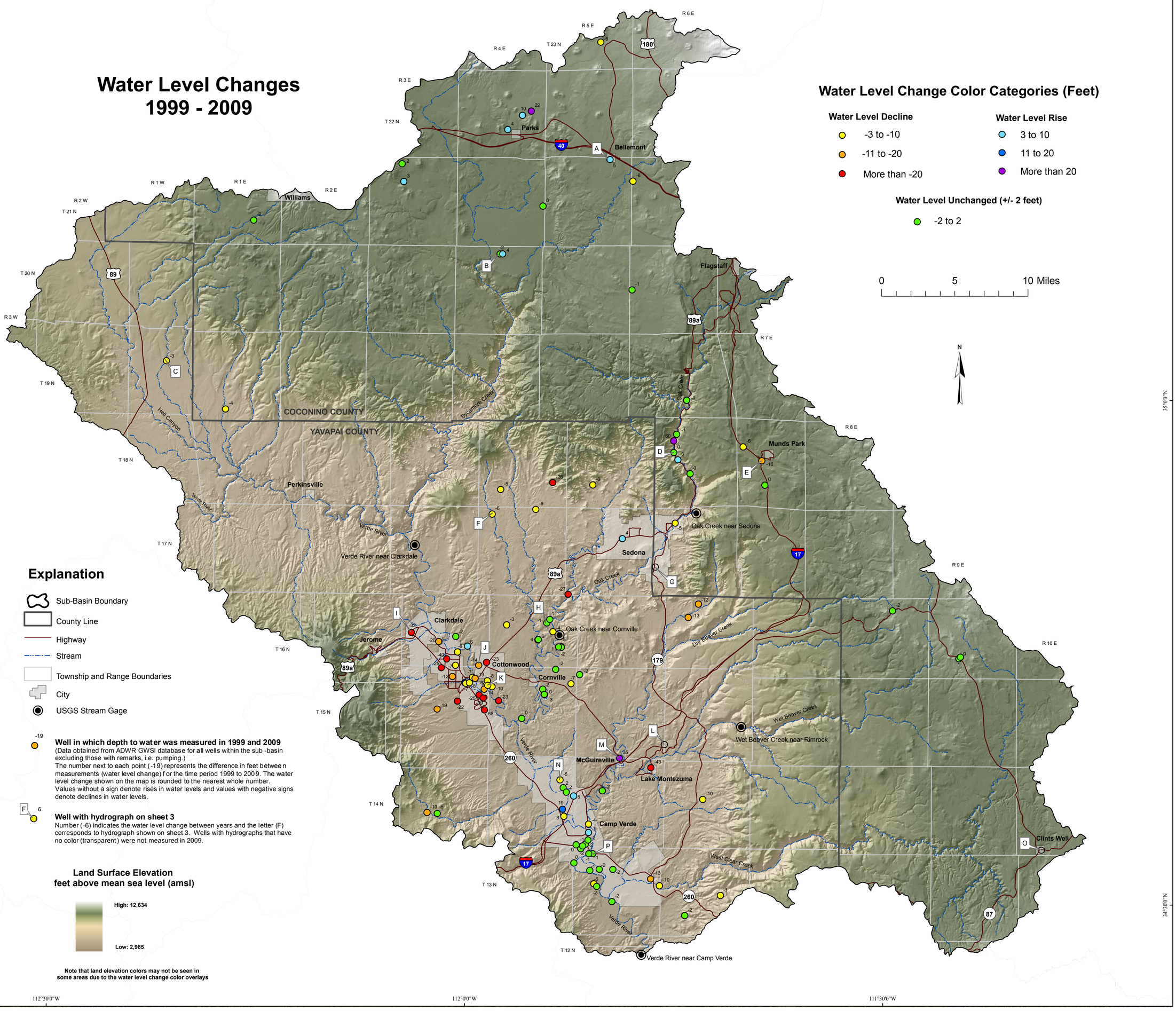
Levings, G.W., 1980, Water Resources in the Sedona Area, Yavapai and Coconino Counties, Arizona: Arizona Department of Water Resources Bulletin 11, 37 p.

Owen-Joyce, S.J. and Bell, C.K., 1983, Appraisal of Water Resources in the Upper Resources in the Upper Verde River Area, Yavapai and Coconino Counties, Arizona: Arizona Department of Water Resources Bulletin 2, 219 p.

United States Geological Survey, 2009, National Water Information System (NWIS), USGS Surface-Water Data for Arizona, accessed October 14, 2009, at: http://waterdata.usgs.gov/az/nwis/sw/

Note: Water Level Change Map Series (WLCMS) reports are prepared by the Hydrology Division of ADWR and are intended for quick release to provide hydrologic information and data to the public with only limited interpretation. WLCMS reports typically include a map and a general overview of water levels and groundwater conditions within a groundwater basin or sub-basin between the last two periods of ADWR water level data collection. For WLMCS No. 5, data for the last three periods of water level data collection (1999, 2004, and 2009) are shown on sheets 1, 2, and 3.





NORTH AMERICAN DATUM 1983 HARN

ARIZONA DEPARTMENT OF WATER RESOURCES

HYDROLOGY DIVISION

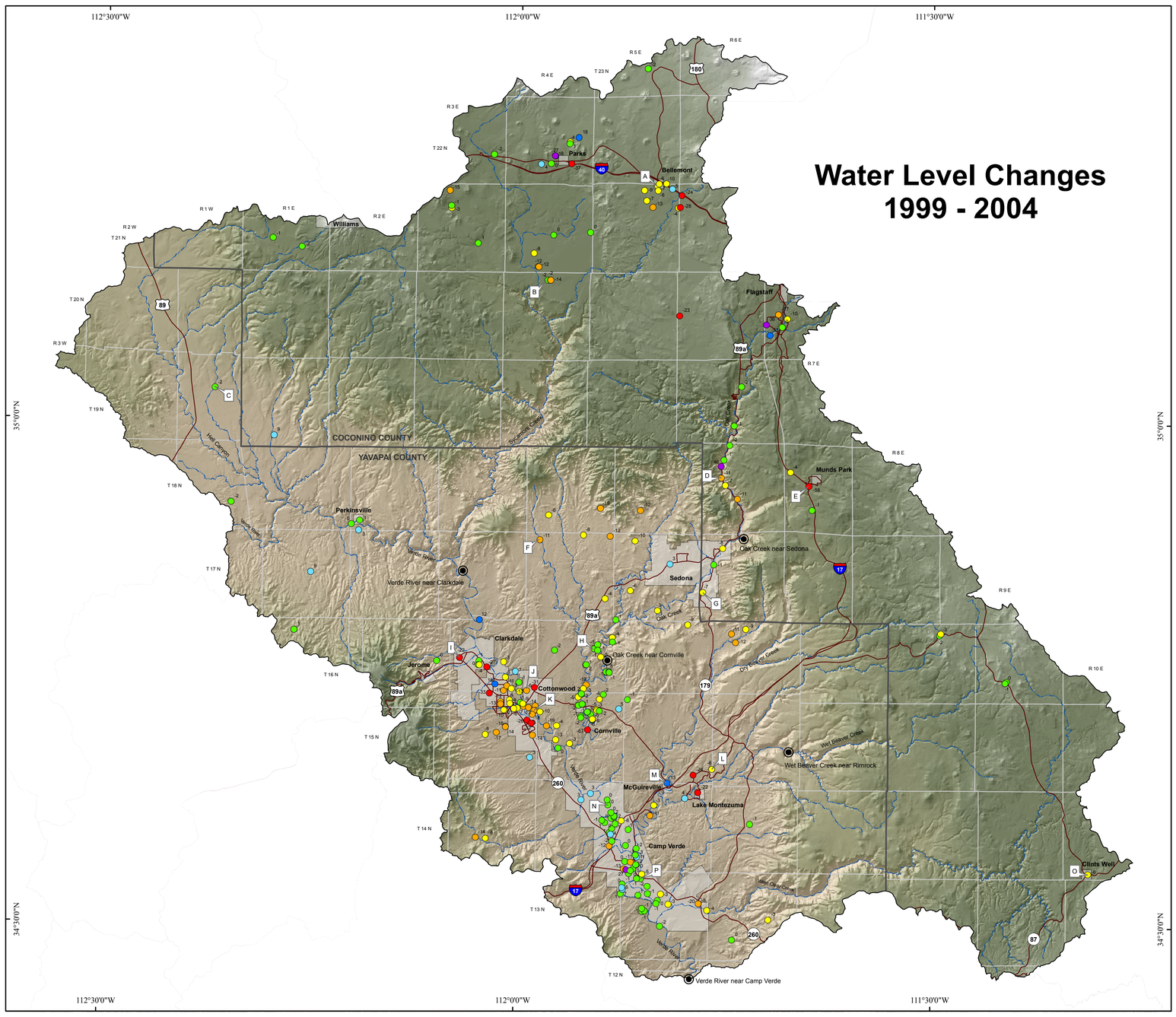
WATER LEVEL CHANGES IN VERDE VALLEY SUB-BASIN, ARIZONA 1999-2009

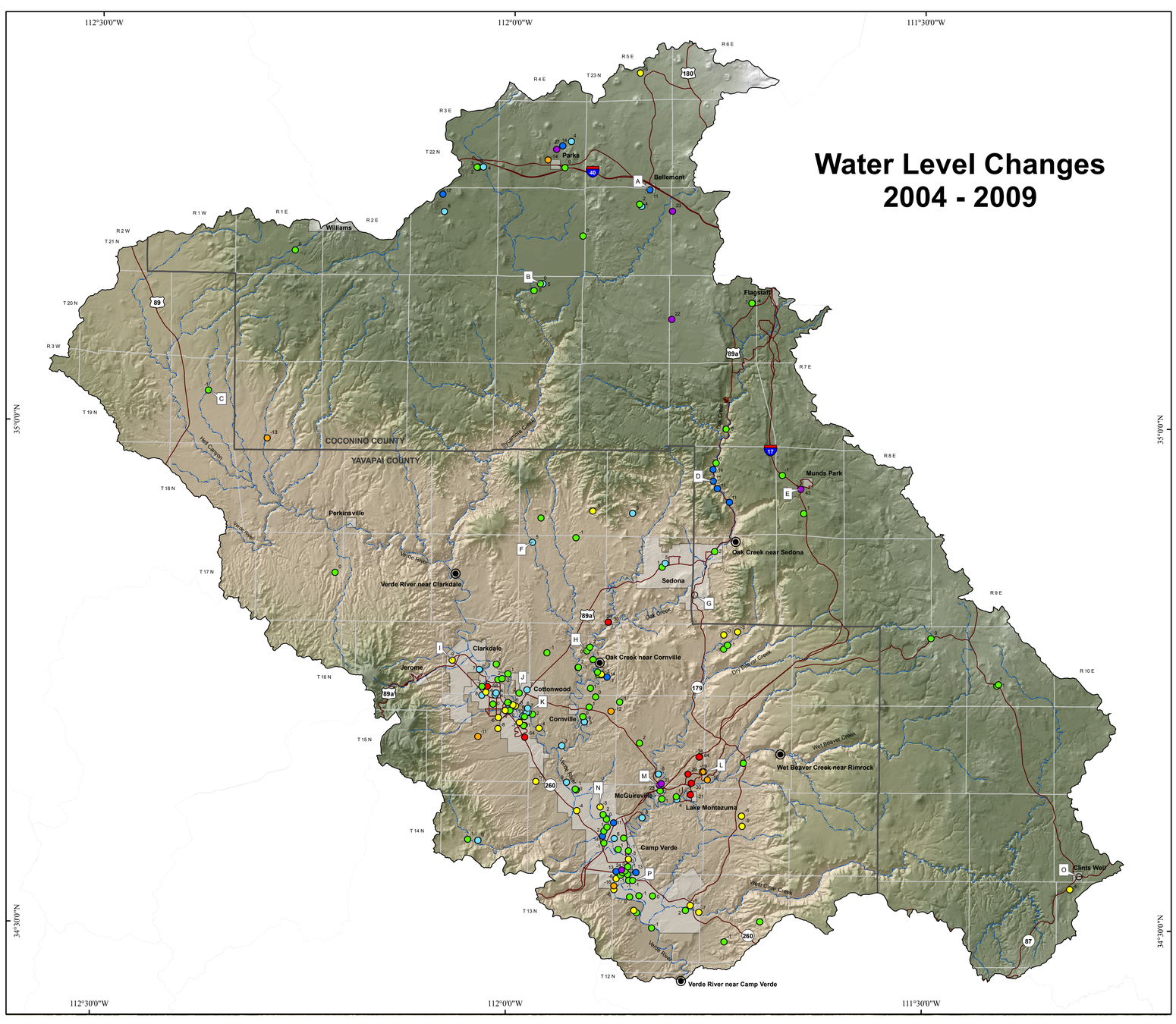
By
Stephen Flora
December 2009

For data go to:
https://gisweb.azwater.gov/waterresourcedata/

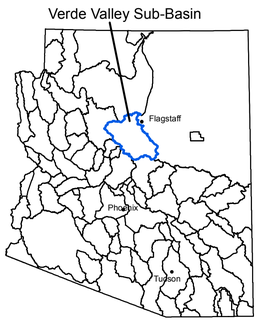
For more information or copies contact:
ADWR Information Services
3550 North Central Avenue
Phoenix, AZ 85012
(602) 771-8627
www.azwater.gov

Expires 3/31/2012





ARIZONA GROUNDWATER BASINS AND SUB-BASINS



Water Level Change Color Categories (Feet)

Water Level declines

- -3 to -10
- -11 to -20
- More than -20

Water Level rises

- 3 to 10
- 11 to 20
- More than 20

Water Level Unchanged (+/- 2 feet)

- -2 to 2

0 5 10 Miles

N

Explanation

- Sub-Basin Boundary
- County Line
- Highway
- Stream
- Township and Range Boundaries
- City
- USGS Stream Gage
- -9 **Well in which depth to water was measured for both years**
  (Data obtained from ADWR GWSI database for all wells within the sub-basin excluding those with remarks, i.e. pumping.)
  The number next to each well point (-9) represents the difference in feet between measurements (water level change) for the given period.
  The water level change shown on the map is rounded to the nearest whole number. Values without a sign denote rises in water levels and values with negative signs denote declines in water levels.
- L -6 **Well with hydrograph shown on sheet 3**
  Number (-6) indicates the water level change between years and the letter (L) corresponds to hydrograph shown on sheet 3. Wells with hydrographs that have no color (transparent) were not measured in 2009.

Land Surface Elevation feet above mean sea level (amsl)

High: 12,634

Low: 2,985

Note that land elevation colors may not be seen in some areas due to the water level change color overlays

Note: Water Level Change Map Series (WLCMS) reports are prepared by the Hydrology Division of ADWR and are intended for quick release to provide hydrologic information and data to the public with only limited interpretation. WLCMS reports typically include a map and a general overview of water levels and groundwater conditions within a groundwater basin or sub-basin between the last two periods of ADWR water level data collection. For WLMCS No. 5, data for the last three periods of water level data collection (1999, 2004, and 2009) are shown on sheets 1 and 2.

NORTH AMERICAN DATUM 1983 HARN

©

ARIZONA DEPARTMENT OF WATER RESOURCES

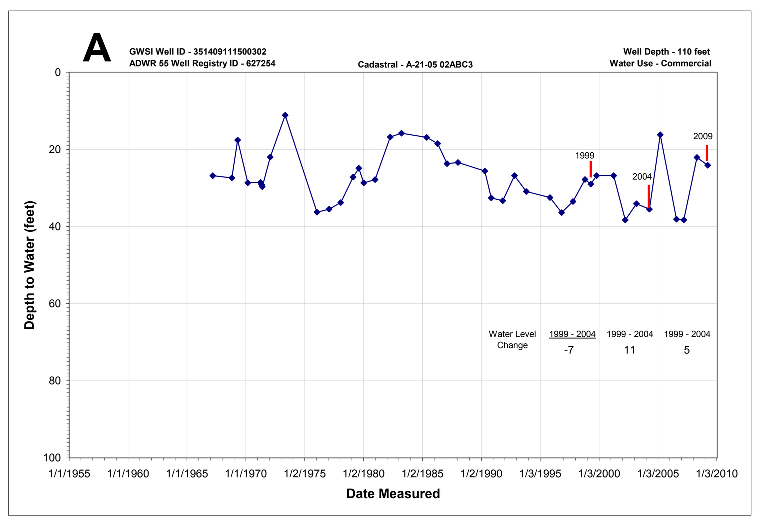
HYDROLOGY DIVISION

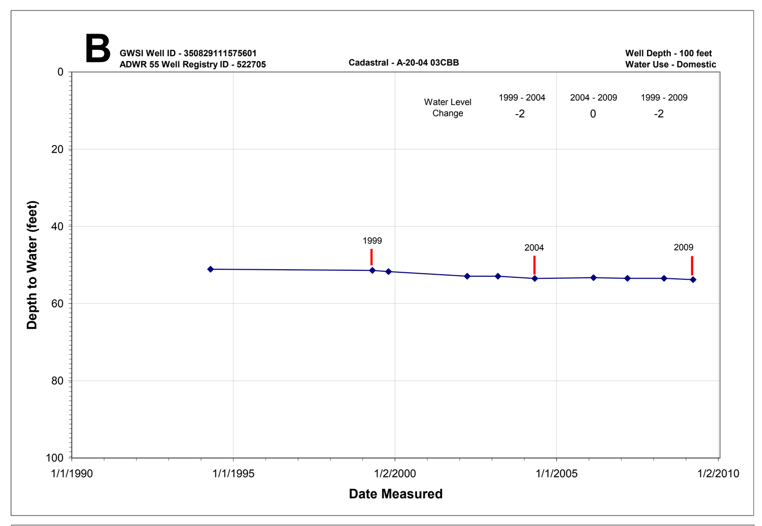
WATER LEVEL CHANGES IN VERDE VALLEY SUB-BASIN, ARIZONA 1999-2009

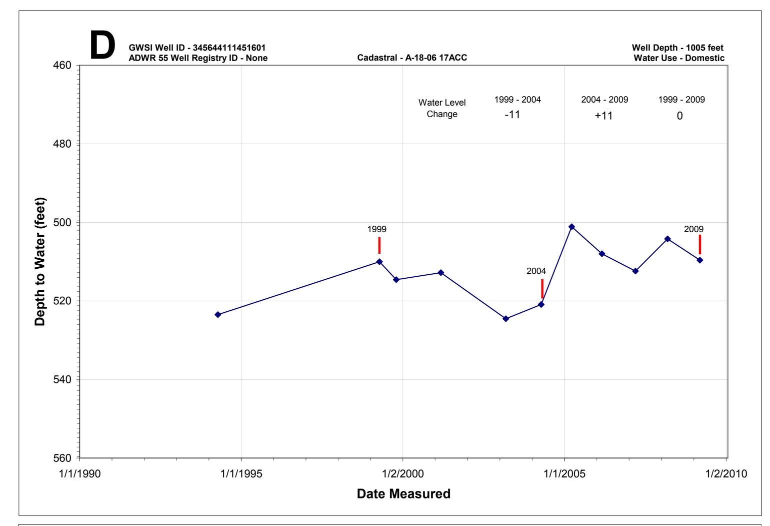
By
Stephen Flora
December 2009

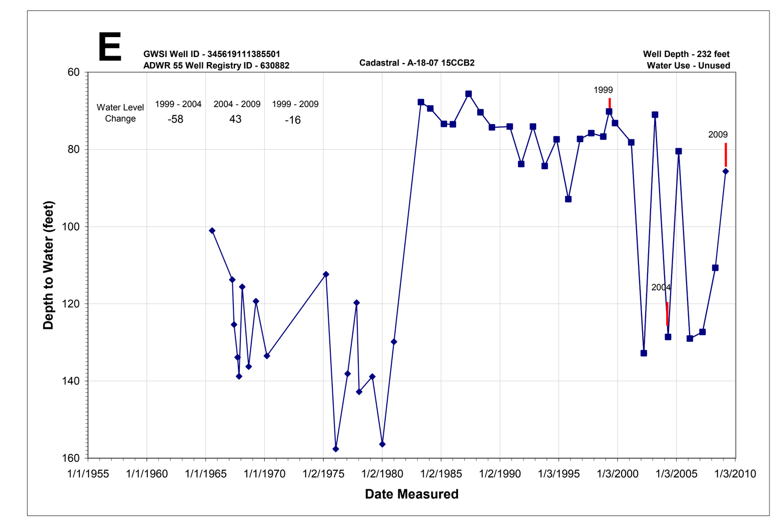
For data go to:
https://gisweb.azwater.gov/waterresourcedata/

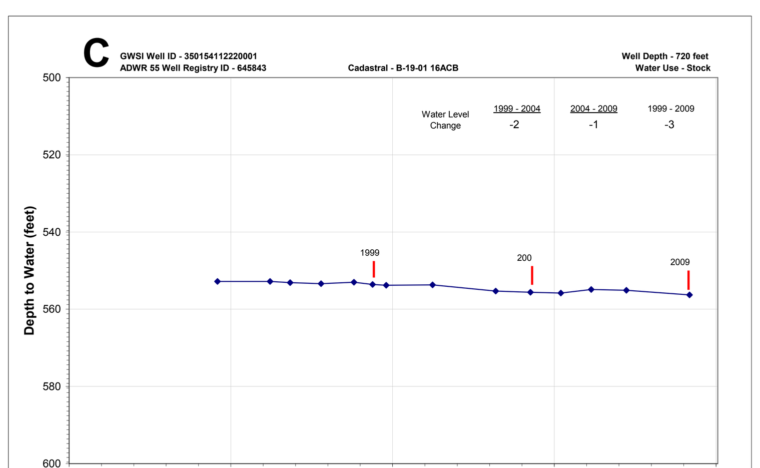
For more information or copies contact:
ADWR Information Services
3550 North Central Avenue
Phoenix, AZ 85012
(602) 771-8627
www.azwater.gov

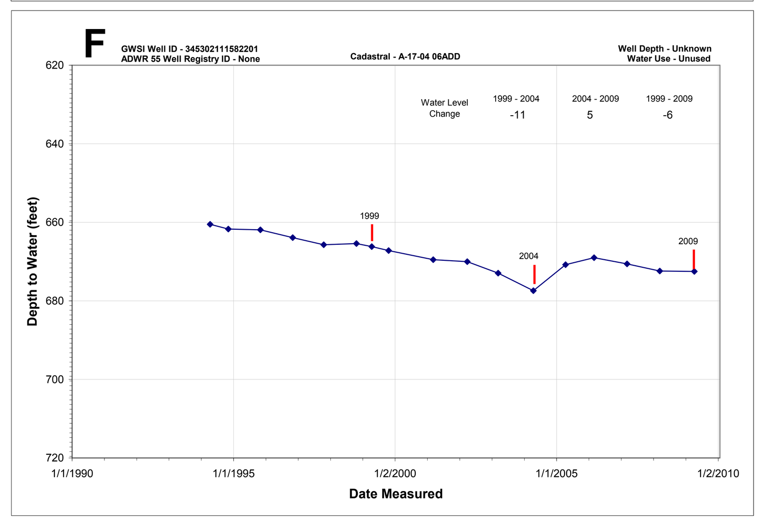


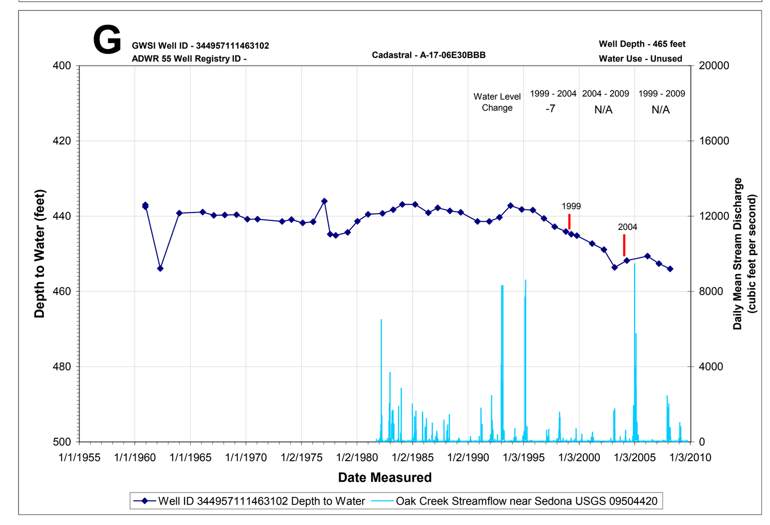


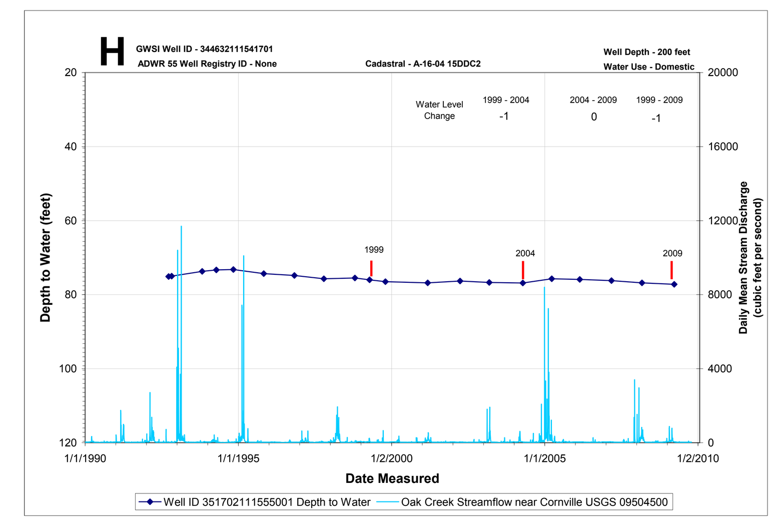


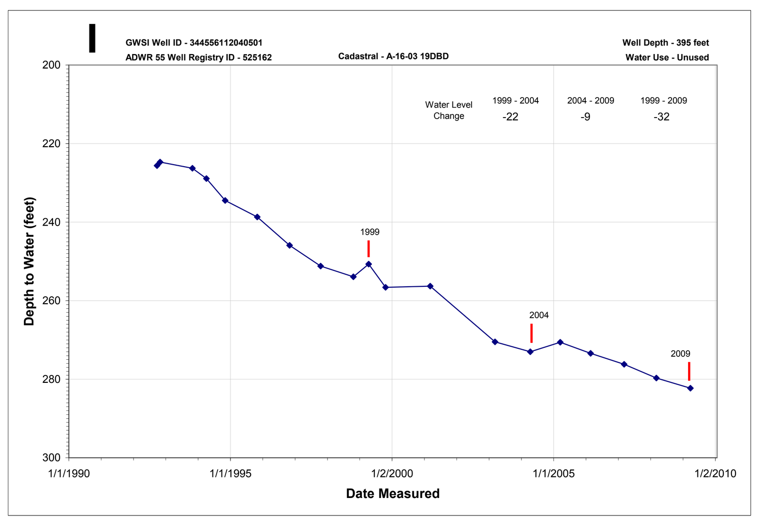


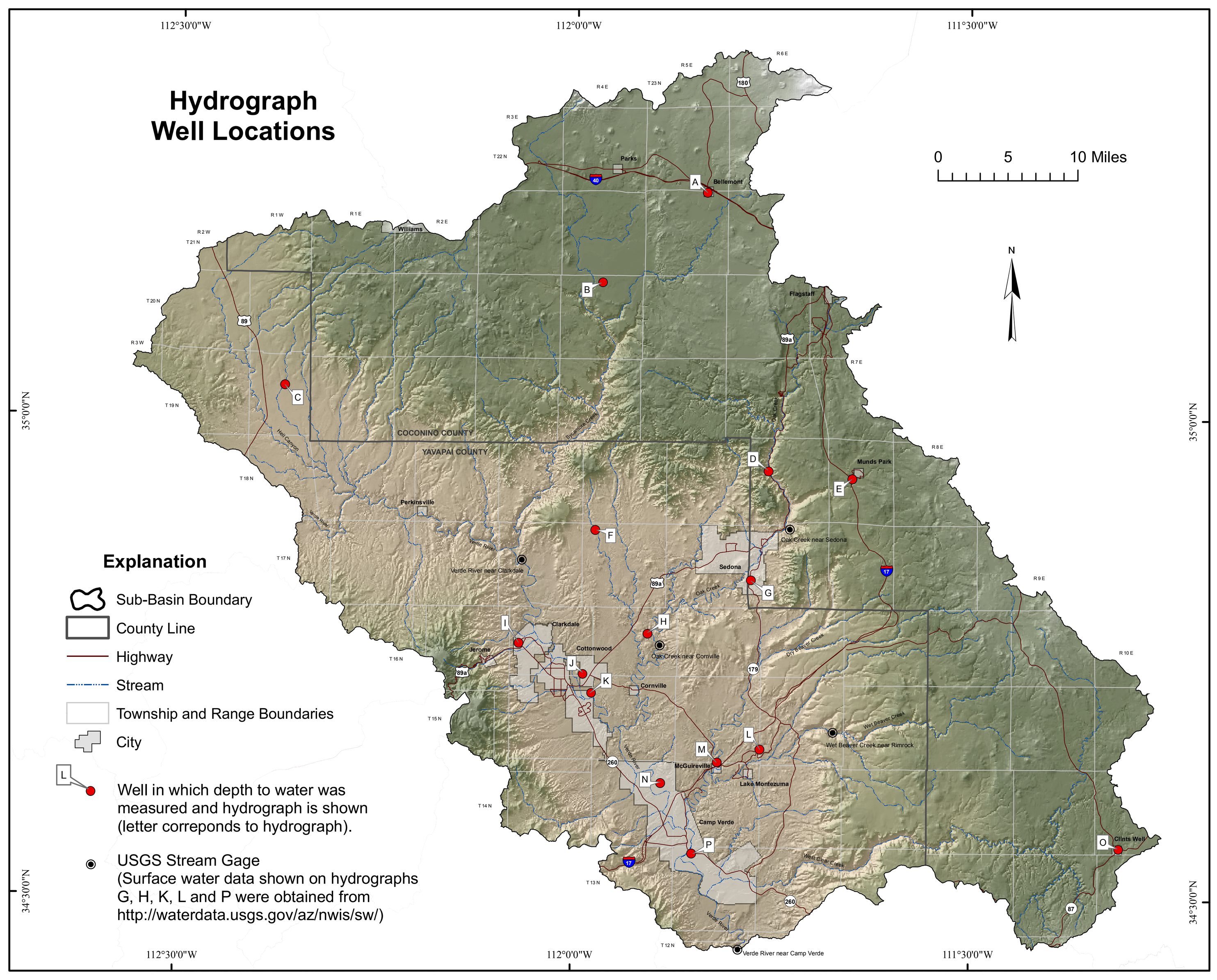


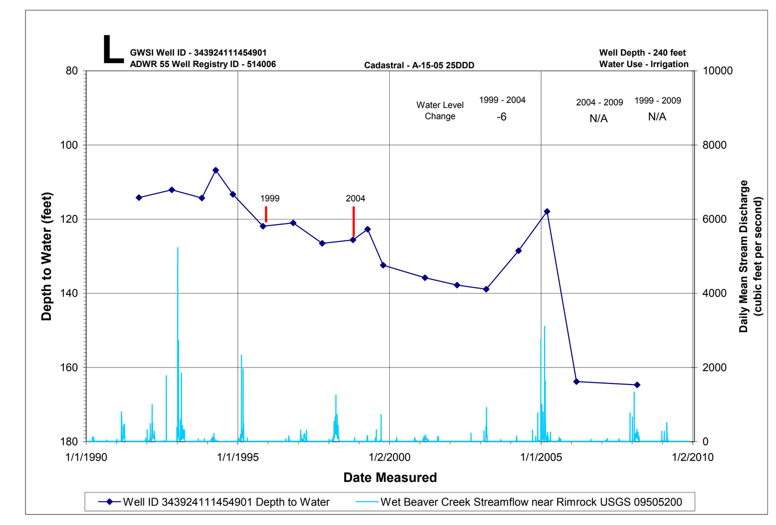


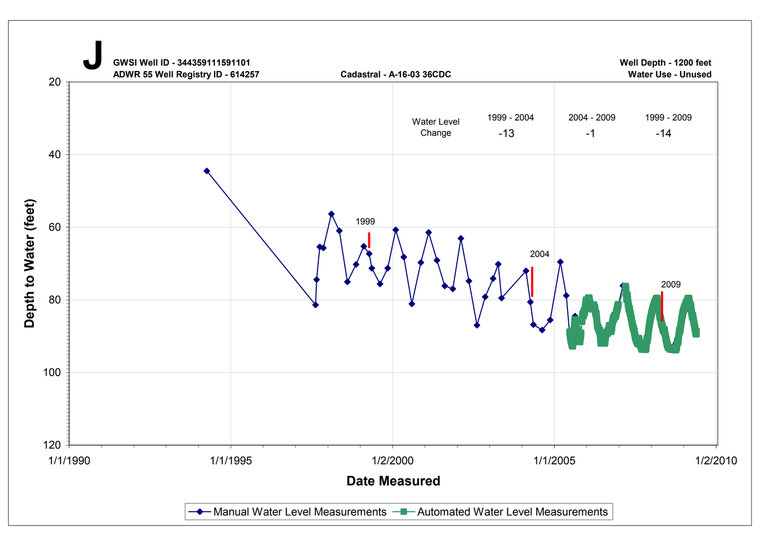


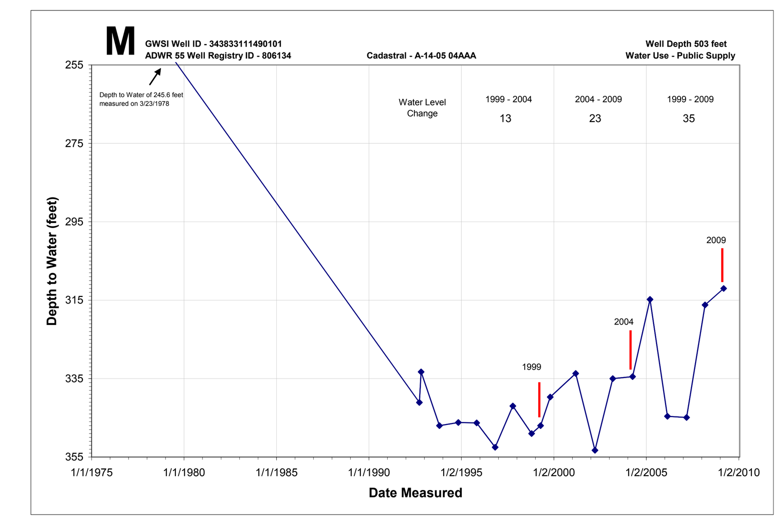


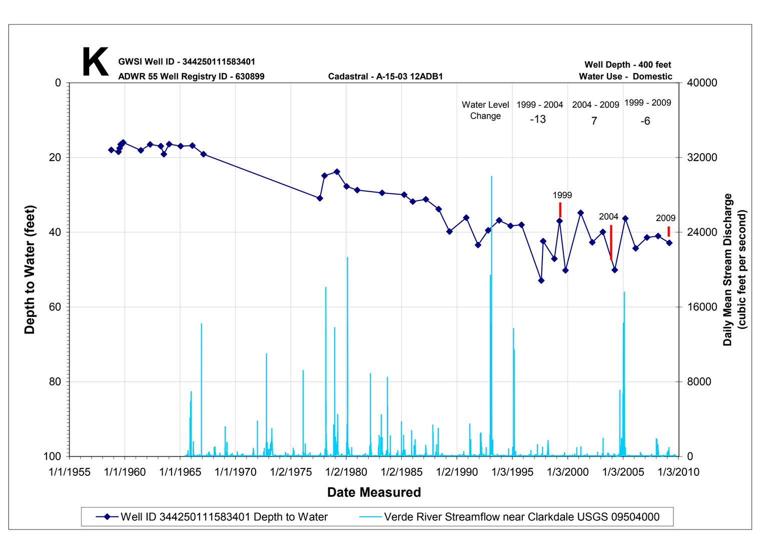


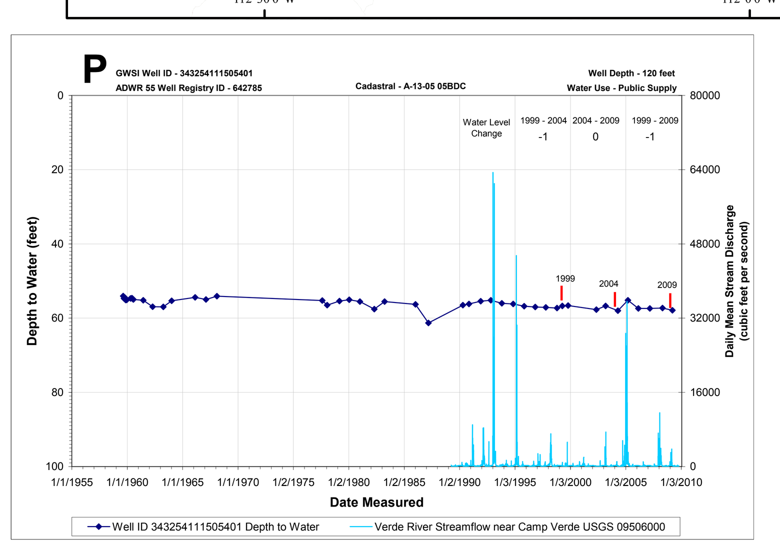


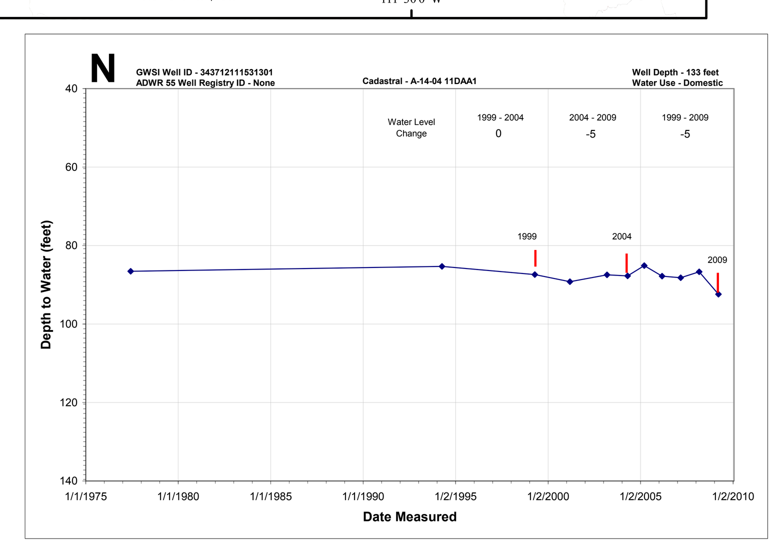












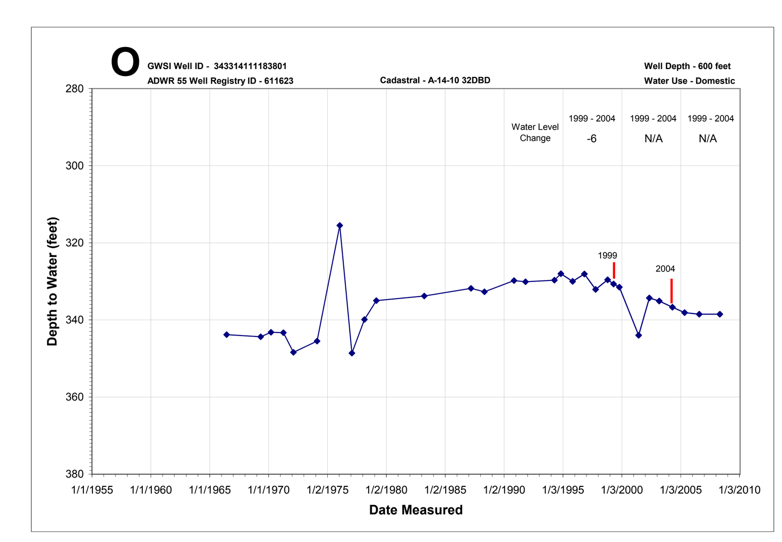


Table 1 - Depth to Water (DTW), Water Level Elevation (WLE), and Water Level Changes (in feet) for wells located in the Verde Valley Sub-Basin measured in 1999, 2004, and 2009. Data obtained from the ADWR GWSI database (https://gisweb.azwater.gov/waterresourcedata/)

			1999			2004			2009			WATER LEVEL CHANGE		
CADASTRAL	WELL ID	HYDROGRAPH	Date	DTW	WLE	Date	DTW	WLE	Date	DTW	WLE	1999 - 2004	2004 - 2009	1999 - 2009
A-13-04 12DAA	343159111521901		4/12/1999	40	3033	4/8/2004	39	3034				1		
A-13-05 05BAD2	343308111504801		4/12/1999	21	3054	4/15/2004	26	3049				-5		
A-13-05 05BDC	343254111505401	P	4/12/1999	57	3053	4/15/2004	58	3052	3/17/2009	58	3052	-1	0	-1
A-13-05 05CBB2	343251111511301		4/12/1999	30	3052	4/16/2004	30	3052	3/9/2009	31	3051	0	-1	-1
A-13-05 06AAA2	343314111511502					4/23/2004	27	3058	3/11/2009	27	3058		0	
A-13-05 06ABB	343310111514501		4/13/1999	22	3065	4/13/2004	22	3065	3/25/2009	23	3064	-1	-1	-2
A-13-05 06BCA	343258111520401					4/13/2004	57	3052	3/25/2009	63	3047		-6	
A-13-05 06CCB2	343232111521201		4/12/1999	39	3044	4/8/2004	39	3044				0		
A-13-05 06CCB3	343232111521202					4/8/2004	32	3051	3/25/2009	48	3035		-16	
A-13-05 07BBC1	343219111521701		4/12/1999	26	3037	4/8/2004	20	3043	3/25/2009	27	3037	6	-6	0
A-13-05 07BBC2	343210111521301		4/12/1999	20	3032	4/8/2004	13	3039				7		
A-13-05 08AAB1	343224111502401		4/20/1999	25	3050	4/16/2004	27	3048				-2		
A-13-05 08ADC	343158111502201		4/13/1999	22	3041	4/16/2004	22	3041	3/12/2009	24	3039	-1	-1	-2
A-13-05 08CBA1	343151111510201		4/13/1999	11	3034	4/19/2004	12	3033	3/12/2009	12	3034	-1	0	-1
A-13-05 09DBA2	343157111492601		4/13/1999	135	3055	4/21/2004	138	3053	3/16/2009	137	3053	-3	0	-2
A-13-05 09DCC	343134111493901		4/15/1999	47	3031	4/21/2004	46	3032				0		
A-13-05 13BAC2	343123111464401		4/14/1999	84	3106	4/22/2004	104	3086				-20		
A-13-05 13BAC3	343124111464301		4/14/1999	84	3105	4/22/2004	91	3098	3/17/2009	96	3093	-8	-5	-13
A-13-05 13DAB	343100111460501		4/14/1999	82	3156	4/19/2004	85	3153	3/17/2009	92	3146	-4	-7	-10
A-13-05 14ADD	343106111470301					4/22/2004	106	3095	3/17/2009	103	3097		2	
A-13-05 15BAC2	343121111485302		4/15/1999	33	3068	4/20/2004	35	3065				-3		
A-13-05 16BAD	343123111494501		4/15/1999	26	3033	4/21/2004	27	3032				-1		
A-13-05 17CAA2	343105111504601		4/14/1999	36	3019	4/22/2004	37	3018	3/12/2009	42	3013	-1	-5	-6
A-13-05 17CAD	343055111504501		4/22/1999	63	3014	4/22/2004	64	3013				-1		
A-13-05 17DBD	343056111503401		4/22/1999	38	3025	4/22/2004	39	3023	3/18/2009	39	3023	-1	-1	-2
A-13-05 21DBD	343002111492901		4/14/1999	13	2997	4/22/2004	15	2995	3/12/2009	16	2995	-2	-1	-2
A-13-06 23BBC	343028111413801		4/20/1999	336	4084	4/15/2004	339	4081	3/24/2009	338	4082	-3	1	-3
A-13-06 29DBB	342914111441601		4/21/1999	301	3192	4/15/2004	301	3191	3/24/2009	302	3190	0	-1	-2
A-13-10 06DAA	343228111191801					4/28/2004	368	6497	3/19/2009	374	6491		-6	
A-14-03 20AAB	343515112024901		4/15/1999	36	4984	4/15/2004	50	4970	3/25/2009	49	4972	-14	1	-13
A-14-03 21ABB1	343512112020501		4/15/1999	38	4912	4/15/2004	44	4906	3/24/2009	38	4912	-6	6	0
A-14-04 03BCD1	343815111550101					4/19/2004	24	3146	3/18/2009	24	3146		0	
A-14-04 03BCD2	343818111550501					4/19/2004	46	3125	3/18/2009	45	3125		1	
A-14-04 03DCB	343754111543801		4/14/1999	42	3123	4/7/2004	40	3125				3		
A-14-04 10BCB	343732111551301		4/14/1999	77	3128	4/20/2004	74	3131				3		
A-14-04 10CDB2	343701111545801					4/21/2004	136	3142	3/18/2009	140	3138		-4	
A-14-04 11AAC	343732111531901		4/19/1999	135	3115	4/21/2004	135	3116				0		
A-14-04 11DAA1	343712111531301	N	4/14/1999	87	3113	4/20/2004	88	3112	3/19/2009	92	3108	0	-5	-5
A-14-04 13DAB4	343617111522001		4/21/1999	106	3102	4/22/2004	112	3096	3/10/2009	101	3107	-6	11	5
A-14-04 24BAB1	343548111525901					4/22/2004	15	3095	3/18/2009	13	3097		2	
A-14-04 24BBA2	343550111525901		4/13/1999	15	3095	4/22/2004	15	3095				0		
A-14-04 24BCB2	343535111531001		4/12/1999	31	3090	4/20/2004	30	3091				1		
A-14-04 24BCD1	343529111530501		4/12/1999	27	3091	4/20/2004	23	3095	3/18/2009	9	3109	4	14	19
A-14-04 24DAA	343522111521401					4/14/2004	41	3074	3/10/2009	35	3081		6	
A-14-04 25BAB	343458111525501		4/12/1999	24	3101	4/20/2004	25	3100	3/18/2009	26	3099	-2	-1	-3
A-14-04 25BCA	343441111530601		4/12/1999	100	3070	4/20/2004	112	3058				-12		
A-14-04S13BBA	343646111530101		4/14/1999	24	3101	4/23/2004	24	3101	3/11/2009	22	3103	0	2	2
A-14-04S13BCA4	343628111530201		4/12/1999	31	3105	4/21/2004	31	3104				0		
A-14-04S13BDB1	343631111524901		4/14/1999	23	3102	4/21/2004	21	3104	3/11/2009	21	3104	2	0	2
A-14-04S13BDB2	343634111525001		4/14/1999	19	3111	4/21/2004	17	3113				2		
A-14-04S13CDA	343606111524501		4/13/1999	12	3098	4/23/2004	12	3098				-1		
A-14-04S13CDD	343602111524501					4/23/2004	9	3101	3/18/2009	8	3102		1	
A-14-04S14DBB	343620111534201		4/15/1999	44	3116	4/22/2004	46	3114				-1		
A-14-04S14DBD2	343610111532901		4/12/1999	43	3107	4/21/2004	42	3108				1		
A-14-05 01CBB	343801111464601		4/13/1999	13	3402	4/20/2004	35	3380	3/17/2009	56	3359	-22	-21	-43
A-14-05 02CBC2	343755111474601					4/12/2004	150	3330	3/16/2009	149	3331		1	
A-14-05 02CCD1	343741111474001					4/23/2004	36	3329	3/18/2009	32	3333		4	
A-14-05 02CCD2	343740111474001		4/12/1999	21	3359	4/14/2004	17	3363				4		
A-14-05 03CCD1	343746111484701					4/12/2004	208	3277	3/17/2009	207	3278		1	
A-14-05 04AAA	343833111490101	M	4/15/1999	347	3133	4/6/2004	335	3146	3/10/2009	312	3168	13	23	35
A-14-05 04ADD	343812111485501					4/13/2004	21	3254	3/12/2009	19	3257		2	
A-14-05 09BCC2	343714111495801		4/15/1999	54	3210	4/9/2004	57	3208				-3		
A-14-05 19BAD	343547111514801		4/21/1999	197	3093	4/14/2004	198	3092				-1		
A-14-05 19DBA2	343524111513502					4/14/2004	71	3089	3/10/2009	72	3088		-1	
A-14-05 30BAD	343450111515101		4/15/1999	60	3060	4/14/2004	60	3060				0		
A-14-05 30BDC	343443111515701					4/16/2004	22	3078	3/25/2009	21	3079		1	
A-14-05 30DDA	343416111511601		4/16/1999	20	3070	4/15/2004	21	3069				-1		
A-14-05 31ACA	343351111513701		4/16/1999	57	3103	4/6/2004	67	3093				-11		
A-14-05 31BDB	343358111520101		4/16/1999	59	3071	4/6/2004	59	3071				0		
A-14-05 31CCA1	343326111520701		4/14/1999	156	3075	4/5/2004	169	3061	3/10/2009	155	3075	-13	13	0
A-14-05 31CDC	343323111515601		4/21/1999	58	3063	4/13/2004	31	3090				27		
A-14-05 31DCB2	343329111514001					4/6/2004	165	3036	3/10/2009	140	3060		24	
A-14-05 31DCD	343320111513701		4/13/1999	21	3076	4/7/2004	21	3076	3/9/2009	22	3076	0	-1	-1
A-14-05 31DDB	343326111512601		4/19/1999	144	3058	4/7/2004	145	3057	3/16/2009	145	3057	-1	-1	-2
A-14-05 32BBB1	343409111511101		4/15/1999	23	3072	4/15/2004	20	3075				3		
A-14-05 32BBB2	343408111511201		4/15/1999	30	3070	4/7/2004	19	3081	3/10/2009	22	3078	11	-3	9
A-14-05 32CBB2	343341111511201		4/14/1999	72	3066	4/7/2004	72	3066				0		
A-14-05 32CBB3	343341111511401		4/14/1999	65	3073	4/7/2004	67	3071	3/11/2009	67	3071	-2	0	-2
A-14-05 32DCC2	343321111503801					4/15/2004	44	3056	3/9/2009	31	3069		13	
A-14-05E17AAC	343638111501301		4/15/1999	37	3153	4/9/2004	47	3143	3/25/2009	39	3151	-11	8	-2
A-14-05W29ADC	343439111511301		4/15/1999	9	3071	4/16/2004	12	3068	3/12/2009	13	3067	-2	-1	-4
A-14-06 09DCD	343646111430201					4/20/2004	78	3832	3/23/2009	83	3827		-5	
A-14-06 16DBD	343611111430201		4/20/1999	33	3917	4/19/2004	34	3916	3/24/2009	43	3907	-1	-9	-10
A-14-10 32DBD	343314111183801	O	4/21/1999	331	6524	4/21/2004	337	6518				-6		
A-15-03 01CCB	344314111592701		4/13/1999	27	3229	4/15/2004	36	3220	3/26/2009	39	3216	-9	-4	-13
A-15-03 01CCC	344304111592601		4/13/1999	25	3231	4/6/2004	40	3215				-15		
A-15-03 01DCC2	344304111585601		4/13/1999	46	3219	4/8/2004	62	3203	3/10/2009	60	3205	-16	2	-14
A-15-03 01DDC1	344307111583501		4/12/1999	56	3229	4/5/2004	70	3215	3/12/2009	64	3221	-14	6	-8
A-15-03 02CAA	344326112000201					4/15/2004	40	3245	3/24/2009	42	3243		-2	
A-15-03 02CBB	344327112002701		4/14/1999	113	3252	4/15/2004	121	3244				-8		
A-15-03 02CCB	344308112002301		4/14/1999	106	3255	4/22/2004	114	3247				-8		
A-15-03 02DAC2	344317111594001		4/13/1999	22	3248	4/6/2004	23	3247	3/26/2009	29	3241	-1	-6	-7
A-15-03 03ABB	344352112005601					4/15/2004	155	3250	3/24/2009	151	3254		4	
A-15-03 03CAD	344318112010601		4/16/1999	204	3264	4/15/2004	216	3252	3/24/2009	216	3252	-12	0	-12
A-15-03 03CDA	344311112010401		4/19/1999	209	3261	4/15/2004	221	3249				-13		
A-15-03 04AAB	344354112014901		4/19/1999	231	3269	4/23/2004	264	3236	3/24/2009	256	3244	-33	8	-25
A-15-03 10ABD2	344251112005101		4/19/1999	240	3242	4/13/2004	250	3232				-10		
A-15-03 10DAB	344231112004201					4/21/2004	287	3203	3/24/2009	293	3197		-6	
A-15-03 11ABB	344258111595501		4/13/1999	61	3260	4/5/2004	68	3252	3/11/2009	68	3252	-7	0	-7
A-15-03 11BAB1	344258112001201		4/15/1999	214	3156	4/14/2004	193	3177	3/23/2009	198	3173	21	-4	16
A-15-03 11BAD	344256112000301		4/15/1999	132	3228	4/14/2004	138	3222	3/23/2009	141	3219	-6	-3	-9
A-15-03 12ADB1	344250111583401	K	4/12/1999	37	3228	4/5/2004	50	3215	3/10/2009	43	3222	-13	7	-6
A-15-03 12ADB3	344250111584101		4/12/1999	37	3228	4/5/2004	51	3214	3/27/2009	45	3220	-14	6	-8
A-15-03 12BAA3	344300111590401		4/15/1999	43	3227	4/12/2004	58	3212				-14		
A-15-03 12CDC	344213111591101		4/13/1999	145	3180	4/22/2004	177	3148	3/26/2009	184	3141	-32	-7	-39
A-15-03 12DBB1	344237111585803					4/15/2004	23	3227	3/12/2009	13	3237		10	
A-15-03 13ABB	344201111585401		4/13/1999	123	3182	4/22/2004	149	3156	3/26/2009	148	3158	-26	1	-25
A-15-03 13DCD	344122111584701		4/13/1999	241	3164	4/22/2004	255	3150	3/26/2009	309	3096	-14	-54	-68
A-15-03 15ADB2	344152112004301		4/15/1999	340	3195	4/19/2004	354	3181	3/24/2009	362	3173	-14	-8	-22
A-15-03 15ADC1	344149112004301		4/15/1999	345	3200	4/22/2004	362	3183				-16		
A-15-03 15CCA	344130112012301		4/15/1999	455	3195	4/19/2004	472	3178				-17		
A-15-03 16CDD	344123112021001		4/21/1999	124	3649	4/14/2004	132	3641	3/23/2009	143	3630	-8	-11	-19
A-15-03 25BDD	344003111585801		4/14/1999	195	3225	4/6/2004	192	3228				3		
A-15-04 02BAA1	344349111534001		4/22/1999	113	3337	4/14/2004	115	3335	3/17/2009	115	3335	-2	0	-2
A-15-04 02BCD1	344334111535401		4/16/1999	99	3336	4/8/2004	103	3332				-4		
A-15-04 02CCB4	344312111540801					4/13/2004	99	3321	3/10/2009	97	3323		1	
A-15-04 03CCB	344315111551201		4/15/1999	17	3293	4/5/2004	17	3293				-1		
A-15-04 04AAA2	344350111551601		4/14/1999	12	3299	4/7/2004	14	3297				-2		
A-15-04 04AAD2	344349111551601		4/14/1999	14	3311	4/7/2004	11	3314				2		
A-15-04 04ACA2	344338111553201		4/15/1999	19	3301	4/5/2004	24	3296				-5		
A-15-04 04DDC1	344307111552701		4/14/1999	57	3298	4/7/2004	60	3296				-2		
A-15-04 07BCA	344244111581501		4/21/1999	42	3258	4/13/2004	52	3248	3/10/2009	52	3248	-10	0	-10
A-15-04 09DAA1	344231111551801		4/21/1999	38	3302	4/8/2004	38	3302				-1		
A-15-04 09DDA	344221111551901		4/21/1999	65	3295	4/12/2004	67	3293				-2		
A-15-04 10ACC	344237111543501		4/20/1999	105	3275	4/8/2004	108	3273	3/26/2009	108	3272	-2	0	-2
A-15-04 10BDA2	344247111544801		4/22/1999	83	3278	4/14/2004	80	3281				3		
A-15-04 10BDA3	344246111544901		4/22/1999	77	3278	4/14/2004	78	3277				-1		
A-15-04 10DCA2	344218111542801		4/22/1999	54	3256	4/14/2004	60	3250	3/24/2009	57	3253	-6	3	-3
A-15-04 10DDB1	344221111542501		4/22/1999	50	3256	4/14/2004	56	3249				-6		
A-15-04 10DDB2	344219111542701		4/22/1999	54	3256	4/14/2004	60	3250	3/24/2009	54	3256	-6	6	0
A-15-04 11BBC1	344251111540801		4/21/1999	123	3292	4/13/2004	125	3290				-3		
A-15-04 11BBC2	344256111541001		4/21/1999	115	3295	4/13/2004	120	3290				-5		
A-15-04 11BBD1	344251111535801		4/21/1999	160	3275	4/13/2004	161	3274				-2		
A-15-04 12ABB	344253111522801		4/22/1999	226	3354	4/7/2004	221	3359	3/23/2009	233	3347	5	-12	-7
A-15-04 15CAA	344142111544501		4/21/1999	115	3265	4/12/2004	182	3198				-67		
A-15-04 17BDB	344155111570201		4/21/1999	214	3227	4/13/2004	217	3223				-4		
A-15-04 18ACC	344148111575001		4/12/1999	78	3187	4/22/2004	97	3168	3/26/2009	101	3165	-19	-4	-23
A-15-04 20BDB	344106111570401		4/21/1999	99	3181	4/13/2004	102	3178				-3		
A-15-04 20CDA	344035111565401		4/21/1999	30	3180	4/13/2004	31	3179				0		
A-15-04 21CBA2	344052111560601		4/21/1999	58	3167	4/13/2004	62	3163	3/12/2009	58	3167	-3	3	0
A-15-04 31DCC	343843111575301					4/23/2004	387	3163	3/11/2009	390	3160		-3	
A-15-04 33DCC	343842111554301					4/15/2004	57	3141	3/18/2009	49	3149		8	
A-15-05 20ABB	344106111502701					4/7/2004	364	3192	3/13/2009	362	3193		2	
A-15-05 24DCC	344024111460801					4/8/2004	166	3574	3/11/2009	200	3540		-34	
A-15-05 24DCD	344018111460501					4/8/2004	295	3445	3/11/2009	231	3509		64	
A-15-05 25DDD	343924111454901	L	4/13/1999	123	3457	4/5/2004	129	3452				-6		
A-15-05 33AAC1	343909111490801					4/8/2004	41	3289	3/12/2009	35	3295		6	
A-15-05 34CCC1	343837111485301					4/7/2004	178	3182	3/13/2009	145	3215		33	
A-15-05 35AAC2	343913111465801					4/13/2004	178	3403	3/16/2009	207	3374		-29	
A-15-05 35ACD	343904111470701		4/14/1999	133	3437	4/13/2004	157	3413				-24		
A-15-05 36AAB	343922111455401					4/5/2004	150	3420	3/11/2009	170	3400		-19	
A-15-05 36CCB1	343843111464101					4/14/2004	118	3407	3/17/2009	148	3377		-30	
A-15-05S06BCA	344331111515501		4/22/1999	382	3318	4/9/2004	383	3317	3/13/2009	384	3316	-1	-1	-2
A-15-06 28ACA	343956111425801					4/19/2004	36	3739	3/23/2009	37	3738		-1	
A-15-06 31CBA2	343854111453301					4/20/2004	105	3410	3/10/2009	121	3394		-16	
A-16-01 04CCA	344731112160401		4/15/1999	200	4960	4/13/2004	200	4960				1		
A-16-02 13CCB	344544112054501		4/22/1999	272	3853	4/12/2004	272	3853				0		
A-16-03 08AAD	323812112024101		4/13/1999	42	3383	4/22/2004	30	3395				12		
A-16-03 19DBD	344556112040501	I	4/12/1999	251	3409	4/12/2004	273	3387	3/26/2009	282	3378	-22	-9	-32
A-16-03 20DDD	344546112024101		4/13/1999	194	3326	4/12/2004	193	3327				1		
A-16-03 22DCD	344545112005401		4/12/1999	41	3389	4/22/2004	44	3386	3/26/2009	43	3387	-3	1	-2
A-16-03 26CAA	344510112000401		4/12/1999	30	3270	4/22/2004	23	3277	3/26/2009	24	3276	7	-1	6
A-16-03 26CCC3	344452112002701					4/21/2004	21	3264	3/24/2009	23	3263		-2	
A-16-03 28BDA	344528112020801		4/14/1999	92	3313	4/12/2004	119	3286	3/25/2009	112	3293	-27	7	-20
A-16-03 29AAD1	344532112024401		4/22/1999	236	3354	4/19/2004	237	3353				0		
A-16-03 29AAD2	344530112023901		4/12/1999	220	3345	4/16/2004	224	3341				-4		
A-16-03 33ACD	344422112015201					4/13/2004	198	3243	3/25/2009	200	3242		-2	
A-16-03 33DDA	344402112013801					4/21/2004	315	3145	3/26/2009	321	3139		-6	
A-16-03 34AAB	344447112004601		4/22/1999	16	3284	4/20/2004	24	3276	3/25/2009	23	3278	-8	2	-6
A-16-03 34BCC	344422112012901		4/13/1999	110	3309	4/21/2004	92	3327	3/24/2009	150	3269	18	-58	-40
A-16-03 34DAA	344418112003501		4/13/1999	64	3266	4/21/2004	75	3255				-11		
A-16-03 34DCD	344358112005301		4/15/1999	125	3268	4/20/2004	136	3257	3/25/2009	131	3261	-11	4	-7
A-16-03 35AAB	344447111594201		4/15/1999	13	3257	4/12/2004	14	3256				-1		
A-16-03 35CCA2	344405112001801		4/13/1999	38	3271	4/21/2004	41	3268				-3		
A-16-03 35DDC	344357111594401		4/15/1999	24	3251	4/8/2004	30	3245				-6		
A-16-03 36CDC	344359111591101	J	4/13/1999	67	3351	4/6/2004	81	3337	3/17/2009	81	3337	-13	-1	-14
A-16-03 36DAC	344425111583901		4/13/1999	56	3364	4/21/2004	87	3334	3/17/2009	79	3341	-31	7	-23
A-16-04 12BAC	344810111523701		4/14/1999	103	3617	4/15/2004	102	3618	3/26/2009	130	3590	1	-28	-27
A-16-04 12BAD1	344809111523601					4/15/2004	146	3584	3/26/2009	116	3614		30	
A-16-04 13BBC	344713111530401		4/14/1999	48	3552	4/15/2004	52	3548				-4		
A-16-04 13CBB	344657111530501		4/14/1999	4	3558	4/15/2004	6	3556				-1		
A-16-04 15DAD	344632111541001		4/15/1999	24	3556	4/22/2004	25	3555	4/15/2009	23	3557	-1	2	1
A-16-04 15DDB3	344632111542201		4/15/1999	44	3617	4/19/2004	44	3616				-1		
A-16-04 15DDC2	344632111541701	H	4/15/1999	76	3544	4/14/2004	77	3543	3/24/2009	77	3543	-1	0	-1
A-16-04 20BBB	344625111571401		4/12/1999	178	3562	4/12/2004	181	3559	3/24/2009	182	3558	-2	-1	-3
A-16-04 23BBB1	344627111540701		4/15/1999	5	3535	4/19/2004	6	3534				-1		
A-16-04 23CAB	344612111532301		4/15/1999	30	3550	4/19/2004	35	3545	3/26/2009	34	3546	-5	1	-4
A-16-04 25CBD	344501111525201					4/22/2004	228	3412	3/24/2009	214	3426		14	
A-16-04 26ACC	344518111533301					4/22/2004	5	3445	3/26/2009	6	3444		-1	
A-16-04 26DAB1	344510111531601		4/14/1999	17	3426	4/14/2004	9	3434	3/24/2009	12	3431	8	-3	5
A-16-04 26DAB2	344508111531501		4/14/1999	6	3434	4/14/2004	7	3433	3/24/2009	7	3433	-1	-1	-2
A-16-04 26DBA1	344509111532901		4/14/1999	50	3429	4/14/2004	51	3428	3/24/2009	48	3431	-1	2	1
A-16-04 26DBA2	344511111533001		4/14/1999	44	3432	4/14/2004	44	3431				-1		
A-16-04 27ABB	344535111545601		4/14/1999	35	3455	4/15/2004	34	3456	3/24/2009	35	3455	1	-1	0
A-16-04 27BBA	344534111545801		4/14/1999	58	3452	4/15/2004	56	3454	3/24/2009	54	3456	2	2	4
A-16-04 34BDC1	344422111545301		4/15/1999	20	3335	4/13/2004	32	3323				-12		
A-16-04 34CCB	344406111550901		4/22/1999	50	3295	4/14/2004	53	3292				-3		
A-16-04 35CAA	344420111540301					4/20/2004	145	3345	3/17/2009	144	3346		1	
A-16-05 11BCA	344800111473701		4/12/1999	410	3710	4/21/2004	419	3701				-9		
A-16-06 08CCA1	344735111442701					4/21/2004	502	3785	3/11/2009	504	3783		-3	
A-16-06 08CCD	344728111442901		4/15/1999	450	3815	4/20/2004	461	3804				-11		
A-16-06 09CAC	344737111432401		4/16/1999	593	3811	4/14/2004	602	3802	3/11/2009	605	3799	-9	-3	-12
A-16-06 17CAC	344648111442001					4/19/2004	440	3774	3/10/2009	441	3773		-1	
A-16-06 17DBB	344658111441401		4/15/1999	435	3803	4/20/2004	447	3791	3/11/2009	449	3790	-12	-1	-13
A-16-08 10ABC	344733111292201		4/19/1999	4	7366	4/22/2004	7	7363				-3		
A-16-08 10ACB	344725111292401		4/19/1999	1	7394	4/22/2004	3	7392	3/16/2009	3	7392	-2	0	-2
A-16-09 28CBA	344442111243201		4/19/1999	39	7458	4/22/2004	40	7457	4/22/2009	39	7458	-1	1	0
A-16-09 28CBC3	344435111243501		4/19/1999	22	7468	4/22/2004	22	7468	4/22/2009	22	7469	0	1	1
A-17-01 13CDA	345110112124201					4/13/2004	228	4082	3/24/2009	228	4083		0	
A-17-01 15CDC	345057112145201		4/15/1999	416	4125	4/13/2004	406	4134				9		
A-17-04 01ACA	345312111532001		4/12/1999	723	3712	4/13/2004	736	3700				-12		
A-17-04 03AAC2	345319111551301		4/13/1999	786	3694	4/13/2004	794	3686	3/24/2009	795	3685	-8	-1	-9
A-17-04 06ADD	345302111582201	F	4/12/1999	666	3679	4/13/2004	677	3668	4/8/2009	673	3673	-11	5	-6
A-17-04 25BDC	344933111533701		4/13/1999	452	3573	4/14/2004	456	3569				-4		
A-17-05 05BDC	345304111513301		4/22/1999	919	3731	4/20/2004	929	3722				-10		
A-17-05 11CCB	345146111484301					4/21/2004	578	3812	3/26/2009	574	3816		5	
A-17-05 15AAB	345137111485601		4/14/1999	520	3856	4/21/2004	517	3858	3/26/2009	516	3859	3	1	4
A-17-05 20CCC1	345001111514801		4/19/1999	404	3626	4/14/2004	410	3620				-6		
A-17-05 33ADA1	344850111494801		4/13/1999	212	3628	4/14/2004	215	3625				-3		
A-17-06 08BAA	345233111450801		4/15/1999	71	4189	4/14/2004	79	4181	5/12/2009	77	4183	-8	2	-5
A-17-06 18AAB	345137111454801		4/12/1999	9	4171	4/14/2004	9	4171				-1		
A-17-06E30BBB	344957111463102	G	4/19/1999	445	3855	4/14/2004	452	3848				-7		
A-18-02 31ACB	345405112112501		4/15/1999	17	3809	4/14/2004	16	3810				1		
A-18-02 31CBB2	345350112120101		4/15/1999	5	3820	4/14/2004	6	3819				0		
A-18-02 31DCC2	345329112113002		4/15/1999	36	3835	4/14/2004	33	3838				3		
A-18-04 25BCB	345455111535901		4/13/1999	857	3903	4/13/2004	876	3884	4/7/2009	883	3877	-19	-8	-26
A-18-04 29CDA	345429111574501		4/12/1999	804	3697	4/13/2004	809	3691	3/24/2009	809	3691	-6	1	-5
A-18-05 29ADC3	345449111510601		4/16/1999	666	3889	4/20/2004	678	3877	4/8/2009	675	3880	-12	3	-9
A-18-06 04BBA1	345846111444101		4/12/1999	25	5255	4/15/2004	27	5253				-2		
A-18-06 08AAC	345752111450501		4/15/1999	20	5101	4/13/2004	20	5100	3/12/2009	20	5100	-1	0	-1
A-18-06 08DBB	345727111451701		4/15/1999	130	4901	4/13/2004	84	4946	3/17/2009	70	4960	46	14	60
A-18-06 17ACC	345644111451601	D	4/13/1999	510	4455	4/13/2004	521	4444	3/12/2009	510	4455	-11	11	0
A-18-06 17DDD2	345621111445801		4/12/1999	560	4360	4/15/2004	568	4353	3/18/2009	557	4363	-7	11	3
A-18-06 21DCA	345532111440501		1/12/1999	46	4705	4/15/2004	57	4693	3/12/2009	46	4704	-11	11	0
A-18-07 08DDC	345706111401301		4/19/1999	724	5766	4/6/2004	729	5761	3/18/2009	730	5760	-4	-1	-6
A-18-07 15CCB2	345619111385501	E	4/19/1999	70	6380	4/22/2004	129	6321	3/13/2009	86	6364	-58	43	-16
A-18-07 27CBA	345452111384001		4/19/1999	341	6144	4/8/2004	342	6143	3/19/2009	341	6144	-1	1	0
A-19-01 33BBD	345905112174401		5/19/1999	540	3920	4/20/2004	531	3929	3/25/2009	545	3916	9	-13	-4
A-19-06W14BAB	350159111435701		4/12/1999	813	5677	4/15/2004	815	5675				-2		
A-19-06W27DD	345954111442201		4/12/1999	5	5425	4/15/2004	6	5424	3/17/2009	7	5424	-1	0	-1
A-20-04 03CBA1	350829111574501		4/22/1999	9	6726	4/29/2004	11	6724	5/7/2009	6	6729	-2	5	4
A-20-04 03CBA2	350828111574201		4/22/1999	80	6662	4/29/2004	94	6648				-14		
A-20-04 03CBB	350829111575601	B	4/22/1999	51	6658	4/29/2004	54	6656	3/24/2009	54	6655	-2	0	-2
A-20-04 04DCC1	350804111582701					4/15/2004	28	6632	3/24/2009	29	6631		0	
A-20-06 12DCD1	350725111423001					4/8/2004	84	6791	3/18/2009	88	6787		-4	
A-20-06 12DCD2	350725111423301					4/8/2004	5	6867	3/19/2009	4	6868		1	
A-20-06 19BBB	350624111482501		4/21/1999	89	7074	4/20/2004	113	7050	5/8/2009	91	7072	-23	22	-1
A-20-07 18DDD	350630111411401		4/20/1999	874	6031	4/6/2004	891	6015				-17		
A-20-07 19CBB	350529111420501		4/21/1999	713	5967	4/6/2004	677	6003				36		
A-20-07 20ABC	350617111403501		4/20/1999	685	6093	4/8/2004	695	6083				-10		
A-20-07 20CCA	350547111405701		4/20/1999	677	6038	4/7/2004	677	6038				0		
A-20-07 30BDB	350516111415001		4/20/1999	659	6026	4/7/2004	646	6039				13		
A-21-01 21CBC	351051112175701		4/21/1999	6	6546	4/15/2004	7	6545				-1		
A-21-01 26BCB	351021112155301		4/21/1999	18	6622	4/13/2004	20	6620	5/7/2009	20	6620	-2	0	-2
A-21-03 04BCD	351345112050401		5/21/1999	130	6830	4/15/2004	145	6815	3/12/2009	128	6832	-15	17	2
A-21-03 09BDC	351253112050001		4/22/1999	148	6775	4/29/2004	149	6774				-1		
A-21-03 09CAB	351249112045801		5/21/1999	181	6736	4/29/2004	184	6733	3/11/2009	178	6739	-3	6	3
A-21-03 26BBA1	351039112030101		4/22/1999	1	6706	4/15/2004	0	6707				1		
A-21-04 22BDC	351108111573201		4/22/1999	59	6670	4/16/2004	59	6670				0		
A-21-04 24AAC	351121111565401		4/21/1999	149	6673	4/14/2004	149	6673	3/24/2009	149	6673	0	0	0
A-21-04 29DAD	351004111585801		4/21/1999	11	6725	4/14/2004	20	6716				-8		
A-21-04 33CAB	350916111583801		4/22/1999	23	6717	4/29/2004	35	6705				-12		
A-21-04 33CBA	350916111584101		4/22/1999	23	6717	4/29/2004	35	6706				-12		
A-21-05 01ACC3	351354111485201		4/22/1999	90	7045	4/21/2004	84	7051				5		
A-21-05 02ABC3	351409111500302	A	4/22/1999	29	7102	4/12/2004	36	7096	3/24/2009	24	7107	-7	11	5
A-21-05 02ACC2	351352111500001		4/21/1999	112	7018	4/22/2004	122	7008				-9		
A-21-05 02ACC3	351354111495901		4/21/1999	27	7103	4/22/2004	33	7097				-6		
A-21-05 10AAB1	351317111505001		4/21/1999	0	7055	4/22/2004	7	7048				-7		
A-21-05 10AAB4	351317111504601					4/22/2004	3	7052	4/6/2009	1	7054		2	
A-21-05 10ADA	351309111503801					4/22/2004	14	7036	4/6/2009	10	7040		4	
A-21-05 11CBD	351251111502301		4/21/1999	3	7047	4/22/2004	16	7034				-13		
A-21-05 12DAD	351250111483201		4/21/1999	24	7037	4/22/2004	28	7033				-4		
A-21-06 06CCA1	351335111481301		4/22/1999	101	7030	4/12/2004	124	7006				-24		
A-21-06 07CBB	351253111482301		4/21/1999	66	7034	4/22/2004	94	7006	4/6/2009	71	7029	-28	23	-6
A-22-03 24CCD	351558112015701		4/20/1999	3	6883	4/20/2004	5	6881				-2		
A-22-03 26CAA	351525112023901					4/22/2004	20	6875	3/12/2009	20	6875		0	
A-22-03 26DAA	351526112021201					4/21/2004	7	6878	5/7/2009	3	6882		4	
A-22-03 26DBB3	351525112023401					4/22/2004	6	6904	3/12/2009	4	6906		2	
A-22-03 26DBB4	351524112023401					4/22/2004	6	6904	3/12/2009	3	6907		3	
A-22-04 14DAD2	351702111555001		4/20/1999	173	7129	4/15/2004	155	7147	3/18/2009	151	7151	18	4	22
A-22-04 22ADA3	351631111565201					4/15/2004	42	7173	3/19/2009	16	7199		27	
A-22-04 23BAC1	351638111562701		4/21/1999	82	7184	4/15/2004	82	7184				1		
A-22-04 23BAC2	351642111562601		4/20/1999	75	7197	4/15/2004	79	7193	3/18/2009	65	7207	-4	14	10
A-22-04 26CAA	351526111561501					4/16/2004	107	6950	3/23/2009	107	6950		0	
A-22-04 26CAA	351526111561901		4/19/1999	99	7003	4/14/2004	136	6966				-37		
A-22-04 27BAB1	351554111573001		4/21/1999	166	6897	4/14/2004	139	6924				27		
A-22-04 27BAB2	351553111573001		4/21/1999	70	6991	4/14/2004	51	7010	3/19/2009	65	6996	18	-14	4
A-22-04 27CBB	351527111574601		4/19/1999	152	6898	4/15/2004	152	6898				0		
A-22-04 28CAA	351526111582901		4/19/1999	49	6921	4/21/2004	46	6924				4		
A-22-05 35DCC2	351416111495602		4/22/1999	29	7099	4/21/2004	35	7093				-6		
A-22-05 36CCC1	351417111492501		4/22/1999	104	7026	4/21/2004	113	7016				-10		
A-23-05 27AAC	352108111504801		4/20/1999	709	6951	4/14/2004	711	6949	5/8/2009	715	6945	-2	-5	-6
B-18-01 27ABD	345505112204501		4/19/1999	189	4218	4/21/2004	192	4216				-2		
B-19-01 16ACB	350154112220001	C	5/21/1999	554	4236	4/7/2004	556	4234	3/9/2009	556	4234	-2	-1	-3

NORTH AMERICAN DATUM 1983 HARN

WATER LEVEL CHANGES IN VERDE VALLEY SUB-BASIN, ARIZONA
1999-2009

By
Stephen Flora
December 2009

©
ARIZONA DEPARTMENT OF WATER RESOURCES

HYDROLOGY DIVISION

For data go to:
https://gisweb.azwater.gov/waterresourcedata/

For more information or copies contact:
ADWR Information Services
3550 North Central Avenue
Phoenix, AZ 85012
(602) 771-8627
www.azwater.gov