

Appendix I

Projected Water Budgets

Appendix I-1

Projected Annual Surface Water Budget

Projected
Annual
Surface Water Budget

Piru Basin Groundwater Sustainability Plan
Fillmore and Piru Basins
Groundwater Sustainability Agency

Water Year	Type	Inflows			Outflows	
		Santa Clara River (into Piru)	Piru Creek	Hopper Creek	Santa Clara River (to Fillmore)	Unaccounted Flows
2022	--	127,637	116,959	5,394	-172,347	-77,643
2023	--	39,219	31,053	1,641	-17,475	-54,438
2024	Dry	32,808	52,532	1,550	-32,454	-54,436
2025	Dry	37,072	30,460	1,730	-16,774	-52,488
2026	Critical	23,920	5,861	224	-466	-29,540
2027	Critical	22,973	5,068	366	-108	-28,300
2028	Critical	22,526	6,282	932	-914	-28,826
2029	Critical	21,924	5,068	131	-31	-27,093
2030	Wet	61,961	34,919	5,755	-37,856	-64,779
2031	Above Normal	29,022	40,580	972	-24,233	-46,341
2032	Dry	31,206	16,179	910	-6,777	-41,518
2033	Dry	26,784	10,467	674	-3,040	-34,884
2034	Below Normal	28,849	11,643	1,678	-5,716	-36,453
2035	Dry	27,089	10,487	1,288	-4,204	-34,660
2036	Wet	52,261	41,973	9,094	-36,795	-66,533
2037	Above Normal	27,491	29,936	1,133	-17,989	-40,571
2038	Critical	22,468	28,467	483	-17,714	-33,703
2039	Critical	22,282	5,068	275	-74	-27,552
2040	Above Normal	52,073	44,172	8,174	-43,475	-60,944
2041	Above Normal	24,552	40,925	835	-25,307	-41,005
2042	Dry	23,327	6,641	646	-1,040	-29,573
2043	Dry	24,314	6,986	935	-1,312	-30,923
2044	Above Normal	63,299	39,937	6,671	-45,618	-64,289
2045	Wet	54,035	37,450	8,324	-30,820	-68,989
2046	Above Normal	35,797	30,486	1,593	-17,808	-50,068
2047	Wet	267,452	201,034	26,459	-394,113	-100,832
2048	Wet	43,707	30,319	1,687	-19,709	-56,004
2049	Dry	45,223	39,584	2,217	-29,436	-57,587
2050	Dry	40,574	32,045	1,313	-21,806	-52,125
2051	Above Normal	98,570	35,823	5,581	-60,776	-79,198
2052	Wet	50,517	36,656	2,057	-29,667	-59,563
2053	Below Normal	38,256	25,630	1,690	-14,583	-50,994
2054	Below Normal	37,889	16,774	665	-8,515	-46,813
2055	Below Normal	37,703	12,787	607	-8,291	-42,807
2056	Wet	192,713	94,688	20,789	-210,153	-98,037
2057	Wet	103,267	65,173	4,096	-100,376	-72,159
2058	Wet	123,563	95,134	13,582	-153,476	-78,804
2059	Above Normal	42,872	30,319	1,382	-19,477	-55,096
2060	Below Normal	48,950	42,644	1,498	-27,657	-65,436
2061	Wet	123,854	91,185	17,943	-144,764	-88,218
2062	Wet	48,858	31,956	1,793	-20,726	-61,881

Projected
Annual
Surface Water Budget

Piru Basin Groundwater Sustainability Plan
Fillmore and Piru Basins
Groundwater Sustainability Agency

Water Year	Type	Inflows			Outflows	
		Santa Clara River (into Piru)	Piru Creek	Hopper Creek	Santa Clara River (to Fillmore)	Unaccounted Flows
2064	Above Normal	80,423	36,837	8,220	-53,739	-71,741
2065	Dry	38,905	22,217	414	-10,660	-50,876
2066	Dry	45,012	23,464	1,434	-11,523	-58,387
2067	Dry	44,998	9,457	368	-7,201	-47,622
2068	Critical	38,990	6,551	514	-2,038	-44,017
2069	Dry	58,267	32,777	4,493	-36,467	-59,069
2070	Wet	86,581	60,767	6,564	-76,254	-77,660
2071	Wet	195,423	137,529	17,356	-261,874	-88,433
2072	Above Normal	47,232	29,936	4,114	-19,466	-61,816
2073	Wet	120,573	122,499	20,476	-176,883	-86,666
2074	Above Normal	66,202	42,297	2,469	-46,092	-64,876
2075	Below Normal	52,053	46,988	2,743	-34,489	-67,295
2076	Wet	208,146	127,994	31,569	-276,249	-91,460
2077	Above Normal	48,403	30,249	1,371	-17,779	-62,245
2078	Dry	55,676	57,798	3,361	-51,217	-65,619
2079	Above Normal	53,386	46,381	7,245	-42,327	-64,685
2080	Critical	31,984	29,724	609	-16,057	-46,260
2081	Dry	40,684	36,381	1,438	-22,879	-55,624
2082	Below Normal	43,042	17,847	1,951	-12,118	-50,723
2083	Wet	280,066	138,359	47,602	-359,147	-106,880
2084	Wet	64,256	49,690	4,335	-48,874	-69,406
2085	Critical	33,055	29,232	388	-15,986	-46,689
2086	Critical	61,458	49,531	9,302	-48,847	-71,444
2087	Dry	41,335	21,005	1,073	-12,100	-51,313
2088	Below Normal	55,637	38,182	1,962	-30,419	-65,361
2089	Above Normal	63,288	39,818	5,539	-40,033	-68,612
2090	--	32,656	29,950	579	-16,848	-46,336
2091	--	25,853	19,878	84	-11,192	-34,623
2092	--	28,787	11,215	2,237	-5,891	-36,347
2093	--	33,400	5,560	350	-1,481	-37,828
2094	--	27,139	6,169	1,157	-2,088	-32,376
2095	--	59,133	19,511	10,093	-29,090	-59,648
2096	--	25,734	10,199	199	-2,758	-33,374
2097	--	67,338	41,032	7,257	-43,299	-72,328

Appendix I-2

Projected Annual Groundwater Budget

Water Year	Type	Inflows				Outflows			Annual Change in Groundwater in Storage	Cumulative	Annual Error	Cumulative	
		Stream Percolation	Recharge (Basin Floor)	Recharge (Mountain Front)	Underflow (from SCRVE)	Underflow from Outside	Underflow to Fillmore	Wells					Evapo-transpiration (ET)
2022	--	52,703	11,583	8,190	5,010	4	-51,292	-14,256	-6,371	5,565	5,565	-7	-7
2023	--	41,112	9,407	5,563	4,997	0	-53,437	-14,362	-5,551	-12,271	-6,707	0	-7
2024	Dry	45,183	8,441	3,908	4,997	0	-52,699	-16,722	-4,256	-11,146	-17,852	3	-3
2025	Dry	44,854	8,417	4,600	4,997	0	-50,123	-13,902	-3,945	-5,102	-22,954	1	-3
2026	Critical	24,731	6,414	1,731	5,010	0	-46,655	-16,444	-2,493	-27,707	-50,661	0	-3
2027	Critical	24,064	7,214	2,411	4,997	0	-39,662	-17,452	-2,219	-20,648	-71,309	0	-3
2028	Critical	24,501	7,547	3,385	4,997	0	-36,874	-14,326	-2,330	-13,098	-84,407	2	-1
2029	Critical	22,924	6,418	1,758	4,997	0	-33,794	-16,261	-2,230	-16,097	-100,504	90	89
2030	Wet	61,229	13,319	11,186	5,010	8	-35,629	-10,793	-2,715	41,647	-58,857	32	122
2031	Above Normal	45,798	7,199	2,997	4,997	0	-43,642	-14,073	-2,796	478	-58,378	0	121
2032	Dry	38,634	9,682	5,670	4,997	0	-43,368	-15,330	-2,716	-2,432	-60,810	-1	121
2033	Dry	31,353	8,394	4,078	4,997	0	-42,056	-14,967	-2,444	-10,645	-71,455	0	120
2034	Below Normal	32,439	8,323	4,610	5,010	2	-39,434	-13,107	-2,431	-4,589	-76,044	1	121
2035	Dry	30,751	8,220	4,016	4,997	2	-37,061	-15,052	-2,509	-6,636	-82,680	1	122
2036	Wet	62,120	13,499	11,192	4,997	1	-39,605	-10,556	-3,012	38,634	-44,045	-1	120
2037	Above Normal	38,915	7,661	3,222	4,997	0	-45,438	-16,478	-2,980	-10,103	-54,148	0	120
2038	Critical	31,369	7,203	2,793	5,010	0	-44,214	-15,633	-2,542	-16,012	-70,160	1	121
2039	Critical	23,560	6,517	1,676	4,997	0	-38,400	-17,349	-2,442	-21,442	-91,602	0	121
2040	Above Normal	56,039	11,852	8,381	4,997	7	-36,036	-14,907	-2,837	27,496	-64,106	0	121
2041	Above Normal	40,411	7,986	3,642	4,997	0	-41,149	-15,615	-2,563	-2,291	-66,397	1	121
2042	Dry	25,483	6,680	2,440	5,010	0	-36,902	-14,539	-2,304	-14,131	-80,528	0	121
2043	Dry	26,537	7,305	3,742	4,997	0	-35,460	-11,848	-2,337	-7,065	-87,593	0	121
2044	Above Normal	60,161	10,828	7,746	4,997	6	-36,035	-13,194	-2,977	31,533	-56,061	1	122
2045	Wet	63,694	11,733	9,140	4,997	0	-44,453	-11,705	-3,222	30,186	-25,875	2	124
2046	Above Normal	46,141	8,425	4,866	5,010	0	-50,046	-11,998	-3,550	-1,150	-27,025	0	125
2047	Wet	73,607	14,157	11,831	4,997	15	-51,822	-12,434	-7,005	33,339	6,313	-6	118
2048	Wet	43,743	7,797	3,504	4,997	0	-53,497	-15,174	-5,903	-14,534	-8,221	0	119
2049	Dry	47,645	8,864	4,578	4,997	1	-52,180	-16,581	-4,405	-7,079	-15,299	3	121
2050	Dry	47,024	7,854	3,022	5,010	0	-52,659	-18,968	-3,608	-12,326	-27,625	0	121
2051	Above Normal	69,828	12,086	8,239	4,997	2	-53,029	-17,035	-4,863	20,222	-7,403	-1	120
2052	Wet	49,729	9,153	5,005	4,997	3	-52,570	-15,806	-4,511	-4,000	-11,402	1	121
2053	Below Normal	43,216	8,977	4,940	4,997	0	-52,171	-15,130	-3,799	-8,971	-20,373	0	121
2054	Below Normal	43,196	8,138	4,178	5,010	0	-49,876	-13,742	-3,047	-6,144	-26,517	-1	120
2055	Below Normal	39,070	7,882	3,809	4,997	0	-47,777	-14,353	-2,928	-9,302	-35,819	-1	120
2056	Wet	76,161	16,622	14,830	4,997	6	-49,496	-12,310	-6,168	44,635	8,816	-6	114
2057	Wet	48,788	11,318	8,146	4,997	1	-54,604	-13,150	-8,557	-3,071	5,745	-10	104
2058	Wet	49,090	13,327	10,465	5,010	7	-53,585	-14,033	-8,415	1,856	7,601	-10	94
2059	Above Normal	43,445	8,116	3,488	4,997	0	-53,714	-17,800	-5,995	-17,463	-9,862	0	94
2060	Below Normal	56,278	8,734	4,487	4,997	0	-52,442	-15,904	-4,335	1,815	-8,047	0	95
2061	Wet	57,808	16,912	14,590	4,997	1	-52,334	-13,577	-7,896	20,486	12,439	-15	80
2062	Wet	45,543	8,014	3,753	5,010	0	-55,393	-15,030	-8,064	-16,166	-3,727	-1	79
2063	Critical	46,224	7,384	2,875	4,997	0	-54,247	-15,937	-5,330	-14,036	-17,763	-2	78
2064	Above Normal	58,422	12,074	9,390	4,997	1	-53,274	-12,116	-5,690	13,802	-3,962	-3	75
2065	Dry	43,940	6,554	1,225	4,997	0	-51,319	-20,081	-4,097	-18,780	-22,741	1	76
2066	Dry	52,578	8,677	4,650	5,010	0	-51,312	-13,844	-3,817	1,942	-20,799	0	76
2067	Dry	43,391	7,416	2,725	4,997	0	-51,917	-16,509	-3,332	-13,230	-34,029	0	76
2068	Critical	39,609	7,197	2,164	4,997	0	-47,563	-18,190	-2,935	-14,722	-48,751	-1	75
2069	Dry	55,114	10,091	5,712	4,997	0	-44,773	-18,706	-2,833	9,602	-39,149	0	75
2070	Wet	70,676	13,720	10,552	5,010	5	-51,060	-15,318	-3,924	29,661	-9,489	0	75
2071	Wet	59,403	15,061	12,845	4,997	12	-52,442	-12,618	-8,340	18,903	9,414	-14	61
2072	Above Normal	47,301	7,503	3,359	4,997	0	-55,249	-14,727	-6,630	-13,446	-4,032	0	61
2073	Wet	55,624	13,659	11,335	4,997	12	-54,437	-12,045	-8,365	10,765	6,733	-14	48
2074	Above Normal	50,459	8,805	4,593	5,010	0	-54,718	-16,565	-7,005	-9,422	-2,689	-2	45
2075	Below Normal	52,442	9,366	5,895	4,997	1	-54,767	-12,806	-6,904	-1,776	-4,465	0	45
2076	Wet	53,518	15,788	14,290	4,997	11	-54,147	-8,728	-8,179	17,535	13,070	-14	31
2077	Above Normal	48,046	6,160	1,790	4,997	0	-55,541	-14,012	-6,803	-15,363	-2,293	1	32
2078	Dry	53,079	8,930	5,054	5,010	1	-54,383	-14,584	-5,719	-2,612	-4,905	-2	30
2079	Above Normal	48,482	11,089	7,900	4,997	2	-54,161	-12,869	-5,801	-360	-5,265	0	30
2080	Critical	39,420	5,571	1,210	4,997	0	-51,816	-13,595	-3,711	-17,926	-23,191	-1	29
2081	Dry	48,262	9,932	6,589	4,997	0	-50,731	-11,159	-3,754	4,136	-19,055	0	29
2082	Below Normal	44,577	7,282	3,173	5,010	0	-50,211	-14,182	-3,471	-7,823	-26,878	-1	28
2083	Wet	64,480	17,246	15,883	4,997	15	-50,457	-10,575	-7,205	34,372	7,494	-11	16
2084	Wet	47,195	9,250	5,720	4,997	0	-53,079	-12,614	-7,369	-5,903	1,592	-3	13
2085	Critical	38,805	5,554	562	4,997	0	-51,565	-17,029	-4,545	-23,222	-21,630	-1	13
2086	Critical	59,940	9,820	5,427	5,010	3	-52,347	-16,970	-4,109	6,775	-14,856	1	14
2087	Dry	44,844	7,558	3,204	4,997	0	-52,034	-15,276	-3,488	-10,197	-25,052	-1	12
2088	Below Normal	58,067	10,352	6,681	4,997	1	-51,875	-13,817	-3,798	10,606	-14,446	-1	11
2089	Above Normal	55,322	10,515	7,295	4,997	2	-52,526	-12,490	-4,797	8,315	-6,131	-3	8
2090	--	38,954	5,664	1,249	5,010	0	-50,208	-14,663	-3,584	-17,578	-23,710	0	8
2091	--	29,338	6,966	2,859	4,997	0	-47,393	-13,942	-2,882	-20,058	-43,768	0	8
2092	--	31,756	7,645	3,352	4,997	0	-42,536	-15,696	-2,670	-13,153	-56,921	0	8
2093	--	33,478	7,345	2,915	4,997	0	-39,358	-15,483	-2,418	-8,526	-65,447	-1	7
2094	--	27,787	8,737	4,585	5,010	0	-37,420	-16,017	-2,623	-9,941	-75,388	0	7
2095	--	50,688	10,714	7,457	4,997	2	-38,770	-13,642	-2,809	18,634	-56,754	-3	4
2096	--	29,844	7,629	3,594	4,997	0	-38,985	-14,779	-2,680	-10,381	-67,135	-1	3
2097	--	67,604	10,366	7,457	4,997	2	-39,411	-12,327	-3,118	35,568	-31,567	-2	0

Notes:

- Flows are in acre-feet/year (AFY) from the United Water Conservation District Ventura Regional Groundwater Flow Model (United, 2021a,b).
- Climate change is based on change factors provided by DWR for the 2070 Central Tendency (CT) scenario.
- Water years without DWR-designated types are denoted as "--".

Appendix J

Sustainable Management
Criteria Technical
Memorandum
(DBS&A, 2021c)

Appendix K

Monitoring Network and
Data Gaps Analysis
Technical Memorandum
(DBS&A, 2021a)

Appendix L

Sampling and Analysis
Plan (DBS&A, 2020)
