

Central Yavapai Highlands Water Resources Management Study - Phase I

Demand Analysis

Per Sub-Basin

Draft

Verde Valley Sub-Basin Status Quo

A	B	C	D (C-B)	E	F	G	H (E+F+G)	I (E/B)	J	K	L (C*K)	M	N	O (L+M+N)	P (J-O)
Water Planning Area ¹	2006 Population ²	2050 Population ²	Pop. Change	2006 Mun/Dom Demand ³ (AF/yr)	2006 Com/Ind Demand ³ (AF/yr)	2006 AG Demand ³ (AF/yr)	Total 2006 Demand	2006 ⁴ GPPD	Estimated Available Water Supply ⁵ (AF/yr)	2050 ⁶ GPPD	2050 Mun/Dom Demand ⁶ (AF/yr)	2050 Com/Ind Demand ⁷ (AF/yr)	2050 AG Demand ⁸ (AF/yr)	Total 2050 Demand (AF/yr)	2050 Water Supply +/- (AF/yr)
Camp Verde	12,497	23,277	10,780	1,701	783	9,320	11,804	122	11,804	112	2,920	783	6,213	9,917	1,887
Clarkdale	3,999	22,460	18,461	481	0	31	512	107	512	75	1,887	300	31	2,218	-1,706
Cottonwood	20,400	77,630	57,230	3,399	1,753	1,137	6,289	149	6,289	125	10,870	1,753	758	13,381	-7,092
Jerome	510	800	290	282	0	0	282	494	282	255	229	53	0	282	0
Sedona	11,080	16,300	5,220	3,801	33	278	4,112	306	4,112	300	5,478	33	185	5,696	-1,584
Big Park CDP	7,731	8,810	1,079	1,363	1,151	0	2,514	157	2,514	198	1,954	1,151	0	3,105	-591
Cornville CDP	4,075	7,448	3,373	959	0	2,823	3,782	210	3,782	185	1,544	0	1,882	3,426	356
Lake Montezuma CDP	4,237	8,308	4,071	674	709	537	1,920	142	1,920	120	1,117	709	358	2,184	-264
Ctn-Verde Village CDP	3,373	11,706	8,333	119	0	1,124	1,243	31	1,243	125	1,639	0	749	2,388	-1,145
Verde CCD	1,644	4,377	2,733	542	690	1,322	2,554	294	2,554	235	1,152	690	881	2,724	-170
Mingus Mtn CCD (portion)*	510	1,358	848	145	218	487	851	254	851	215	327	218	325	870	-19
Humboldt CCD (portion)**	225	600	374	53	0	759	812	210	812	170	114	0	506	620	192
Total	70,281	183,073	112,792	13,519	5,337	17,818	36,675		36,675		29,231	5,690	11,889	46,811	-10,136

Water Balance Method															
VV Sub-Basin (with net natural recharge)	See Blasch, 2006, pg. 82. Inflow (167,000) - baseflow out (144,100)								22,900					46,811	-23,911
VV Sub-Basin (with 1997 demands)	See ADWR, 2000 pg. 5-23. Sum of Dom., Other/Industrial, Municipal, and AG								26,660					46,811	-20,151

Assumptions:

1. See Demand Analysis and Data Sources Documentation for discussion of WPA boundaries. Note: Many municipal boundaries vary from the WPA boundaries.
 2. See Population Comparison for 2006 and 2050 population assumptions.
 3. See CYHWRMS - Water Planning Area - Water Use and Available Supply Summary Table for all 2006 Demand Estimates. (Note: Mun/Dom demands include Com/Ind demands delivered by water providers. Column F - Com/Inc demands are individually served through private wells.
 4. 2006 Gallons Per Person per Day is calculated by dividing the 2006 Mun/Dom demand by the 2006 population (conversion formula: AF/person * 325,851gal/AF / 365day/year = gal/person/day (GPPD))
 5. Estimated Available Water Supply represents either the "Status Quo" (amount available in 2006 is available in perpetuity) or the "Water Balance" (estimated amount available using components from existing water budgets for the area) methods - See Phase I - Demand Analysis Data Sources and Documentation.
 6. 2050 GPPD was provided for each Water Planning Area. The value is multiplied by the 2050 population to calculate 2050 Municipal/Domestic Demand (conversion formula: person * gal/person/day / 325,851gal/AF * 365day/year = AF/year)
 7. 2050 Commercial/Industrial Demands are held in Status Quo for 2050 for WPAs outside of the PrAMA (except Clarkdale and Jerome who provided their own estimate and 240 AF was added to the Verde CCD for new GC on reservation).
 8. 2050 Agricultural Groundwater Demand is assumed to be $\frac{2}{3}$ of the 2006 Agricultural Groundwater Demand (except Clarkdale and Jerome who provided their own AG estimate).
- * 30% of the Mingus Mountain CCD Water Planning Area is in the Verde Valley Sub-Basin. (100% of the Mingus Mountain CCD Water Planning Area irrigated acreage is in the Verde Valley Sub-Basin.)
- ** 98% of the Humboldt CCD Water Planning Area is in the Verde Valley Sub-Basin. (100% of the Humboldt CCD Water Planning Area irrigated acreage is in the Verde Valley Sub-Basin.)

**Little Chino and Upper Agua Fria Sub-Basins (Prescott AMA)
Status Quo**

A	B	C	D (C-B)	E	F	G	H (E+F+G)	I (E/B)	J Estimated Available Water Supply ⁵	K	L (C*K) 2050 Mun/Dom Demand ⁶	M 2050 Com/Ind Demand ⁷	N 2050 AG Demand ⁸	O (L+M+N) Total 2050 Demand	P (J-O) 2050 Water Supply +/- (AF/yr)
Water Planning Area ¹	2006 Population ²	2050 Population ²	Pop. Change	2006 Mun/Dom Demand ³ (AF/yr)	2006 Com/Ind Demand ³ (AF/yr)	2006 AG Demand ³ (AF/yr)	Total 2006 Demand	2006 ⁴ GPPD	(AF/yr)	GPPD	(AF/yr)	(AF/yr)	(AF/yr)	(AF/yr)	(AF/yr)
Dewey Humboldt	4,134	6,943	2,809	629	16	569	1,214	136	1,214	120	933	700	37	1,670	-456
Prescott Valley	41,610	146,000	104,390	6,221	545	55	6,821	133	6,821	121	19,790	900	0	20,690	-13,869
Chino Valley	12,690	63,690	51,000	1,325	522	1,691	3,538	93	2,755	75	5,351	4,192	158	9,701	-6,946
Prescott	49,072	100,000	50,928	10,531	1	375	10,907	192	10,907	125	14,003	3,224	375	17,602	-6,695
Paulden CDP (portion)*	107	282	175	18	0	578	597	154	597	120	38	0	578	616	-20
Williamson CDP (portion)**	3,241	7,344	4,103	924	0	0	924	255	924	221	1,818	0	0	1,818	-894
Prescott CCD (portion)***	9,580	25,501	15,921	1,174	0	176	1,349	109	1,349	135	3,857	7	176	4,040	-2,690
Mgs Mtn CCD (portion)****	1,190	3,168	1,978	339	510	0	848	254	848	215	763	510	0	1,272	-424
Humboldt CCD (portion)*****	5	12	8	1	0	0	1	210	1	170	2	0	0	2	-1
Total	121,629	352,940	231,311	21,162	1,594	3,444	26,200		25,416		46,555	9,533	1,324	57,411	-31,995

Water Balance Method															
PRAMA (using net nat. recharge)	K. Nelson, 2009 Nat. Recharge memo (8,070) - Avg. outflow from ADWR, 1999 declaration (4,850)								3,220					57,411	-54,191
Prescott AMA (using avg 1990 - 1997 demands)	ADWR, 1999 declaration, Table 2 Sum of 1990-1997 Muni (incls. Exempt), AG and Industrial)								16,317					57,411	-41,094

Assumptions:

1. See Demand Analysis and Data Sources Documentation for discussion of WPA boundaries. Note: Many municipal boundaries vary from the WPA boundaries.
 2. See Population Comparison for 2006 and 2050 population assumptions.
 3. See CYHWRMS - Water Planning Area - Water Use and Available Supply Summary Table for all 2006 Demand Estimates. (Note: Mun/Dom demands include Com/Ind demands delivered by water providers. Column F - Com/Ind demands are individually served through private wells.
 4. 2006 Gallons Per Person per Day is calculated by dividing the 2006 Mun/Dom demand by the 2006 population (conversion formula: AF/person * 325,851gal/AF / 365day/year = gal/person/day (GPPD))
 5. Estimated Available Water Supply represents either the "Status Quo" (amount available in 2006 is available in perpetuity) or the "Water Balance" (estimated amount available using components from existing water budgets for the area) methods - See Phase I - Demand Analysis Data Sources and Documentation.
 6. 2050 GPPD was provided for each Water Planning Area. The value is multiplied by the 2050 population to calculate 2050 Municipal/Domestic Demand (conversion formula: person * gal/person/day / 325,851gal/AF * 365day/year = AF/year)
 7. 2050 Commercial/Industrial Demands are held in Status Quo for 2050 for WPAs outside of the PrAMA (except Clarkdale and Jerome who provided their own estimate and 240 AF was added to the Verde CCD for new GC on
 8. In the PrAMA Agricultural Surface Water Demand (Granite Dells Ranch - Prescott) is assumed to remain constant and 2050 uses of groundwater were determined by ADWR based on extinguishment of rights.
- * 2% of the Paulden CDP Water Planning Area is in the Prescott AMA. (43% of the Paulden CDP Water Planning Area irrigated acres is in the Prescott AMA.)
**62% of the Williamson CDP Water Planning Area is in the Prescott AMA.
*** 87% of the Prescott CCD Water Planning Area is in the Prescott AMA. (4% of the Prescott CCD Water Planning Area irrigated acres is in the Prescott AMA.)
**** 70% of the Mingus Mountain CCD Water Planning Area is in the Prescott AMA. (None of the Mingus Mountain CCD Water Planning Area irrigated acres are in the Prescott AMA.)
***** 2% of the Humboldt CCD Water Planning Area is in the Prescott AMA. (None of the Humboldt CCD Water Planning Area irrigated acres are in the Prescott AMA.)

Big Chino Sub-Basin

Status Quo

A	B	C	D (C-B)	E	F	G	H (E+F+G)	I (E/B)	J Estimated Available Water Supply ⁵	K	L (C*K) 2050 Mun/Dom Demand ⁶	M 2050 Com/Ind Demand ⁷	N 2050 AG Demand ⁸	O (L+M+N) Total 2050 Demand	P (J-O) 2050 Water Supply +/- (AF/yr)
Water Planning Area ¹	2006 Population ²	2050 Population ²	Pop. Change	2006 Mun/Dom Demand ³ (AF/yr)	2006 Com/Ind Demand ³ (AF/yr)	2006 AG Demand ³ (AF/yr)	Total 2006 Demand	2006 ⁴ GPPD	(AF/yr)	GPPD	(AF/yr)	(AF/yr)	(AF/yr)	(AF/yr)	(AF/yr)
Paulden CDP*	5,235	13,817	8,582	903	7	768	1,677	154	1,677	120	1,857	7	384	2,248	-571
Williamson CDP (portion)**	1,987	4,501	2,514	567	0	0	567	255	567	221	1,114	0	0	1,114	-548
Prescott CCD (portion)***	1,432	3,811	2,379	175	0	4,760	4,936	109	4,936	135	576	1	2,380	2,957	1,978
Ashfork CCD	471	36,250	35,779	36	0	2,796	2,832	68	2,832	134	5,441	0	1,398	6,839	-4,007
Total	9,124	58,379	49,254	1,681	7	8,324	10,012		10,012		8,989	8	4,162	13,159	-3,148

Water Balance Method																
Big Chino Sub-Basin (Using net nat. recharge)	See Blasch, 2006. Pg 82 Inflow (30,300) - baseflow out (17,900)															
Big Chino Sub-Basin (using avg 1990 - 1997 demands)	See ADWR, 2000 pg 5-8. Sum of Dom., Other/Industrial, Sm Providers, and AG															
									12,400						13,159	-759
									15,720						13,159	2,561

Assumptions:

1. See Demand Analysis and Data Sources Documentation for discussion of WPA boundaries. Note: Many municipal boundaries vary from the WPA boundaries.
 2. See Population Comparison for 2006 and 2050 population assumptions.
 3. See CYHWRMS - Water Planning Area - Water Use and Available Supply Summary Table for all 2006 Demand Estimates. (Note: Mun/Dom demands include Com/Ind demands delivered by water providers. Column F - Com/Ind demands are individually served through private wells.
 4. 2006 Gallons Per Person per Day is calculated by dividing the 2006 Mun/Dom demand by the 2006 population (conversion formula: AF/person * 325,851gal/AF / 365day/year = gal/person/day (GPPD))
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 6. 2050 GPPD was provided for each Water Planning Area. The value is multiplied by the 2050 population to calculate 2050 Municipal/Domestic Demand (conversion formula: person * gal/person/day / 325,851gal/AF * 365day/year = AF/year)
 7. 2050 Commercial/Industrial Demands are held in Status Quo for 2050 for WPAs outside of the PrAMA (except Clarkdale and Jerome who provided their own estimate and 240 AF was added to the Verde CCD for new GC on reservation).
 8. 2050 Agricultural Groundwater Demand is assumed to be 1/2 of the 2006 Agricultural Groundwater Demand.
- *98% of the Paulden CDP Water Planning Area is in the Big Chino Sub-Basin. (57% of the Paulden CDP Water Planning Area irrigated acreage is in the Big Chino Sub-Basin.)
- **38% of the Williamson CDP Water Planning Area is in the Prescott AMA.
- ***13% of the Prescott CCD Water Planning Area is in the Big Chino Sub-Basin. (96% of the Prescott CCD Water Planning Area irrigated acreage is in the Big Chino Sub-Basin.)