Flow Budget for the UAS in Pleasant Valley

influx(+) outflux(-); units in Acre-feet

Date	Stress	days in month	STORAGE	Mountain Front Recharge	GW Flux from East Las Posas	ET	Recharge	Pumping from Wells	Pleasant Valley Semi-Perched Aquifer	Oxnard UAS	Los Posas	Pleasant Valley LAS	Arroyo Las Posas Percolation	Conejo Creek Percolation	Calleguas Creek percolation
6/30/1991	2372	30	275.3	0.0	90.5	-175.2	21.1	-1175.5	1373.5	-43.5	0.0	-610.2	16.1	228.0	0.0
7/31/1991	2403	31	301.2	0.0	89.7	-181.4	22.2	-1099.7	1292.0	-28.8	0.0	-647.8	16.0	236.5	0.0
8/31/1991	2434	31	308.0	0.0	86.3	-174.7	21.6	-1116.7	1308.1	-22.0	0.0	-662.6	14.8	237.1	0.0
9/30/1991	2464	30	296.5	0.0	80.7	-141.4	20.6	-1107.2	1284.3	-19.7	0.0	-653.9	13.1	227.1	0.0
10/31/1991	2495	31	299.7	0.0	80.6	-129.4	21.4	-1135.3	1323.3	-22.4	0.0	-684.1	12.3	233.9	0.0
11/30/1991	2525	30	289.8	0.0	75.6	-96.4	21.1	-1119.7	1299.7	-20.9	0.0	-670.8	11.9	209.7	0.0
12/31/1991	2556	31	-520.7	622.5	101.3	-83.7	185.7	-599.0	1009.6	-107.5	0.0	-1392.9	613.4	171.3	0.0
1/31/1992	2587	31	-151.9	217.4	110.2	-94.6	84.2	-527.5	919.8	-108.9	-0.2	-1047.7	445.2	153.9	0.0
2/29/1992	2616	29	-2246.1	1341.8	136.7	-97.1	400.8	-348.6	1089.5	-132.8	-3.7	-1275.0	1066.0	68.5	0.0
3/31/1992	2647	31	-1420.7	689.3	159.6	-147.3	226.4	-330.6	1110.6	-122.3	-9.0	-1092.5	861.3	75.3	0.0
4/30/1992	2677	30	-33.6	0.0	149.1	-170.9	18.6	-645.4	1063.6	-45.6	-10.1	-622.1	156.5	139.8	0.0
5/31/1992	2708	31	3.9	0.0	144.2	-202.2	21.6	-684.3	1123.0	-16.3	-8.1	-643.2	65.8	195.7	0.0
6/30/1992	2738	30	-27.7	0.0	132.0	-186.9	21.6	-690.5	1096.5	-4.0	-5.8	-608.5	57.7	215.4	0.0
7/31/1992	2769	31	45.4	0.0	132.1	-192.3	23.8	-845.0	1158.8	38.2	-4.5	-654.9	62.7	235.6	0.0
8/31/1992	2800	31	89.9	0.0	127.7	-183.3	25.9	-884.9	1172.9	42.7	-3.4	-678.1	49.8	240.7	0.0
9/30/1992	2830	30	103.8	0.0	120.4	-148.6	23.4	-894.5	1158.6	35.6	-2.3	-667.2	44.0	226.6	0.0
10/31/1992	2861	31	-151.8	23.9	130.2	-134.5	36.9	-794.4	1150.1	17.6	-2.6	-645.0	144.5	225.1	0.0
11/30/1992	2891	30	61.1	0.0	118.9	-97.6	22.3	-895.7	1183.7	35.1	-2.3	-658.9	38.1	195.3	0.0
12/31/1992	2922	31	-1303.0	539.2	136.3	-83.7	175.5	-473.3	1078.0	-3.4	-4.0	-878.5	672.2	144.6	0.0
1/31/1993	2953	31	-2632.4	1248.1	165.6	-94.6	393.4	-336.1	1121.1	-9.2	-8.7	-960.4	1032.5	80.6	0.0
2/28/1993	2981	28	-2303.2	909.6	157.8	-101.4	299.3	-273.4	1046.3	31.1	-14.3	-771.6	1014.7	5.0	0.0
3/31/1993	3012	31	-1419.1	258.2	178.7	-154.2	89.6	-324.4	1055.8	103.1	-22.4	-616.1	767.2	83.5	0.0
4/30/1993	3042	30	-402.2	0.0	166.4	-170.9	22.3	-595.5	956.6	161.3	-22.2	-511.9	251.1	145.1	0.0
5/31/1993	3073	31	-365.6	0.0	165.5	-202.7	25.1	-641.9	1039.1	171.9	-21.3	-598.0	232.4	195.5	0.0
6/30/1993	3103	30	-310.3	0.0	156.1	-187.2	24.3	-656.9	1004.7	164.4	-19.4	-615.6	229.1	210.7	0.0
7/31/1993	3134	31	-172.7	0.0	156.2	-195.7	23.5	-634.4	935.5	149.9	-18.2	-661.9	181.4	236.3	0.0
8/31/1993	3165	31	-138.1	0.0	152.0	-188.5	25.1	-644.9	971.9	125.0	-16.1	-671.0	141.4	243.2	0.0
9/30/1993	3195	30	-76.2	0.0	143.6	-150.9	25.1	-643.1	938.9	103.4	-13.5	-664.6	116.6	220.7	0.0
10/31/1993	3226	31	-142.3	0.0	147.2	-134.6	26.0	-661.4	971.3	105.4	-12.9	-693.0	172.8	221.6	0.0
11/30/1993	3256	30	-122.6	0.0	140.8	-98.3	22.7	-578.2	882.2	109.0	-11.8	-681.1	146.4	190.9	0.0
12/31/1993	3287	31	-483.6	72.3	146.6	-83.7	47.2	-469.9	788.4	122.3	-13.1	-608.3	307.4	174.4	0.0
1/31/1994	3318	31	-336.3	0.0	148.3	-94.6	18.8	-623.9	900.7	140.8	-15.3	-642.1	319.1	184.5	0.0
2/28/1994	3346	28	-1345.1	501.9	140.1	-93.8	177.6	-318.0	773.7	105.7	-14.6	-698.1	633.2	137.4	0.0
3/31/1994	3377	31	-1020.6	237.8	157.3	-147.3	99.7	-335.0	741.8	132.7	-19.6	-648.6	626.3	175.5	0.0
4/30/1994	3407	30	-221.5	0.0	150.5	-167.2	19.6	-563.4	785.4	149.9	-19.6	-544.9	206.5	204.8	0.0
5/31/1994	3438	31	-193.1	0.0	154.5	-188.1	21.1	-601.5	844.2	142.1	-18.9	-609.1	209.1	239.8	0.0
6/30/1994	3468	30	-57.4	0.0	147.3	-182.9	24.0	-610.5	843.2	114.8	-16.3	-612.9	116.0	234.7	0.0
7/31/1994	3499	31	98.9	0.0	149.4	-188.4	25.9	-813.6	968.5	132.9	-14.2	-697.9	93.5	245.1	0.0
8/31/1994	3530	31	133.3	0.0	146.7	-181.3	28.0	-849.4	1021.6	118.4	-11.9	-729.4	79.3	244.8	0.0
9/30/1994	3560	30	138.2	0.0	139.5	-148.9	26.1	-860.2	1042.5	97.9	-9.8	-732.3	67.8	239.2	0.0
10/31/1994	3591	31	134.6	0.0	138.7	-133.6	25.7	-890.1	1100.4	93.2	-8.6	-740.3	46.1	233.8	0.0
11/30/1994	3621	30	-101.9	42.6	136.8	-98.0	43.4	-676.2	931.4	79.0	-7.4	-652.2	100.0	202.5	0.0
12/31/1994	3652	31	-190.9	33.2	144.9	-83.5	38.2	-681.1	931.8	91.5	-8.3	-676.6	218.3	182.6	0.0
1/31/1995	3683	31	-3086.8	1835.0	174.0	-96.0	557.8	-349.0	863.2	7.1	-9.3	-1079.1	1117.8	65.3	0.0
2/28/1995	3711	28	-297.1	67.0	156.0	-95.9	42.4	-434.7	657.1	44.4	-17.0	-567.6	382.6	62.5	0.0
3/31/1995	3742	31	-2343.6	1069.7	184.1	-157.9	342.8	-280.6	806.7	61.5	-20.4	-710.3	999.5	48.7	0.0
4/30/1995	3772	30	-381.4	0.0	174.0	-176.9	22.1	-485.6	749.6	85.8	-25.1	-579.4	494.5	122.4	0.0
5/31/1995	3803	31	-289.3	0.2	174.9	-204.4	24.7	-595.0	886.2	94.6	-26.4	-637.8	386.8	185.6	0.0
6/30/1995	3833	30	-185.7	0.0	165.7	-189.0	26.3	-599.3	870.2	90.4	-25.1	-633.9	276.1	204.4	0.0
7/31/1995	3864	31	-152.3	0.0	168.0	-196.3	29.8	-564.4	827.6	112.2	-23.6	-612.6	184.5	227.2	0.0
8/31/1995	3895	31	-186.4	0.0	165.2	-190.1	32.5	-582.7	835.7	130.8	-20.8	-582.0	162.3	235.4	0.0
9/30/1995	3925	30	-143.9	0.0	157.4	-151.4	32.0	-584.7	815.5	133.7	-17.8	-586.7	130.9	215.1	0.0
10/31/1995	3956	31	-100.3	0.0	159.7	-134.4	30.2	-601.8	821.3	139.8	-16.1	-614.1	103.9	212.0	0.0
11/30/1995	3986	30	-43.3	0.0	151.5	-97.9	24.7	-596.6	784.0	135.6	-13.5	-606.8	80.9	181.4	0.0
12/31/1995	4017	31	-613.7	170.5	160.1	-83.7	65.3	-377.1	580.2	125.6	-15.1	-627.0	448.9	166.0	0.0
1/31/1996	4048	31	-252.5	46.3	157.7	-94.6	41.6	-490.5	674.9	140.9	-16.6	-550.3	170.9	172.2	0.0
2/29/1996	4077	29	-1656.4	775.2	156.3	-97.1	260.6	-282.2	577.1	113.2	-16.1	-609.9	678.9	100.6	0.0
3/31/1996	4108	31	-781.1	95.4	167.8	-147.3	57.7	-407.7	615.6	153.5	-22.6	-505.5	618.2	156.1	0.0
4/30/1996	4138	30	-72.0	0.0	160.2	-170.9	27.9	-593.8	729.3	176.6	-22.3	-642.1	212.4	194.7	0.0
5/31/1996	4169	31	36.7	0.0	162.7	-190.0	31.6	-659.8	807.5	177.2	-20.5	-722.2	147.0	229.8	0.0
6/30/1996	4199	30	76.6	0.0	156.0	-184.1	31.6	-676.8	825.7	150.6	-17.4	-736.0	139.2	234.6	0.0
7/31/1996	4230	31	75.2	0.0	160.8	-191.3	32.7	-843.5	944.4	166.8	-16.3	-709.3	140.2	240.2	0.0
8/31/1996	4261	31	75.4	0.0	160.8	-184.3	32.5	-889.4	1017.9	144.9	-15.3	-735.2	143.3	249.5	0.0
9/30/1996	4291	30	79.0	0.0	156.1	-149.8	32.6	-907.0	1060.3	115.1	-14.4	-756.9	153.5	231.5	0.0
10/31/1996	4322	31	-267.2	45.4	164.5	-134.9	45.7	-730.9	974.8	74.3	-17.1	-770.2	384.3	231.5	0.0
11/30/1996	4352	30	-711.3	262.7	162.0	-100.3	102.0	-487.5	724.8	34.6	-20.1	-687.6	549.2	171.4	0.0
12/31/1996	4383	31	-1651.7	801.7	179.2	-83.7	244.8	-373.9	745.4	16.2	-24.8	-709.6	755.0	101.7	0.0
1/31/1997	4414	31	-1470.4	656.7	181.4	-94.6	206.4	-265.5	609.7	33.5	-31.1	-638.2	734.4	77.6	0.0
2/28/1997	4442	28	-12.2	0.0	157.8	-93.8	22.4	-557.1	685.0	89.1	-30.2	-625.4	261.6	102.8	0.0
3/31/1997	4473	31	12.2	0.0	168.5	-147.3	28.2	-628.1	837.1	116.5	-30.0	-747.4	218.9	171.3	0.0
4/30/1997	4503	30	55.1	0.0	158.5	-170.9	28.8	-643.8	854.3	109.1	-25.9	-760.0	196.4	198.4	0.0
5/31/1997	4534	31	76.6	0.0	160.8	-193.1	28.5	-670.8	899.7	94.0	-24.6	-801.3	198.6	231.6	0.0
6/30/1997	4564	30	87.3	0.0	153.7	-182.0	30.0	-671.5	904.9	70.3	-22.6	-799.9	197.6	232.2	0.0
7/31/1997	4595	31	154.7	0.0	156.8	-188.7	30.9	-822.8	1047.2	57.6	-21.9	-836.6	174.0	248.8	0.0
8/31/1997	4626	31	159.6	0.0	155.1	-182.9	33.1	-843.5	1098.7	33.4	-20.4	-848.0	164.2	250.7	0.0
9/30/1997	4656	30	139.5	0.0	148.9	-148.9	33.6	-847.1	1110.1	15.2	-18.8	-842.6	174.9	235.1	0.0
10/31/1997	4687	31	45.0	0.0	154.6	-134.0	35.2	-871.8	1160.6	3.5	-20.3	-885.9	281.6	231.4	0.0

Flow Budget for the UAS in Pleasant Valley

Date	Stress	days in month	STORAGE	Mountain Front Recharge	GW Flux from East Las Posas	ET	Recharge	Pumping from Wells	Pleasant Valley Semi-Perched Aquifer	Oxnard UAS	Los Posas	Pleasant Valley LAS	Arroyo Las Posas Percolation	Conejo Creek Percolation	Calleguas Creek percolation
			influx(+) outflux(-); units in Acre-feet												
11/30/1997	4717	30	-701.8	226.5	151.5	-100.3	91.5	-493.6	863.5	-32.9	-22.5	-765.7	596.0	187.8	0.0
12/31/1997	4748	31	-1705.6	824.3	172.2	-83.7	255.8	-346.6	835.4	-61.9	-29.5	-780.2	809.1	110.6	0.0
1/31/1998	4779	31	-1047.6	317.5	176.8	-94.6	117.8	-383.6	858.8	-41.5	-40.6	-690.1	719.9	107.2	0.0
2/28/1998	4807	28	-3523.7	2285.8	168.5	-109.3	707.1	-239.7	537.8	-80.7	-67.2	-887.1	1276.6	-68.1	0.0
3/31/1998	4838	31	-877.4	330.2	190.3	-180.1	122.7	-318.5	720.0	-32.8	-101.6	-665.9	801.6	11.5	0.0
4/30/1998	4868	30	-656.6	107.8	181.6	-172.5	58.0	-378.5	833.5	20.1	-94.1	-665.3	671.6	94.5	0.0
5/31/1998	4899	31	-877.0	198.9	187.3	-204.5	87.5	-325.9	794.1	38.9	-94.9	-666.2	718.6	143.2	0.0
6/30/1998	4929	30	-180.4	0.0	177.1	-193.7	35.3	-615.7	917.9	45.4	-89.1	-865.9	599.5	169.6	0.0
7/31/1998	4960	31	-68.6	0.0	178.0	-197.6	29.5	-530.3	808.8	22.6	-84.5	-824.1	464.8	201.4	0.0
8/31/1998	4991	31	-54.1	0.0	173.8	-190.8	31.3	-543.2	831.3	17.7	-81.3	-793.6	395.4	213.7	0.0
9/30/1998	5021	30	-102.4	0.0	165.2	-152.1	27.8	-544.8	818.9	5.6	-76.9	-784.0	445.7	197.2	0.0
10/31/1998	5052	31	3.2	0.0	167.7	-134.8	29.0	-560.8	846.4	-2.7	-77.0	-806.6	341.3	194.3	0.0
11/30/1998	5082	30	-246.1	10.1	160.8	-98.8	34.8	-491.2	778.5	5.1	-73.5	-765.9	521.8	164.3	0.0
12/31/1998	5113	31	-49.7	0.0	164.2	-83.7	24.3	-516.9	771.3	24.1	-75.4	-801.2	383.1	159.9	0.0
1/31/1999	5144	31	-552.4	144.6	162.3	-94.6	65.3	-392.1	648.4	38.5	-76.1	-716.7	614.1	158.8	0.0
2/28/1999	5172	28	-176.3	0.4	144.8	-93.8	22.6	-658.7	809.5	36.7	-70.2	-706.8	533.7	158.2	0.0
3/31/1999	5203	31	-868.6	319.6	161.6	-147.3	113.6	-358.3	691.2	40.1	-78.9	-725.6	669.0	183.7	0.0
4/30/1999	5233	30	-750.8	139.1	158.5	-166.3	67.7	-352.6	721.2	48.6	-80.7	-644.6	663.6	196.2	0.0
5/31/1999	5264	31	25.9	0.0	161.9	-188.5	31.0	-658.1	803.7	44.9	-82.4	-779.5	413.2	227.9	0.0
6/30/1999	5294	30	153.6	0.0	154.4	-184.1	31.8	-684.5	871.4	18.9	-72.3	-812.7	290.4	233.0	0.0
7/31/1999	5325	31	129.0	0.0	157.1	-191.9	30.5	-739.3	909.4	40.2	-65.3	-765.7	252.7	243.2	0.0
8/31/1999	5356	31	108.8	0.0	155.1	-183.9	31.8	-785.2	979.6	27.7	-59.1	-779.5	260.1	244.4	0.0
9/30/1999	5386	30	104.8	0.0	148.2	-149.8	29.5	-803.2	1020.1	9.3	-54.1	-792.1	258.2	229.1	0.0
10/31/1999	5417	31	165.8	0.0	150.6	-133.6	34.8	-837.2	1094.9	-6.7	-50.0	-837.8	201.1	218.2	0.0
11/30/1999	5447	30	-50.4	15.9	145.1	-98.2	36.6	-692.2	964.4	-25.1	-49.8	-784.7	347.5	190.8	0.0
12/31/1999	5478	31	101.9	0.0	149.0	-83.2	29.0	-833.4	1070.2	-29.7	-57.0	-839.7	317.9	175.0	0.0
1/31/2000	5509	31	-260.4	119.5	147.7	-94.4	64.6	-485.6	800.6	-78.3	-61.1	-819.2	493.1	173.4	0.0
2/29/2000	5538	29	-1313.5	759.6	148.8	-97.1	235.1	-322.6	682.8	-103.0	-65.7	-758.7	722.4	111.8	0.0
3/31/2000	5569	31	-532.2	156.7	157.8	-147.3	68.9	-361.9	725.4	-82.0	-77.7	-695.9	627.0	161.4	0.0
4/30/2000	5599	30	-651.7	182.8	151.3	-168.8	79.9	-327.3	718.5	-48.2	-76.5	-663.6	618.1	185.5	0.0
5/31/2000	5630	31	168.6	0.0	153.0	-189.2	33.5	-568.7	795.9	-36.5	-74.6	-814.1	314.2	218.0	0.0
6/30/2000	5660	30	270.7	0.0	145.2	-184.2	35.2	-605.3	855.2	-55.4	-60.1	-867.0	238.6	227.1	0.0
7/31/2000	5691	31	188.7	0.0	156.2	-191.3	23.6	-742.6	989.4	-67.4	-52.2	-790.2	242.3	243.6	0.0
8/31/2000	5722	31	147.9	0.0	159.8	-182.8	24.4	-759.0	1018.9	-79.4	-47.9	-769.4	244.7	242.8	0.0
9/30/2000	5752	30	118.1	0.0	156.1	-147.9	22.6	-760.0	1025.7	-89.1	-45.0	-758.9	255.3	223.2	0.0
10/31/2000	5783	31	-7.0	1.7	162.2	-133.8	20.1	-717.0	1007.2	-94.2	-50.7	-760.1	350.5	221.0	0.0
11/30/2000	5813	30	109.3	0.0	156.4	-97.5	21.2	-763.8	1027.0	-82.0	-50.0	-760.4	248.7	191.0	0.0
12/31/2000	5844	31	117.9	0.0	160.9	-83.2	20.0	-785.7	1048.4	-84.5	-49.1	-798.0	271.8	181.6	0.0
1/31/2001	5875	31	-1286.7	628.2	172.3	-94.6	192.8	-363.1	812.4	-127.6	-57.5	-769.5	752.3	141.0	0.0
2/28/2001	5903	28	-1479.5	745.2	167.6	-93.8	254.8	-268.7	648.4	-114.4	-68.6	-665.6	792.6	82.0	0.0
3/31/2001	5934	31	-1261.6	577.2	191.3	-147.3	157.7	-272.5	640.7	-96.7	-92.3	-665.8	844.6	124.8	0.0
4/30/2001	5964	30	-434.6	26.7	181.3	-170.9	36.3	-450.4	809.4	-69.2	-92.1	-597.0	605.8	154.7	0.0
5/31/2001	5995	31	-191.7	0.0	183.0	-200.8	25.1	-570.1	839.5	-70.3	-90.0	-691.4	566.3	200.4	0.0
6/30/2001	6025	30	-26.4	0.0	174.0	-186.3	26.0	-588.4	863.2	-85.8	-82.1	-706.5	399.9	212.6	0.0
7/31/2001	6056	31	78.2	0.0	172.2	-194.2	33.5	-830.1	1090.7	-73.2	-79.5	-817.7	384.3	235.7	0.0
8/31/2001	6087	31	123.4	0.0	167.1	-185.9	33.3	-849.1	1114.4	-89.0	-74.0	-855.1	375.7	239.2	0.0
9/30/2001	6117	30	133.3	0.0	158.6	-150.2	30.5	-852.9	1121.2	-102.1	-67.4	-860.3	373.7	215.7	0.0
10/31/2001	6148	31	92.9	0.0	162.2	-134.1	31.9	-874.5	1152.4	-108.3	-66.5	-910.2	441.5	212.6	0.0
11/30/2001	6178	30	-650.7	264.2	157.7	-100.1	99.2	-440.4	827.9	-102.1	-64.9	-768.4	610.0	167.5	0.0
12/31/2001	6209	31	-320.2	114.6	162.6	-83.7	52.4	-491.9	712.3	-71.6	-70.3	-759.7	608.9	146.8	0.0
1/31/2002	6240	31	-316.6	50.5	154.1	-94.6	39.0	-520.2	740.7	-33.4	-71.1	-721.2	611.7	161.1	0.0
2/28/2002	6268	28	-3.9	0.0	132.6	-93.8	22.9	-694.0	837.3	-9.2	-62.9	-730.4	442.1	159.4	0.0
3/31/2002	6299	31	10.9	0.0	143.0	-143.6	26.4	-745.2	923.1	-15.8	-66.3	-822.8	477.8	212.6	0.0
4/30/2002	6329	30	78.4	0.0	135.6	-159.7	26.3	-747.0	912.6	-29.0	-61.5	-799.7	417.7	226.3	0.0
5/31/2002	6360	31	136.6	0.0	138.1	-186.0	28.6	-765.1	946.2	-47.4	-61.2	-819.5	382.5	247.1	0.0
6/30/2002	6390	30	145.2	0.0	131.9	-177.9	29.0	-760.5	939.8	-60.5	-57.3	-795.0	367.7	237.6	0.0
7/31/2002	6421	31	275.3	0.0	148.6	-185.2	35.2	-775.3	923.5	-53.4	-56.7	-886.2	324.7	249.7	0.0
8/31/2002	6452	31	307.8	0.0	156.5	-180.1	35.2	-820.3	1018.0	-70.0	-54.0	-960.2	314.8	252.1	0.0
9/30/2002	6482	30	332.2	0.0	155.6	-146.4	37.0	-837.1	1058.6	-83.2	-49.6	-991.5	291.6	232.8	0.0
10/31/2002	6513	31	365.6	0.0	163.4	-133.2	34.3	-875.0	1112.9	-94.6	-49.2	-1061.1	302.5	234.2	0.0
11/30/2002	6543	30	-955.3	530.9	165.0	-100.5	178.6	-476.7	933.3	-155.0	-52.2	-909.0	674.3	166.5	0.0
12/31/2002	6574	31	-747.3	312.6	176.4	-83.7	99.5	-445.6	875.5	-157.2	-65.6	-805.2	710.2	130.5	0.0
1/31/2003	6605	31	206.8	0.0	174.7	-94.6	21.3	-540.7	815.6	-144.2	-68.4	-850.0	325.3	154.2	0.0
2/28/2003	6633	28	-1291.2	713.5	170.8	-93.8	217.3	-291.8	686.4	-155.1	-68.7	-753.3	763.2	102.7	0.0
3/31/2003	6664	31	-799.5	284.8	190.2	-147.3	110.1	-301.3	730.6	-149.7	-86.7	-681.0	704.6	145.3	0.0
4/30/2003	6694	30	-268.3	8.8	181.0	-170.9	33.1	-418.1	754.8	-114.7	-84.3	-708.5	603.2	183.9	0.0
5/31/2003	6725	31	-299.5	89.5	184.1	-195.3	51.4	-326.2	576.5	-114.2	-84.9	-703.1	600.7	220.9	0.0
6/30/2003	6755	30	195.0	0.0	175.4	-185.2	24.5	-454.8	671.7	-109.8	-77.2	-761.1	299.9	221.6	0.0
7/31/2003	6786	31	277.5	0.0	178.5	-191.4	28.1	-663.8	835.6	-79.2	-69.3	-825.0	266.2	242.7	0.0
8/31/2003	6817	31	277.9	0.0	176.2	-182.2	29.7	-707.0	897.6	-85.1	-61.1	-853.6	265.0	242.6	0.0
9/30/2003	6847	30	283.4	0.0	168.6	-147.4	27.4	-721.9	914.9	-97.6	-54.8	-860.4	263.6	224.2	0.0
10/31/2003	6878	31	312.5	0.0	172.2	-133.6	28.9	-750.5	968.9	-116.6	-53.0	-905.6	257.6	219.1	0.0
11/30/2003	6908	30	184.9	39.7	165.3	-97.9	36.2	-501.8	780.0	-152.8	-50.6	-878.9	285.0	190.7	0.0
12/31/2003	6939	31	-283.9	80.0	171.3	-83.6	49.1	-500.8	787.5	-163.0	-58.6	-789.7	613.0	178.7	0.0
1/31/2004	6970	31	133.6	0.0	169.9	-94.5	18.0	-511.3	748.3	-169.0	-65.0	-787.0	367.7	189.2	0.0
2/29/2004	6999	29	-1085.2	546.5	169.0	-97.1	172.9	-276.7	679.1	-195.9	-69.3	-703.2	715.1	144.8	0.0
3/31/2004	7030	31	164.5	0.0	178.2	-147.1	20.4	-479.4	675.9	-161.7	-78.7	-733.1	365.2	195.9	0.0

Flow Budget for the UAS in Pleasant Valley

influx(+) outflux(-); units in Acre-feet

Date	Stress	days in month	STORAGE	Mountain Front Recharge	GW Flux from East Las Posas	ET	Recharge	Pumping from Wells	Pleasant Valley Semi-Perched Aquifer	Oxnard UAS	Los Posas	Pleasant Valley LAS	Arroyo Las Posas Percolation	Conejo Creek Percolation	Calleguas Creek percolation
4/30/2004	7060	30	145.0	0.0	169.9	-160.9	25.0	-491.2	713.6	-143.3	-73.2	-743.7	341.6	217.4	0.0
5/31/2004	7091	31	249.5	0.0	173.0	-183.9	36.0	-511.7	766.6	-164.3	-66.3	-781.0	241.0	241.1	0.0
6/30/2004	7121	30	296.3	0.0	165.2	-175.6	28.5	-510.8	756.9	-174.8	-52.1	-770.6	192.8	244.1	0.0
7/31/2004	7152	31	373.0	0.0	169.1	-183.1	29.9	-770.1	980.6	-167.3	-45.2	-841.3	202.9	251.6	0.0
8/31/2004	7183	31	426.6	0.0	167.2	-176.9	30.7	-814.9	1050.7	-177.4	-38.4	-891.2	172.8	251.0	0.0
9/30/2004	7213	30	416.9	0.0	160.8	-143.5	29.5	-831.2	1071.1	-187.9	-33.5	-908.4	189.8	236.4	0.0
10/31/2004	7244	31	-1161.1	645.6	179.1	-140.5	216.0	-446.4	933.8	-278.5	-48.7	-879.4	770.8	209.4	0.0
11/30/2004	7274	30	354.7	0.0	170.6	-98.4	24.0	-783.5	987.5	-214.0	-58.9	-834.3	288.0	164.2	0.0
12/31/2004	7305	31	-1407.3	815.1	189.5	-83.7	248.0	-407.3	901.4	-284.5	-74.6	-865.5	868.5	100.5	0.0
1/31/2005	7336	31	-2246.9	1207.3	195.0	-94.6	417.4	-295.6	825.4	-311.6	-110.0	-821.6	1211.2	23.9	0.0
2/28/2005	7364	28	-2095.0	1145.5	178.7	-108.1	364.8	-226.4	683.4	-263.9	-133.6	-706.1	1206.6	-45.9	0.0
3/31/2005	7395	31	-686.9	194.0	198.7	-176.7	92.1	-266.9	769.8	-226.1	-137.8	-574.3	768.6	45.5	0.0
4/30/2005	7425	30	-446.6	15.0	188.4	-185.3	36.0	-328.0	811.9	-170.7	-113.8	-577.8	652.9	118.0	0.0
5/31/2005	7456	31	-212.6	0.0	190.4	-214.1	25.9	-405.7	793.4	-158.5	-104.7	-712.0	624.2	173.7	0.0
6/30/2005	7486	30	-6.6	0.0	180.9	-196.3	27.3	-416.5	683.0	-146.1	-92.0	-756.4	529.6	193.0	0.0
7/31/2005	7517	31	90.0	0.0	184.3	-200.7	28.2	-435.6	710.1	-142.7	-88.2	-793.0	428.0	219.7	0.0
8/31/2005	7548	31	94.7	0.0	182.2	-189.1	28.1	-441.3	698.8	-130.1	-83.6	-775.6	389.8	226.0	0.0
9/30/2005	7578	30	135.1	0.0	174.6	-150.0	25.9	-437.2	665.0	-119.9	-76.4	-742.2	321.3	203.8	0.0
10/31/2005	7609	31	-379.4	61.7	180.5	-136.3	54.7	-357.2	624.7	-111.1	-79.0	-678.6	614.9	205.0	0.0
11/30/2005	7639	30	-69.6	0.0	174.1	-98.4	23.7	-421.4	596.9	-96.6	-78.2	-702.9	496.9	175.6	0.0
12/31/2005	7670	31	14.2	0.0	179.2	-83.6	22.2	-438.1	608.8	-99.5	-79.4	-745.8	454.4	167.6	0.0
1/31/2006	7701	31	-738.9	266.8	182.2	-94.6	91.7	-280.3	607.5	-110.3	-82.2	-693.1	688.2	162.7	0.0
2/28/2006	7729	28	-779.7	312.5	166.8	-93.8	123.0	-232.5	511.8	-97.0	-79.2	-583.7	624.5	127.4	0.0
3/31/2006	7760	31	-898.4	381.0	187.5	-147.3	146.1	-229.1	492.3	-92.6	-92.9	-601.5	702.0	152.8	0.0
4/30/2006	7790	30	-848.3	353.4	183.8	-176.2	134.1	-211.0	430.1	-62.5	-94.3	-553.9	684.7	160.1	0.0
5/31/2006	7821	31	-204.5	68.3	187.8	-206.3	49.6	-267.9	335.3	-52.5	-95.9	-591.6	578.6	199.2	0.0
6/30/2006	7851	30	206.5	0.0	179.4	-189.5	31.1	-386.5	473.5	-73.6	-86.6	-747.4	385.6	207.5	0.0
7/31/2006	7882	31	196.1	0.0	183.0	-194.9	28.8	-413.1	519.9	-82.2	-82.0	-725.9	338.2	232.1	0.0
8/31/2006	7913	31	130.5	0.0	180.9	-185.1	29.4	-423.4	540.3	-92.8	-79.3	-699.2	360.3	238.3	0.0
9/30/2006	7943	30	170.1	0.0	173.0	-149.8	26.8	-423.6	542.5	-108.9	-73.8	-682.6	311.8	214.3	0.0
10/31/2006	7974	31	181.2	0.0	176.8	-134.3	27.5	-437.1	564.4	-124.9	-72.1	-702.7	311.1	210.0	0.0
11/30/2006	8004	30	155.9	0.0	169.5	-97.9	24.2	-433.5	561.3	-131.9	-68.1	-689.1	326.7	182.9	0.0
12/31/2006	8035	31	-98.1	56.0	174.4	-83.6	42.7	-343.2	485.8	-143.4	-72.4	-650.5	463.0	169.3	0.0
1/31/2007	8066	31	-384.6	187.8	174.2	-94.6	93.9	-292.4	397.4	-135.2	-77.1	-552.6	526.9	156.1	0.0
2/28/2007	8094	28	-225.3	35.8	157.6	-93.8	34.5	-364.5	455.5	-108.9	-73.3	-523.6	551.1	154.9	0.0
3/31/2007	8125	31	87.1	0.0	173.8	-145.6	22.9	-475.6	568.6	-122.0	-81.4	-625.7	389.8	208.1	0.0
4/30/2007	8155	30	-93.7	0.0	168.5	-160.8	21.2	-430.7	543.7	-130.7	-78.9	-609.3	545.7	225.0	0.0
5/31/2007	8186	31	135.0	0.0	173.6	-186.7	27.0	-485.2	607.1	-152.4	-81.4	-658.5	373.2	248.2	0.0
6/30/2007	8216	30	154.8	0.0	167.7	-178.8	27.0	-488.8	630.8	-179.1	-77.6	-660.2	363.0	241.3	0.0
7/31/2007	8247	31	302.8	0.0	172.7	-185.6	30.3	-567.1	695.5	-178.6	-77.8	-780.9	338.2	250.5	0.0
8/31/2007	8278	31	292.7	0.0	172.3	-179.7	28.8	-592.7	737.8	-182.6	-75.1	-828.6	375.7	251.3	0.0
9/30/2007	8308	30	139.9	0.0	167.0	-146.6	28.3	-599.6	763.4	-184.3	-71.9	-833.3	499.2	237.9	0.0
10/31/2007	8339	31	333.6	0.0	171.4	-133.5	30.2	-621.1	800.0	-194.7	-71.0	-865.4	319.1	231.3	0.0
11/30/2007	8369	30	367.8	0.0	164.7	-97.6	26.8	-618.9	787.9	-191.4	-62.4	-848.2	272.5	198.9	0.0
12/31/2007	8400	31	-202.1	133.5	170.6	-83.6	67.1	-452.0	647.4	-226.1	-66.1	-718.3	550.3	179.4	0.0
1/31/2008	8431	31	-1616.5	991.1	188.5	-94.9	309.1	-294.1	581.1	-274.7	-86.7	-725.5	913.5	109.1	0.0
2/29/2008	8460	29	-414.4	226.5	174.8	-97.9	90.3	-290.7	528.2	-243.7	-90.7	-566.5	585.7	98.4	0.0
3/31/2008	8491	31	293.9	0.0	181.6	-147.3	30.1	-463.9	633.0	-226.0	-91.1	-697.8	321.6	165.9	0.0
4/30/2008	8521	30	301.2	0.0	172.0	-170.9	34.1	-473.9	658.0	-200.2	-80.8	-743.5	308.2	195.7	0.0
5/31/2008	8552	31	339.1	0.0	175.1	-191.7	35.5	-494.0	687.7	-205.1	-76.5	-786.7	286.5	230.0	0.0
6/30/2008	8582	30	359.0	0.0	167.7	-180.8	35.6	-494.1	686.9	-206.5	-66.9	-787.1	251.1	235.2	0.0
7/31/2008	8613	31	498.6	0.0	171.3	-187.6	36.7	-610.0	776.1	-207.0	-60.1	-876.8	210.3	248.4	0.0
8/31/2008	8644	31	525.2	0.0	169.6	-181.2	35.5	-639.5	824.0	-219.7	-51.9	-913.1	202.3	248.7	0.0
9/30/2008	8674	30	506.7	0.0	163.0	-147.4	34.5	-647.6	854.5	-227.7	-46.0	-917.2	197.6	229.6	0.0
10/31/2008	8705	31	503.7	0.0	167.6	-133.7	36.6	-671.8	911.4	-247.8	-46.3	-962.0	219.5	222.7	0.0
11/30/2008	8735	30	-79.2	118.1	163.2	-99.3	72.4	-425.6	699.1	-255.7	-53.3	-759.0	430.2	189.2	0.0
12/31/2008	8766	31	-304.2	192.4	169.7	-83.7	85.1	-382.0	589.9	-251.7	-70.1	-679.0	574.9	158.7	0.0
1/31/2009	8797	31	288.2	0.0	168.5	-94.6	24.9	-369.0	608.7	-244.6	-71.8	-721.2	236.7	174.2	0.0
2/28/2009	8825	28	-1092.9	673.1	161.2	-93.8	216.9	-221.2	494.7	-230.6	-71.3	-630.0	681.2	112.8	0.0
3/31/2009	8856	31	265.0	0.0	176.2	-147.3	24.9	-330.3	509.7	-225.9	-86.7	-667.2	308.1	173.6	0.0
4/30/2009	8886	30	225.0	0.0	168.4	-166.4	27.7	-328.6	537.8	-212.4	-82.7	-685.0	314.8	201.4	0.0
5/31/2009	8917	31	387.4	0.0	170.4	-186.9	28.7	-338.0	564.2	-232.8	-72.3	-709.3	152.5	236.2	0.0
6/30/2009	8947	30	403.6	0.0	162.2	-176.4	26.1	-332.6	550.4	-244.1	-54.7	-696.2	129.1	232.6	0.0
7/31/2009	8978	31	480.3	0.0	165.9	-182.6	31.1	-557.6	739.5	-235.9	-48.3	-784.0	145.7	245.9	0.0
8/31/2009	9009	31	469.4	0.0	165.0	-176.3	35.4	-601.5	827.1	-251.5	-45.2	-837.4	169.7	245.3	0.0
9/30/2009	9039	30	403.0	0.0	160.1	-142.9	32.1	-619.6	859.6	-263.4	-47.7	-854.3	244.6	228.6	0.0
10/31/2009	9070	31	-79.6	73.1	166.8	-134.3	54.6	-480.0	796.6	-312.8	-61.5	-746.1	495.0	228.1	0.0
11/30/2009	9100	30	457.0	0.0	159.2	-97.5	30.6	-625.5	892.6	-299.0	-61.0	-811.4	164.8	190.3	0.0
12/31/2009	9131	31	-613.4	334.1	167.5	-83.7	115.3	-378.0	815.0	-352.8	-68.0	-745.5	645.1	164.5	0.0
1/31/2010	9162	31	-1209.4	676.5	185.0	-94.6	170.5	-275.4	689.9	-365.6	-92.2	-679.7	853.1	141.8	0.0
2/28/2010	9190	28	-816.6	446.3	170.7	-93.8	136.3	-225.5	588.4	-317.3	-98.6	-566.0	675.2	100.9	0.0
3/31/2010	9221	31	292.4	0.0	183.4	-147.3	27.4	-367.3	648.0	-327.4	-110.8	-730.4	368.9	163.0	0.0
4/30/2010	9251	30	-44.7	68.6	173.4	-169.4	45.5	-274.8	563.7	-297.3	-103.1	-654.0	496.9	195.3	0.0
5/31/2010	9282	31	188.3	0.0	176.2	-188.5	33.2	-363.7	655.9	-304.3	-105.8	-766.7	452.5	222.8	0.0
6/30/2010	9312	30	417.9	0.0	167.7	-177.4	31.8	-367.3	661.6	-308.1	-92.7	-803.6	242.2	227.9	0.0
7/31/2010	9343	31	540.0	0.0	170.3	-183.4	39.3	-540.2	773.3	-286.0	-80.4	-871.3	195.5	242.9	0.0
8/31/2010	9374	31	555.1	0.0	167.8	-176.8	39.4	-577.0	828.7	-289.8	-68.2	-902.9	179.5	244.0	0.0

Flow Budget for the UAS in Pleasant Valley

Date	Stress	days in month	STORAGE	Mountain Front Recharge	GW Flux from East Las Posas	ET	Recharge	Pumping from Wells	Pleasant Valley Semi-Perched Aquifer	Oxnard UAS	Los Posas	Pleasant Valley LAS	Arroyo Las Posas Percolation	Conejo Creek Percolation	Calleguas Creek percolation
			influx(+) outflux(-); units in Acre-feet												
9/30/2010	9404	30	515.1	0.0	161.3	-143.4	38.4	-590.6	858.7	-294.3	-60.7	-908.6	199.3	224.8	0.0
10/31/2010	9435	31	-99.7	225.4	167.6	-136.2	91.0	-371.5	680.3	-343.5	-72.1	-793.2	435.9	215.7	0.0
11/30/2010	9465	30	335.6	1.1	161.6	-97.0	26.2	-530.0	782.5	-291.7	-79.4	-757.7	275.5	173.2	0.0
12/31/2010	9496	31	-1505.8	1081.3	181.6	-83.7	346.5	-284.1	638.2	-346.4	-97.9	-795.4	803.9	61.7	0.0
1/31/2011	9527	31	223.1	0.0	178.8	-94.6	33.6	-329.7	590.5	-332.7	-110.0	-736.1	457.5	119.7	0.0
2/28/2011	9555	28	-692.5	295.8	164.0	-93.8	111.5	-227.2	666.4	-284.4	-103.7	-609.4	654.2	119.2	0.0
3/31/2011	9586	31	-1336.0	723.3	191.1	-152.3	223.4	-203.6	621.7	-299.2	-129.5	-634.7	848.2	147.8	0.0
4/30/2011	9616	30	103.9	0.0	180.3	-182.3	36.2	-292.1	537.5	-262.5	-128.5	-662.6	515.3	154.8	0.0
5/31/2011	9647	31	143.1	0.0	181.1	-215.1	37.3	-321.9	610.8	-261.0	-124.4	-746.2	493.1	203.2	0.0
6/30/2011	9677	30	346.7	0.0	170.7	-195.3	39.4	-330.6	616.6	-259.2	-108.7	-747.6	254.7	213.3	0.0
7/31/2011	9708	31	418.8	0.0	171.8	-195.4	35.7	-384.8	681.5	-258.4	-94.1	-790.0	183.2	231.7	0.0
8/31/2011	9739	31	448.2	0.0	167.6	-185.6	35.9	-390.3	687.2	-263.1	-76.7	-802.2	144.5	234.4	0.0
9/30/2011	9769	30	435.9	0.0	159.3	-148.9	33.6	-386.8	681.0	-266.4	-61.9	-792.1	131.5	214.6	0.0
10/31/2011	9800	31	149.9	3.7	165.2	-135.6	35.3	-374.8	687.1	-275.2	-70.0	-729.0	331.4	212.0	0.0
11/30/2011	9830	30	-319.1	139.8	161.4	-101.1	74.9	-283.6	547.9	-253.1	-84.3	-651.6	586.7	182.1	0.0
12/31/2011	9861	31	277.0	0.0	165.9	-84.2	29.4	-368.5	615.9	-246.3	-93.6	-746.0	285.9	164.4	0.0
1/31/2012	9892	31	-9.2	96.1	165.2	-94.7	66.3	-278.8	542.6	-249.1	-96.9	-679.3	368.3	169.6	0.0
2/29/2012	9921	29	415.1	0.0	153.1	-97.1	38.7	-349.5	573.7	-233.6	-83.4	-756.3	170.8	168.5	0.0
3/31/2012	9952	31	-551.7	233.9	166.9	-147.3	101.2	-269.0	662.6	-258.3	-90.3	-708.5	655.6	204.9	0.0
4/30/2012	9982	30	-323.8	111.7	162.5	-164.9	55.0	-244.8	549.5	-241.7	-100.5	-624.8	600.4	221.2	0.0
5/31/2012	10013	31	483.1	0.0	164.3	-188.4	41.5	-348.6	586.6	-247.9	-91.5	-778.0	143.3	235.6	0.0
6/30/2012	10043	30	531.4	0.0	156.1	-178.6	42.6	-368.8	618.6	-257.2	-67.8	-837.3	127.9	232.9	0.0
7/31/2012	10074	31	490.9	0.0	159.7	-181.9	34.5	-568.6	779.1	-242.8	-61.1	-798.6	148.2	240.6	0.0
8/31/2012	10105	31	485.1	0.0	157.5	-174.3	35.3	-606.8	851.7	-255.0	-56.6	-789.9	116.8	236.3	0.0
9/30/2012	10135	30	465.8	0.0	150.1	-140.7	34.9	-621.0	887.8	-263.3	-49.1	-785.1	96.4	224.3	0.0
10/31/2012	10166	31	455.8	0.0	153.8	-129.4	36.5	-649.5	951.5	-287.6	-47.1	-823.8	114.4	225.5	0.0
11/30/2012	10196	30	417.3	2.6	148.3	-97.2	29.2	-542.6	849.1	-287.4	-45.4	-806.9	135.7	197.3	0.0
12/31/2012	10227	31	105.2	132.3	155.5	-83.7	51.1	-433.5	735.4	-308.4	-61.0	-832.0	351.7	187.4	0.0
1/31/2013	10258	31	167.0	60.4	156.5	-94.6	45.4	-417.8	731.6	-293.6	-79.4	-785.8	333.3	177.0	0.0
2/28/2013	10286	28	420.7	0.0	139.5	-93.5	19.8	-499.6	732.7	-244.2	-69.1	-709.9	132.7	171.0	0.0
3/31/2013	10317	31	257.5	0.0	155.3	-141.1	20.0	-474.8	769.6	-278.1	-77.6	-776.8	324.0	222.0	0.0
4/30/2013	10347	30	435.6	0.0	148.2	-158.4	22.9	-530.6	790.3	-264.5	-71.1	-738.6	136.9	229.3	0.0
5/31/2013	10378	31	492.0	0.0	148.6	-178.8	23.9	-555.7	838.7	-283.4	-56.7	-741.1	70.7	241.7	0.0
6/30/2013	10408	30	484.2	0.0	138.2	-171.2	23.5	-554.5	832.3	-283.4	-41.1	-715.3	48.2	239.1	0.0
7/31/2013	10439	31	590.9	0.0	134.4	-178.3	28.1	-741.4	997.5	-282.1	-30.9	-789.0	30.1	240.7	0.0
8/31/2013	10470	31	610.2	0.0	129.0	-170.9	28.1	-775.2	1055.9	-289.3	-21.8	-827.3	28.3	233.3	0.0
9/30/2013	10500	30	586.0	0.0	121.1	-137.7	28.0	-784.6	1073.5	-288.1	-15.3	-831.1	27.4	220.9	0.0
10/31/2013	10531	31	590.2	0.0	122.9	-125.9	26.8	-815.5	1136.3	-309.9	-13.3	-871.4	31.4	228.3	0.0
11/30/2013	10561	30	552.8	0.0	122.3	-96.2	24.3	-811.8	1130.2	-307.1	-12.1	-866.3	50.6	213.1	0.0
12/31/2013	10592	31	604.0	0.0	118.9	-82.4	24.6	-835.7	1183.5	-326.8	-11.4	-896.5	24.6	197.2	0.0
1/31/2014	10623	31	420.0	0.0	131.0	-92.3	28.2	-851.6	1220.5	-337.5	-13.8	-897.1	194.3	198.3	0.0
2/28/2014	10651	28	55.8	268.8	116.3	-93.6	112.6	-478.7	868.1	-347.0	-14.0	-699.9	50.5	161.0	0.0
3/31/2014	10682	31	-224.8	62.5	137.7	-143.5	45.8	-591.3	1000.7	-362.0	-28.0	-728.6	609.1	222.3	0.0
4/30/2014	10712	30	133.6	0.0	137.1	-158.6	27.4	-772.4	1096.6	-318.4	-47.2	-816.5	498.6	219.9	0.0
5/31/2014	10743	31	656.2	0.0	132.6	-180.0	31.2	-826.3	1179.8	-329.3	-42.0	-892.5	41.2	229.2	0.0
6/30/2014	10773	30	651.3	0.0	121.9	-169.4	30.5	-835.4	1184.3	-321.4	-25.0	-897.8	36.3	224.8	0.0
7/31/2014	10804	31	635.3	0.0	125.1	-176.7	28.7	-851.9	1242.8	-351.3	-18.3	-915.5	45.5	236.2	0.0
8/31/2014	10835	31	653.4	0.0	121.4	-170.1	27.6	-832.4	1212.3	-358.6	-15.3	-906.9	36.3	232.4	0.0
9/30/2014	10865	30	644.4	0.0	114.4	-136.3	26.2	-823.0	1181.1	-349.4	-12.6	-890.7	31.5	214.4	0.0
10/31/2014	10896	31	652.9	0.0	118.3	-123.6	25.3	-845.6	1217.3	-363.3	-11.6	-928.4	38.7	219.9	0.0
11/30/2014	10926	30	571.0	0.0	117.1	-94.8	20.0	-807.6	1168.7	-351.1	-10.8	-880.5	49.4	218.6	0.0
12/31/2014	10957	31	-334.8	579.9	130.4	-83.7	188.3	-497.1	904.1	-411.4	-16.3	-858.9	230.0	169.8	0.0
1/31/2015	10988	31	-140.6	134.0	136.0	-94.6	73.7	-386.0	840.7	-378.9	-34.2	-692.4	388.6	153.7	0.0
2/28/2015	11016	28	111.3	0.0	125.9	-93.8	19.7	-511.3	843.4	-302.9	-47.5	-679.5	379.3	155.3	0.0
3/31/2015	11047	31	469.5	16.2	127.2	-147.3	33.2	-470.6	901.8	-350.5	-43.5	-778.9	29.5	213.4	0.0
4/30/2015	11077	30	526.1	0.0	116.8	-161.0	22.4	-557.1	916.5	-325.7	-24.9	-754.6	28.0	213.6	0.0
5/31/2015	11108	31	521.3	0.0	123.0	-175.5	21.9	-589.3	966.4	-335.9	-18.6	-789.5	47.3	228.7	0.0
6/30/2015	11138	30	526.9	0.0	112.8	-167.5	21.8	-589.5	959.7	-325.9	-14.5	-774.9	23.2	228.0	0.0
7/31/2015	11169	31	495.6	0.0	113.0	-177.5	18.4	-635.7	1011.1	-338.0	-12.4	-743.0	21.5	247.0	0.0
8/31/2015	11200	31	555.2	0.0	109.0	-168.7	23.2	-708.5	1068.0	-329.0	-11.2	-783.2	16.0	228.9	0.0
9/30/2015	11230	30	548.1	0.0	102.4	-136.2	22.6	-712.0	1051.6	-312.0	-9.8	-793.3	13.7	225.0	0.0
10/31/2015	11261	31	580.1	0.0	103.8	-122.0	22.4	-736.3	1089.3	-322.4	-9.4	-835.9	17.2	213.1	0.0
11/30/2015	11291	30	540.9	0.0	100.6	-91.2	23.4	-729.4	1077.2	-311.6	-8.6	-826.9	24.4	201.3	0.0
12/31/2015	11322	31	557.9	0.0	99.9	-81.7	23.9	-748.6	1114.7	-322.8	-8.6	-865.4	14.8	215.9	0.0

Flow Budget for the LAS in Pleasant Valley

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
			influx(+) outflux(-); units in Acre-feet					
1/31/1985	31	31	-34.0	18.0	-445.1	429.3	30.8	1.0
2/28/1985	59	28	77.0	17.4	-411.8	277.3	31.1	9.0
3/31/1985	90	31	270.2	15.0	-619.1	308.0	3.0	22.8
4/30/1985	120	30	722.5	7.8	-1208.4	415.9	15.3	46.8
5/31/1985	151	31	549.2	8.0	-1155.8	503.5	22.4	72.7
6/30/1985	181	30	499.1	8.5	-1139.6	530.3	17.2	84.5
7/31/1985	212	31	459.1	8.3	-1086.6	558.1	-34.6	95.7
8/31/1985	243	31	437.4	8.1	-1061.5	572.1	-60.1	104.0
9/30/1985	273	30	439.1	8.0	-1055.3	572.5	-72.5	108.2
10/31/1985	304	31	381.2	7.6	-1026.7	605.1	-84.5	117.4
11/30/1985	334	30	-1003.1	73.5	148.2	750.0	-64.2	95.5
12/31/1985	365	31	250.5	8.9	-805.9	501.0	-32.9	78.4
1/31/1986	396	31	-1057.7	59.3	89.3	878.5	-28.8	59.5
2/28/1986	424	28	-1229.1	112.2	131.4	984.6	-17.6	18.5
3/31/1986	455	31	-1007.1	97.8	91.7	832.2	-4.9	-9.7
4/30/1986	485	30	270.6	13.9	-765.2	532.3	-34.1	-17.5
5/31/1986	516	31	501.0	8.3	-896.9	476.2	-89.5	0.8
6/30/1986	546	30	500.2	8.2	-873.7	474.4	-130.7	21.6
7/31/1986	577	31	577.1	8.8	-1050.2	480.5	-68.2	52.1
8/31/1986	608	31	450.2	7.7	-998.4	487.9	-24.1	76.7
9/30/1986	638	30	65.2	12.3	-644.5	482.9	2.2	81.9
10/31/1986	669	31	357.9	7.7	-979.1	517.0	9.5	87.0
11/30/1986	699	30	-465.3	23.2	-146.7	518.1	-4.0	74.6
12/31/1986	730	31	423.0	7.6	-1002.9	500.3	-0.2	72.3
1/31/1987	761	31	-285.1	22.1	-294.7	513.3	-29.8	74.1
2/28/1987	789	28	97.9	16.3	-606.3	445.4	-16.7	63.5
3/31/1987	820	31	-300.9	24.8	-262.6	480.2	-3.4	61.9
4/30/1987	850	30	908.0	8.8	-1432.5	514.6	-77.5	78.5
5/31/1987	881	31	681.4	8.4	-1331.4	611.6	-90.6	120.5
6/30/1987	911	30	613.4	8.8	-1295.3	638.7	-104.5	139.0
7/31/1987	942	31	398.6	10.5	-1123.9	702.7	-146.6	158.7
8/31/1987	973	31	401.5	10.5	-1114.9	724.9	-184.4	162.4
9/30/1987	1003	30	430.1	10.0	-1119.1	715.9	-197.8	160.9
10/31/1987	1034	31	-747.0	22.8	-178.9	912.8	-145.9	136.2
11/30/1987	1064	30	-656.9	32.9	-46.2	697.4	-114.5	87.2
12/31/1987	1095	31	-1116.9	40.6	-9.5	1102.4	-66.7	50.2
1/31/1988	1126	31	-814.1	34.7	-95.7	909.1	-46.8	12.7
2/29/1988	1155	29	-204.9	21.1	-355.7	600.5	-55.4	-5.7
3/31/1988	1186	31	586.4	8.6	-1154.2	666.2	-114.5	7.5
4/30/1988	1216	30	-511.4	29.1	-186.0	706.9	-49.7	11.0
5/31/1988	1247	31	556.6	9.0	-1136.2	667.2	-108.2	11.7

Flow Budget for the LAS in Pleasant Valley

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
			influx(+) outflux(-); units in Acre-feet					
6/30/1988	1277	30	582.3	8.8	-1096.7	596.1	-126.3	35.8
7/31/1988	1308	31	645.8	8.6	-1278.4	614.2	-56.3	66.0
8/31/1988	1339	31	522.5	8.6	-1239.8	649.8	-33.2	92.1
9/30/1988	1369	30	472.1	8.7	-1230.1	676.0	-31.4	104.7
10/31/1988	1400	31	403.0	8.6	-1192.5	696.6	-33.7	118.0
11/30/1988	1430	30	-294.7	14.6	-466.7	680.9	-35.9	101.9
12/31/1988	1461	31	-1355.0	66.3	129.2	1113.2	-11.4	57.7
1/31/1989	1492	31	352.0	7.5	-967.5	583.0	-17.4	42.5
2/28/1989	1520	28	-835.7	43.6	-27.4	790.5	4.9	24.0
3/31/1989	1551	31	138.5	9.6	-699.0	561.4	-25.1	14.6
4/30/1989	1581	30	527.1	8.4	-1063.3	536.2	-47.6	39.3
5/31/1989	1612	31	430.0	8.3	-1017.5	577.1	-60.5	62.7
6/30/1989	1642	30	426.2	8.4	-1011.0	570.4	-67.9	73.9
7/31/1989	1673	31	612.8	7.9	-1329.6	614.5	5.6	86.9
8/31/1989	1704	31	506.4	7.8	-1295.0	643.9	35.2	99.0
9/30/1989	1734	30	479.8	8.0	-1292.5	651.6	43.1	105.3
10/31/1989	1765	31	388.5	7.8	-1256.1	694.3	47.2	114.6
11/30/1989	1795	30	396.6	7.8	-1265.9	694.9	46.8	114.3
12/31/1989	1826	31	329.6	8.2	-1235.8	727.4	46.9	119.5
1/31/1990	1857	31	-983.4	26.8	-144.0	1011.4	-2.1	91.3
2/28/1990	1885	28	-714.0	24.4	-221.4	900.7	-34.3	44.6
3/31/1990	1916	31	649.5	8.4	-1277.0	650.7	-91.9	60.3
4/30/1990	1946	30	587.1	8.5	-1241.5	662.2	-108.0	91.7
5/31/1990	1977	31	354.6	7.6	-1073.2	720.7	-122.9	113.1
6/30/1990	2007	30	483.5	9.2	-1187.6	707.1	-130.4	118.2
7/31/1990	2038	31	211.6	9.2	-1006.2	737.5	-76.4	124.3
8/31/1990	2069	31	216.7	9.2	-1016.4	736.0	-66.9	121.5
9/30/1990	2099	30	263.9	9.1	-1039.4	715.0	-66.2	117.7
10/31/1990	2130	31	211.7	9.7	-1018.4	746.1	-70.2	121.1
11/30/1990	2160	30	-4.5	8.3	-731.8	725.3	-105.5	108.3
12/31/1990	2191	31	285.1	8.4	-1037.4	732.0	-98.4	110.3
1/31/1991	2222	31	-313.3	15.5	-546.2	767.2	-24.0	100.8
2/28/1991	2250	28	-902.4	27.7	-125.6	930.6	12.7	57.0
3/31/1991	2281	31	-2014.1	131.5	313.8	1528.7	31.2	9.0
4/30/1991	2311	30	556.8	7.1	-1231.0	607.1	54.9	5.0
5/31/1991	2342	31	435.9	7.6	-1154.2	605.4	64.0	41.3
6/30/1991	2372	30	398.2	7.2	-1139.5	610.2	64.2	59.8
7/31/1991	2403	31	271.8	7.4	-1076.5	647.8	71.0	78.4
8/31/1991	2434	31	231.9	7.4	-1058.9	662.6	67.1	89.1
9/30/1991	2464	30	249.8	7.6	-1068.6	653.9	59.5	93.8

Flow Budget for the LAS in Pleasant Valley

Date	Stress	days in month	influx(+) outflux(-); units in Acre-feet					
			STORAGE	RECHARGE	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
10/31/1991	2495	31	188.5	7.3	-1038.5	684.1	55.4	101.4
11/30/1991	2525	30	219.2	7.3	-1055.1	670.8	51.7	101.3
12/31/1991	2556	31	-1873.1	69.2	326.9	1392.9	26.0	58.1
1/31/1992	2587	31	-1224.1	30.9	100.4	1047.7	51.8	-6.5
2/29/1992	2616	29	-1675.0	144.6	262.9	1275.0	47.8	-55.3
3/31/1992	2647	31	-1310.9	89.8	188.1	1092.5	49.1	-108.6
4/30/1992	2677	30	215.8	6.4	-829.3	622.1	85.8	-100.8
5/31/1992	2708	31	108.1	7.0	-788.1	643.2	101.5	-71.6
6/30/1992	2738	30	121.2	6.8	-782.2	608.5	96.6	-51.0
7/31/1992	2769	31	370.2	9.0	-1116.8	654.9	117.9	-35.2
8/31/1992	2800	31	290.2	9.5	-1075.2	678.1	114.3	-16.9
9/30/1992	2830	30	283.8	9.0	-1065.5	667.2	108.5	-2.9
10/31/1992	2861	31	-182.6	14.8	-557.7	645.0	86.5	-5.9
11/30/1992	2891	30	302.7	8.6	-1064.1	658.9	97.5	-3.6
12/31/1992	2922	31	-1160.4	64.2	191.6	878.5	55.4	-29.3
1/31/1993	2953	31	-1328.8	155.5	247.2	960.4	50.7	-84.9
2/28/1993	2981	28	-956.2	114.0	124.7	771.6	59.7	-113.9
3/31/1993	3012	31	-515.7	39.0	-81.8	616.1	93.6	-151.2
4/30/1993	3042	30	483.5	7.8	-1034.8	511.9	156.5	-125.0
5/31/1993	3073	31	301.2	8.0	-986.4	598.0	175.5	-96.3
6/30/1993	3103	30	255.1	6.6	-971.5	615.6	169.7	-75.5
7/31/1993	3134	31	80.9	9.2	-780.5	661.9	96.6	-68.1
8/31/1993	3165	31	83.4	9.3	-769.5	671.0	67.1	-61.3
9/30/1993	3195	30	97.4	9.3	-771.6	664.6	49.4	-49.1
10/31/1993	3226	31	54.1	9.4	-752.1	693.0	40.6	-45.0
11/30/1993	3256	30	-68.0	8.9	-609.6	681.1	33.8	-46.2
12/31/1993	3287	31	-420.5	17.6	-176.5	608.3	38.5	-67.4
1/31/1994	3318	31	93.2	6.8	-677.9	642.1	6.8	-71.0
2/28/1994	3346	28	-848.4	72.5	123.4	698.1	26.6	-72.2
3/31/1994	3377	31	-635.6	36.3	21.8	648.6	39.2	-110.2
4/30/1994	3407	30	307.0	6.8	-792.4	544.9	29.6	-95.9
5/31/1994	3438	31	180.5	6.9	-752.4	609.1	27.9	-72.0
6/30/1994	3468	30	159.4	7.4	-743.4	612.9	17.8	-54.1
7/31/1994	3499	31	281.0	9.6	-987.1	697.9	37.0	-38.5
8/31/1994	3530	31	227.2	9.9	-949.5	729.4	6.1	-23.2
9/30/1994	3560	30	217.9	9.6	-937.9	732.3	-12.7	-9.2
10/31/1994	3591	31	139.0	8.1	-861.5	740.3	-26.5	0.6
11/30/1994	3621	30	-274.1	13.6	-349.8	652.2	-34.6	-7.3
12/31/1994	3652	31	-151.1	14.1	-505.9	676.6	-11.4	-22.3
1/31/1995	3683	31	-1555.7	224.5	309.7	1079.1	-1.5	-56.1

Flow Budget for the LAS in Pleasant Valley

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
			influx(+) outflux(-); units in Acre-feet					
2/28/1995	3711	28	-273.8	16.2	-231.8	567.6	4.6	-82.8
3/31/1995	3742	31	-937.7	128.1	184.7	710.3	24.6	-110.0
4/30/1995	3772	30	28.3	8.2	-499.1	579.4	4.6	-121.4
5/31/1995	3803	31	86.6	9.2	-613.5	637.8	-7.6	-112.5
6/30/1995	3833	30	76.8	9.1	-609.2	633.9	-13.5	-97.1
7/31/1995	3864	31	96.5	12.0	-644.7	612.6	5.3	-81.7
8/31/1995	3895	31	76.9	12.2	-626.2	582.0	20.9	-65.7
9/30/1995	3925	30	57.3	12.4	-624.4	586.7	21.0	-52.9
10/31/1995	3956	31	7.7	11.8	-606.7	614.1	19.9	-46.9
11/30/1995	3986	30	15.8	11.2	-612.2	606.8	17.0	-38.6
12/31/1995	4017	31	-635.1	26.6	26.9	627.0	11.7	-57.1
1/31/1996	4048	31	-37.3	14.8	-475.8	550.3	21.0	-73.0
2/29/1996	4077	29	-762.0	101.5	101.6	609.9	26.3	-77.2
3/31/1996	4108	31	-174.0	24.3	-293.5	505.5	38.9	-101.2
4/30/1996	4138	30	336.9	10.9	-966.4	642.1	58.9	-82.3
5/31/1996	4169	31	242.4	11.7	-973.7	722.2	58.2	-60.8
6/30/1996	4199	30	206.8	11.6	-956.0	736.0	44.0	-42.3
7/31/1996	4230	31	397.4	12.6	-1091.4	709.3	-9.6	-18.2
8/31/1996	4261	31	337.9	12.6	-1043.3	735.2	-46.7	4.3
9/30/1996	4291	30	302.0	12.6	-1024.7	756.9	-64.0	17.2
10/31/1996	4322	31	-227.9	18.7	-503.2	770.2	-65.2	7.3
11/30/1996	4352	30	-681.2	34.2	25.0	687.6	-37.9	-27.6
12/31/1996	4383	31	-890.1	93.0	164.6	709.6	-8.5	-68.6
1/31/1997	4414	31	-701.6	79.7	70.3	638.2	16.7	-103.2
2/28/1997	4442	28	499.7	8.7	-1043.5	625.4	-9.9	-80.5
3/31/1997	4473	31	269.3	9.7	-968.7	747.4	-4.2	-53.5
4/30/1997	4503	30	225.2	9.7	-952.2	760.0	-10.4	-32.4
5/31/1997	4534	31	147.2	9.8	-923.8	801.3	-13.2	-21.2
6/30/1997	4564	30	143.0	10.3	-923.0	799.9	-17.5	-12.7
7/31/1997	4595	31	150.8	11.3	-1012.7	836.6	28.3	-14.3
8/31/1997	4626	31	129.7	11.5	-990.7	848.0	9.8	-8.3
9/30/1997	4656	30	140.4	11.6	-986.6	842.6	-5.5	-2.5
10/31/1997	4687	31	80.7	12.4	-960.3	885.9	-17.2	-1.5
11/30/1997	4717	30	-743.7	34.3	-13.7	765.7	-20.5	-22.1
12/31/1997	4748	31	-987.0	97.7	183.8	780.2	-7.7	-67.0
1/31/1998	4779	31	-640.7	48.1	0.2	690.1	5.3	-103.0
2/28/1998	4807	28	-1256.6	273.6	186.6	887.1	23.3	-114.1
3/31/1998	4838	31	-517.1	50.1	-74.0	665.9	24.1	-149.0
4/30/1998	4868	30	-179.6	22.0	-398.5	665.3	31.9	-141.1
5/31/1998	4899	31	-431.1	38.2	-174.5	666.2	40.1	-138.8

Flow Budget for the LAS in Pleasant Valley

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
			influx(+) outflux(-); units in Acre-feet					
6/30/1998	4929	30	399.4	12.9	-1154.5	865.9	3.7	-127.4
7/31/1998	4960	31	-27.8	10.2	-692.9	824.1	-9.3	-104.2
8/31/1998	4991	31	-9.4	11.2	-679.2	793.6	-28.4	-87.8
9/30/1998	5021	30	-3.6	10.4	-677.3	784.0	-37.0	-76.6
10/31/1998	5052	31	-40.3	10.0	-660.5	806.6	-42.8	-73.1
11/30/1998	5082	30	-197.7	14.7	-483.5	765.9	-29.6	-69.8
12/31/1998	5113	31	-98.2	9.4	-627.9	801.2	-9.6	-74.9
1/31/1999	5144	31	-496.3	24.1	-183.3	716.7	18.7	-80.0
2/28/1999	5172	28	308.7	8.6	-974.6	706.8	14.3	-63.8
3/31/1999	5203	31	-706.1	41.4	-40.0	725.6	47.3	-68.2
4/30/1999	5233	30	-438.9	26.4	-187.8	644.6	41.3	-85.6
5/31/1999	5264	31	321.3	10.1	-1066.3	779.5	38.5	-83.1
6/30/1999	5294	30	228.8	10.3	-1038.2	812.7	44.0	-57.5
7/31/1999	5325	31	324.3	9.3	-1078.9	765.7	9.5	-29.8
8/31/1999	5356	31	273.3	9.6	-1031.1	779.5	-28.4	-2.9
9/30/1999	5386	30	244.3	9.2	-1011.8	792.1	-45.6	11.9
10/31/1999	5417	31	162.1	10.9	-976.1	837.8	-57.0	22.3
11/30/1999	5447	30	-205.4	11.0	-556.0	784.7	-50.9	16.5
12/31/1999	5478	31	178.9	9.9	-979.2	839.7	-62.7	13.4
1/31/2000	5509	31	-647.9	22.8	-150.7	819.2	-48.3	4.8
2/29/2000	5538	29	-926.7	95.1	117.7	758.7	-18.3	-26.5
3/31/2000	5569	31	-465.9	29.3	-186.1	695.9	-17.3	-56.1
4/30/2000	5599	30	-415.2	30.8	-213.9	663.6	-1.2	-64.1
5/31/2000	5630	31	476.9	11.9	-1225.8	814.1	-33.3	-43.8
6/30/2000	5660	30	356.7	12.3	-1187.2	867.0	-40.5	-8.2
7/31/2000	5691	31	75.2	6.2	-850.7	790.2	-20.9	-0.1
8/31/2000	5722	31	94.8	6.3	-833.3	769.4	-40.0	2.8
9/30/2000	5752	30	106.7	5.9	-831.9	758.9	-46.7	7.2
10/31/2000	5783	31	-106.8	7.5	-612.7	760.1	-51.6	3.5
11/30/2000	5813	30	108.5	5.7	-827.4	760.4	-51.8	4.6
12/31/2000	5844	31	44.9	5.4	-804.2	798.0	-53.3	9.2
1/31/2001	5875	31	-966.1	75.0	179.0	769.5	-45.5	-12.0
2/28/2001	5903	28	-824.3	101.3	126.2	665.6	-26.5	-42.3
3/31/2001	5934	31	-673.9	55.0	37.7	665.8	-11.9	-72.7
4/30/2001	5964	30	56.1	14.8	-520.6	597.0	-76.4	-70.8
5/31/2001	5995	31	289.7	7.2	-849.2	691.4	-93.4	-45.8
6/30/2001	6025	30	235.3	7.2	-830.1	706.5	-95.9	-23.1
7/31/2001	6056	31	255.2	10.0	-996.1	817.7	-74.1	-12.7
8/31/2001	6087	31	212.0	10.2	-976.3	855.1	-96.6	-4.4
9/30/2001	6117	30	206.1	9.5	-972.0	860.3	-107.1	3.3

Flow Budget for the LAS in Pleasant Valley

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
			influx(+) outflux(-); units in Acre-feet					
10/31/2001	6148	31	136.8	10.5	-949.2	910.2	-116.7	8.5
11/30/2001	6178	30	-737.5	38.0	5.7	768.4	-64.3	-10.3
12/31/2001	6209	31	-360.8	17.9	-335.9	759.7	-44.5	-36.4
1/31/2002	6240	31	-283.4	12.5	-358.4	721.2	-47.2	-44.6
2/28/2002	6268	28	236.1	8.7	-885.0	730.4	-63.8	-26.2
3/31/2002	6299	31	76.6	9.2	-832.0	822.8	-63.3	-13.3
4/30/2002	6329	30	88.8	9.3	-830.4	799.7	-62.0	-5.5
5/31/2002	6360	31	46.6	9.7	-811.7	819.5	-62.6	-1.5
6/30/2002	6390	30	72.8	9.8	-816.8	795.0	-62.5	1.6
7/31/2002	6421	31	577.5	12.5	-1480.4	886.2	-25.9	28.3
8/31/2002	6452	31	431.6	13.3	-1432.7	960.2	-34.7	59.3
9/30/2002	6482	30	377.8	14.9	-1414.6	991.5	-44.9	75.4
10/31/2002	6513	31	269.3	13.6	-1374.6	1061.1	-57.2	87.9
11/30/2002	6543	30	-1095.1	68.3	127.0	909.0	-57.4	48.2
12/31/2002	6574	31	-704.3	41.6	-101.1	805.2	-39.6	-1.7
1/31/2003	6605	31	199.6	6.3	-1005.3	850.0	-41.8	-8.9
2/28/2003	6633	28	-920.6	80.2	114.3	753.3	-2.6	-24.5
3/31/2003	6664	31	-625.1	43.7	-25.8	681.0	-11.4	-62.4
4/30/2003	6694	30	221.9	12.4	-888.2	708.5	0.1	-54.7
5/31/2003	6725	31	-403.9	17.9	-271.8	703.1	12.0	-57.2
6/30/2003	6755	30	378.8	6.4	-1096.1	761.1	-5.3	-45.0
7/31/2003	6786	31	366.9	9.5	-1197.2	825.0	13.6	-17.8
8/31/2003	6817	31	274.4	9.8	-1152.1	853.6	10.7	3.7
9/30/2003	6847	30	245.3	9.3	-1136.4	860.4	4.3	17.1
10/31/2003	6878	31	165.8	9.7	-1106.3	905.6	-0.6	25.8
11/30/2003	6908	30	-376.1	14.1	-502.7	878.9	-21.7	7.5
12/31/2003	6939	31	-376.5	20.4	-381.9	789.7	-34.2	-17.5
1/31/2004	6970	31	50.2	6.7	-833.9	787.0	11.5	-21.5
2/29/2004	6999	29	-794.4	67.3	59.1	703.2	-0.1	-35.1
3/31/2004	7030	31	212.2	8.0	-923.0	733.1	17.6	-47.9
4/30/2004	7060	30	163.2	9.0	-910.5	743.7	25.2	-30.7
5/31/2004	7091	31	104.6	11.5	-889.2	781.0	14.0	-22.0
6/30/2004	7121	30	117.9	9.9	-890.2	770.6	5.9	-14.1
7/31/2004	7152	31	495.6	10.0	-1381.7	841.3	23.8	10.9
8/31/2004	7183	31	388.3	10.2	-1334.7	891.2	6.3	38.7
9/30/2004	7213	30	353.1	10.0	-1317.1	908.4	-8.4	54.1
10/31/2004	7244	31	-1074.7	77.2	153.1	879.4	-59.6	24.7
11/30/2004	7274	30	531.6	8.1	-1366.3	834.3	-22.0	14.4
12/31/2004	7305	31	-1050.1	89.0	148.7	865.5	-53.1	0.0
1/31/2005	7336	31	-1097.4	162.4	220.1	821.6	-59.5	-47.2

Flow Budget for the LAS in Pleasant Valley

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
			influx(+) outflux(-); units in Acre-feet					
2/28/2005	7364	28	-853.9	127.0	133.3	706.1	-39.1	-73.4
3/31/2005	7395	31	-391.0	36.9	-88.0	574.3	-32.9	-99.3
4/30/2005	7425	30	88.0	9.6	-558.4	577.8	-30.7	-86.3
5/31/2005	7456	31	314.2	8.3	-946.7	712.0	-23.4	-64.4
6/30/2005	7486	30	235.5	8.9	-935.7	756.4	-21.7	-43.3
7/31/2005	7517	31	-59.2	9.1	-638.7	793.0	-59.9	-44.4
8/31/2005	7548	31	-22.6	8.9	-633.1	775.6	-82.3	-46.5
9/30/2005	7578	30	17.4	8.5	-637.7	742.2	-87.3	-43.1
10/31/2005	7609	31	-355.6	17.1	-203.5	678.6	-79.6	-56.9
11/30/2005	7639	30	86.4	8.1	-651.1	702.9	-91.1	-55.3
12/31/2005	7670	31	23.3	7.7	-636.5	745.8	-90.4	-49.8
1/31/2006	7701	31	-445.7	37.2	-149.3	693.1	-72.5	-62.8
2/28/2006	7729	28	-381.0	47.1	-123.2	583.7	-55.9	-70.7
3/31/2006	7760	31	-450.6	55.2	-68.6	601.5	-45.9	-91.6
4/30/2006	7790	30	-355.0	52.4	-116.6	553.9	-35.7	-99.1
5/31/2006	7821	31	21.6	14.8	-478.6	591.6	-49.5	-99.9
6/30/2006	7851	30	549.0	10.6	-1137.2	747.4	-107.1	-62.7
7/31/2006	7882	31	48.0	10.3	-589.9	725.9	-144.4	-49.9
8/31/2006	7913	31	78.6	10.1	-579.0	699.2	-160.7	-48.1
9/30/2006	7943	30	93.7	9.7	-578.6	682.6	-165.7	-41.7
10/31/2006	7974	31	66.1	9.2	-564.4	702.7	-173.9	-39.7
11/30/2006	8004	30	80.5	8.7	-567.9	689.1	-174.9	-35.5
12/31/2006	8035	31	-227.6	10.9	-243.1	650.5	-145.2	-45.5
1/31/2007	8066	31	-398.5	30.2	-29.8	552.6	-89.1	-65.3
2/28/2007	8094	28	85.0	13.9	-492.6	523.6	-67.0	-63.0
3/31/2007	8125	31	199.4	8.2	-696.2	625.7	-78.2	-58.9
4/30/2007	8155	30	-8.5	6.9	-500.9	609.3	-52.2	-54.6
5/31/2007	8186	31	142.6	8.8	-686.3	658.5	-70.4	-53.2
6/30/2007	8216	30	137.8	8.9	-682.5	660.2	-80.3	-44.2
7/31/2007	8247	31	298.8	10.4	-958.3	780.9	-97.8	-33.9
8/31/2007	8278	31	218.8	9.8	-931.7	828.6	-102.7	-22.8
9/30/2007	8308	30	200.5	9.5	-924.3	833.3	-103.9	-15.1
10/31/2007	8339	31	146.0	10.0	-901.7	865.4	-107.7	-11.9
11/30/2007	8369	30	160.8	10.3	-903.7	848.2	-107.0	-8.5
12/31/2007	8400	31	-469.2	29.0	-128.4	718.3	-125.2	-24.5
1/31/2008	8431	31	-863.2	114.8	164.9	725.5	-89.7	-52.4
2/29/2008	8460	29	-305.9	30.1	-118.9	566.5	-97.8	-74.1
3/31/2008	8491	31	306.5	12.5	-830.5	697.8	-109.5	-76.9
4/30/2008	8521	30	235.6	13.7	-819.9	743.5	-110.3	-62.6
5/31/2008	8552	31	175.0	14.7	-799.2	786.7	-119.2	-58.0

Flow Budget for the LAS in Pleasant Valley

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
			influx(+) outflux(-); units in Acre-feet					
6/30/2008	8582	30	171.9	14.2	-799.2	787.1	-121.8	-52.2
7/31/2008	8613	31	337.1	15.6	-1051.5	876.8	-119.4	-58.6
8/31/2008	8644	31	279.9	15.3	-1020.4	913.1	-134.3	-53.6
9/30/2008	8674	30	266.0	14.8	-1011.5	917.2	-140.9	-45.6
10/31/2008	8705	31	203.0	14.9	-985.7	962.0	-151.4	-42.8
11/30/2008	8735	30	-545.5	27.9	-85.3	759.0	-112.1	-43.9
12/31/2008	8766	31	-456.8	32.0	-84.8	679.0	-100.7	-68.8
1/31/2009	8797	31	12.6	10.6	-522.0	721.2	-128.4	-94.0
2/28/2009	8825	28	-656.0	76.0	97.5	630.0	-65.9	-81.7
3/31/2009	8856	31	109.1	10.5	-563.6	667.2	-106.4	-116.8
4/30/2009	8886	30	95.2	11.2	-565.4	685.0	-115.6	-110.4
5/31/2009	8917	31	67.2	11.7	-555.5	709.3	-124.0	-108.7
6/30/2009	8947	30	81.2	11.1	-561.3	696.2	-126.2	-101.0
7/31/2009	8978	31	515.4	13.6	-1118.0	784.0	-112.9	-82.1
8/31/2009	9009	31	387.2	14.7	-1071.8	837.4	-110.9	-56.7
9/30/2009	9039	30	340.1	13.8	-1052.4	854.3	-113.5	-42.5
10/31/2009	9070	31	-291.8	23.8	-282.9	746.1	-158.2	-37.0
11/30/2009	9100	30	415.6	13.3	-1045.6	811.4	-149.0	-45.8
12/31/2009	9131	31	-644.0	36.9	6.7	745.5	-98.7	-46.5
1/31/2010	9162	31	-711.2	59.4	133.7	679.7	-79.3	-82.3
2/28/2010	9190	28	-473.2	44.5	25.8	566.0	-58.1	-104.9
3/31/2010	9221	31	258.1	11.9	-744.9	730.4	-102.1	-153.5
4/30/2010	9251	30	-186.7	16.2	-261.8	654.0	-82.6	-139.1
5/31/2010	9282	31	232.5	13.9	-748.6	766.7	-110.3	-154.3
6/30/2010	9312	30	194.2	13.1	-744.6	803.6	-121.6	-144.6
7/31/2010	9343	31	407.0	17.8	-1078.0	871.3	-82.5	-135.7
8/31/2010	9374	31	321.8	17.9	-1039.4	902.9	-87.2	-116.0
9/30/2010	9404	30	292.1	18.0	-1024.8	908.6	-91.8	-102.0
10/31/2010	9435	31	-530.9	31.1	-83.7	793.2	-96.3	-113.4
11/30/2010	9465	30	202.7	14.0	-765.3	757.7	-85.8	-123.4
12/31/2010	9496	31	-881.4	128.4	166.7	795.4	-82.1	-127.0
1/31/2011	9527	31	79.6	15.9	-545.6	736.1	-127.4	-158.6
2/28/2011	9555	28	-411.1	43.7	-17.1	609.4	-81.7	-143.3
3/31/2011	9586	31	-608.9	82.8	105.9	634.7	-61.4	-153.2
4/30/2011	9616	30	318.6	16.2	-682.4	662.6	-140.9	-174.1
5/31/2011	9647	31	220.8	15.5	-647.5	746.2	-170.2	-164.8
6/30/2011	9677	30	213.5	17.0	-642.3	747.6	-183.4	-152.3
7/31/2011	9708	31	189.1	15.6	-710.5	790.0	-140.4	-143.8
8/31/2011	9739	31	153.7	15.9	-704.7	802.2	-131.1	-136.2
9/30/2011	9769	30	155.6	15.3	-708.1	792.1	-128.9	-126.0

Flow Budget for the LAS in Pleasant Valley

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
			influx(+) outflux(-); units in Acre-feet					
10/31/2011	9800	31	-92.1	14.3	-379.7	729.0	-139.1	-132.4
11/30/2011	9830	30	-348.8	24.8	-89.0	651.6	-96.9	-141.6
12/31/2011	9861	31	228.3	14.0	-727.8	746.0	-111.1	-149.4
1/31/2012	9892	31	-251.1	21.1	-188.4	679.3	-110.0	-150.8
2/29/2012	9921	29	442.9	18.3	-925.8	756.3	-149.5	-142.2
3/31/2012	9952	31	-445.0	34.5	-61.7	708.5	-88.7	-147.6
4/30/2012	9982	30	-193.3	23.4	-214.7	624.8	-77.6	-162.6
5/31/2012	10013	31	429.3	19.3	-927.5	778.0	-135.9	-163.1
6/30/2012	10043	30	335.2	19.6	-906.4	837.3	-143.1	-142.6
7/31/2012	10074	31	356.0	15.5	-954.4	798.6	-95.6	-120.1
8/31/2012	10105	31	308.9	15.8	-914.2	789.9	-99.9	-100.5
9/30/2012	10135	30	288.0	15.7	-898.9	785.1	-103.9	-86.0
10/31/2012	10166	31	222.0	15.6	-868.4	823.8	-110.9	-82.2
11/30/2012	10196	30	-55.1	15.5	-597.4	806.9	-78.8	-91.2
12/31/2012	10227	31	-324.1	20.6	-343.6	832.0	-69.8	-115.1
1/31/2013	10258	31	-217.0	15.0	-381.8	785.8	-74.3	-127.6
2/28/2013	10286	28	282.3	8.1	-821.8	709.9	-81.7	-96.8
3/31/2013	10317	31	-46.5	8.5	-549.2	776.8	-88.6	-101.0
4/30/2013	10347	30	219.9	9.0	-789.5	738.6	-91.4	-86.5
5/31/2013	10378	31	168.4	9.7	-763.0	741.1	-99.5	-56.7
6/30/2013	10408	30	177.4	9.9	-763.9	715.3	-101.0	-37.7
7/31/2013	10439	31	458.4	12.1	-1121.9	789.0	-105.8	-32.0
8/31/2013	10470	31	373.5	12.1	-1086.3	827.3	-112.9	-13.8
9/30/2013	10500	30	348.7	12.2	-1076.2	831.1	-116.0	0.1
10/31/2013	10531	31	276.0	11.6	-1043.5	871.4	-125.5	10.0
11/30/2013	10561	30	274.7	10.4	-1042.3	866.3	-124.4	14.2
12/31/2013	10592	31	225.4	11.1	-1020.7	896.5	-131.5	19.3
1/31/2014	10623	31	394.5	11.8	-1225.8	897.1	-100.9	23.3
2/28/2014	10651	28	-717.0	42.2	52.4	699.9	-80.3	2.7
3/31/2014	10682	31	-144.2	19.2	-484.4	728.6	-80.3	-38.8
4/30/2014	10712	30	573.6	11.5	-1308.5	816.5	-63.3	-29.8
5/31/2014	10743	31	411.9	12.8	-1252.6	892.5	-63.0	-1.7
6/30/2014	10773	30	379.8	12.7	-1243.2	897.8	-62.9	15.8
7/31/2014	10804	31	220.8	13.0	-1068.7	915.5	-91.8	11.2
8/31/2014	10835	31	247.0	12.3	-1073.0	906.9	-100.9	7.7
9/30/2014	10865	30	270.2	11.6	-1082.5	890.7	-99.9	10.0
10/31/2014	10896	31	211.7	11.0	-1058.6	928.4	-104.7	12.2
11/30/2014	10926	30	94.7	8.5	-883.3	880.5	-108.9	8.5
12/31/2014	10957	31	-1058.6	69.8	239.4	858.9	-88.4	-21.1
1/31/2015	10988	31	-540.4	25.0	-14.9	692.4	-85.7	-76.6

Flow Budget for the LAS in Pleasant Valley

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
			influx(+) outflux(-); units in Acre-feet					
2/28/2015	11016	28	447.3	8.6	-956.0	679.5	-99.9	-79.5
3/31/2015	11047	31	84.5	11.1	-707.6	778.9	-105.3	-61.7
4/30/2015	11077	30	309.3	9.5	-908.4	754.6	-113.1	-51.9
5/31/2015	11108	31	249.5	8.9	-874.9	789.5	-130.0	-42.9
6/30/2015	11138	30	254.6	9.1	-875.0	774.9	-131.3	-32.3
7/31/2015	11169	31	202.8	7.7	-818.5	743.0	-114.9	-20.2
8/31/2015	11200	31	344.2	10.1	-1028.2	783.2	-95.4	-13.9
9/30/2015	11230	30	313.0	9.9	-1024.4	793.3	-85.3	-6.5
10/31/2015	11261	31	240.9	10.0	-998.7	835.9	-86.5	-1.6
11/30/2015	11291	30	249.8	10.5	-1005.8	826.9	-82.6	1.1
12/31/2015	11322	31	190.5	10.5	-984.9	865.4	-84.5	3.0

Flow Budget for the Shallow Aquifer in partial Las Posas Basin (West)

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Oxnard Basin	Pleasant Valley	Las Posas LAS
			influx(+) outflux(-); units in Acre-feet					
1/31/1985	31	31	-148.0	292.6	-21.9	333.2	0.8	-456.6
2/28/1985	59	28	-91.9	310.6	-16.3	221.4	0.0	-423.8
3/31/1985	90	31	-48.1	230.5	-21.7	215.6	0.0	-376.3
4/30/1985	120	30	96.3	209.0	-43.7	91.4	0.0	-353.0
5/31/1985	151	31	219.2	210.7	-43.7	-24.1	0.0	-362.1
6/30/1985	181	30	267.0	210.6	-43.7	-87.3	0.0	-346.7
7/31/1985	212	31	329.1	237.5	-40.7	-157.1	0.0	-368.9
8/31/1985	243	31	355.3	234.2	-40.7	-191.9	0.0	-356.9
9/30/1985	273	30	295.2	237.5	-40.7	-148.0	0.0	-344.0
10/31/1985	304	31	250.2	228.4	-40.3	-103.3	0.0	-334.9
11/30/1985	334	30	-0.7	1110.5	-6.3	-62.9	0.0	-1040.5
12/31/1985	365	31	217.8	196.2	-34.8	-66.6	0.0	-312.6
1/31/1986	396	31	-52.8	939.1	-9.6	20.1	0.0	-896.8
2/28/1986	424	28	-400.9	2026.1	-4.7	89.2	0.0	-1709.7
3/31/1986	455	31	-403.8	1341.5	-7.4	311.3	0.8	-1242.5
4/30/1986	485	30	-314.2	230.6	-37.0	508.9	1.0	-389.3
5/31/1986	516	31	-297.7	239.8	-58.7	511.6	0.0	-395.0
6/30/1986	546	30	-66.9	235.8	-58.7	298.8	0.0	-409.0
7/31/1986	577	31	24.8	273.3	-61.9	216.2	0.0	-452.3
8/31/1986	608	31	95.4	267.8	-61.9	142.2	0.0	-443.6
9/30/1986	638	30	218.7	257.3	-37.2	-20.7	0.0	-418.0
10/31/1986	669	31	310.8	263.5	-61.9	-105.3	0.0	-407.1
11/30/1986	699	30	196.3	392.8	-22.4	-70.4	0.0	-496.2
12/31/1986	730	31	294.2	262.5	-61.9	-126.8	0.0	-368.0
1/31/1987	761	31	194.2	336.2	-15.5	-93.2	0.0	-421.6
2/28/1987	789	28	157.2	291.3	-18.6	-71.5	0.0	-358.4
3/31/1987	820	31	91.4	415.6	-14.4	-22.0	0.0	-470.6
4/30/1987	850	30	145.7	301.4	-44.2	-33.0	0.0	-369.9
5/31/1987	881	31	184.9	293.8	-44.2	-58.1	0.0	-376.4
6/30/1987	911	30	171.5	295.3	-44.2	-46.1	0.0	-376.5
7/31/1987	942	31	109.0	309.4	-45.3	27.0	0.0	-400.1
8/31/1987	973	31	140.5	309.3	-45.3	5.6	0.0	-410.2
9/30/1987	1003	30	246.0	307.8	-45.3	-98.7	0.0	-409.8
10/31/1987	1034	31	202.4	367.9	-18.5	-91.8	0.0	-460.0
11/30/1987	1064	30	188.3	407.5	-21.2	-100.5	0.0	-474.1
12/31/1987	1095	31	30.5	876.4	-9.1	-46.0	0.0	-851.8
1/31/1988	1126	31	16.8	679.8	-8.3	7.8	0.3	-696.4
2/29/1988	1155	29	10.1	340.2	-14.9	55.8	1.8	-393.1
3/31/1988	1186	31	26.3	235.1	-32.5	77.3	1.2	-307.4
4/30/1988	1216	30	-235.0	612.7	-8.3	267.7	1.6	-638.7
5/31/1988	1247	31	-144.1	234.8	-32.5	264.0	1.6	-323.9
6/30/1988	1277	30	-85.6	233.9	-32.5	223.9	0.1	-339.8
7/31/1988	1308	31	76.3	317.1	-19.9	68.1	0.0	-441.6
8/31/1988	1339	31	202.5	320.0	-19.9	-49.7	0.0	-452.9
9/30/1988	1369	30	257.6	320.8	-19.9	-111.3	0.0	-447.2
10/31/1988	1400	31	286.3	320.6	-19.9	-138.4	0.0	-448.6
11/30/1988	1430	30	244.5	299.1	-11.0	-119.1	0.0	-413.4
12/31/1988	1461	31	91.7	973.2	-4.4	-90.2	0.0	-970.3
1/31/1989	1492	31	238.1	235.8	-20.7	-106.3	0.0	-346.8
2/28/1989	1520	28	23.4	799.3	-5.0	-23.1	0.1	-794.7
3/31/1989	1551	31	40.6	237.0	-14.3	65.6	0.1	-329.0
4/30/1989	1581	30	32.3	245.4	-21.7	71.8	0.0	-327.8
5/31/1989	1612	31	126.0	244.3	-21.7	-6.8	0.0	-341.8
6/30/1989	1642	30	174.4	244.6	-21.7	-55.1	0.0	-342.2
7/31/1989	1673	31	215.6	276.6	-37.0	-77.2	0.0	-378.0
8/31/1989	1704	31	237.0	277.3	-37.0	-98.4	0.0	-378.8
9/30/1989	1734	30	246.8	278.2	-37.0	-112.5	0.0	-375.5
10/31/1989	1765	31	253.9	277.4	-37.0	-116.5	0.0	-377.8
11/30/1989	1795	30	230.8	238.1	-31.8	-101.7	0.0	-335.3
12/31/1989	1826	31	239.3	281.6	-37.0	-108.4	0.0	-375.4
1/31/1990	1857	31	116.6	535.1	-10.2	-53.1	0.0	-588.3
2/28/1990	1885	28	57.0	441.5	-12.1	-4.0	0.0	-482.5
3/31/1990	1916	31	115.8	315.1	-36.6	-6.8	0.0	-387.6
4/30/1990	1946	30	156.8	314.5	-36.6	-33.8	0.0	-400.9

Flow Budget for the Shallow Aquifer in partial Las Posas Basin (West)

Date	Stress	days in month	influx(+) outflux(-); units in Acre-feet					
			STORAGE	RECHARGE	Pumping from Wells	Oxnard Basin	Pleasant Valley	Las Posas LAS
5/31/1990	1977	31	176.1	253.3	-29.2	-40.6	0.0	-359.6
6/30/1990	2007	30	186.4	320.6	-36.6	-51.4	0.0	-419.0
7/31/1990	2038	31	204.5	313.1	-25.1	-62.0	0.0	-430.5
8/31/1990	2069	31	201.5	313.3	-25.1	-64.0	0.0	-425.8
9/30/1990	2099	30	196.0	312.1	-25.1	-63.8	0.0	-419.1
10/31/1990	2130	31	205.7	315.7	-25.1	-67.2	0.0	-429.1
11/30/1990	2160	30	206.0	298.9	-23.7	-68.7	0.0	-412.5
12/31/1990	2191	31	213.4	305.7	-25.1	-74.2	0.0	-419.8
1/31/1991	2222	31	176.0	236.0	-11.9	-57.3	0.0	-342.8
2/28/1991	2250	28	66.7	519.9	-4.3	-23.8	0.0	-558.5
3/31/1991	2281	31	-460.9	2413.2	-1.1	117.0	0.0	-2068.1
4/30/1991	2311	30	-157.5	236.6	-17.0	353.8	0.0	-416.0
5/31/1991	2342	31	-266.5	239.5	-17.0	410.3	0.0	-366.4
6/30/1991	2372	30	-149.4	237.0	-17.0	291.3	0.0	-361.9
7/31/1991	2403	31	-18.1	279.7	-25.1	184.0	0.0	-420.5
8/31/1991	2434	31	75.9	279.4	-25.1	94.0	0.0	-424.2
9/30/1991	2464	30	129.8	282.2	-25.1	33.2	0.0	-420.1
10/31/1991	2495	31	153.4	279.2	-25.1	13.9	0.0	-421.5
11/30/1991	2525	30	148.5	278.9	-25.1	12.5	0.0	-414.8
12/31/1991	2556	31	-48.3	1093.9	-3.9	55.2	0.0	-1096.9
1/31/1992	2587	31	-25.8	459.4	-3.8	124.0	0.2	-554.1
2/29/1992	2616	29	-541.5	2207.2	-0.9	244.2	3.7	-1912.7
3/31/1992	2647	31	-625.5	1497.2	-1.5	553.1	9.0	-1432.3
4/30/1992	2677	30	-493.2	218.0	-12.4	713.1	10.1	-435.6
5/31/1992	2708	31	-463.4	224.5	-12.4	668.3	8.1	-425.2
6/30/1992	2738	30	-319.4	220.9	-12.4	525.3	5.8	-420.1
7/31/1992	2769	31	-149.9	276.0	-18.9	380.2	4.5	-491.9
8/31/1992	2800	31	5.8	280.1	-18.9	232.7	3.4	-503.0
9/30/1992	2830	30	114.1	277.1	-18.9	112.1	2.3	-486.7
10/31/1992	2861	31	-4.1	328.6	-8.6	206.2	2.6	-524.7
11/30/1992	2891	30	-291.0	274.5	-18.9	488.8	2.3	-455.6
12/31/1992	2922	31	-652.5	1168.1	-2.5	707.5	4.0	-1224.6
1/31/1993	2953	31	-833.3	2462.0	-1.0	640.9	8.7	-2277.2
2/28/1993	2981	28	-623.0	2036.8	-1.0	527.6	14.3	-1954.6
3/31/1993	3012	31	-272.5	816.6	-2.6	551.1	22.4	-1115.0
4/30/1993	3042	30	-372.7	225.5	-13.7	745.9	22.2	-607.2
5/31/1993	3073	31	-380.7	223.7	-13.7	760.3	21.3	-611.0
6/30/1993	3103	30	-94.5	195.8	-12.8	464.7	19.4	-572.6
7/31/1993	3134	31	112.3	265.5	-19.6	247.4	18.2	-623.7
8/31/1993	3165	31	141.2	266.2	-19.6	189.1	16.1	-592.8
9/30/1993	3195	30	2.8	266.1	-19.6	295.3	13.5	-558.0
10/31/1993	3226	31	-172.3	266.5	-19.6	481.9	12.9	-569.3
11/30/1993	3256	30	-180.8	248.8	-16.6	497.3	11.8	-560.5
12/31/1993	3287	31	-170.8	316.4	-8.3	486.7	13.1	-637.2
1/31/1994	3318	31	-71.3	203.4	-13.5	399.4	15.3	-533.3
2/28/1994	3346	28	-263.3	1380.0	-1.6	334.8	14.6	-1464.5
3/31/1994	3377	31	-70.5	619.3	-3.1	347.3	19.6	-912.6
4/30/1994	3407	30	-24.6	209.1	-13.5	327.3	19.6	-517.8
5/31/1994	3438	31	-44.4	205.7	-13.5	351.7	18.9	-518.3
6/30/1994	3468	30	17.8	208.6	-13.5	273.0	16.3	-502.1
7/31/1994	3499	31	181.4	242.9	-20.9	112.8	14.2	-530.4
8/31/1994	3530	31	253.6	245.1	-20.9	20.7	11.9	-510.4
9/30/1994	3560	30	265.3	243.0	-20.9	-22.5	9.8	-474.6
10/31/1994	3591	31	245.5	205.3	-20.9	-11.2	8.6	-427.3
11/30/1994	3621	30	112.2	253.6	-8.7	88.3	7.4	-452.7
12/31/1994	3652	31	77.7	219.0	-14.0	130.6	8.3	-421.5
1/31/1995	3683	31	-815.7	3923.6	-0.4	217.7	9.3	-3334.5
2/28/1995	3711	28	2.6	171.7	-6.3	376.1	17.0	-561.0
3/31/1995	3742	31	-752.5	2088.8	-0.8	629.5	20.4	-1985.4
4/30/1995	3772	30	-121.1	143.4	-9.5	517.5	25.1	-555.5
5/31/1995	3803	31	-203.0	129.3	-8.3	548.7	26.4	-493.0
6/30/1995	3833	30	-198.6	154.0	-10.3	520.7	25.1	-490.9
7/31/1995	3864	31	-70.7	238.7	-23.8	414.2	23.6	-582.0
8/31/1995	3895	31	-54.2	233.8	-23.8	400.5	20.8	-577.2

Flow Budget for the Shallow Aquifer in partial Las Posas Basin (West)

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Oxnard Basin	Pleasant Valley	Las Posas LAS
			influx(+) outflux(-); units in Acre-feet					
9/30/1995	3925	30	-73.3	234.9	-23.8	408.4	17.8	-564.1
10/31/1995	3956	31	-117.9	237.1	-23.8	467.8	16.1	-579.5
11/30/1995	3986	30	-118.2	238.4	-23.8	460.8	13.5	-570.6
12/31/1995	4017	31	-189.1	479.3	-6.7	490.0	15.1	-788.6
1/31/1996	4048	31	-90.6	217.8	-7.0	413.2	16.6	-550.0
2/29/1996	4077	29	-476.8	1798.1	-1.1	455.9	16.1	-1792.2
3/31/1996	4108	31	-247.5	515.6	-4.2	585.6	22.6	-872.1
4/30/1996	4138	30	-134.6	185.8	-12.8	476.1	22.3	-536.9
5/31/1996	4169	31	26.5	193.7	-13.0	326.5	20.5	-554.3
6/30/1996	4199	30	184.9	190.6	-13.0	141.2	17.4	-521.2
7/31/1996	4230	31	301.8	270.9	-37.5	28.2	16.3	-579.7
8/31/1996	4261	31	350.8	270.9	-37.5	-37.1	15.3	-562.4
9/30/1996	4291	30	345.3	270.8	-37.5	-65.9	14.4	-527.1
10/31/1996	4322	31	230.9	279.5	-22.3	23.6	17.1	-528.9
11/30/1996	4352	30	53.9	522.5	-9.1	120.9	20.1	-708.3
12/31/1996	4383	31	-332.9	1410.6	-4.3	332.8	24.8	-1431.0
1/31/1997	4414	31	-601.7	1347.1	-4.0	653.9	31.1	-1426.3
2/28/1997	4442	28	-268.2	206.2	-30.5	586.2	30.2	-523.9
3/31/1997	4473	31	-200.2	206.3	-30.5	539.6	30.0	-545.3
4/30/1997	4503	30	-46.7	207.5	-30.5	382.8	25.9	-539.1
5/31/1997	4534	31	145.8	206.7	-30.5	189.7	24.6	-536.4
6/30/1997	4564	30	279.3	206.8	-30.5	22.7	22.6	-500.9
7/31/1997	4595	31	383.7	282.5	-45.6	-91.3	21.9	-551.3
8/31/1997	4626	31	417.2	282.8	-45.6	-146.5	20.4	-528.4
9/30/1997	4656	30	397.5	282.7	-45.6	-151.9	18.8	-501.5
10/31/1997	4687	31	343.2	295.6	-45.6	-100.7	20.3	-512.7
11/30/1997	4717	30	158.0	572.3	-12.7	-1.9	22.5	-738.2
12/31/1997	4748	31	-222.7	1698.5	-4.1	91.1	29.5	-1592.4
1/31/1998	4779	31	-220.8	913.6	-5.1	309.1	40.6	-1037.4
2/28/1998	4807	28	-1367.5	4811.0	-0.8	356.2	67.2	-3866.0
3/31/1998	4838	31	-336.5	871.1	-5.1	534.7	101.6	-1165.7
4/30/1998	4868	30	-475.2	301.2	-10.6	753.8	94.1	-663.3
5/31/1998	4899	31	-675.4	825.0	-4.9	811.5	94.9	-1051.1
6/30/1998	4929	30	-396.9	173.6	-26.2	735.3	89.1	-574.9
7/31/1998	4960	31	-232.9	211.1	-35.2	584.0	84.5	-611.5
8/31/1998	4991	31	9.1	223.1	-35.2	327.5	81.3	-605.7
9/30/1998	5021	30	121.9	216.8	-35.2	187.1	76.9	-567.5
10/31/1998	5052	31	-74.3	210.9	-35.2	381.9	77.0	-560.3
11/30/1998	5082	30	-298.6	198.2	-21.2	589.8	73.5	-541.7
12/31/1998	5113	31	-254.7	211.4	-35.2	588.7	75.4	-585.7
1/31/1999	5144	31	-164.1	406.2	-10.6	435.7	76.1	-743.4
2/28/1999	5172	28	58.1	229.4	-28.3	209.1	70.2	-538.5
3/31/1999	5203	31	-114.5	732.4	-7.6	266.3	78.9	-955.5
4/30/1999	5233	30	-184.5	521.5	-9.0	342.6	80.7	-751.2
5/31/1999	5264	31	3.3	204.2	-34.5	261.6	82.4	-517.0
6/30/1999	5294	30	231.3	204.4	-34.5	34.7	72.3	-508.2
7/31/1999	5325	31	359.4	234.4	-25.2	-98.2	65.3	-535.7
8/31/1999	5356	31	406.1	234.5	-25.2	-157.2	59.1	-517.2
9/30/1999	5386	30	381.7	234.4	-25.2	-160.2	54.1	-484.7
10/31/1999	5417	31	315.3	247.8	-25.2	-92.5	50.0	-495.4
11/30/1999	5447	30	222.9	245.2	-15.3	-37.7	49.8	-465.0
12/31/1999	5478	31	317.3	244.4	-25.2	-127.3	57.0	-466.2
1/31/2000	5509	31	224.5	391.4	-10.0	-110.0	61.1	-556.9
2/29/2000	5538	29	-179.3	1665.6	-2.7	-29.8	65.7	-1519.5
3/31/2000	5569	31	-126.2	578.8	-7.8	203.7	77.7	-726.3
4/30/2000	5599	30	-342.3	515.1	-7.4	398.4	76.5	-640.3
5/31/2000	5630	31	-77.7	265.2	-28.3	230.2	74.6	-464.1
6/30/2000	5660	30	133.0	266.5	-28.3	45.2	60.1	-476.5
7/31/2000	5691	31	268.9	235.4	-21.5	-75.4	52.2	-459.7
8/31/2000	5722	31	306.2	234.9	-21.5	-128.1	47.9	-439.3
9/30/2000	5752	30	264.3	234.0	-21.5	-104.9	45.0	-416.8
10/31/2000	5783	31	-17.5	231.2	-12.8	162.9	50.7	-414.6
11/30/2000	5813	30	-136.1	234.2	-21.5	293.3	50.0	-419.8
12/31/2000	5844	31	34.5	231.9	-21.5	156.0	49.1	-450.0

Flow Budget for the Shallow Aquifer in partial Las Posas Basin (West)

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Oxnard Basin	Pleasant Valley	Las Posas LAS
			influx(+) outflux(-); units in Acre-feet					
1/31/2001	5875	31	-158.7	1452.3	-7.6	81.2	57.5	-1424.7
2/28/2001	5903	28	-365.2	1897.8	-6.2	131.3	68.6	-1726.3
3/31/2001	5934	31	-408.8	1048.1	-9.0	416.6	92.3	-1139.2
4/30/2001	5964	30	-357.8	281.3	-23.0	552.7	92.1	-545.2
5/31/2001	5995	31	-176.8	219.1	-46.2	407.1	90.0	-493.2
6/30/2001	6025	30	67.3	219.3	-46.3	165.4	82.1	-487.9
7/31/2001	6056	31	235.5	207.6	-84.6	37.5	79.5	-475.5
8/31/2001	6087	31	300.1	207.7	-84.4	-45.7	74.0	-451.7
9/30/2001	6117	30	216.0	207.5	-84.4	9.1	67.4	-415.5
10/31/2001	6148	31	-80.0	220.3	-84.9	304.6	66.5	-426.6
11/30/2001	6178	30	-387.2	745.0	-21.9	487.8	64.9	-888.6
12/31/2001	6209	31	-98.5	239.6	-49.7	328.2	70.3	-489.9
1/31/2002	6240	31	-7.1	235.6	-25.8	213.0	71.1	-486.7
2/28/2002	6268	28	111.2	193.8	-47.7	91.2	62.9	-411.4
3/31/2002	6299	31	200.0	194.1	-48.0	16.5	66.3	-428.9
4/30/2002	6329	30	236.8	194.1	-47.9	-39.2	61.5	-405.4
5/31/2002	6360	31	265.7	194.4	-47.9	-74.9	61.2	-398.5
6/30/2002	6390	30	259.6	194.6	-47.8	-87.4	57.3	-376.3
7/31/2002	6421	31	308.7	268.9	-74.4	-120.1	56.7	-439.8
8/31/2002	6452	31	317.5	281.0	-74.5	-129.6	54.0	-448.3
9/30/2002	6482	30	294.1	300.2	-74.4	-112.0	49.6	-457.6
10/31/2002	6513	31	261.6	290.3	-74.5	-69.0	49.2	-457.6
11/30/2002	6543	30	-60.1	1151.2	-13.2	23.1	52.2	-1153.2
12/31/2002	6574	31	-73.1	850.3	-15.5	90.3	65.6	-917.6
1/31/2003	6605	31	122.0	171.5	-37.4	28.3	68.4	-352.8
2/28/2003	6633	28	-195.4	1238.7	-6.3	55.7	68.7	-1161.3
3/31/2003	6664	31	-174.4	970.9	-7.6	130.0	86.7	-1005.7
4/30/2003	6694	30	5.0	189.3	-20.1	115.8	84.3	-374.3
5/31/2003	6725	31	-73.9	273.0	-17.2	162.0	84.9	-428.9
6/30/2003	6755	30	-2.4	171.7	-37.4	132.0	77.2	-341.2
7/31/2003	6786	31	127.9	237.1	-66.2	35.8	69.3	-403.9
8/31/2003	6817	31	196.0	237.6	-66.3	-26.0	61.1	-402.3
9/30/2003	6847	30	232.3	236.0	-66.2	-65.5	54.8	-391.4
10/31/2003	6878	31	253.3	236.8	-66.3	-82.3	53.0	-394.5
11/30/2003	6908	30	152.7	227.6	-31.7	-27.7	50.6	-371.5
12/31/2003	6939	31	121.8	316.6	-30.0	-22.3	58.6	-444.7
1/31/2004	6970	31	154.8	167.2	-36.4	-42.2	65.0	-308.5
2/29/2004	6999	29	-207.8	1309.1	-5.8	68.3	69.3	-1233.1
3/31/2004	7030	31	59.0	196.8	-35.7	81.6	78.7	-380.4
4/30/2004	7060	30	-4.7	200.6	-36.6	117.0	73.2	-349.5
5/31/2004	7091	31	59.2	207.5	-36.8	67.7	66.3	-363.9
6/30/2004	7121	30	147.6	201.3	-36.7	-11.9	52.1	-352.3
7/31/2004	7152	31	192.9	241.2	-39.1	-49.3	45.2	-390.9
8/31/2004	7183	31	222.1	241.5	-39.2	-65.9	38.4	-396.9
9/30/2004	7213	30	242.3	241.2	-39.2	-84.3	33.5	-393.5
10/31/2004	7244	31	-40.5	1217.9	-7.4	-28.7	48.7	-1190.1
11/30/2004	7274	30	182.5	233.7	-38.6	-33.3	58.9	-403.3
12/31/2004	7305	31	-174.0	1383.3	-6.5	36.9	74.6	-1314.2
1/31/2005	7336	31	-723.4	2997.4	-2.0	160.3	110.0	-2542.4
2/28/2005	7364	28	-777.3	2104.1	-2.2	400.6	133.6	-1858.8
3/31/2005	7395	31	-576.8	733.9	-4.6	651.0	137.8	-941.2
4/30/2005	7425	30	-603.4	193.4	-11.7	814.3	113.8	-506.4
5/31/2005	7456	31	-580.8	203.8	-14.7	846.1	104.7	-559.2
6/30/2005	7486	30	-448.7	208.0	-15.0	745.9	92.0	-582.2
7/31/2005	7517	31	-347.0	214.1	-11.5	680.8	88.2	-624.6
8/31/2005	7548	31	-136.5	213.2	-11.3	480.3	83.6	-629.2
9/30/2005	7578	30	-100.0	212.6	-11.5	425.0	76.4	-602.4
10/31/2005	7609	31	-269.0	239.6	-7.6	592.9	79.0	-634.8
11/30/2005	7639	30	-55.9	214.6	-11.1	373.0	78.2	-598.8
12/31/2005	7670	31	126.8	208.7	-11.3	191.2	79.4	-594.8
1/31/2006	7701	31	-48.8	697.7	-7.6	258.1	82.2	-981.6
2/28/2006	7729	28	-154.4	833.2	-6.6	277.9	79.2	-1029.3
3/31/2006	7760	31	-303.7	896.6	-6.4	421.7	92.9	-1101.1
4/30/2006	7790	30	-583.0	826.9	-6.4	713.5	94.3	-1045.2

Flow Budget for the Shallow Aquifer in partial Las Posas Basin (West)

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Oxnard Basin	Pleasant Valley	Las Posas LAS
			influx(+) outflux(-); units in Acre-feet					
5/31/2006	7821	31	-515.0	287.2	-11.0	803.3	95.9	-660.4
6/30/2006	7851	30	-191.1	243.4	-20.8	516.1	86.6	-634.3
7/31/2006	7882	31	69.6	213.2	-24.8	301.5	82.0	-641.5
8/31/2006	7913	31	240.1	210.4	-24.7	107.1	79.3	-612.3
9/30/2006	7943	30	245.9	206.5	-24.7	63.1	73.8	-564.6
10/31/2006	7974	31	92.0	204.3	-25.0	213.8	72.1	-557.2
11/30/2006	8004	30	85.1	201.7	-24.6	206.4	68.1	-536.8
12/31/2006	8035	31	181.9	181.3	-17.8	101.8	72.4	-519.6
1/31/2007	8066	31	105.9	490.6	-15.4	94.8	77.1	-753.0
2/28/2007	8094	28	206.0	207.3	-38.0	12.8	73.3	-461.4
3/31/2007	8125	31	248.5	221.8	-50.1	-3.3	81.4	-498.3
4/30/2007	8155	30	229.4	183.5	-37.5	-10.5	78.9	-443.7
5/31/2007	8186	31	313.2	220.6	-50.0	-94.6	81.4	-470.8
6/30/2007	8216	30	336.0	221.0	-49.9	-144.2	77.6	-440.5
7/31/2007	8247	31	337.5	238.8	-23.4	-171.3	77.8	-459.4
8/31/2007	8278	31	354.3	238.3	-23.5	-192.3	75.1	-451.9
9/30/2007	8308	30	307.2	237.7	-23.4	-158.2	71.9	-435.2
10/31/2007	8339	31	172.0	245.2	-23.5	-19.8	71.0	-444.9
11/30/2007	8369	30	119.0	254.5	-23.4	37.2	62.4	-449.7
12/31/2007	8400	31	16.3	610.8	-8.2	78.9	66.1	-764.0
1/31/2008	8431	31	-472.5	1965.7	-5.4	209.1	86.7	-1783.6
2/29/2008	8460	29	-271.5	373.7	-16.2	424.2	90.7	-601.0
3/31/2008	8491	31	-355.0	231.8	-42.9	593.1	91.1	-518.1
4/30/2008	8521	30	-126.4	242.2	-43.3	415.8	80.8	-569.1
5/31/2008	8552	31	154.1	257.2	-43.4	162.2	76.5	-606.6
6/30/2008	8582	30	306.7	246.0	-43.3	-10.8	66.9	-565.5
7/31/2008	8613	31	383.2	300.8	-45.7	-79.0	60.1	-619.3
8/31/2008	8644	31	410.6	298.3	-45.8	-111.4	51.9	-603.7
9/30/2008	8674	30	392.4	297.5	-45.6	-113.4	46.0	-576.8
10/31/2008	8705	31	197.7	299.6	-45.8	76.2	46.3	-574.0
11/30/2008	8735	30	-105.3	485.6	-16.2	271.3	53.3	-688.7
12/31/2008	8766	31	-12.9	595.1	-13.8	125.8	70.1	-764.4
1/31/2009	8797	31	180.3	213.3	-31.4	27.4	71.8	-461.4
2/28/2009	8825	28	-144.1	1224.8	-5.6	60.4	71.3	-1206.9
3/31/2009	8856	31	152.2	211.5	-31.1	60.4	86.7	-479.8
4/30/2009	8886	30	140.2	218.0	-31.5	53.2	82.7	-462.7
5/31/2009	8917	31	199.6	221.3	-31.6	7.0	72.3	-468.6
6/30/2009	8947	30	254.8	218.7	-31.5	-44.7	54.7	-451.9
7/31/2009	8978	31	302.1	285.3	-32.2	-85.0	48.3	-518.6
8/31/2009	9009	31	322.5	281.9	-32.4	-102.2	45.2	-515.0
9/30/2009	9039	30	305.3	281.2	-32.3	-100.3	47.7	-501.6
10/31/2009	9070	31	157.2	508.8	-11.6	-43.6	61.5	-672.3
11/30/2009	9100	30	183.2	283.1	-31.6	-27.0	61.0	-468.9
12/31/2009	9131	31	-17.3	792.9	-10.0	56.5	68.0	-890.1
1/31/2010	9162	31	-368.8	1403.1	-8.7	196.7	92.2	-1314.6
2/28/2010	9190	28	-286.9	927.5	-12.5	219.6	98.6	-946.3
3/31/2010	9221	31	-15.9	229.4	-64.1	226.0	110.8	-486.4
4/30/2010	9251	30	-74.6	294.4	-29.5	211.6	103.1	-505.0
5/31/2010	9282	31	82.8	243.6	-64.4	123.4	105.8	-491.3
6/30/2010	9312	30	168.3	233.9	-64.6	58.6	92.7	-489.0
7/31/2010	9343	31	228.1	310.0	-37.8	-8.0	80.4	-572.7
8/31/2010	9374	31	277.0	308.5	-38.1	-39.4	68.2	-576.2
9/30/2010	9404	30	308.2	315.1	-38.0	-73.1	60.7	-572.9
10/31/2010	9435	31	192.9	531.0	-13.3	-34.1	72.1	-748.5
11/30/2010	9465	30	127.8	252.0	-25.3	37.8	79.4	-471.7
12/31/2010	9496	31	-457.6	2158.9	-4.3	145.2	97.9	-1940.1
1/31/2011	9527	31	-113.0	224.5	-64.4	368.6	110.0	-525.7
2/28/2011	9555	28	-439.5	629.8	-17.1	507.6	103.7	-784.5
3/31/2011	9586	31	-716.9	1478.2	-8.7	539.2	129.5	-1421.3
4/30/2011	9616	30	-338.8	223.5	-65.2	600.0	128.5	-548.0
5/31/2011	9647	31	-301.0	206.1	-62.6	605.3	124.4	-572.2
6/30/2011	9677	30	7.7	223.9	-65.9	321.1	108.7	-595.5
7/31/2011	9708	31	146.7	277.2	-26.9	163.8	94.1	-654.9
8/31/2011	9739	31	220.1	282.2	-26.9	85.3	76.7	-637.3

Flow Budget for the Shallow Aquifer in partial Las Posas Basin (West)

Date	Stress	days in month	STORAGE	RECHARGE	Pumping from Wells	Oxnard Basin	Pleasant Valley	Las Posas LAS
			influx(+) outflux(-); units in Acre-feet					
9/30/2011	9769	30	242.9	278.6	-26.8	40.4	61.9	-597.0
10/31/2011	9800	31	59.3	311.5	-16.8	193.6	70.0	-617.6
11/30/2011	9830	30	-120.4	384.7	-13.1	310.7	84.3	-646.3
12/31/2011	9861	31	21.3	275.9	-26.5	197.8	93.6	-562.2
1/31/2012	9892	31	73.9	301.6	-45.4	151.5	96.9	-578.5
2/29/2012	9921	29	175.7	293.6	-87.1	68.2	83.4	-533.8
3/31/2012	9952	31	89.3	539.4	-31.3	85.4	90.3	-773.1
4/30/2012	9982	30	87.2	373.7	-41.2	71.6	100.5	-591.7
5/31/2012	10013	31	172.9	298.2	-87.0	50.7	91.5	-526.4
6/30/2012	10043	30	243.3	296.2	-87.2	16.4	67.8	-536.4
7/31/2012	10074	31	282.9	328.6	-74.3	-5.6	61.1	-592.7
8/31/2012	10105	31	297.8	328.7	-74.4	-19.9	56.6	-588.9
9/30/2012	10135	30	292.7	327.4	-74.2	-23.0	49.1	-572.1
10/31/2012	10166	31	282.5	352.1	-74.3	-5.8	47.1	-601.7
11/30/2012	10196	30	156.0	334.9	-39.6	75.5	45.4	-572.2
12/31/2012	10227	31	101.7	542.8	-22.6	60.6	61.0	-743.5
1/31/2013	10258	31	109.1	279.9	-28.0	45.9	79.4	-486.2
2/28/2013	10286	28	144.5	229.2	-55.4	14.2	69.1	-401.6
3/31/2013	10317	31	129.9	188.8	-38.5	25.1	77.6	-382.9
4/30/2013	10347	30	148.1	233.8	-55.7	3.5	71.1	-400.9
5/31/2013	10378	31	145.9	238.8	-55.9	-10.8	56.7	-374.7
6/30/2013	10408	30	156.9	240.1	-55.9	-26.2	41.1	-356.0
7/31/2013	10439	31	210.8	280.1	-40.4	-61.2	30.9	-420.3
8/31/2013	10470	31	240.3	281.1	-40.3	-72.1	21.8	-430.8
9/30/2013	10500	30	245.5	281.4	-40.2	-73.3	15.3	-428.7
10/31/2013	10531	31	257.5	277.8	-40.3	-75.6	13.3	-432.6
11/30/2013	10561	30	246.0	246.5	-36.2	-68.9	12.1	-399.4
12/31/2013	10592	31	257.6	272.8	-40.2	-74.8	11.4	-426.8
1/31/2014	10623	31	252.2	274.1	-47.4	-64.6	13.8	-428.2
2/28/2014	10651	28	5.7	948.4	-9.7	-24.8	14.0	-933.5
3/31/2014	10682	31	151.3	269.8	-27.2	-29.4	28.0	-392.4
4/30/2014	10712	30	149.2	273.4	-46.8	-34.0	47.2	-389.0
5/31/2014	10743	31	172.7	279.8	-47.3	-32.4	42.0	-414.9
6/30/2014	10773	30	196.7	277.2	-47.3	-35.9	25.0	-415.7
7/31/2014	10804	31	207.2	271.9	-47.0	-25.5	18.3	-424.8
8/31/2014	10835	31	207.4	267.9	-47.0	-23.6	15.3	-419.8
9/30/2014	10865	30	205.8	261.4	-47.0	-22.7	12.6	-410.1
10/31/2014	10896	31	213.4	258.0	-47.1	-20.7	11.6	-415.2
11/30/2014	10926	30	185.2	214.0	-37.4	-9.9	10.8	-362.7
12/31/2014	10957	31	-53.5	1066.5	-8.5	10.6	16.3	-1031.4
1/31/2015	10988	31	11.6	530.3	-12.1	24.4	34.2	-588.3
2/28/2015	11016	28	79.3	207.5	-42.5	18.1	47.5	-309.8
3/31/2015	11047	31	89.0	195.1	-42.8	28.2	43.5	-312.9
4/30/2015	11077	30	110.3	210.6	-43.2	28.9	24.9	-331.5
5/31/2015	11108	31	132.0	200.5	-43.4	24.8	18.6	-332.4
6/30/2015	11138	30	141.5	209.8	-43.4	16.4	14.5	-338.8
7/31/2015	11169	31	135.0	247.4	-54.7	21.1	12.4	-361.2
8/31/2015	11200	31	142.4	247.9	-54.7	20.6	11.2	-367.2
9/30/2015	11230	30	145.8	246.3	-54.7	18.6	9.8	-365.8
10/31/2015	11261	31	155.6	249.1	-54.8	18.1	9.4	-377.4
11/30/2015	11291	30	154.8	254.5	-54.7	17.3	8.6	-380.5
12/31/2015	11322	31	158.4	251.3	-54.8	20.6	8.6	-384.0

Flow Budget for the LAS in partial Las Posas Basin (West)

Date	Stress	days in month	influx(+) outflux(-); units in Acre-feet							
			STORAGE	San Pedro Outcrop Recharge	RECHARGE	Pumping from Wells	Outside Area	Las Posas UAS	Oxnard Basin	Pleasant Valley
1/31/1985	31	31	-235.5	111.9	128.8	-513.5	16.7	456.6	36.0	-0.973
2/28/1985	59	28	-208.9	115.7	136.3	-505.6	12.1	423.8	35.7	-9.041
3/31/1985	90	31	133.1	61.5	96.1	-680.4	11.3	376.3	24.9	-22.78
4/30/1985	120	30	980.0	0.0	50.0	-1309.1	8.9	353.0	-36.0	-46.817
5/31/1985	151	31	1039.0	0.0	50.9	-1309.1	7.1	362.1	-77.3	-72.728
6/30/1985	181	30	1094.9	0.0	52.4	-1309.1	5.2	346.7	-105.6	-84.487
7/31/1985	212	31	1210.7	0.0	58.7	-1397.5	4.1	368.9	-149.1	-95.696
8/31/1985	243	31	1243.2	0.0	57.8	-1397.5	3.6	356.9	-160.0	-104.007
9/30/1985	273	30	1265.3	0.0	57.8	-1397.5	3.1	344.0	-164.5	-108.199
10/31/1985	304	31	1264.2	0.0	54.9	-1380.5	2.8	334.9	-158.9	-117.446
11/30/1985	334	30	-1674.3	524.7	501.4	-200.5	6.1	1040.5	-102.6	-95.486
12/31/1985	365	31	933.1	1.2	59.4	-1090.8	7.9	312.6	-145.0	-78.398
1/31/1986	396	31	-1411.5	475.8	420.4	-252.8	9.1	896.8	-78.3	-59.483
2/28/1986	424	28	-3609.1	1131.0	953.5	-115.4	14.9	1709.7	-66.0	-18.491
3/31/1986	455	31	-2307.3	620.0	603.1	-167.4	20.5	1242.5	-21.2	9.684
4/30/1986	485	30	524.9	27.6	80.9	-1093.7	16.5	389.3	37.0	17.47
5/31/1986	516	31	939.1	0.0	51.3	-1441.2	12.5	395.0	44.1	-0.834
6/30/1986	546	30	985.1	0.0	50.9	-1441.2	9.4	409.0	8.4	-21.624
7/31/1986	577	31	1092.3	0.0	61.2	-1583.4	7.8	452.3	21.9	-52.094
8/31/1986	608	31	1131.8	0.0	58.3	-1583.4	6.4	443.6	20.0	-76.747
9/30/1986	638	30	499.3	47.9	90.6	-971.4	5.7	418.0	-8.3	-81.887
10/31/1986	669	31	1261.4	0.0	56.7	-1583.4	5.4	407.1	-60.2	-87.001
11/30/1986	699	30	-172.4	148.6	167.2	-517.9	5.6	496.2	-52.8	-74.595
12/31/1986	730	31	1317.1	0.0	56.1	-1583.4	6.1	368.0	-91.5	-72.348
1/31/1987	761	31	138.2	109.0	140.9	-662.4	6.1	421.6	-79.3	-74.125
2/28/1987	789	28	377.3	79.3	112.0	-790.7	6.2	358.4	-79.0	-63.47
3/31/1987	820	31	-139.9	169.3	179.2	-544.9	7.4	470.6	-79.8	-61.853
4/30/1987	850	30	1474.6	0.0	60.6	-1719.1	7.2	369.9	-114.7	-78.52
5/31/1987	881	31	1529.9	0.0	59.2	-1719.1	6.3	376.4	-132.0	-120.544
6/30/1987	911	30	1557.0	0.0	60.6	-1719.1	5.0	376.5	-141.0	-138.958
7/31/1987	942	31	1719.3	0.0	71.8	-1897.7	4.3	400.1	-139.0	-158.718
8/31/1987	973	31	1718.5	0.0	72.0	-1897.7	3.6	410.2	-144.2	-162.386
9/30/1987	1003	30	1745.6	0.0	70.3	-1897.7	3.0	409.8	-170.1	-160.899
10/31/1987	1034	31	216.2	118.8	155.8	-664.7	3.8	460.0	-153.8	-136.194
11/30/1987	1064	30	51.0	136.7	178.9	-609.5	5.5	474.1	-149.4	-87.19
12/31/1987	1095	31	-1134.6	449.5	393.9	-395.0	8.5	851.8	-123.8	-50.171
1/31/1988	1126	31	-842.7	334.2	294.4	-372.7	10.6	696.4	-107.6	-12.736
2/29/1988	1155	29	1.2	139.1	156.7	-613.6	9.9	393.1	-92.2	5.704
3/31/1988	1186	31	1377.1	0.0	53.6	-1625.7	8.9	307.4	-113.7	-7.489
4/30/1988	1216	30	-776.6	320.4	278.3	-411.4	8.8	638.7	-47.1	-11.023
5/31/1988	1247	31	1305.8	0.0	55.3	-1625.7	8.8	323.9	-56.3	-11.692
6/30/1988	1277	30	1307.3	0.0	55.4	-1625.7	6.8	339.8	-47.8	-35.815
7/31/1988	1308	31	1552.8	0.0	67.7	-1899.3	6.2	441.6	-103.0	-66.005
8/31/1988	1339	31	1601.5	0.0	67.8	-1899.2	5.6	452.9	-136.5	-92.119
9/30/1988	1369	30	1648.8	0.0	68.2	-1899.2	4.7	447.2	-164.9	-104.743
10/31/1988	1400	31	1687.8	0.0	67.5	-1899.2	4.3	448.6	-191.0	-117.961
11/30/1988	1430	30	591.6	68.3	106.9	-925.7	4.2	413.4	-156.8	-101.916
12/31/1988	1461	31	-1421.0	510.0	444.0	-327.9	7.7	970.3	-125.3	-57.712
1/31/1989	1492	31	1212.8	0.0	50.1	-1408.6	8.6	346.8	-167.2	-42.458
2/28/1989	1520	28	-1105.4	398.0	338.2	-300.5	8.1	794.7	-109.0	-24.049
3/31/1989	1551	31	568.9	41.0	72.0	-888.6	9.2	329.0	-117.0	-14.559

Flow Budget for the LAS in partial Las Posas Basin (West)

Date	Stress	days in month	STORAGE	San Pedro Outcrop Recharge	RECHARGE	Pumping from Wells	Outside Area	Las Posas UAS	Oxnard Basin	Pleasant Valley
			influx(+) outflux(-); units in Acre-feet							
4/30/1989	1581	30	1230.5	0.0	54.6	-1439.4	7.2	327.8	-141.4	-39.265
5/31/1989	1612	31	1266.7	0.0	54.1	-1439.3	6.2	341.8	-166.9	-62.746
6/30/1989	1642	30	1293.8	0.0	54.5	-1439.2	5.7	342.2	-183.1	-73.887
7/31/1989	1673	31	1470.3	0.0	57.6	-1657.3	5.1	378.0	-166.8	-86.857
8/31/1989	1704	31	1479.6	0.0	57.3	-1657.3	4.5	378.8	-164.0	-98.951
9/30/1989	1734	30	1492.2	0.0	57.8	-1657.3	3.9	375.5	-166.9	-105.261
10/31/1989	1765	31	1512.8	0.0	55.3	-1657.3	3.7	377.8	-177.7	-114.645
11/30/1989	1795	30	1332.0	0.0	49.7	-1432.3	3.3	335.3	-173.7	-114.325
12/31/1989	1826	31	1531.0	0.0	55.8	-1657.3	3.1	375.4	-188.4	-119.526
1/31/1990	1857	31	-329.9	251.6	232.9	-498.1	4.6	588.3	-158.2	-91.305
2/28/1990	1885	28	-159.6	214.9	199.7	-567.5	6.4	482.5	-132.0	-44.574
3/31/1990	1916	31	1628.2	0.0	55.9	-1822.9	6.9	387.6	-195.4	-60.317
4/30/1990	1946	30	1663.1	0.0	56.4	-1822.8	6.0	400.9	-211.9	-91.67
5/31/1990	1977	31	1362.6	0.0	48.2	-1446.7	5.4	359.6	-216.1	-113.098
6/30/1990	2007	30	1697.5	0.0	59.8	-1822.8	4.5	419.0	-239.9	-118.2
7/31/1990	2038	31	1683.0	0.0	67.1	-1760.5	4.2	430.5	-300.0	-124.282
8/31/1990	2069	31	1685.3	0.0	66.2	-1760.5	3.8	425.8	-299.1	-121.471
9/30/1990	2099	30	1682.4	0.0	65.6	-1760.5	3.3	419.1	-292.3	-117.698
10/31/1990	2130	31	1680.2	0.0	67.1	-1760.5	3.2	429.1	-298.0	-121.146
11/30/1990	2160	30	1634.9	0.0	60.7	-1713.8	2.9	412.5	-289.0	-108.252
12/31/1990	2191	31	1682.6	0.0	62.1	-1760.5	2.9	419.8	-296.5	-110.283
1/31/1991	2222	31	717.7	48.2	86.8	-861.8	3.3	342.8	-236.1	-100.777
2/28/1991	2250	28	-435.1	242.1	230.6	-391.4	4.7	558.5	-152.4	-56.972
3/31/1991	2281	31	-4446.5	1431.3	1146.7	-92.6	14.7	2068.1	-112.7	-9.006
4/30/1991	2311	30	1056.8	0.0	45.8	-1403.9	17.4	416.0	-127.1	-5.031
5/31/1991	2342	31	1121.4	0.0	47.5	-1403.9	14.2	366.4	-104.2	-41.327
6/30/1991	2372	30	1159.4	0.0	47.3	-1403.9	11.5	361.9	-116.5	-59.766
7/31/1991	2403	31	1342.6	0.0	59.8	-1587.8	10.3	420.5	-167.0	-78.384
8/31/1991	2434	31	1370.4	0.0	59.6	-1587.8	9.0	424.2	-186.3	-89.12
9/30/1991	2464	30	1393.6	0.0	60.5	-1587.7	7.8	420.1	-200.4	-93.829
10/31/1991	2495	31	1415.4	0.0	58.0	-1587.6	7.2	421.5	-213.0	-101.4
11/30/1991	2525	30	1428.8	0.0	57.6	-1587.6	6.8	414.8	-219.1	-101.316
12/31/1991	2556	31	-1711.4	515.3	485.6	-235.3	9.2	1096.9	-102.0	-58.137
1/31/1992	2587	31	-534.9	212.0	210.6	-406.7	12.1	554.1	-53.6	6.548
2/29/1992	2616	29	-4192.7	1264.8	1046.5	-101.4	18.1	1912.7	-3.3	55.311
3/31/1992	2647	31	-3031.4	817.8	705.1	-149.5	27.2	1432.3	90.0	108.603
4/30/1992	2677	30	703.8	0.0	46.8	-1416.3	25.2	435.6	104.0	100.835
5/31/1992	2708	31	731.7	0.0	48.6	-1416.3	21.7	425.2	117.5	71.63
6/30/1992	2738	30	782.2	0.0	50.2	-1416.3	18.0	420.1	94.7	51.018
7/31/1992	2769	31	1040.3	0.0	64.1	-1678.8	16.3	491.9	31.1	35.15
8/31/1992	2800	31	1081.7	0.0	65.2	-1678.8	14.5	503.0	-2.6	16.93
9/30/1992	2830	30	1151.9	0.0	63.3	-1678.8	12.5	486.7	-38.6	2.913
10/31/1992	2861	31	-173.6	130.6	142.0	-671.3	12.7	524.7	28.9	5.936
11/30/1992	2891	30	1131.6	0.0	60.8	-1678.7	11.8	455.6	15.3	3.581
12/31/1992	2922	31	-2305.3	589.9	527.7	-244.7	14.4	1224.6	164.2	29.32
1/31/1993	2953	31	-4937.9	1323.8	1149.6	-94.7	24.3	2277.2	172.7	84.893
2/28/1993	2981	28	-4212.7	1130.9	944.5	-119.6	31.1	1954.6	157.5	113.852
3/31/1993	3012	31	-1975.6	446.4	371.8	-326.9	36.1	1115.0	182.1	151.216
4/30/1993	3042	30	540.1	0.0	53.1	-1512.5	30.8	607.2	156.4	124.968
5/31/1993	3073	31	522.3	0.0	54.1	-1512.5	27.2	611.0	201.6	96.303
6/30/1993	3103	30	278.6	7.8	60.1	-1163.7	23.2	572.6	146.0	75.461

Flow Budget for the LAS in partial Las Posas Basin (West)

Date	Stress	days in month	STORAGE	San Pedro Outcrop Recharge	RECHARGE	Pumping from Wells	Outside Area	Las Posas UAS	Oxnard Basin	Pleasant Valley
			influx(+) outflux(-); units in Acre-feet							
7/31/1993	3134	31	784.6	0.0	60.2	-1646.3	21.3	623.7	88.4	68.103
8/31/1993	3165	31	853.3	0.0	60.6	-1646.3	18.8	592.8	59.4	61.334
9/30/1993	3195	30	905.0	0.0	60.1	-1646.3	16.3	558.0	57.8	49.134
10/31/1993	3226	31	858.8	0.0	59.6	-1646.3	15.2	569.3	98.4	45.03
11/30/1993	3256	30	768.3	0.0	53.9	-1568.3	13.3	560.5	126.2	46.219
12/31/1993	3287	31	-467.0	108.7	133.3	-653.5	13.3	637.2	160.7	67.383
1/31/1994	3318	31	492.6	0.0	48.3	-1272.6	12.7	533.3	114.8	70.963
2/28/1994	3346	28	-2896.1	747.8	636.3	-155.6	14.4	1464.5	116.5	72.154
3/31/1994	3377	31	-1419.3	287.5	269.0	-308.9	19.4	912.6	129.5	110.247
4/30/1994	3407	30	537.4	0.0	48.6	-1309.8	17.2	517.8	93.0	95.854
5/31/1994	3438	31	531.2	0.0	48.7	-1281.3	15.4	518.3	95.7	71.984
6/30/1994	3468	30	604.7	0.0	50.5	-1309.8	13.2	502.1	85.3	54.119
7/31/1994	3499	31	851.6	0.0	60.6	-1524.0	12.2	530.4	30.7	38.517
8/31/1994	3530	31	925.4	0.0	60.7	-1523.9	11.0	510.4	-6.7	23.183
9/30/1994	3560	30	1009.0	0.0	59.4	-1523.9	9.7	474.6	-38.0	9.195
10/31/1994	3591	31	788.7	0.0	52.4	-1219.2	9.1	427.3	-57.7	-0.57
11/30/1994	3621	30	182.8	59.1	96.2	-792.6	8.7	452.7	-14.3	7.347
12/31/1994	3652	31	522.1	22.3	81.3	-1055.1	9.0	421.5	-23.5	22.29
1/31/1995	3683	31	-7568.7	2318.3	1876.0	-39.6	25.7	3334.5	-2.1	56.093
2/28/1995	3711	28	-207.2	42.0	82.9	-629.0	28.9	561.0	38.5	82.763
3/31/1995	3742	31	-4296.3	1134.0	974.1	-75.7	32.4	1985.4	136.1	109.953
4/30/1995	3772	30	71.1	0.0	37.1	-933.7	31.0	555.5	117.6	121.359
5/31/1995	3803	31	69.7	0.0	42.4	-880.8	26.8	493.0	136.4	112.45
6/30/1995	3833	30	203.5	0.0	42.9	-986.7	22.6	490.9	129.5	97.127
7/31/1995	3864	31	551.7	0.0	57.9	-1385.3	20.6	582.0	91.3	81.671
8/31/1995	3895	31	587.4	0.0	58.4	-1385.3	18.3	577.2	78.3	65.746
9/30/1995	3925	30	621.0	0.0	58.3	-1385.3	15.8	564.1	73.1	52.919
10/31/1995	3956	31	596.6	0.0	56.5	-1385.3	14.7	579.5	91.1	46.891
11/30/1995	3986	30	606.7	0.0	55.8	-1385.3	12.9	570.6	100.7	38.619
12/31/1995	4017	31	-1039.6	197.9	209.7	-383.3	13.4	788.6	156.2	57.065
1/31/1996	4048	31	-258.3	55.7	86.5	-665.3	13.5	550.0	144.8	72.98
2/29/1996	4077	29	-3794.9	1038.4	836.8	-108.5	18.0	1792.2	140.8	77.205
3/31/1996	4108	31	-1325.4	259.7	224.3	-338.1	23.2	872.1	183.0	101.235
4/30/1996	4138	30	344.4	0.0	43.9	-1177.8	20.1	536.9	150.2	82.3
5/31/1996	4169	31	405.7	0.0	46.7	-1213.3	17.9	554.3	128.0	60.779
6/30/1996	4199	30	508.0	0.0	46.9	-1213.3	15.2	521.2	79.7	42.335
7/31/1996	4230	31	948.5	0.0	60.7	-1638.2	14.0	579.7	17.1	18.201
8/31/1996	4261	31	1025.4	0.0	60.6	-1638.1	12.5	562.4	-18.5	-4.303
9/30/1996	4291	30	1101.5	0.0	60.4	-1638.0	10.9	527.1	-44.8	-17.229
10/31/1996	4322	31	220.9	91.5	119.4	-951.6	11.3	528.9	-13.1	-7.322
11/30/1996	4352	30	-797.5	235.8	226.7	-438.1	12.1	708.3	25.2	27.551
12/31/1996	4383	31	-2820.2	770.8	653.0	-185.4	17.1	1431.0	65.0	68.637
1/31/1997	4414	31	-2907.7	725.1	623.0	-149.9	23.0	1426.3	157.0	103.186
2/28/1997	4442	28	428.0	0.0	50.6	-1264.2	20.7	523.9	160.5	80.453
3/31/1997	4473	31	429.4	0.0	51.3	-1264.2	19.4	545.3	165.3	53.495
4/30/1997	4503	30	495.4	0.0	51.4	-1264.2	16.3	539.1	129.6	32.448
5/31/1997	4534	31	547.8	0.0	52.0	-1264.2	14.8	536.4	91.9	21.243
6/30/1997	4564	30	639.3	0.0	53.6	-1264.1	12.8	500.9	44.8	12.684
7/31/1997	4595	31	1076.3	0.0	58.7	-1670.1	11.9	551.3	-42.4	14.254
8/31/1997	4626	31	1138.2	0.0	60.6	-1670.0	10.7	528.4	-76.2	8.312
9/30/1997	4656	30	1195.1	0.0	60.1	-1670.0	9.4	501.5	-98.5	2.479

Flow Budget for the LAS in partial Las Posas Basin (West)

Date	Stress	days in month	STORAGE	San Pedro Outcrop Recharge	RECHARGE	Pumping from Wells	Outside Area	Las Posas UAS	Oxnard Basin	Pleasant Valley
			influx(+) outflux(-); units in Acre-feet							
10/31/1997	4687	31	1194.6	0.0	61.8	-1670.0	9.1	512.7	-109.7	1.469
11/30/1997	4717	30	-796.1	241.4	242.3	-421.6	9.3	738.2	-35.7	22.114
12/31/1997	4748	31	-3104.0	832.3	762.4	-160.5	14.8	1592.4	-4.4	67.038
1/31/1998	4779	31	-1795.5	429.0	393.9	-244.6	19.0	1037.4	57.8	103.006
2/28/1998	4807	28	-8851.1	2610.2	2225.3	-44.1	34.1	3866.0	45.4	114.084
3/31/1998	4838	31	-2073.7	456.4	393.3	-258.9	44.9	1165.7	123.3	149
4/30/1998	4868	30	-790.2	122.1	143.0	-522.4	36.2	663.3	206.9	141.131
5/31/1998	4899	31	-2057.0	502.5	382.6	-288.4	35.3	1051.1	235.1	138.813
6/30/1998	4929	30	269.2	0.0	49.6	-1275.7	31.4	574.9	223.2	127.355
7/31/1998	4960	31	366.6	0.0	47.4	-1321.7	28.0	611.5	164.0	104.196
8/31/1998	4991	31	431.7	0.0	50.3	-1321.7	24.7	605.7	121.5	87.804
9/30/1998	5021	30	522.6	0.0	48.3	-1315.2	21.3	567.5	78.9	76.588
10/31/1998	5052	31	532.1	0.0	46.4	-1321.7	19.8	560.3	90.2	73.053
11/30/1998	5082	30	17.4	26.0	73.4	-914.9	17.6	541.7	169.0	69.813
12/31/1998	5113	31	436.8	0.0	45.1	-1319.5	16.7	585.7	160.4	74.946
1/31/1999	5144	31	-1015.9	190.9	185.7	-395.4	16.4	743.4	195.0	80.006
2/28/1999	5172	28	-78.6	70.7	92.3	-824.6	14.9	538.5	123.0	63.76
3/31/1999	5203	31	-1529.9	326.6	303.0	-269.6	17.1	955.5	129.2	68.153
4/30/1999	5233	30	-1120.7	241.0	227.0	-337.7	17.6	751.2	136.0	85.554
5/31/1999	5264	31	476.4	0.0	51.5	-1281.8	17.1	517.0	136.7	83.125
6/30/1999	5294	30	552.8	0.0	52.7	-1281.8	14.5	508.2	96.1	57.535
7/31/1999	5325	31	772.6	0.0	54.2	-1400.4	13.3	535.7	-5.3	29.788
8/31/1999	5356	31	863.8	0.0	54.5	-1400.4	12.0	517.2	-50.0	2.908
9/30/1999	5386	30	939.4	0.0	54.2	-1400.2	10.5	484.7	-76.8	-11.923
10/31/1999	5417	31	941.9	0.0	58.9	-1400.1	9.9	495.4	-83.7	-22.281
11/30/1999	5447	30	315.3	43.6	76.8	-846.7	9.1	465.0	-46.5	-16.541
12/31/1999	5478	31	971.0	0.0	55.8	-1400.1	9.2	466.2	-88.7	-13.442
1/31/2000	5509	31	-334.8	164.8	173.6	-526.1	9.1	556.9	-38.7	-4.825
2/29/2000	5538	29	-3057.8	908.8	766.3	-154.5	13.9	1519.5	-22.7	26.538
3/31/2000	5569	31	-946.9	283.3	255.7	-409.6	18.8	726.3	16.3	56.059
4/30/2000	5599	30	-843.5	237.5	233.5	-439.9	18.1	640.3	89.8	64.122
5/31/2000	5630	31	965.8	0.0	67.1	-1605.9	17.1	464.1	48.0	43.811
6/30/2000	5660	30	1027.7	0.0	68.6	-1605.6	14.4	476.5	10.2	8.182
7/31/2000	5691	31	799.9	0.0	53.8	-1294.9	13.1	459.7	-31.6	0.08
8/31/2000	5722	31	851.7	0.0	53.4	-1294.7	11.7	439.3	-58.5	-2.822
9/30/2000	5752	30	896.0	0.0	52.8	-1294.7	10.1	416.8	-73.9	-7.2
10/31/2000	5783	31	255.7	54.3	87.1	-801.7	10.0	414.6	-16.4	-3.532
11/30/2000	5813	30	817.5	0.0	55.1	-1294.7	9.2	419.8	-2.3	-4.577
12/31/2000	5844	31	797.1	0.0	53.4	-1294.7	8.9	450.0	-5.5	-9.178
1/31/2001	5875	31	-2846.2	830.8	677.9	-141.3	12.8	1424.7	29.4	11.95
2/28/2001	5903	28	-3655.6	1069.5	886.6	-106.1	19.9	1726.3	17.1	42.314
3/31/2001	5934	31	-2202.0	607.8	492.5	-202.0	26.9	1139.2	65.0	72.667
4/30/2001	5964	30	-412.1	115.6	128.5	-577.9	24.9	545.2	105.1	70.794
5/31/2001	5995	31	585.1	0.0	55.1	-1272.1	22.6	493.2	70.4	45.802
6/30/2001	6025	30	659.3	0.0	55.8	-1272.0	18.9	487.9	27.1	23.072
7/31/2001	6056	31	568.8	0.0	52.0	-1142.5	17.2	475.5	16.3	12.674
8/31/2001	6087	31	629.8	0.0	53.8	-1142.6	15.2	451.7	-12.3	4.359
9/30/2001	6117	30	689.6	0.0	52.4	-1142.7	13.2	415.5	-24.9	-3.25
10/31/2001	6148	31	643.8	0.0	56.0	-1142.2	12.3	426.6	12.0	-8.487
11/30/2001	6178	30	-1494.0	403.0	332.2	-248.7	13.2	888.6	95.4	10.28
12/31/2001	6209	31	-188.4	61.5	102.5	-607.4	14.7	489.9	90.7	36.409

Flow Budget for the LAS in partial Las Posas Basin (West)

Date	Stress	days in month	STORAGE	San Pedro Outcrop Recharge	RECHARGE	Pumping from Wells	Outside Area	Las Posas UAS	Oxnard Basin	Pleasant Valley
			influx(+) outflux(-); units in Acre-feet							
1/31/2002	6240	31	-263.5	69.1	93.5	-511.7	13.8	486.7	67.6	44.561
2/28/2002	6268	28	566.8	0.0	47.3	-1083.9	11.5	411.4	20.8	26.215
3/31/2002	6299	31	581.2	0.0	47.4	-1083.5	11.3	428.9	1.4	13.275
4/30/2002	6329	30	634.3	0.0	47.8	-1083.6	9.8	405.4	-19.1	5.483
5/31/2002	6360	31	660.1	0.0	48.6	-1083.6	9.3	398.5	-34.4	1.532
6/30/2002	6390	30	698.7	0.0	49.3	-1083.8	8.5	376.3	-47.3	-1.606
7/31/2002	6421	31	1100.0	0.0	68.7	-1492.9	8.0	439.8	-95.2	-28.323
8/31/2002	6452	31	1145.4	0.0	71.7	-1492.8	7.4	448.3	-120.7	-59.3
9/30/2002	6482	30	1163.8	0.0	77.0	-1492.9	6.6	457.6	-136.7	-75.418
10/31/2002	6513	31	1193.7	0.0	73.4	-1492.8	6.3	457.6	-150.4	-87.852
11/30/2002	6543	30	-1892.2	573.2	513.8	-212.9	8.7	1153.2	-95.7	-48.179
12/31/2002	6574	31	-1419.4	478.8	384.7	-311.5	13.8	917.6	-65.8	1.74
1/31/2003	6605	31	678.5	0.0	45.9	-1036.8	14.0	352.8	-63.3	8.895
2/28/2003	6633	28	-2211.9	603.1	562.4	-128.1	14.0	1161.3	-25.4	24.513
3/31/2003	6664	31	-1830.0	496.8	420.6	-173.0	19.2	1005.7	-1.7	62.431
4/30/2003	6694	30	86.9	50.5	83.3	-671.2	18.2	374.3	3.2	54.728
5/31/2003	6725	31	-334.9	100.6	127.6	-413.2	17.2	428.9	16.5	57.234
6/30/2003	6755	30	588.9	0.0	45.9	-1036.9	15.1	341.2	0.7	45.029
7/31/2003	6786	31	866.4	0.0	55.8	-1306.5	13.7	403.9	-51.2	17.817
8/31/2003	6817	31	910.1	0.0	55.9	-1306.3	12.1	402.3	-70.5	-3.66
9/30/2003	6847	30	954.6	0.0	54.7	-1306.1	10.5	391.4	-88.0	-17.107
10/31/2003	6878	31	973.8	0.0	57.0	-1306.1	9.8	394.5	-103.2	-25.779
11/30/2003	6908	30	435.4	40.0	89.1	-874.3	9.0	371.5	-63.2	-7.524
12/31/2003	6939	31	-124.3	87.9	133.6	-509.0	9.5	444.7	-59.9	17.504
1/31/2004	6970	31	620.4	0.0	43.7	-935.9	9.5	308.5	-67.7	21.51
2/29/2004	6999	29	-2446.2	729.6	600.0	-131.9	11.8	1233.1	-31.4	35.05
3/31/2004	7030	31	624.2	0.0	48.2	-1078.7	14.5	380.4	-36.5	47.917
4/30/2004	7060	30	668.2	0.0	48.6	-1078.8	11.8	349.5	-30.0	30.683
5/31/2004	7091	31	667.0	0.0	51.9	-1078.3	10.7	363.9	-37.1	21.986
6/30/2004	7121	30	704.2	0.0	50.8	-1078.4	9.2	352.3	-52.3	14.123
7/31/2004	7152	31	973.7	0.0	58.6	-1299.6	8.9	390.9	-121.5	-10.944
8/31/2004	7183	31	1025.9	0.0	58.8	-1299.4	8.1	396.9	-151.6	-38.722
9/30/2004	7213	30	1063.9	0.0	58.2	-1299.4	7.2	393.5	-169.3	-54.052
10/31/2004	7244	31	-2036.7	593.3	542.8	-168.3	10.0	1190.1	-106.5	-24.744
11/30/2004	7274	30	1001.3	0.0	54.2	-1300.4	11.3	403.3	-155.2	-14.432
12/31/2004	7305	31	-2421.8	707.9	625.6	-150.6	14.5	1314.2	-89.9	0.033
1/31/2005	7336	31	-5571.8	1691.1	1384.6	-63.5	28.3	2542.4	-58.2	47.223
2/28/2005	7364	28	-4007.6	1139.0	979.0	-91.7	35.3	1858.8	13.8	73.383
3/31/2005	7395	31	-1545.2	344.5	301.3	-266.3	38.2	941.2	87.0	99.34
4/30/2005	7425	30	24.7	21.7	60.6	-868.5	31.9	506.4	136.8	86.348
5/31/2005	7456	31	395.6	0.0	46.1	-1261.8	28.3	559.2	168.3	64.363
6/30/2005	7486	30	405.1	0.0	48.4	-1261.6	23.9	582.2	158.6	43.336
7/31/2005	7517	31	268.8	0.0	52.0	-1173.6	21.9	624.6	161.9	44.407
8/31/2005	7548	31	290.1	0.0	51.4	-1173.8	19.3	629.2	137.2	46.509
9/30/2005	7578	30	357.6	0.0	50.7	-1173.6	16.7	602.4	103.0	43.138
10/31/2005	7609	31	-448.4	56.7	97.3	-566.7	16.0	634.8	153.4	56.913
11/30/2005	7639	30	350.7	0.0	51.7	-1173.3	14.4	598.8	102.4	55.264
12/31/2005	7670	31	405.5	0.0	50.4	-1173.8	13.4	594.8	60.0	49.844
1/31/2006	7701	31	-1501.3	371.8	318.9	-315.4	14.6	981.6	67.0	62.824
2/28/2006	7729	28	-1666.3	410.5	355.5	-275.4	15.9	1029.3	59.9	70.691
3/31/2006	7760	31	-1923.0	463.2	399.5	-243.8	20.1	1101.1	91.3	91.63

Flow Budget for the LAS in partial Las Posas Basin (West)

Date	Stress	days in month	influx(+) outflux(-); units in Acre-feet							
			STORAGE	San Pedro Outcrop Recharge	RECHARGE	Pumping from Wells	Outside Area	Las Posas UAS	Oxnard Basin	Pleasant Valley
4/30/2006	7790	30	-1832.0	410.1	362.4	-265.6	21.3	1045.2	159.6	99.092
5/31/2006	7821	31	-635.2	84.0	110.0	-535.3	21.4	660.4	194.7	99.926
6/30/2006	7851	30	444.0	0.0	60.6	-1328.0	18.4	634.3	108.0	62.708
7/31/2006	7882	31	221.7	0.0	56.1	-1073.0	16.7	641.5	87.0	49.946
8/31/2006	7913	31	305.6	0.0	53.9	-1072.9	14.9	612.3	38.1	48.135
9/30/2006	7943	30	393.1	0.0	52.7	-1072.7	12.9	564.6	7.7	41.738
10/31/2006	7974	31	393.3	0.0	50.5	-1072.2	12.0	557.2	19.5	39.717
11/30/2006	8004	30	409.0	0.0	49.6	-1072.3	10.6	536.8	30.8	35.519
12/31/2006	8035	31	71.9	15.9	61.6	-749.4	10.2	519.6	24.7	45.536
1/31/2007	8066	31	-969.7	216.4	215.8	-331.3	10.8	753.0	39.6	65.309
2/28/2007	8094	28	226.8	22.0	79.4	-886.2	10.2	461.4	23.4	63.038
3/31/2007	8125	31	588.1	0.0	55.3	-1226.8	10.4	498.3	15.8	58.917
4/30/2007	8155	30	474.8	0.0	44.9	-1051.2	9.4	443.7	23.9	54.599
5/31/2007	8186	31	638.0	0.0	55.9	-1226.9	8.8	470.8	0.3	53.228
6/30/2007	8216	30	696.3	0.0	56.4	-1227.0	7.9	440.5	-18.3	44.198
7/31/2007	8247	31	885.1	0.0	63.7	-1383.8	7.5	459.4	-65.8	33.913
8/31/2007	8278	31	920.9	0.0	62.1	-1383.7	7.0	451.9	-81.0	22.751
9/30/2007	8308	30	952.7	0.0	60.8	-1383.9	6.3	435.2	-86.2	15.129
10/31/2007	8339	31	927.6	0.0	62.9	-1383.8	6.1	444.9	-69.6	11.911
11/30/2007	8369	30	908.4	0.0	64.7	-1383.8	5.5	449.7	-53.0	8.546
12/31/2007	8400	31	-1037.0	332.8	269.3	-352.8	7.0	764.0	-7.7	24.507
1/31/2008	8431	31	-3844.2	1171.9	921.9	-108.7	15.5	1783.6	7.7	52.357
2/29/2008	8460	29	-629.6	154.1	171.1	-439.0	18.5	601.0	49.8	74.064
3/31/2008	8491	31	652.1	0.0	66.3	-1377.3	17.2	518.1	46.8	76.855
4/30/2008	8521	30	646.9	0.0	68.9	-1377.0	14.1	569.1	15.3	62.552
5/31/2008	8552	31	666.8	0.0	72.2	-1376.8	12.8	606.6	-39.5	57.95
6/30/2008	8582	30	768.9	0.0	70.2	-1376.9	11.0	565.5	-90.8	52.185
7/31/2008	8613	31	1151.2	0.0	78.5	-1735.2	10.2	619.3	-182.6	58.613
8/31/2008	8644	31	1186.9	0.0	77.6	-1735.0	9.2	603.7	-196.0	53.584
9/30/2008	8674	30	1236.5	0.0	76.8	-1735.1	8.4	576.8	-209.0	45.591
10/31/2008	8705	31	1222.5	0.0	77.3	-1734.9	8.2	574.0	-189.8	42.787
11/30/2008	8735	30	-630.1	206.0	210.1	-497.4	8.1	688.7	-29.3	43.93
12/31/2008	8766	31	-904.1	250.1	247.7	-423.4	10.2	764.4	-13.7	68.8
1/31/2009	8797	31	722.7	0.0	53.5	-1259.2	10.1	461.4	-82.6	94.047
2/28/2009	8825	28	-2317.2	648.5	549.4	-169.6	11.5	1206.9	-11.0	81.652
3/31/2009	8856	31	715.4	0.0	53.4	-1295.2	14.1	479.8	-84.3	116.811
4/30/2009	8886	30	752.2	0.0	54.9	-1294.7	11.5	462.7	-97.0	110.428
5/31/2009	8917	31	756.9	0.0	56.4	-1294.4	10.5	468.6	-106.7	108.682
6/30/2009	8947	30	794.7	0.0	54.7	-1294.5	9.1	451.9	-116.9	101.044
7/31/2009	8978	31	1179.4	0.0	72.5	-1673.0	9.0	518.6	-188.6	82.053
8/31/2009	9009	31	1232.1	0.0	71.2	-1672.8	8.2	515.0	-210.3	56.677
9/30/2009	9039	30	1276.2	0.0	70.7	-1672.9	7.3	501.6	-225.3	42.468
10/31/2009	9070	31	-579.0	254.2	226.5	-492.0	8.1	672.3	-127.1	36.953
11/30/2009	9100	30	1292.4	0.0	69.7	-1673.7	8.4	468.9	-211.4	45.757
12/31/2009	9131	31	-1234.0	401.0	350.8	-371.7	10.1	890.1	-92.8	46.501
1/31/2010	9162	31	-2607.2	744.9	633.5	-167.0	15.3	1314.6	-16.5	82.311
2/28/2010	9190	28	-1671.6	438.8	403.5	-251.9	17.4	946.3	12.6	104.932
3/31/2010	9221	31	761.8	0.0	58.0	-1402.9	18.2	486.4	-75.0	153.48
4/30/2010	9251	30	-269.4	106.0	133.1	-619.1	15.8	505.0	-10.5	139.094
5/31/2010	9282	31	767.9	0.0	62.9	-1402.6	14.8	491.3	-88.6	154.264
6/30/2010	9312	30	806.5	0.0	61.6	-1402.3	12.6	489.0	-112.0	144.63

Flow Budget for the LAS in partial Las Posas Basin (West)

Date	Stress	days in month	STORAGE	San Pedro Outcrop Recharge	RECHARGE	Pumping from Wells	Outside Area	Las Posas UAS	Oxnard Basin	Pleasant Valley
			influx(+) outflux(-); units in Acre-feet							
7/31/2010	9343	31	1255.9	0.0	76.8	-1868.0	11.6	572.7	-184.7	135.686
8/31/2010	9374	31	1298.9	0.0	77.7	-1867.6	10.5	576.2	-211.7	115.959
9/30/2010	9404	30	1334.2	0.0	78.6	-1867.7	9.2	572.9	-229.2	101.987
10/31/2010	9435	31	-742.5	251.4	235.8	-508.6	10.3	748.5	-108.3	113.354
11/30/2010	9465	30	739.1	14.6	79.6	-1293.3	10.4	471.7	-145.4	123.36
12/31/2010	9496	31	-3949.8	1082.5	955.0	-134.5	16.4	1940.1	-36.6	126.979
1/31/2011	9527	31	762.1	0.0	57.4	-1472.7	19.2	525.7	-50.4	158.577
2/28/2011	9555	28	-1222.1	282.1	270.7	-338.3	16.2	784.5	63.5	143.324
3/31/2011	9586	31	-2904.8	715.3	651.3	-163.5	21.1	1421.3	106.1	153.206
4/30/2011	9616	30	644.2	0.0	58.5	-1490.9	20.6	548.0	45.6	174.101
5/31/2011	9647	31	487.6	0.0	54.2	-1357.3	18.0	572.2	60.5	164.81
6/30/2011	9677	30	660.3	0.0	59.4	-1490.3	15.3	595.5	7.5	152.331
7/31/2011	9708	31	869.7	0.0	72.8	-1698.8	14.0	654.9	-56.5	143.828
8/31/2011	9739	31	909.3	0.0	74.1	-1698.6	12.6	637.3	-70.9	136.154
9/30/2011	9769	30	977.7	0.0	72.3	-1698.6	11.0	597.0	-85.4	125.991
10/31/2011	9800	31	-179.8	102.5	124.7	-787.0	11.1	617.6	-21.5	132.419
11/30/2011	9830	30	-566.3	136.4	163.6	-556.5	11.3	646.3	23.7	141.646
12/31/2011	9861	31	951.8	0.0	69.3	-1698.9	11.2	562.2	-45.0	149.404
1/31/2012	9892	31	-114.8	54.7	109.2	-806.0	10.5	578.5	17.0	150.801
2/29/2012	9921	29	1270.1	0.0	75.8	-1980.6	9.6	533.8	-50.9	142.211
3/31/2012	9952	31	-804.1	186.0	210.6	-515.5	10.2	773.1	-7.8	147.605
4/30/2012	9982	30	-327.8	127.2	153.4	-702.5	10.8	591.7	-15.5	162.649
5/31/2012	10013	31	1271.8	0.0	78.5	-1980.8	11.0	526.4	-70.0	163.112
6/30/2012	10043	30	1302.2	0.0	79.2	-1980.5	9.5	536.4	-89.4	142.633
7/31/2012	10074	31	1299.7	0.0	79.4	-1930.3	8.8	592.7	-170.4	120.117
8/31/2012	10105	31	1336.3	0.0	79.8	-1930.2	8.0	588.9	-183.3	100.523
9/30/2012	10135	30	1378.8	0.0	79.4	-1930.3	7.1	572.1	-193.0	86.012
10/31/2012	10166	31	851.7	113.4	139.8	-1598.0	6.5	601.7	-197.2	82.159
11/30/2012	10196	30	259.0	118.5	141.1	-1084.4	7.0	572.2	-104.6	91.223
12/31/2012	10227	31	-688.6	273.5	237.3	-626.0	8.9	743.5	-63.6	115.091
1/31/2013	10258	31	-207.6	98.1	124.0	-568.0	9.9	486.2	-70.2	127.6
2/28/2013	10286	28	856.0	0.0	56.1	-1282.8	8.3	401.6	-135.9	96.807
3/31/2013	10317	31	642.4	0.0	48.9	-1074.5	8.4	382.9	-109.1	100.96
4/30/2013	10347	30	875.8	0.0	57.7	-1282.5	7.4	400.9	-145.8	86.542
5/31/2013	10378	31	941.7	0.0	60.0	-1282.2	6.9	374.7	-157.9	56.7
6/30/2013	10408	30	984.1	0.0	60.4	-1282.3	6.2	356.0	-162.1	37.698
7/31/2013	10439	31	1173.1	0.0	68.9	-1537.8	5.9	420.3	-162.3	31.951
8/31/2013	10470	31	1195.9	0.0	69.1	-1537.9	5.5	430.8	-177.1	13.823
9/30/2013	10500	30	1224.6	0.0	68.9	-1538.0	4.9	428.7	-189.0	-0.076
10/31/2013	10531	31	1248.5	0.0	67.5	-1537.9	4.6	432.6	-205.3	-10.03
11/30/2013	10561	30	1134.5	0.0	60.9	-1382.9	4.1	399.4	-201.8	-14.152
12/31/2013	10592	31	1280.7	0.0	67.4	-1538.0	3.9	426.8	-221.5	-19.279
1/31/2014	10623	31	1267.1	0.0	67.2	-1489.1	3.7	428.2	-253.6	-23.343
2/28/2014	10651	28	-1401.1	458.0	405.4	-264.9	5.4	933.5	-133.6	-2.714
3/31/2014	10682	31	301.9	67.9	116.3	-766.5	8.0	392.4	-158.8	38.797
4/30/2014	10712	30	1216.1	0.0	64.6	-1489.8	7.0	389.0	-216.8	29.77
5/31/2014	10743	31	1238.9	0.0	68.5	-1489.3	6.6	414.9	-241.3	1.67
6/30/2014	10773	30	1263.3	0.0	67.7	-1489.2	6.1	415.7	-247.8	-15.767
7/31/2014	10804	31	1233.8	0.0	67.6	-1464.1	5.8	424.8	-256.6	-11.187
8/31/2014	10835	31	1182.7	0.0	66.3	-1408.0	5.2	419.8	-258.3	-7.743
9/30/2014	10865	30	1196.9	0.0	64.3	-1408.1	4.6	410.1	-257.7	-10.01

Flow Budget for the LAS in partial Las Posas Basin (West)

Date	Stress	days in month	influx(+) outflux(-); units in Acre-feet							
			STORAGE	San Pedro Outcrop Recharge	RECHARGE	Pumping from Wells	Outside Area	Las Posas UAS	Oxnard Basin	Pleasant Valley
10/31/2014	10896	31	1203.1	0.0	62.9	-1408.0	4.4	415.2	-265.4	-12.189
11/30/2014	10926	30	901.2	6.0	61.8	-1095.2	4.1	362.7	-232.1	-8.484
12/31/2014	10957	31	-1663.0	488.3	461.3	-209.8	6.8	1031.4	-136.1	21.13
1/31/2015	10988	31	-710.8	217.0	212.6	-291.5	9.5	588.3	-101.7	76.553
2/28/2015	11016	28	893.9	0.0	51.4	-1172.7	8.1	309.8	-170.1	79.516
3/31/2015	11047	31	799.6	0.0	51.8	-1047.3	7.7	312.9	-186.3	61.71
4/30/2015	11077	30	916.2	0.0	54.6	-1172.9	6.9	331.5	-188.2	51.917
5/31/2015	11108	31	873.3	0.0	49.3	-1109.0	6.6	332.4	-195.5	42.885
6/30/2015	11138	30	941.1	0.0	52.1	-1172.8	5.8	338.8	-197.5	32.346
7/31/2015	11169	31	745.3	34.7	74.5	-1023.0	5.7	361.2	-218.5	20.162
8/31/2015	11200	31	1106.8	0.0	57.3	-1336.1	5.6	367.2	-214.7	13.928
9/30/2015	11230	30	1128.7	0.0	56.8	-1350.5	4.8	365.8	-212.2	6.542
10/31/2015	11261	31	1124.9	0.0	57.2	-1348.6	4.5	377.4	-217.0	1.637
11/30/2015	11291	30	1123.3	0.0	59.4	-1350.5	4.0	380.5	-215.5	-1.141
12/31/2015	11322	31	1126.5	0.0	58.5	-1350.4	3.8	384.0	-219.4	-3.029

Monthly Streamflow Budget
units in Acre-feet

Stress	Year	Month	days in month	Rising Groundwater									Stream Percolation								
				System A Rising Groundwater			System B Rising Groundwater			System C Rising Groundwater			System A Stream Percolation			System B Stream Percolation			System C Stream Percolation		
				Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula
1	1985	1	31	-2300.94	-4184.10	-996.51	0.00	-277.14	-161.39	0.00	-118.37	-65.19	5112.24	970.25	62.52	0.00	0.00	162.01	0.00	0.00	0.00
2	1985	2	28	-1897.30	-3720.34	-924.64	0.00	-269.58	-124.95	0.00	-116.28	-55.83	4258.11	899.02	59.65	0.00	0.00	124.34	0.00	0.00	0.00
3	1985	3	31	-2050.91	-3894.01	-985.96	0.00	-312.57	-124.98	0.00	-126.21	-60.45	4691.16	974.67	58.01	0.00	0.00	123.33	0.00	0.00	0.00
4	1985	4	30	-1905.28	-3545.87	-905.64	0.00	-316.12	-109.66	0.00	-117.35	-55.74	3585.25	938.07	61.97	0.00	0.00	109.60	0.00	0.00	0.00
5	1985	5	31	-2486.75	-3335.45	-850.11	0.00	-333.11	-106.48	0.00	-118.66	-55.50	3960.95	924.19	66.20	0.00	0.00	105.96	0.00	0.00	0.00
6	1985	6	30	-1765.90	-2981.11	-762.47	0.00	-322.89	-97.85	0.00	-112.67	-52.30	2964.16	764.89	65.18	0.00	0.00	97.05	0.00	0.00	0.00
7	1985	7	31	-2288.39	-2746.91	-730.29	0.00	-329.77	-97.69	0.00	-114.24	-52.75	3265.42	756.46	67.59	0.00	0.00	97.53	0.00	0.00	0.00
8	1985	8	31	-2267.27	-2433.25	-683.51	0.00	-322.51	-91.11	0.00	-112.08	-51.40	3515.60	740.96	67.68	0.00	0.00	90.65	0.00	0.00	0.00
9	1985	9	30	-2144.47	-2926.93	-744.46	0.00	-302.95	-85.01	0.00	-106.44	-48.44	10679.23	2385.20	320.12	0.00	0.00	84.54	0.00	0.00	0.00
10	1985	10	31	-1835.19	-2060.99	-633.56	0.00	-302.02	-83.78	0.00	-107.96	-48.73	4106.40	858.06	72.33	0.00	0.00	83.72	0.00	0.00	0.00
11	1985	11	30	-2433.60	-2428.29	-719.60	0.00	-313.34	-153.94	0.00	-123.81	-52.72	4384.92	1081.70	72.18	0.00	0.00	159.30	0.00	0.00	0.00
12	1985	12	31	-2620.99	-2576.90	-730.84	0.00	-277.26	-90.23	0.00	-105.52	-50.48	5527.27	977.49	66.13	0.00	0.00	89.11	0.00	0.00	0.00
13	1986	1	31	-2919.04	-2707.81	-765.26	0.00	-294.05	-149.93	0.00	-117.33	-53.06	6720.06	1225.31	62.90	0.00	0.00	150.83	0.00	0.00	0.00
14	1986	2	28	-3519.89	-2819.49	-858.89	0.00	-304.43	-250.14	0.00	-155.14	-58.27	8571.74	2222.79	93.91	0.00	0.00	257.99	0.00	0.00	0.00
15	1986	3	31	-3260.35	-3616.26	-1058.29	0.00	-298.57	-208.90	0.00	-125.31	-63.28	8803.63	1814.75	93.17	0.00	0.00	220.35	0.00	0.00	0.00
16	1986	4	30	-2750.72	-3736.98	-1030.10	0.00	-246.61	-113.29	0.00	-99.06	-52.00	5791.84	1261.86	79.09	0.00	0.00	108.82	0.00	0.00	0.00
17	1986	5	31	-2647.35	-3521.06	-1006.55	0.00	-238.46	-92.21	0.00	-96.50	-47.77	4993.40	1051.82	70.96	0.00	0.00	88.97	0.00	0.00	0.00
18	1986	6	30	-2210.20	-3532.45	-956.57	0.00	-216.35	-81.38	0.00	-91.42	-44.40	3535.75	1176.71	107.32	0.00	0.00	79.17	0.00	0.00	0.00
19	1986	7	31	-2452.60	-3426.91	-990.43	0.00	-209.29	-76.84	0.00	-92.81	-44.72	9019.40	2035.51	277.05	0.00	0.00	77.71	0.00	0.00	0.00
20	1986	8	31	-2638.73	-2566.15	-807.09	0.00	-160.59	-71.61	0.00	-91.15	-43.69	3407.85	616.23	62.93	0.00	0.00	73.71	0.00	0.00	0.00
21	1986	9	30	-1868.98	-2432.01	-768.40	0.00	-122.69	-66.78	0.00	-88.76	-42.35	3490.85	671.79	57.39	0.00	0.00	68.52	0.00	0.00	0.00
22	1986	10	31	-1891.73	-2384.50	-767.32	0.00	-118.26	-66.07	0.00	-88.30	-42.68	3452.64	743.08	60.74	0.00	0.00	68.85	0.00	0.00	0.00
23	1986	11	30	-1997.31	-2422.57	-749.44	0.00	-109.37	-64.75	0.00	-87.99	-41.84	4263.62	790.11	59.28	0.00	0.00	65.54	0.00	0.00	0.00
24	1986	12	31	-1930.98	-2436.88	-766.73	0.00	-104.21	-62.39	0.00	-85.63	-41.89	4486.12	740.43	57.58	0.00	0.00	65.40	0.00	0.00	0.00
25	1987	1	31	-1971.31	-2456.51	-777.75	0.00	-100.04	-70.06	0.00	-87.65	-42.48	4535.16	768.86	63.27	0.00	0.00	69.44	0.00	0.00	0.00
26	1987	2	28	-1744.58	-2274.59	-709.90	0.00	-84.79	-59.48	0.00	-77.09	-38.03	4121.12	682.97	56.57	0.00	0.00	60.25	0.00	0.00	0.00
27	1987	3	31	-1969.90	-2556.87	-774.60	0.00	-92.35	-74.82	0.00	-86.04	-42.46	4551.35	873.02	74.23	0.00	0.00	72.35	0.00	0.00	0.00
28	1987	4	30	-1733.79	-2245.43	-700.75	0.00	-80.64	-57.30	0.00	-77.06	-39.26	3377.33	742.32	61.69	0.00	0.00	59.90	0.00	0.00	0.00
29	1987	5	31	-1703.74	-1922.57	-644.61	0.00	-79.09	-53.30	0.00	-77.53	-39.14	3514.79	730.80	60.13	0.00	0.00	55.66	0.00	0.00	0.00
30	1987	6	30	-2474.02	-2331.82	-698.84	0.00	-72.80	-48.36	0.00	-73.64	-37.19	11138.85	2409.42	282.79	0.00	0.00	50.69	0.00	0.00	0.00
31	1987	7	31	-1996.98	-1895.18	-647.19	0.00	-71.72	-49.22	0.00	-74.69	-37.79	7270.35	1483.20	246.35	0.00	0.00	52.20	0.00	0.00	0.00
32	1987	8	31	-2295.78	-1395.54	-551.16	0.00	-68.48	-47.76	0.00	-73.32	-37.17	4850.72	476.42	72.11	0.00	0.00	50.61	0.00	0.00	0.00
33	1987	9	30	-1610.31	-1215.35	-528.25	0.00	-63.46	-45.71	0.00	-69.68	-35.38	3218.14	382.66	54.41	0.00	0.00	48.55	0.00	0.00	0.00
34	1987	10	31	-1750.02	-1334.66	-541.26	0.00	-64.89	-47.04	0.00	-74.05	-37.27	3988.55	476.02	51.79	0.00	0.00	47.49	0.00	0.00	0.00
35	1987	11	30	-1961.37	-1542.32	-533.33	0.00	-61.47	-37.10	0.00	-71.64	-36.33	3930.05	687.16	55.46	0.00	0.00	36.58	0.00	0.00	0.00
36	1987	12	31	-2422.34	-1755.67	-552.57	0.00	-121.57	-87.92	0.00	-80.87	-40.16	6698.29	785.97	44.15	0.00	0.00	78.60	0.00	0.00	0.00
37	1988	1	31	-2932.93	-2179.26	-666.39	0.00	-86.68	-76.74	0.00	-75.71	-40.35	6543.72	1021.93	70.84	0.00	0.00	71.92	0.00	0.00	0.00
38	1988	2	29	-2530.60	-2264.42	-647.17	0.00	-69.96	-56.20	0.00	-69.31	-36.90	5726.78	1196.51	95.57	0.00	0.00	55.87	0.00	0.00	0.00
39	1988	3	31	-2511.16	-2210.09	-631.44	0.00	-57.12	-41.32	0.00	-66.41	-36.56	5713.21	1278.56	106.27	0.00	0.00	41.46	0.00	0.00	0.00
40	1988	4	30	-2071.19	-2303.21	-652.79	0.00	-101.72	-76.35	0.00	-72.10	-38.48	5143.76	953.36	80.14	0.00	0.00	71.14	0.00	0.00	0.00
41	1988	5	31	-2802.26	-3132.85	-806.09	0.00	-55.69	-45.67	0.00	-64.88	-37.00	11809.11	2259.81	292.47	0.00	0.00	46.85	0.00	0.00	0.00
42	1988	6	30	-1887.50	-1894.40	-603.38	0.00	-52.19	-38.67	0.00	-60.78	-33.62	5755.54	905.32	119.30	0.00	0.00	39.91	0.00	0.00	0.00
43	1988	7	31	-1769.33	-1695.33	-566.78	0.00	-52.38	-40.58	0.00	-61.83	-33.90	3661.56	599.76	57.00	0.00	0.00	42.72	0.00	0.00	0.00
44	1988	8	31	-2228.29	-1435.82	-526.48	0.00	-50.93	-39.34	0.00	-60.87	-33.23	3855.40	509.74	55.95	0.00	0.00	41.36	0.00	0.00	0.00
45	1988	9	30	-2129.36	-1167.46	-480.42	0.00	-47.84	-37.55	0.00	-58.02	-31.57	3858.97	441.37	53.14	0.00	0.00	39.62	0.00	0.00	0.00
46	1988	10	31	-1599.95	-1031.41	-468.85	0.00	-48.14	-37.24	0.00	-59.06	-32.02	3668.22	517.82	53.42	0.00	0.00	39.02	0.00	0.00	0.00
47	1988	11	30	-1570.36	-1070.17	-463.79	0.00	-46.02	-31.56	0.00	-58.94	-31.36	3791.39	683.30	56.19	0.00	0.00	30.82	0.00	0.00	0.00
48	1988	12	31	-2601.84	-1246.94	-435.84	0.00	-108.77	-67.86	0.00	-69.71	-35.87	7884.78	822.43	27.61	0.00	0.00	63.39	0.00	0.00	0.00
49	1989	1	31	-1861.56	-1516.04	-533.32	0.00	-47.90	-36.21	0.00	-57.81	-33.22	4698.77	693.11	56.31	0.00	0.00	35.52	0.00	0.00	0.00
50	1989	2	28	-1874.86	-1440.00	-494.89	0.00	-68.06	-66.34	0.00	-57.57	-31.33	5066.83	1036.84	75.61	0.00	0.00	59.69	0.00	0.00	0.00
51	1989	3	31	-1758.32	-1657.63	-567.24	0.00	-46.96	-33.98	0.00	-56.25	-32.52	4585.22	804.60	66.20	0.00	0.00	32.00	0.00	0.00	0.00
52	1989	4	30	-1587.02	-1441.73	-515.31	0.00	-44.44	-27.90	0.00	-52.86	-29.69	3771.79	682.46	58.11	0.00	0.00	27.16	0.00	0.00	0.00
53	1989	5	31	-1665.89	-1715.87	-548.15	0.00	-44.98	-26.40	0.00	-53.88	-29.88	7610.81	1592.86	143.24	0.00	0.00	25.35	0.00	0.00	0.00
54	1989	6	30	-2169.76	-1153.85	-443.26	0.00	-42.70	-24.77	0.00	-51.44	-28.33	4060.43	562.90	53.79	0.00	0.00	23.79	0.00	0.00	0.00
55	1989	7	31	-1551.93	-1086.97	-428.78	0.00	-43.35	-28.58	0.00	-52.44	-28.79	3339.33	391.60	55.97	0.00	0.00	28.59	0.00	0.00	0.00
56	1989	8	31	-1505.69	-996.73	-406.63	0.00	-42.63	-28.48	0.00	-51.73	-28.31	2866.25	219.88	61.30	0.00	0.00	28.35	0.00	0.00	0.00
57	1989	9	30	-2048.70	-910.60	-372.25	0.00	-40.64	-27.59	0.00	-49.40	-26.93	3624.15	167.40	57.56	0.00	0.00	27.55	0.00	0.00	0.00
58	1989	10	31	-1569.82	-914.04	-361.41	0.00	-41.41	-27.31	0.00	-50.40	-27.35	3808.85	163.05	54.15	0.00	0.00	26.93	0.00	0.00	0.00
59	1989	11	30	-1543.58	-876.45	-347.22	0.00	-39.56	-26.38	0.00	-48.14	-26.02	3616.50	148.01	55.39	0.00	0.00	26.09	0.00	0.00	0.00
60	1989	12	31	-1580.17	-874.18	-350.70	0.00	-40.40	-26.14	0.00	-49.12	-26.42	3613.89	146.93	61.51	0.00	0.00	25.51	0.00	0.00	0.00
61	1990	1	31	-1849.89	-1083.10	-370.07	0.00	-72.98	-44.06	0.00	-56.82	-29.43	4852.16	641.20	68.15	0.00	0.00	42.82	0.00	0.00	0.00
62	1990	2	28	-1855.90	-1111.07	-354.61	0.00	-60.27	-51.38	0.00	-51.36	-27.78	4957.94	851.64	55.89	0.00	0.00	51.33	0.00	0.00	0.00
63	1990	3	31	-2321.00	-1098.36	-368.54	0.00	-41.51	-29.63	0.00	-48.54	-27.67	4963.18	642.57	61.18	0.00	0.00	28.77	0.00	0.00	0.00
64	1990	4	30	-2140.02	-888.99	-310.26	0.00	-39.64	-25.12	0.00	-45.59	-25.05	4897.36	276.39	60.99	0.00	0.00	24.39	0.00	0.00	0.00
65	1990	5	31	-1553.64	-846.87	-297.27	0.00	-40.45	-20.54	0.00	-46.55	-25.36	3451.10	148.44	68.30	0.00	0.00	18.03	0.00	0.00	0.00
66	1990	6	30	-1488.60	-737.53	-260.03	0.00	-38.71	-23.04	0.00	-44.51	-24.13	3238.01	139.16	66.69	0.00	0.00	22.09	0.00	0.00	0.00
67	1990	7	31	-2093.19	-683.14	-248.37	0.00	-39.58	-24.58	0.00	-45.45	-24.58	3778.81	142.32	75.98	0.00	0.00	23.61	0.00	0.00	0.00
68	1990	8	31	-1530.34	-628.98	-231.87	0.00	-39.19	-24.13	0.00	-44.92	-24.25	3479.38	141.48	72.02	0.00	0.00	23.05	0.00	0.00	0.00
69	1990	9	30	-2085.30	-574.78	-221.53	0.00	-37.59	-23.57	0.00	-42.97	-23.15	3979.59	135.99	69.37	0.00	0.00	22.64	0.00	0.00	0.00
70	1990	10	31	-1540.69	-564.02	-226.93	0.00	-38.53	-23.21	0.00	-43.90	-23.58	3366.64	152.74	73.38	0.00	0.00	21.94	0.00	0.00	0.00
71	1990	11	30	-1534.34	-514.12	-212.69	0.00	-37.00	-22.55	0.00	-42.01	-22.50	3634.04	147.88	69.19	0.00	0.00	21.44	0.00	0.00	0.00
72	1990	12	31	-1560.60	-511.40	-224.09	0.00	-37.97	-22.15	0.00	-42.92	-22.91	3340.15	159.22	75.66	0.00	0.00	20.68	0.00	0.00	0.00
73	1991	1	31	-1644.16	-547.76	-217.56	0.00	-38.86	-20.01	0.00	-45.75	-24.05	3835.84	297.46	75.14	0.00	0.00	15.49	0.00	0.00	0.00
74	1991	2	28	-1610.38	-631.70	-210.03	0.00	-62.17	-38.45	0.00	-44.57	-22.85	4012.37	557.82	70.67	0.00	0.00	37.39	0.00	0.00	0.00
75	1991	3	31	-4198.00	-979.65	-371.17	0.00	-292.20	-180.25	0.00	-156.63	-35.46	9860.75	3727.40	193.12	0.00	0.00	173.59	0.00	0.00	0.00
76	1991	4	30	-2101.48	-1007.03	-355.82	0.00	-78.31	-40.17	0.00	-44.52	-27.86	3966.69	1879.79	173.24	0.00	0.00	37.36	0.00	0.00	0.00
77	1991	5	31	-1590.05	-778.62	-335.60	0.00	-49.64	-21.70	0.00	-41.56	-24.31	4669.60	1300.73	134.79	0.00	0.00	18.58	0.00	0.00	0.00
78	1991	6	30	-1549.85	-652.05	-308.47	0.00	-46.66	-19.40	0.00	-39.80	-22.65	3575.80	843.86	104.82	0.00	0.00	16.50	0.00	0.00	0.00
79	1991	7	31	-2065.79	-611.31	-298.54	0.00	-46.98	-21.01	0.00	-40.72	-23.03	3401.45	372.67	81.88	0.00	0.00	18.64	0.00	0.00	0.00
80	1991	8	31	-1939.63	-555.01	-282.07	0.00	-45.86	-19.66	0.00	-40.31	-22.75	2944.04	182.85	82.97	0.00	0.00	17.24	0.00	0.00	0.00
81	1991	9	30	-1417.34	-487.81	-257.63	0.00	-43.42	-19.06	0.00	-38.63	-21.74	2524.59	157.54	80.54	0.00	0.00	16.87	0.00	0.00	0.00
82	1991	10	31	-1529.16	-760.92	-288.51	0.00	-43.98	-19.08	0.00	-39.55	-22.17	12742.65	3667.96	467.01	0.00	0.00	16.55	0.00	0.00	0.00
83	1991	11	30	-2160.23	-506.68	-245.21	0.00	-41.78	-18.44	0.00	-37.92	-21.16	5144.32	850.10	189.43	0.00	0.00	16.13	0.00	0.00	0.00
84	1991	12	31	-2255.04	-611.15	-244.32	0.00	-111.69	-64.47	0.00	-51.11	-25.40	4986.60	646.06	47.01	0.00	0.00	59.77	0.00	0.00	0.00
85	1992	1	31	-2132.14	-773.76	-287.92	0.00	-53.76	-38.85	0.00	-44.67	-25.15	5243.98	1286.99	77.09	0.00	0.00	35.33	0.00	0.00	0.00
86	1992	2	29	-4602.74	-1061.13	-390.35	0.00	-275.22	-179.40	0.00	-147.24	-33.36	14055.43	4788.33	186.21	0.00	0.00	174.36	0.00	0.00	0.00
87	1992	3	31	-3545.53	-1456.88	-499.17	0.00	-227.60	-157.10	0.00	-90.64	-36.43	9526.75	3562.34	269.28	0.00	0.00	140.47	0.00	0.00	0.00
88	1992	4	30	-2914.51	-1598.23	-584.36	0.00	-58.35	-31.69	0.00	-39.50	-27.61	8890.09	2291.98	368.31	0.00	0.00	26.90	0.00	0.00	0.00
89	1992	5	31	-2645.31	-1083.11	-436.75	0.00	-58.05	-18.23	0.00	-38.33	-24.92	5656.60	1444.06	125.73	0.00	0.00	13.14	0.00	0.00	0.00
90	1992	6	30	-1597.40	-958.75	-406.63	0.00	-54.21	-17.13	0.00	-36.75	-23.16	3720.81	1060.44	95.97	0.00	0.00	12.29	0.00	0.00	0.00
91	1992	7	31	-1536.61	-902.07	-388.89	0.00	-54.18	-19.26	0.00	-37.64	-23.32	3110.10	1007.62	87.41	0.00	0.00	16.46	0.00	0.00	0.00
92	1992	8	31	-1492.36	-821.56	-362.92	0.00	-52.53	-19.13	0.00	-37.29	-23.00	2729.93	674.29	78.93	0.00	0.00	16.31	0.00	0.00	0.00
93	1992	9	30	-1441.84	-918.96	-337.76	0.00	-49.42	-18.53	0.00	-35.77	-21.97	6993.33	1648.73	176.76	0.00	0.00	15.98	0.00	0.00	0.00
94	1992	10	31	-1776.36	-1273.95	-412.33	0.00	-51.35	-21.65	0.00	-40.68	-23.84	11567.44	3688.73	579.11	0.00	0.00	16.88	0.00	0.00	0.00
95	1992	11	30	-2422.83	-1169.91	-401.47	0.00	-46.72	-18.34	0.00	-35.66	-22.03	8770.28	2859.19	445.83	0.00	0.00	15.69	0.00	0.00	0.00
96	1992	12	31	-2755.16	-1227.40	-441.86	0.00	-143.98	-60.16	0.00	-61.51	-26.93	6341.45	1740.10	159.95	0.00	0.00	53.86	0.00	0.00	0.00
97	1993	1	31	-4782.79	-1911.91	-531.60	0.00	-290.69	-177.96	0.00	-148.08	-36.98	12318.77	4644.98	196.20	0.00	0.00	168.57	0.00	0.00	0.00
98	1993	2	28	-4200.21	-2596.44	-664.06	0.00	-259.93	-221.14	0.00	-127.93	-37.26	12127.12	5028.29	366.93	0.00	0.00	214.67	0.00	0.00	0.00
99	1993	3	31	-4934.59	-3295.58	-790.07	0.00	-188.57	-133.51	0.00	-53.43	-35.63	16451.97	3185.06	341.84	0.00	0.00	120.50	0.00	0.00	0.00
100	1993	4	30	-4532.41	-3042.47	-672.79	0.00	-67.30	-40.08	0.00	-36.31	-27.91	11904.33	1814.28	258.02	0.00	0.00	36.08	0.00	0.00	0.00
101	1993	5	31	-5772.15	-3087.29	-721.64	0.00	-66.48	-22.52	0.00	-36.13	-26.23	9393.57	1525.33	382.56	0.00	0.00	18.25	0.00	0.00	0.00
102	1993	6	30	-3885.56	-2143.87	-455.20	0.00	-61.64	-17.56	0.00	-34.67	-24.53	6804.61	930.21	96.82	0.00	0.00	12.89	0.00	0.01	0.00
103	1993	7	31	-3367.33	-2119.03	-455.70	0.00	-61.17	-19.13	0.00	-35.60	-24.79	5274.75	866.56	100.17	0.00	0.00	16.31	0.00	0.09	0.00
104	1993	8	31	-3288.93	-1990.02	-424.89	0.00	-58.85	-18.99	0.00	-35.41	-24.34	6141.23	801.18	104.16	0.00	0.00	16.14	0.00	0.21	0.00
105	1993	9	30	-3106.29	-1816.74	-397.86	0.00	-54.94	-18.43	0.00	-34.07	-23.16	7237.27	776.63	124.33	0.00	0.00	15.83	0.00	0.31	0.00
106	1993	10	31	-3692.59	-1777.60	-415.83	0.00	-54.89	-18.78	0.00	-35.00	-23.57	6842.52	814.18	137.18	0.00	0.00	15.86	0.00	0.43	0.00
107	1993	11	30	-2936.86	-1814.27	-424.93	0.00	-51.48	-17.64	0.00	-33.69	-22.48	5841.81	801.85	117.31	0.00	0.00	13.29	0.00	0.52	0.00
108	1993	12	31	-2819.06	-2010.19	-452.68	0.00	-53.15	-21.81	0.00	-37.40	-24.13	5879.15	802.92	82.02	0.00	0.00	17.12	0.00	0.02	0.00
109	1994	1	31	-2593.65	-2131.01	-436.60	0.00	-50.27	-17.16	0.00	-34.69	-23.13	6294.23	1026.00	93.58	0.00	0.00	12.34	0.00	0.57	0.00
110	1994	2	28	-3138.00	-2274.36	-461.59	0.00	-161.50	-67.65	0.00	-67.86	-25.83	5876.73	1500.08	127.33	0.00	0.00	53.35	0.00	0.01	0.00
111	1994	3	31	-3041.65	-2813.22	-510.08	0.00	-63.50	-43.33	0.00	-40.83	-28.07	5912.41	1110.05	84.32	0.00	0.00	40.11	0.00	0.00	0.00

Monthly Streamflow Budget
units in Acre-feet

				Rising Groundwater									Stream Percolation								
				System A Rising Groundwater			System B Rising Groundwater			System C Rising Groundwater			System A Stream Percolation			System B Stream Percolation			System C Stream Percolation		
Stress	Year	Month	days in month	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula
112	1994	4	30	-3117.32	-2508.74	-458.77	0.00	-50.39	-18.49	0.00	-33.57	-23.79	6009.42	890.11	68.29	0.00	0.00	14.18	0.00	0.65	0.00
113	1994	5	31	-3027.96	-2384.43	-442.64	0.00	-50.62	-17.72	0.00	-34.13	-22.99	6032.65	924.00	64.38	0.00	0.00	13.09	0.00	1.02	0.00
114	1994	6	30	-2290.48	-2289.91	-438.14	0.00	-47.55	-17.08	0.00	-32.84	-21.65	4193.27	769.90	81.04	0.00	0.00	12.71	0.00	1.08	0.00
115	1994	7	31	-2806.57	-2124.60	-435.51	0.00	-47.87	-18.41	0.00	-33.73	-22.03	3998.79	752.56	79.78	0.00	0.00	15.11	0.00	1.20	0.00
116	1994	8	31	-2684.85	-1888.38	-410.14	0.00	-46.71	-18.23	0.00	-33.54	-21.73	4733.51	779.76	106.25	0.00	0.00	14.88	0.00	1.29	0.00
117	1994	9	30	-3318.10	-2516.49	-425.62	0.00	-44.21	-17.61	0.00	-32.28	-20.70	9405.66	2470.98	352.51	0.00	0.00	14.52	0.00	1.33	0.00
118	1994	10	31	-3264.96	-2559.25	-428.89	0.00	-44.76	-16.91	0.00	-33.18	-21.07	8118.90	2058.91	372.37	0.00	0.00	11.37	0.00	1.45	0.00
119	1994	11	30	-2371.58	-1933.76	-384.23	0.00	-42.75	-18.73	0.00	-33.25	-20.71	6126.55	1027.61	168.14	0.00	0.00	14.18	0.00	0.88	0.00
120	1994	12	31	-2142.07	-1713.13	-344.10	0.00	-43.94	-17.61	0.00	-34.94	-21.70	7289.01	626.66	53.30	0.00	0.00	12.10	0.00	0.60	0.00
121	1995	1	31	-5809.89	-3296.06	-644.62	0.00	-363.69	-283.49	0.00	-234.94	-42.99	10882.75	5377.96	447.42	0.00	0.00	246.23	0.00	0.01	0.00
122	1995	2	28	-4999.39	-4466.92	-943.93	0.00	-180.54	-64.72	0.00	-40.04	-32.39	7738.72	2245.77	990.81	0.00	0.00	59.12	0.00	0.00	0.00
123	1995	3	31	-4413.15	-3609.64	-781.76	0.00	-242.96	-197.10	0.00	-101.95	-35.86	11470.99	2713.36	323.75	0.00	0.00	187.95	0.00	0.00	0.00
124	1995	4	30	-4610.39	-4011.38	-763.17	0.00	-64.20	-44.10	0.00	-34.55	-28.76	8505.31	1467.15	257.49	0.00	0.00	38.38	0.00	0.87	0.00
125	1995	5	31	-6440.47	-4755.65	-1134.98	0.00	-63.88	-23.82	0.00	-35.18	-26.45	7747.70	1714.84	708.96	0.00	0.00	17.76	0.00	0.85	0.00
126	1995	6	30	-3578.54	-2817.32	-521.85	0.00	-59.10	-17.48	0.00	-32.40	-24.19	5812.78	890.04	94.74	0.00	0.00	11.80	0.00	1.52	0.00
127	1995	7	31	-6906.78	-4246.92	-676.25	0.00	-58.78	-18.56	0.00	-33.14	-24.01	8692.94	2323.19	381.36	0.00	0.00	14.92	0.00	1.78	0.00
128	1995	8	31	-5173.87	-3406.87	-597.55	0.00	-56.68	-18.42	0.00	-32.94	-23.50	8209.30	1852.71	368.84	0.00	0.00	14.77	0.00	1.85	0.00
129	1995	9	30	-4363.14	-3118.00	-550.34	0.00	-53.03	-17.85	0.00	-31.69	-22.32	7126.27	1859.14	366.37	0.00	0.00	14.49	0.00	1.86	0.00
130	1995	10	31	-4145.72	-3088.57	-552.49	0.00	-53.12	-18.18	0.00	-32.56	-22.71	7571.24	2053.86	401.82	0.00	0.00	14.50	0.00	1.99	0.00
131	1995	11	30	-3981.79	-2944.31	-533.93	0.00	-49.97	-17.60	0.00	-31.33	-21.67	7113.81	1817.28	345.61	0.00	0.00	14.19	0.00	1.98	0.00
132	1995	12	31	-2522.03	-2133.28	-487.44	0.00	-51.57	-27.92	0.00	-34.16	-23.66	5667.22	716.29	64.87	0.00	0.00	25.01	0.00	1.22	0.00
133	1996	1	31	-2351.83	-2250.53	-489.32	0.00	-49.07	-19.11	0.00	-33.48	-23.54	5138.66	764.56	61.89	0.00	0.00	13.60	0.00	1.44	0.00
134	1996	2	29	-3053.74	-2160.94	-517.01	0.00	-157.47	-94.58	0.00	-71.24	-30.35	7312.39	1244.39	52.62	0.00	0.00	82.60	0.00	0.06	0.00
135	1996	3	31	-2827.69	-2666.68	-588.57	0.00	-53.52	-33.99	0.00	-35.90	-29.48	8229.39	841.79	44.35	0.00	0.00	28.65	0.00	0.53	0.00
136	1996	4	30	-3128.38	-2526.01	-534.70	0.00	-48.86	-17.40	0.00	-31.19	-23.98	8829.17	627.79	38.22	0.00	0.00	12.81	0.00	2.00	0.00
137	1996	5	31	-2542.77	-2602.86	-530.90	0.00	-49.02	-17.60	0.00	-31.85	-23.08	5526.14	674.53	54.72	0.00	0.00	12.79	0.00	2.32	0.00
138	1996	6	30	-2520.25	-2490.71	-505.62	0.00	-46.22	-16.97	0.00	-30.66	-21.65	3427.29	653.03	76.42	0.00	0.00	12.45	0.00	2.30	0.00
139	1996	7	31	-2322.87	-2217.71	-472.10	0.00	-46.63	-18.32	0.00	-31.52	-21.94	3419.88	500.13	75.26	0.00	0.00	14.89	0.00	2.44	0.00
140	1996	8	31	-2737.57	-1904.01	-427.40	0.00	-45.59	-18.14	0.00	-31.35	-21.63	4140.74	398.34	77.56	0.00	0.00	14.68	0.00	2.49	0.00
141	1996	9	30	-3332.93	-2426.83	-436.49	0.00	-43.23	-17.53	0.00	-30.19	-20.64	7813.28	2069.00	292.67	0.00	0.00	14.34	0.00	2.47	0.00
142	1996	10	31	-3481.99	-2584.19	-440.28	0.00	-46.62	-27.24	0.00	-34.58	-23.96	9608.12	1968.12	372.44	0.00	0.00	23.19	0.00	0.97	0.00
143	1996	11	30	-2800.91	-2202.24	-469.77	0.00	-44.98	-30.63	0.00	-33.24	-24.16	5285.87	1293.22	194.47	0.00	0.00	28.70	0.00	0.90	0.00
144	1996	12	31	-3045.70	-2015.38	-476.45	0.00	-142.38	-91.75	0.00	-64.24	-31.51	6823.17	1884.45	110.53	0.00	0.00	75.92	0.00	0.04	0.00
145	1997	1	31	-3752.19	-2785.09	-643.13	0.00	-108.20	-118.81	0.00	-43.84	-32.35	7957.50	1680.80	188.68	0.00	0.00	105.29	0.00	0.00	0.00
146	1997	2	28	-2639.86	-2762.10	-604.54	0.00	-43.72	-24.77	0.00	-28.63	-23.87	6024.11	896.14	130.15	0.00	0.00	20.50	0.00	1.92	0.00
147	1997	3	31	-2760.26	-2217.13	-485.10	0.00	-47.18	-17.45	0.00	-31.01	-23.38	10339.29	703.62	37.28	0.00	0.00	12.27	0.00	2.78	0.00
148	1997	4	30	-2768.98	-2323.52	-498.98	0.00	-44.60	-16.79	0.00	-30.00	-21.73	5855.57	640.44	62.33	0.00	0.00	11.92	0.00	2.89	0.00
149	1997	5	31	-2234.40	-2384.28	-508.82	0.00	-45.10	-17.04	0.00	-31.00	-21.88	3450.60	629.42	81.31	0.00	0.00	11.87	0.00	3.19	0.00
150	1997	6	30	-2062.47	-2138.92	-459.55	0.00	-42.78	-16.41	0.00	-30.00	-20.84	2952.50	443.64	81.54	0.00	0.00	11.53	0.00	3.27	0.00
151	1997	7	31	-2939.85	-2081.74	-429.01	0.00	-43.40	-17.77	0.00	-31.00	-21.25	4575.15	581.95	97.79	0.00	0.00	14.04	0.00	3.57	0.00
152	1997	8	31	-3387.35	-2585.94	-448.88	0.00	-42.66	-17.59	0.00	-31.00	-20.97	9827.17	2252.91	365.36	0.00	0.00	13.82	0.00	3.76	0.00
153	1997	9	30	-2979.44	-2173.79	-397.23	0.00	-40.65	-16.99	0.00	-30.00	-20.02	7466.83	1721.15	355.29	0.00	0.00	13.50	0.00	3.82	0.00
154	1997	10	31	-3713.53	-2136.57	-381.01	0.00	-41.40	-17.23	0.00	-31.00	-20.37	8895.17	1845.69	391.87	0.00	0.00	13.39	0.00	4.12	0.00
155	1997	11	30	-2385.60	-1651.80	-358.84	0.00	-47.97	-28.95	0.00	-32.17	-22.36	5302.77	717.65	101.68	0.00	0.00	26.16	0.00	1.58	0.00
156	1997	12	31	-3152.63	-1728.18	-406.85	0.00	-106.78	-71.41	0.00	-42.06	-27.04	6046.47	1120.94	62.55	0.00	0.00	56.60	0.00	0.12	0.00
157	1998	1	31	-2609.24	-1900.72	-432.28	0.00	-59.64	-64.47	0.00	-33.63	-26.63	6652.13	1144.97	34.92	0.00	0.00	62.37	0.00	1.10	0.00
158	1998	2	28	-6070.42	-3116.58	-890.63	0.00	-278.37	-394.78	0.00	-166.18	-41.95	13842.52	5741.86	446.02	0.00	0.00	305.95	0.00	0.04	0.00
159	1998	3	31	-6523.93	-3868.86	-1018.21	0.00	-137.43	-144.29	0.00	-38.54	-38.94	14679.92	2127.50	250.25	0.00	0.00	134.06	0.00	0.31	0.00
160	1998	4	30	-6096.57	-3656.89	-928.86	0.00	-55.25	-51.18	0.00	-31.96	-29.12	10506.19	1685.86	275.34	0.00	0.00	45.56	0.00	1.57	0.00
161	1998	5	31	-6777.82	-3945.95	-979.79	0.00	-101.15	-83.22	0.00	-36.14	-31.06	9379.47	1725.27	206.00	0.00	0.00	78.78	0.00	0.25	0.00
162	1998	6	30	-7296.70	-4198.07	-1050.27	0.00	-52.54	-23.97	0.00	-30.18	-26.65	7619.26	1377.92	360.78	0.00	0.00	18.09	0.00	3.03	0.00
163	1998	7	31	-7266.85	-4071.09	-1275.06	0.00	-52.63	-18.25	0.00	-31.00	-25.20	7314.52	1599.10	605.99	0.00	0.00	13.80	0.00	4.09	0.00
164	1998	8	31	-2499.91	-2436.46	-543.59	0.00	-51.12	-17.76	0.00	-31.00	-24.46	5996.42	713.02	56.97	0.00	0.00	13.30	0.00	4.28	0.00
165	1998	9	30	-5329.31	-3326.51	-668.32	0.00	-47.99	-17.10	0.00	-30.00	-23.18	8071.31	1904.33	272.21	0.00	0.00	12.82	0.00	4.32	0.00
166	1998	10	31	-4695.04	-3225.92	-740.50	0.00	-48.23	-17.52	0.00	-31.00	-23.54	8232.84	2053.04	395.87	0.00	0.00	13.03	0.00	4.65	0.00
167	1998	11	30	-5133.24	-3059.04	-735.52	0.00	-45.96	-18.03	0.00	-30.53	-23.10	8669.75	1888.68	360.43	0.00	0.00	13.21	0.00	3.81	0.00
168	1998	12	31	-4551.61	-3041.31	-732.51	0.00	-45.98	-17.28	0.00	-31.00	-23.22	9465.78	1873.93	346.43	0.00	0.00	12.66	0.00	4.79	0.00
169	1999	1	31	-2743.73	-2182.50	-625.20	0.00	-46.68	-27.55	0.00	-32.47	-25.12	6999.17	841.03	77.46	0.00	0.00	23.72	0.00	2.77	0.00
170	1999	2	28	-2237.91	-1994.56	-555.74	0.00	-40.15	-18.07	0.00	-28.90	-22.71	6048.60	678.12	46.35	0.00	0.00	13.31	0.00	2.86	0.00
171	1999	3	31	-2572.25	-2288.04	-631.42	0.00	-45.49	-33.76	0.00	-32.55	-26.26	6554.84	702.14	39.66	0.00	0.00	32.43	0.00	2.56	0.00
172	1999	4	30	-3097.80	-2057.51	-590.24	0.00	-43.11	-29.35	0.00	-31.34	-25.28	9491.96	774.54	24.68	0.00	0.00	26.13	0.00	2.59	0.00
173	1999	5	31	-2922.00	-2149.50	-586.13	0.00	-42.14	-17.87	0.00	-31.00	-23.78	7381.80	626.09	30.50	0.00	0.00	13.51	0.00	5.04	0.00
174	1999	6	30	-2495.52	-2162.28	-549.65	0.00	-40.19	-16.99	0.00	-30.00	-21.73	5448.02	581.28	50.82	0.00	0.00	12.90	0.00	5.41	0.00
175	1999	7	31	-2635.54	-2248.66	-560.42	0.00	-40.98	-17.42	0.00	-31.00	-21.93	2451.63	600.15	81.90	0.00	0.00	13.21	0.00	5.74	0.00
176	1999	8	31	-2278.30	-1988.56	-506.03	0.00	-40.47	-17.24	0.00	-31.00	-21.60	2713.06	471.90	76.74	0.00	0.00	12.99	0.00	5.89	0.00
177	1999	9	30	-3656.58	-2651.71	-512.53	0.00	-38.71	-16.65	0.00	-30.00	-20.62	8968.02	2242.77	328.03	0.00	0.00	12.67	0.00	5.83	0.00
178	1999	10	31	-2840.80	-2117.66	-496.55	0.00	-39.59	-16.89	0.00	-31.00	-21.00	6428.99	1249.15	272.52	0.00	0.00	12.55	0.00	6.17	0.00
179	1999	11	30	-2109.86	-1601.31	-445.09	0.00	-37.94	-16.31	0.00	-30.00	-20.04	3933.79	372.90	67.88	0.00	0.00	11.37	0.00	6.10	0.00
180	1999	12	31	-2143.19	-1595.38	-444.80	0.00	-38.85	-16.56	0.00	-31.00	-20.41	3927.42	506.35	67.32	0.00	0.00	12.12	0.00	6.43	0.00
181	2000	1	31	-2224.67	-1636.53	-451.09	0.00	-39.39	-21.66	0.00	-31.92	-21.52	4401.19	647.50	70.12	0.00	0.00	16.32	0.00	5.08	0.00
182	2000	2	29	-2981.84	-1590.64	-464.41	0.00	-123.92	-96.61	0.00	-55.66	-27.91	8471.17	1479.30	79.35	0.00	0.00	87.96	0.00	0.39	0.00
183	2000	3	31	-2868.67	-2126.01	-573.15	0.00	-44.39	-51.97	0.00	-32.68	-27.17	8548.18	1329.81	103.15	0.00	0.00	49.54	0.00	2.66	0.00
184	2000	4	30	-2421.05	-2140.84	-611.33	0.00	-41.98	-60.23	0.00	-31.46	-24.30	4985.33	1127.89	103.02	0.00	0.00	58.16	0.00	3.55	0.00
185	2000	5	31	-2702.54	-1893.51	-536.95	0.00	-40.80	-20.84	0.00	-31.00	-22.52	5981.28	742.17	59.82	0.00	0.00	16.53	0.00	6.11	0.00
186	2000	6	30	-2434.94	-1397.55	-386.96	0.00	-38.99	-17.12	0.00	-30.00	-20.35	7627.64	523.49	22.52	0.00	0.00	13.14	0.00	6.45	0.00
187	2000	7	31	-2036.67	-1683.32	-477.96	0.00	-39.83	-16.88	0.00	-31.00	-20.51	3359.96	518.25	72.51	0.00	0.00	12.00	0.00	6.80	0.00
188	2000	8	31	-1940.54	-1462.39	-450.94	0.00	-39.40	-16.66	0.00	-31.00	-20.23	2959.43	442.39	72.97	0.00	0.00	11.77	0.00	6.93	0.00
189	2000	9	30	-2960.86	-2007.55	-461.04	0.00	-37.76	-16.04	0.00	-30.00	-19.31	11384.62	2872.52	434.25	0.00	0.00	11.46	0.00	6.83	0.00
190	2000	10	31	-3230.74	-2273.85	-514.20	0.00	-39.83	-21.45	0.00	-32.45	-21.55	9413.22	2233.49	500.33	0.00	0.00	15.84	0.00	4.80	0.00
191	2000	11	30	-2563.13	-1767.89	-484.86	0.00	-37.17	-15.76	0.00	-30.00	-19.64	5951.25	1149.83	232.81	0.00	0.00	11.12	0.00	6.56	0.00
192	2000	12	31	-2102.78	-1433.49	-453.51	0.00	-38.12	-15.98	0.00	-31.00	-19.37	3922.49	599.50	68.25	0.00	0.00	10.98	0.00	7.32	0.00
193	2001	1	31	-2761.48	-1734.94	-491.66	0.00	-156.64	-62.40	0.00	-63.54	-26.19	6024.45	1093.09	90.79	0.00	0.00	45.33	0.00	0.58	0.00
194	2001	2	28	-3508.18	-2138.76	-562.60	0.00	-195.84	-102.16	0.00	-81.35	-28.43	7209.64	2238.51	189.81	0.00	0.00	89.77	0.00	0.00	0.00
195	2001	3	31	-3336.60	-3031.83	-745.97	0.00	-133.16	-157.05	0.00	-53.46	-31.66	8915.10	2996.43	328.67	0.00	0.00	141.95	0.00	0.00	0.00
196	2001	4	30	-3131.77	-2993.10	-691.71	0.00	-52.09	-33.85	0.00	-31.88	-26.54	6265.39	1063.11	114.68	0.00	0.00	27.85	0.00	2.19	0.00
197	2001	5	31	-2238.36	-2621.46	-627.28	0.00	-50.47	-17.68	0.00	-31.00	-23.29	4403.28	810.98	93.75	0.00	0.00	12.70	0.00	6.11	0.00
198	2001	6	30	-2069.49	-2151.08	-534.07	0.00	-47.35	-16.97	0.00	-30.00	-20.93	4262.74	710.57	86.54	0.00	0.00	12.33	0.00	6.57	0.00
199	2001	7	31	-2098.03	-1975.51	-514.08	0.00	-47.61	-16.95	0.00	-31.00	-20.90	3349.50	698.76	84.80	0.00	0.00	11.46	0.00	6.94	0.00
200	2001	8	31	-2567.06	-1816.88	-487.77	0.00	-46.43	-16.73	0.00	-31.00	-20.49	3156.75	651.99	80.41	0.00	0.00	11.26	0.00	7.09	0.00
201	2001	9	30	-3123.04	-2427.17	-506.11	0.00	-43.91	-15.98	0.00	-30.00	-19.54	11385.33	2991.32	455.61	0.00	0.00	10.84	0.00	6.99	0.00
202	2001	10	31	-3172.68	-2366.46	-533.56	0.00	-44.44	-16.31	0.00	-31.00	-19.92	9140.06	2326.89	499.98	0.00	0.00	10.86	0.00	7.35	0.00
203	2001	11	30	-3059.27	-2362.77	-550.03	0.00	-68.68	-38.08	0.00	-32.44	-21.92	6436.22	1279.24	221.77	0.00	0.00	35.73	0.00	3.09	0.00
204	2001	12	31	-2336.66	-2171.18	-522.87	0.00	-45.44	-19.47	0.00	-32.12	-21.93	5435.02	658.65	66.48	0.00	0.00	13.13	0.00	4.77	0.00
205	2002	1	31	-2234.99	-2268.27	-528.46	0.00	-43.53	-17.47	0.00	-31.71	-20.76	5082.88	671.54	70.87	0.00	0.00	10.65	0.00	5.97	0.00
206	2002	2	28	-1964.15	-1998.61	-472.08	0.00	-38.42	-14.53	0.00	-28.00	-17.81	3877.63	618.97	70.44	0.00	0.00	9.42	0.00	6.64	0.00
207	2002	3	31	-2069.90	-1969.55	-473.54	0.00	-41.89	-15.91	0.00	-31.00	-19.19	4714.32	658.86	70.89	0.00	0.00	9.81	0.00	7.70	0.00
208	2002	4	30	-1946.27	-1772.45	-432.32	0.00	-39.96	-15.21	0.00	-30.00	-18.30	4143.57	628.13	69.28	0.00	0.00	9.39	0.00	7.57	0.00
209	2002	5	31	-2523.34	-1736.93	-430.06	0.00	-40.74	-15.54	0.00	-31.00	-18.66	3899.70	627.16	75.29	0.00	0.00	9.34	0.00	7.94	0.00
210	2002	6	30	-1800.06	-1558.88	-393.42	0.00	-38.95	-14.87	0.00	-30.00	-17.81	3168.40	518.34	70.56	0.00	0.00	8.94	0.00	7.79	0.00
211	2002	7	31	-2389.08	-1436.42	-369.39	0.00	-39.79	-15.85	0.00	-31.00	-18.18	3605.72	489.10	70.43	0.00	0.00	11.27	0.00	8.15	0.00
212	2002	8	31	-2035.27	-1280.17	-354.85	0.00	-39.37	-15.67	0.00	-31.00	-17.95	2319.59	522.78	79.65	0.00	0.00	11.04	0.00	8.26	0.00
213	2002	9	30	-2185.52	-1767.88	-356.88	0.00	-37.74	-15.14	0.00	-30.00	-17.15	10895.64	3005.91	458.21	0.00	0.00	10.78	0.00	8.09	0.00
214	2002	10	31	-1921.31	-1159.07	-323.33	0.00	-38.66	-15.33	0.00	-31.00	-17.48	2934.03	581.85	88.73	0.00	0.00	10.59	0.00	8.46	0.00
215	2002	11	30	-2295.04	-1438.34	-368.03	0.00	-90.83	-45.66	0.00	-33.02	-20.14	3870.28	745.59	80.43	0.00	0.00	38.81	0.00	3.06	0.00
216	2002	12	31	-2455.96	-1686.22	-389.27	0.00	-89.35	-41.97	0.00	-33.97	-22.62	6053.64	773.04	44.81	0.00	0.00	37.99	0.00	2.36	0.00
217	2003	1	31	-2012.23	-1780.34	-421.77	0.00	-41.92	-15.35	0.00	-31.00	-19.06	4699.91	683.10	71.80	0.00	0.00	8.48	0.00	7.48	0.00
218	2003	2	28	-2627.27	-1547.63	-367.21	0.00	-112.02	-47.49	0.00	-39.95	-19.91	6462.38	1079.89	58.79	0.00	0.00	39.71	0.00	1.72	0.00
219	2003	3	31	-2535.11	-2039.78	-460.90	0.00	-80.19	-60.00	0.00	-33.66	-22.40	6440.47	1120.17	73.38	0.00	0.00	58.38	0.00	2.54	0.00
220	2003	4	30	-2586.00	-1768.14	-375.53	0.00	-44.79	-19.66	0.00	-31.50	-20.31	8169.48	914.41	35.43	0.00	0.00	12.34	0.00	4.76	0.00
221	2003	5	31	-2007.30	-2135.60	-479.58	0.00	-46.17	-22.98	0.00	-32.70	-20.89	4827.78	1201.88	122.26	0.00	0.00	17.27	0.00	5.04	0.00
222	2003	6	30	-1777.00	-1904.41	-450.24	0.00	-41.86	-15.17	0.00	-30.00	-18.37	3741.74	687.98	76.37	0.00	0.00	8.66	0.00	7.55	0.00

Monthly Streamflow Budget
units in Acre-feet

				Rising Groundwater									Stream Percolation								
				System A Rising Groundwater			System B Rising Groundwater			System C Rising Groundwater			System A Stream Percolation			System B Stream Percolation			System C Stream Percolation		
Stress	Year	Month	days in month	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula
223	2003	7	31	-1740.67	-1701.42	-436.66	0.00	-42.51	-16.18	0.00	-31.00	-17.81	3140.26	638.16	73.76	0.00	0.00	11.57	0.00	8.42	0.00
224	2003	8	31	-1657.07	-1488.30	-413.56	0.00	-41.82	-15.96	0.00	-31.00	-17.59	2705.96	612.41	73.33	0.00	0.00	11.33	0.00	8.53	0.00
225	2003	9	30	-2029.07	-1950.89	-428.28	0.00	-39.89	-15.38	0.00	-30.00	-16.81	11468.81	2962.48	445.11	0.00	0.00	11.06	0.00	8.35	0.00
226	2003	10	31	-2247.32	-1623.63	-405.17	0.00	-40.67	-15.55	0.00	-31.00	-17.16	6802.21	1368.95	248.91	0.00	0.00	10.86	0.00	8.73	0.00
227	2003	11	30	-1864.64	-1439.94	-368.33	0.00	-41.17	-28.36	0.00	-32.14	-18.13	4338.49	620.83	60.79	0.00	0.00	25.66	0.00	4.94	0.00
228	2003	12	31	-1988.83	-1590.52	-369.67	0.00	-44.95	-20.97	0.00	-33.05	-19.90	5439.57	729.55	53.56	0.00	0.00	15.25	0.00	4.82	0.00
229	2004	1	31	-1934.47	-1513.87	-348.71	0.00	-39.57	-14.68	0.00	-31.00	-17.73	6053.44	630.60	45.65	0.00	0.00	8.23	0.00	8.19	0.00
230	2004	2	29	-2611.43	-1658.29	-370.84	0.00	-155.90	-61.02	0.00	-62.03	-22.13	7485.11	1424.63	70.53	0.00	0.00	46.20	0.00	0.89	0.00
231	2004	3	31	-2768.40	-1810.95	-396.51	0.00	-44.08	-16.97	0.00	-31.08	-19.93	7077.92	785.21	52.26	0.00	0.00	10.99	0.00	6.73	0.00
232	2004	4	30	-1783.51	-1735.32	-415.22	0.00	-41.85	-14.57	0.00	-30.00	-16.77	3817.15	693.68	76.27	0.00	0.00	8.75	0.00	8.39	0.00
233	2004	5	31	-2378.63	-1588.65	-393.33	0.00	-42.50	-14.87	0.00	-31.00	-17.02	4301.07	649.92	73.65	0.00	0.00	8.71	0.00	8.78	0.00
234	2004	6	30	-1674.40	-1396.39	-353.50	0.00	-40.47	-14.20	0.00	-30.00	-16.28	3478.34	579.11	68.32	0.00	0.00	8.37	0.00	8.60	0.00
235	2004	7	31	-1642.22	-1253.35	-344.52	0.00	-41.21	-15.35	0.00	-31.00	-16.63	2789.92	501.94	73.09	0.00	0.00	10.84	0.00	8.98	0.00
236	2004	8	31	-1618.21	-1054.68	-313.61	0.00	-40.65	-15.16	0.00	-31.00	-16.41	3037.70	471.44	71.91	0.00	0.00	10.63	0.00	9.08	0.00
237	2004	9	30	-2100.12	-919.19	-289.86	0.00	-38.85	-14.65	0.00	-30.00	-15.68	3227.38	333.89	74.15	0.00	0.00	10.44	0.00	8.88	0.00
238	2004	10	31	-2855.00	-1638.32	-333.02	0.00	-162.26	-55.87	0.00	-65.49	-22.13	12160.73	2875.29	307.75	0.00	0.00	42.97	0.00	1.15	0.00
239	2004	11	30	-2033.43	-1334.76	-333.39	0.00	-43.28	-15.00	0.00	-30.05	-18.46	4410.87	703.53	76.04	0.00	0.00	10.77	0.00	6.88	0.00
240	2004	12	31	-2821.72	-1478.91	-333.02	0.00	-196.78	-84.75	0.00	-81.12	-24.76	8315.88	1810.56	62.70	0.00	0.00	68.28	0.00	0.78	0.00
241	2005	1	31	-6429.60	-3084.91	-605.40	0.00	-336.60	-284.76	0.00	-207.34	-42.09	17981.96	5810.06	391.73	0.00	0.00	255.23	0.00	0.00	0.07
242	2005	2	28	-5665.26	-3441.83	-766.33	0.00	-253.84	-215.40	0.00	-105.87	-37.26	15755.06	4371.63	356.29	0.00	0.00	222.13	0.00	0.00	0.00
243	2005	3	31	-5414.85	-4117.31	-896.49	0.00	-173.13	-94.37	0.00	-34.57	-30.61	14552.29	2198.76	327.17	0.00	0.00	90.29	0.00	1.52	0.00
244	2005	4	30	-4616.38	-3865.95	-825.38	0.00	-67.32	-20.87	0.00	-30.00	-23.66	11469.44	1409.70	292.05	0.00	0.00	13.84	0.00	6.46	0.00
245	2005	5	31	-5515.47	-3663.77	-834.34	0.00	-66.47	-17.29	0.00	-31.00	-22.28	11160.25	1399.79	411.92	0.00	0.00	10.82	0.00	7.56	0.00
246	2005	6	30	-6748.76	-3713.56	-1129.44	0.00	-61.61	-16.51	0.00	-30.00	-20.80	8764.41	1787.49	779.67	0.00	0.00	10.41	0.00	7.47	0.00
247	2005	7	31	-3516.61	-2366.34	-440.06	0.00	-61.13	-16.95	0.00	-31.00	-20.97	6775.43	732.07	97.30	0.00	0.00	11.88	0.00	7.88	0.00
248	2005	8	31	-4928.86	-3047.23	-529.16	0.00	-58.80	-16.74	0.00	-31.00	-20.56	6623.04	1404.14	197.12	0.00	0.00	11.70	0.00	8.03	0.00
249	2005	9	30	-4866.07	-3082.25	-552.93	0.00	-54.89	-16.13	0.00	-30.00	-19.58	9229.58	2168.42	437.84	0.00	0.00	11.44	0.00	7.90	0.00
250	2005	10	31	-3370.16	-2449.70	-494.12	0.00	-55.76	-17.83	0.00	-32.00	-21.02	7719.12	1178.29	204.70	0.00	0.00	11.61	0.00	6.65	0.00
251	2005	11	30	-2439.93	-2115.28	-461.94	0.00	-51.47	-15.58	0.00	-30.00	-19.60	5510.35	628.60	53.65	0.00	0.00	10.45	0.00	7.82	0.00
252	2005	12	31	-2494.09	-2172.24	-456.22	0.00	-51.69	-16.04	0.00	-31.00	-19.59	5564.20	684.23	56.86	0.00	0.00	10.99	0.00	8.50	0.00
253	2006	1	31	-2711.43	-2098.76	-429.55	0.00	-125.37	-44.23	0.00	-44.29	-24.48	8528.65	1186.02	29.87	0.00	0.00	38.67	0.00	1.93	0.00
254	2006	2	28	-2523.86	-2290.00	-413.02	0.00	-107.62	-25.40	0.00	-35.11	-24.05	7572.61	1026.53	21.97	0.00	0.00	21.48	0.00	0.49	0.00
255	2006	3	31	-4434.27	-2756.21	-528.89	0.00	-122.22	-59.20	0.00	-40.92	-27.07	11428.94	1394.52	51.24	0.00	0.00	52.39	0.00	0.96	0.00
256	2006	4	30	-4854.52	-3130.89	-599.63	0.00	-134.78	-76.72	0.00	-44.69	-26.47	11474.35	2365.68	128.70	0.00	0.00	68.82	0.00	0.54	0.00
257	2006	5	31	-5265.42	-3568.61	-666.56	0.00	-57.45	-25.47	0.00	-31.94	-24.74	9976.59	864.03	98.75	0.00	0.00	20.11	0.00	5.29	0.00
258	2006	6	30	-4860.58	-2991.14	-579.59	0.00	-53.35	-16.96	0.00	-30.00	-21.23	7909.18	726.01	88.12	0.00	0.00	12.84	0.00	7.67	0.00
259	2006	7	31	-3956.03	-3063.85	-552.19	0.00	-53.40	-16.59	0.00	-31.00	-20.72	4201.87	783.82	106.97	0.00	0.00	11.38	0.00	8.35	0.00
260	2006	8	31	-7011.38	-3878.22	-643.20	0.00	-51.86	-16.36	0.00	-31.00	-20.14	7409.60	2084.68	402.25	0.00	0.00	11.14	0.00	8.48	0.00
261	2006	9	30	-4474.84	-3086.35	-559.99	0.00	-48.76	-15.73	0.00	-30.00	-19.16	6914.65	1796.86	390.31	0.00	0.00	10.82	0.00	8.32	0.00
262	2006	10	31	-4369.03	-3039.20	-551.25	0.00	-48.93	-15.94	0.00	-31.00	-19.57	7925.56	1937.79	413.99	0.00	0.00	10.68	0.00	8.72	0.00
263	2006	11	30	-2647.28	-2160.89	-474.65	0.00	-46.15	-15.33	0.00	-30.00	-18.68	4798.63	795.42	117.67	0.00	0.00	10.36	0.00	8.55	0.00
264	2006	12	31	-2385.52	-2146.93	-467.16	0.00	-46.56	-15.70	0.00	-31.00	-19.00	4590.19	681.83	78.73	0.00	0.00	9.21	0.00	8.94	0.00
265	2007	1	31	-2381.55	-2251.39	-470.47	0.00	-47.69	-27.64	0.00	-32.62	-20.80	5549.32	693.21	65.42	0.00	0.00	23.72	0.00	6.33	0.00
266	2007	2	28	-2179.93	-2114.07	-425.26	0.00	-41.60	-15.80	0.00	-29.24	-18.80	5380.93	616.76	63.59	0.00	0.00	10.28	0.00	5.78	0.00
267	2007	3	31	-2925.69	-2226.67	-456.77	0.00	-43.95	-15.33	0.00	-31.00	-19.18	5439.14	685.22	78.82	0.00	0.00	9.65	0.00	8.70	0.00
268	2007	4	30	-2119.82	-2043.39	-423.69	0.00	-41.79	-15.78	0.00	-30.00	-17.84	4570.08	643.38	74.18	0.00	0.00	9.68	0.00	8.89	0.00
269	2007	5	31	-2119.26	-2007.05	-421.58	0.00	-42.48	-14.99	0.00	-31.00	-18.21	3854.04	645.31	78.17	0.00	0.00	9.21	0.00	9.28	0.00
270	2007	6	30	-2564.65	-1779.18	-385.75	0.00	-40.50	-14.34	0.00	-30.00	-17.41	3778.02	610.58	77.92	0.00	0.00	8.85	0.00	9.07	0.00
271	2007	7	31	-2495.35	-1725.60	-373.58	0.00	-41.27	-14.65	0.00	-31.00	-17.78	3425.03	608.92	83.67	0.00	0.00	8.85	0.00	9.47	0.00
272	2007	8	31	-2686.22	-2196.40	-374.65	0.00	-40.73	-14.49	0.00	-31.00	-17.55	8476.31	2123.82	272.59	0.00	0.00	8.63	0.00	9.55	0.00
273	2007	9	30	-2594.88	-2072.24	-357.88	0.00	-38.96	-13.87	0.00	-30.00	-16.77	8735.94	2176.37	435.84	0.00	0.00	8.30	0.00	9.33	0.00
274	2007	10	31	-3430.79	-2120.55	-364.43	0.00	-39.82	-14.18	0.00	-31.00	-17.12	10045.82	2295.48	475.03	0.00	0.00	8.22	0.00	9.72	0.00
275	2007	11	30	-2112.32	-1481.69	-328.20	0.00	-38.14	-13.58	0.00	-30.00	-16.36	4790.89	784.85	127.76	0.00	0.00	7.91	0.00	9.49	0.00
276	2007	12	31	-2234.14	-1619.92	-348.24	0.00	-67.28	-35.67	0.00	-34.28	-19.44	6094.84	758.56	55.48	0.00	0.00	34.67	0.00	4.45	0.00
277	2008	1	31	-4176.38	-2172.16	-484.12	0.00	-261.84	-127.92	0.00	-119.48	-30.97	10889.57	3266.75	191.49	0.00	0.00	123.88	0.00	0.19	0.00
278	2008	2	29	-3480.90	-2614.18	-519.01	0.00	-52.84	-29.99	0.00	-31.71	-23.93	9075.18	1675.77	259.82	0.00	0.00	24.30	0.00	3.19	0.00
279	2008	3	31	-3054.54	-2569.65	-542.46	0.00	-48.57	-15.57	0.00	-31.00	-19.96	8121.41	1114.25	166.27	0.00	0.00	8.95	0.00	8.60	0.00
280	2008	4	30	-1976.46	-1975.89	-441.25	0.00	-45.76	-14.90	0.00	-30.00	-17.83	5489.47	787.53	73.65	0.00	0.00	8.64	0.00	8.97	0.00
281	2008	5	31	-2060.50	-1987.40	-445.38	0.00	-46.16	-15.18	0.00	-31.00	-17.90	4604.37	778.33	87.38	0.00	0.00	8.58	0.00	9.37	0.00
282	2008	6	30	-2560.53	-1740.42	-387.73	0.00	-43.69	-14.48	0.00	-30.00	-17.16	5547.11	647.75	66.57	0.00	0.00	8.23	0.00	9.16	0.00
283	2008	7	31	-1984.83	-1674.61	-376.62	0.00	-44.23	-15.29	0.00	-31.00	-17.54	4263.10	642.95	73.37	0.00	0.00	10.30	0.00	9.57	0.00
284	2008	8	31	-2592.05	-1438.36	-333.30	0.00	-43.39	-15.08	0.00	-31.00	-17.34	5572.91	618.69	64.57	0.00	0.00	10.08	0.00	9.66	0.00
285	2008	9	30	-3076.17	-2247.30	-364.11	0.00	-41.27	-14.55	0.00	-30.00	-16.58	12631.56	3262.40	533.08	0.00	0.00	9.87	0.00	9.43	0.00
286	2008	10	31	-3002.84	-2078.45	-372.85	0.00	-41.97	-14.71	0.00	-31.00	-16.92	10262.81	2627.65	598.00	0.00	0.00	9.66	0.00	9.83	0.00
287	2008	11	30	-2320.59	-1573.97	-354.29	0.00	-52.49	-26.19	0.00	-32.29	-17.60	5453.23	680.18	71.36	0.00	0.00	22.65	0.00	5.74	0.00
288	2008	12	31	-2339.21	-1790.80	-370.69	0.00	-55.01	-24.91	0.00	-33.09	-19.28	6318.28	717.57	52.45	0.00	0.00	20.48	0.00	5.58	0.00
289	2009	1	31	-2160.22	-1855.05	-366.97	0.00	-41.34	-14.12	0.00	-31.00	-17.34	5840.97	709.56	66.70	0.00	0.00	6.41	0.00	9.18	0.00
290	2009	2	28	-2649.09	-1607.55	-335.24	0.00	-130.73	-45.36	0.00	-51.28	-20.02	9077.00	1278.95	45.47	0.00	0.00	37.09	0.00	1.73	0.00
291	2009	3	31	-2899.18	-2046.05	-368.88	0.00	-44.48	-14.39	0.00	-31.02	-18.82	8166.02	815.37	59.50	0.00	0.00	6.72	0.00	7.98	0.00
292	2009	4	30	-2666.90	-1935.60	-350.07	0.00	-42.22	-13.81	0.00	-30.00	-16.37	6061.02	695.39	68.88	0.00	0.00	7.25	0.00	9.42	0.00
293	2009	5	31	-2131.55	-1956.73	-361.81	0.00	-42.86	-14.10	0.00	-31.00	-16.64	3887.49	685.15	87.76	0.00	0.00	7.16	0.00	9.82	0.00
294	2009	6	30	-2004.14	-1735.97	-333.58	0.00	-40.80	-13.48	0.00	-30.00	-15.90	3252.15	656.64	87.66	0.00	0.00	6.87	0.00	9.59	0.00
295	2009	7	31	-1996.43	-1620.32	-320.26	0.00	-41.52	-13.80	0.00	-31.00	-16.25	2825.10	594.94	91.28	0.00	0.00	7.99	0.00	9.99	0.00
296	2009	8	31	-1916.83	-1400.49	-289.09	0.00	-40.94	-13.64	0.00	-31.00	-16.05	2893.66	609.51	88.83	0.00	0.00	7.79	0.00	10.06	0.00
297	2009	9	30	-2699.43	-1843.88	-286.50	0.00	-39.12	-13.17	0.00	-30.00	-15.34	9860.68	2551.18	376.07	0.00	0.00	7.65	0.00	9.81	0.00
298	2009	10	31	-3284.79	-2401.35	-338.36	0.00	-81.85	-35.05	0.00	-35.04	-18.91	9716.80	2322.58	495.87	0.00	0.00	32.81	0.00	3.71	0.00
299	2009	11	30	-2244.08	-1585.11	-293.38	0.00	-40.02	-13.11	0.00	-30.00	-16.99	5509.57	846.18	129.06	0.00	0.00	7.53	0.00	8.60	0.00
300	2009	12	31	-2508.89	-1527.36	-276.46	0.00	-103.44	-36.26	0.00	-37.03	-19.63	7180.00	849.75	31.39	0.00	0.00	34.97	0.00	4.30	0.00
301	2010	1	31	-3201.74	-1906.14	-368.24	0.00	-154.87	-62.42	0.00	-58.33	-23.52	9011.97	1599.53	65.25	0.00	0.00	45.65	0.00	0.82	0.00
302	2010	2	28	-2841.38	-2113.86	-387.10	0.00	-101.51	-57.76	0.00	-33.76	-20.92	7631.25	1314.34	72.51	0.00	0.00	54.12	0.00	2.09	0.00
303	2010	3	31	-2901.85	-2132.45	-378.27	0.00	-49.04	-16.22	0.00	-31.00	-18.90	10549.57	870.27	51.60	0.00	0.00	8.60	0.00	8.59	0.00
304	2010	4	30	-2967.16	-2011.09	-351.73	0.00	-49.91	-21.78	0.00	-32.12	-18.88	11214.62	838.99	44.24	0.00	0.00	15.65	0.00	5.99	0.00
305	2010	5	31	-2105.01	-2091.86	-354.02	0.00	-46.64	-14.37	0.00	-31.00	-17.97	6087.62	714.52	50.71	0.00	0.00	6.90	0.00	9.07	0.00
306	2010	6	30	-2146.75	-2158.50	-362.58	0.00	-44.09	-13.73	0.00	-30.00	-16.15	3362.89	664.65	88.96	0.00	0.00	6.61	0.00	9.48	0.00
307	2010	7	31	-2132.96	-1980.56	-351.78	0.00	-44.60	-14.28	0.00	-31.00	-16.49	2348.15	675.72	100.04	0.00	0.00	8.81	0.00	9.89	0.00
308	2010	8	31	-2054.28	-1762.02	-324.81	0.00	-43.72	-14.10	0.00	-31.00	-16.29	2192.80	664.07	101.60	0.00	0.00	8.61	0.00	9.97	0.00
309	2010	9	30	-2812.83	-2057.65	-310.96	0.00	-41.56	-13.61	0.00	-30.00	-15.57	7900.84	2111.13	315.47	0.00	0.00	8.47	0.00	9.73	0.00
310	2010	10	31	-3420.84	-2600.34	-368.47	0.00	-45.02	-22.62	0.00	-32.68	-16.71	9613.78	2420.51	556.52	0.00	0.00	16.90	0.00	7.28	0.00
311	2010	11	30	-2781.37	-2222.75	-332.82	0.00	-41.38	-14.89	0.00	-31.67	-17.25	6466.16	1278.77	258.01	0.00	0.00	8.05	0.00	6.60	0.00
312	2010	12	31	-3737.37	-2096.98	-390.71	0.00	-246.97	-83.75	0.00	-102.89	-26.26	9084.66	1911.53	104.01	0.00	0.00	73.25	0.00	0.50	0.00
313	2011	1	31	-3542.31	-2714.39	-456.43	0.00	-50.09	-15.72	0.00	-31.41	-21.06	6621.64	966.94	168.15	0.00	0.00	8.42	0.00	7.05	0.00
314	2011	2	28	-2881.37	-1998.44	-351.65	0.00	-104.12	-47.15	0.00	-34.98	-19.69	7414.05	1003.01	50.75	0.00	0.00	42.90	0.00	2.95	0.00
315	2011	3	31	-4059.91	-2509.32	-448.02	0.00	-188.09	-89.72	0.00	-72.05	-27.02	12990.61	2351.31	78.89	0.00	0.00	76.21	0.00	0.18	0.02
316	2011	4	30	-3473.70	-2552.01	-427.97	0.00	-53.41	-17.49	0.00	-30.10	-21.25	12057.48	1051.53	71.31	0.00	0.00	10.67	0.00	6.91	0.00
317	2011	5	31	-3339.58	-2845.40	-483.87	0.00	-53.40	-15.11	0.00	-31.00	-18.47	6766.36	856.86	106.98	0.00	0.00	7.14	0.00	9.32	0.00
318	2011	6	30	-2786.90	-2278.90	-391.07	0.00	-50.17	-14.18	0.00	-30.00	-16.94	6218.60	701.27	53.78	0.00	0.00	7.42	0.00	9.14	0.00
319	2011	7	31	-2519.59	-2452.14	-430.57	0.00	-50.33	-14.43	0.00	-31.00	-17.12	3364.43	715.04	92.61	0.00	0.00	8.35	0.00	9.56	0.00
320	2011	8	31	-2344.41	-2213.17	-397.65	0.00	-48.82	-14.23	0.00	-31.00	-16.98	3388.69	648.31	84.44	0.00	0.00	8.15	0.00	9.67	0.00
321	2011	9	30	-3437.23	-2780.91	-410.73	0.00	-46.02	-13.60	0.00	-30.00	-16.24	7967.96	2337.49	395.11	0.00	0.00	7.86	0.00	9.45	0.00
322	2011	10	31	-3466.92	-2921.12	-438.52	0.00	-47.04	-15.03	0.00	-32.19	-16.99	8720.41	1896.05	454.68	0.00	0.00	7.03	0.00	7.81	0.00
323	2011	11	30	-2360.83	-2227.35	-388.56	0.00	-46.10	-15.10	0.00	-31.50	-17.17	5508.88	609.94	84.09	0.00	0.00	7.54	0.00	6.67	0.00
324	2011	12	31	-2271.30	-2217.62	-380.18	0.00	-44.59	-13.62	0.00	-31.00	-16.74	5337.62	624.51	68.59	0.00	0.00	7.42	0.00	9.42	0.00
325	2012	1	31	-2916.67	-2334.05	-385.01	0.00	-44.47	-13.52	0.00	-31.80	-16.68	4988.71	680.90	90.42	0.00	0.00	6.19	0.00	8.50	0.00
326	2012	2	29	-2050.42	-1980.16	-330.01	0.00	-40.25	-12.49	0.00	-29.00	-15.26	4447.08	821.72	79.19	0.00	0.00	6.78	0.00	9.11	0.00
327	2012	3	31	-2315.07	-2039.52	-331.57	0.00	-59.28	-30.22	0.00	-33.40	-18.56	6142.05	964.16	56.28	0.00	0.00	27.30	0.00	6.01	0.00
328	2012	4	30	-2218.37	-2103.39	-321.81	0.00	-49.76	-22.20	0.00	-32.18	-18.79	6406.18	757.99	46.93	0.00	0.00	17.13	0.00	5.32	0.00
329	2012	5	31	-2217.04	-2323.59	-353.35	0.00	-42.14	-13.29	0.00	-31.00	-16.96	4507.70	638.64	81.83	0.00	0.00	6.78	0.00	9.32	0.00
330	2012	6	30	-2046.86	-1993.75	-322.02	0.00	-40.18	-12.74	0.00	-30.00	-15.50	2899.63	606.43	88.67	0.00	0.00	6.55	0.00	9.75	0.00
331	2012	7	31	-1982.87	-1803.64	-308.46	0.00	-40.96	-14.55	0.00	-31.00	-15.79	2849.33	575.36	88.12	0.00	0.00	10.60	0.00	10.16	0.00
332	2012	8	31	-2471.39	-1612.94	-293.66	0.00	-40.44	-14.43	0.00	-31.00	-15.58	3102.92	566.47	91.73	0.00	0.00	10.44	0.00	10.24	0.00
333	2012	9	30	-2800.81	-2123.76	-307.67	0.00	-38.69	-14.04	0.00	-30.00	-14.88	10403.11	2768.61	487.01	0.00	0.00	10.39	0.00	9.98	0.00

Monthly Streamflow Budget
units in Acre-feet

				Rising Groundwater									Stream Percolation								
				System A Rising Groundwater			System B Rising Groundwater			System C Rising Groundwater			System A Stream Percolation			System B Stream Percolation			System C Stream Percolation		
Stress	Year	Month	days in month	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula
334	2012	10	31	-2947.80	-2065.37	-318.87	0.00	-39.55	-13.05	0.00	-31.00	-13.34	8815.93	2204.82	539.75	0.00	0.00	7.44	0.00	10.39	0.00
335	2012	11	30	-2109.06	-1559.18	-289.43	0.00	-39.55	-17.03	0.00	-31.61	-14.41	3984.46	591.38	86.13	0.00	0.00	10.65	0.00	7.53	0.00
336	2012	12	31	-2180.19	-1823.26	-321.24	0.00	-40.93	-23.23	0.00	-32.51	-15.60	4604.58	600.96	76.76	0.00	0.00	18.66	0.00	7.42	0.00
337	2013	1	31	-2129.39	-1962.24	-334.87	0.00	-40.21	-16.04	0.00	-32.41	-14.53	4183.43	645.43	85.65	0.00	0.00	9.22	0.00	7.65	0.00
338	2013	2	28	-1825.71	-1651.54	-285.30	0.00	-34.66	-12.80	0.00	-28.00	-11.65	3982.07	595.97	76.52	0.00	0.00	9.20	0.00	9.00	0.00
339	2013	3	31	-2549.31	-1633.90	-299.08	0.00	-38.10	-13.21	0.00	-31.00	-12.47	4927.18	657.58	82.67	0.00	0.00	7.04	0.00	10.48	0.02
340	2013	4	30	-2397.17	-1453.96	-275.74	0.00	-36.62	-13.16	0.00	-30.00	-11.88	4465.27	620.62	79.96	0.00	0.00	8.77	0.00	10.21	0.04
341	2013	5	31	-1765.85	-1343.87	-264.88	0.00	-37.60	-13.33	0.00	-31.00	-12.11	3361.35	558.57	82.46	0.00	0.00	8.55	0.00	10.61	0.07
342	2013	6	30	-2183.89	-1171.98	-248.66	0.00	-36.17	-12.97	0.00	-30.00	-11.56	3078.70	477.69	84.06	0.00	0.00	8.54	0.00	10.34	0.09
343	2013	7	31	-2156.47	-1069.09	-244.66	0.00	-37.18	-13.46	0.00	-31.00	-11.79	3057.02	438.25	85.74	0.00	0.00	9.04	0.00	10.74	0.12
344	2013	8	31	-1573.96	-947.56	-238.61	0.00	-36.99	-13.38	0.00	-31.00	-11.62	2327.39	368.35	89.02	0.00	0.00	8.93	0.00	10.81	0.15
345	2013	9	30	-1501.37	-852.02	-223.56	0.00	-35.63	-13.05	0.00	-30.00	-11.09	2548.52	309.76	83.06	0.00	0.00	8.96	0.00	10.51	0.15
346	2013	10	31	-1601.46	-838.81	-221.86	0.00	-36.67	-13.24	0.00	-31.00	-11.30	3272.84	326.27	79.54	0.00	0.00	8.75	0.00	10.92	0.16
347	2013	11	30	-1583.06	-801.64	-211.30	0.00	-35.35	-12.47	0.00	-30.00	-10.78	3897.22	337.57	71.80	0.00	0.00	7.74	0.00	10.62	0.15
348	2013	12	31	-1647.92	-819.43	-216.10	0.00	-36.39	-13.10	0.00	-31.00	-10.97	3881.60	365.35	75.03	0.00	0.00	8.56	0.00	11.03	0.16
349	2014	1	31	-1616.04	-774.24	-207.75	0.00	-36.27	-14.04	0.00	-31.00	-10.82	3895.12	360.27	77.72	0.00	0.00	10.81	0.00	11.08	0.16
350	2014	2	28	-1828.64	-837.04	-202.44	0.00	-78.81	-32.16	0.00	-30.95	-13.66	4864.05	759.54	62.91	0.00	0.00	31.81	0.00	5.22	0.15
351	2014	3	31	-1965.92	-1064.98	-232.12	0.00	-46.77	-16.75	0.00	-33.31	-15.67	4844.10	1374.00	132.95	0.00	0.00	9.97	0.00	6.33	0.18
352	2014	4	30	-1553.54	-886.99	-219.22	0.00	-36.83	-13.67	0.00	-30.00	-13.78	3295.95	741.68	94.49	0.00	0.00	10.77	0.00	9.92	0.16
353	2014	5	31	-2057.18	-779.60	-213.24	0.00	-37.78	-13.85	0.00	-31.00	-11.08	3368.25	540.67	89.79	0.00	0.00	10.56	0.00	10.99	0.16
354	2014	6	30	-1487.63	-654.36	-188.52	0.00	-36.32	-13.55	0.00	-30.00	-10.51	3142.64	268.87	77.20	0.00	0.00	10.63	0.00	10.68	0.15
355	2014	7	31	-1410.59	-632.40	-204.32	0.00	-37.30	-13.01	0.00	-31.00	-10.71	2270.04	259.07	88.74	0.00	0.00	8.74	0.00	11.10	0.16
356	2014	8	31	-1279.04	-596.90	-201.24	0.00	-37.09	-12.94	0.00	-31.00	-10.57	1922.37	251.30	88.87	0.00	0.00	8.65	0.00	11.14	0.16
357	2014	9	30	-1303.81	-542.77	-188.16	0.00	-35.71	-12.64	0.00	-30.00	-10.09	2172.41	216.27	83.11	0.00	0.00	8.71	0.00	10.84	0.15
358	2014	10	31	-1505.11	-528.76	-184.66	0.00	-36.73	-12.80	0.00	-31.00	-10.28	2771.56	273.97	81.97	0.00	0.00	8.47	0.00	11.24	0.16
359	2014	11	30	-1547.55	-506.73	-166.91	0.00	-35.39	-11.87	0.00	-30.00	-9.81	3679.36	327.52	73.29	0.00	0.00	6.18	0.00	10.93	0.15
360	2014	12	31	-2550.72	-632.33	-134.29	0.00	-95.23	-37.68	0.00	-36.53	-14.49	7528.13	1087.04	41.37	0.00	0.00	36.12	0.00	5.99	0.17
361	2015	1	31	-2009.57	-748.06	-179.09	0.00	-40.46	-14.99	0.00	-32.41	-14.69	6249.86	956.58	64.84	0.00	0.00	7.23	0.00	7.83	0.17
362	2015	2	28	-2091.21	-671.89	-179.68	0.00	-34.74	-10.29	0.00	-28.00	-10.40	4250.16	723.99	81.16	0.00	0.00	4.85	0.00	9.66	0.15
363	2015	3	31	-2244.34	-681.02	-182.32	0.00	-38.16	-11.29	0.00	-31.00	-10.25	4710.46	756.48	83.71	0.00	0.00	3.63	0.00	11.20	0.17
364	2015	4	30	-1496.31	-609.20	-182.98	0.00	-36.65	-11.35	0.00	-30.00	-9.76	3102.74	577.34	82.22	0.00	0.00	6.04	0.00	10.90	0.16
365	2015	5	31	-1584.21	-592.22	-161.48	0.00	-37.61	-11.07	0.00	-31.00	-9.95	4377.19	461.39	74.47	0.00	0.00	3.77	0.00	11.31	0.16
366	2015	6	30	-1463.31	-544.49	-176.43	0.00	-36.17	-11.23	0.00	-30.00	-9.51	2776.83	270.16	82.41	0.00	0.00	5.85	0.00	10.99	0.15
367	2015	7	31	-1666.48	-598.08	-174.87	0.00	-37.15	-10.96	0.00	-31.00	-9.69	2811.07	291.22	90.53	0.00	0.00	2.55	0.00	11.41	0.16
368	2015	8	31	-1602.50	-537.00	-174.06	0.00	-36.95	-12.29	0.00	-31.00	-9.55	2358.55	216.15	90.23	0.00	0.00	7.75	0.00	11.45	0.16
369	2015	9	30	-1383.58	-470.66	-148.75	0.00	-35.59	-10.49	0.00	-30.00	-9.12	2869.81	238.57	80.18	0.00	0.00	4.10	0.00	11.13	0.15
370	2015	10	31	-1508.57	-456.38	-159.07	0.00	-36.61	-12.15	0.00	-31.00	-9.30	2807.02	246.35	82.48	0.00	0.00	7.54	0.00	11.53	0.16
371	2015	11	30	-1494.21	-401.54	-149.71	0.00	-35.29	-11.87	0.00	-30.00	-8.87	3043.47	294.55	79.03	0.00	0.00	7.63	0.00	11.21	0.15
372	2015	12	31	-1568.03	-382.65	-148.72	0.00	-36.33	-12.00	0.00	-31.00	-9.03	3407.05	327.04	78.60	0.00	0.00	7.33	0.00	11.62	0.16

Appendix E-2

Implementation of Groundwater and Surface Water Model Inputs for Simulations in Support of Groundwater Sustainability Plan Development by the Mound, Fillmore and Piru Groundwater Sustainability Agencies Technical Memorandum (United, 2021b)

TECHNICAL MEMORANDUM

IMPLEMENTATION OF GROUNDWATER AND SURFACE WATER MODEL INPUTS FOR SIMULATIONS IN SUPPORT OF GROUNDWATER SUSTAINABILITY PLAN DEVELOPMENT BY THE MOUND, FILLMORE AND PIRU GROUNDWATER SUSTAINABILITY AGENCIES

UNITED WATER CONSERVATION DISTRICT

JUNE 2021

This document describes selected modeling stresses and assumptions used by United Water Conservation District to conduct simulations of future hydrologic conditions considered in the Groundwater Sustainability Plans prepared by the Mound Basin Groundwater Sustainability Agency and the Fillmore and Piru Basins Groundwater Sustainability Agency that may not be described in detail in the Groundwater Sustainability Plans.

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1 INTRODUCTION

The Fillmore and Piru Basins Groundwater Sustainability Agency (FPBGSA) and the Mound Basin Groundwater Sustainability Agency (MBGSA), with the assistance of their consultants, Daniel B. Stephens and Associates and INTERA Incorporated, respectively, are developing the Groundwater Sustainability Plans (GSPs) for the Piru, Fillmore, and Mound subbasins of the Santa Clara River Valley groundwater basin (Figure 1) in compliance with the 2014 Sustainability Groundwater Management Act (SGMA). The United Water Conservation District (UWCD or United) is supporting the analysis of the GSPs for the Piru, Fillmore, and Mound subbasins by using its recently expanded MODFLOW-based Regional Groundwater Flow Model ("Regional Model") (UWCD, 2021; 2018).

In supporting the GSP development efforts of the FPBGSA and MBGSA, this document details the implementation of selected modeling stresses used for the GSP simulations for three future scenarios: (1) future baseline reference, (2) near future (2030 climate change factors), and (3) late future (2070 climate change factors). All future scenarios use the period 1943-2019 as the past reference period for hydrological inputs, the longest period possible with good recorded hydrologic data. The document contains two main sections which describe selected processes and assumptions used in the simulations by UWCD to conduct simulations for the Groundwater Sustainability Plans: Section 3 *Groundwater Flow Modeling Inputs*, and Section 4 *Surface Water Hydrology Modeling*. Section 4 details the modeling of several surface water hydrology spreadsheet models that provide input data to the groundwater model. The groundwater model reports (UWCD, 2021, 2018) detail the construction and calibration of the Regional Model. Specific to the GSP modeling presented here, this document provides additional detail regarding how the surface water and groundwater forecasting for the future runs requested by FPBGSA and MBGSA was implemented into the Regional Model.

2 INTERACTIONS BETWEEN GROUNDWATER FLOW MODEL AND SURFACE WATER HYDROLOGY MODELS

Surface water hydrology inputs to the Regional Model (UWCD, 2021) were determined using a number of hydrological models used for reservoir operations, streamflow routing and Freeman Diversion operations. Figure 2 provides a schematic of the model integration employed for the GSP supporting work. Figure 3 shows the streamflow locations used in Figure 2, as well as stream gages described in Section 4. A more detailed explanation of each surface water hydrology model is also provided in Section 4. The modeling workflow consists of the following four elements:

1) Groundwater Flow Model upstream of Freeman Diversion facility.

The Regional Model simulates streamflow, groundwater levels and water balances for the Piru, Fillmore and Santa Paula basins. Hydrological models are used to calculate Lake Piru outflows (including spills), Castaic Lake reservoir releases, and streamflow in the Santa Clara River (SCR) upstream of the confluence with Castaic Creek. Estimated future discharges from water reclamation facilities (WRFs) in the Santa Clarita Valley (SCV) are combined with simulated Castaic Lake releases and streamflow in the SCR upstream of Castaic Creek to calculate streamflow in the SCR upstream of the confluence with Piru Creek. Lake Piru outflows and streamflow in the SCR upstream of Piru Creek are used as inputs to the Regional Model. Additionally, the Regional Model incorporates inputs for tributary flows, weather, recharge, pumping, diversions and WRF discharges in Ventura County.

2) Diversions and bypass flows at the Freeman Diversion

Stream flow in the Santa Clara River just upstream of the Freeman Diversion facility was calculated using United's Upper Basins Routing Model. Diversions and Santa Clara River flows just downstream of the Freeman Diversion ("bypass flows") were calculated by United's Hydrological Operations Simulation System (HOSS). The HOSS requires inputs for groundwater elevations for selected wells in the Oxnard Forebay. Since the HOSS is not integrated with the Regional Model, the first HOSS model run for a scenario is generally run using historical groundwater elevations or estimates from a prior run. Model outputs are then input to the Oxnard Plain Surface Water Distribution Model (SWDM, see below), which provides inputs to the Regional Model. Selected groundwater elevation outputs from the Regional Model are then used as inputs for a second run of the HOSS, the SWDM and the Regional Model. This iterative process is repeated until groundwater elevations converge.

While the Regional Model also calculates streamflow at the Freeman Diversion, its simulated streamflow at the Freeman Diversion was not able to adequately reproduce the historical daily flow magnitudes and trends during model calibration, although the simulated monthly-average streamflow was close to the historical monthly records. The MODFLOW Stream Package (STR) used by the Regional Model is based on a simplistic concept of stream routing which does not include the streamflow travel time in the stream channel, leading to the limitation that the STR package is more suitable for the relatively stable streams. Although the Reginal Model may not be able to adequately simulate the daily SCR streamflow rates, it should be noted that the Regional Model was able to simulate the groundwater levels in the basins of the SCR valley with good calibration.

3) Artificial recharge and surface water deliveries by United

The Oxnard Plain Surface Water Distribution Model (SWDM) was used to calculate the volumes of artificial recharge to each of United's recharge basins and surface water deliveries to the Pumping-Trough-Pipeline (PTP) and the Pleasant Valley (PV) pipeline, based on diversions calculated by the HOSS. The SWDM also calculates pumping demands in United's surface water delivery service areas (PTP and PV) as the deficit between total demand and surface water deliveries. Conejo Creek diversions are also incorporated in the SWDM, and are an important water supply to the PV service area. The SWDM requires inputs for groundwater elevations for selected wells in the Oxnard Forebay. Since the SWDM is not integrated with the Regional Model, iterative runs are performed in a similar manner as with the HOSS model.

4) Groundwater Flow Model downstream of Freeman Diversion Facility.

The Regional Model uses inputs provided by the upgradient portion of the model (groundwater fluxes from Santa Paula basin), the SWDM (artificial recharge, surface water deliveries, pumping) and HOSS (diversions, bypass flows) to simulate streamflow, groundwater levels and water balances for the Mound, Oxnard, Pleasant Valley and western Las Posas Valley basins. Selected groundwater elevations from wells in the Oxnard Forebay are exported to the HOSS and SWDM operations models for iterative runs until groundwater elevations for wells in the Oxnard Forebay and fluxes to Mound basin converge (as described in the previous paragraphs and in Sections 4.6 and 4.7). Generally two-to-four model runs are required, depending on how well initial water levels assumed for the HOSS and SWDM runs match the Regional Model outputs.

3 GROUNDWATER FLOW MODELING INPUTS

This section describes the various data inputs that were required for simulations by the Regional Model in support of the GSP analysis in cooperation with FPBGSA and MBGSA and their consultants. Some of these components have previously been described within the Regional Model documentation (UWCD, 2021, 2018), while some are specific to the scenarios simulated for the GSP development.

3.1 WEATHER DATA

Precipitation used over the model domain and reference evapotranspiration (ET) used in riparian stream channel reaches were estimated based on the California Department of Water Resources (DWR) datasets and guidelines for the preparation of GSPs (DWR, 2018a). DWR provided Variable Infiltration Capacity (VIC) model output for precipitation and reference ET at 1/16th degree resolution spatial resolution and monthly temporal resolution (monthly totals) for a reference simulation over 1915-2011 that represents a historical simulation with the temperature detrended as well as monthly total change factors for each month for two future climate periods representing the near future (2030) and the late future (2070).

United, FPBGSA, and MBGSA selected three weather datasets based on a single historical climate cycle (1943-2019). The historical climate cycle was adjusted by the two DWR climate factors provided for precipitation and reference ET corresponding to the DWR baseline reference simulation and recommended central tendency scenarios for each climate periods for the near future (2030) and the late future (2070). This resulted in a total of three 77-year climate datasets to be used for model simulations.

Using the monthly totals for precipitation and reference ET from the DWR baseline reference simulation, near future (2030) and late future (2070) estimates were calculated for input into the Regional Model future climate simulations. A crop coefficient of 1.0 was used for riparian vegetation. Monthly total values for precipitation and ET were then mapped from the VIC grid cells to MODFLOW grid cells based on the VIC grid cell that the center of a MODFLOW grid cell was determined to be located within (Figure 4). Monthly totals of precipitation and ET were then uniformly distributed across each month.

Lastly, as the DWR precipitation and reference ET change factors were available for model years 1915-2011 as monthly totals, input for recent model years 2012-2019 were determined by selecting analogous water years in the historical record and applying the precipitation and reference evapotranspiration change factors published for these analogous water years. The analogous year selection criteria were chosen based on streamflow analysis, and more detail related to those methods is presented in Section 4.8.

3.2 RECHARGE

The Regional Model was used to simulate groundwater recharge resulting from various sources and uses of surface water, as described below. The recharge from different sources and/or uses were summed as total recharge in the recharge package (RCH) in the Regional Model. The groundwater recharge from various sources and/or usages of surface water is detailed in the following subsections. The recharge rates used were based on the calibration result of the Regional Model (UWCD; 2021, 2018).

3.2.1 PRECIPITATION

In relation to areal recharge calculations, monthly evapotranspiration (ET) was assumed to be 0.75 inch. If the monthly precipitation was less than 0.75 inch, no recharge from the precipitation was simulated. If the monthly precipitation was greater than 0.75 inch, the recharge was assumed to increase linearly, proportional to the monthly precipitation, with a maximum recharge rate of 30 percent. The recharge from precipitation was implemented as follows:

- If monthly precipitation was less than 0.75 inch, then no recharge was assigned in that area;
- If monthly precipitation was 0.75 to 1 inch, then recharge was assigned from 0 to 10 percent of precipitation (on a sliding scale);
- If monthly precipitation was 1 to 3 inches, then recharge was assigned from 10 to 30 percent of precipitation
- If monthly precipitation was greater than 3 inches, then recharge was assigned as 30 percent of precipitation.

3.2.2 EXTRACTED WATER FROM WELLS

The extracted groundwater from wells serves agricultural need as well as municipal and industrial (M&I) use. The extracted groundwater for agriculture was assumed to have higher recharge rate than M&I use.

The agricultural water recharge rate was assumed to be 25% for Oxnard subbasin and 20% for all other basins (Piru, Fillmore, Santa Paula, Mound, Pleasant Valley, and West Las Posas). If the precipitation recharge rate was higher than the assumed agricultural water recharge rate (20% or 25%) particularly during wet months, the agricultural water recharge rate was replaced by the higher precipitation recharge rate. The M&I water recharge rate was assumed to be 5% (of delivered water) for all basins.

3.2.3 APPLIED WATER

Regardless of the source, for modeling purposes water use is classified so that return flows to the systems can be characterized properly. The recharge rates for agricultural and M&I uses were calculated in the same manner as described in Section 3.2.2 *Extracted Water from Wells*, above. Cities, and various local water companies and mutuals pump and deliver water to users, in addition to a multitude of private groundwater wells that are operated within the model domain. Several surface water diversions are also maintained and operated. Cities on the Oxnard Plain import water from the State Water Project (via Calleguas Municipal Water District (CMWD)), but direct deliveries of State Water does not yet occur in the Piru, Fillmore, Santa Paula or Mound basins. In a few instances extracted water is transported by pipeline to other basins.

3.2.4 UWCD Recharge Activities and Surface Water Deliveries

UWCD diverts streamflow from the Santa Clara River for artificial recharge within its spreading basins and delivers a portion of diverted SCR water via pipelines to Pumping Trough Pipeline (PTP) users and Pleasant Valley County Water District (PVCWD) users for agricultural irrigation. Additionally, Camrosa Water District (Camrosa) diverts water from Conejo Creek to supply PVCWD users and users within their own service area. The recharge resulting from surface water deliveries from the water diverted and delivered water by UWCD and Camrosa was calculated as agricultural return flow in the same manner as described in Section 3.2.2 *Extracted Water from Wells*, above. The recharge occurring in UWCD's spreading basins was calculated without loss based on a series of surface water hydrology and operational models, as detailed in *Section 4 Surface Water Hydrology Modeling*. United is not currently operating their Piru Spreading Grounds and there are no UWCD surface water deliveries within Piru, Fillmore, or Mound basins. Recharge activities related to conservation releases from Lake Piru and other releases along the Santa Clara River are detailed in *Section 4 Surface Water Hydrology Modeling*.

3.3 MOUNTAIN FRONT RECHARGE

There are some areas outside of the Regional Model domain that are part of surface watersheds associated with the Oxnard, Pleasant Valley, West Las Posas, Mound, Santa Paula, Fillmore, and Piru groundwater basins. Precipitation that falls on these areas may contribute mountain front recharge to the aquifers. The precipitation is calculated based on the surface watershed areas outside of the Regional Model. The sum of precipitation is multiplied by the same precipitation recharge ratio used in calculating the precipitation recharge detailed in Section 3.2.1 *Precipitation*, which is presented above.

3.4 STREAMFLOW, INTER-BASIN SUBSURFACE FLOW, AND DIVERSIONS

The Regional Model simulated flows in the Santa Clara River and several tributaries, Conejo Creek, Arroyo Las Posas, and Calleguas Creek. The streamflow rates at the Freeman Diversion were calculated as detailed in Section 4.5 *Santa Clara River Upstream of Freeman Diversion Facility*, below. UWCD simulated SCR flow from Piru basin to the ocean. The simulated SCR streamflow at the Los Angeles Country boundary in Piru and the simulated streamflows of its tributaries (Piru, Hopper, Pole, Sespe, and Santa Paula Creeks) were calculated as described in

Section 4. *Surface Water Hydrology Inputs*. Diversions along the Santa Clara River and tributaries were implemented similarly as described in the 2020 Regional Model documentation (UWCD, 2021) with future monthly total estimates calculated as the average for the available reported data 2010-2019.

The streamflow in Conejo Creek entering the Regional Model was based on data provided by the Fox Canyon Groundwater Management Agency (FCGMA)'s consultant, DUDEK, for the previous future modeling of the lower basins (UWCD, 2019). Estimates based on a relationship between monthly precipitation for a nearby VIC grid cell (DWR, 2018a) and historical observed Conejo Creek streamflow were previously provided to UWCD. For the future simulations presented here, the relationship was modified slightly using a VIC grid cell (ID 9894) that was within the Conejo Creek watershed and produced a slightly improved relationship between the VIC precipitation and historical observed Conejo Creek streamflow. This relationship was then applied to the 1915-2011 DWR records, adjusted for 2030 and 2070 change factors and the 2012-2019 years were determined by selecting analogous water years in the historical record in the same manner as mentioned in Section 3.1, above, and detailed in 4.8, below. The discharge to Conejo Creek by Camarillo Sanitation District was included in the Stream (STR) package, as was the flow diversion by Camrosa.

The streamflow in Arroyo Las Posas enters the Regional Model from East Las Posas. There was also an inter-basin flow between East Las Posas and the PV basin in the form of subsurface flow (groundwater flux) beneath Arroyo Las Posas. Similar to Conejo Creek, streamflow entering the Regional Model was based on data provided by the FCGMA's consultant, DUDEK for the previous future modeling of the lower basins (UWCD, 2019) based on a relationship between monthly precipitation for a nearby VIC grid cell (DWR, 2018a) and historical observed Arroyo Las Posas Creek streamflow. The same relationship was used and applied to estimated streamflow for the future baseline, 2030 and 2070 simulations, and the 2012-2019 years were determined by selecting analogous water years in the historical record in the same manner as mentioned in Section 3.1, above, and detailed in 4.8, below.

The inter-basin flow between the East Las Posas and the Pleasant Valley basins were previously simulated by a groundwater model developed by CMWD's consultant, INTERA and previously provided to UWCD (UWCD, 2019). The 1930-1979 inter-basin flow for the 2030 and 2070 future climates were used to fill associated years in the 1943-2019 records. 1980-2019 was filled with 1930-1979 monthly averages, adjusted for the difference between the 1970-1979 average and the 1930-1979 average. In the absence of future baseline information, future baseline was filled with estimated 2030 data over 1943-2019.

3.5 PUMPING

Pumping within the Piru, Fillmore, and Mound Basins were prescribed for the future baseline, 2030, and 2070 simulations by FPBGSA and MBGSA. Because the Santa Paula basin is adjudicated, the pumping within the Santa Paula basin uses average 2015-2019 pumping for future baseline, 2030, and 2070 simulations. Future pumping related to the Oxnard basin, Pleasant Valley basin, and Las Posas basin was previously prescribed by FCGMA in accordance with their GSPs (FCGMA, 2019a, 2019b, 2019c), and the implementation in the future scenarios is detailed in previous modeling documentation (UWCD, 2019).

4 SURFACE WATER HYDROLOGY INPUTS

A number of hydrological models were used to simulate reservoir operations, streamflow routing and Freeman diversion operations. All models were run using historical hydrology for the period 1943-2019 for the future baseline scenarios, and with adjustments for climate change according to the DWR Guidance Document for the Sustainable Management of Groundwater. All models were calculated and calibrated in daily time steps. Hydrology models were spreadsheet models, calculated in Microsoft Excel, except for the runoff model used to calculate change factors to account for development in the Santa Clarita Valley. A description of all surface water hydrology models and major assumptions is presented here. More detailed information is available in other published reports, as referenced.

4.1 CASTAIC RESERVOIR RELEASES

The California Department of Water Resources (DWR) completed construction of Castaic Dam in 1973. The current operations of Castaic Reservoir include flood flow releases to the Downstream Water Users (DWUs), of which United is member. Flood flow releases are implemented according to a 1978 agreement between DWR and the DWUs, allowing for storage and later release of natural inflows in excess of 100 cfs into Castaic Reservoir. Storage of flood flows is contingent on availability of sufficient storage volume, and all stored water is to be releases by May 1. Any remaining water can be appropriated by DWR. United coordinates the flood flow release program for the DWUs and makes the requests for water storage and release to DWR.

Simulation of releases from Castaic Reservoir was performed using a Castaic Reservoir operations model. While daily operations logs with releases are available for the 1977-2019 period, an operations model allows calculation of releases for the entire 1943-2019 modeling period, and allows simulated releases for different climate change scenarios.

The Castaic Reservoir model was developed as a simple water balance model in Microsoft Excel. Reservoir inflows were calculated as follows (Figure 3):

- 1/1/1943 – 9/30/1946: estimated based on correlation with gage USGS 11108500 SANTA CLARA RIVER AT L.A.-VENTURA CO. LINE CA
- 10/1/1946 - 12/31/1976: Gage USGS 11108145 CASTAIC C NR SAUGUS CA
- 1/1/1977 – 12/31/2019: natural inflows from DWR Southern Field Division Water Operations Logs.

The following assumptions were made for calculating flood flow releases:

- Inflow-outflow regime is implemented when reservoir inflows are less than 100 cfs.
- Flood flow releases occur between February and April.
- Flood flow releases are initiated when stored flood flows exceed 10,000 acre-feet (February), 4,000 acre-feet (March) or 0 acre-feet (April)

- Maximum flood flow release rates are determined as such that flows in the Santa Clara River downstream of the Castaic Creek confluence do not exceed 75 cfs (February) or 200 cfs (March-April).
- Percolation losses in Castaic Creek during flood flows releases equal 10% of flow.
- When reservoir inflows exceed 5000 cfs (daily), 50% of inflows are released as inflow-outflow and 50% are stored for later release (if storage capacity is available).
- Inflow-outflow regime is implemented when stored flood flows exceed 15,000 to 45,000 acre-feet (depending on month).
- All flood flows are appropriated by DWR when cumulative inflows exceed 40,000 acre-feet (indicating wet years when historically no flood flow releases were requested).

The Castaic Reservoir model was calibrated by comparing modeled and observed annual total releases (including flood flow releases and releases during inflow-outflow operations) for the 1979-2020 period, and by comparing modeled and observed flood flow releases for the 1998-2020 period (Figure 5). Figure 6 shows an example of how simulated reservoir releases differ from historical flows in Castaic Creek before construction of Castaic Reservoir.

4.2 SANTA CLARA RIVER NATURAL RUNOFF UPSTREAM OF CASTAIC CREEK

The historical record of "natural" (no WRF discharges") streamflow in the Santa Clara River upstream of Castaic Creek was calculated by subtracting historical Valencia WRF discharges and Castaic Creek discharges from the flows at Santa Clara River downstream of Castaic Creek. The latter were compiled using the following records (Figure 3):

- 1943-1946: estimated based on correlations with gage USGS 11108000 SANTA CLARA R NR SAUGUS CA.
- 1947-1952: sum of flows from gages USGS 11108000 SANTA CLARA R NR SAUGUS CA and USGS 11108145 CASTAIC C NR SAUGUS CA.
- 1952-1996: Gage USGS 11108500 SANTA CLARA RIVER AT L.A.-VENTURA CO. LINE CA
- 1996-2019: Gage USGS 11109000 SANTA CLARA R NR PIRU CA.

Significant development occurred in the Santa Clarita Valley between 1943 and 2019. Therefore, for future modeling efforts, the historical flow record for the Santa Clara River upstream of Castaic Creek was adjusted to reflect the current rainfall-to-runoff response associated with a higher degree of urban development and land use with impervious surfaces. It was assumed that future developments will not significantly alter the current percentage of effective impervious area, and therefore the flow record was not further adjusted for future land use changes. This assumption is based on the expectation of infill development and the implementation of stormwater Best Management Practices in most future developments.

Adjustment of historical flows to reflect current levels of impervious area was performed as follows:

1) Daily runoff in the Santa Clara River upstream of Castaic Creek was simulated for 1960-2005 using the calibrated and validated Santa Clara River hydrology model developed by the Ventura County Watershed Protection District using the U.S. EPA Hydrologic Simulation Program – FORTRAN (HSPF) (VCWPD, 2009). This model run used the 2001 Southern California Association of Governments (SCAG) land use data. Flows were simulated for station RCH190 in the HSPF model (Figure 3).
2) The HSPF model was run as before but with impervious area reflecting 1950s, 1970s and 1990s land use. Land use coverage in the HSPF model was adjusted by reducing the impervious land use proportional to the reduction in population in the Santa Clarita Valley between 2000 (pop. 190,000) and the earlier periods. Impervious land use was reduced by 94% (pop. 12,000), 70% (pop. 58,000) and 28% (pop 136,000) for the 1950s, 1970s and 1990s, respectively. The area corresponding to the impervious land use reductions was assigned to open space and agriculture according to available historical land use data (Price et al., 2007, Robson, 1972).
3) For each of the HSPF runs with reduced impervious area (1950s, 1970s, 1990s), the difference in runoff with the 2000s land use run was calculated. The only variables that were different between model runs were the percentages of impervious, agricultural and open space land use. Relationships were established between the reduction in runoff with reduced impervious land use and modeled discharge, separately for peak flows and flows on receding limb of hydrograph, for the 1950s, 1970s and 1990s model runs (Figure 7).
4) The relationships from step 3 for the 1950s, 1970s and 1990s were applied to the historical record of 1943-1959, 1960-1979, and 1980-1999, respectively, effectively increasing daily flows during storm peaks and hydrograph receding limbs (only storm runoff exceeding 50 cfs). The historical record from year 2000 onwards was not adjusted for land use changes. The resulting flow record and a comparison with the historical record is shown in Figure 8.

4.3 SANTA CLARA RIVER DOWNSTREAM OF CASTAIC CREEK

Daily discharge in the Santa Clara River downstream of Castaic Creek (Figure 3) was calculated as the sum of the flows upstream of Castaic Creek (Section 4.2), releases from Castaic Reservoir (Section 4.1) and estimated discharges from the Valencia, Saugus and future Newhall Ranch WRFs. Future discharges from the WRFs were assumed to be constant at 30 cfs, no streamflow losses were applied. United's estimate of WRFs discharges corresponds well with the total WRF discharges assumed by Santa Clarita Valley Water Agency (SCVWA) for their GSPs future water balance (Dirk Marks, personal communications). SCVWA assumes average monthly discharges between 25 and 37 cfs, or 29 cfs on average.

4.4 LAKE PIRU RESERVOIR OUTFLOWS

The Lake Piru reservoir model is a water balance model calculating water levels and storage in Lake Piru based on historical data or assumed scenarios for inputs and outputs. Water inputs include inflows from the Middle Piru Creek watershed (natural flows, State Water imports, releases from Pyramid Lake) and rainfall; outputs include releases through the Santa Felicia Dam (SFD) outlet works (conservation releases, migration releases, habitat releases), spills and evaporation. Inflows from Middle Piru Creek were compiled based on gages USGS 11110000 PIRU C NR PIRU CA (1943-1955) and USGS 11109600 PIRU CREEK ABOVE LAKE PIRU CA (1955-2019) (Figure 3).

Important assumptions and inputs include:

- Lake Piru storage area and volume were gradually decreased to reflect the current rate of sedimentation in the reservoir. Storage capacities and corresponding areas were reduced gradually every 5 years from 82,000 AF (1943-1947 model years) to 69,384 AF (2013-2019 model years). The starting storage capacity was based on a 2020 bathymetry survey, and the 5-year sediment loads to the reservoir were calculated based on the average annual rainfall for each 5-year period using the equation 5-yr sediment load (AF) = 126.5 * average rainfall (inches) – 1,653. This relationship was developed from the 1985, 1996, 2005, 2015 and 2020 Lake Piru bathymetry surveys.
- Historical inflows from Middle Piru Creek includes periods when Pyramid Lake operations were different from current operations (inflow-outflow).
- Habitat and migration releases are simulated using operational rules that mimic releases according to operations specified in the Santa Felicia Water Release Plan (UWCD, 2012).
- Conservation releases are simulated using operational rules that mimic current operations. Conservation releases were started in September with maximum release rates of 400 cfs during dry and normal years, and started in August with a maximum release rate of 300 cfs during wet years. Minimum carry-over storage volumes during dry, normal and wet years were 15,000 AF, 30,000 AF and 50,000 AF, respectively.
- UWCD has a State Water Project Table A allocation of 3,150 AF. Annual allocations of Table A water were based on DWR's modeling of the State Water Project's existing delivery capability, which includes current flow regulations and adjusted to account for land-use changes (DWR, 2018b). To simulate current operations, it was assumed that UWCD would not purchase Table A water during wet years (water year rainfall at Santa Paula gage #245 < 25" or 3-year running average for Sespe runoff > 200,000 AF when rainfall at gage #245 > 10") and during years when the conservation release exceeds 31,000 AF.

4.5 SANTA CLARA RIVER UPSTREAM OF FREEMAN DIVERSION FACILITY

Streamflow in the Santa Clara River at the Freeman Diversion facility was calculated using the Upper Basins Surface Water Model. This model calculates surface flows, recharge to groundwater and rising groundwater for the reaches of the Santa Clara River overlying the Piru, Fillmore and Santa Paula basins (Figure 9). Model inputs include releases from Lake Piru (Section 4.4), Santa Clara River flows from Los Angeles County (Section 4.3), tributary flows (Hopper Creek, Sespe Creek, Santa Paula Creek), and historical available storage in Piru and Fillmore basins. Model outputs include available storage in the Piru and Fillmore basins for model scenarios, and river flows at the Freeman Diversion. Empirical relationships (based on observations) are used to model the following processes: recharge to groundwater in the Piru and Fillmore basins, rising groundwater at the Piru/Fillmore and Fillmore/Santa Paula basin boundaries, underflow between Piru and Fillmore basins, and losses in surface flows across Santa Paula basin. The model calculates the change in available storage in Piru and Fillmore basins for a modeling scenario compared to historical trends in available storage (based on a water mass balance for each basin), and subsequently adjusts fluxes for recharge, rising groundwater and underflow for the modeling scenario based on the calculated available storage and the established empirical relationships. The groundwater basin water balances for Piru and Fillmore only include fluxes for stream recharge, rising groundwater and underflow. Other fluxes including groundwater pumping, recharge not associated with the stream channel and evapotranspiration are assumed to remain unchanged between the historical hydrology and modeled scenarios. The influxes and outfluxes calculated for each reach are summarized in Table 1.

Two additional calculations were included in the model to improve model calibration.

- A multiplication factor of 1.2 was applied to gaged daily streamflows from major tributaries (Hopper Creek, Sespe Creek, and Santa Paula Creek). The correction factor improves calibration by accounting for bank storage and inflows from minor tributaries that were not included in the model.
- Simulated daily streamflow at the Freeman Diversion Facility was adjusted for model bias by subtracting the modeling error obtained from simulating historical hydrology and operations. This bias correction improves the model results when the unadjusted model would consistently over- or under predict streamflow for a period of time (e.g. during a conservation release, or on the receding limb of hydrograph for a specific storm event).

Model calibration results for streamflow just upstream of the Freeman Diversion Facility for the Upper Basins Surface Water Model and the Regional Model, and simulated diversions based on these streamflows, are compared in Figure 10. While both models perform well, the Regional Model underpredicts long-term average streamflow, leading to an underprediction of simulated diversions. Diversions simulated by the HOSS (simulating bypass flows proposed in United's Multiple Species Habitat Conservation Plan; UWCD, 2020) based on observed historical streamflows are 65,060 AF/yr, while simulated diversions based on streamflows from the Upper

Basins Surface Water Model and the Regional Model are 65,700 AF/yr and 57,300 AF/yr, respectively. Therefore, the Upper Basins Surface Water Model was used to simulate future streamflow at the Freeman Diversions.

4.6 DIVERSIONS AND BYPASS FLOWS AT FREEMAN DIVERSION FACILITY

Diversions are calculated based on total river flows entering the Freeman Diversion facility (imported from the Upper Basins Surface Water Model), and operational simulations using the Hydrological Operations Simulation System (HOSS) model.

The HOSS is a hydrology-based operations model that simulates diversions and flow magnitudes in the Santa Clara River downstream of the Freeman Diversion (bypass flows), and the amount of water that is lost or gained to/from groundwater in the “critical reach” of the SCR in the Oxnard Forebay. The HOSS is based upon several decades of historical flow gage data, groundwater conditions in the Forebay, and diversion flow rates, and has been peer-reviewed by R2 Resource consultants (R2 Resource Consultants, 2016).

Since some modeled operations in the HOSS depend on groundwater levels, iterative runs were performed where diversions from the HOSS were used in the SWDM and Regional Model, and groundwater level outputs from the groundwater model run (forecasted groundwater elevations at three wells) were then used to re-run the same scenario in the HOSS and SWDM until model runs converged (see also Section 4.7).

For groundwater modeling for GSP development, bypass flow and diversion operations were implemented as follows:

- 1943-1945 model years (2020-2022): Bypass flow operations as currently implemented by United, based on the reasonable and prudent alternative 2 (RPA 2(a) and 2(b)) as contained in the 2008 Biological Opinion issued by National Marine Fisheries Service (NMFS, 2008). These operations require increased bypass flows for steelhead migration compared to historical operations. Operations correspond to Scenario 4 (UWCD, 2016).
- 1946-1949 model years (2023-2026): Bypass flow operations proposed by United in its Freeman Diversion Multiple Species Habitat Conservation Plan (UWCD, 2020), without infrastructure improvements. These operations are designed to provide adequate bypass flows for fish migration while increasing diversions compared to the operations based on the Biological Opinion, and represents a realistic scenario for future diversion operations. No updates to United’s facilities are implemented during these years.
- 1950-2019 model years (2027-2096): Bypass flow operations as for the prior period, but with implementation of Freeman Expansion Phase 1 project. This project will connect the Ferro basin and make improvements to the existing desilting basin and headworks. Maximum diversion rates are 375 cfs as before, but diversion of water with higher suspended sediment concentrations is possible (up to 7,000 mg/l total suspended solids compared to 4,000 mg/l prior).

4.7 ARTIFICAL RECHARGE AND SURFACE WATER DELIVERIES ON OXNARD PLAIN

The Oxnard Plain Surface Water Distribution Model was used to calculate the amounts of artificial recharge at UWCD's facilities and surface water deliveries to the PTP and the PVWCD surface water delivery systems. The Oxnard Plain Surface Water Distribution Model is a water routing model that simulates amounts of groundwater recharge and surface water deliveries based on a series of adjustable hydrologic inputs (e.g. total river flow, diversions, obtained from the HOSS model) and operational assumptions. Some modeled operations in the Surface Water Distribution Model depend on available storage in the Oxnard Forebay and groundwater mounding in the vicinity of the Saticoy Recharge Facility, which is determined based on groundwater levels for three wells in the Oxnard Forebay. Therefore, iterative runs were performed where outputs from the Surface Water Distribution Model (spreading at recharge basins and calculated groundwater extractions) were used in the groundwater model, and groundwater level outputs from the groundwater model run were then used to re-run the same scenario in the Surface Water Distribution Model. The model runs were repeated until groundwater elevations in two wells in the Oxnard Forebay (2N22W12R01S and 2N22W12E04S) and fluxes between the Oxnard Forebay and Mound basin converged (daily water levels mostly within 5 ft and monthly fluxes within 20 AF between consecutive runs).

The Surface Water Distribution Model was also used to calculate pumping demands in the PTP and PV service areas, based on the difference between surface water deliveries and total agricultural demands within the respective service areas. Baseline total agricultural demands were based on the average historical demand for the years 2015-2017, and were reduced by 35% in the Oxnard Basin and 20% in Pleasant Valley basin during the first 20-year period. These demand assumptions are the same as those used for the scenario with projects in the Groundwater Sustainability Plans for the Oxnard Basin and Pleasant Valley Basin (FCGMA, 2019a, 2019b).

Water resource inputs to the Surface Water Distribution Model include diversion amounts, pumping from Saticoy wells and Conejo Creek diversions. Operational assumptions govern how the distribution of surface water is prioritized among recharge basins and surface water deliveries, and change based on season and hydrologic conditions (dry, normal or wet years). The following assumptions were made regarding water inputs:

- Surface water from the Freeman Diversion can supply all recharge basins and surface water delivery systems, while water occasionally pumped from UWCD's Saticoy well field is restricted to the PTP and PVCWD surface water delivery pipelines. Surface water from Conejo Creek diversions are restricted to the PVCWD delivery pipeline.
- Diversions calculated in the HOSS were reduced by 10% for days when bypass flows were provided, in order to account for inefficiencies in diversion operations due to flushing, maintenance and other reasons.

- The Saticoy well field is used to pump down the groundwater mound that sometimes develops beneath the Saticoy recharge basins in wet years. The production capacity of the Saticoy well field is dependent upon groundwater elevation. The well field does operate during periods of significant spreading in the recharge basins, because pipeline demands can normally be met with diverted surface water at these times.
- Surface water deliveries to PVCWD from the Conejo Creek diversion were estimated at 4,500 AF/year by Camrosa Water District.

Water routing prioritization indicates the order in which recharge basins and surface water delivery systems receive available water. A priority assignment of 1 is the highest priority. Facilities assigned a priority of 3 or greater often receive no water, as all available surface water has been used by facilities with higher priority. Prioritization rules for water routing are summarized in Table 2, and depend on the following factors:

- Water year hydrology: defined as dry, normal, wet, based on streamflow magnitude (R2 Resource Consultants, 2016).
- Season: summer is defined as beginning on July 1st and continuing to the first significant storm event of the winter (equal to first turn-out of the season); winter is the remaining period. During summer dry and normal conditions, the highest priorities for surface water routing are El Rio, PTP and PV (percentages to each facility are detailed in Table 2). During the winter season and wet summers, the highest priority is surface water deliveries (equally divided between PTP and PV), followed by recharge at El Rio and then other recharge basins.
- Forebay available storage: the estimated volume of additional groundwater that could be stored in the Forebay, calculated based on groundwater elevations in two key wells. Conditions with available storage > 70,000 AF indicate dry conditions, with increased priority for recharge in El Rio.
- Suspended sediment concentrations: when sediment levels in the river exceed 3,000 NTUs, diversions are routed to the Ferro basin (from 2027 onwards), and the Noble and Rose recharge basins first, to avoid clogging of the surface layer in the Saticoy and El Rio recharge basins. Sediment levels in the river were estimated based on a historical empirical correlation between average daily streamflow and sediment concentration.

Water deliveries to recharge basins and surface water delivery pipelines are limited by conveyance capacity, basin infiltration rates and demands for surface water deliveries to the PTP and PV pipelines.

- The modeled instantaneous conveyance capacity limits for facilities are: 350 cfs for Saticoy, 180 cfs for Noble, 80 cfs for Rose, 0 cfs (2020-2026) and 375 cfs (2027-2096) for Ferro, 120 cfs for El Rio, 65 cfs for PTP and PV systems (individually), and 75 cfs for PTP and PV systems combined.
- When modeled groundwater elevations in well 02N22W12R01S were less than 95 ft amsl, the maximum infiltration rates in each of the recharge basins were 145 cfs for Saticoy, 100

cfs for Noble, 52 cfs for Rose, 151 cfs for Ferro and 100 cfs for El Rio, for a maximum combined artificial recharge rate in the Oxnard Forebay of 397 cfs without Ferro basin, and 548 cfs with Ferro basin. When groundwater elevations at well 02N22W12R01S exceeded 95 ft amsl, combined maximum infiltration rates were gradually reduced according to the relationship shown in Figure 11. For example, at a groundwater elevation of 120 ft in well 02N22W12R01S, artificial recharge to the Oxnard Forebay is limited to 191 cfs (without Ferro basin) and 263 cfs (with Ferro basin). These maximum and reduced infiltration rates due to mounding were based on field observations.

- Demand for surface water deliveries was estimated on a daily basis using historical surface water delivery data, and accounts for seasonal, daily and weather-related variability in demand.

4.8 SURFACE FLOW INPUTS UNDER CLIMATE CHANGE SCENARIOS

All hydrology models presented in Section 4 require daily inputs for streamflow. For scenario runs that simulate climate change, daily flows from tributaries and drainage areas that feed into the models were adjusted using the 2030 and 2070 future conditions streamflow change factors provided by DWR. The following historical records were adjusted for climate change (see locations in Figure 3):

- Castaic Reservoir inflows. Historical records were compiled based on USGS gage records and DWR operations logs as detailed in Section 4.1.
- Santa Clara River upstream of Castaic Creek. Historical records were compiled based on USGS gage records and adjusted for current development as detailed in Section 4.2.
- Middle Piru Creek (inflows to Lake Piru). Historical records were compiled based on USGS gage records as detailed in Section 4.4.
- Pole Creek. Historical records were compiled from VCWPD Station 713 Pole Creek at Sespe Ave (1974-2018). Missing data were estimated based on correlations with Hopper Creek. Flows from Pole Creek were exclusively used by the Regional Groundwater Flow Model.
- Hopper Creek. Historical records from USGS gage 11110500 Hopper Creek near Piru CA, and VCWPD Station 701 Hopper Creek at Hwy 126 near Piru. Flows from Hopper Creek were also used by the Regional Groundwater Flow Model.
- Sespe Creek. Historical records are from gage USGS 11113000 SESPE C NR FILLMORE. Flows from Sespe Creek were also used by the Regional Groundwater Flow Model.
- Santa Paula Creek. Historical records are from gage USGS 11113500 SANTA PAULA C NR SANTA PAULA. Flows from Santa Paula Creek were also used by the Regional Groundwater Flow Model.

Daily historical flow records were adjusted to 2030 and 2070 future conditions using the HUC8_18070102 annual and monthly streamflow change factors provided by the DWR, using the methodology for application of time series change factor data described in the Guidance Document for Climate Change Data Use during Groundwater Sustainability Plan Development (DWR, 2018a). The methodology was applied to the daily flow data using the same methods as recommended for monthly data.

DWR streamflow change factors were available for model years 1916-2011. Change factors for model years 2012-2019 were determined by selecting analogous water years in the historical record, and applying the streamflow change factors published for these analogous water years. Analogous water years were determined using the monthly precipitation record for VCWPD rain gage 245 (Santa Paula), which has a complete data record from 1915-2019, and is representative of the average annual precipitation observed in large portions of the watershed. Analogous water years for each of the 2012-2020 water years were determined by calculating the root mean square error (RMSE) based on monthly precipitation with each water year from 1915-2011. Monthly precipitation for each of the 2012-20 water years was compared with the two 1915-2011 water years with lowest RMSE (see example in Figure 12). Generally, the year with the lowest RMSE was selected as the analogous water year, except for WY 2017. For 2017, the year with the lowest RMSE had significantly higher precipitation, and therefore the water year with second-lowest RMSE was selected. The analogous water years, annual precipitation and RMSEs for 2012-2020 are tabulated in Table 3.

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6 TABLES

Table 1. Model reaches and influxes/outfluxes for the Santa Clara River Upper Basins Surface Water Model.

Reach No.	Reach Description	Influxes	Outfluxes
1	Piru Creek SFD dam to SCR confluence	- Flows from SFD (from Lake Piru model)	- Piru Creek diversions - Percolation Piru Creek - Piru Creek flow upstream SCR confluence
2	SCR Newhall to Torrey	- Piru Creek flow upstream SCR confluence - SCR flow upstream of Piru Creek	- Percolation Newhall to Torrey - SCR flow Torrey
3	SCR Torrey to Piru/Fillmore basin boundary	- SCR flow Torrey - Hopper Creek flow - Piru basin rising groundwater	- Percolation Torrey to Piru basin boundary - Percolation Hopper Creek - SCR flow Cavin
4	SCR Piru/Fillmore basin boundary to Sespe confluence	- SCR flow Cavin	- Percolation Cavin to Sespe - SCR flow upstream Sespe confluence
5	SCR Sespe confluence to Fillmore/Santa Paula basin boundary	- SCR flow upstream Sespe confluence - Sespe Creek flow - Fillmore basin rising groundwater	- Percolation Sespe Creek - Percolation SCR downstream Sespe - SCR flow at Fillmore basin boundary
6	SCR Fillmore/ Santa Paula basin boundary to Freeman diversion	- SCR flow at Fillmore basin boundary - Santa Paula Creek	- Percolation Santa Paula Creek - Santa Paula basin losses (percolation and diversions) - SCR flows at Freeman

Table 2. Prioritization order for water resources supply to recharge basins and PTP/PV systems. When facilities are assigned identical priorities, the percentages of supply received for each facility are included in parentheses.

Facility	Summer (dry)	Summer (normal-wet), winter	Forebay storage > 70,000 AF	NTU > 3,000
El Rio basin	1 (50%)	2	1	5
PTP system	1 (25%)	1 (50%)	2 (50%)	6 (50%)
PV system	1 (25%)	1 (50%)	2 (50%)	6 (50%)
Saticoy basin	2	3	3	4
Noble basin	3	4	4	2
Rose basin	4	5	5	3
Ferro basin	5	6	6	1

Table 3. Summary of analogous water years for water years 2012-2020 for the purpose of calculating streamflow change factors, with annual precipitation for each year and calculated root mean square error (RMSE).

WY	WY analog	WY precip	WY analog precip	RMSE (monthly)
2012	1925	10.18	10.01	0.68
2013	2002	6.03	6.98	0.53
2014	1959	6.12	6.67	0.85
2015	1949	10.63	9.79	0.76
2016	1930	9.63	11.59	0.43
2017	1973	21.65	23.32	1.62
2018	1981	8.84	11.88	0.62
2019	1973	22.23	23.32	1.33
2020	1942	15.04	14.19	0.99

7 FIGURES

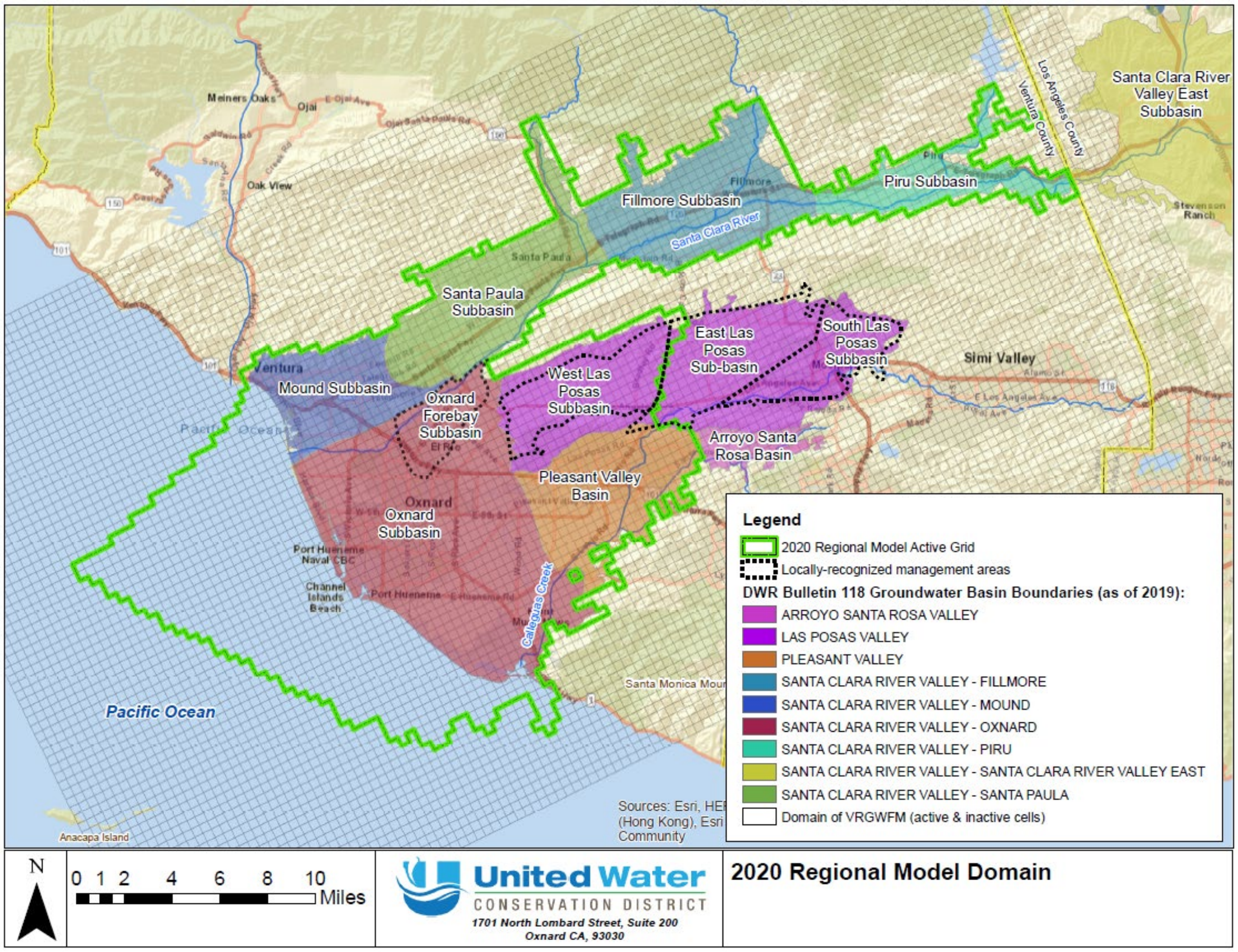

Figure 1. Regional Model Domain with Santa Clara River Valley Expansion.

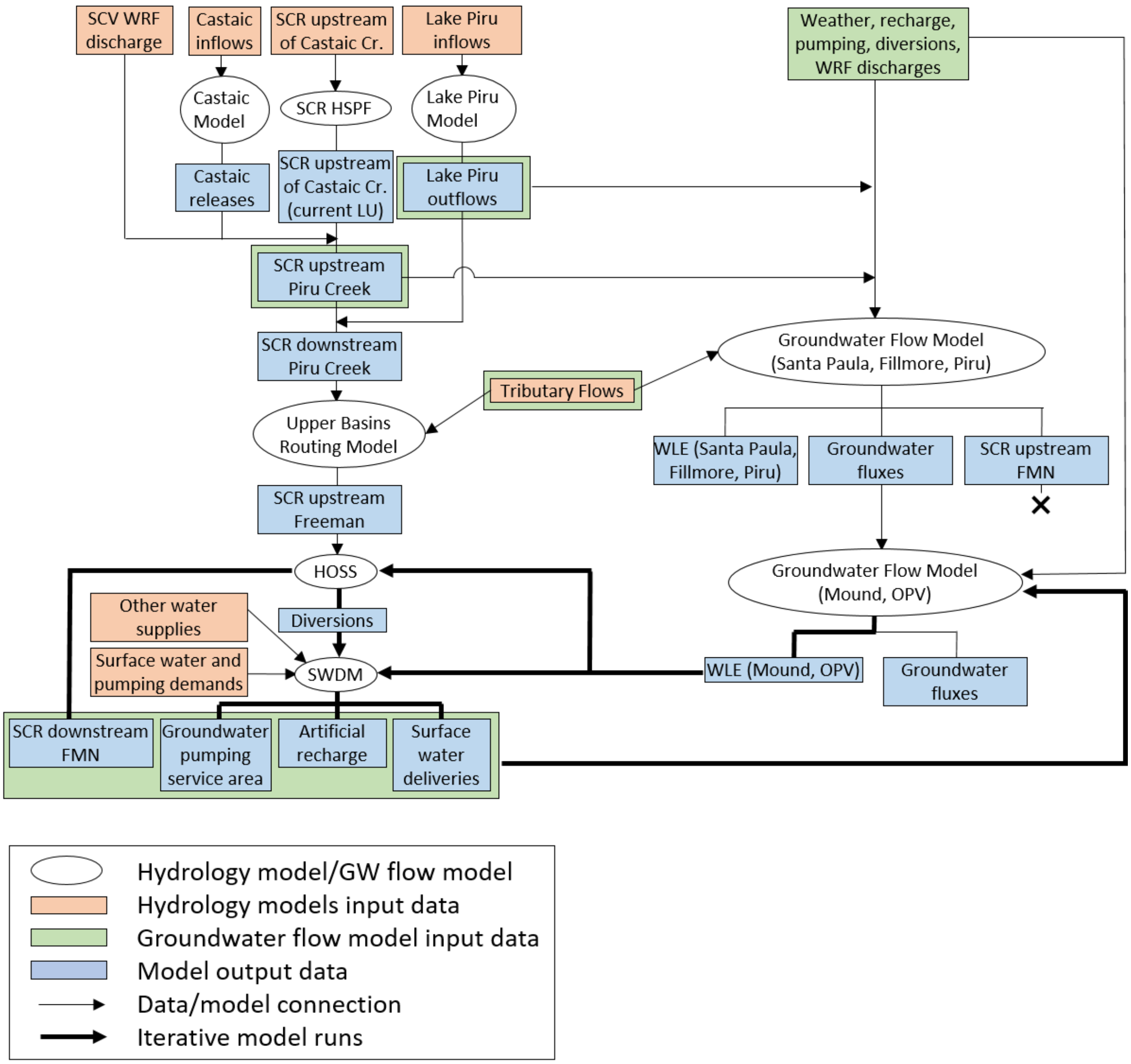

Figure 2. Schematic of the interaction between surface water hydrology models and Ventura Regional Groundwater Flow Model.

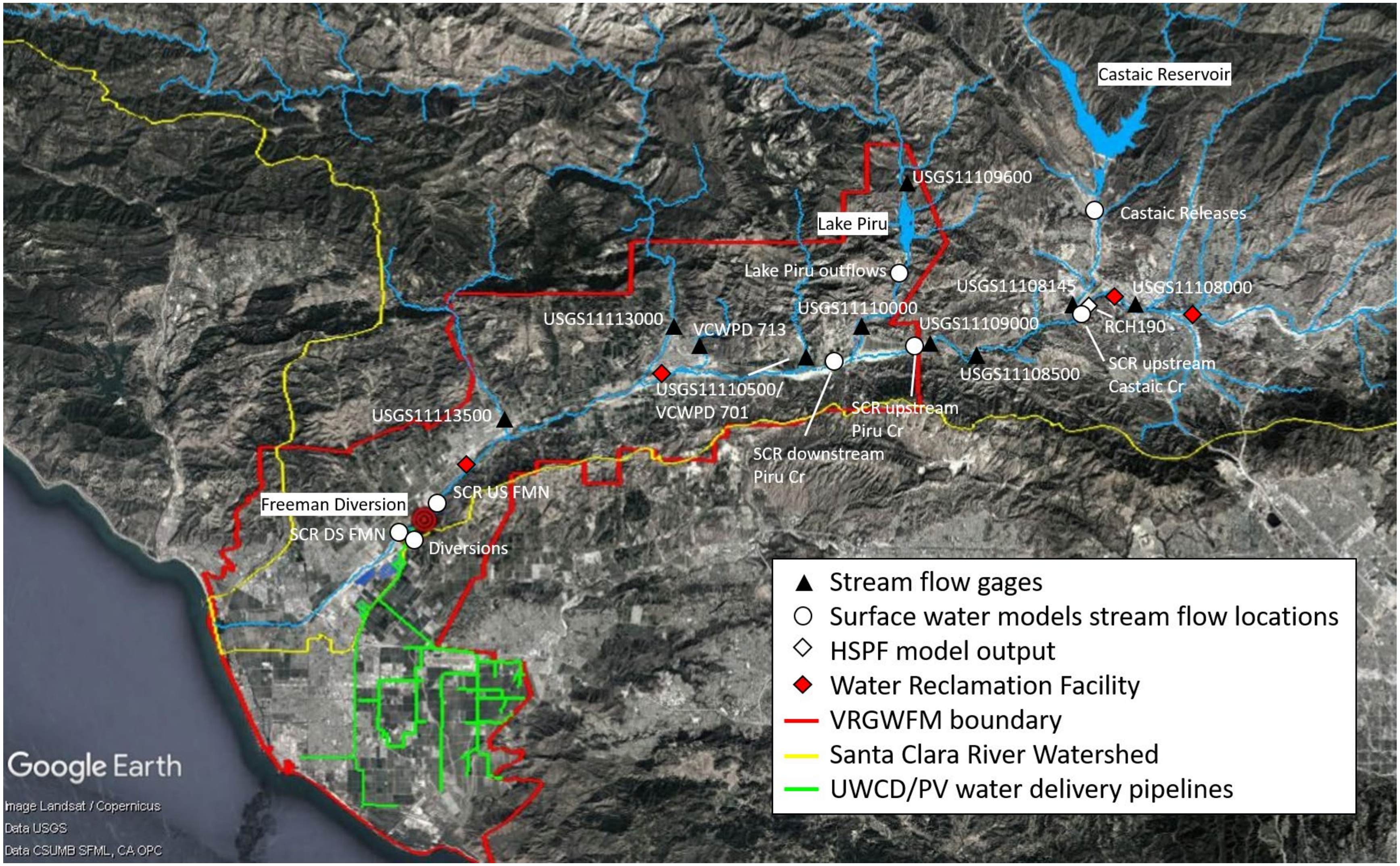

Figure 3. Map of streamflow locations, gages and water reclamation facilities used in surface water hydrology and Regional Model models.

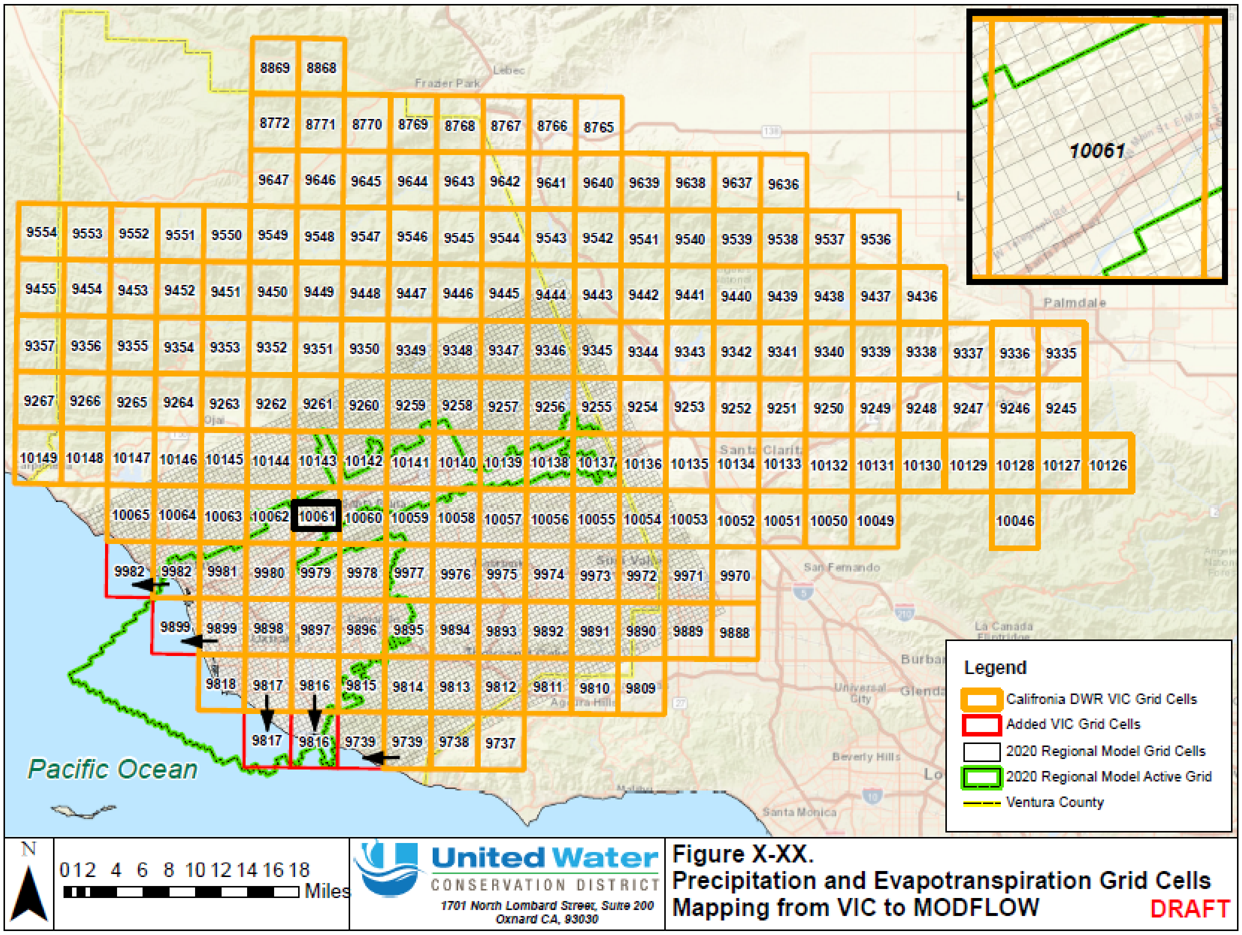

Figure 4: Mapping of California DWR provided Variable Infiltration Capacity (VIC) grid cells to Regional Model MODFLOW grid cell; Additional VIC cells (red) were added for completeness based on neighboring grid cells; Inset figure displays example of Regional Model MODFLOW grid cells located within a single VIC grid cell (ID 10061) within Santa Paula basin.

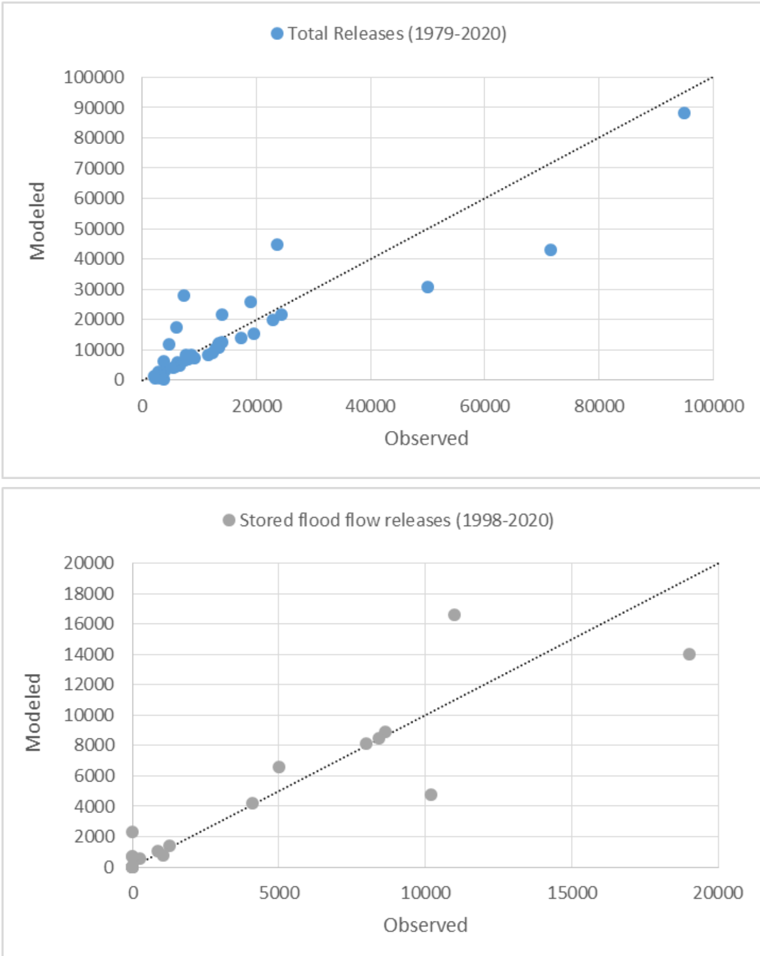

Figure 5. Calibration of Castaic Reservoir Operations Model. Modeled versus observed total releases (top) and flood flow releases (bottom) from Castaic Reservoir.

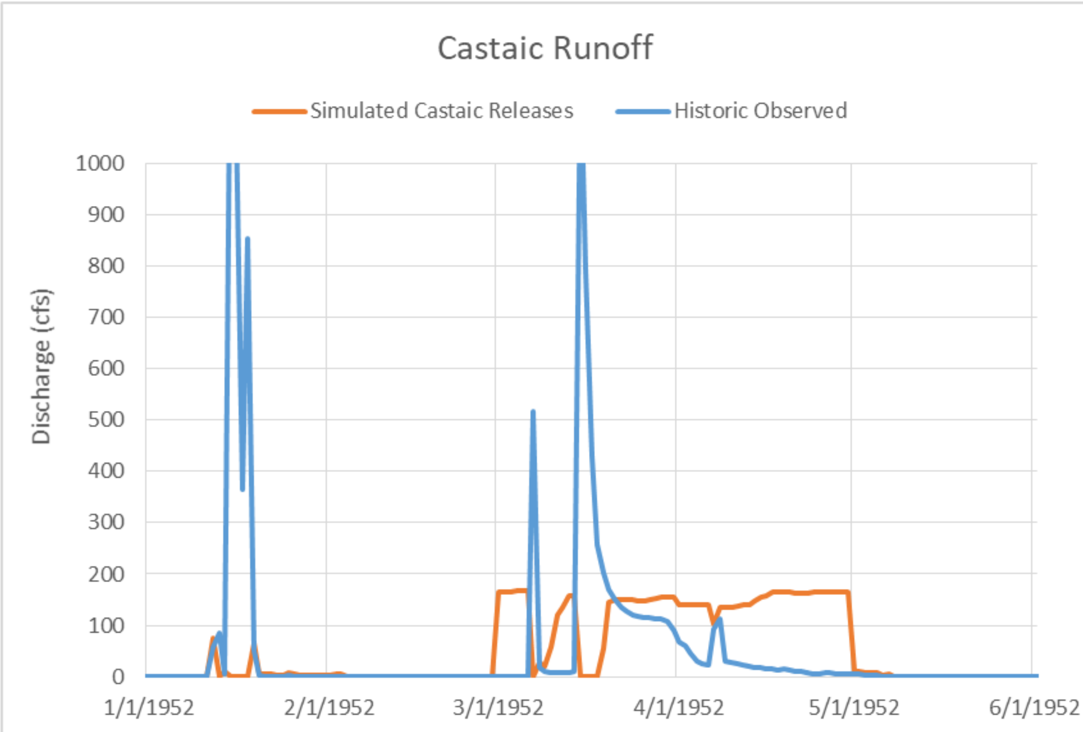

Figure 6. Example of simulated releases from Castaic Reservoir compared to historical flows in Castaic Creek before construction of Castaic Reservoir.

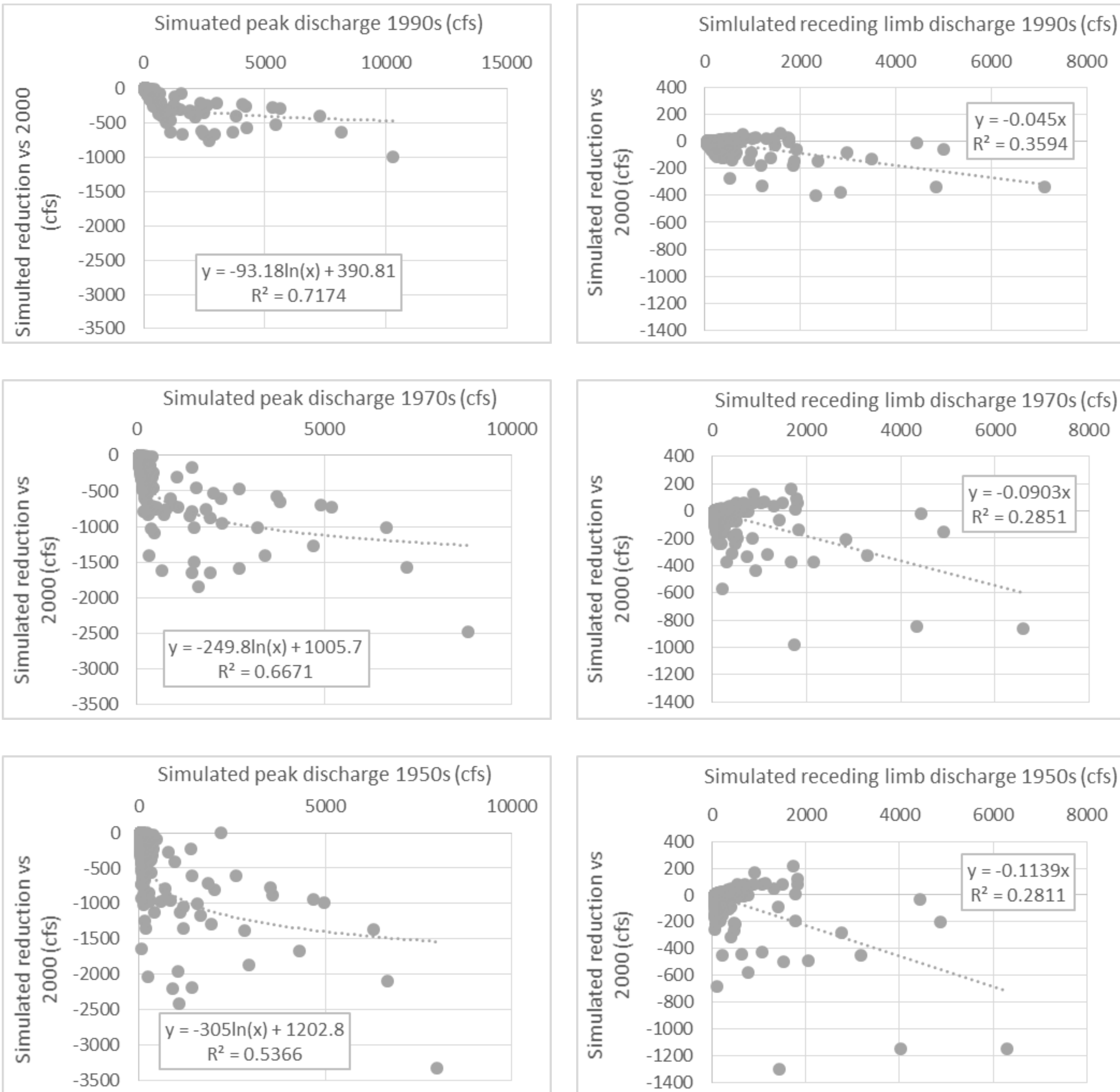

Figure 7. Simulated reduction in daily streamflow for storm peak discharges (left side) and storm flow discharges on receding limb (right side) for the 1950s, 1970s and 1990s simulation periods compared to the model run using 2000s land use. Best fit regression curves and equations are shown for each run.

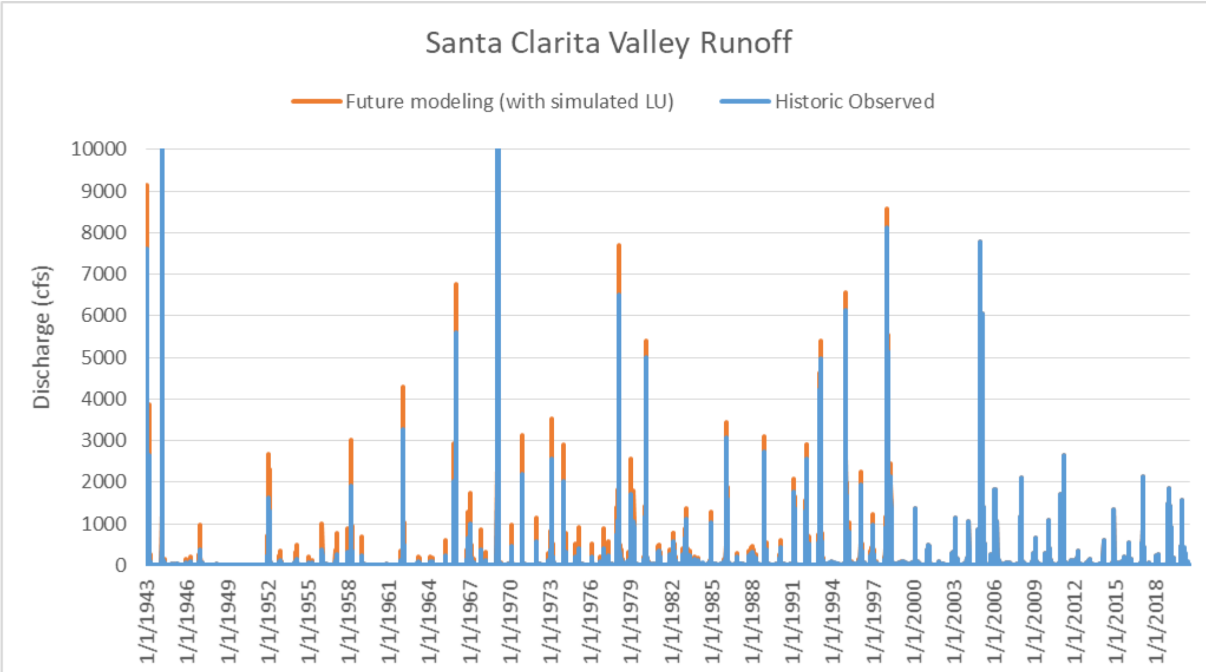

Figure 8. Natural streamflow in the Santa Clara River upstream of Castaic Creek before (historical observed) and after adjustment to reflect current impervious land use (LU). The adjusted record with simulated land use was used in future modeling efforts.

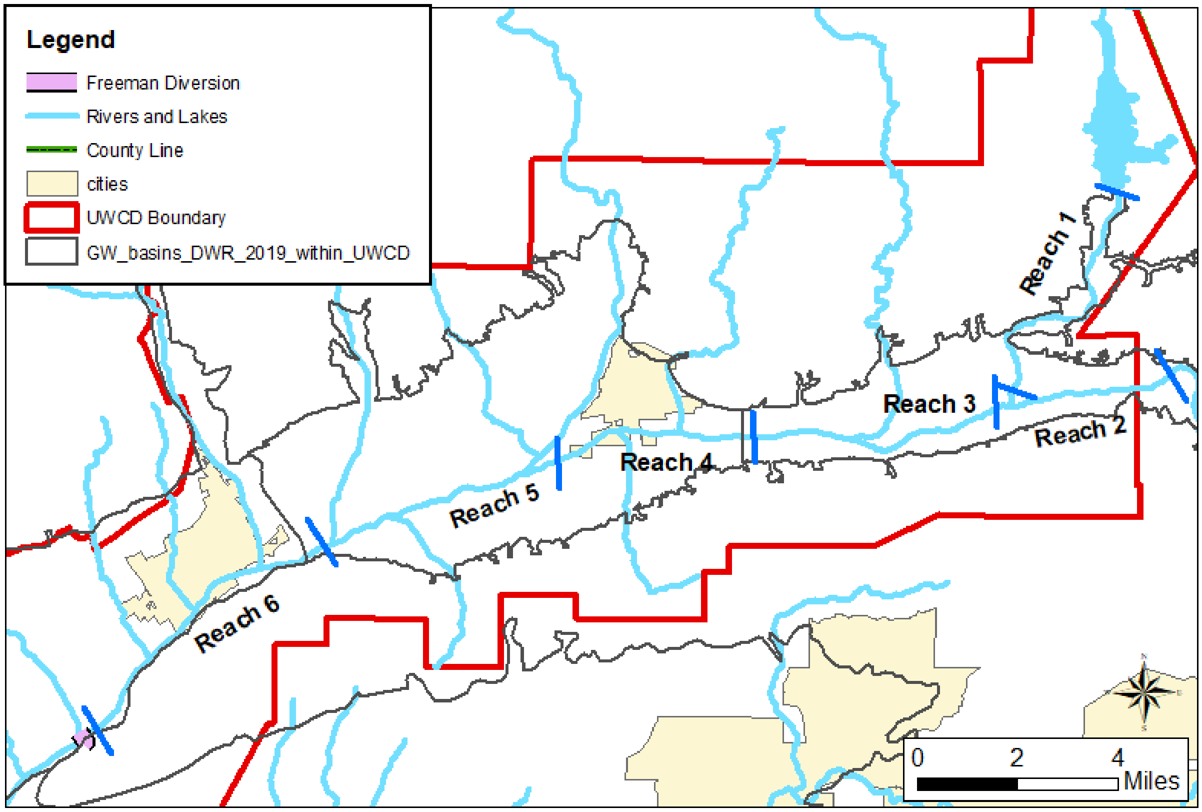

Figure 9. Model reaches for the Santa Clara River Upper Basins Surface Water Model. Reaches are numbered and separated by blue lines.

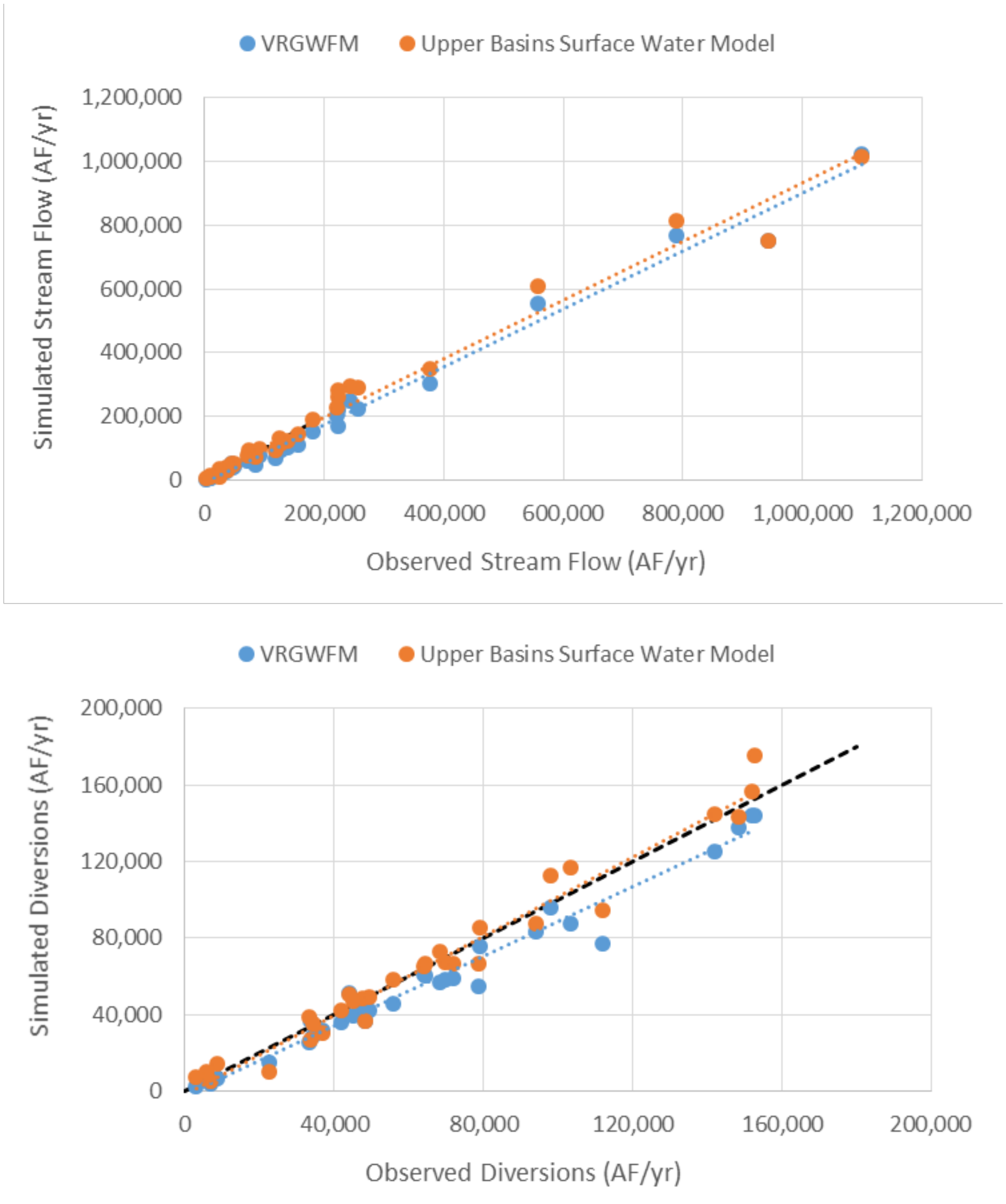

Figure 10. Simulated versus observed historical annual streamflow at the Freeman Diversion (top) and annual diversions based on simulated streamflow (bottom), for the regional groundwater flow model (Regional Model) and the Upper Basins Surface Water Model. Model simulations were performed for the 1985-2015 calibration period, assuming bypass flow operations as proposed in United's Multiple Species Habitat Conservation Plan (UWCD, 2020). Simulations of diversions were performed with the Hydrological Operations Simulation System (HOSS).

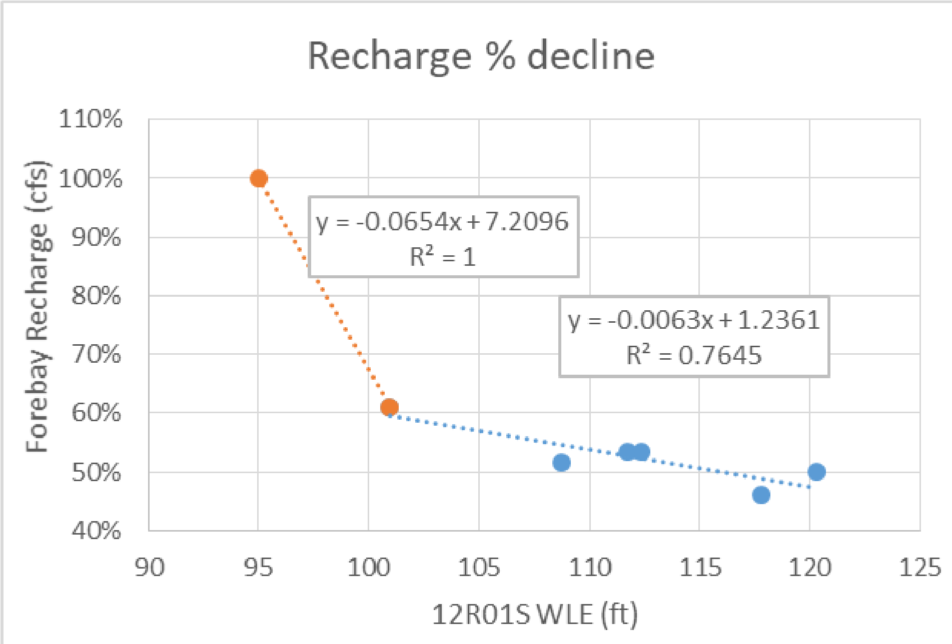

Figure 11. Decrease in maximum infiltration rate for artificial recharge to the Oxnard Forebay as a function of groundwater elevation at well 2N22W12R01S.

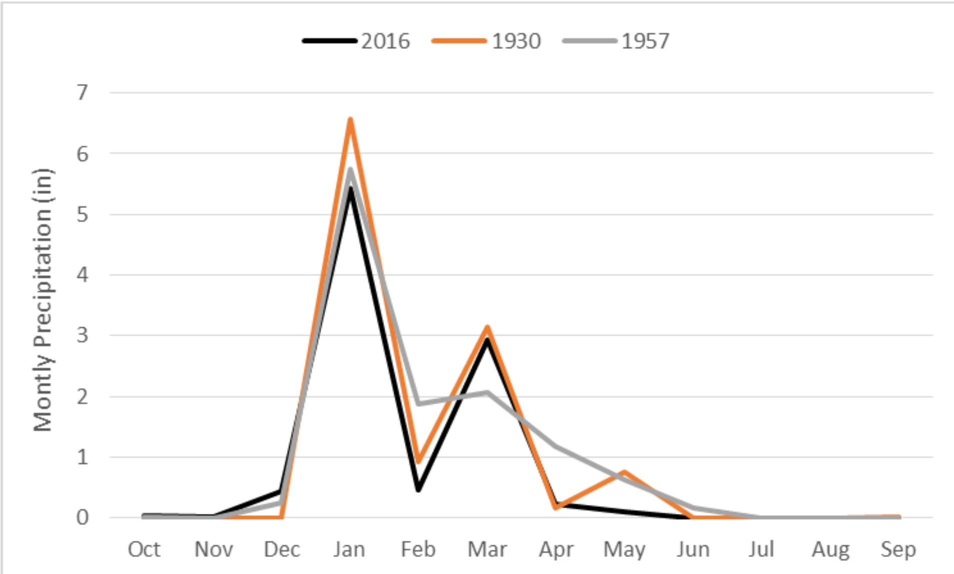

Figure. 12. Comparison of monthly precipitation for VCWPD gage 245 (Santa Paula) for water year 2016 and the two water years with streamflow change factors with the lowest RMSE (0.42 for WY 1930, 0.59 for WY 1957). Water year 1930 was selected as the analogous year for 2016 for the purpose of calculating streamflow change factors.

Appendix E-3

Ventura Regional Groundwater Flow Model 2016-2019 Update for the Piru, Fillmore, Santa Paula, Mound, Oxnard, Pleasant Valley, and West Las Posas Groundwater Basins (United, 2021e)

VENTURA REGIONAL GROUNDWATER FLOW MODEL 2016-2019 UPDATE FOR THE PIRU, FILLMORE, SANTA PAULA, MOUND, OXNARD, PLEASANT VALLEY, AND WEST LAS POSAS VALLEY GROUNDWATER BASINS

United Water Conservation District

Open-File Report 2021-02
September 2021

WATER RESOURCES DEPARTMENT
UNITED WATER CONSERVATION DISTRICT

THIS REPORT IS PRELIMINARY AND SUBJECT TO MODIFICATION BASED UPON FUTURE ANALYSIS AND EVALUATIONS

VENTURA REGIONAL GROUNDWATER FLOW MODEL 2016-2019 UPDATE FOR THE PIRU, FILLMORE, SANTA PAULA, MOUND, OXNARD, PLEASANT VALLEY, AND WEST LAS POSAS GROUNDWATER BASINS

United Water Conservation District
Open-File Report 2021-02
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PREPARED BY

WATER RESOURCES DEPARTMENT

SEPTEMBER 2021

THIS REPORT IS PRELIMINARY AND SUBJECT TO MODIFICATION BASED UPON FUTURE ANALYSIS AND EVALUATIONS

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Principal Authors: Dr Jason Sun, PE, Dr Bram Sercu, Dr Zachary Hanson, and
Dan Detmer, PG, CHG

EXECUTIVE SUMMARY

A regional groundwater flow model (Regional Model) was built and calibrated by United Water Conservation District (UWCD or United) in 2020 (UWCD, 2021a). The Regional Model covers the seven groundwater basins within United's District boundaries, and areas of the Pleasant Valley and West Las Posas Valley basins that are outside District boundaries. The simulation and calibration period for the Regional Model was for the years 1985 through 2015, using a daily time step to capture surface water dynamics along the Santa Clara River and United's water diversions. The 2020 Regional Model was an expansion of United's 2018 groundwater flow model, which simulated the Oxnard, Pleasant Valley, Mound and West Las Posas Valley basins and used a monthly time step The expanded Regional Model was reviewed by an expert panel comprised of three nationally recognized experts on groundwater flow models: Dr Sorab Panday, Mr. Jim Rumbaugh, and Mr John Porcello The expert panel concluded that "The model calibration to both heads and streamflows is very good" (GSI Water Solutions and others, 2021)

As hydrologic data from years 2016 through 2019 became available, United was able to extend the simulation period of the Regional Model through the end of the year 2019 The model update through 2019 is presented in this report. Updating the model included the following steps.

- Collection of precipitation and areal recharge data, streamflow measurements, data related to United's conservation releases from Lake Piru, streamflow diversion records, groundwater extraction records, and groundwater elevation measurements, from 2016 to 2019
- Pre-processing the 2016-2019 data into the model input files
- Model simulation for the years 2016-2019
- Post-processing the model output to generate simulated groundwater elevations, streamflow rates, gaining and losing stream reaches, and water budget components for the years 2016-2019
- Comparison of simulated groundwater elevations and modeled streamflow with measured values to evaluate the model calibration with the 2016-2019 record set that is independent of the original model calibration record set (years 1985-2015).

United staff started the data collection in early 2020 and completed the model update in fall 2020 In this Model Update Report, it is shown that the Regional Model's simulation of the 2016-2019 groundwater elevations closely approximates the measured 2016-2019 groundwater elevations Streamflow and surface water-groundwater interaction along the Santa Clara River is also well simulated. The uniform numerical model grid size of 2000 feet by 2000 feet implies that the Regional Model may be used to support basin-scale groundwater analysis but one should be cautious when using the model to interpret smaller/local scale projects or conditions.

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1 INTRODUCTION

United Water Conservation District (United or UWCD) is a California special district (i e , a public agency) with a service area of approximately 335 square miles (214,000 acres) in southern Ventura County United's service area includes the Ventura County portion of the Santa Clara River Valley and much of the Oxnard coastal plain, including the lower part of the Calleguas Creek watershed, as shown on Figure 1-1. United serves as a steward for managing the surface water and groundwater resources within all or part of seven groundwater basins It is governed by a seven-person board of directors elected by region, and receives revenue from property taxes, pump charges, recreation fees, and water delivery charges. United is authorized under the California Water Code to conduct water resource investigations, acquire water rights, build facilities to store and recharge water, construct wells and pipelines for water deliveries, commence actions involving water rights and water use, prevent interference with or diminution of stream/river flows and their associated natural subterranean supply of water, and to acquire and operate recreational facilities (California Water Code, section 74500 et al)

This report documents the update of the Regional Model for the years 2016-2019, covering the groundwater basins of the coastal plain and the Santa Clara River (SCR) valley within Ventura County, California. The groundwater conditions on the coastal plain, which includes the Oxnard, Pleasant Valley, Mound, and West Las Posas Valley basins are distinctly different from the basin setting and groundwater conditions in the basins of the SCR Valley subbasins, which include the Piru, Fillmore and Santa Paula basins (Figure 1-2). For example, the SCR basins are largely unconfined, and seasonally recharged by SCR streamflow and conservation releases conducted by UWCD, resulting in rapid groundwater elevation rebound in the SCR basins in wet years. The largely confined basins of the Oxnard coastal plain basins are predominantly influenced by the availability of surface water for artificial recharge in the Oxnard Forebay area and direct water deliveries to offset pumping in the more central and coastal portions of these basins.

As a note related to basin naming terminology, for the sake of brevity, groundwater subbasins are commonly referred to as "basins" throughout this report. Additionally, the Forebay portion of the Oxnard basin and the western portion of Las Posas Valley basin (West Las Posas Valley) are not recognized basins or subbasins by California Department of Water Resource (DWR), but are locally-recognized and established management areas. As such, these management areas are referenced for analysis during this report due to their relevance to local understanding and consistency with previous reporting and analysis.

Since the 1990s, United's Board of Directors has endeavored to have a regional groundwater flow model covering all the above-mentioned basins, for water resources planning and management purposes (USGS, 2003; FCGMA and others, 2007, UWCD, 2018a, UWCD, 2021a) In 2020 United staff completed construction and calibration of a regional model covering its service area and some adjacent areas outside its jurisdiction (in the West Las Posas Valley basin and the northern Pleasant Valley basin) (UWCD, 2021a) The simulation period for the expanded Regional Model is from 1985 to 2015 with a daily time step, specifically for surface water inputs. The Regional Model was reviewed by an expert panel comprised of three nationally recognized experts in groundwater modeling. Dr Sorab Panday, Mr Jim Rumbaugh, and Mr John Porcello. The expert panel concluded that "The model calibration to both heads and streamflows is very good" (UWCD, 2021a)

When hydrologic data for 2016 to 2019 period became available, the simulation period of the Regional Model was extended through 2019 This report documents the first update of the Regional Model, which was completed in the fall of 2020. Model input data for 2016-2019 (the "Update Period") were implemented with the same methodologies as the 1985-2015 "Calibration Period" data, except for a single streamflow and single subsurface underflow component (see Section 2 2; Conejo Creek and Arroyo Las Posas subsurface underflow) which no longer had the same data available for the Update Period. Overall, the model and the processes for data acquisition and implementation were not revised, and this report documents the update for the 2016-2019 time period.

Generally, when a groundwater flow model is constructed, a historical data set is used to calibrate the model Over time, as recent data sets become available, the newly available data sets can be used to extend the simulation period of the model The new data sets can also be used to evaluate model calibration and help assess whether further model calibration is necessary. United's Regional Model (UWCD, 2021a) was calibrated with data available from calendar years 1985 through 2015 As data became available in ensuing years, the new data were gathered and evaluated as described in Section 2, and then was used to evaluate the calibration of the Regional Model and extend the simulation period with calendar years 2016 through 2019. Simulated groundwater elevations, streamflow and surface flow pattern results for the Update Period were processed and compared with observed groundwater elevation data and measured streamflows and surface water flow patterns for the same period. In this report, it is shown that the Regional Model simulates groundwater elevations for the Update Period with sufficient accuracy Streamflow rates and surface water-groundwater interactions along the Santa Clara River are also reasonably simulated on a monthly basis during the Update Period In general, model performance during the 2016-2019 Update Period is considered good and in line with model performance from the 1985-2015 Calibration Period

2 UPDATED MODEL INPUTS AND DATA SETS FOR 2016-2019 PERIOD

With the inclusion of data from 2016 through 2019, the simulation period of the Regional Model is extended through December 2019. The various data sets necessary for the model update and comparison process included: (1) precipitation for implementation into the areal recharge component of the numerical model, (2) streamflow records and subsurface underflow estimates for implementation into the streamflow and related underflow components, (3) streamflow diversions for implementation into the streamflow components, (4) groundwater extraction records for implementation into the well pumping component of the numerical model (5) areal recharge from agricultural and municipal and industrial return flows for implementation into the areal recharge component of the numerical model, (6) wastewater treatment plant discharges for implementation into the areal recharge component of the numerical model, and (7) groundwater elevation records for comparison This section will describe the data sets gathered, and the methodology used to acquire and process the data sets for implementation in the numerical model.

2.1 PRECIPITATION DATA

Precipitation records were updated in order to estimate monthly total precipitation across the entire domain of the Regional Model. Daily precipitation data were collected for 110 rainfall gage stations located within and near Ventura County that have data available during the 2016-2019 Update Period (Table 2-1 and Figure 2-1). The daily precipitation records were downloaded from the Ventura County Watershed Protection District (VCWPD; http://www.vcwatershed.net/hydrodata/). Previously, Ventura County had 180 gages active during the 1985-2015 Calibration Period. The same procedures were used in the Update Period as were performed in the Calibration Period: daily data were aggregated to monthly data and Kriging was used to generate monthly precipitation distributions across Ventura County The monthly precipitation distributions were then mapped to the numerical grid of the Regional Model for use as an input when calculating areal recharge.

Precipitation records from VCWPD Gage 245A over the modeling period (1985-2019) is representative of precipitation over the model area for both periods (Figure 2-2) Gage 245A was discontinued by VCWPD after water Year 2010, and the VCWPD Gage record was continued using nearby VCWPD Gage 245B (Figure 2-1) However, United continued to record precipitation data through year 2019 at Gage 245A. Figure 2-2 shows that the average calendar year rainfall at VCWPD Gage 245A was very similar between the Calibration Period (17 13 inches) and the Update Period (17.37 inches) Also, the Calibration Period contained some very wet years (e.g. 1998 and 2005) as well as significant drought conditions (2011-2015), leading to basin conditions being severely depleted at the beginning of the Update Period When comparing 2011-2015 rainfall to the 2016-2019 Update Period, there is a significant increase in recorded precipitation, with average annual rainfall nearly doubling from 8.89 inches from 2011-2015 to 17.37 inches per year for the 2016-2019 Update Period.

2.2 STREAMFLOW AND SUBSURFACE UNDERFLOW

Streamflow was updated for the 2016-2019 Update Period with data acquired from the USGS and VCWPD. The methods used for estimating streamflow and subsurface underflow for Arroyo Las Posas, and streamflow for Conejo Creek, which no longer had data available for the Update Period, are described below in this Section. For the SCR and tributaries, streamflow data was available through the USGS, VCWPD, and United's records at Freeman Diversion (Table 2-2 and Figure 2-3).

Annual average streamflow along the SCR near Piru (USGS gage 11109000) was higher in 2017 and 2019 due to significant releases from Castaic Lake (15,200 AF in 2017, 19,000 AF in 2019) Note that the 2017 Castaic Lake release included 10,000 AF of imported State Water Project (Article 21 water purchase) Field monitoring by United staff indicated that most (75-95%) of the released water percolated to Piru basin, while the remainder percolated in the Castaic Creek streambed upstream Groundwater underflow into Piru basin along the SCR near County Line remained the same as during the Regional Model Calibration Period (5000 AFY, UWCD, 2021a). Although average annual precipitation is similar for the Update and Calibration Periods (Figure 2-2), streamflow gages in the SCR basins indicate decreased annual average streamflow during the Update Period compared to the Calibration Period The decrease in streamflow is due to dry antecedent conditions in all watersheds following the drought conditions from fall 2011 through 2015, as mentioned above Measurements of rising groundwater at the Piru-Fillmore and Fillmore-Santa Paula basin boundaries were performed by United staff and are available for the 2016-2019 Update Period. Measurements were obtained by manually measuring streamflow in the Santa Clara River upstream and downstream of the rising groundwater reach, which varies spatially, and subtracting upstream flows from downstream flows. Streamflow measurements are generally within 5-10% accuracy Rising groundwater measurements are generally available for dry months only, as it is difficult to accurately measure rising groundwater when streamflow is high and dynamic. Rising groundwater measurements were not used as an input to the Regional Model, but are used in evaluation of the streamflow as detailed in Section 3.3.4. Similarly, measurements of percolation of streamflow to the groundwater basins are made by United staff, and that data is described briefly in Section 2 3, below, as well as Section 3 3.2

In the Pleasant Valley basin, data was not available for the surface water flows into the model domain at the Arroyo Las Posas and Conejo Creek locations (Figure 2-3) Arroyo Las Posas streamflow was estimated based on a relationship developed between observed monthly precipitation (VCWPD site 190) and monthly simulated streamflow that was provided by Calleguas Municipal Water District's Las Posas Valley Model (CMWD, 2018) that was previously used in the Coastal Plain model (UWCD, 2018a) from 1985 – 2015 (coefficient of determination, R^2 = 0.74). As the 1985-2015 period contained both wet and dry conditions, the relationship is assumed to hold reasonably well for the 2016-2019 period. Conejo Creek streamflow data was unavailable from Ventura County Watershed Protection District, and therefore, streamflow entering the model domain was estimated over 2016-2019 based on dry weather (June – August) streamflow measurements provided by The City of Thousand Oak's Hill Canyon Treatment Plant and applied equally across the year of measurement. Although this data does not capture wet season storms, Conejo Creek flows are dominated by discharge from the treatment plant, which serve as a reasonable estimate of total flow in Conejo Creek. Low percolation rates are also expected to be associated with the Conejo Creek flows Estimates of annual average streamflow discharge for Arroyo Las Posas and Conejo Creek are shown in Table 2-3 Subsurface underflow along Arroyo Las Posas for the 2016-2019 Update Period was unavailable from the Calleguas Las Posas Valley Model (CMWD, 2018) United estimated the subsurface underflow from the East Las Posas basin into the Pleasant Valley basin along Arroyo Las Posas for the 2016-2019 time period based on a relationship developed between monthly simulated underflow available from then Calleguas Las Posas Valley Model (CMWD, 2018) for 2014-2015 and available groundwater elevation records from well 02N20W17J06S (R^2 = 0 70), which was determined to be the well with best available data for an estimation of the Arroyo Las Posas underflow into the Regional Model domain (Table 2-4).

2.3 LAKE PIRU CONSERVATION RELEASES

Lake Piru stores natural runoff from the Piru Creek watershed and State Water purchases that are released from Lake Pyramid, located on Piru Creek upstream of Lake Piru. Conservation releases from Lake Piru are conducted to provide direct groundwater recharge to the Piru, Fillmore, Santa Paula and Oxnard basins at times when natural runoff in the SCR watershed is limited Daily release volumes from Lake Piru are measured below Santa Felicia Dam at USGS gage 11109800 Conservation releases provide recharge to the basins and help to sustain rising groundwater at the Piru/Fillmore and Fillmore/Santa Paula basin boundaries Released water that does not percolate into the Piru and Fillmore basins flows downstream to the Santa Paula basin, and is diverted at the Freeman Diversion for subsequent surface water deliveries and managed aquifer recharge operations in the Oxnard and Pleasant Valley basins. Groundwater underflow also exists between these groundwater basins. United's conservation releases typically last from over a month to several months, and are scheduled in order to optimize the distribution of the recharge occurring in downstream basins and to optimize the distribution of diverted surface water in the coastal basins

Streamflow percolation to the groundwater basins is estimated using manual measurements of streamflow made at the basin boundaries Measurements by United staff were available for conservation releases during the 2016-2019 Update Period (Table 2-5) Table 2-5 shows the measured distribution of released water to each basin over the 2016-2019 Update Period and compares these with the averages over the 1985-2015 Calibration Period (note that measurements of the distribution of released water are only available from 1999 onwards). Annual average conservation release volumes during the Update Period (14,204 AFY) were a little more than half of those during the Calibration Period (25,184 AFY), due to continued drought conditions that reduce inflows into the Lake Piru, and thus limit the volume of stored runoff available for release This illustrates the severity of the recent drought conditions and the impacts it had on watershed drainage for local replenishment. The 2019 release volume form Lake Piru included 15,000 AF of imported State Water Project (Article 21) Without this imported water, the total and average release volume over the Update Period would have been substantially lower

United is also required to release water continuously from Lake Piru to maintain fish habitat in lower Piru Creek. Current habitat water release requirements range between 7 and 20 cfs, depending on cumulative annual rainfall at the Piru-Temescal Guard Station rain gage at Lake Piru (VCWPD Gage 160; see Figure 2-1) (UWCD, 2012). Much of the water released for habitat requirements flows down Piru Creek and provides recharge to the Piru basin. Piru Mutual Water Company and Rancho Temescal operate permitted diversions on lower Piru Creek, diverting a portion of the creek flow for agricultural uses, as discussed in detail in Section 2.3.8 of the Regional Model Expansion Report (UWCD, 2021a) and briefly in the next section Additional information related to Lake Piru conservation releases can be found in Section 2.3.2.1 of the Regional Model Expansion Report (UWCD, 2021a)

2.4 DIVERSIONS

The Regional Model 2016-2019 Update Period adopts the same methodologies utilized in the Regional Model Expansion Report (UWCD, 2021a), relying largely on reported data to the State The Update Period includes the same 15 diversions in addition to United's Freeman Diversion as the model for the Calibration Period (Figure 2-4)

- Camulos Ranch (Santa Clara River, Piru basin)
- Isola (Santa Clara River, Piru basin)
- Rancho Temescal 1 (Piru Creek, Piru basin),
- Rancho Temescal 2 (Piru Creek, Piru basin),
- Piru Mutual (Piru Creek, Piru basin),
- United's Piru Diversion (Piru Creek, Piru basin)
- Fillmore Irrigation Company (Sespe Creek, Fillmore basin)
- Limoneira (minor; Boulder Creek, Filmore basin)
- Beans Ranch (Boulder Creek, Fillmore basin)
- Canyon and Farmer's Irrigation Companies (Santa Paula Creek, Santa Paula basin)
- Zaragosa (minor; Santa Clara River, Santa Paula basin)

- Diversions related to Hyde Ditch (Santa Clara River, Santa Paula basin)
- Southfork Ranch (Santa Clara River, Santa Paula basin)
- UWCD Freeman Diversion (Santa Clara River, Santa Paula basin)
- Camrosa Water District Diversion (Conejo Creek, Pleasant Valley basin)

During the 2016-2019 Update Period, several active diversions from the Calibration Period remained unused, including Isola (inactive after 2005), UWCD's Piru Diversion (diversion and spreading grounds inactive after 2008), Fillmore Irrigation Company (inactive after 2008), and Limoneira (no 2016-2019 use). Diversion data was obtained from monthly data reported to the California State Water Resources Control Board's Water Rights Information Management System, which are available to the public (https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/EWMenuPublic.jsp). Where necessary, data gaps were filled in a manner similar to that used during the model expansion effort (see Piru Mutual; Section 2.3.8.1 in UWCD, 2021a). Monthly records were acquired or estimated for diversions within the model domain and reported monthly diversion totals were distributed equally across the days of each month in the model. Reported and estimated annual average diversion rates over the 2016-2019 Update Period are shown in Table 2-6.

Surface water diversions were implemented with the stream (STR) package in MODFLOW-NWT (Niswonger and others, 2011) for the reported diversion locations and rates detailed here, except for Freeman Diversion As detailed in the Regional Model Expansion report (UWCD, 2021a) and the Technical Memorandum on Model Inputs for Simulations in Support of GSPs (UWCD, 2021b), United used separate surface water models to estimate daily streamflow (Upper Basins Surface Water Model) as well as diversions at the Freeman Diversion (Hydrological Operations Simulation System, HOSS) The use of these surface water models provides more accurate estimates of diversions and downstream flows compared to relying solely on MODFLOW-NWT Additionally, an operational model (Surface Water Distribution Model) was used to calculate the portion of the diverted water that was delivered to United's recharge facilities and to surface water deliveries via the Pumping Trough Pipeline (PTP) and Pleasant Valley Pipeline (PVP) systems. Both the application of surface water to the spreading basins for recharge and streamflow downstream of Freeman were implemented into the Regional Model using the same methods that areal spreading and streamflow were implemented upstream of Freeman (see Sections 3 5.2.1 and 3 5.2 3 in [UWCD, 2021a])

Annual average diversions decreased significantly from 63,133 AFY during the Calibration Period to 14,596 AFY during the Update Period This decrease is in part due to reduced streamflow in the SCR basins due to drought conditions (Tables 2-2 and 2-3), but is also attributed to reductions in allowable diversion due to increased environmental regulatory requirements The reduction in allowed surface water diversions at Freeman Diversion reduces both artificial recharge activities in the Oxnard Forebay area and surface water deliveries to the PTP and PVP for agriculture use

Additional information regarding diversions and the application of diverted water can be found in previous modeling reports (UWCD, 2018a; UWCD, 2021a)

2.5 PUMPING FROM WATER-SUPPLY WELLS

Since 1980 and 1985, respectively, United and the Fox Canyon Groundwater Management Agency (FCGMA) have required semi-annual reporting of groundwater extractions by well owners and operators within their service areas, greatly improving the understanding and accuracy of groundwater pumping in the study area. Further details related to pumping operations within the Regional Model domain are available in previous reports (UWCD, 2018a, UWCD, 2021a). Reported locations and the relative magnitude of groundwater pumping from active wells for the Update Period in the Regional Model domain are shown in Figures 2-5 through and 2-8 For wells located in both the United and FCGMA boundaries (FCGMA boundaries include the Oxnard, Pleasant Valley, and Las Posas Valley basins), United staff worked with FCGMA staff to reconcile any large discrepancies between production records reported to the two agencies and to reconcile any omissions in extraction reporting between the two agencies. Many of the water-supply wells that exist in the study area are screened across multiple aquifers to maximize water production rates.

The FCGMA Board adopted Emergency Ordinance E in 2014 in response to the severely depleted groundwater conditions in the coastal basins following the onset of drought conditions in fall 2011 Temporary extraction allocations were applied to wells within the FCGMA, adding additional pumping restrictions. In February 2015, the County of Ventura passed a well ordinance prohibiting the construction of new wells in High and Medium Priority basins, as designated by CA DWR, which includes all basins within the model domain. Construction of replacement wells is allowed, as the ordinance was intended to prevent increased groundwater use rather than to limit existing use. Pumping extractions in nearly all the groundwater basins located within the Regional Model was reduced during the Update Period compared to the Calibration Period, and few new wells were constructed. The exception is West Las Posas Valley basin, which saw a slight increase in reported production.

2.6 RECHARGE

The Regional Model implements areal recharge as a combination of recharge derived from precipitation and recharge derived from agricultural and municipal and industrial return flows. Other areal recharge sources included in the Regional Model are United's artificial recharge activities, and the percolation ponds at wastewater treatment plants The Regional Model adopts the same methodologies used in the Update Period that were used in the Calibration Period (UWCD, 2021a). There are nine wastewater treatment plants located within the expanded study area that are considered for both their discharges and distribution of recycled water; their locations are shown on Figure 2-9 and the annual discharges to percolation or application are shown in

Table 2-7 Treated wastewater from plants in the SCR basins is discharged to percolation basins (Fillmore also distributes water for landscape irrigation) Downstream, Ventura's Wastewater Reclamation Facility distributes water to nearby golf courses, and Oxnard's Advanced Water Purification Facility began supplying recycled water to several agriculture users in the southern Oxnard basin beginning in 2016 (it was not active during the calibration period of 1985-2015). Camarillo's Wastewater Treatment Plant and Camrosa's Water Reclamation Facility have supplied Pleasant Valley County Water District (PVCWD) with treated water for agricultural uses.

In addition to areal recharge, the Regional Model adopts the same assumptions and methodologies for the Update Period as were used for the Calibration Period (UWCD, 2021a) for streamflow percolation, which recharges the underlying groundwater aquifers from surface water sources, as well as mountain front recharge, which is directly related to the observed precipitation (Figure 2-1) that falls on the various areas in the Regional Model domain. Section 3.3 of this report describes the analysis of the modeling results related to the interaction between the groundwater and surface water components along the Santa Clara River within the Piru, Fillmore, and Santa Paula basins The percolation and rising groundwater that recharges to, and discharges from the groundwater aquifer below the river is often an important component of the groundwater budget within these basins, especially in the Piru and Fillmore basins.

2.7 RIPARIAN VEGETATION

Riparian evapotranspiration (ET) was implemented in the same way as described in in the extended Regional Model calibration (see Section 3.5.2.6 in UWCD, 2021a) Within the coastal basins, the maximum ET flux is 0 01 feet per day over the area of stream channel and wetland. The ET surface elevation is assumed at 3 feet below ground surface, and the ET extinction depth is set at 5 feet. In the Piru, Fillmore, and Santa Paula basins, the maximum ET flux was increased to 0 014 feet per day (5.2 feet per year) in order to account for higher estimated water use with the presence of Arundo donax within the SCR corridor along with other vegetation species. To account for seasonal variation in ET, the maximum ET rates were adjusted according to percentages for each month.

2.8 GROUNDWATER ELEVATION RECORDS

As described in the Regional Model Expansion report (UWCD, 2021a), United's groundwater elevation database includes historical groundwater elevation data for 1,369 wells within the Regional Model domain (as of May 2020) The groundwater elevation database is a compilation of information provided by several cooperating entities, with data collection protocols among the agencies in the area being fairly consistent. In this report, the term "groundwater elevations" is used to describe the measured or simulated elevation of the water column in a well, and refers to both unconfined water table elevations and potentiometric surface elevations in confined aquifers. Groundwater elevations are normally measured in wells that are not pumping; these measurements are referred to as "static." When evaluating trends in long-term groundwater elevations, static groundwater elevation measurements are preferred. However, the groundwater elevation in a non-pumping well may remain depressed for some time due to residual drawdown in the well being monitored, or because of pumping interference from a nearby well. Although it is not possible to eliminate all effects of pumping when manually measuring groundwater elevations in a developed groundwater basin, UWCD and other parties take care to measure wells when residual drawdown is not expected, and nearby wells are not known to be pumping. When groundwater elevations are measured during the low-irrigation season (winter and early spring), potential pumping effects on the measurements are typically reduced Some area wells are equipped with pressure transducers that collect frequent measurements and seasonal high and low groundwater elevations can be assessed with greater confidence United's groundwater elevation database records are updated on a continuous basis, and all available groundwater elevation records were utilized for the 2016-2019 period for update purposes, as described in Section 3 of this report. Additional background and details regarding the database can be found in Section 2 7 of the Regional Model Expansion Report (UWCD, 2021a) Time series plots of measured groundwater elevations and simulated groundwater elevations in area wells were used in evaluating model calibration.

All available groundwater elevation measurements were also paired with the simulated groundwater elevations in scatter plots. As detailed in Section 4.1.1 in the Regional Model Expansion Report (UWCD, 2021), the simulated groundwater elevations from wells with screen interval spanning multiple aquifers is plotted as the maximum of the simulated groundwater elevation in the individual model layers.

2.9 SUMMARY OF UPDATE PERIOD CONDITIONS

From the hydrologic input datasets described previously in this section, this 2016-2019 Update Period can be characterized as an atypical period While the precipitation during the entire Update Period is about average, with two very dry years and two wet years, due to the 2011-2015 drought conditions, the watersheds did not yield much water This is evident from (1) the reduced observed streamflow entering the Regional Model domain (see Table 2-2), (2) the below-average volume of conservation releases and (3) measured surface water inputs that were lower than would be expected under the actual rainfall amounts that occurred in the area. The reduced surface water flows resulted in reductions in diversions in the SCR basins, including at the Freeman Diversion (Table 2-6), and those reductions in diversions had impacts on the amount of water available for recharging and replenishing the coastal basins following the 2011-2015 drought conditions. Although the drought conditions and reduced streamflow into the Regional Model domain persisted for much of the Update Period, supplemental State Water imports of Article 21 water allowed for increased water releases from Castaic Lake (in 2017) and Lake Piru (in 2019) These releases benefited the groundwater basins of the Santa Clara River Valley as well as the coastal groundwater basins. Overall, the Update Period is considered to be a period with significant hydrologic stress and fluctuation within the 35-year modeling period.

3 NUMERICAL MODEL RESULTS COMPARISON

The comparison for groundwater elevations was performed by evaluating the residual statistics, scatter plots, hydrographs, and flow budget. Residual statistics are the statistical values for an overall evaluation of model calibration. Scatter plots combine all groundwater elevation measurements paired with simulated groundwater elevations in one figure for visual inspection of model calibration Hydrographs provide an evaluation for individual wells Groundwater budgets provide an evaluation of inflow and outflow for the major components of groundwater flow The comparisons for streamflow also relied on scatter plots to compare simulated and observed data, but also used heat maps to evaluate spatial and temporal trends of simulated and observed flows. The simulation results from 2016 to 2019 were paired with the calibration results from 1985 to 2015 (reported in the Regional Model Expansion Report [UWCD, 2021a]) to evaluate any significant difference. It is noted that years 2016 and 2017 combine the last year of a record drought and the following wet year with significant rebound of groundwater elevation and streamflow conditions, which posed challenges for the Regional Model in some cases. The following sections provide background on the model setup, and then detail the comparison of the model's ability to simulate groundwater and surface water conditions during the 2016-2019 Update Period.

3.1 MODEL SETUP

Updates to the model input conditions for the model simulation from 2016 to 2019 include updates to the areal recharge components, streamflow components, and pumping components as discussed previously in Section 2 of this report. The input conditions were implemented in the same way as the period from 1985 to 2015, and the uniform numerical model grid size of 2000 feet by 2000 feet remained the same between the Calibration Period and the Update Period. The model input implementation is detailed in the Regional Model Expansion Report (UWCD, 2021a) and the Coastal Plain Model Report (UWCD, 2018a). The initial head used in the 2016-2019 simulation is from the simulated head on December 31, 2015. The aquifer systems and layering within the Regional Model are identical between the Calibration Period and the Update Period, as detailed in the Regional Model Expansion Report (see Sections 2 and 3, and Figure 2-23 in UWCD, 2021a)

3.2 GROUNDWATER RESULTS COMPARISON

The groundwater results comparison was performed based on all basins combined, and also for each basin individually Note that the individual basins referred to here include the basins as defined by Department of Water Resources (DWR, 2019). However, the unconfined Forebay area of the Oxnard basin is separated from the confined majority portion of the basin for characterization

3.2.1 RESIDUAL STATISTICS

As detailed in Section 4.1.1 in the Regional Model Expansion Report (UWCD, 2021a), residual mean (RM), absolute residual mean (ARM), root mean square (RMS), and standard deviation (Std Dev) were calculated for all the basins together and for each individual basin to evaluate model calibration for the Update Period. The ARM, RMS, and Std Dev should be less than 10% of the range of groundwater elevation measurement for a well-calibrated model, and RM should be close to zero. Residual statistics were prepared for all groundwater elevation measurements, and for a data set excluding several outlier wells and wells with less than 10 groundwater elevation measurements. The residual statistics based on the groundwater elevation measurements excluding the outlier wells and wells with less than 10 measurements are used for groundwater results comparison. The residuals statistics based on all groundwater elevation data is included for information purposes.

Tables 3-1 to 3-3 show the residual statistics from 2016 to 2019 for all basins combined and for each basin separately For comparison, the residual statistics from 1985 to 2015 are listed in Tables 3-4 and 3-5 By comparing the residual statistics between the two periods, 1985 to 2015 and 2016 to 2019, it is noted that:

- For all the basins together, the residual statistics meets the criteria of a well-calibrated model The ARM, RMS, and Std Dev were less than 3% of the range of groundwater elevation data.
- For the Piru, Fillmore, Santa Paula, Oxnard Forebay area, and Oxnard Plain basins, the residual statistics meets the criteria of a well-calibrated model. The ARM, RMS, and Std Dev were less than 10% of the range of groundwater elevation data.
- The RM for Santa Paula basin is about -10 feet for both periods: 1985-2015 and 2016-2019, indicating a consistent overestimation of groundwater elevations The ARMS, RMS and Std Dev percentages are slightly higher for the Update Period compared to the Calibration Period
- For Pleasant Valley basin, the residual statistics increase from the 1985-2015 period to the 2016-2019 period The ARM percentage remains less than 10% while the percentages of RMS and Std Dev increase to more than 11% The increase in ARM, RMS, and Std Dev suggest that the Regional Model is less calibrated from 2016-2019
- For Mound basin, the initial ARM, RMS, and Std Dev percentages were significantly higher in the 2016-2019 period than the 1985-2015 period After further examination, it was noted that the range of the 2016-2019 groundwater elevations, 78 1 ft, was much smaller than the range of the 1985-2015 groundwater elevations, 132 ft. By using the 1985 to 2015 groundwater elevation range to calculate the percentages of ARM, RMS, and Std Dev, the adjusted statistics are shown in Table 3-3 The adjusted percentage of ARM, RMS, and Std Dev are less than 10%, and less than or about equal to the percentages for the Calibration Period.
- For West Las Posas basin, the initial ARM, RMS, and Std Dev percentages were significantly higher in the 2016-2019 period than the 1985-2015 period After further examination, it was noted that the range of the 2016-2019 groundwater elevations, 303.1

ft, was much smaller than the range of the 1985-2015 groundwater elevations, 651 3 ft. By using the 1985 to 2015 groundwater elevation ranges to calculate the percentages of ARM, RMS, and Std Dev, the adjusted statistics are shown in Table 3-3. The adjusted percentage of ARM is 7 96% The percentage of RMS, and Std Dev are 11.09% and 10.74%, very similar to those of the Calibration Period.

3.2.2 SCATTER PLOTS

A scatter plot uses measured groundwater elevation as the X-axis and simulated groundwater elevation as the Y-axis By plotting the simulated groundwater elevation corresponding to the groundwater elevation measurements on a scatter plot, the correlation between simulated groundwater elevation and measured groundwater elevation may be evaluated. Scatter plots for the 2016-2019 and 1985-2015 periods were also compared. Scatter plots for all the basins, with all groundwater elevation data from all wells with measured data, and for individual basins are shown on Figures 3-1 to 3-9 Note that most, but not all, scatter plot points are represented on hydrographs available in Section 3.2.3 and Appendix A.

- All the basins. Figure 3-1 shows that there is no significant difference between the 1985-2015 period and the 2016-2019 period
- Piru basin: Figures 3-2a and 3-2b show there is no significant difference between the 1985-2015 period and the 2016-2019 period. Piru basin calibrates well during both periods, except data points from a few wells screened in both Aquifer Systems B and C where the simulated groundwater elevation is higher than the measured data, and data points in Aquifer System A underpredicting heads during the Update Period.
- Fillmore basin: Figures 3-3a and 3-3b show there is no significant change between the 1985-2015 period and 2016-2019 period, except for a few wells screened in Aquifer System C, where simulated groundwater elevations are higher than the measured data for the Update Period.
- Santa Paula basin: Figures 3-4a and 3-4c show there is no significant change between the 1985-2015 period and 2016-2019 period The wells with unknown screen depths were assigned an assumed screen interval based on their groundwater elevation measurements Simulated groundwater elevations from Aquifer System B and unknown screen interval are closer to the measurements
- Mound basin: Figures 3-5a and 3-5d show there is no significant change between the 1985-2015 period and 2016-2019 period.
- Oxnard Forebay area: Figures 3-6a and 3-6b show there is a noticeable change between the 1985-2015 period and 2016-2019 period. The 2016-2019 simulated groundwater elevations tend to be lower than the measured groundwater elevations in both the Upper Aquifer System (UAS) and the Lower Aquifer System (LAS)
- Oxnard basin: Figures 3-7a and 3-7b show there is no significant change between the 1985-2015 period and 2016-2019 period.
- Pleasant Valley basin: Figures 3-8a and 3-8b show there is no significant change between the 1985-2015 period and 2016-2019 period.

- West Las Posas basin: Figures 3-9a to 3-9c show there is no significant change between the 1985-2015 period and 2016-2019 period.

3.2.3 HYDROGRAPHS

The simulated hydrographs in select wells for each basin are compared to observed groundwater elevations for the Calibration Period (1985-2015, shown in blue) and the Update Period (2016-2019, shown in red) in Figures 3-13 through 3-23. Additionally, Figures 3-24 through 3-36 show locations of all wells that have hydrographs available in Appendix A (not all wells with data, as shown in the scatter plots, have hydrographs available, but this report does include a substantial number of hydrographs between those presented in this section and in Appendix A) Comparing the Calibration Period and the Update Period, the following observations are noted:

- Piru basin. The hydrographs from 1985 to 2019 for wells in Piru basin are shown in Figure 3-10 (additional well locations with hydrographs in Appendix A are also shown on Figures 3-24 and 3-25). From all the hydrographs, it is noted that the simulated 2016-2019 groundwater elevations are close to the observed groundwater elevations for most wells, and the recovery from drought conditions is generally captured well. However for a number of wells on the western side of the basin (e g. 04N19W34K01S and 04N18W31D04S in Figure 3-10), the observed groundwater elevation increases following the 2016 drought period are somewhat underestimated. The underestimation of recovery of groundwater elevations following drought conditions is generally apparent for both the Update Period and the Calibration Period (following the 1987-1991 drought, when data is available)
- Fillmore basin: The hydrographs from 1985 to 2019 for wells in Fillmore basin are shown in Figure 3-11 (additional well locations with hydrographs in Appendix A are also shown on Figures 3-26 and 3-27) From all the hydrographs, it is noted that the simulated 2016-2019 groundwater elevations are generally close to the observed groundwater elevations for most wells, though not quite as well as in Piru basin For several wells, simulated groundwater elevations during the drought in 2016 (and during the preceding drought years of 1987-1991) were higher than the measured groundwater elevations (e.g., 03N20W08A01S in Figure 3-11). Where observed, overestimation of low groundwater elevations during drought conditions was apparent in both the Update Period and Calibration Period. Overall, the model performs consistently in both the Calibration Period and the Update Period
- Santa Paula basin The hydrographs from 1985 to 2019 for wells in Santa Paula basin are shown in Figure 3-12 (additional well locations with hydrographs in Appendix A are also shown on Figures 3-28 and 3-29) From all the hydrographs, it is noted that the Regional Model performs similarly in the Update Period and the Calibration Period. For the wells with simulated groundwater elevations higher than measured in the Calibration Period, the simulated groundwater elevations are also higher than the measurements in the Update Period. Similarly, for the wells with simulated groundwater elevations lower than measured in the Calibration Period, the simulated groundwater elevations are also lower than the measurements in the Update Period For several wells, simulated groundwater elevations during the 2012-2016 drought period were higher than measured groundwater elevations (e.g., 03N21W31L01S, 03N21W09R04S), indicating that in some wells the model underpredicts the rate of decline during droughts and the

subsequent rate of recovery Note that groundwater elevation declines during drought conditions are much less in Santa Paula basin compared to the Fillmore and Piru basins. Overall, the model performs consistently in both the Calibration Period and the Update Period.

- Mound basin (additional well locations with hydrographs in Appendix A are also shown on Figure 3-30) The hydrographs from 1985 to 2019 for wells in Mound basin are shown in Figure 3-13. From all the hydrographs, it is noted that the simulated 2016-2019 groundwater elevations are close to the observed groundwater elevations for many wells. It should be noted that there are a few wells with outlier groundwater elevation measurements, potentially influenced by very local geology (faults) which the groundwater model cannot simulate For most wells, the groundwater model performs consistently in both the Calibration Period and the Update Period. Several wells screened in LAS are identified as outliers. These outlier wells (02N22W09K05S, 02N22W09L03S, and 02N22W09L04S) have groundwater elevation measurements higher than groundwater elevation measurements from a nearby well (02N22W09K04S) where heads are simulated well by the model

- Oxnard Forebay area: The hydrographs from 1985 to 2019 for wells in Forebay area are shown in Figures 3-14 and 3-15 (additional well locations with hydrographs in Appendix A are also shown on Figures 3-31 and 3-32) From all the hydrographs, it is noted that the simulated 2016-2019 groundwater elevations are close to the observed groundwater elevations for most wells Several wells screened across both the UAS and the LAS (e.g., 02N22W02R05S) did not capture the groundwater elevation rebound during the Update Period, while many wells screened only in the UAS (e g., wells 02N21W07L06S and02N22W23B08S) or only in the LAS (e.g. 02N22W23B04S) did capture the groundwater elevation rebound recorded during in the Update Period. Several wells screened only in the UAS (e.g., 02N22W15R02S and 02N22W23B02S) and only in the LAS (e g , 02N22W23B06S) underpredict the rate of decline of groundwater elevations during most recent drought conditions, resulting in overestimated groundwater elevations during the end of the Calibration Period and portions of the Update Period for these well locations within the Oxnard Forebay area.

- Oxnard basin: The hydrographs from 1985 to 2019 for wells in Oxnard basin are shown in Figures 3-16 to 3-20 (additional well locations with hydrographs in Appendix A are also shown on Figures 3-33 and 3-35) From all the hydrographs, it is noted that the simulated 1985-2015 and 2016-2019 groundwater elevations are close to the observed groundwater elevations for most wells. The groundwater model performs consistently in both the Calibration Period and the Update Period

- Pleasant Valley basin: The hydrographs from 1985 to 2019 for wells in Pleasant Valley basin are shown in Figure 3-20 and 3-21 (additional well locations with hydrographs in Appendix A are also shown on Figure 3-36) From all the hydrographs, it is noted that the simulated 1985-2015 and 2016-2019 groundwater elevations are close to the observed groundwater elevations for most wells The groundwater model performs consistently in both the Calibration Period and the Update Period

- West Las Posas basin: The hydrographs from 1985 to 2019 for wells in West Las Posas basin are shown in Figures 3-22 and 3-23 (additional well locations with hydrographs in Appendix A are also shown on Figure 3-37) From all the hydrographs, it is noted that the model calibration in West Las Posas basin is generally not as good as the above-mentioned basins For wells with good calibration in the Calibration Period, the simulated groundwater elevation in the Update Period is reasonably close to the groundwater elevation measurements (e.g., 02N20W06R01S and 02N21W18H03S) The complex hydrogeology in the shallow layer (hundreds of feet thick) between ground surface and the groundwater table, and the known geologic faults along the base of South Mountain poses a challenge in the model calibration for West Las Posas basin in both the Calibration Period and the Update Period (e.g., 02N21W01L01S and 02N21W11J06S)

3.2.4 SIMULATED GROUNDWATER ELEVATION CONTOURS

Simulated groundwater elevations, also known as potentiometric heads, or heads, were also contoured for each of the model layers in the Regional Model for December 2017 and December 2019 These dates include the central time of the Update Period, which corresponds with dry-to-normal conditions, as well as the end of the Update Period, which saw slightly wetter conditions. These groundwater-elevation contours are shown on Figures 3-37 through 3-62 (layers 11 through 13 are not present in the Piru, Fillmore and Santa Paula basins). The Regional Model Expansion Report (UWCD, 2021a) included simulated groundwater elevation contours for December 2015, which is representative of the most-recent major drought conditions The simulated groundwater elevation contours are not presented for direct comparison to measured groundwater elevations, but rather are provided as a supplemental visualization of the simulated groundwater elevations from the Update Period, as discussed in the above sections.

Inspection of these figures shows that simulated groundwater elevations in all applicable layers (1 through 10) of the Piru, Fillmore, and Santa Paula basins reasonably simulates the observed westerly groundwater flow down the SCR Valley, generally following the elevation changes along the valley floor, as well as the steeper gradients down the hillslopes and tributaries discharging into SCR Valley from the north The model does capture the variation in groundwater elevations between the dry and wet periods, most notably along the valley floor and areas near the basin boundaries, where rising water typically occurs (e.g., for Model Layer 3, compare Figures 3-39 and 3-52) Simulated groundwater elevations in all applicable layers (1 through 13) of the coastal plain basins capture the significant areas of depressed groundwater elevations associated with high groundwater extraction rates. The model also simulates onshore gradients in coastal areas during the drought conditions, and increasing heads during the wetter conditions towards the end of the Update Period (e.g., for Model Layer 7, compare the steep depression in the southern portion of the model domain on Figure 3-43 [December 2017] with the shallower depression shown on Figure 3-56 [December 2019])

3.2.5 GROUNDWATER BUDGETS

In this section, the annual average groundwater flow budgets for the Regional Model groundwater basins during the 2016-2019 Update Period are compared with the annual averages from the 1985-2015 Calibration Period.

For context, readers are directed to the annual groundwater budget components for the SCR basins (presented as separately for Piru, Fillmore, and Santa Paula) as historically estimated by other investigations (see Tables 2-15 and 2-16 in [UWCD, 2021a]) as well as annual groundwater budgets components for the Coastal Plain Model basins (presented as combined for Mound, Oxnard, Pleasant Valley, and West Las Posas) as estimated by other investigations (see Table 2-2 in [UWCD, 2018a]) Comparison and discussion of simulated groundwater flow budgets for the Calibration Period and the estimated groundwater budgets are presented in previous reports (UWCD, 2018 and 2021a) The flow budgets from United's Regional Model are within the range of the flow budget estimated by other investigators (UWCD, 2018a and 2021a)

Monthly groundwater flow budgets based on the Update Period model outputs are provided in Appendix B These monthly groundwater budgets show the variability in a basin's groundwater flow budgets from wet to dry periods. Tables 3-6 to 3-12 show the annual average groundwater flow budgets during the Update Period for the seven DWR basins as well as by aquifer zone. As described previously in this report, the Update Period followed substantial drought conditions at the end of the Calibration Period, resulting in declined groundwater elevations in most of the Regional Model domain at the beginning of the Update Period.

The water budgets calculated from the Regional Model represent volumetric budgets that are based on volumes of water and volumetric flow rates Continuity of flow must be satisfied numerically, meaning that the total change of storage should equal the difference between the inflows and the outflows over a given amount of time Following this convention, wet years and drought years are reflected in the change-in-storage component in the flow budget in the following way:

- negative change-in-storage volumes represent accumulation in storage, which is the excess of net groundwater flow, and stores that volume in the aquifer. Total groundwater recharge (inflows) exceeds total groundwater discharge and extraction (outflows), resulting in an increase in the volume of water stored as groundwater and an increase in groundwater elevations;
- positive change-in-storage volumes represent storage release, which compensates for the deficit of net groundwater flow Total groundwater recharge (inflows) is less than total groundwater discharge and extraction (outflows), resulting in a decrease in the volume of water stored as groundwater and a decrease in groundwater elevations.

The Piru, Fillmore, and Santa Paula basin experienced a rebound from the 2013-2016 drought years during the wetter period from 2017 to 2019, as reflected in the change-in-storage component. The 2016-2019 average annual change-in-storage volumes for Piru, Fillmore and Santa Paula basins are -12,090, -5,720, and -1,978 acre-ft, respectively, representing an increase in the volume of stored groundwater (Tables 3-6 to 3-8) Groundwater elevations generally declined over the 1985-2015 Calibration Period, largely due to the severe drought at the end of the period This is reflected by the positive annual change-in-storage volumes for the 1985-2015 period for Piru, Fillmore and Santa Paula basins (2,119, 4,334, and 3,487 acre-ft, respectively).

Although there was a rebound in storage and groundwater elevations within the SCR basins, simulated riparian evapotranspiration (ET) within all SCR basins (Piru, Fillmore, and Santa Paula) as well as other basins with simulated riparian ET (Mound, Oxnard, Pleasant Valley) was lower during 2016-2019 compared with 1985-2015 This occurred as a result of the lowering of groundwater elevations during the 2012-2016 drought period and therefore reduced connection with riparian vegetation, even was groundwater elevations generally rose during the Update Period When groundwater elevations are low, there is a reduction in simulated ET as rates drop to zero if the water table drops below the extinction depth of 5 feet below ground surface elevation.

Also related to reduced simulated groundwater elevations during the Update Period as a result of dry antecedent conditions, all SCR stream percolation and rising groundwater volumes were reduced compared to the Calibration Period. Similarly, net percolation for Arroyo Las Posas were also reduced during the Update Period in Pleasant Valley basin.

As discussed in Section 2.4 above, significant decreases in diversion volumes from the SCR at Freeman Diversion resulted in a significant reduction (approximately 50%) of United's artificial recharge in the Forebay area of the Oxnard basin. The reduction in recharge to the Oxnard basin and continued groundwater extraction in excess of recharge to the basin resulted in lower groundwater elevations. Simulated groundwater inflow from adjacent basins that witnessed less groundwater elevation decline (Santa Paula, Mound, Pleasant Valley, and West Las Posas) increased. Similarly, the reduction in groundwater elevations due to reduced recharge and changes in inter-basin flows resulted in increased coastal flux from areas offshore of the Mound and Oxnard basins. With the exception of West Las Posas, all basins reported a reduction in pumping during the Update Period

3.2.6 GROUNDWATER MODEL UPDATE PERIOD SUMMARY

The following model evaluation and comparison for the Update Period is summarized for all basins combined, as well as for each basin individually, as follows

- All the basins. From the residual statistics, and the scatter plots described in Sections 3.2 1 and 3.2.2, the model performs consistently in both the Calibration Period and the Update Period
- Piru basin: From the residual statistics, scatter plots, and hydrographs for Piru basin detailed in Sections 3.2.1, 3.2.2, and 3.2 3, the Regional Model performs equally well between the Calibration Period and the Update Period For some wells, simulated groundwater elevations were lower than measured values during recovery from severe droughts.
- Fillmore basin: From the residual statistics, scatter plots, and hydrographs for Fillmore basin detailed in Sections 3.2.1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period. Simulated groundwater elevations in drought years are higher than measured values in several wells, but consistently in both the Calibration Period and the Update Period
- Santa Paula basin: From the residual statistics, scatter plots, and hydrographs for Santa Paula basin detailed in Sections 3.2.1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period, and it is noted that

the modeling simulates an overestimation of groundwater elevations in some wells during both the Calibration Period and the Update Period

- Mound basin From the residual statistics, scatter plots, and hydrographs for Mound basin detailed in Sections 3.2 1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period.
- Oxnard Forebay area. From the residual statistics, scatter plots, and hydrographs for Oxnard Forebay detailed in Sections 3.2 1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period except several wells that are screened across both the UAS and LAS, capture some but not the full rebounds in the groundwater elevations from recharge activities in the area. Several wells underpredict the rate of decline of groundwater elevations during most recent drought conditions, resulting in overestimated groundwater elevations during the end of the Calibration Period and portions of the Update Period
- Oxnard basin: From the residual statistics, scatter plots, and hydrographs for Oxnard Plain detailed in Sections 3 2 1, 3.2.2, and 3.2 3, the Regional Model performs equally well between the Calibration Period and the Update Period.
- Pleasant Valley basin From the residual statistics, scatter plots, and hydrographs for Pleasant Valley detailed in Sections 3.2.1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period.
- West Las Posas basin: From the residual statistics, scatter plots, and hydrographs for West Las Posas detailed in Sections 3.2 1, 3.2 2, and 3.2 3, wells screened in the thick shallow layer and along the edge of South Mountain do not perform as well compared to elsewhere within the basin, and this was consistent between both the Calibration and Update Periods.

3.3 STREAMFLOW RESULTS COMPARISON

Significant effort was expended during development of the Regional Model to simulate the complex surface water flow patterns in the Santa Clara River, characterized by highly variable and intermittent flows, and the frequent occurrence of alternating wet and dry reaches in dry seasons and years (UWCD, 2021a). The analyses that were performed to assess streamflow calibration for the 1985-2015 Calibration Period were repeated for the 2016-2019 Update Period, and included a detailed assessment of how well historic spatial and temporal patterns of streamflow, stream channel recharge (percolation) and rising groundwater were simulated. Three criteria were used to evaluate streamflow simulations by the Regional Model during the Update Period. stream channel recharge (Sections 3.3.1 and 3.3.2), rising groundwater (Section 3 3.4), and streamflow patterns and magnitude (Sections 3.3.2, 3.3.3, and 3 3.5) These were the same criteria as used to evaluate model calibration for the 1985-2015 period.

For most analyses presented here, results are described for the model Update Period, and compared to results for the Calibration Period that were described in the Regional Model Expansion Report (UWCD, 2021a). For Piru and Fillmore basins the focus was on simulation of recharge (percolation) and surface flow, as these basins are where the most natural recharge percolates into the groundwater basins of the Regional Model In Santa Paula basin the focus was on streamflow at the Freeman Diversion facility, as less direct streamflow percolation occurs in this basin and accurate percolation measurements are not available While model runs were performed using daily time steps, results were generally shown using averaged (monthly or seasonal) data The analysis was largely based on assessing the correlation between simulated and observed data, but also by visualization of flow patterns using "heat maps" and comparing to known spatiotemporal flow trends

3.3.1 BASIN RESPONSE DUE TO RECHARGE DURING RAINY SEASON

Direct measurements of stream channel recharge during the rainy season are very limited due to (1) the difficulty of accurately and safely performing manual discharge measurements during high flows for calculating recharge rates, and (2) a lack of appropriate locations for automated gaging stations at the downstream end of Piru and Fillmore basins (because of the high degree and variability of sediment scour and deposition in the sandy river channel associated with large storm events). Therefore, evaluation of stream channel recharge during the rainy season in these two basins consisted of evaluating simulated versus measured groundwater basin responses, which are largely driven by stream channel recharge during the rainy season. More specifically, this was done by comparing simulated and observed groundwater elevation increases between January 1 and May 1 for key wells in the Piru and Fillmore basins (wells with a long historical record that are used by United to represent basin conditions and calculate available storage) Changes in groundwater elevations were calculated by subtracting January 1 elevations from May 1 elevations, resulting in one data point for each year at each well for comparing the observed and simulated increases in groundwater elevation

For the model Update Period for Piru basin, simulated basin responses correlated well with observed basin responses, as was also achieved for the model Calibration Period (Figure 3-63) Note that observed groundwater elevation changes were not available for the years 2016 and 2017 as the key well for the Piru basin went dry due to ongoing drought conditions. For Fillmore basin, simulated basin responses for the model Update Period were under-predicted for three out of the four years, when observed groundwater elevation changes between January 1 and May 1 were 8 ft or more (Figure 3-64) Two of the observed groundwater elevation changes for the model Update Period were well outside the range observed for the model Calibration Period and were significantly under predicted by the Regional Model. A hydrograph for the key well in the Fillmore basin (well 03N20W02A01S; see Figure 3-72B) confirms that the simulations during the model Update Period do not completely capture the groundwater elevation declines during drought years and the subsequent recovery in groundwater elevations during the winter period of years with normal or above-normal rainfall, which explains the reduced performance in predicting groundwater elevation changes as identified in the previous discussions in Section 3.2.3 regarding the groundwater analysis during the Update Period Similar observations were made for some of the other wells located in Fillmore basin (see Figure 3-11), where simulated groundwater elevation increases during winter were much smaller than observed groundwater elevation increases during winter for the model Update Period (e.g., 03N21W01P02S and 04N20W26C02S in Figure 3-11) Overall, results suggest that stream channel recharge during the rainy season is well-predicted for Piru basin, but under-predicted for Fillmore basin following dry periods when stream channel recharge is high Stream channel recharge to Fillmore basin originates from the mainstem SCR as well as from Sespe Creek upstream of the confluence with the SCR and is more complex than in Piru basin.

3.3.2 SURFACE FLOWS AND BASIN RESPONSE DURING CONSERVATION RELEASES

United monitors streamflow at multiple locations in the watershed during conservation releases, in order to monitor the progress of the release and allow calculation of recharge benefits to each of the groundwater basins upstream of the Freeman Diversion Facility Two significant conservation releases from Lake Piru occurred during the model Update Period, in 2017 (3 weeks in late spring,) and 2019 (8 weeks in late spring and early summer) (Table 2-5)

3.3.2.1 PIRU BASIN

Simulated and observed monthly streamflow at the downstream end of Piru basin (upstream of the rising groundwater) correlate well during the model Update Period, similarly as for the Calibration Period (Figure 3-65) Recharge to Piru basin was also reasonably well-predicted for both years with conservation releases, with a similar accuracy as for the Calibration Period (Figure 3-66) Figure 3-67 displays the hydrograph for simulated daily streamflow at the downstream end of Piru basin Streamflow measurements were performed during releases and occasionally during periods with low flows during the period 2000-2019, and match the simulated streamflows closely in most cases, during both the Calibration Period and the Update Period. The response of Piru basin to recharge during the conservation releases was assessed by comparing simulated and observed groundwater elevation changes in the Piru basin key well. Groundwater elevation increases were calculated by subtracting elevations just before release from elevations just after release, resulting in one data point each for observed and simulated groundwater elevation increases during release years. The increase in groundwater elevations in the Piru basin key well (04N18W29M02S) due to conservation releases during the model Update Period was well simulated by the Regional Model (Figure 3-68 A) Groundwater elevation changes were slightly underestimated, but within the range observed during the Calibration Period. It should be noted that the hydrograph for this key well (04N18W29M02S) generally shows a very good calibration during the model Update Period (Figure 3-68 B). The hydrograph also shows that increases in groundwater elevations during the winter season were greater than increases during conservation releases, which occurred shortly after the end of the rainy season In 2017, releases from Castaic

Lake resulted in additional groundwater elevation increases after the end of the conservation release from Lake Piru

3.3.2.2 FILLMORE BASIN

Monthly simulated and observed streamflow at the downstream end of Fillmore basin (upstream of the rising groundwater) generally correlated well during the model Update Period, similarly as for the Calibration Period (Figure 3-69). Simulated flows for one month during the 2019 release were somewhat under predicted. Recharge to Fillmore basin was better predicted for 2017 than for 2019, but generally within the accuracy observed for the Calibration Period (Fig 3-70) The under-prediction of recharge for the 2019 release was related at least in part to the under-prediction of surface flow at the basin boundary (Figure 3-65) Figure 3-71 displays the hydrograph for simulated daily streamflow at the downstream end of Fillmore basin. Streamflow measurements were performed during the releases and occasionally during periods of low flow during the period 2000-2019, and these measurements match the simulated streamflows closely in most cases, during both the Calibration Period and the Update Period.

Fillmore basin response to recharge during the conservation releases was assessed by comparing simulated and observed groundwater elevation changes in the Fillmore basin key well. Groundwater elevation increases were calculated by subtracting groundwater elevations just before the release from elevations just after release, resulting in one data point for observed and simulated groundwater elevation increases during release years. The increase in groundwater elevations in the Fillmore basin key well 03N20W02A01S resulting from conservation releases during the model Update Period was well-simulated by the Regional Model (Figure 3-72 A) As observed during the Calibration Period, groundwater elevations changed little in response to conservation releases. Note that the hydrograph for key well 03N20W02A01S shows relatively poor-calibration during the model Update Period, especially during the 2015 and 2016 drought years (Figure 3-72 B). However, calibration was better during years with conservation releases. Similarly, as observed in Piru basin, groundwater elevation increases in the Fillmore key well occurred predominantly during the rainy season (with recharge from SCR mainstem and Sespe Creek), but smaller or no increases we simulated during the conservation releases

3.3.3 SURFACE FLOW PATTERNS

3.3.3.1 PIRU BASIN

A heat map for flows in Piru basin shows spatial and temporal trends in simulated monthly flows, compared to observed losing and gaining reaches (Figure 3-73). The heat map rows represent monthly time steps, from the oldest on top to the most recent at the bottom (in this case October 2017 to December 2019) The heat map columns represent location along the SCR stream channel (each column is one model grid cell along the stream channel, or "stream cell"), in this case from Ventura/Los Angeles County line to near the Fillmore Fish Hatchery Flow direction is from left-to-right, corresponding to the general flow direction from east-to-west. The value in each cell is the simulated monthly streamflow (cfs) Each row essentially provides a monthly snapshot of the streamflow from upstream (left) to downstream (right), with changes in streamflow driven by surface water-groundwater interactions Blue colors indicate high flows, yellow colors intermediate flows, and red colors low flows. Watershed features are listed for reference in the top row above the heat map, and colors in the top row indicate known losing reaches (red), gaining reaches (green) or stable reaches (yellow)

The Piru losing reach (also known as the "dry gap") starts downstream of USGS gage 11109000. Simulated streamflows rapidly decreases to zero in this area, except during the wettest months when surface flows persisted across the basin (as shown inside the "A" box on Figure 3-73). During a conservation release, simulated flow inputs from Piru Creek decreased due to channel percolation, but surface flows persisted across the basin, matching field observations, as shown for the 2019 release (inside the "B" box on Figure 3-73)

Simulated flows in the area of rising groundwater near the western basin boundary accurately reflect the mostly dry conditions prior to 2019 (as shown inside the upper half of the "C" box on Figure 3-73). However, the Regional Model does not capture the return of the wetted stream channel due to rising groundwater in Piru basin following the 2019 rainy season and the late spring/early summer conservation release in 2019 (as shown inside the lower half of the "C" box on Figure 3-73) Under-prediction of Piru basin rising groundwater flows is also observed for the Calibration Period. In general, simulated flow patterns in Piru basin for the model Update Period are similar to those for the Calibration Period

3.3.3.2 FILLMORE BASIN

A heat map for flows in Fillmore basin shows spatial and temporal trends in the simulated monthly flows, compared to observed losing and gaining reaches for the period January 2017 to August 2019 (Figure 3-74) The Fillmore basin losing reach starts downstream of the Fillmore Fish Hatchery (top row colored red) During conservation releases, simulated flows decrease in this reach, as they should based on field measurements (as shown inside the "A" box on Figure 3-74). During drier periods with lower flows, simulated surface flows persist across the basin (as shown inside the "B" box on Figure 3-74), which does not quite match field observations. Field observations have shown that low flows from Piru basin (or rising groundwater from Piru-Fillmore basin boundary) generally percolate completely to groundwater in Fillmore basin Recharge of these low flows in Fillmore basin are a small part of the basin water balance, and simulated groundwater elevations are therefore not very sensitive to this component

Simulated flows in the area of rising groundwater at the western end of the basin during the model Update Period did not reflect the observed rising groundwater there. Instead, simulated flows were constant (less than 1 cfs difference entering and exiting the rising groundwater reach) or indicated a consistently dry reach (as shown inside the “C” box on Figure 3-74). In contrast, field measurements documented 4 to 10 cfs of rising groundwater in the area in 2017 and 2018 (after the 2017 winter season), resulting in a wetted stream channel at the western end of Fillmore basin. Under-prediction of Fillmore basin rising groundwater flows was also observed for the Calibration Period. In general, simulated flow patterns in Fillmore basin for the model Update Period were similar as those for the Calibration Period.

3.3.4 RISING GROUNDWATER IN PIRU AND FILLMORE BASINS

Measurements of rising groundwater at the Piru-Fillmore and Fillmore-Santa Paula basin boundaries are available for the period 2011-2019, which includes periods with both high and low groundwater elevations. Observations are available for dry months only, as it is difficult to measure rising groundwater when streamflow is high and dynamic. For both basins, observed rising groundwater correlates well with groundwater elevations at selected wells (non-linear correlation, see observed data in Figure 3-75 A and Figure 3-76 A).

Simulated rising groundwater during dry months in western Piru basin was zero during the entire model Update Period. The relationship between simulated rising groundwater and groundwater elevations was very similar to the one observed for the Calibration Period, with both periods significantly under-predicted rates of rising groundwater as a function of groundwater elevation (Figure 3-75 A) In addition, the under-prediction of rising groundwater in Piru basin was also due to the slight under-prediction of groundwater elevations during the 2017-2019 period when water levels generally rose in the basin (Figure 3-75 B)

In the Fillmore basin, simulated rising groundwater during dry periods varied between 0 and 1 cfs for the model Update Period The relationship between simulated rising groundwater and groundwater elevations was very similar to the one observed for the Calibration Period, with both periods showing significantly (up to tenfold) under-predicted rates of rising groundwater (Figure 3-76 A) For Fillmore basin, under prediction of rising groundwater was not associated with under-prediction of groundwater elevations, as groundwater elevations were generally over-predicted (except during most of 2019, see Figure 3-76 B). Due to the importance of Fillmore rising groundwater for dry season diversions at the Freeman Diversion, improving rising groundwater simulations there will be considered in future model updates

3.3.5 STREAMFLOW AND DIVERSION AT FREEMAN DIVERSION FACILITY

In the Santa Paula basin, simulated and observed daily streamflow just upstream of the Freeman Diversion correlated well for the Update Period, as they did during the Calibration Period (Figure 3-77) Simulated streamflow just upstream of the Freeman Diversion was generally lower during the Update Period than during the Calibration Period As observed during calibration, there was significant scatter in the low to moderate flow ranges, which are most relevant to operations of the Freeman Diversion (up to about 3,000 cfs) (Figure 3-78) Figure 3-79 compares hydrographs for simulated and observed daily streamflow at the Freeman Diversion, for the Calibration Period and the Update Period Simulated streamflow generally captures the magnitude and seasonal variability of observed streamflow well Streamflow simulations are slightly better during the Update Period, as in some cases flows less than approximately 20 cfs were overestimated during the Calibration Period

To better understand the impact of streamflow simulation discrepancy on simulated diversions, the Hydrological Operations Simulation System (HOSS) model was used to calculate simulated diversion volumes at Freeman Diversion, once based on observed streamflows, and once based on simulated streamflows upstream of the diversion This was conducted for the Update Period, as was previously done for the Calibration Period. For the purpose of this comparison, the HOSS model calculated diversion volumes based on the bypass flow operations proposed in United's Freeman Diversion Multiple Species Habitat Conservation Plan, without any infrastructure improvements. A more detailed description of the HOSS and modeling scenarios for future simulations is available in the Regional Model documentation report (UWCD, 2021b). Simulated annual diversions based on observed and simulated streamflow correlate well for the Update Period, as they did for the Calibration Period (Figure 3-80) Note that calculated diversions for the Calibration Period are consistently lower when based on simulated streamflow compared to when based on observed streamflow. This was not apparent for the Update Period, likely because of the limited number of observations (four years with comparatively low annual diversions volumes)

As explained in more detail in the Regional Model expansion report (UWCD, 2021a) and United's Technical Memorandum on model inputs for simulations in support of GSPs (UWCD, 2021b), United opted to use its Surface Water Hydrology Model for the upper basins to simulate streamflow at the Freeman Diversion, instead of the Regional Model Simulated streamflow and diversions based on the Surface Water Hydrology Model matched the observations better than those based on the Regional Model.

3.3.6 STREAMFLOW UPDATE PERIOD SUMMARY

Three criteria were used to evaluate streamflow simulations by the Regional Model during the 2016-2019 Update Period: stream channel recharge, rising groundwater, and streamflow These were the same criteria as used to evaluate model calibration of the 1985-2015 period. In general, the results of the surface water flow comparisons for the Update Period are very much in line with results of model Calibration Period. The conclusions regarding streamflow calibration that were made in the Regional Model expansion report (UWCD, 2021a) therefore remain valid:

- Recharge from stream channels. The simulated recharge to groundwater from streams in the Piru and Fillmore basins during conservation releases is well-predicted by the Regional Model The location and seasonal occurrence of the dry gap in Piru basin was also accurately simulated. Outside the conservation release periods, recharge of natural baseflows to the groundwater system in Fillmore basin was slightly under-estimated (during the rainy season as well as the dry season), however the calibration of groundwater elevations in the basin was not affected. Recharge from stream channels was not assessed for Santa Paula basin as recharge is relatively low there

- Rising groundwater: The locations of simulated rising groundwater is generally in agreement with observed locations, i.e at Piru-Filmore and Fillmore-Santa Paula basin boundaries. The volume of rising groundwater is under-estimated by the model, especially in the Fillmore basin The simulated groundwater elevations in the areas of rising groundwater are generally well-calibrated, but tend to be under-predicted in Fillmore basin, which may cause the under-estimation of rising groundwater Because the simulated rising groundwater is sensitive to groundwater elevation changes of less than one foot to a few feet, it may be too sensitive for the numerical model to simulate the rising groundwater adequately Rather than simulating the flow downstream as surface flow stemming from the rising groundwater, the model may simulate that flow as shallow underflow. In this case groundwater elevation calibrations are not affected as the volumetric flow rate downstream would be comparable to one another, although not in the same component (groundwater flow versus surface water flow).
- Streamflow: The streamflow patterns and magnitudes across the Piru and Fillmore basins were generally well simulated during conservation releases and outside the winter season. Streamflow calibration within those basins could not directly be assessed for flows exceeding approximately 350 cfs due to the lack of manual observations in that flow range. Streamflow in the Santa Paula basin at the Freeman Diversion Facility, was consistently under-predicted, resulting in a significant under prediction of annual average diversions there. Therefore, United opted to use an alternative surface water spreadsheet model to simulate streamflow at the Freeman Diversion. The numerical groundwater model has limited surface water routing capabilities, and was not expected to fully capture the highly flashy streamflow conditions in the SCR on a daily basis across the entire flow range

Based on the above summary, the Regional Model is well-calibrated for simulating basin recharge from streamflow, which was one of the main goals of the groundwater model. Daily streamflow patterns and magnitudes were adequately captured, but as expected the numerical groundwater flow model alone was inherently limited for the purpose of daily streamflow simulations

4 CONCLUSIONS

The Regional Model update with the 2016-2019 data sets provides an opportunity to evaluate the calibration quality of the Regional Model and helped identify a few areas for model improvement. When evaluating the Regional Model as a whole, local imperfections in model calibration in certain areas is generally not affecting the model calibration on the regional scale. The uniform numerical model grid size of 2000 feet by 2000 feet implies that the Regional Model may be used to support basin-scale groundwater analysis, but caution should be taken when using the model to interpret smaller/local scale projects or conditions. From the discussion included in Section 3, it is concluded that the Regional Model is well-calibrated with the 2016-2019 data when all basins are evaluated overall.

When evaluating the basins individually, local model imperfections suggest areas for further model improvement. The Regional Model performs equally well in both the Calibration Period (1985-2015) and the Update Period (2016-2019) in the Oxnard, Pleasant Valley and Mound basins The areas for potential future model improvement are summarized in the following:

- Piru basin Groundwater elevations are well-calibrated. The simulation of rising groundwater may be further improved near the Fish Hatchery at the downstream basin boundary
- Fillmore basin: Groundwater elevations along SCR between the Fillmore Fish Hatchery and the City of Fillmore may be improved, as simulated groundwater elevations in a few wells along the SCR are noticeable underestimated The rising groundwater near the basin boundary with Santa Paula may be further improved
- Santa Paula basin: Simulated groundwater elevations trend slightly higher than the observed groundwater elevations Further investigation of the SCR stream interaction and the complex geologic transition from the river basins to coastal plain basins might improve model calibration
- Oxnard Forebay area: The simulated groundwater elevation rebound in the 2016-2019 Update Period was less than the measured groundwater elevation recovery in several wells, and may be further calibrated.
- West Las Posas basin: Groundwater elevations in wells located along South Mountain are influenced by local faults, and wells that are screened in the shallow aquifer pose a challenge to the Regional Model. Additional calibration efforts related to model parameterization, such as aquifer layering, aquifer parameters and revising the fault lines, can be expected to improve calibration this area of the Regional Model

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TABLES

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Table 2-1.
Precipitation Stations Used for Input to Regional Model over 2016-2019 Update Period

VCWPD Site ID	Site Description	Elevation (ft amsl)	Easting	Northing
004A	Casitas Dam	360	6,160,010.91	1,958,955.34
017C	Port Hueneme - Oxnard Sewer Plant	10	6,202,612.24	1,876,061.34
020B	Ventura River County Water District	570	6,170,758.70	1,981,130.10
25	Piru-Newhall Ranch	825	6,343,123.88	1,969,310.51
030D	Ojai-County Fire Station	760	6,190,467.13	1,987,706.04
032A	Oxnard Civic Center	53	6,204,789.76	1,897,291.08
036A	Piru-County Fire Station	700	6,321,351.01	1,973,815.88
59	Ojai-Thacher School	1,440	6,205,907.61	1,994,283.67
064B	Upper Ojai-Happy Valley	1,320	6,202,885.48	1,983,618.91
065A	Upper Ojai Summit-County Fire Station	1,550	6,219,449.62	1,983,278.49
066E	Ventura-Downtown (City Hall-Historic Courthouse)	120	6,171,185.26	1,927,708.89
85	Canada Larga	760	6,190,598.14	1,963,078.28
101A	Piru-Camulos Ranch	725	6,333,332.60	1,971,015.62
106A	Piru RAWS	614	6,317,366.66	1,970,481.35
121C	Lake Sherwood-County Fire Station	975	6,296,513.06	1,874,846.97
122	Ventura-Kingston Reservoir	205	6,170,807.24	1,949,698.08
126A	Moorpark - Ventura County Yard	725	6,296,498.89	1,931,079.69
128C	Thousand Oaks APCD APCD	795	6,298,492.31	1,899,996.39
130B	Chuchupate Ranger Station	5,277	6,257,382.24	2,117,386.68
134B	Matilija Dam	1,060	6,168,203.04	2,000,997.89
140	Oak View-County Fire Station	520	6,169,171.47	1,968,715.20
152	Piedra Blanca Guard Station	3,065	6,210,318.65	2,028,386.86
153A	Ojai-Bower Tree Farm	780	6,193,259.19	1,985,249.48
160	Piru-Temescal Guard Station	1,105	6,332,314.04	1,995,886.74
163C	Sulphur Mountain	2,450	6,207,309.68	1,973,378.94
165	Ojai-Stewart Canyon	970	6,185,297.19	1,992,310.81
167	Ventura-Hall Canyon	180	6,181,192.34	1,926,836.47
168	Oxnard Airport	34	6,196,509.92	1,897,957.19
169A	Thousand Oaks - Civic Center	850	6,304,980.44	1,887,209.50
171	Fillmore-Fish Hatchery	465	6,294,702.26	1,966,783.81
172	Piru Canyon	1,160	6,333,401.68	2,010,027.87
173A	Santa Paula Canyon-Ferndale Ranch	1,010	6,233,981.10	1,979,605.84
175A	Saticoy-County Yard	150	6,216,995.42	1,926,675.70
177A	Camarillo-Pacific Sod	24	6,237,051.88	1,880,691.87
180A	Ortega Hill (Type C)	5,215	6,169,656.59	2,032,959.70
188A	Newbury Park-County Fire Station #35	645	6,280,378.29	1,891,465.74
189	Somis-Deboni	520	6,237,481.43	1,927,918.91
190	Somis-Bard	460	6,257,126.22	1,926,683.02
193A	Santa Susana	960	6,347,291.26	1,920,641.77
194A	Camarillo-Adohr (Sanitation Plant)	110	6,258,557.72	1,895,499.74
196C	Tapo Canyon - County Park	1,380	6,347,001.76	1,940,710.05

Table 2-1.
Precipitation Stations Used for Input to Regional Model over 2016-2019 Update Period

VCWPD Site ID	Site Description	Elevation (ft amsl)	Easting	Northing
197A	Topa Topa	2,500	6,255,748.03	2,032,448.62
199A	Fillmore Sanitation	390	6,278,113.78	1,965,774.18
206B	Somis-Fuller	733	6,265,744.08	1,936,974.70
207C	Matilija Canyon	1,400	6,153,846.48	2,007,743.73
209A	Lockwood Valley-County Yard	5,163	6,230,083.75	2,091,074.52
211A	Alamo Mountain	6,705	6,266,686.74	2,067,523.99
215	Channel Islands Harbor	5	6,191,789.69	1,883,600.23
215A	Channel Is Harbor - Kiddie Beach	15	6,191,890.63	1,882,471.50
216C	Ventura Harbor	12	6,179,264.01	1,916,713.49
218	Meiners Oaks-County Fire Station	730	6,174,196.93	1,986,656.64
219A	Camarillo-Hauser	192	6,251,232.81	1,910,261.08
219B	Camarillo - CHD	167	6,246,294.05	1,909,285.64
221B	Sea Cliff - County Fire Station	10	6,133,025.30	1,951,120.06
222A	Ventura-County Government Center	280	6,195,762.90	1,921,839.48
224A	Sespe-Westates	2,870	6,295,734.01	1,997,948.69
225	Wheeler Canyon	900	6,215,927.31	1,966,562.48
227	Lake Bard	1,030	6,311,199.14	1,911,833.57
230A	Ventura-Sexton Canyon	880	6,191,509.93	1,938,304.60
232	Santa Monica Mts-Deals Flat	1,475	6,268,508.25	1,856,193.20
234B	Las Llajas Canyon	1,160	6,353,216.94	1,933,069.75
235A	Piru-L.A./Ventura County Line	800	6,349,004.67	1,968,584.50
237	San Guillermo	5,125	6,209,751.14	2,063,561.73
238	South Mountain-Shell Oil	1,624	6,257,058.81	1,944,644.71
239	El Rio-UWCD Spreading Grounds	105	6,213,198.85	1,911,502.97
242	Tripas Canyon	2,500	6,330,865.14	1,956,896.70
244	Cuddy Valley-Cuddy Ranch	5,500	6,243,779.26	2,129,751.59
245B	Santa Paula - Wilson Ranch	405	6,243,086.17	1,959,223.84
246A	Simi Sanitation Plant	660	6,316,423.15	1,926,755.02
250	Moorpark-Happy Camp Canyon	1,410	6,304,945.44	1,949,562.15
254	Casitas Station Station Canyon	630	6,148,134.04	1,973,671.64
259	Camarillo-PVWD	90	6,238,341.98	1,901,620.25
264	Wheeler Gorge	1,900	6,179,131.33	2,012,365.69
268	Last Chance (Type C)	4,510	6,245,359.76	2,003,549.85
272	Sage Ranch	2,045	6,357,157.87	1,910,272.42
273A	Oxnard NWS	63	6,217,788.37	1,899,732.49
279	Borracho Saddle (Type C)	4,350	6,287,889.19	2,043,867.99
280	Circle X Ranch (Type B)	1,700	6,278,074.76	1,863,577.77
281	Oak Park Fire Station	1,096	6,331,412.60	1,889,247.99
300	Senior Gridley Canyon (Type B)	2,514	6,197,406.84	1,999,945.09
301	Old Man Mountain (Type C)	4,370	6,127,959.25	2,009,046.46
302	Canada Larga-Verde Canyon (Type B)	1,590	6,195,219.04	1,953,482.70
303	Nordhoff Ridge (Type C)	4,112	6,190,904.54	2,010,205.12

Table 2-1.
Precipitation Stations Used for Input to Regional Model over 2016-2019 Update Period

VCWPD Site ID	Site Description	Elevation (ft amsl)	Easting	Northing
304	Matilija Hot Springs at No Fork (Type B)	1,142	6,168,013.37	2,004,259 19
305	La Granada Mountain (Type B)	2,230	6,132,137 17	1,977,451.39
306	White Ledge Peak (Type C)	4,405	6,142,028.70	1,997,262.35
307	Upper Matilija Canyon (Type C)	4,440	6,148,481.82	2,022,194.58
308	Red Mountain (Type B)	2,075	6,157,218.33	1,952,181.82
309	La Conchita Schaefer Ranch	734	6,126,614.29	1,958,994.90
400	Fillmore-Grand Ave (Type B)	580	6,282,064.84	1,984,441.53
401	Sycamore Canyon (Type C)	4,811	6,237,367 55	2,036,357 76
402	Tommys Creek (Type C)	5,287	6,193,989.88	2,044,352.38
403	Silverstrand Alert (Type B)	18	6,192,883.46	1,880,190.61
404	Sisar North ALERT (Type C)	5,170	6,219,025.53	2,008,956.33
405	Choro Grande (Type C)	4,594	6,159,597.90	2,046,385.27
406	Fagan Canyon West (Type B)	700	6,233,836.94	1,961,275.67
408	Rose Valley Alert (Type C)	3,331	6,204,812.73	2,022,246.68
409	Hopper Mountain (Type C)	4,200	6,300,989.02	1,998,286.59
410	Pyramid Lake Visitors Center (Type B)	2,680	6,331,873.34	2,063,588.68
500A	Camrosa Water District	200	6,269,287.47	1,910,664.24
501	Rocky Peak (Type B)	2,430	6,367,258.62	1,929,842.08
502	Santa Rosa Valley Basin 2	410	6,294,226 70	1,912,082 33
505	Camarillo CSUCI (Type B)	58	6,247,267.45	1,889,157.81
506	Wood Ranch - Sycamore Canyon Dam (Type B)	810	6,320,088.63	1,915,931.84
507	South Mountain East (Type B)	965	6,246,056.69	1,933,756.38
508	Moorpark · Home Acres ALERT (Type B)	400	6,282,260.64	1,922,392.56
509	Spanish Hills - Las Posas Res (Type B)	300	6,233,302.06	1,906,536.16
510	Lang Ranch (Type B)	1,600	6,314,046.86	1,898,453.98
512	Camarillo - Upland (Type B)	207	6,257,148.69	1,911,053.90
513	Rancho Sierra Vista · Big Sycamore Canyon (Type B)	885	6,269,566.68	1,877,111.49

Table 2-2: Santa Clara River Basins Annual Average Streamflow (CFS)

Santa Clara River basins Streamgage Flows (CFS) Annual Average

Calendar Year	Santa Clara River LA County Line (USGS 11108500) Near Piru, CA (USGS 11109000)	Piru Creek* (USGS 11109800)	Hopper Creek (USGS 11110500)	Pole Creek (VCWPD 713)	Sespe Creek (USGS 11113000)	Santa Paula Creek (USGS 11113500)	UWCD Freeman
2016	25.32	9.13	1 80	0.12	9.76	2 13	10.32
2017	80.00	37.47	13.44	3.71	129.66	21.18	134 93
2018	31.68	8.93	0.62	0.35	27 31	6.23	15.56
2019	87.34	68.90	8.50	2.55	204.20	32.80	296.74
2016 - 2019 Average	**56.08**	**31.11**	**6.09**	**1.68**	**92.73**	**15.59**	**114.39**
1985 - 2015 Average	77.83	62.22	8.68	3.00	144.06	27.46	272.45

Data from USGS and VCWPD; and United Units: CFS;

**Value includes Santa Felicia Dam releases and spills*

Table 2-3: Coastal Basins Annual Average Streamflow (CFS)

Location	Arroyo Las Posas	Conejo Creek
2016	6.25	16.32 (89%)
2017	10.83	19.78 (78%)
2018	6.48	19.09 (79%)
2019	14.40	21.82 (73%)
2016 - 2019 Average	**9.49**	**19.24 (79%)**
1985 - 2015 Average	2.27	30.26

Note Percentage of Thousand Oaks Hill Canyon Treatment Plant annual average effluent discharge to total dry season Conejo Creek measured discharge is provided in parenthesis. Conejo Creek data from 1985-2015 represents data from VCWPD Gage 800 and 800A. Data for these gages were not available for the 2016-2019 Update Period

Table 2-4: Arroyo Las Posas Subsurface Underflow Entering Regional Model Domain (AFY)

Streamgage	Arroyo Las Posas Subsurface Underflow (AFY)
2016	1301.65
2017	1361.64
2018	1141.67
2019	1379.54
2016 - 2019 Average	**1296.13**
1985 - 2015 Average	1646.39

Arroyo Las Posas underflow: United estimation based on relationship developed between available observed (02N20W17J06S) WLE records and monthly Intera Model GW output from 2014 – 2015 (R^2 = 0.70)

Table 2-5. Benefits of the Santa Felicia Dam (SFD) Conservation Releases, 2016-2019

Year	Start Date	End Date	Total conservation release from SFD	Direct deliveries (AF) of SFD Release to:					
				Recharge Piru Basin	Recharge Fillmore Basin	Recharge + Diversions Santa Paula Basin	Diversions at Freeman	Recharge	Surface water
			(AF)					(Saticoy and El Rio)	(Deliveries PTP & PV)
2016	12/7/2016	12/15/2016	970	970	0	0	0	*0*	0
2017	5/29/2017	6/19/2017	15,300	11,700	2,000	700	800	800	0
2018	6/8/2018	7/11/2018	1,103	1,103	0	0	0	0	0
2019	6/3/2019	7/28/2019	39,444	11,776	5,800	3,600	17,100	16,000	970
Total			56,817	25,549	7,800	4,300	17,900	16,800	970
2016-2019 Average			**14,204**	**6,387**	**1,950**	**1,075**	**4,475**	**4,200**	**243**
1999-2015 Average			25,184	9,597	3,453	n/a	4,718*	10,177*	1,957

*Includes recharge to Santa Paula basin (benefits to Santa Paula basin were not measured separately prior to 2016)

Table 2-6: Average Annual Streamflow Diversions in Regional Model Domain (AFY)

Diversion	Isola	Camulos	Rancho Temescal 1	Rancho Temescal 2	Piru Mutual	Fillmore Irr. Co.	Beans Ranch	Limoneira	Canyon Irr. Co.	Farmers Irr. Co.	Zaragosa	Hyde-Turner Ditch	South Fork	United -Piru	United - Freeman	Camrosa*
Approximate Area (ac)	210	770	242	314	546	1,105	82	126	784	3,178	2	346	159	47	416	11,984
Total Diversions (AFY)																
Year																
2016	0	2,000	1,130	278	1,261	0	85	0	119	0	0.4	377	390	0	2,927	7,469
2017	0	1,800	1,052	166	1,350	0	59	0	522	123	0.4	326	301	0	10,261	9,326
2018	0	1,756	1,011	181	1,300	0	62	0	432	128	0.3	329	298	0	3,741	8,858
2019	0	1,118	655	152	1,343	0	79	0	1,062	588	0.4	415	570	0	41,455	9,190
2016 - 2019 Average	**0**	**1,669**	**962**	**194**	**1,314**	**0**	**71**	**0**	**534**	**210**	**0.4**	**362**	**390**	**0**	**14,596**	**8,711**
1985-2015 Average	318	1,438	385	53	1,456	1,670	66	13	551	56	0.1	493	378	2,792	63,113	9,021

*Area of application within Model domain is Pleasant Valley only; Camrosa utilizes diverted water outside of model domain and with other sources

Table 2-7: Annual Average Wastewater Discharge in Regional Model Domain (AFY)

Wastewater Plant	Piru WWTP[1]	Fillmore WWTP[1]	Santa Paula WRF[1]	Todd Rd. Co. Jail WWTP[1]	Jose Flores (Saticoy)[1]	Ventura WWTP (Recycled Water)[2]	Oxnard AWPF (Recycled Water)[3]	Camrosa WWTP (Recycled Water)[4]	Camarillo WWTP (Discharge to Conejo Creek)[5]	Camarillo WWTP (Recycled Water)[5]
2016	135	959	2,025	41	86	700	1,024	1,250	1,771	2,102
2017	134	951	2,296	46	107	700	1,568	1,250	1,792	2,097
2018	139	949	2,077	48	87	700	2,770	1,250	2,138	1,797
2019	142	966	2,198	48	105	700	685	1,250	1,995	1,946
2016 - 2019 Average	137	956	2,149	46	96	700	1,512	1,250	1,924	1,985
1985 - 2015 Average	172	1,288	2,279	29	71	534	0	1,250	3,073	1,392

Units. AFY; [1]Data from data submitted to State Water Resources Control Board, [2]Data from Ventura Water's 2015 Urban Water Management Plan projections (Ventura Water, 2016); [3]Data from 2016 – 2019 Recycled Water Management Impact Analysis Reports (UWCD, 2016; 2017, 2018, 2019); [5]Data from correspondence with Camrosa Staff; [5]Data from correspondence with Camarillo Sanitary District Staff; WWTP – Wastewater Treatment Plant; WWRP – Wastewater Recycling Plant; WRF – Water Reclamation Facility; WWRF – Wastewater Reclamation Facility; AWPF – Advanced Water Purification Facility

Table 3-1: 2016-2019 Residual Statistics with All Groundwater Elevation Data Included

Basin	Data No.	RM	ARM	ARM %	RMS	RMS %	Std Dev	Std Dev %	WL Range	WL Min	WL Max
All Basins	18,376	-2.15	19.0	1.48%	30.6	2.40%	30.5	2.39%	1,278.0	-265.9	1,012.1
Piru	1,137	6.25	17.1	6.97%	21.7	8.85%	20.8	8.48%	245.0	427.4	672.4
Fillmore	992	5.07	17.3	3.93%	28.3	6.44%	27.9	6.34%	439.4	243.9	683.2
Santa Paula	2,630	-10.88	14.5	6.27%	22.2	9.57%	19.3	8.35%	231.8	41.0	272.8
Mound	843	20.40	25.5	12.16%	35.0	16.65%	28.4	13.53%	210.1	-65.0	145.1
Forebay	3,470	8.98	20.9	6.95%	26.6	8.83%	25.0	8.31%	301.2	-182.3	118.9
Oxnard Plain	7,068	-5.95	12.0	3.77%	17.4	5.47%	16.4	5.15%	318.0	-265.9	52.1
Pleasant Valley	1,518	-4.80	26.4	8.95%	34.5	11.70%	34.2	11.59%	294.6	-220.1	74.5
West Las Posas	623	-34.75	85.2	18.55%	106.8	23.26%	101.1	22.01%	459.3	-213.1	246.2

Note 1. Data No. = Number of data points; RM = Residual Mean (feet); ARM = Absolute Residual Mean (feet); ARM % = Absolute Residual Mean percentage of the range of measurements; RMS = Root Mean Square (feet); RMS % = Root Mean Square percentage of the range of measurements; Std Dev = Standard Deviation (feet); Std Dev % = Standard Deviation percentage of the range of measurements; WL Range = range of (water level) measurements (feet); WL Min = Minimum value of (water level) measurements (feet); WL Max = Maximum value of (water level) measurements (feet);

Note 2: The ARM%, RMS%, and Std Dev% are in RED font and highlighted in Yellow if the percentage >10%

Table 3-2: 2016-2019 Residual Statistics Excluding Outlier Wells and Wells with less than 10 Groundwater Elevation Records

Basin	Data No.	RM	ARM	ARM %	RMS	RMS %	Std Dev	Std Dev %	WL Range	WL Min	WL Max
All Basins	17,224	-2.57	16.8	1.77%	25.1	2.65%	25.0	2.63%	949.1	-265.9	683.2
Piru	1,111	6.27	16.9	6.91%	21.4	8.75%	20.5	8.38%	245.0	427.4	672.4
Fillmore	938	5.04	17.0	3.87%	28.4	6.45%	27.9	6.36%	439.4	243.9	683.2
Santa Paula	2,604	-10.67	14.4	6.20%	21.9	9.47%	19.2	8.27%	231.8	41.0	272.8
Mound	544	3.31	11.3	14.44%	13.5	17.25%	13.1	16.74%	78.1	-65.0	13.1
Forebay	3,379	9.10	21.0	6.98%	26.7	8.86%	25.1	8.33%	301.2	-182.3	118.9
Oxnard Plain	6,667	-6.92	11.7	3.69%	17.4	5.47%	16.0	5.02%	318.0	-265.9	52.1
Pleasant Valley	1,503	-4.78	26.1	8.87%	34.2	11.59%	33.8	11.48%	294.6	-220.1	74.5
West Las Posas	391	-18.32	51.9	17.12%	72.2	23.84%	70.0	23.09%	303.1	-198.3	104.8

Note 1. Data No. = Number of data points; RM = Residual Mean (feet); ARM = Absolute Residual Mean (feet); ARM % = Absolute Residual Mean percentage of the range of measurements; RMS = Root Mean Square (feet); RMS % = Root Mean Square percentage of the range of measurements; Std Dev = Standard Deviation (feet); Std Dev % = Standard Deviation percentage of the range of measurements; WL Range = range of (water level) measurements (feet); WL Min = Minimum value of (water level) measurements (feet); WL Max = Maximum value of (water level) measurements (feet);

Note 2: The ARM%, RMS%, and Std Dev% are in RED font and highlighted in Yellow if the percentage >10%

Note 3: The WL range for Mound and West Las Posas highlighted in yellow are much less than the WL range in the Calibration Period (1985-2015)

Table 3-3: 2016-2019 Adjusted Residual Statistics Excluding Outlier Wells and Wells with less than 10 Groundwater Elevation Records

Basin	Data No.	RM	ARM	Adjusted ARM %	RMS	Adjusted RMS %	Std Dev	Adjusted Std Dev %	1985-2015 WL Range	1985-2015 WL Min	1985-2015 WL Max
Mound	544	3.31	11.3	8.54%	13.5	10.20%	13.1	9.90%	132.0	-55.4	76.6
West Las Posas	391	-18.32	51.9	7.96%	72.2	11.09%	70.0	10.74%	651.3	-367.5	283.8

Note 1. Data No. = Number of data points; RM = Residual Mean (feet); ARM = Absolute Residual Mean (feet); ARM % = Absolute Residual Mean percentage of the range of measurements; RMS = Root Mean Square (feet); RMS % = Root Mean Square percentage of the range of measurements; Std Dev = Standard Deviation (feet); Std Dev % = Standard Deviation percentage of the range of measurements; WL Range = range of (water level) measurements (feet); WL Min = Minimum value of (water level) measurements (feet); WL Max = Maximum value of (water level) measurements (feet);

Note 2: The ARM%, RMS%, and Std Dev% are in RED font and highlighted in Yellow if the percentage >10%

Note 3: The WL range for Mound and West Las Posas highlighted in yellow

Table 3-4: 1985-2015 Residual Statistics with All Groundwater Elevation Data Included

Basin	Data No.	RM	ARM	ARM %	RMS	RMS %	Std Dev	Std Dev %	WL Range	WL Min	WL Max
All Basins	90,502	0.61	13.4	1.11%	22.3	1.85%	22.3	1.85%	1203.5	-367.5	836.0
Piru	5,481	-3.10	9.7	3.88%	12.6	5.03%	12.2	4.88%	249.5	449.4	698.9
Fillmore	4,827	2.48	11.6	2.47%	16.3	3.47%	16.1	3.43%	470.8	220.7	691.5
Santa Paula	16,684	-10.04	12.1	4.71%	18.4	7.13%	15.4	5.97%	258.0	28.0	286.0
Mound	4,035	9.06	16.4	7.96%	25.7	12.53%	24.1	11.73%	205.5	-55.4	150.1
Forebay	18,428	4.01	9.8	3.06%	15.2	4.74%	14.7	4.57%	321.6	-183.1	138.5
Oxnard Plain	29,656	2.51	11.0	2.51%	16.3	3.72%	16.1	3.67%	438.4	-324.5	113.9
Pleasant Valley	7,355	-0.46	19.6	5.67%	25.8	7.48%	25.8	7.48%	344.9	-200.8	144.1
West Las Posas	3,315	16.84	48.6	7.46%	69.2	10.63%	67.2	10.31%	651.3	-367.5	283.8

Note 1. Data No. = Number of data points; RM = Residual Mean (feet); ARM = Absolute Residual Mean (feet); ARM % = Absolute Residual Mean percentage of the range of measurements; RMS = Root Mean Square (feet); RMS % = Root Mean Square percentage of the range of measurements; Std Dev = Standard Deviation (feet); Std Dev % = Standard Deviation percentage of the range of measurements; WL Range = range of (water level) measurements (feet); WL Min = Minimum value of (water level) measurements (feet); WL Max = Maximum value of (water level) measurements (feet);

Note 2: The ARM%, RMS%, and Std Dev% are in RED font

Table 3-5: 1985-2015 Residual Statistics Excluding Outlier Wells and Wells with less than 10 Groundwater Elevation Records

Basin	Data No.	RM	ARM	ARM %	RMS	RMS %	Std Dev	Std Dev %	WL Range	WL Min	WL Max
All Basins	88,754	-0.30	12.4	1.16%	19.1	1.79%	19.1	1.79%	1063.4	-367.5	695.9
Piru	5,451	-3.09	9.6	3.90%	12.4	5.03%	12.0	4.87%	246.5	449.4	695.9
Fillmore	4,737	2.57	11.5	4.69%	15.8	6.46%	15.6	6.38%	244.2	220.7	464.9
Santa Paula	16,622	-9.99	12.1	5.01%	18.2	7.54%	15.3	6.31%	241.8	44.2	286.0
Mound	3,322	0.17	9.0	6.80%	11.7	8.90%	11.7	8.90%	132.0	-55.4	76.6
Forebay	18,345	3.95	9.8	3.05%	15.2	4.71%	14.6	4.55%	321.6	-183.1	138.5
Oxnard Plain	29,483	2.52	11.0	2.91%	16.0	4.26%	15.8	4.21%	376.5	-262.6	113.9
Pleasant Valley	7,326	-0.31	19.5	5.65%	25.6	7.43%	25.6	7.43%	344.9	-200.8	144.1
West Las Posas	2,781	2.15	34.6	5.31%	48.4	7.43%	48.3	7.42%	651.3	-367.5	283.8

Note 1. Data No. = Number of data points; RM = Residual Mean (feet); ARM = Absolute Residual Mean (feet); ARM % = Absolute Residual Mean percentage of the range of measurements; RMS = Root Mean Square (feet); RMS % = Root Mean Square percentage of the range of measurements; Std Dev = Standard Deviation (feet); Std Dev % = Standard Deviation percentage of the range of measurements; WL Range = range of (water level) measurements (feet); WL Min = Minimum value of (water level) measurements (feet); WL Max = Maximum value of (water level) measurements (feet);

Note 2: The ARM%, RMS%, and Std Dev% are in RED font

Table 3-6. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Piru Basin

Aquifer System A	Change in Storage	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Outside of Basin, within Model Domain	Underflow from Eastern Basin (LA County)	Internal Flow from Aquifer Above	Internal Flow to Aquifer Below (B)	Underflow to Fillmore Basin (A)	Stream Percolation	Rising Groundwater	Net Stream Percolation	Total Inflows	Total Outflows
	-6,102	968	-2,239	7,970	-1,334	15	5,000	--	-39,960	-6,226	65,064	-23,152	41,912	79,017	-79,012
Aquifer System B	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Eastern Basin (LA County)**	**Internal Flow from Aquifer Above (A)**	**Internal Flow to Aquifer Below (C)**	**Underflow to Fillmore Basin (B)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-5,660	4,772	--	--	-10,351	--	--	39,960	-6,184	-22,536	--	--	--	44,732	-44,732
Aquifer System C	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Eastern Basin (LA County)**	**Internal Flow from Aquifer Above (B)**	**Internal Flow to Aquifer Below**	**Underflow to Fillmore Basin (C)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-329	--	--	--	86	--	--	6,184	--	-5,942	--	--	--	6,270	-6,270
Sum (2016-2019 Average)	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Eastern Basin (LA County)**	**Internal Flow from Aquifer Above**	**Internal Flow to Aquifer Below**	**Underflow to Fillmore Basin**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-12,090	**5,740**	**-2,239**	**7,970**	**-11,599**	**15**	**5,000**	**46,144**	**-46,144**	**-34,704**	**65,064**	**-23,152**	**41,912**	**129,933**	**-129,928**
1985-2015 Average	2,119	5,473	-3,802	10,358	-12,630	14	5,000	47,241	-47,241	-47,124	72,991	-32,394	40,598	143,196	-143,191

Notes: Units are in acre-feet per year (AFY); Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;
ET = Evapotranspiration
Positive pumping from wells results from internal flows in wells screened across multiple model layers

Table 3-7. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Fillmore Basin

Aquifer System A	Change in Storage	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Outside of Basin, within Model Domain	Underflow from Piru Basin (A)	--	Internal Flow to Aquifer Below (B)	Underflow to Santa Paula Basin (A)	Stream Percolation	Rising Groundwater	Net Stream Percolation	Total Inflows	Total Outflows
	-3,715	1,131	-2,215	17,783	-4,732	-156	6,226	--	-18,768	-2,683	12,726	-5,599	7,127	37,866	-37,866
Aquifer System B	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Piru Basin (B)**	**Internal Flow from Aquifer Above (A)**	**Internal Flow to Aquifer Below (C)**	**Underflow to Santa Paula Basin (B)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-1,112	3,495	--	854	-33,146	395	22,536	18,768	-1,083	-9,928	0	-780	-780	46,049	-46,049
Aquifer System C	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Piru Basin (C)**	**Internal Flow from Aquifer Above (B)**	**--**	**Underflow to Santa Paula Basin (C)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-893	2,392	--	91	-4,585	901	5,942	1,083	--	-4,594	105	-442	-337	10,514	-10,514
Sum (2016-2019 Average)	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Piru Basin**	**Internal Flow from Aquifer Above**	**Internal Flow to Aquifer Below**	**Underflow to Santa Paula Basin**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-5,720	**7,018**	**-2,215**	**18,728**	**-42,462**	**1,141**	**34,704**	**19,852**	**-19,852**	**-17,205**	**12,831**	**-6,820**	**6,010**	**94,274**	**-94,274**
1985-2015 Average	4,334	6,723	-4,406	20,796	-47,028	1,858	47,124	9,026	-9,026	-17,965	13,740	-25,178	-11,438	103,601	-103,603

Notes: Units are in acre-feet per year (AFY); Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;
ET = Evapotranspiration

Table 3-8. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Santa Paula Basin

Aquifer System A	Change in Storage	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Outside of Basin, within Model Domain	Underflow from Fillmore Basin (A)	--	Internal Flow to Aquifer Below (B)	Underflow to Mound Basin (Shallow)	Underflow to Mound Basin (UAS)	Underflow to Mound Basin (LAS)	Underflow to Oxnard Basin (UAS)	Underflow to Oxnard Basin (LAS)	Stream Percolation	Rising Groundwater	Net Stream Percolation	Total Inflows	Total Outflows
	-1,357	--	-712	12,322	-1,189	-230	2,683	--	-7,244	0	0	--	-4,009	--	1,319	-1,584	-264	16,324	-16,324
Aquifer System B	Change in Storage	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Outside of Basin, within Model Domain	Underflow from Fillmore Basin (B)	Internal Flow to Aquifer Above (A)	Internal Flow to Aquifer Below (C)	Underflow to Mound Basin (Shallow)	Underflow to Mound Basin (UAS)	Underflow to Mound Basin (LAS)	Underflow to Oxnard Basin (UAS)	Underflow to Oxnard Basin (LAS)	Stream Percolation	Rising Groundwater	Net Stream Percolation	Total Inflows	Total Outflows
	-308	1,392	--	3,055	-19,343	792	9,928	7,244	322	--	-348	-2,644	-2	-9	144	-224	-79	22,877	-22,877
Aquifer System C	Change in Storage	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Outside of Basin, within Model Domain	Underflow from Fillmore Basin (C)	Internal Flow to Aquifer Above (B)	--	Underflow to Mound Basin (Shallow)	Underflow to Mound Basin (UAS)	Underflow to Mound Basin (LAS)	Underflow to Oxnard Basin (UAS)	Underflow to Oxnard Basin (LAS)	Stream Percolation	Rising Groundwater	Net Stream Percolation	Total Inflows	Total Outflows
	-313	6	--	431	-1,041	-61	4,594	-322	--	--	--	-3,148	--	-21	3	-155	-153	5,034	-5,060
Sum (2016-2019 Average)	Change in Storage	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Outside of Basin, within Model Domain	Underflow from Fillmore Basin	Internal Flow to Aquifer Above	Internal Flow to Aquifer Below	Underflow to Mound Basin (Shallow)	Underflow to Mound Basin (UAS)	Underflow to Mound Basin (LAS)	Underflow to Oxnard Basin (UAS)	Underflow to Oxnard Basin (LAS)	Stream Percolation	Rising Groundwater	Net Stream Percolation	Total Inflows	Total Outflows
	-1,978	1,398	-712	15,808	-21,573	502	17,205	6,923	-6,923	0	-348	-5,792	-4,011	-30	1,466	-1,963	-496	43,302	-43,328
1985-2015 Average	3,487	1,394	-2,291	15,796	-24,561	750	17,965	3,628	-3,628	1	-387	-5,621	-2,278	-22	2,165	-6,399	-4,233	45,186	-45,187

Notes: Units are in acre-feet per year (AFY); Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;
ET = Evapotranspiration

Table 3-9. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Mound Basin

Shallow Aquifer System	Change in Storage	Tile Drains	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Underflow from Santa Paula Basin (A)	Underflow from Santa Paula Basin (B)	Underflow from Santa Paula Basin (C)	Internal Flow to Aquifer Above	Internal Flow to Aquifer Below (UAS)	Underflow with Oxnard Basin (Shallow)	Coastal Flux	Net Stream Percolation (SCR)	Total Inflows	Total Outflows
	-105	-5	--	-226	2,692	--	0	--	--	--	-1,585	362	-257	-863	3,054	-3,040
Upper Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow from Santa Paula Basin (A)**	**Underflow from Santa Paula Basin (B)**	**Underflow from Santa Paula Basin (C)**	**Internal Flow to Aquifer Above (Shallow)**	**Internal Flow to Aquifer Below (LAS)**	**Underflow with Oxnard Basin (UAS)**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Total Inflows**	**Total Outflows**
	796	--	--	--	161	-2,007	0	348	--	1,585	-395	-2,230	1,729	--	4,619	-4,632
Lower Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow from Santa Paula Basin (A)**	**Underflow from Santa Paula Basin (B)**	**Underflow from Santa Paula Basin (C)**	**Internal Flow to Aquifer Above (UAS)**	**Internal Flow to Aquifer Below**	**Underflow with Oxnard Basin (LAS)**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Total Inflows**	**Total Outflows**
	-283	--	2,585	--	546	-4,437	--	2,644	3,148	395	--	-5,333	735	--	10,053	-10,053
Sum (2016-2019 Average)	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow from Santa Paula Basin (A)**	**Underflow from Santa Paula Basin (B)**	**Underflow from Santa Paula Basin (C)**	**Internal Flow to Aquifer Above**	**Internal Flow to Aquifer Below**	**Underflow with Oxnard Basin**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Total Inflows**	**Total Outflows**
	407	**-5**	**2,585**	**-226**	**3,399**	**-6,444**	**0**	**2,992**	**3,148**	**1,979**	**-1,979**	**-7,202**	**2,207**	**-863**	**16,718**	**-16,718**
1985-2015 Average	1,092	-129	2,485	-665	3,719	-7,371	27	2,869	3,112	2,166	-2,166	-3,236	-371	-1,541	15,469	-15,479

Notes: Units are in acre-feet per year; Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;
ET = Evapotranspiration; UAS = Upper Aquifer System; LAS = Lower Aquifer System
Net Streamflow percolation in shallow aquifer represents all aquifer systems;
Totals represent net streamflow percolation and not total inflow or outflow

Table 3-10. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Oxnard Basin

Semi-Perched Aquifer System	Change in Storage	Tile Drains	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Underflow with Santa Paula Basin	Underflow with Mound Basin	Underflow with Pleasant Valley Basin	Underflow with Las Posas Basin (West)	Internal Flow to Aquifer Above	Internal Flow to Aquifer Below (UAS)	Coastal Flux	Net Stream Percolation (SCR)	Net Stream Percolation (Calleguas Creek)	Total Inflows	Total Outflows
	2,798	-4,204	--	-6,246	21,008	-44	--	-362	2,301	0	--	-19,193	152	372	3,418	30,048	-30,048
Upper Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge (Volcanic Outcrop)**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow with Santa Paula Basin**	**Underflow with Mound Basin**	**Underflow with Pleasant Valley Basin**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above (Semi-Perched)**	**Internal Flow to Aquifer Below (LAS)**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	1,194	0	12	0	16,546	-39,023	4,011	2,230	4,053	-1,259	19,193	-21,190	12,620	1,562	--	61,421	-61,472
Lower Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow with Santa Paula Basin**	**Underflow with Mound Basin**	**Underflow with Pleasant Valley Basin**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above (UAS)**	**Internal Flow to Aquifer Below**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	-1,047	--	--	--	29	-37,773	30	5,333	1,576	1,720	21,190	--	8,913	--	--	38,791	-38,820
Sum (2016-2019 Average)	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow with Santa Paula Basin**	**Underflow with Mound Basin**	**Underflow with Pleasant Valley Basin**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above**	**Internal Flow to Aquifer Below**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	2,944	**-4,204**	**12**	**-6,246**	**37,583**	**-76,841**	**4,040**	**7,202**	**7,930**	**461**	**40,383**	**-40,383**	**21,685**	**1,934**	**3,418**	**127,592**	**-127,673**
1985-2015 Average	4,417	-10,225	11	-8,797	74,334	-84,324	2,300	3,236	5,105	-1,222	30,239	-30,239	9,001	3,104	3,046	134,794	-134,806

Notes:

Units are in acre-feet per year; Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;

ET = Evapotranspiration; SCR = Santa Clara River; UAS = Upper Aquifer System; LAS = Lower Aquifer System;

Totals represent net streamflow percolation and not total inflow or outflow

Oxnard Basin includes the Forebay that has major United spreading activities that add to the areal recharge.

Table 3-11. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Pleasant Valley Basin

Semi-Perched Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow to Oxnard Basin**	**Underflow from Las Posas Basin (East)**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above**	**Internal Flow to Aquifer Below (UAS)**	**Net Stream Percolation (Arroyo Las Posas)**	**Net Stream Percolation (Conejo Creek)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	-65	-288	--	-2	4,433	-275	-2,301	--	--	--	-11,941	847	5,026	4,566	14,872	-14,872
Upper Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow to Oxnard Basin**	**Underflow from Las Posas Basin (East)**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above (Semi-Perched)**	**Internal Flow to Aquifer Below (LAS)**	**Net Stream Percolation (Arroyo Las Posas)**	**Net Stream Percolation (Conejo Creek)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	720	--	1,625	-1,658	661	-6,327	-4,053	1,296	-319	11,941	-9,233	2,843	2,504	--	21,590	-21,590
Lower Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow to Oxnard Basin**	**Underflow from Las Posas Basin (East)**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above (UAS)**	**Internal Flow to Aquifer Below**	**Net Stream Percolation (Arroyo Las Posas)**	**Net Stream Percolation (Conejo Creek)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	-307	--	--	--	266	-6,899	-1,576	--	-723	9,233	--	--	--	--	9,499	-9,504
Sum (2016-2019 Average)	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow to Oxnard Basin**	**Underflow from Las Posas Basin (East)**	**Underflow with Las Posas Basin (West)**	**Internal Flow with Aquifer Above**	**Internal Flow with Aquifer Below**	**Net Stream Percolation (Arroyo Las Posas)**	**Net Stream Percolation (Conejo Creek)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	349	**-288**	**1,625**	**-1,660**	**5,360**	**-13,501**	**-7,930**	**1,296**	**-1,042**	**21,175**	**-21,175**	**3,689**	**7,530**	**4,566**	**45,590**	**-45,595**
1985-2015 Average	-1,513	-894	1,421	-1,865	6,653	-15,671	-5,105	1,646	-795	19,664	-19,664	4,260	7,300	4,561	45,505	-45,506

Notes:

Units are in acre-feet per year; Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;

ET = Evapotranspiration; SCR = Santa Clara River; UAS = Upper Aquifer System; LAS = Lower Aquifer System;

Totals represent net streamflow percolation and not total inflow or outflow

Table 3-12. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in West Las Posas Valley Basin

Semi-Perched and UAS	Change in Storage	Mountain Front Recharge	Areal Recharge	Pumping from Wells	Underflow with Oxnard Basin	Underflow with Pleasant Valley Basin	Internal Flow to Aquifer Above	Internal Flow to Aquifer Below (LAS)	Outside of Basin, within Model Domain	Total Inflows	Total Outflows
	62	--	5,559	-461	1,259	319	--	-6,738	--	7,199	-7,199
Lower Aquifer System	**Change in Storage**	**Mountain Front Recharge**	**Areal Recharge**	**Pumping from Wells**	**Underflow with Oxnard Basin**	**Underflow with Pleasant Valley Basin**	**Internal Flow to Aquifer Above (UAS)**	**Internal Flow to Aquifer Below**	**Outside of Basin, within Model Domain**	**Total Inflows**	**Total Outflows**
	3,542	1,621	2,272	-13,295	-1,720	723	6,738	--	119	15,015	-15,015
Sum (2016-2019 Average)	**Change in Storage**	**Mountain Front Recharge**	**Areal Recharge**	**Pumping from Wells**	**Underflow with Oxnard Basin**	**Underflow with Pleasant Valley Basin**	**Internal Flow to Aquifer Above**	**Internal Flow to Aquifer Below**	**Outside of Basin, within Model Domain**	**Total Inflows**	**Total Outflows**
	3,604	1,621	7,831	-13,755	-461	1,042	6,738	-6,738	119	20,954	-20,954
1985-2015 Average	2,115	1,710	7,377	-13,367	1,222	795	7,487	-7,487	149	20,854	-20,854

Notes:

Units are in acre-feet per year; Positive values indicate inflows, negative values indicate outflows;

Rounded to nearest whole number;

ET = Evapotranspiration; SCR = Santa Clara River; UAS = Upper Aquifer System; LAS = Lower Aquifer System;

FIGURES

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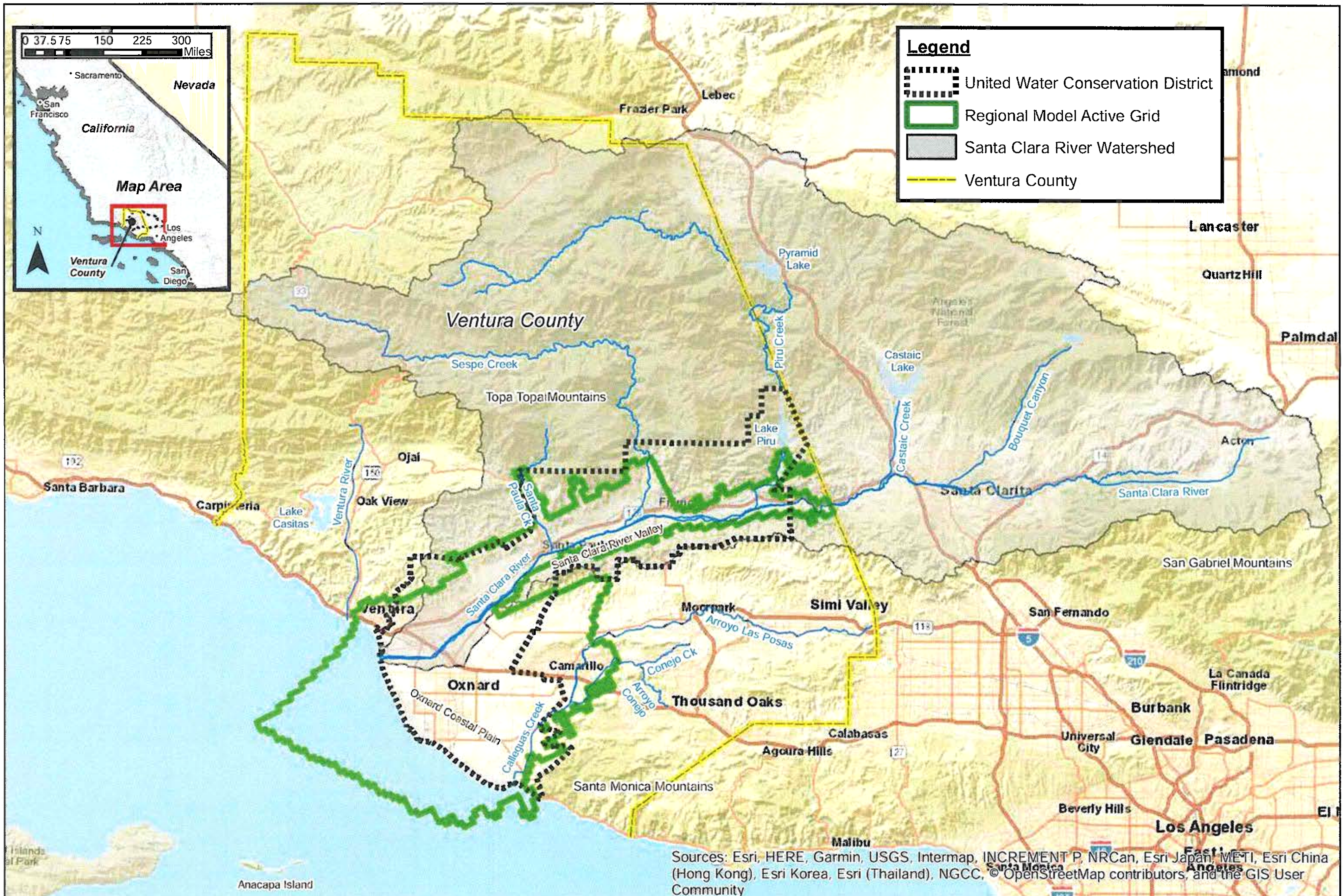

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Figure 1-1. Location Map

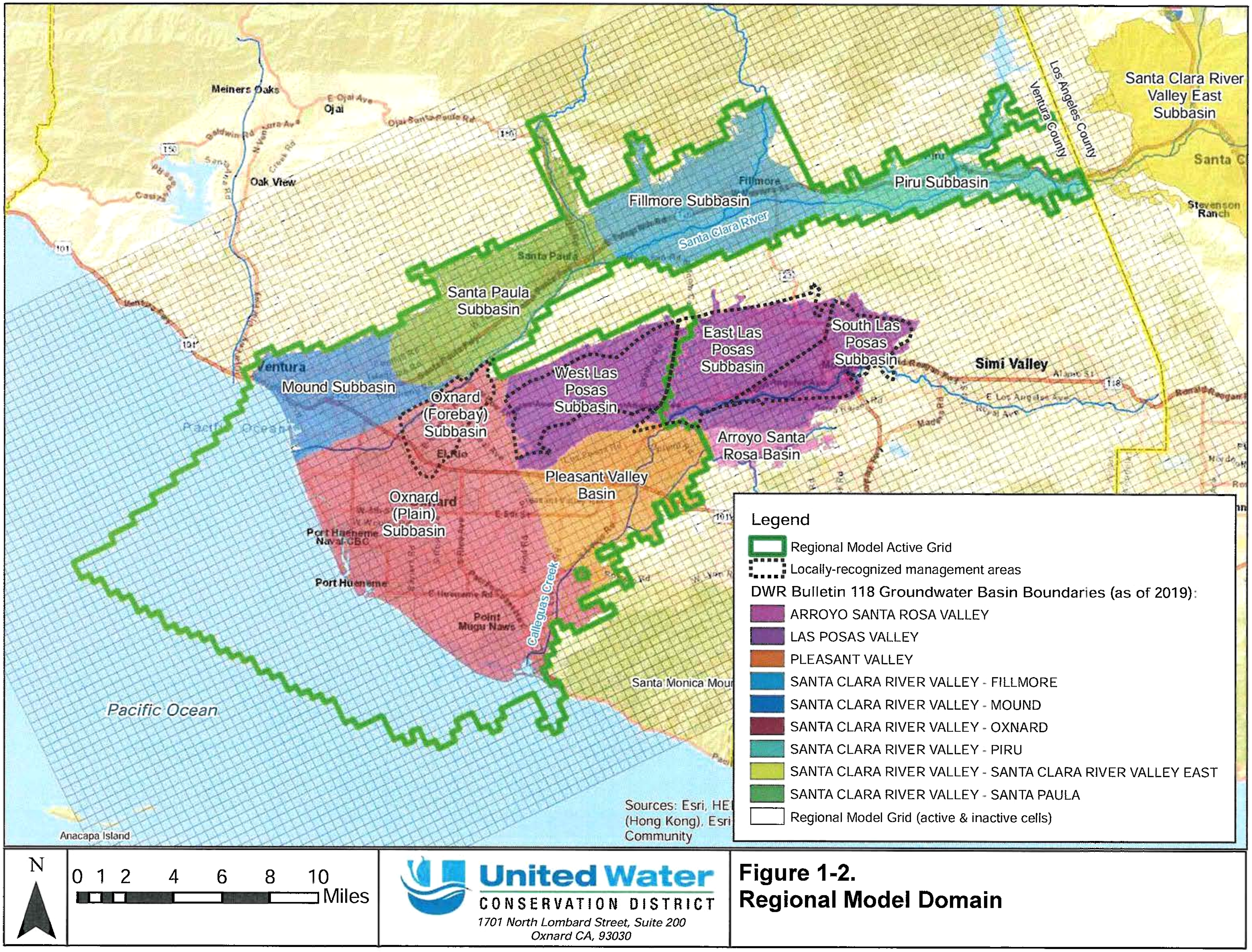

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Figure 1-2.
Regional Model Domain

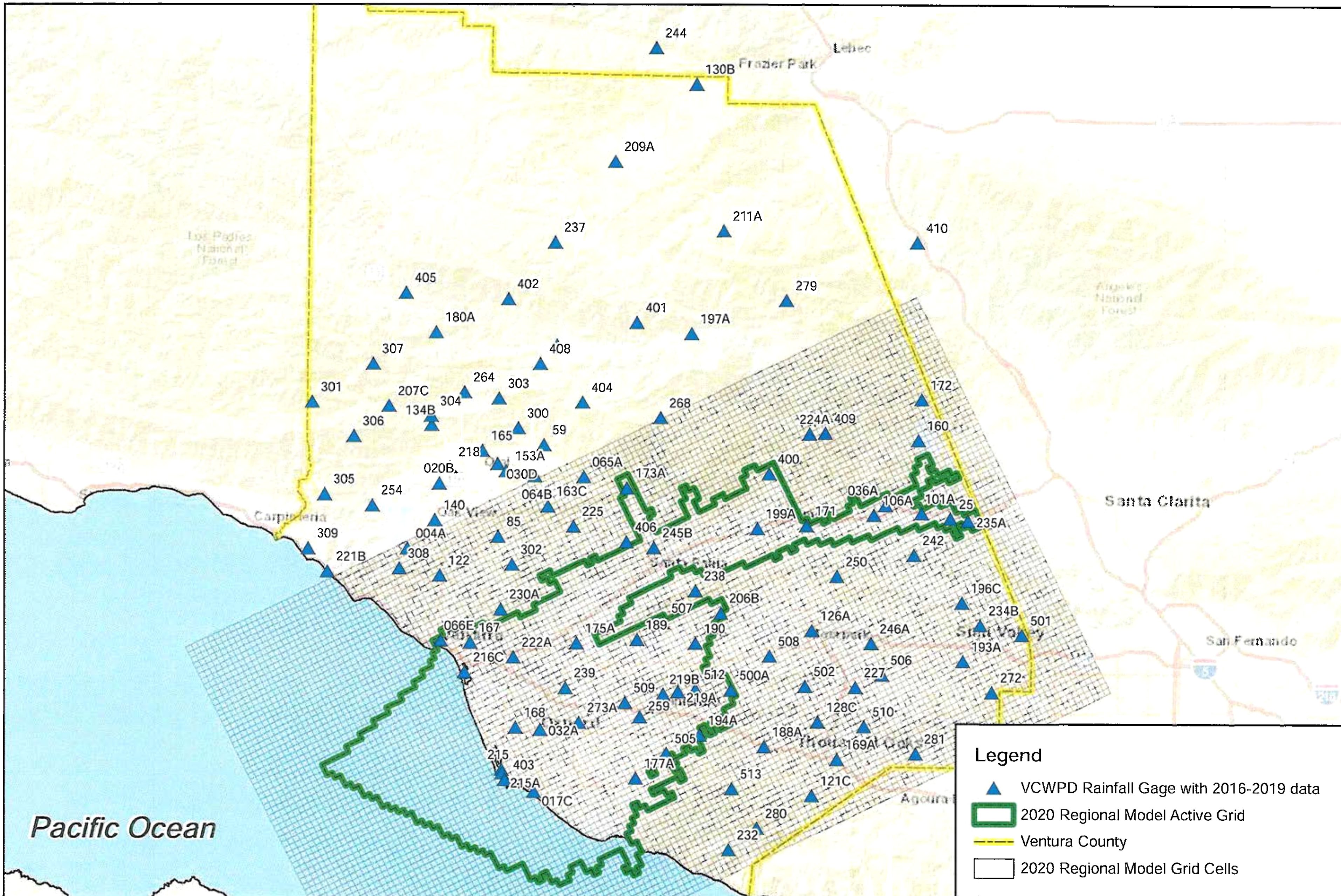

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Figure 2-1.
Ventura County Watershed Protection District (VCWPD) Rainfall Gages with 2016-2019 Data

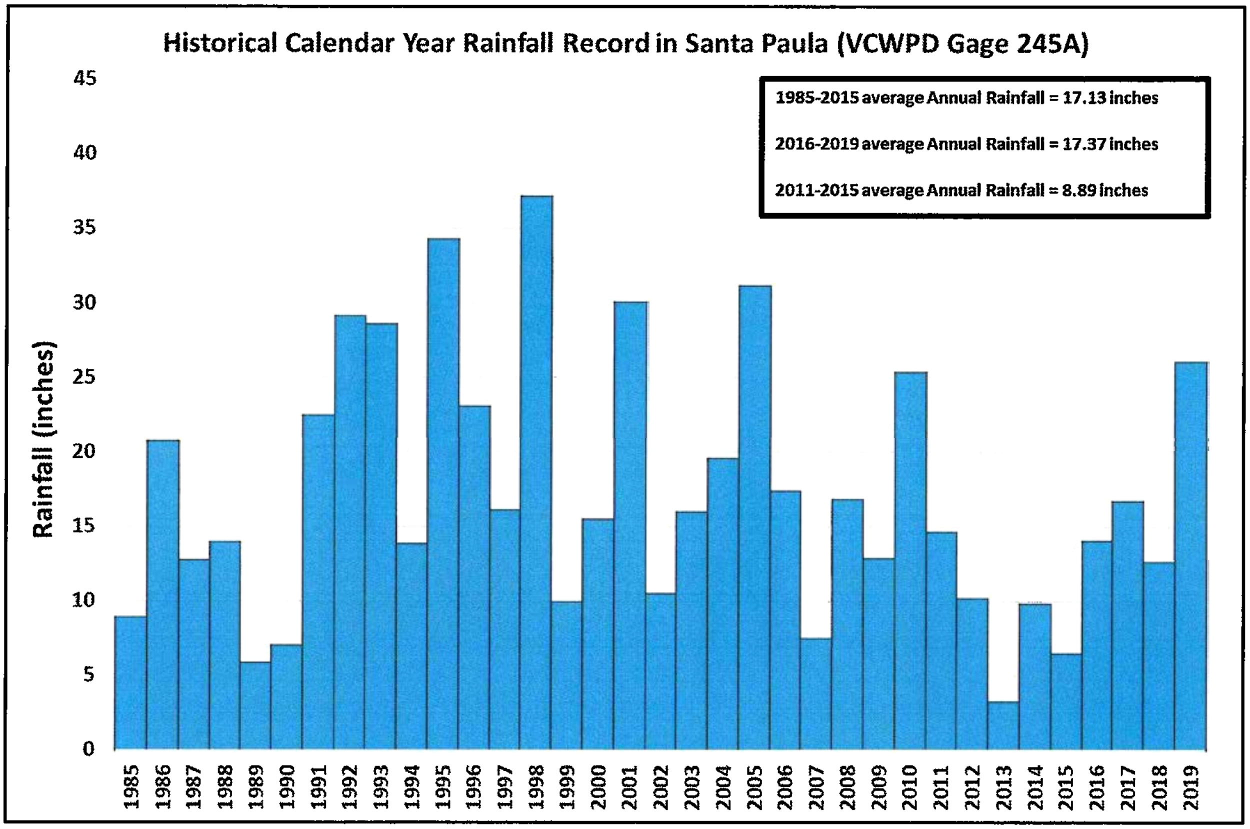

Figure 2-2. Calendar Year Precipitation Records for Regional Model Representative Location in Santa Paula Basin

Note: Santa Paula Station Ventura County Watershed Protection District (VCWPD) Gage 245A was discontinued by VCWPD after water Year 2010 and VCWPD records continued Gage 245 records nearby at Gage 245B. However. United continued maintaining and recording precipitation data through the year 2019 at Gage 245A. Gage 245A is used for this presentation.

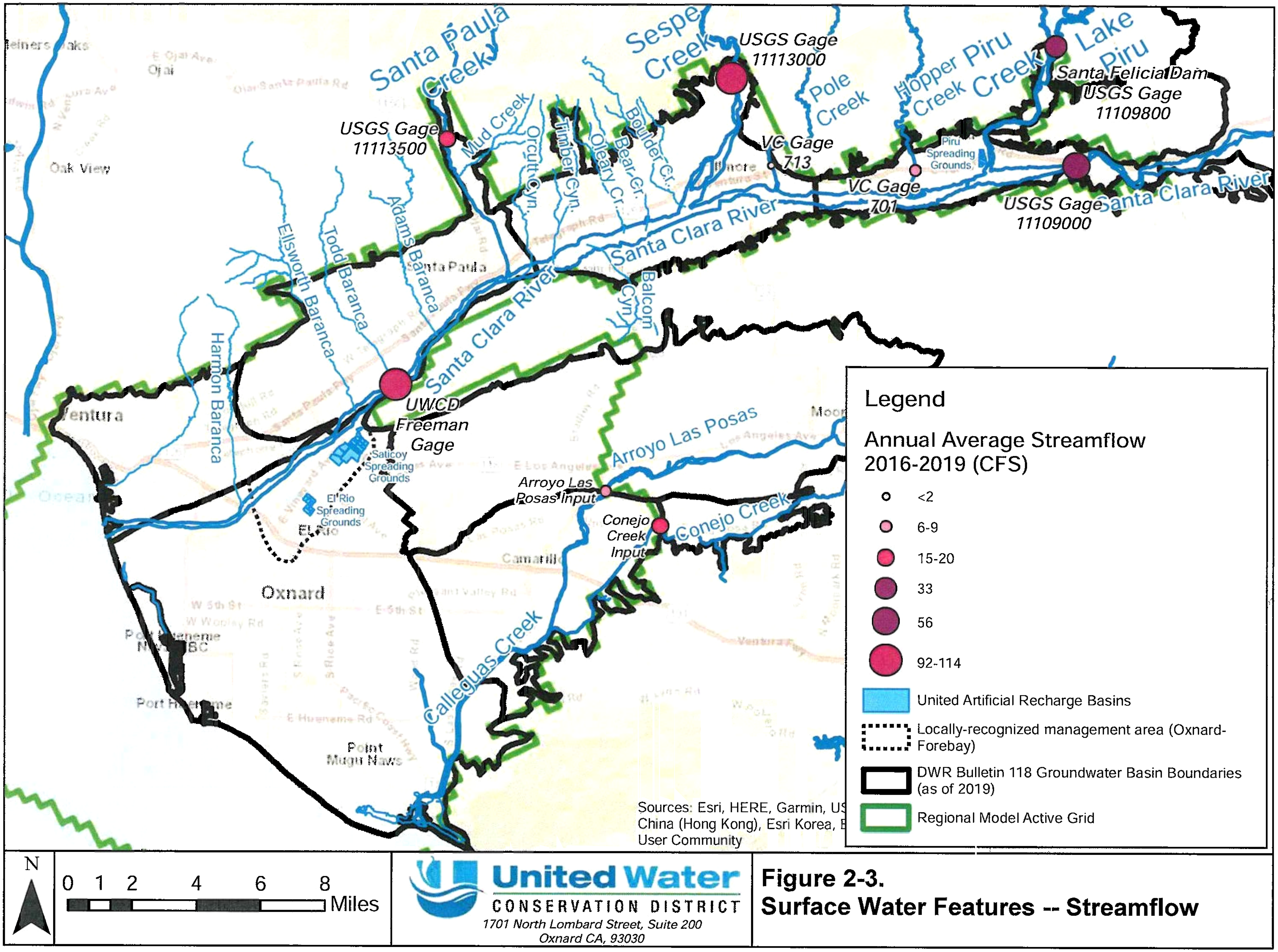

Figure 2-3.
Surface Water Features -- Streamflow

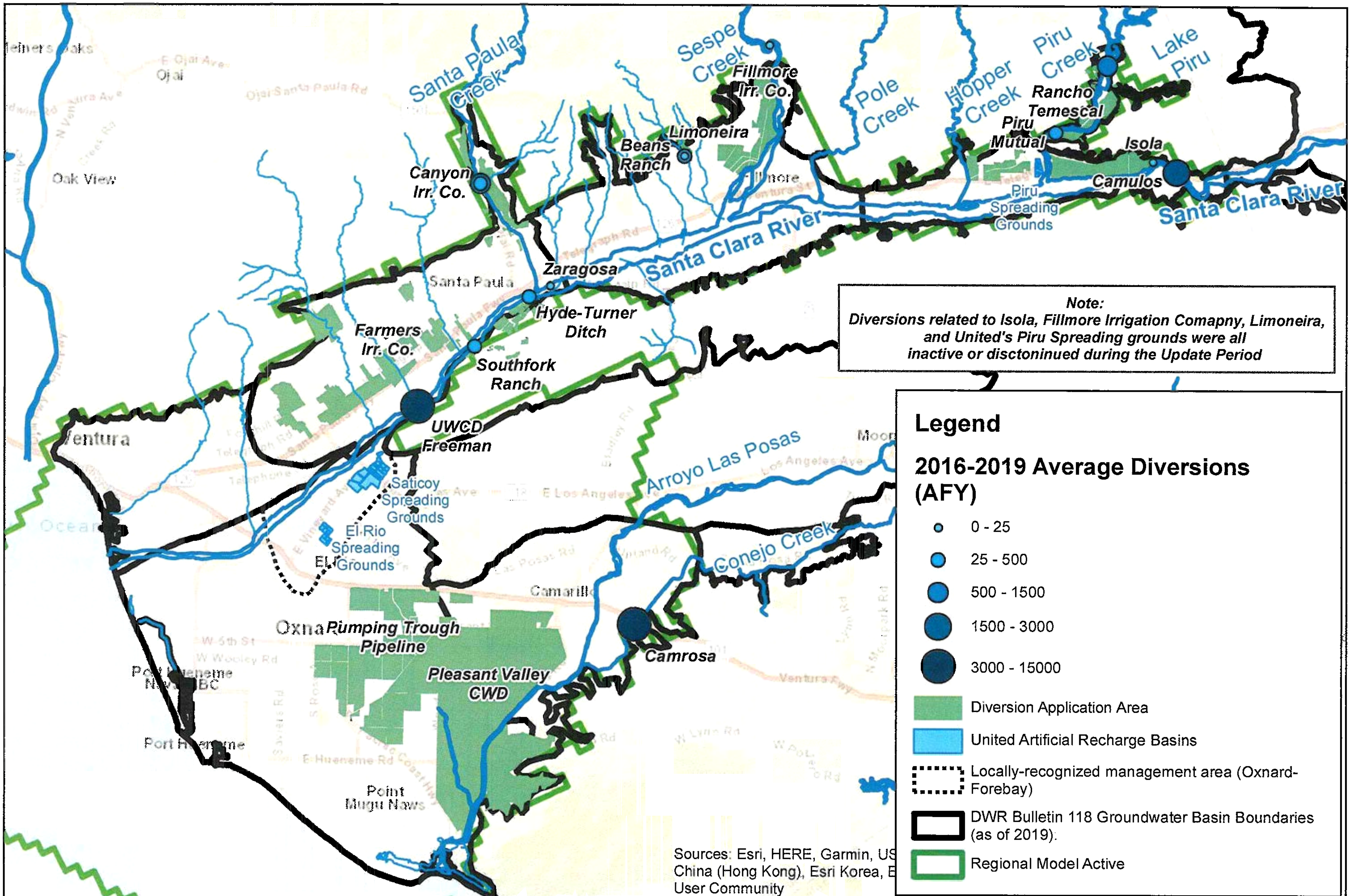

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Figure 2-4.
Surface Water Features -- Diversions

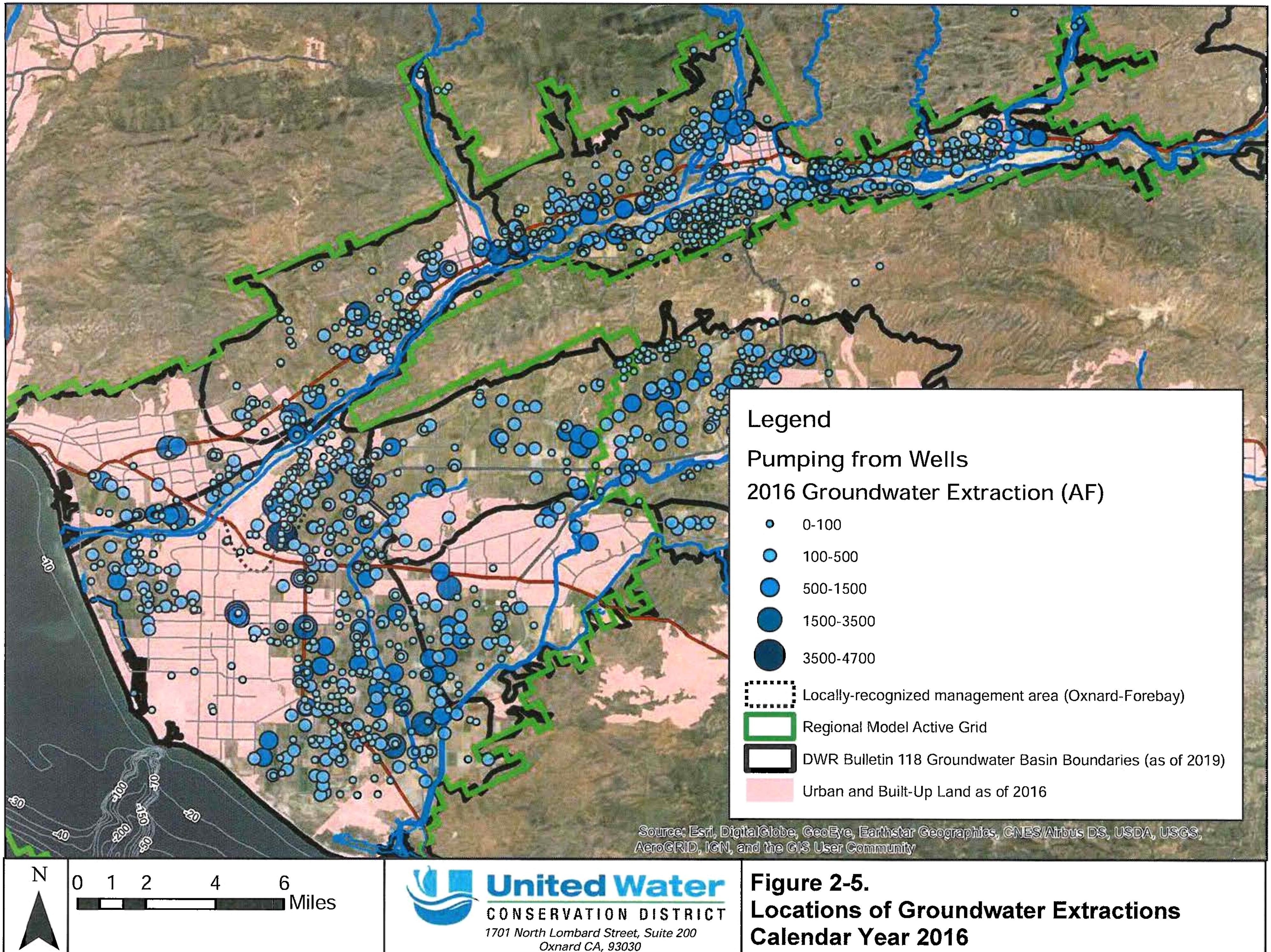

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Figure 2-5.
Locations of Groundwater Extractions Calendar Year 2016

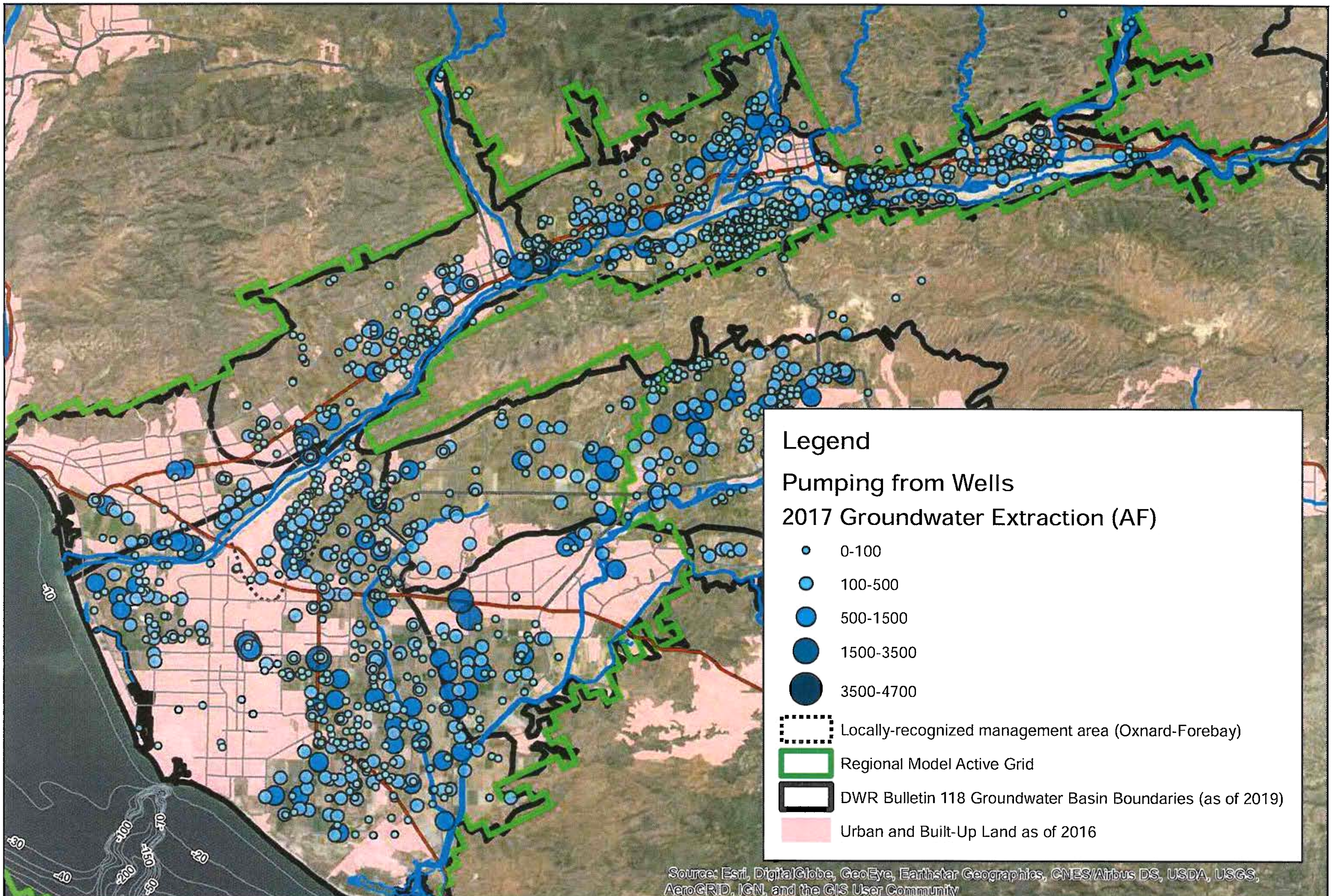

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Figure 2-6.
Locations of Groundwater Extractions Calendar Year 2017

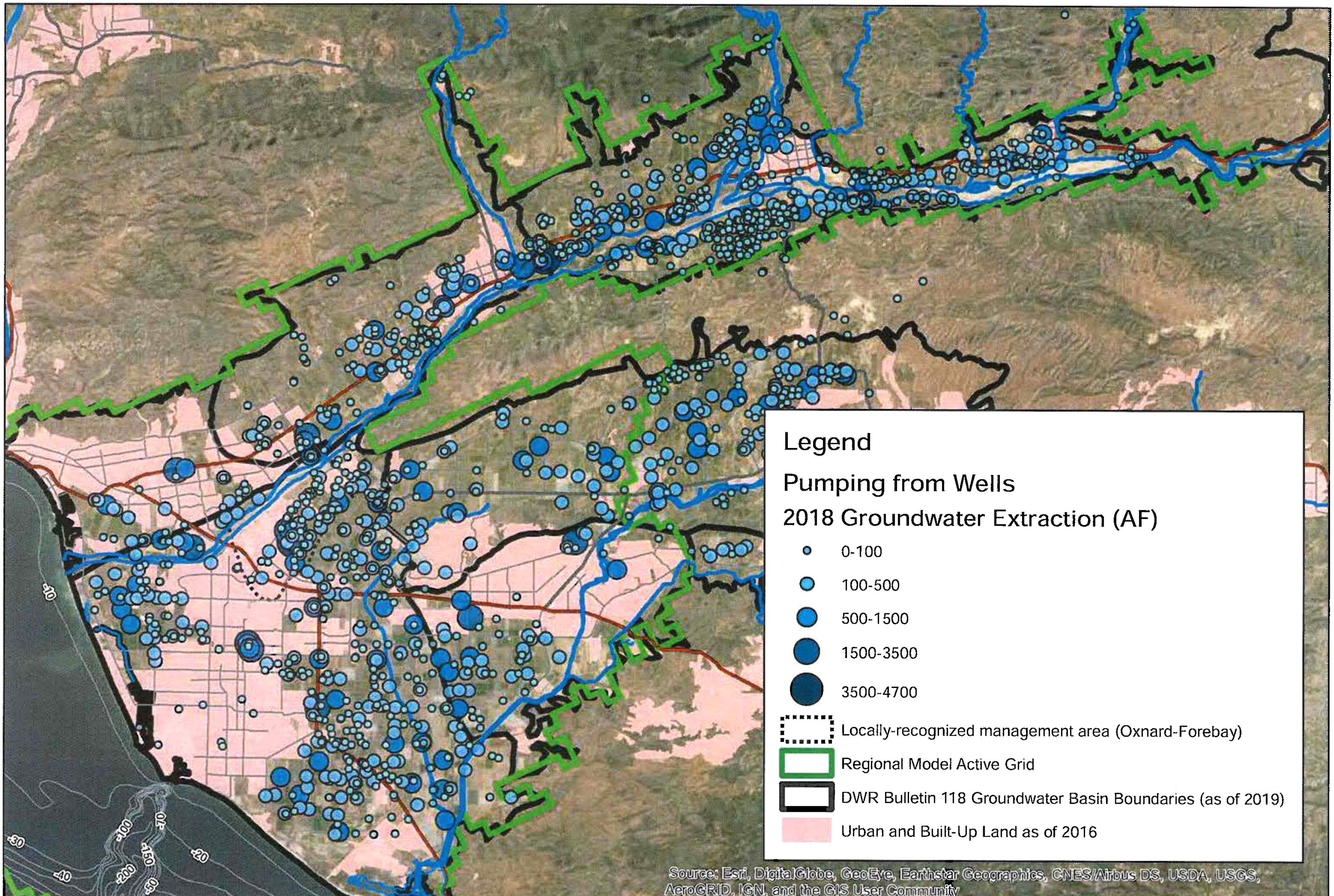

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Figure 2-7.
Locations of Groundwater Extractions Calendar Year 2018

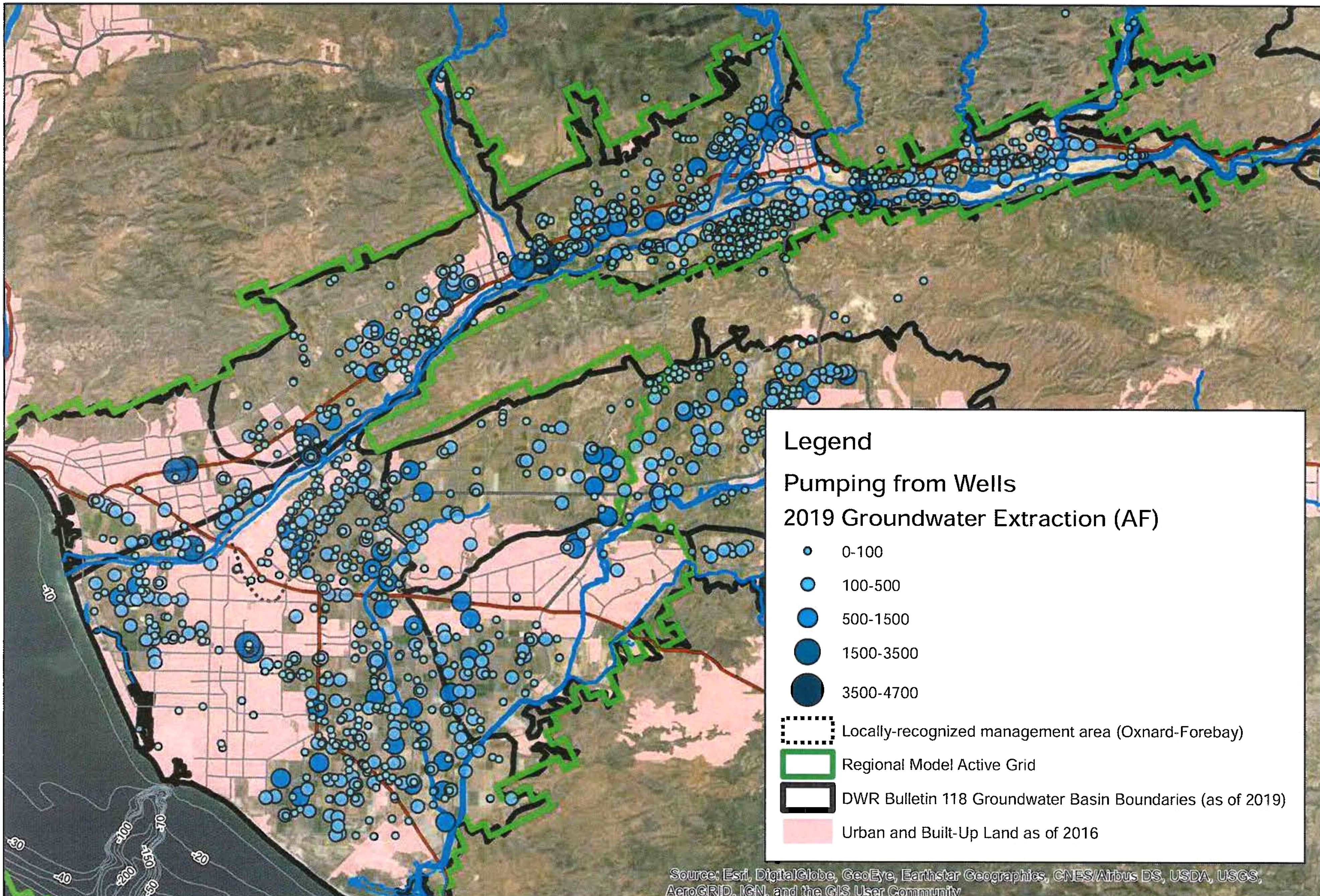

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Figure 2-8.
Locations of Groundwater Extractions Calendar Year 2019

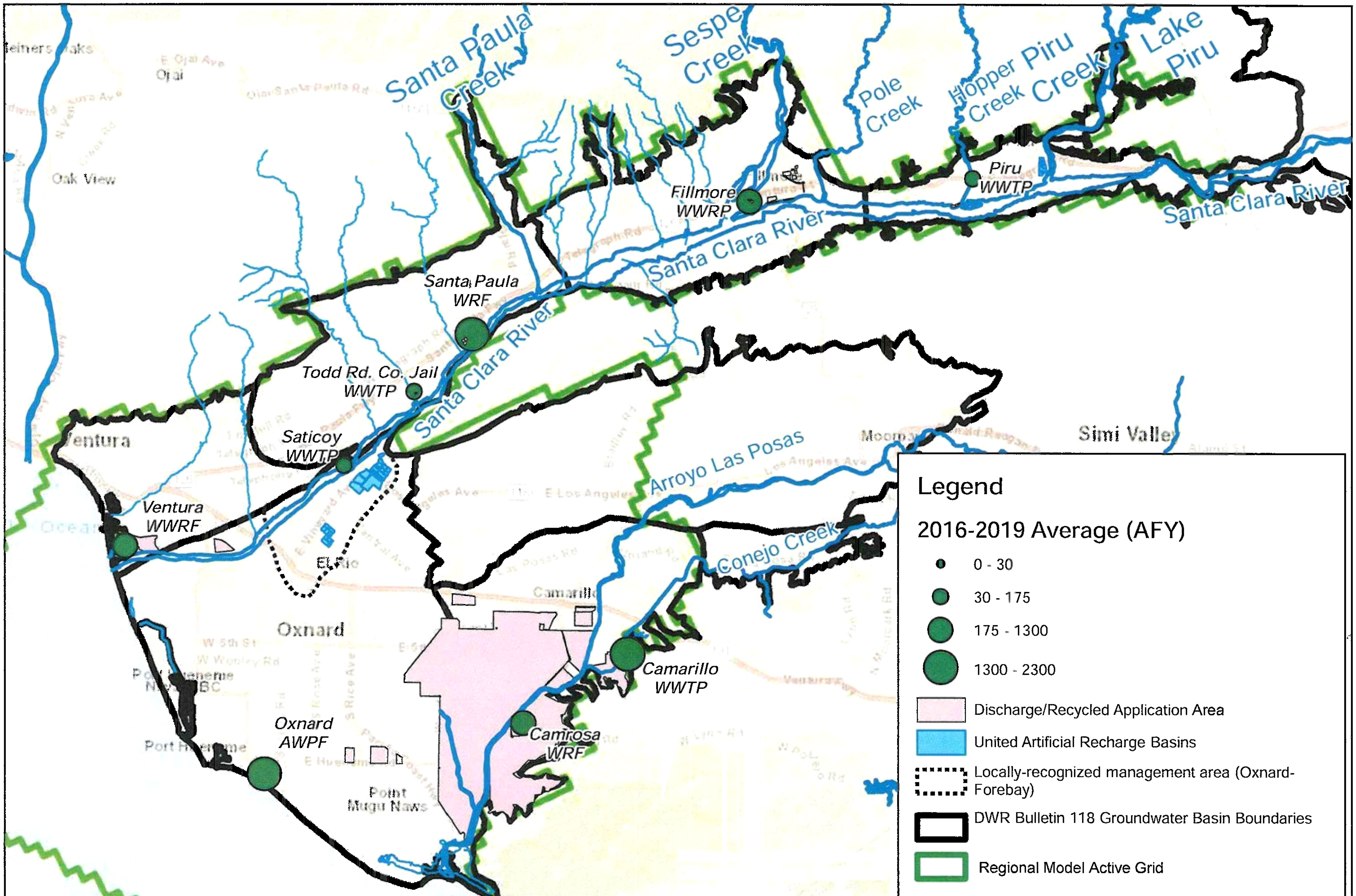

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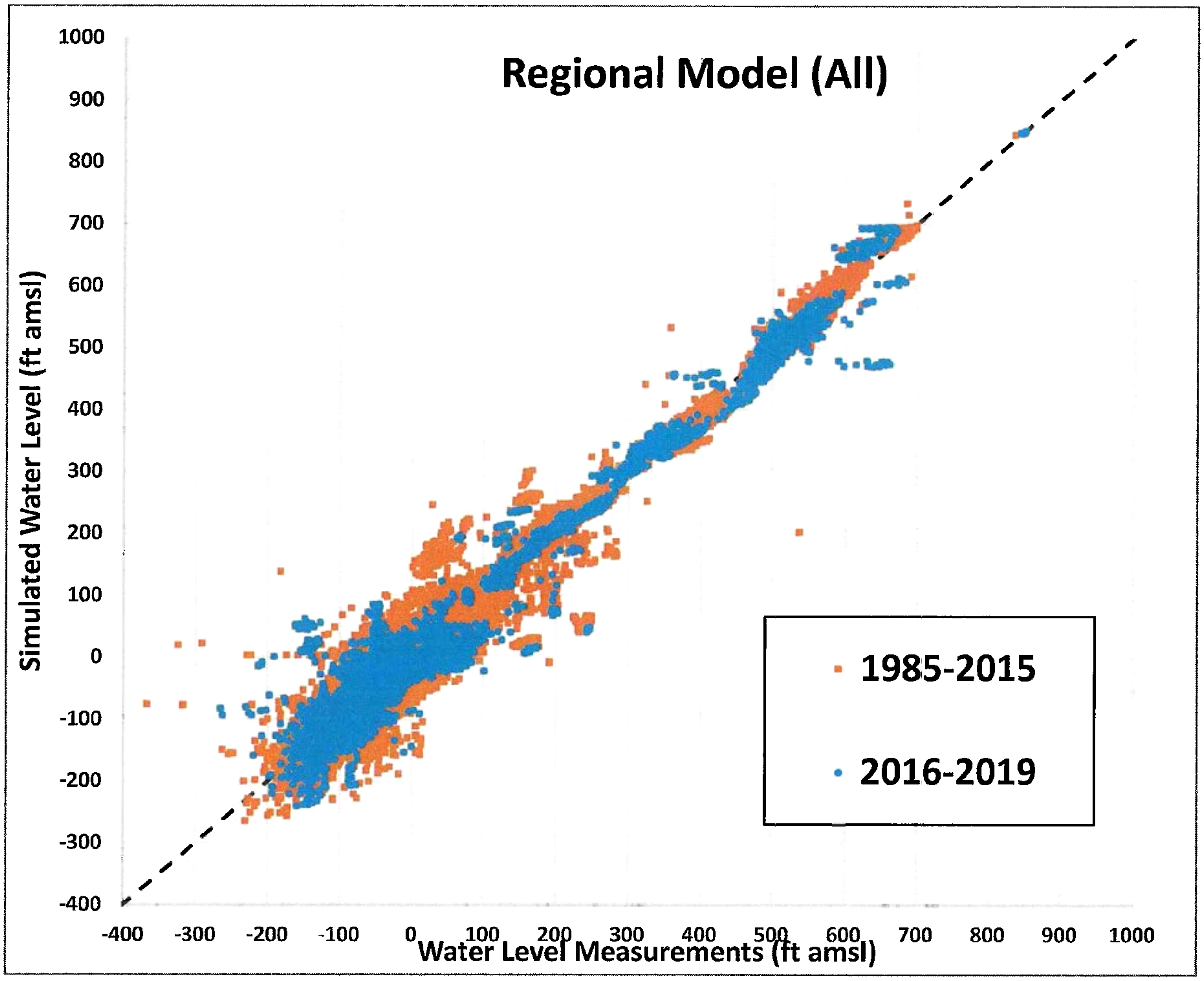
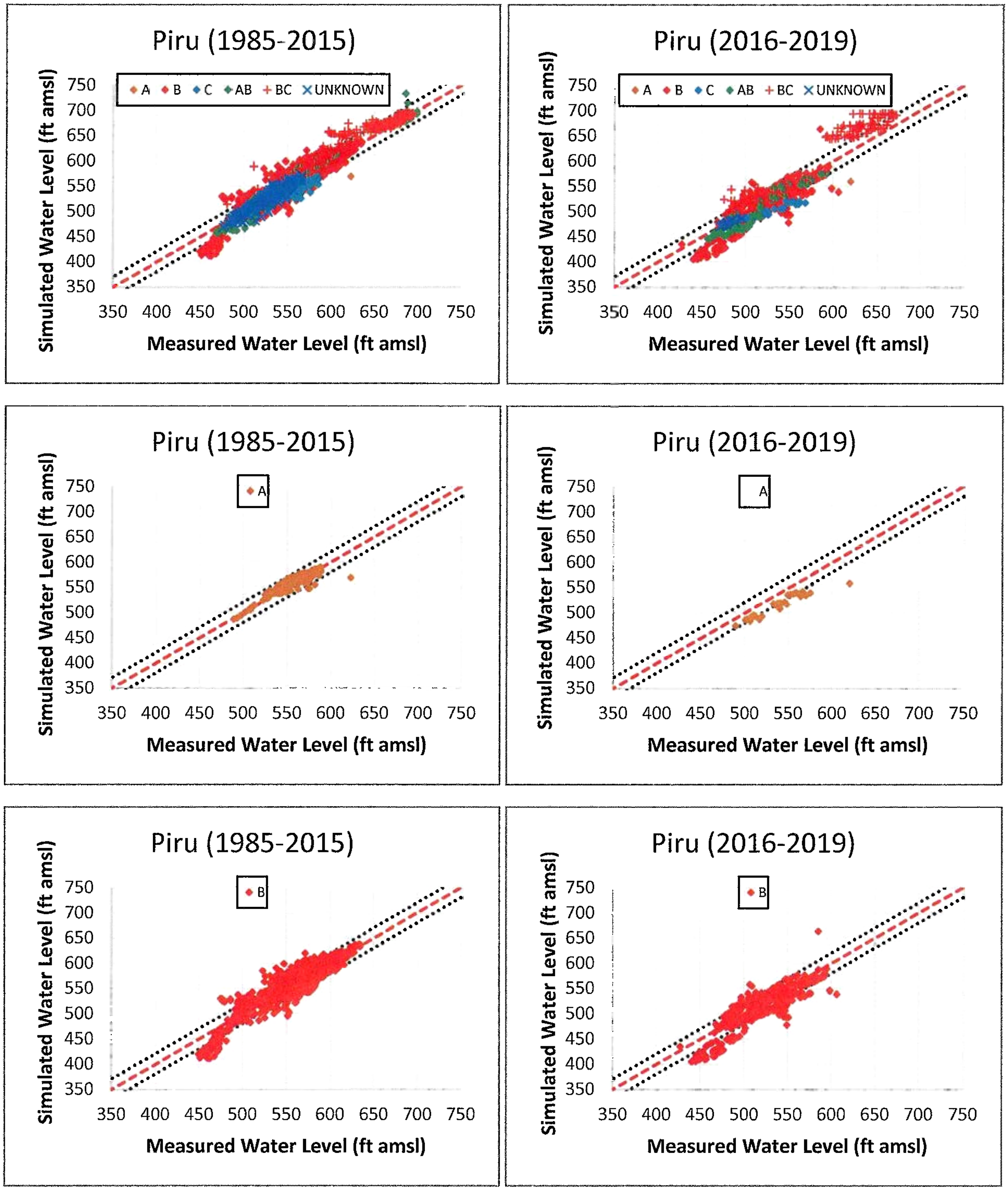
Figure 2-9.
Surface Water Features -- Wastewater/Recycled Application



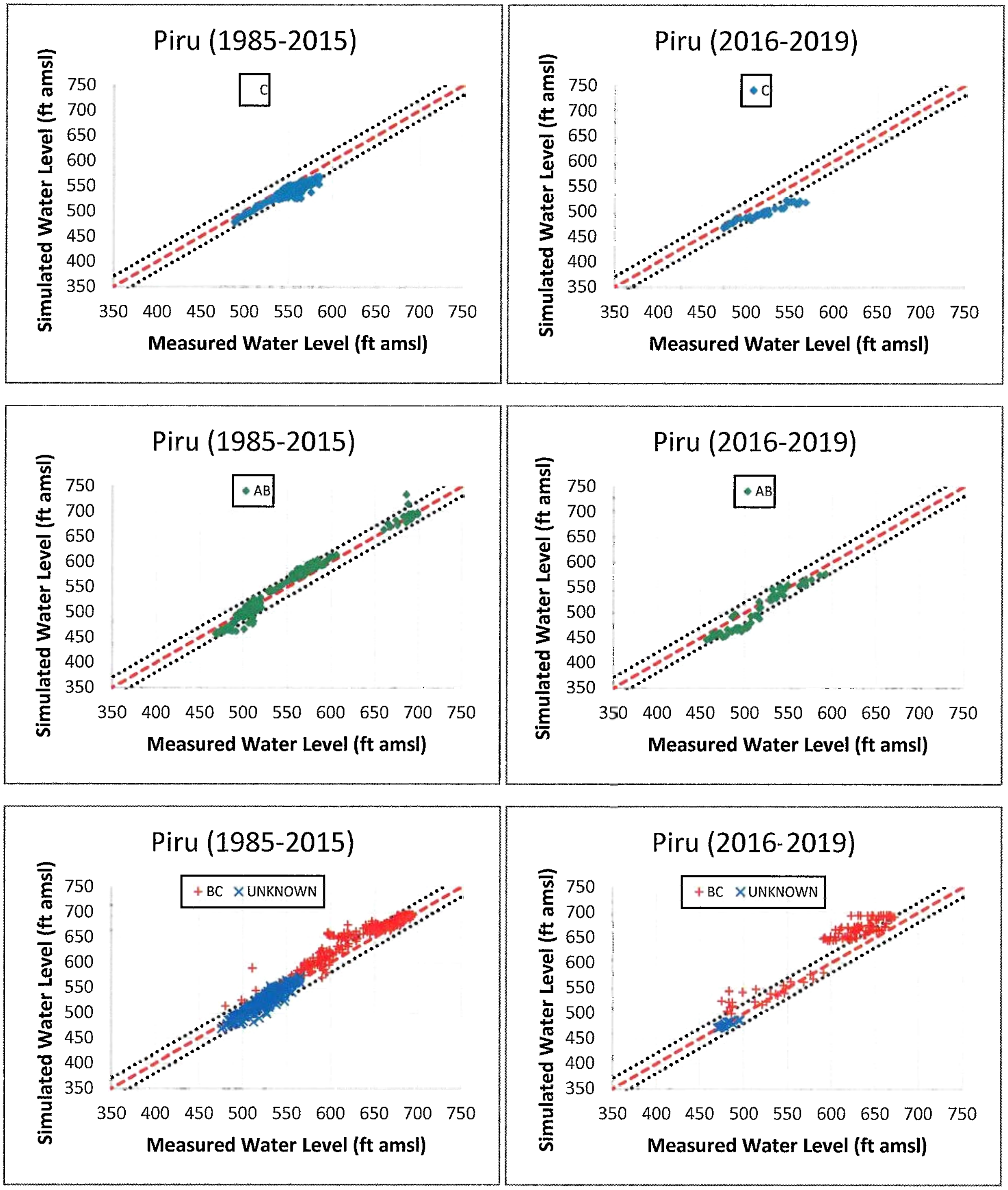
Note: Dashed black line represents a 1 1 relationship between measured and simulated groundwater elevations. Orange dots represent 1985-2015 Calibration Period. Blue dots represent 2016-2019 Update Period

Figure 3-1: Scatterplots of Simulated versus Measured Groundwater Elevations in the Regional Model Domain in both the 1985-2015 Calibration Period and the 2016-2019 Update Period.



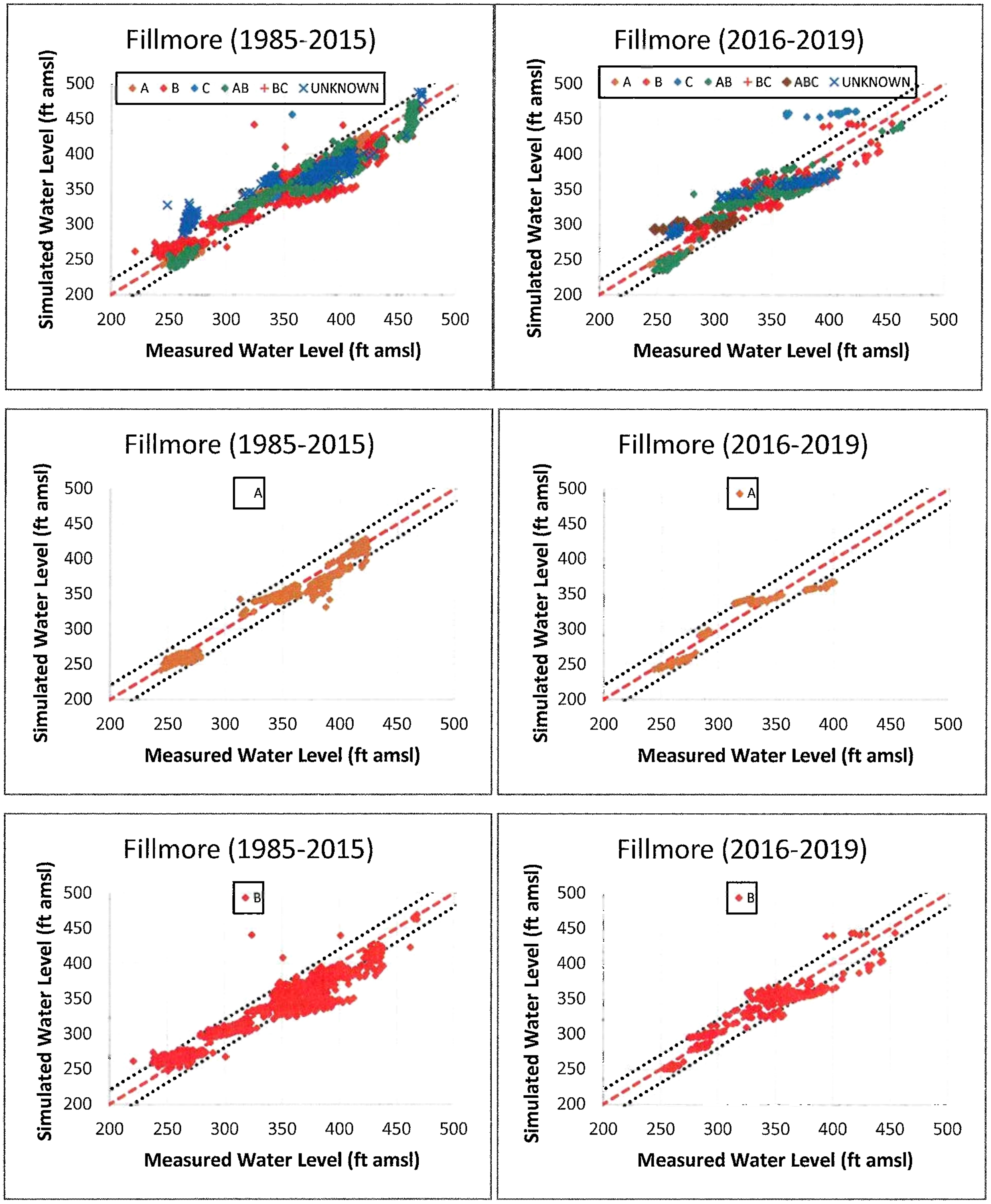
Note: Dashed red line in each graph represents a 1 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 1 (dashed red) line.

Figure 3-2a-: Scatterplots of Simulated versus Measured Groundwater Elevations in the Piru Basin



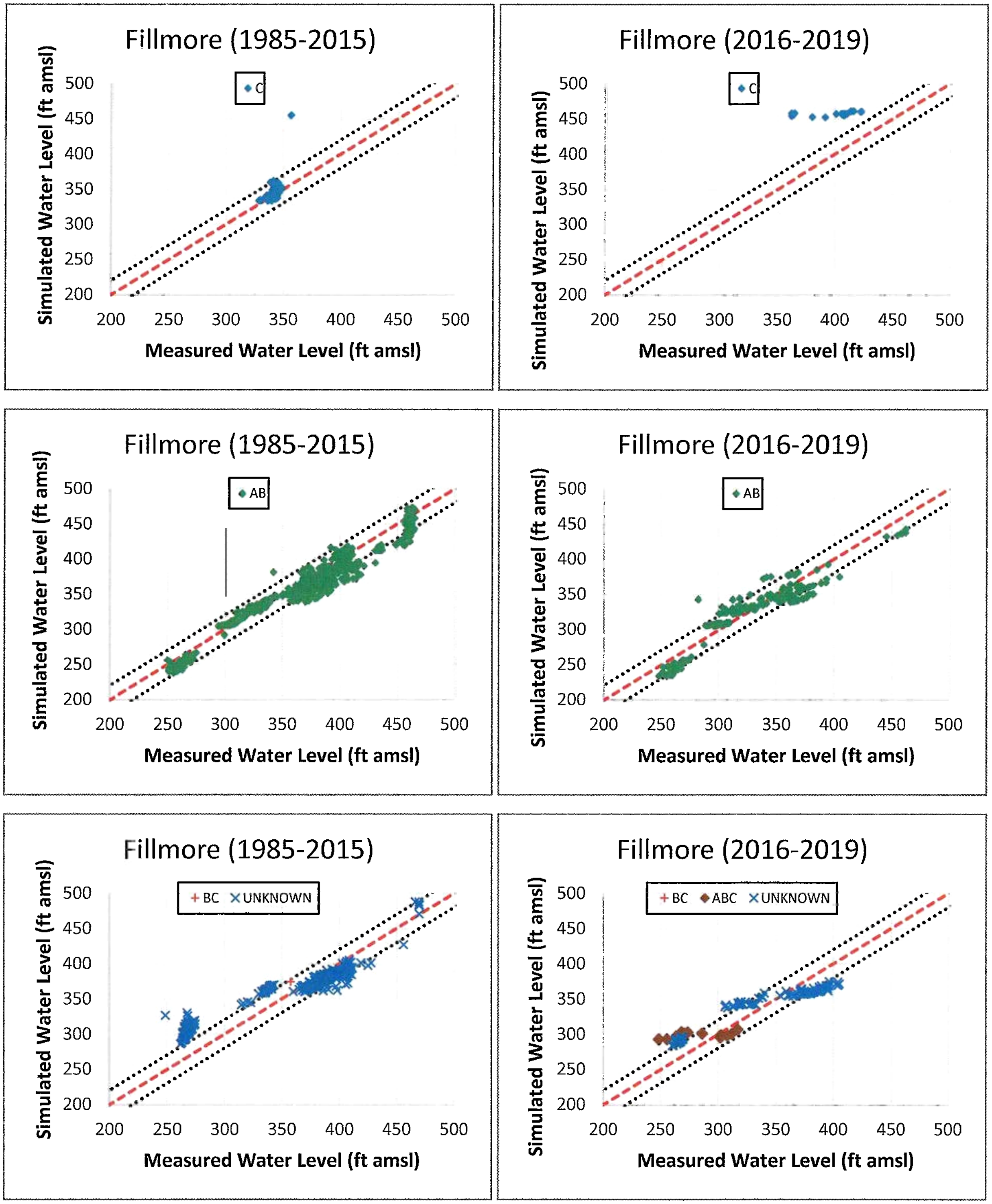
Note: Dashed red line in each graph represents a 1:1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1:1 (dashed red) line

Figure 3-2b-: Scatterplots of Simulated versus Measured Groundwater Elevations in the Piru Basin



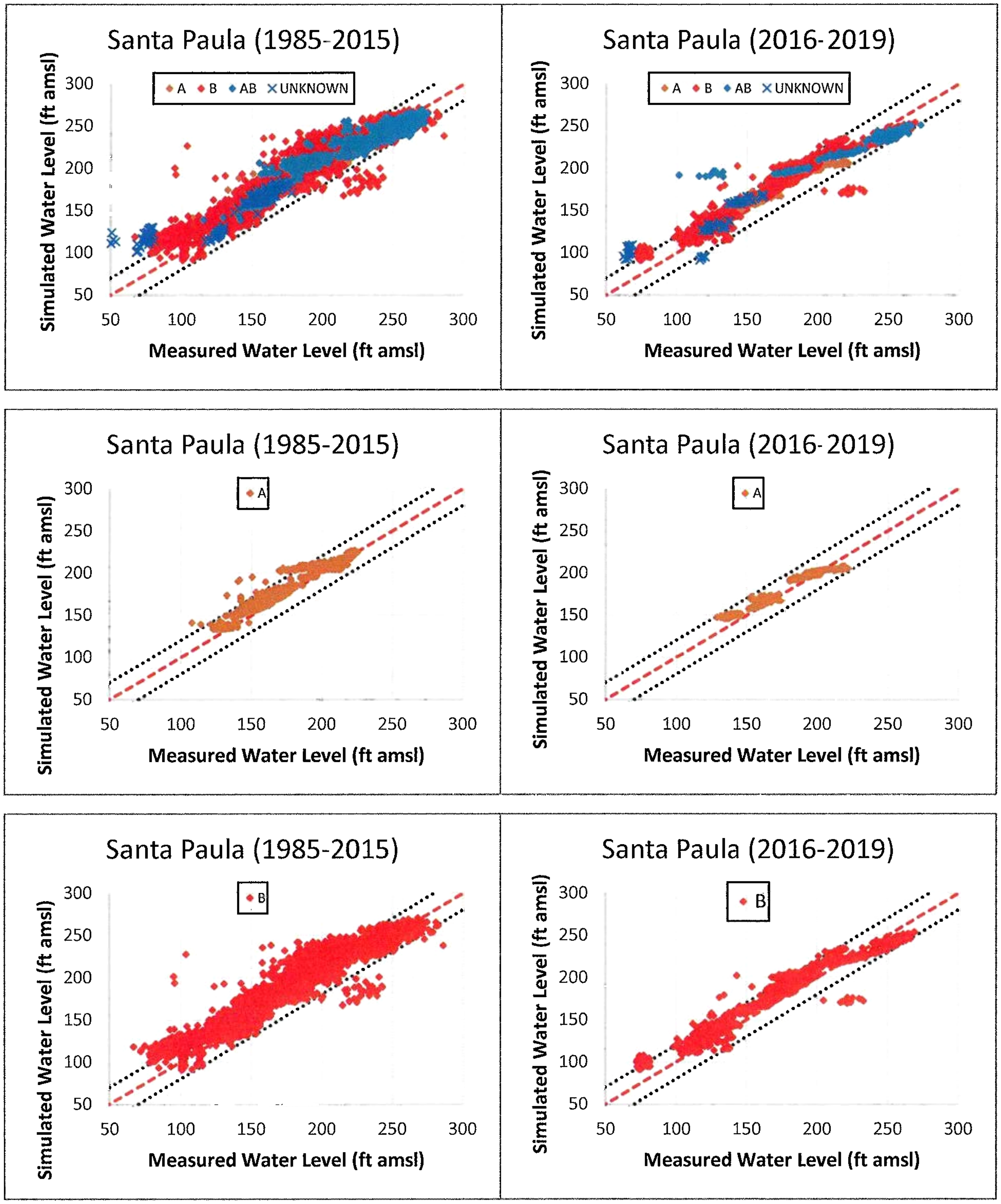
Note: Dashed red line in each graph represents a 1 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 1 (dashed red) line.

Figure 3-3a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Fillmore Basin



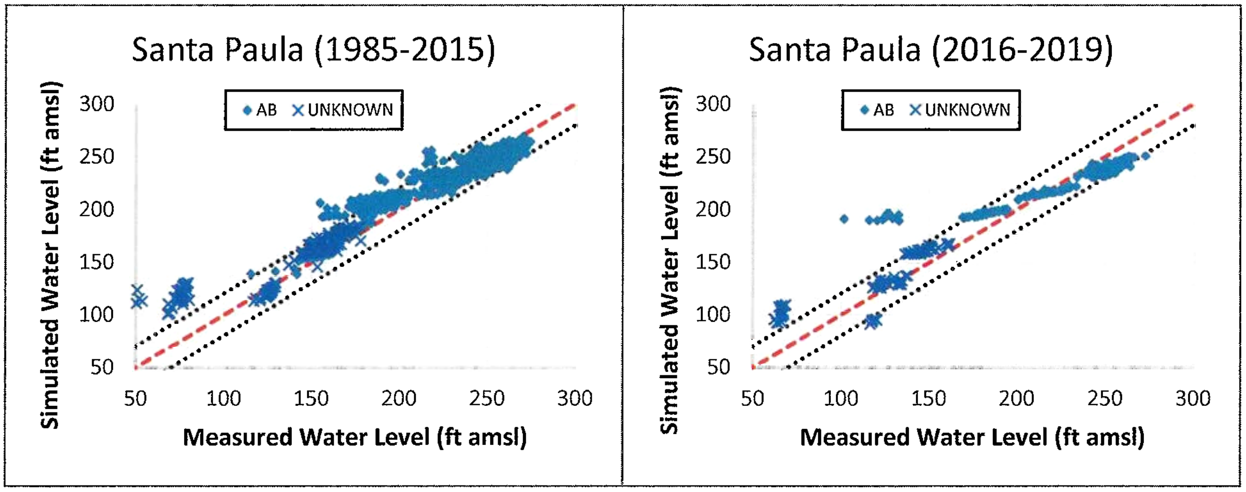
Note: Dashed red line in each graph represents a 1 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 1 (dashed red) line.

Figure 3-3b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Fillmore Basin



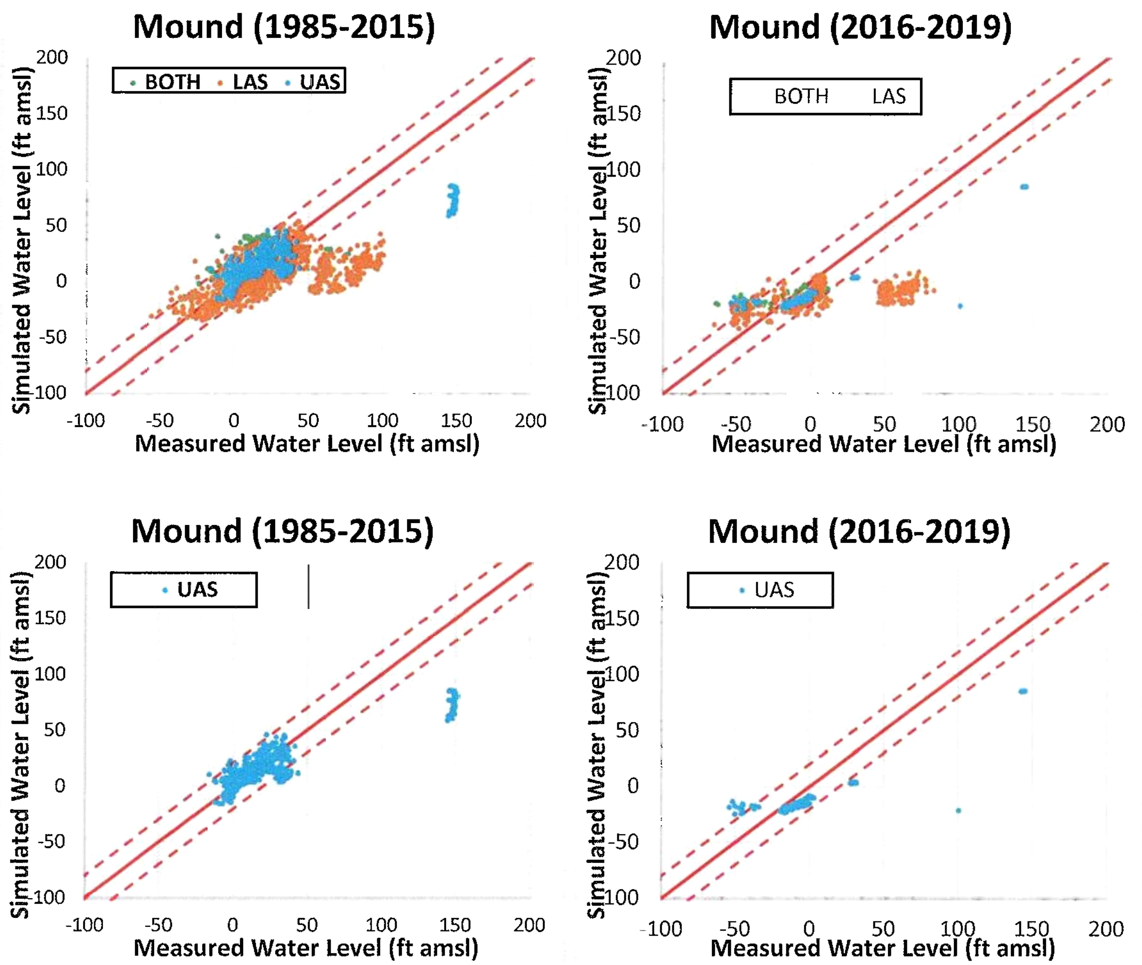
Note: Dashed red line in each graph represents a 1 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 1 (dashed red) line.

Figure 3-4a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Santa Paula Basin



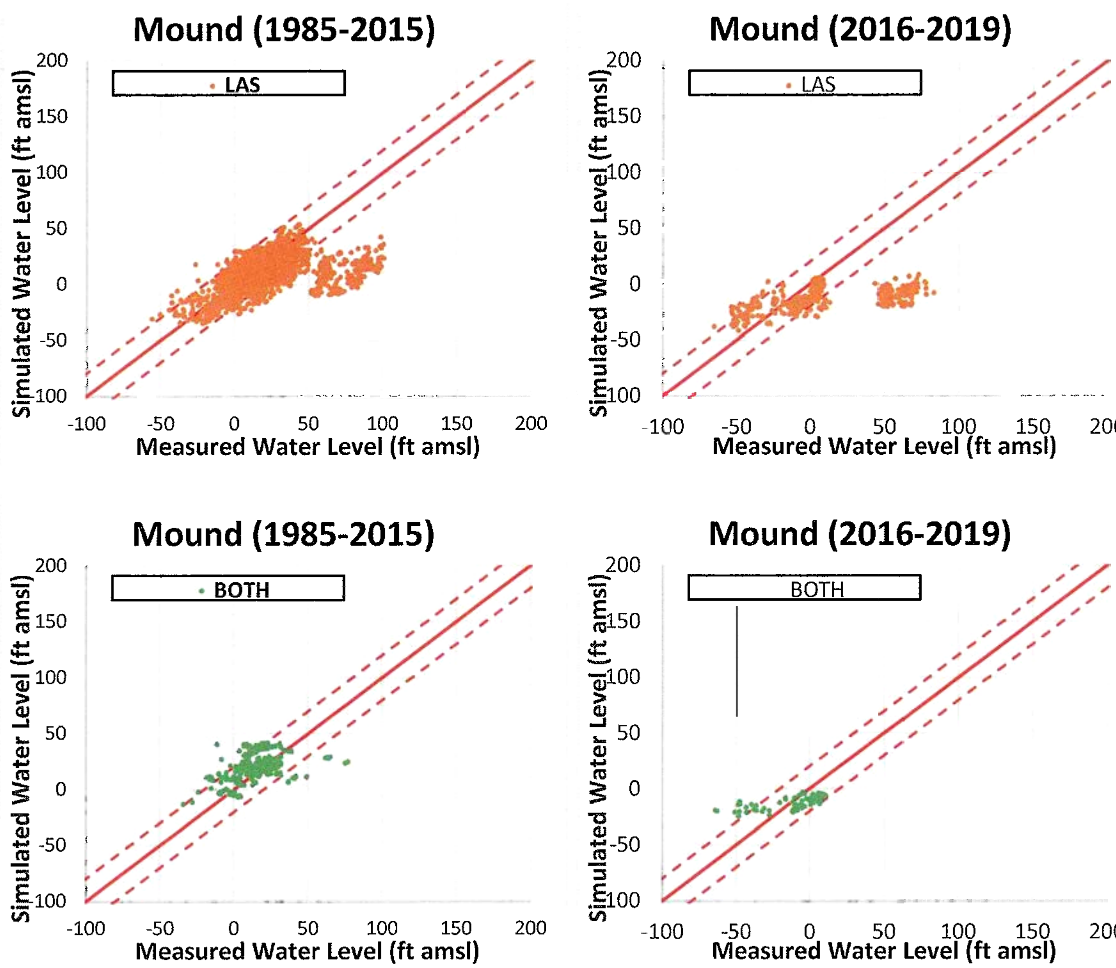
Note: Dashed red line in each graph represents a 1 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 1 (dashed red) line.

Figure 3-4b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Santa Paula Basin



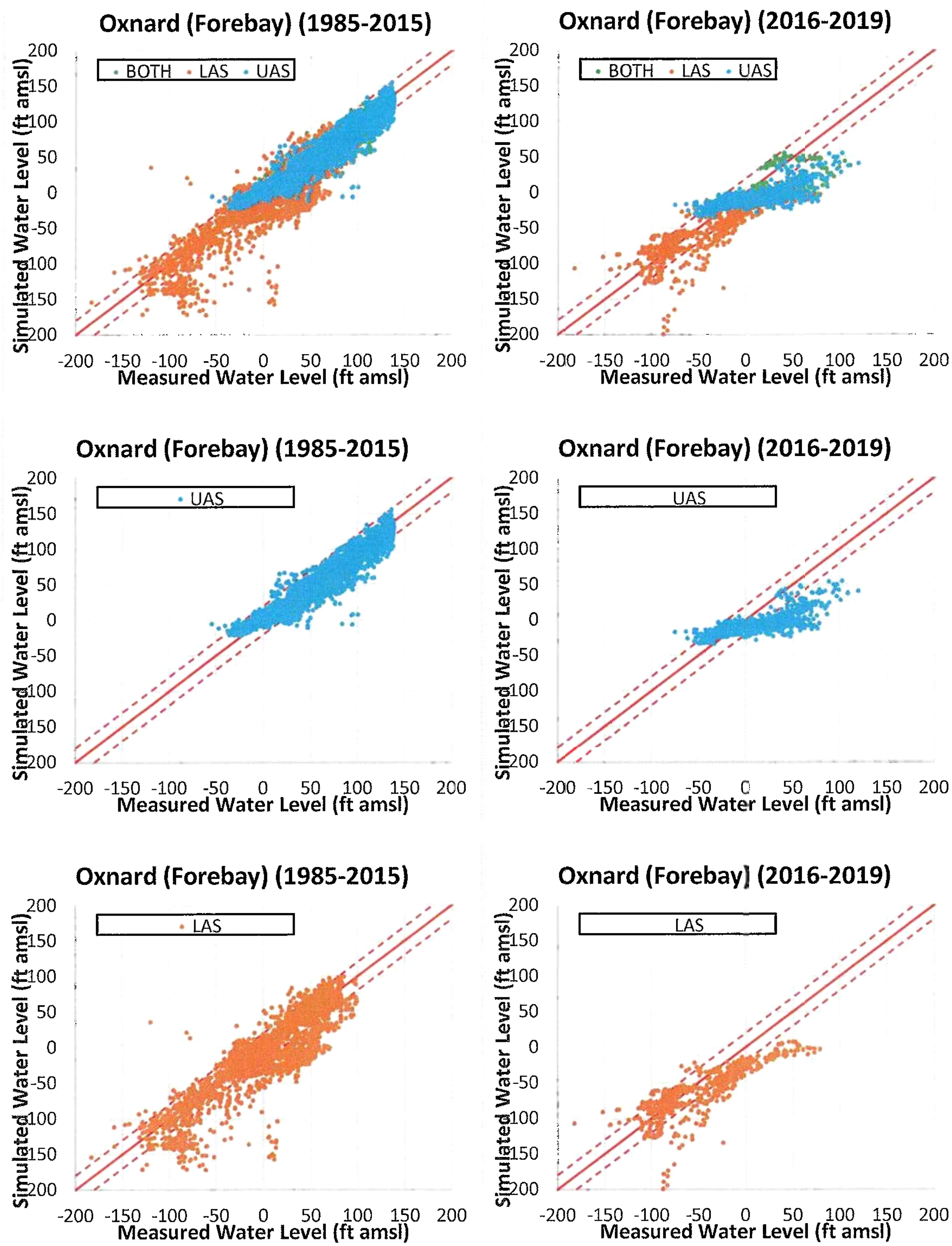
Note. Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 1 (solid) line.

Figure 3-5a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Mound Basin



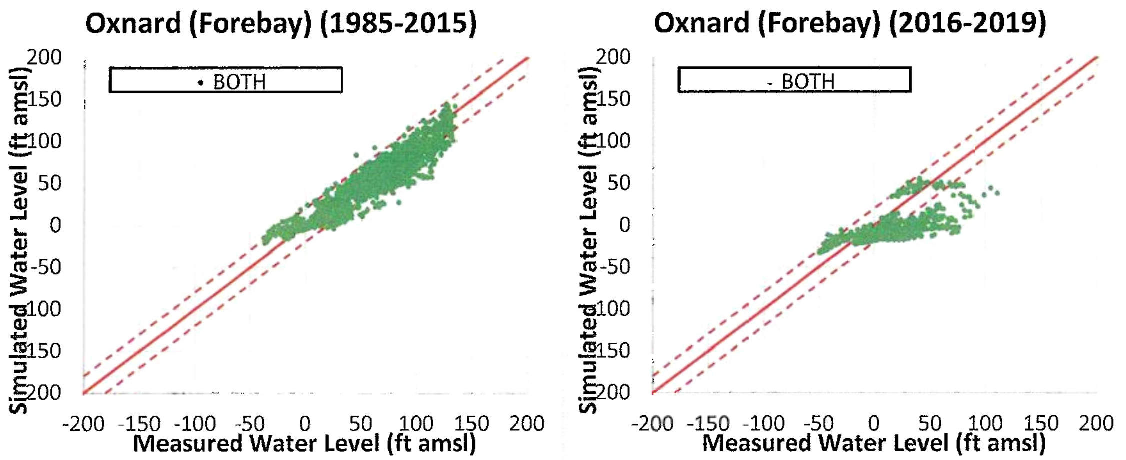
Note: Solid red line in each graph represents a 1 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 1 (solid) line.

Figure 3-5b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Mound Basin



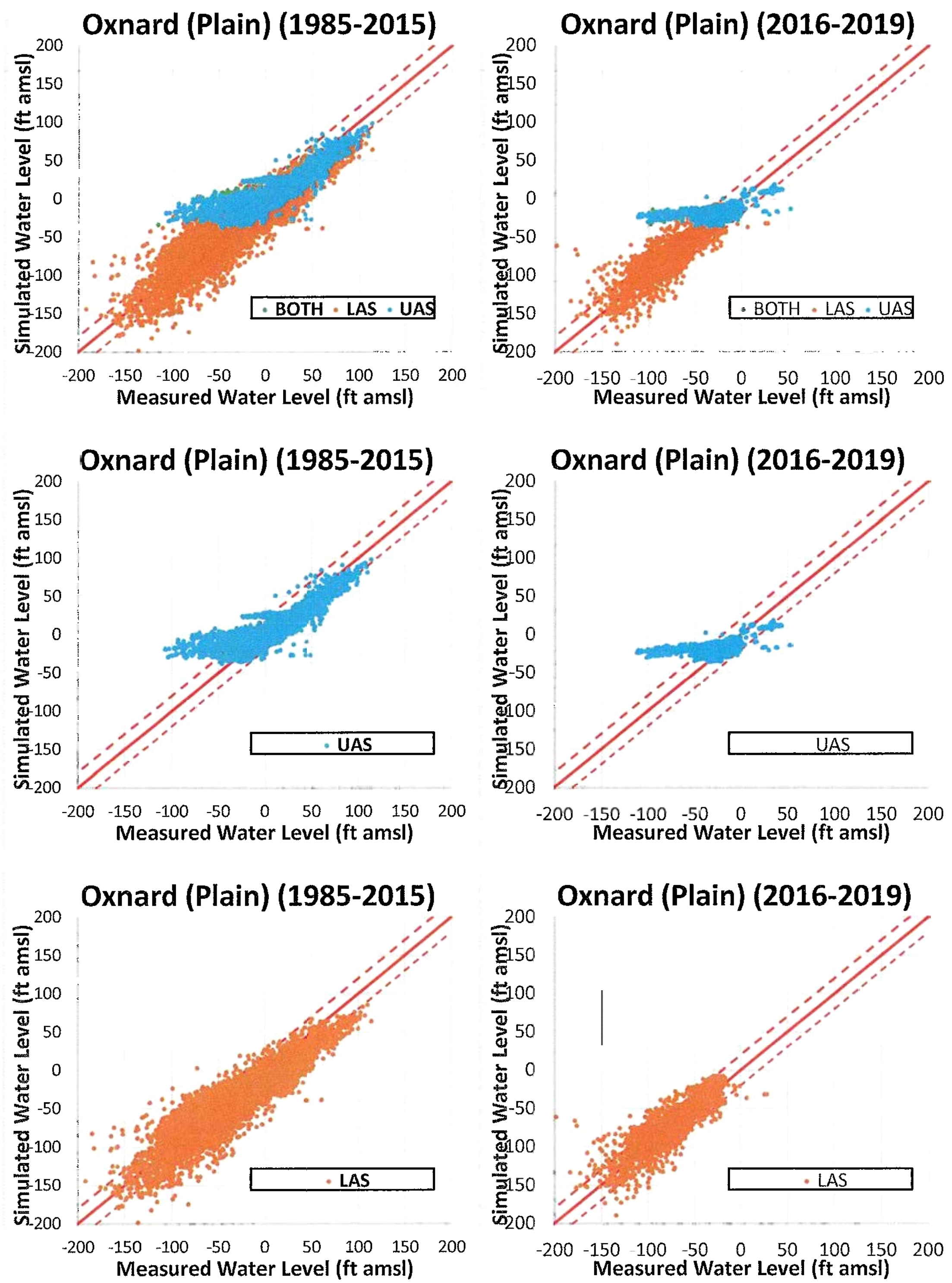
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 1 (solid) line

Figure 3-6a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Oxnard (Forebay) Basin



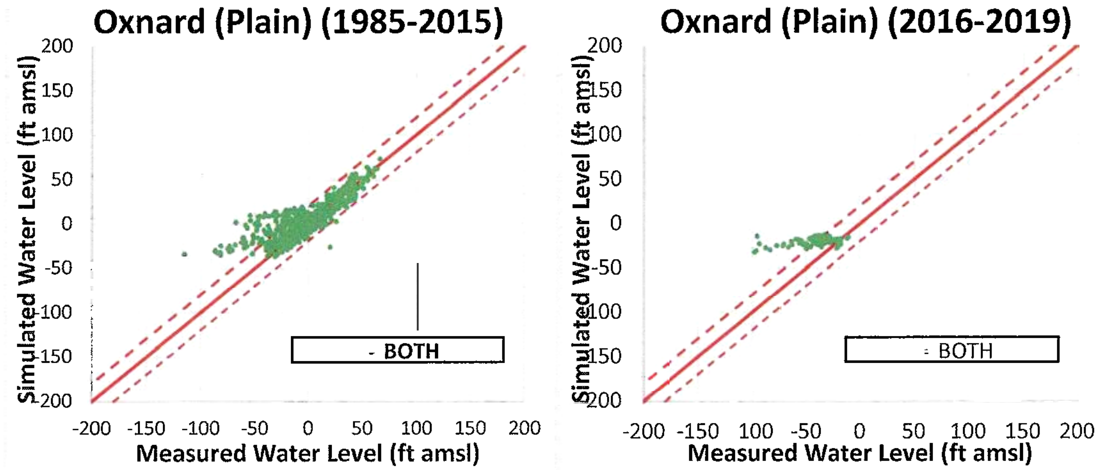
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

Figure 3-6b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Oxnard (Forebay) Basin



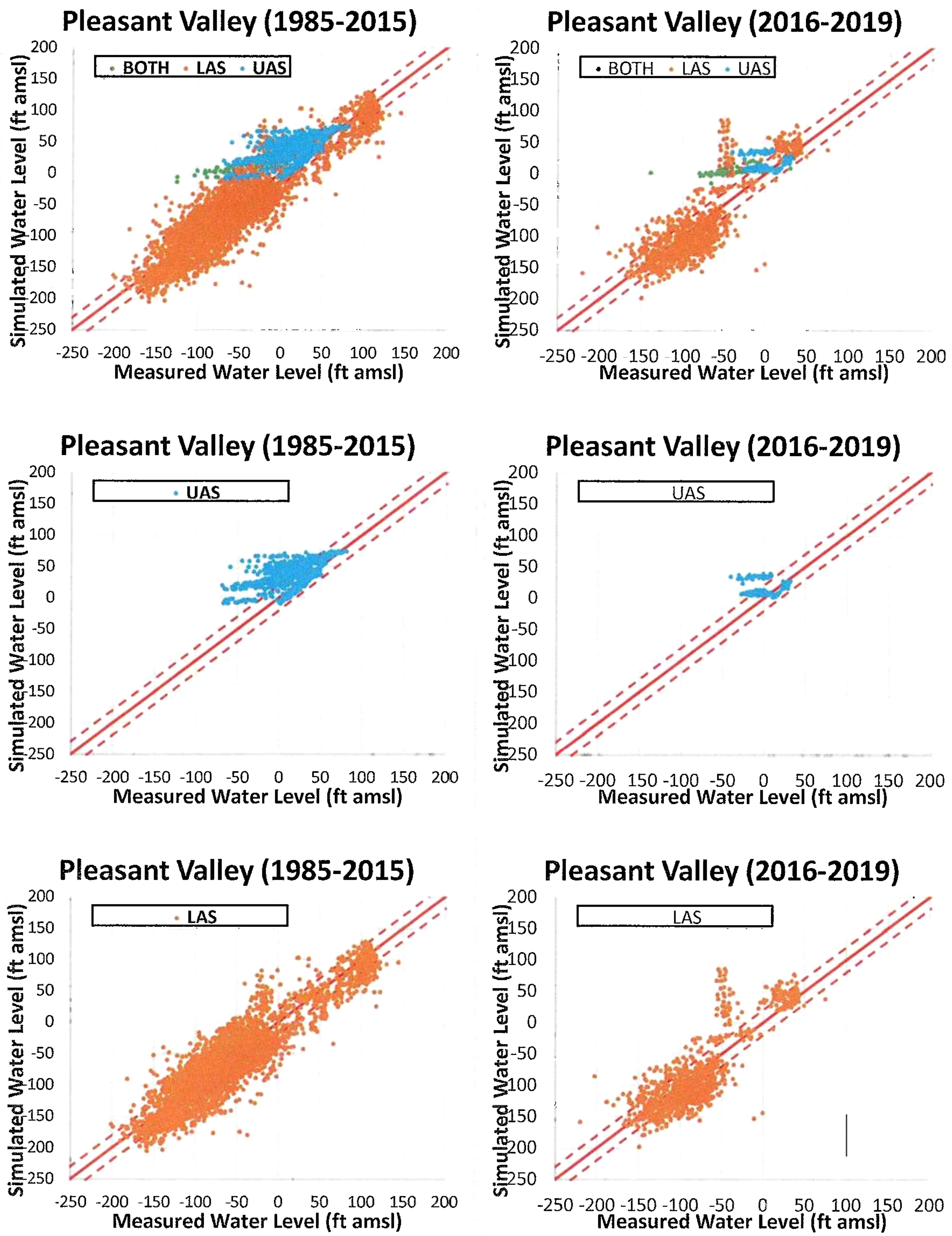
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 1 (solid) line

Figure 3-7a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Oxnard Basin (area not including Forebay)



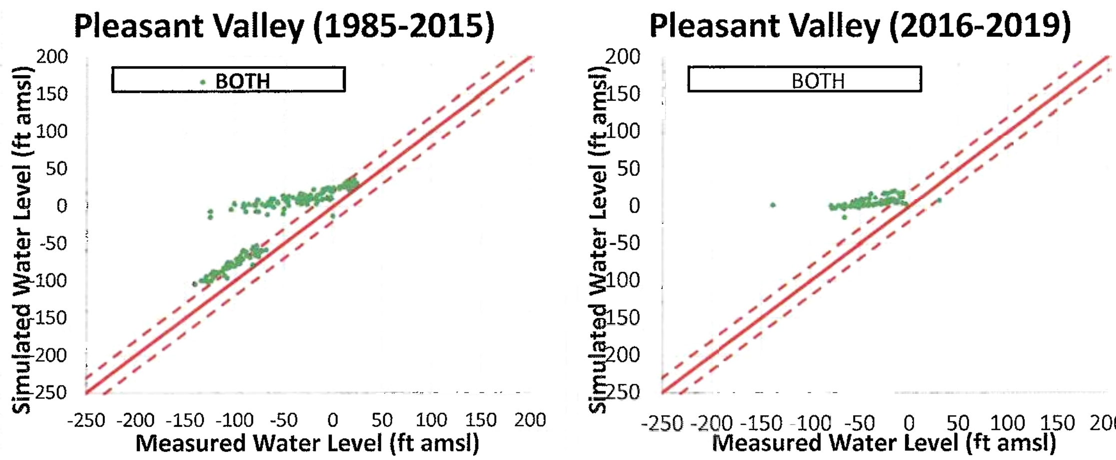
Note: Solid red line in each graph represents a 1 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 . 1 (solid) line.

Figure 3-7b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Oxnard Basin (area not including Forebay)



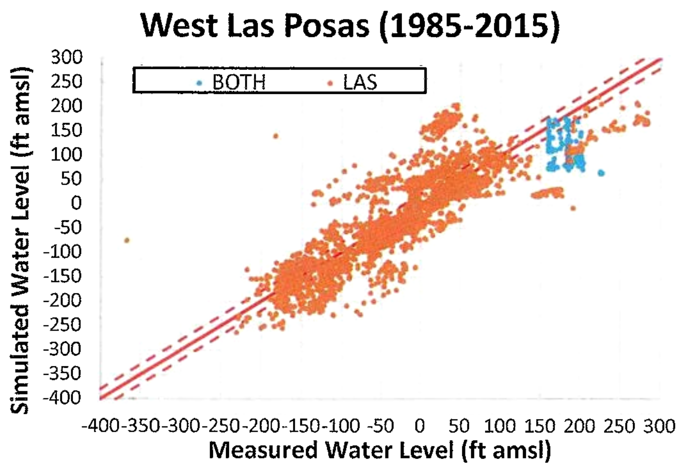
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

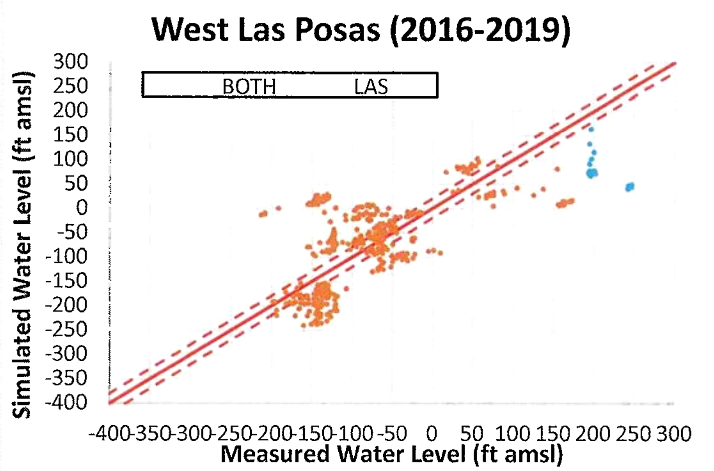
Figure 3-8a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Pleasant Valley Basin



Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

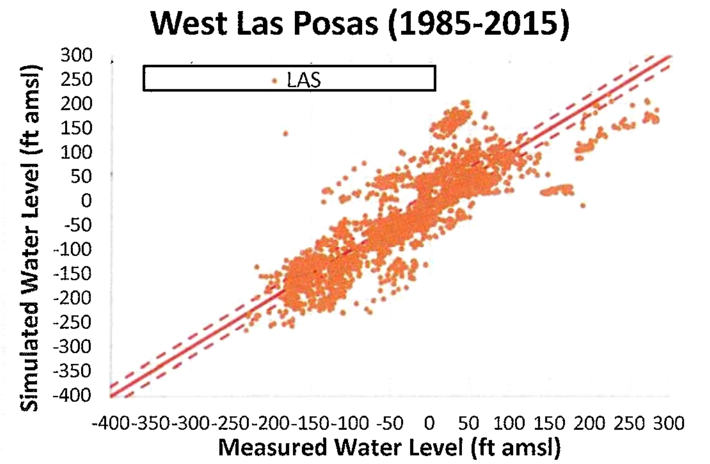
Figure 3-8b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Pleasant Valley Basin

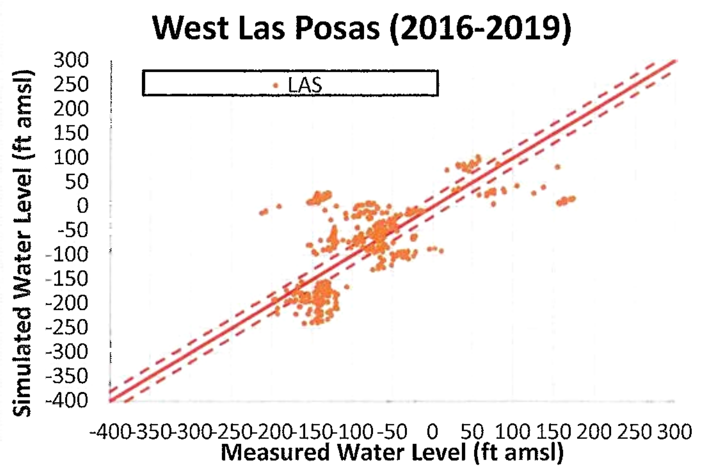




Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 1 (solid) line.

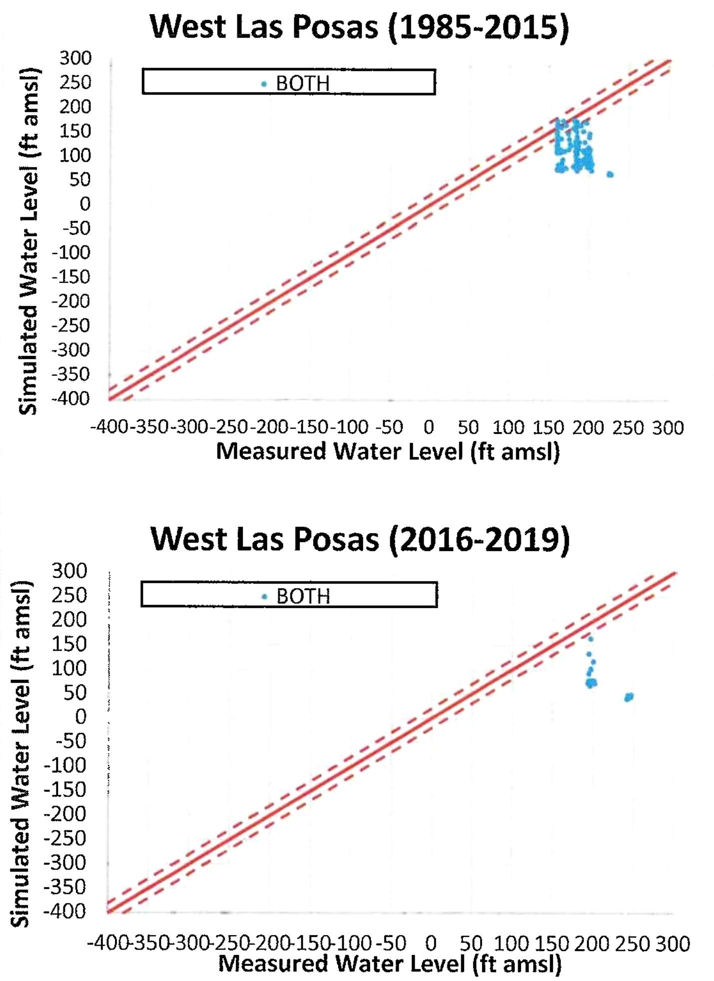
Figure 3-9a: Scatterplots of Simulated versus Measured Groundwater Elevations in the West Las Posas Valley Basin





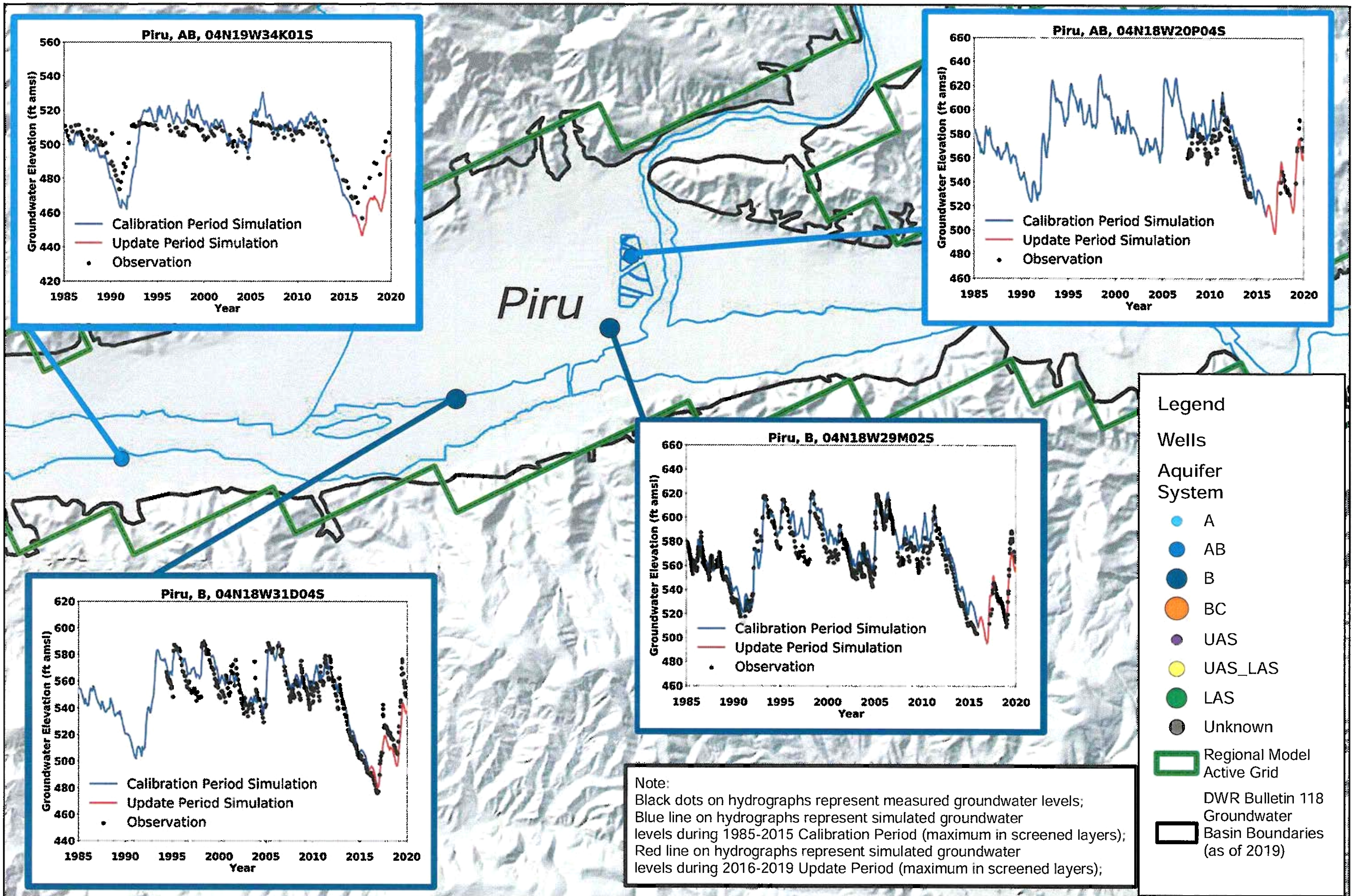
Note: Solid red line in each graph represents a 1 · 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 . 1 (solid) line

Figure 3-9b: Scatterplots of Simulated versus Measured Groundwater Elevations in the West Las Posas Valley Basin



Note: Solid red line in each graph represents a 1 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 1 (solid) line.

Figure 3-9c: Scatterplots of Simulated versus Measured Groundwater Elevations in the West Las Posas Valley Basin



Note:
Black dots on hydrographs represent measured groundwater levels;
Blue line on hydrographs represent simulated groundwater levels during 1985-2015 Calibration Period (maximum in screened layers);
Red line on hydrographs represent simulated groundwater levels during 2016-2019 Update Period (maximum in screened layers);

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Figure 3-10.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Piru Basin

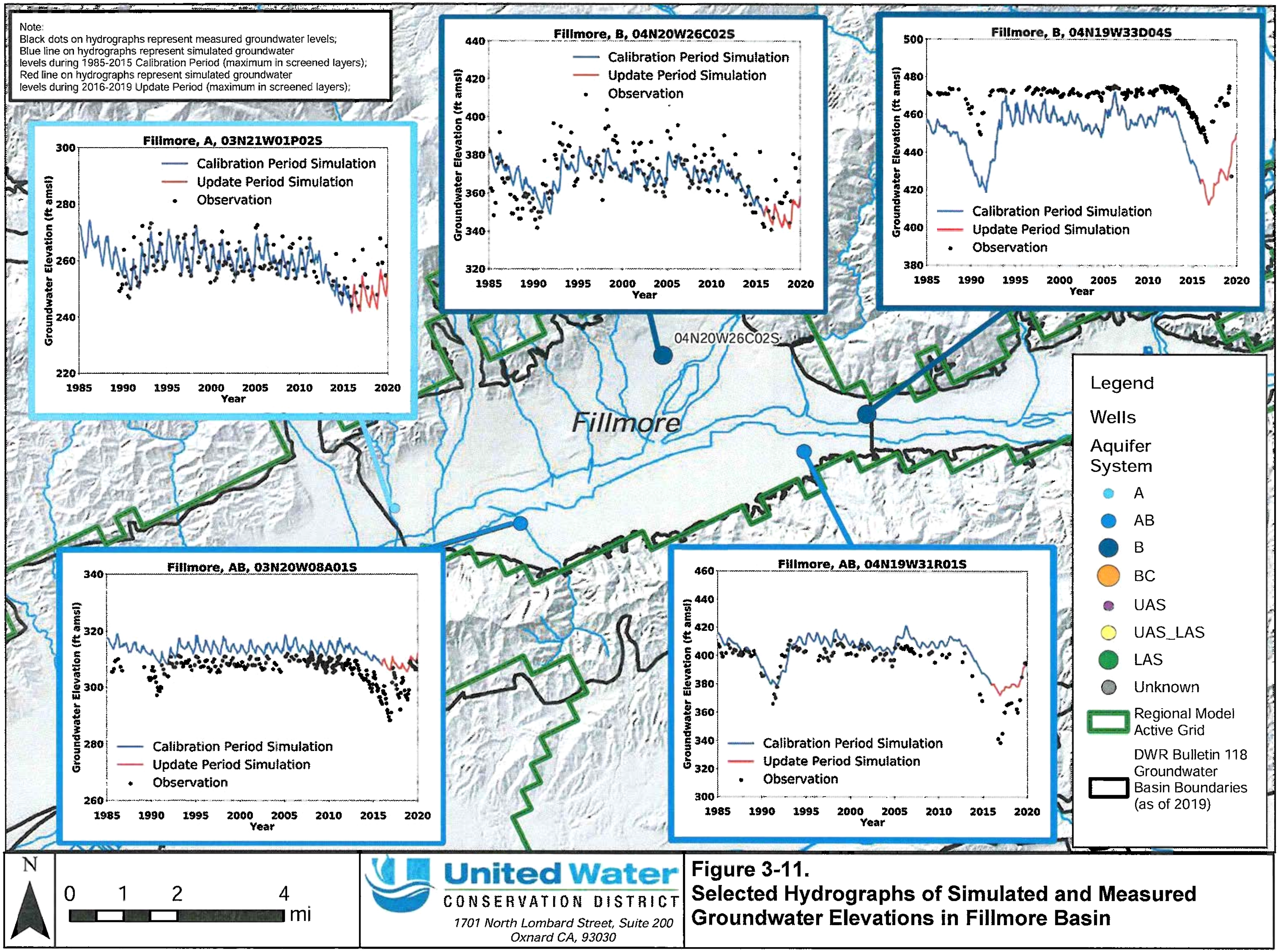

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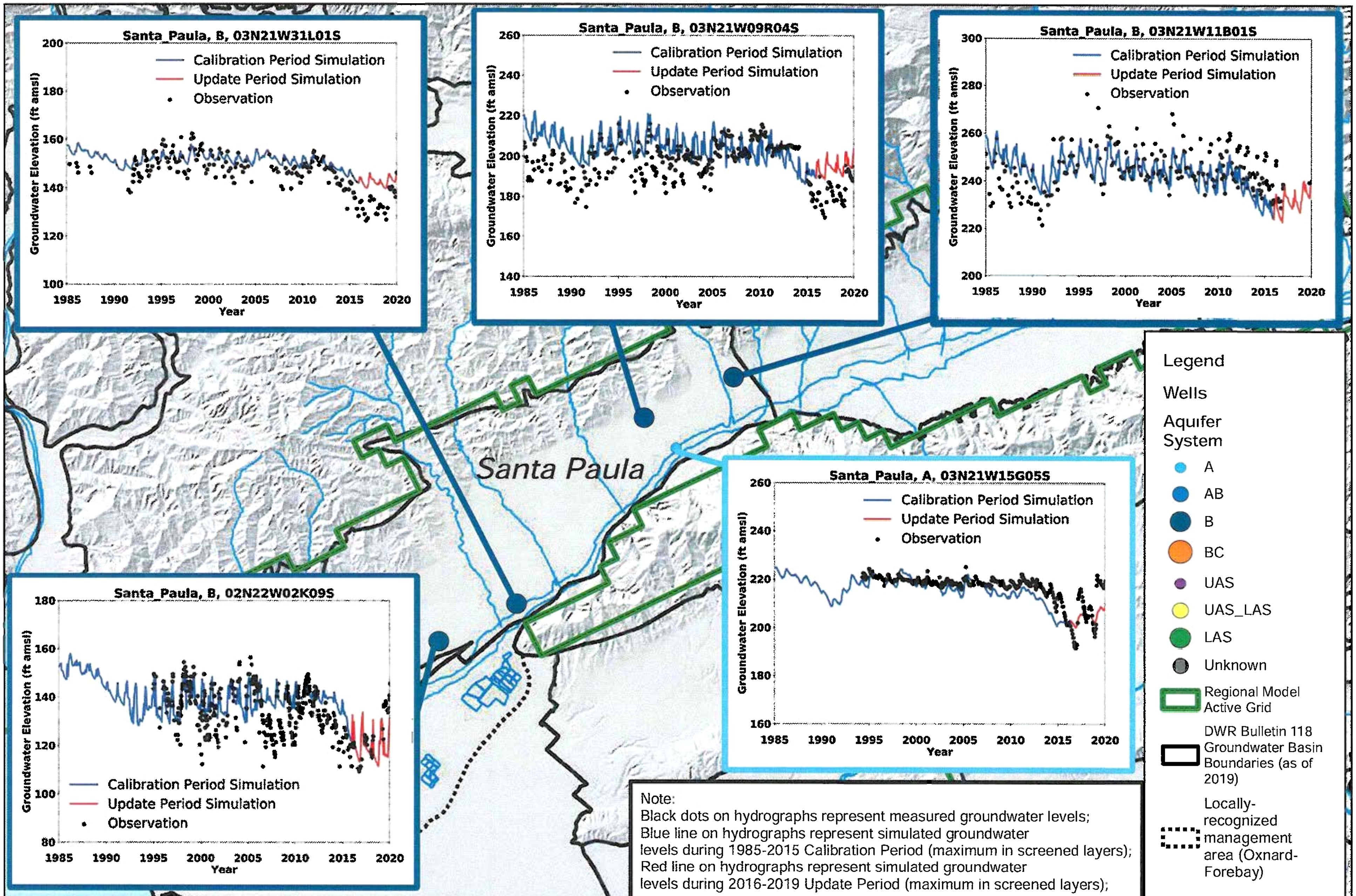
Figure 3-11.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Fillmore Basin



Note:
Black dots on hydrographs represent measured groundwater levels;
Blue line on hydrographs represent simulated groundwater levels during 1985-2015 Calibration Period (maximum in screened layers);
Red line on hydrographs represent simulated groundwater levels during 2016-2019 Update Period (maximum in screened layers);

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Figure 3-12.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Santa Paula Basin

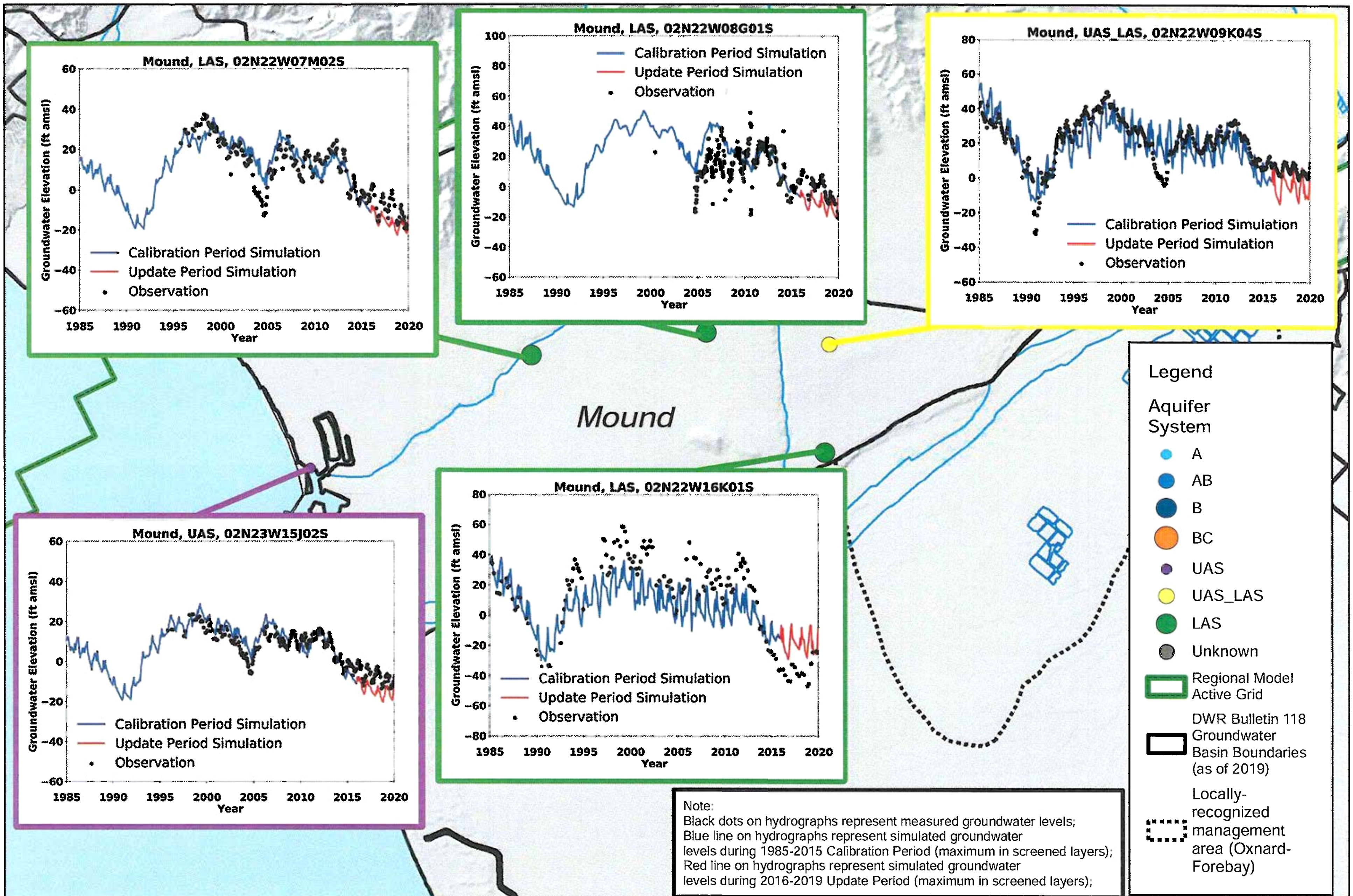

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Figure 3-13.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Mound Basin

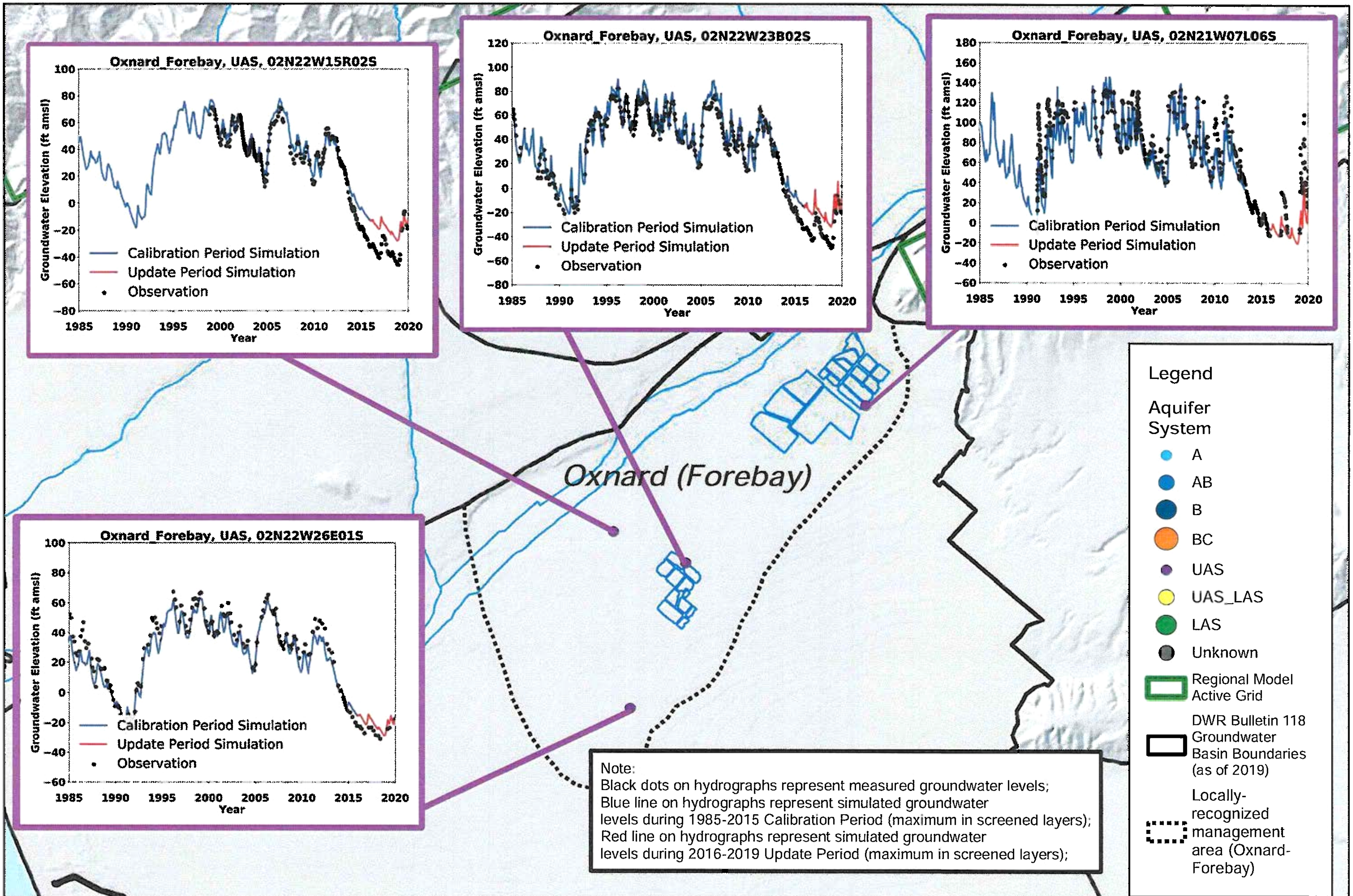

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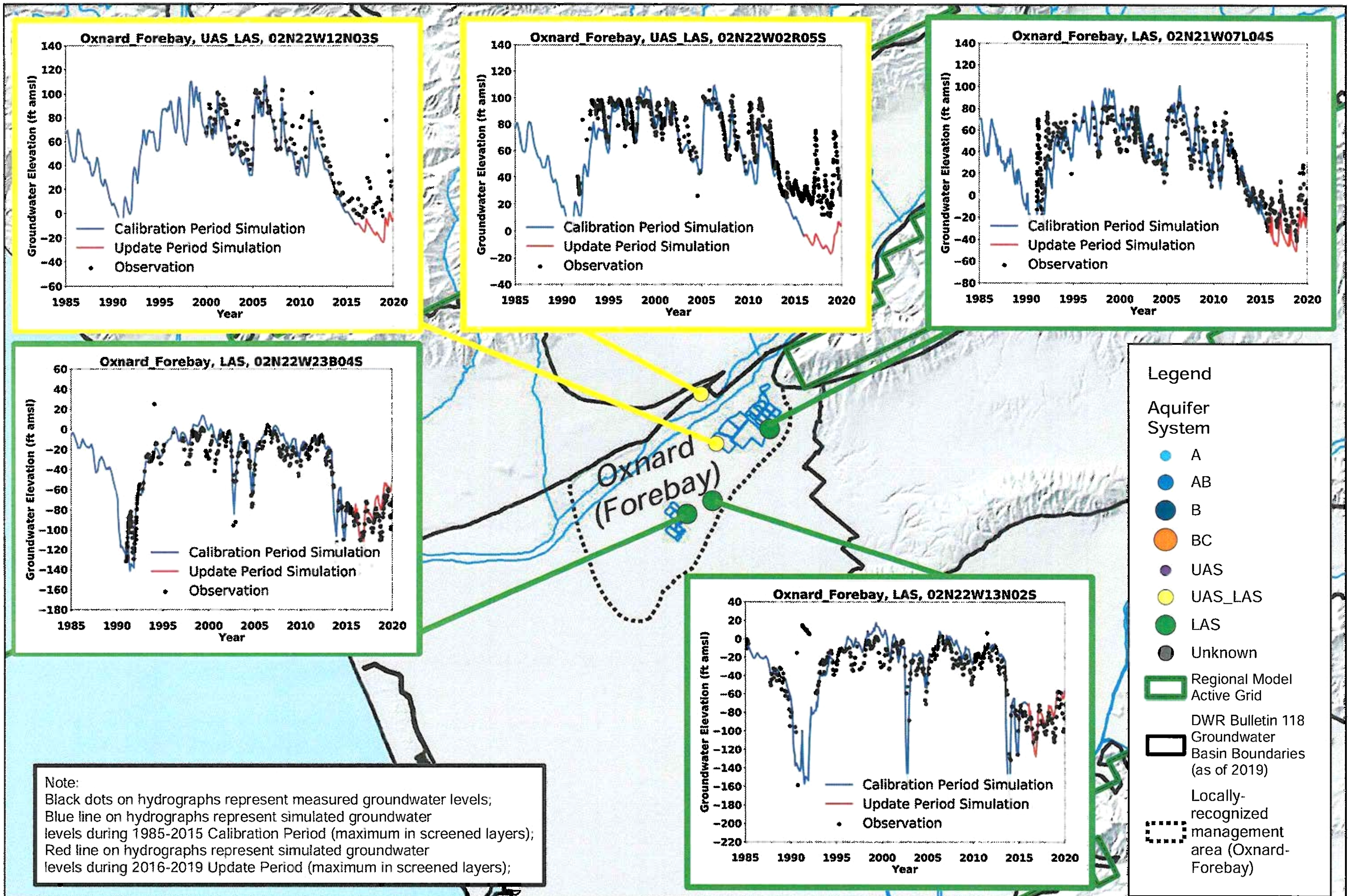
Figure 3-14.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Oxnard (Forebay) Basin Upper Aquifer System



N

0 0.5 1 2 3 4 mi

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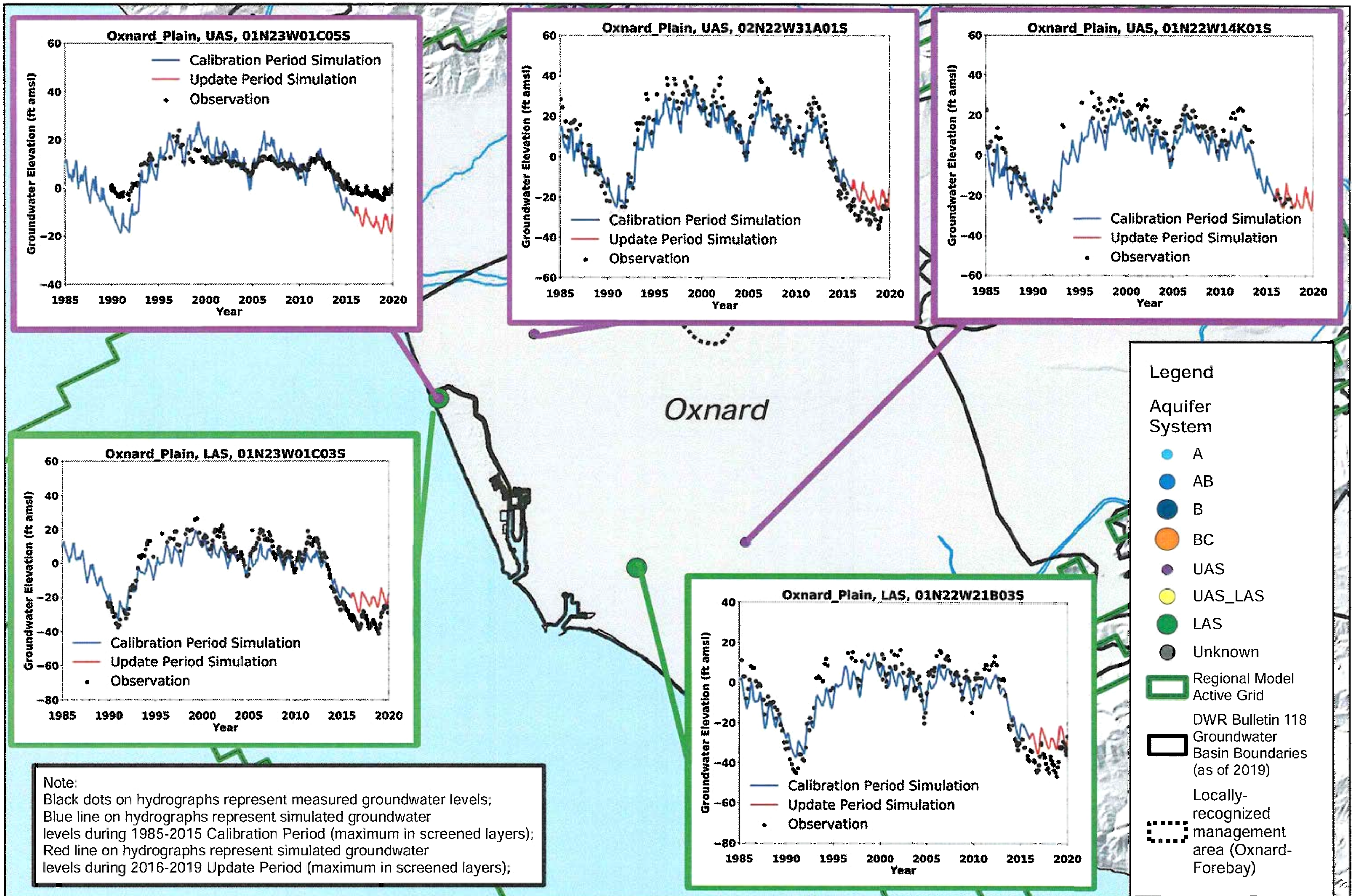
Figure 3-15.
Selected Hydrographs of Simulated Groundwater Elevations in Oxnard (Forebay) Basin Upper and Lower Aquifer Systems



N

0 0.5 1 2 3 4 mi

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Figure 3-16.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the northwest portion of Oxnard Basin

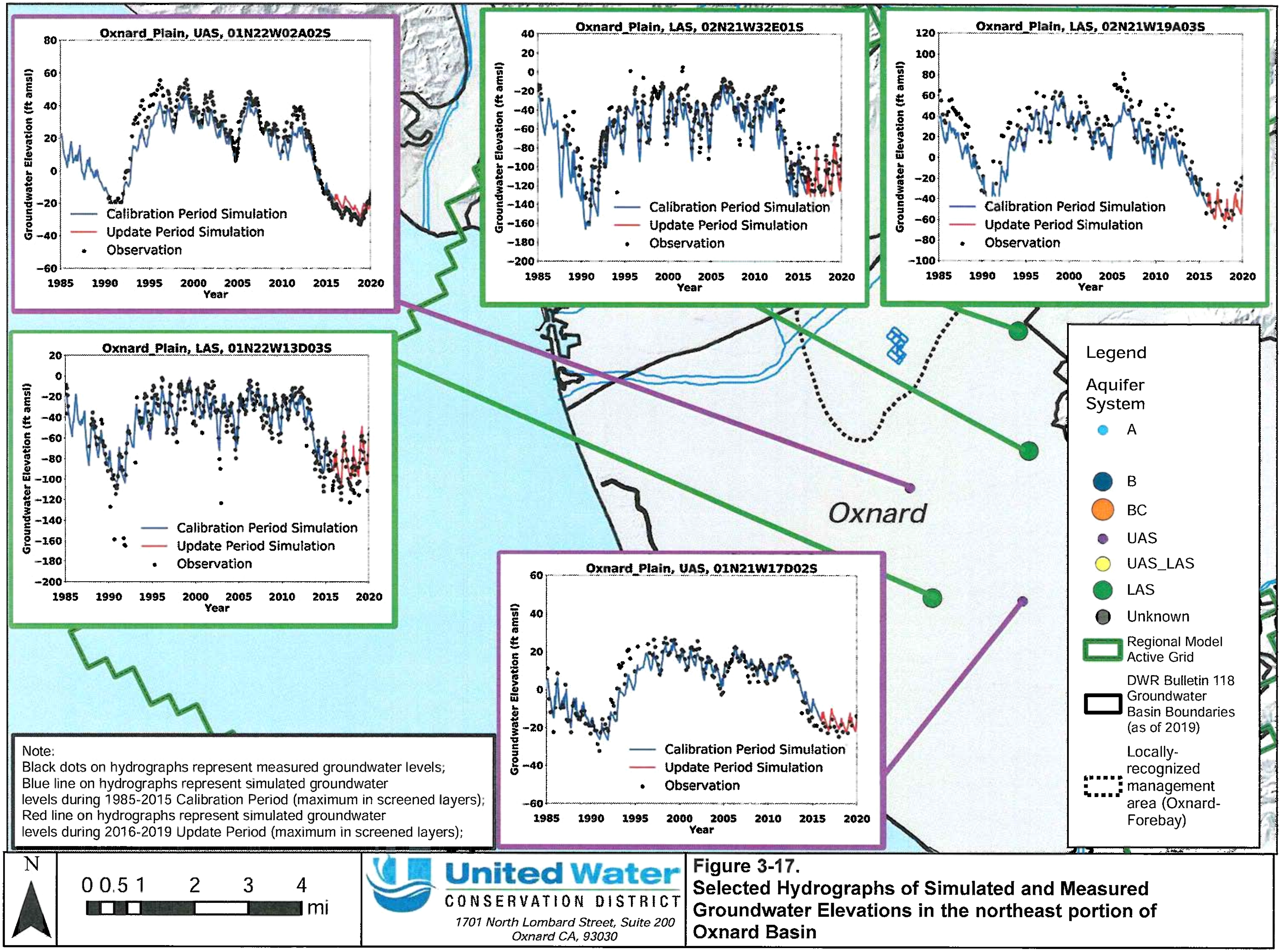

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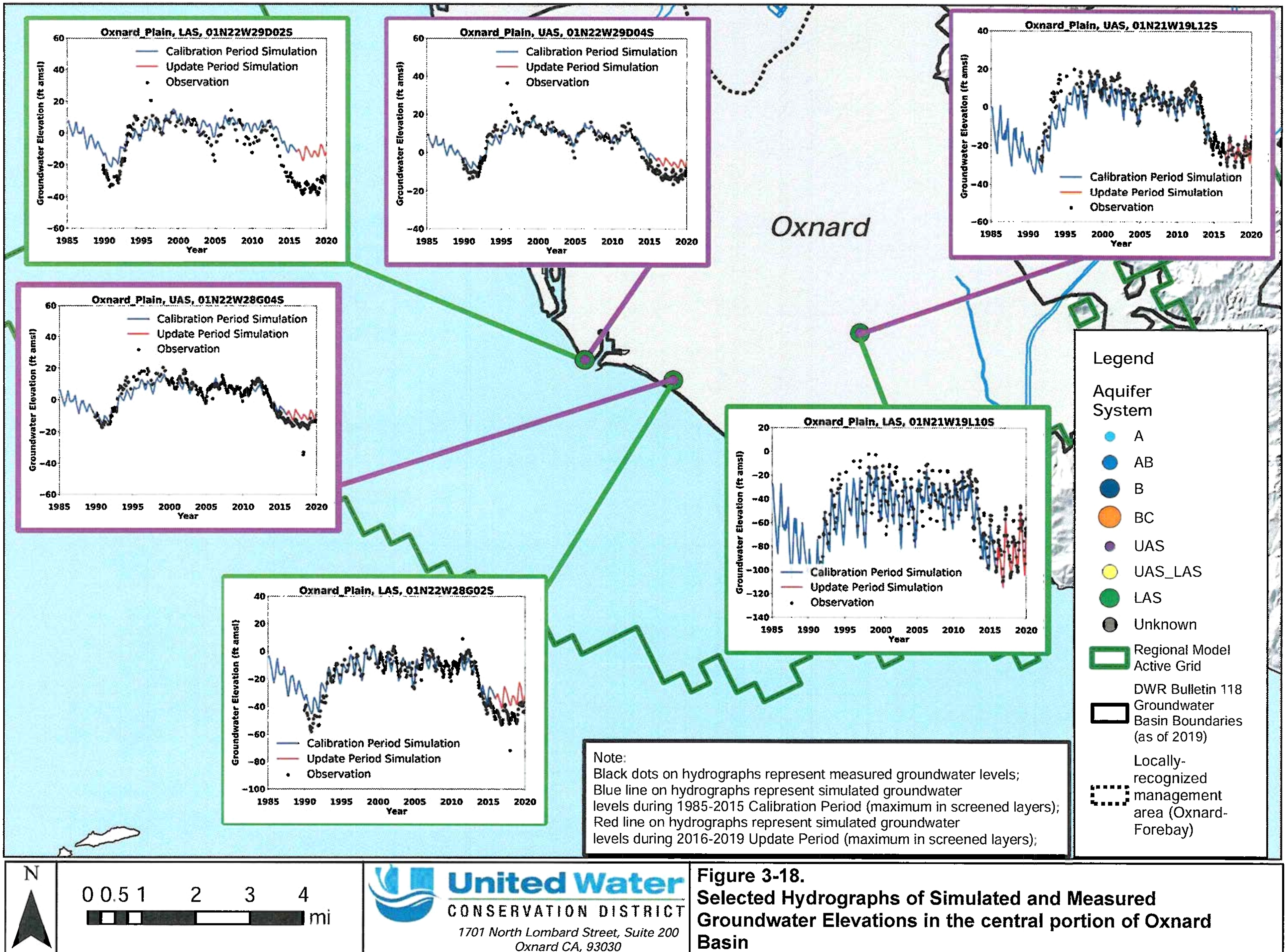
Figure 3-17.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the northeast portion of Oxnard Basin



Note:
Black dots on hydrographs represent measured groundwater levels;
Blue line on hydrographs represent simulated groundwater levels during 1985-2015 Calibration Period (maximum in screened layers);
Red line on hydrographs represent simulated groundwater levels during 2016-2019 Update Period (maximum in screened layers);

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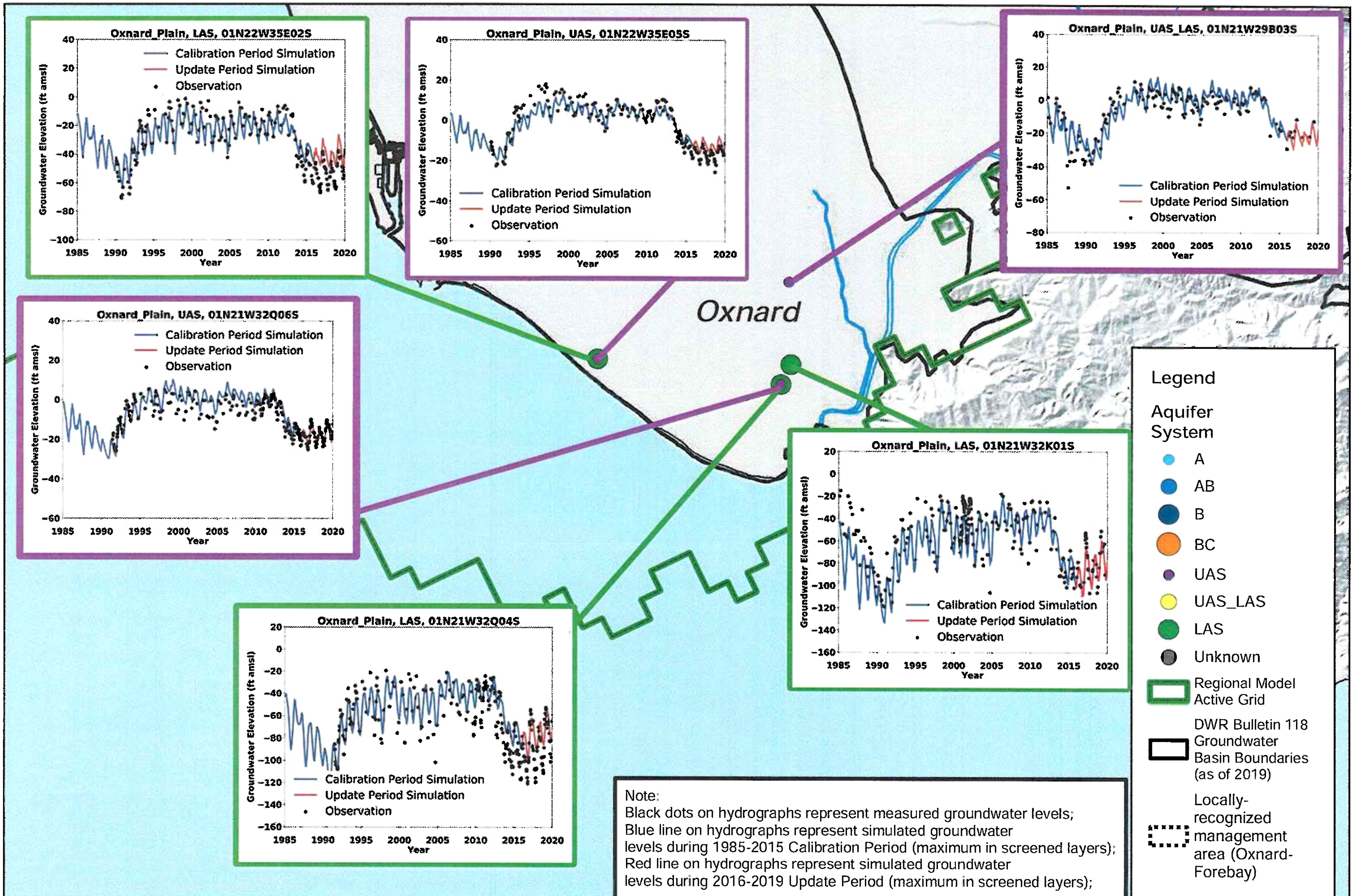
Figure 3-18.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the central portion of Oxnard Basin



N

0 0.5 1 2 3 4 mi

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Figure 3-19.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the in the southern portion of Oxnard Basin

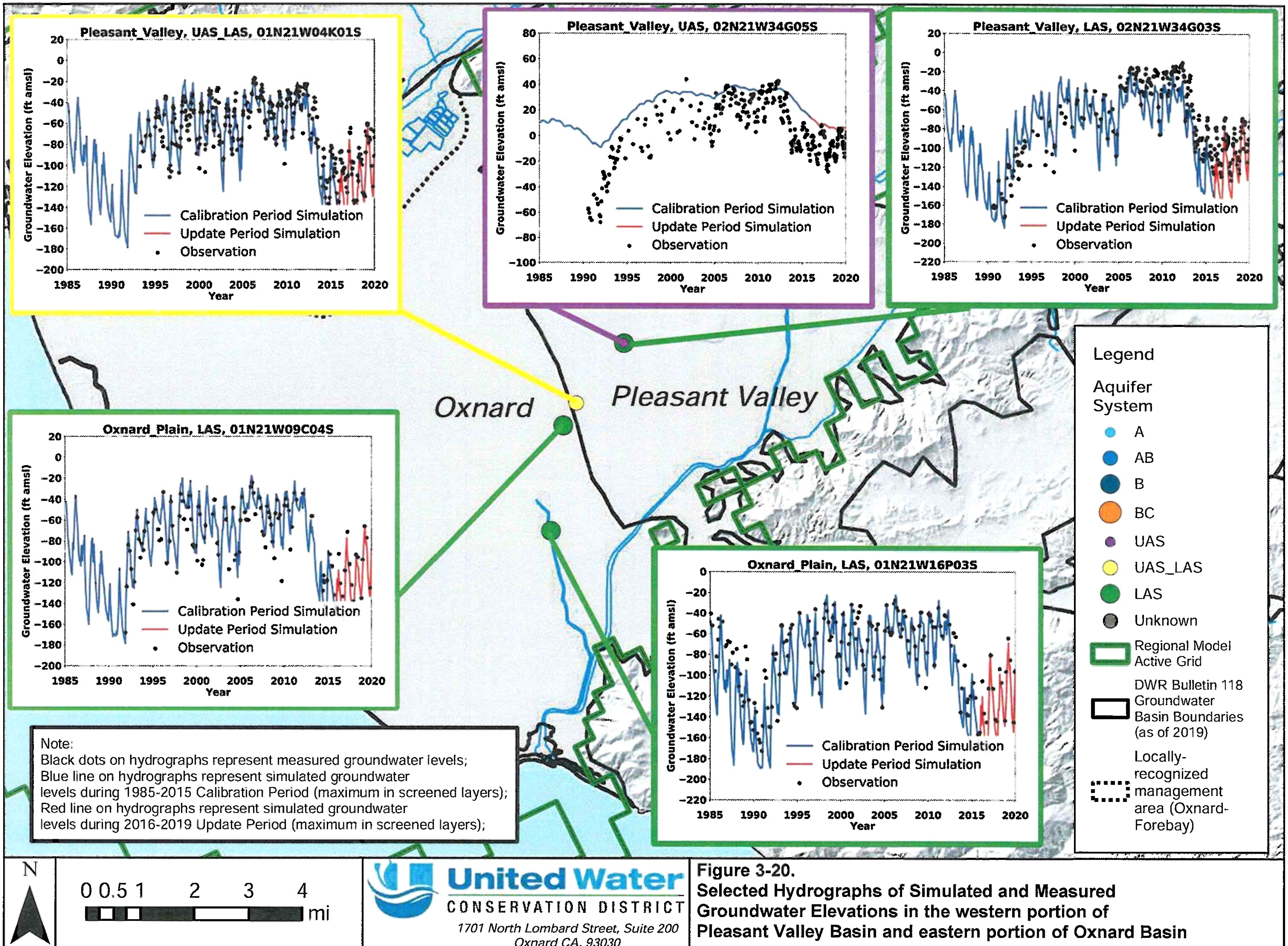

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Figure 3-20.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the western portion of Pleasant Valley Basin and eastern portion of Oxnard Basin

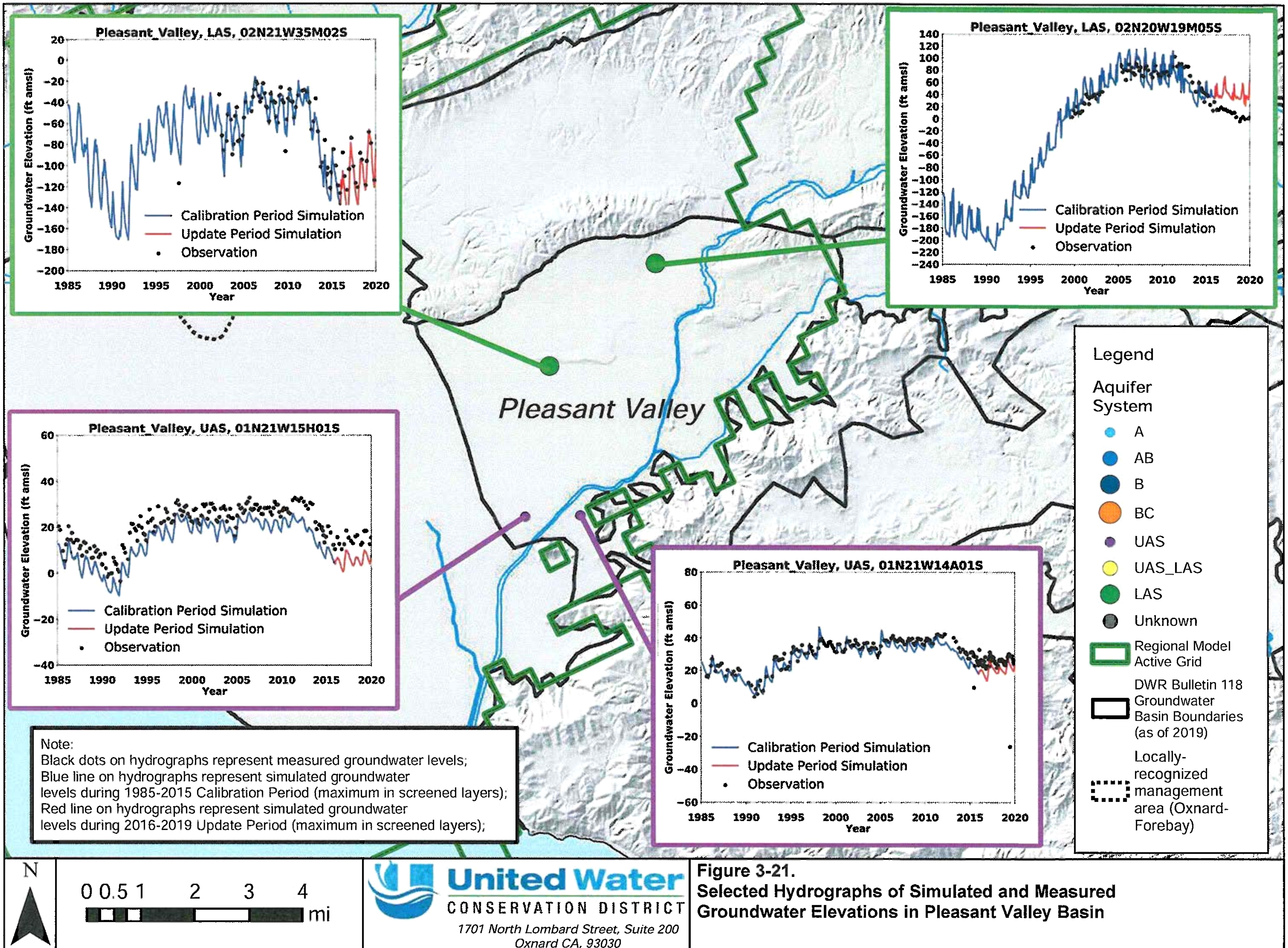


Figure 3-21.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Pleasant Valley Basin

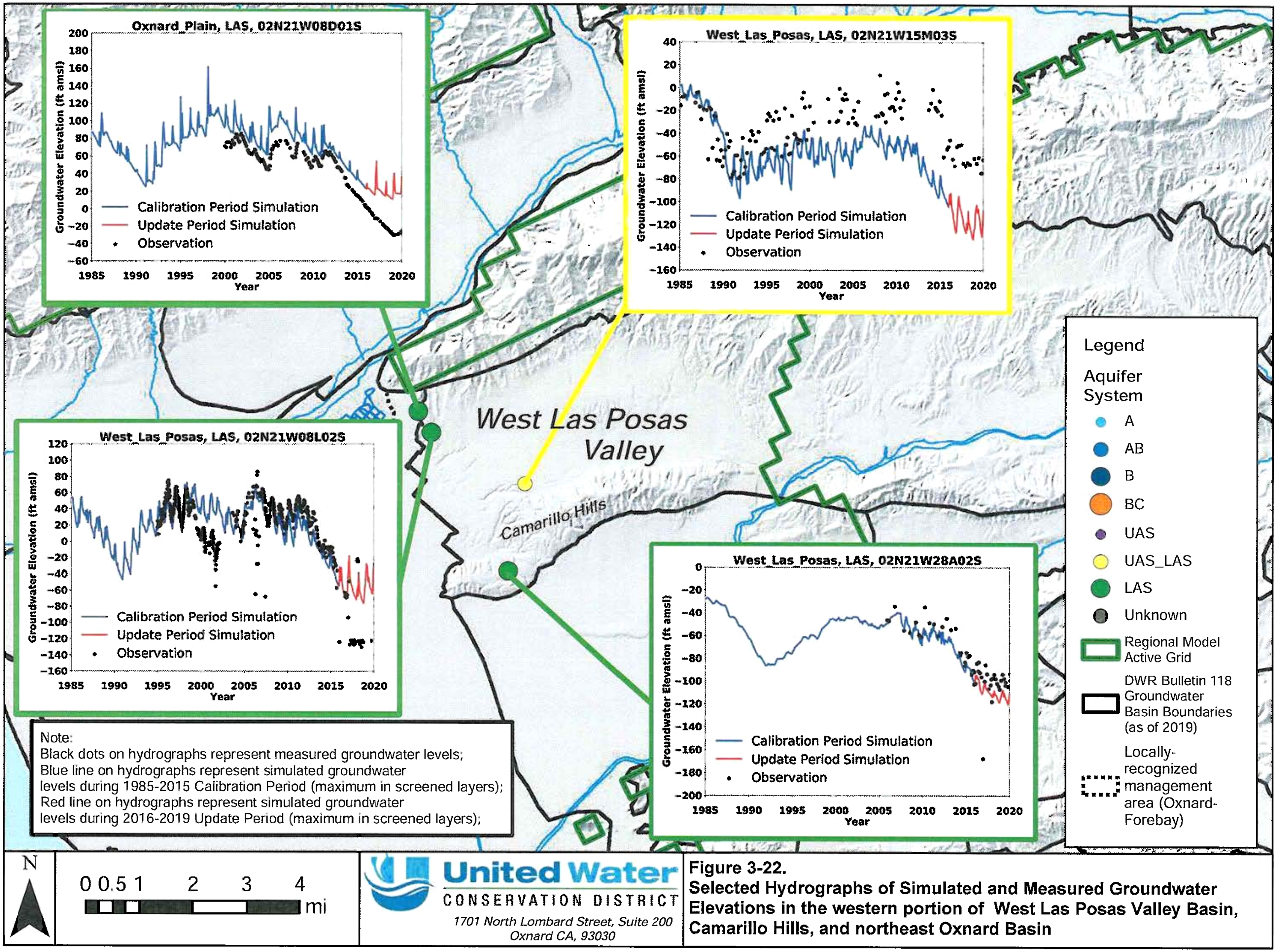
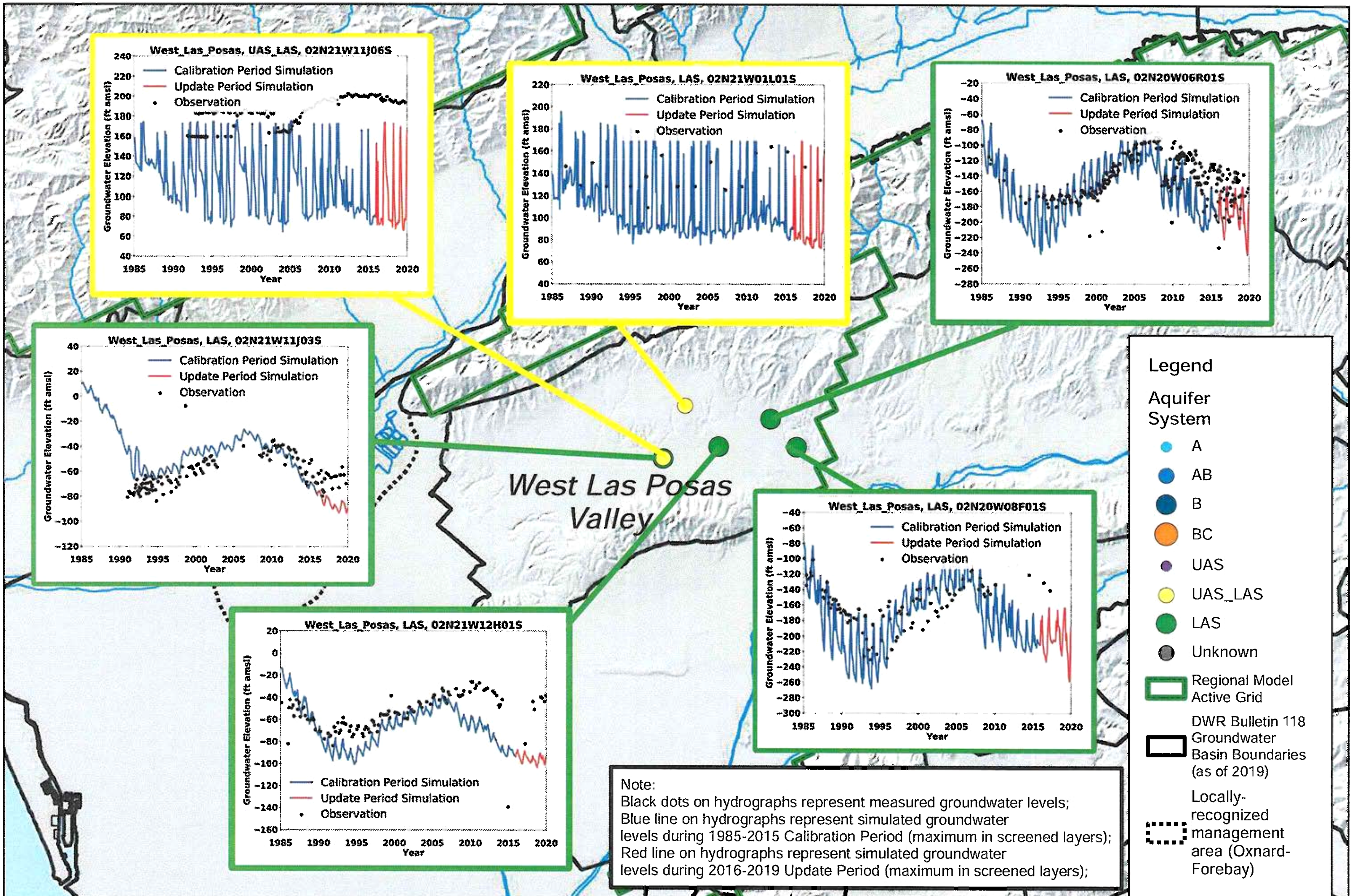


Figure 3-22.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the western portion of West Las Posas Valley Basin, Camarillo Hills, and northeast Oxnard Basin



Note:
Black dots on hydrographs represent measured groundwater levels;
Blue line on hydrographs represent simulated groundwater levels during 1985-2015 Calibration Period (maximum in screened layers);
Red line on hydrographs represent simulated groundwater levels during 2016-2019 Update Period (maximum in screened layers);

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Figure 3-23.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the eastern portion of West Las Posas Valley Basin

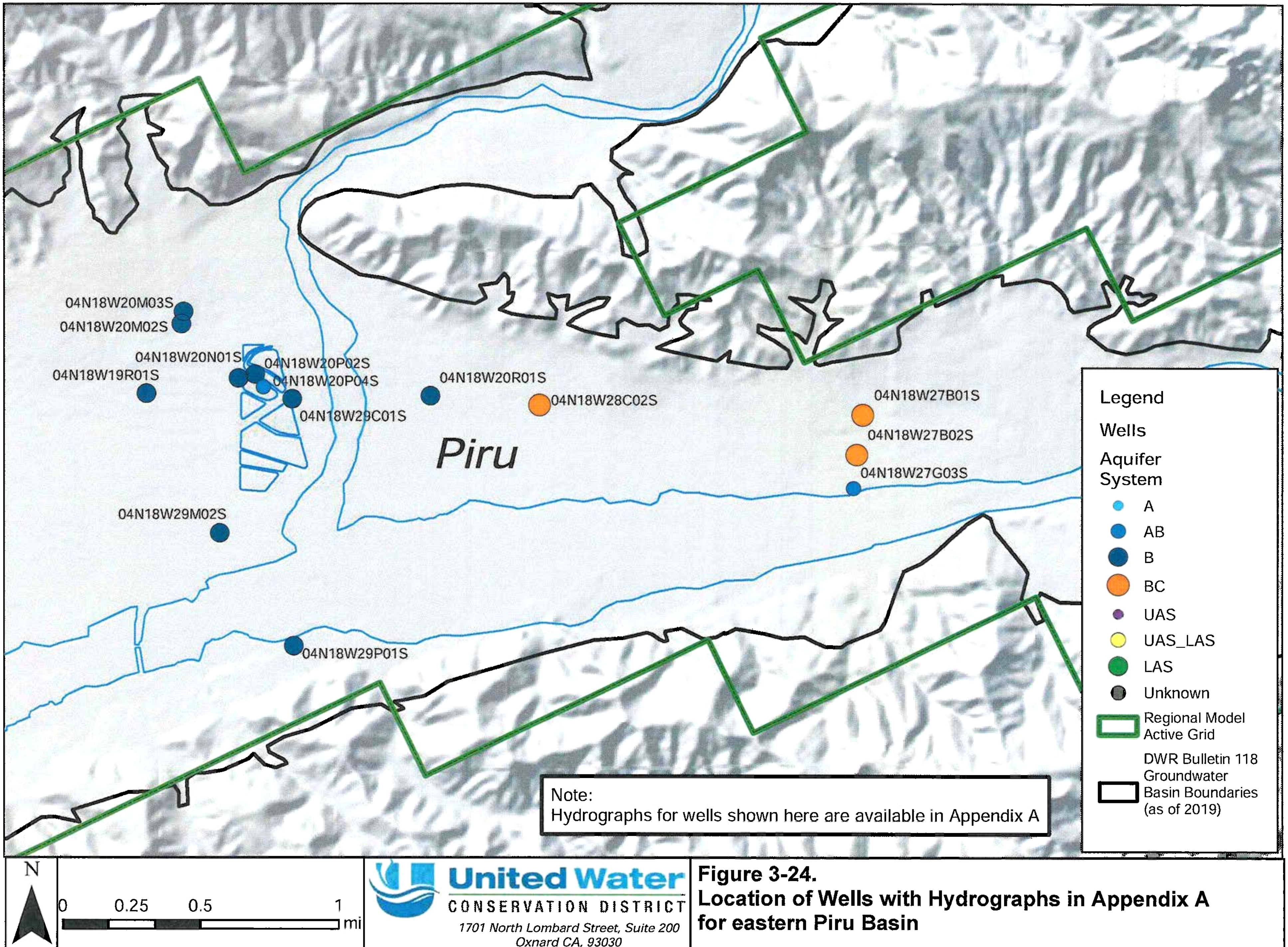

Figure 3-24.
Location of Wells with Hydrographs in Appendix A for eastern Piru Basin

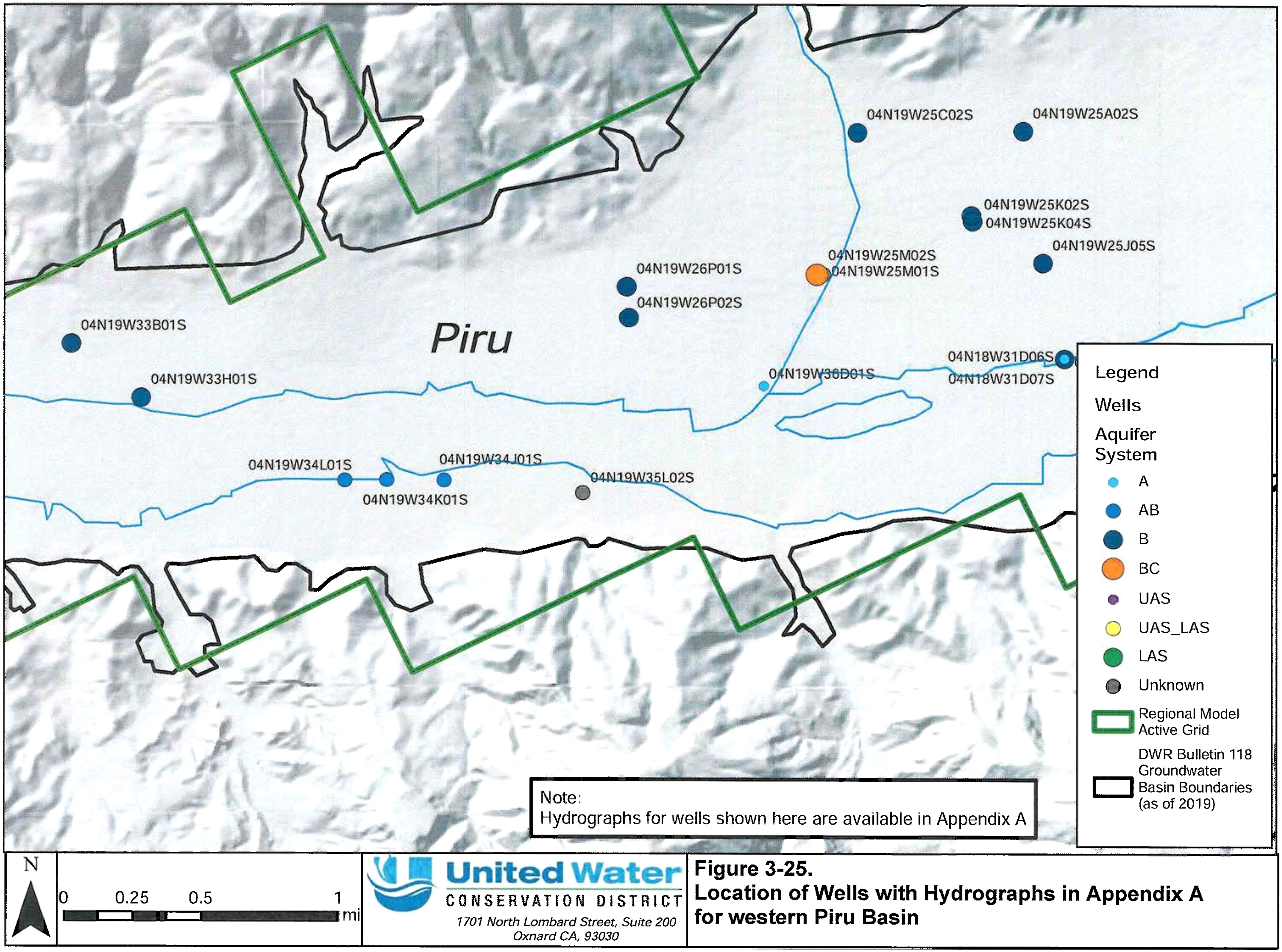

Figure 3-25.
Location of Wells with Hydrographs in Appendix A for western Piru Basin

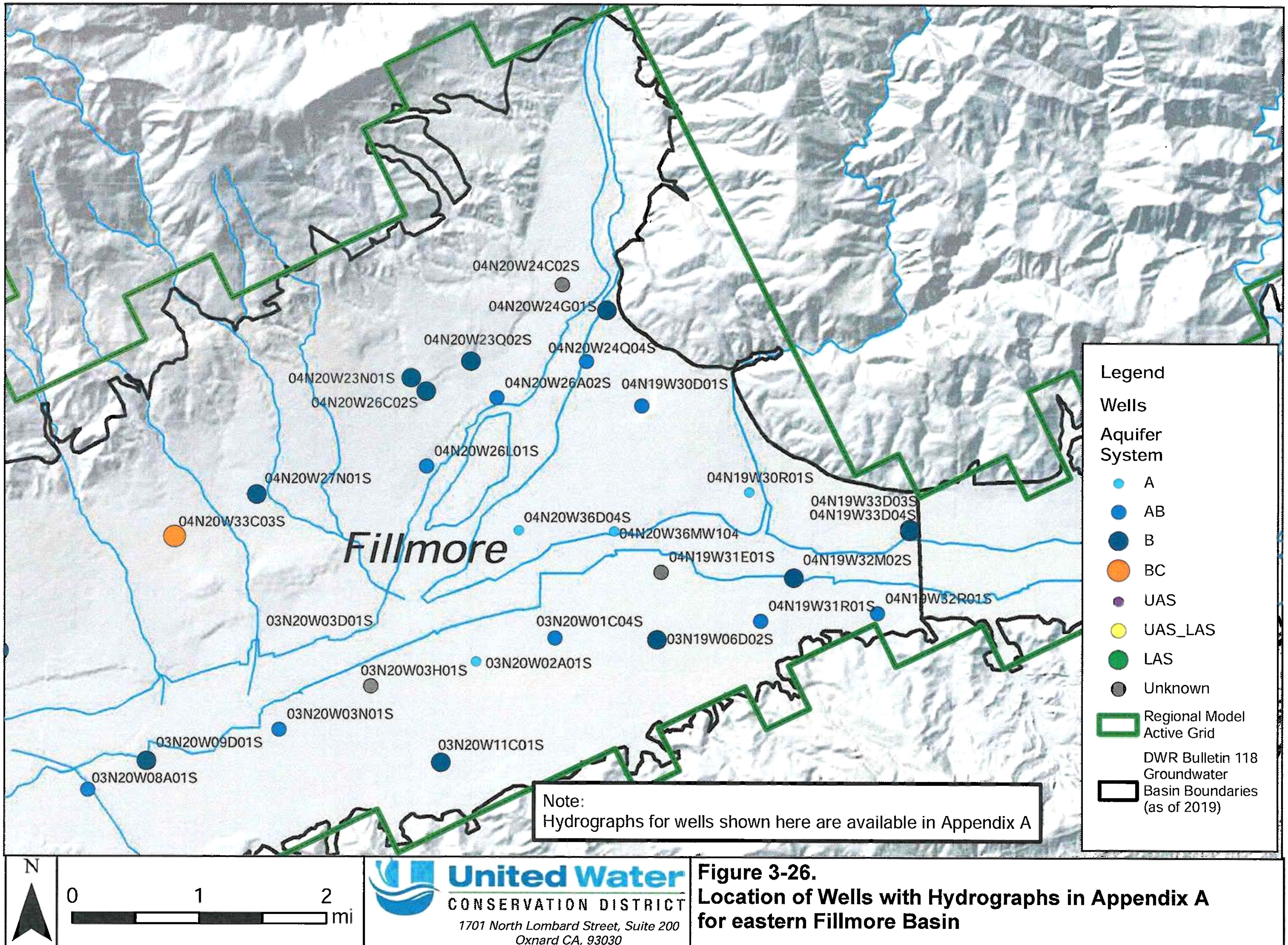

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Figure 3-26.
Location of Wells with Hydrographs in Appendix A for eastern Fillmore Basin

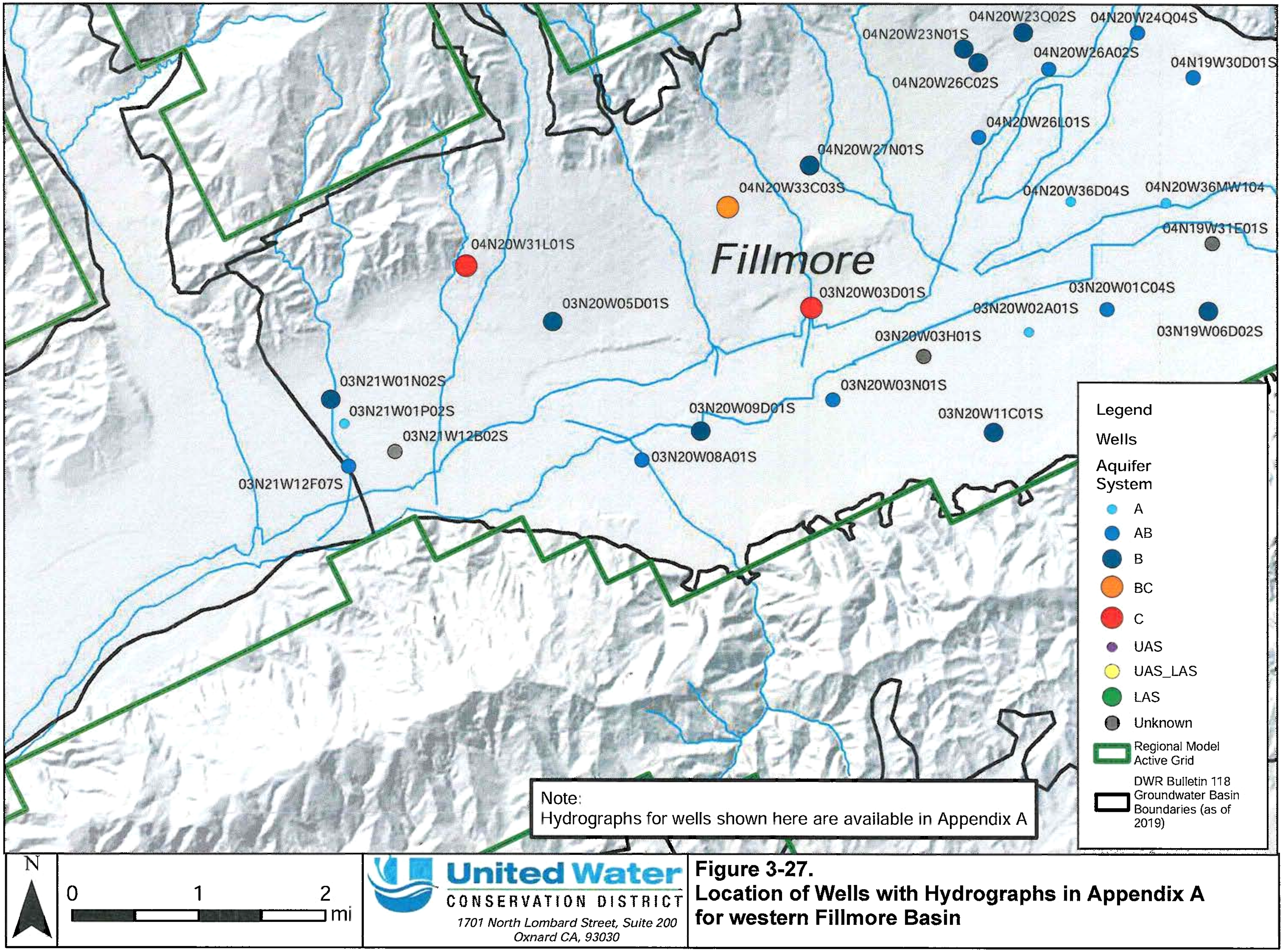

Figure 3-27.
Location of Wells with Hydrographs in Appendix A for western Fillmore Basin

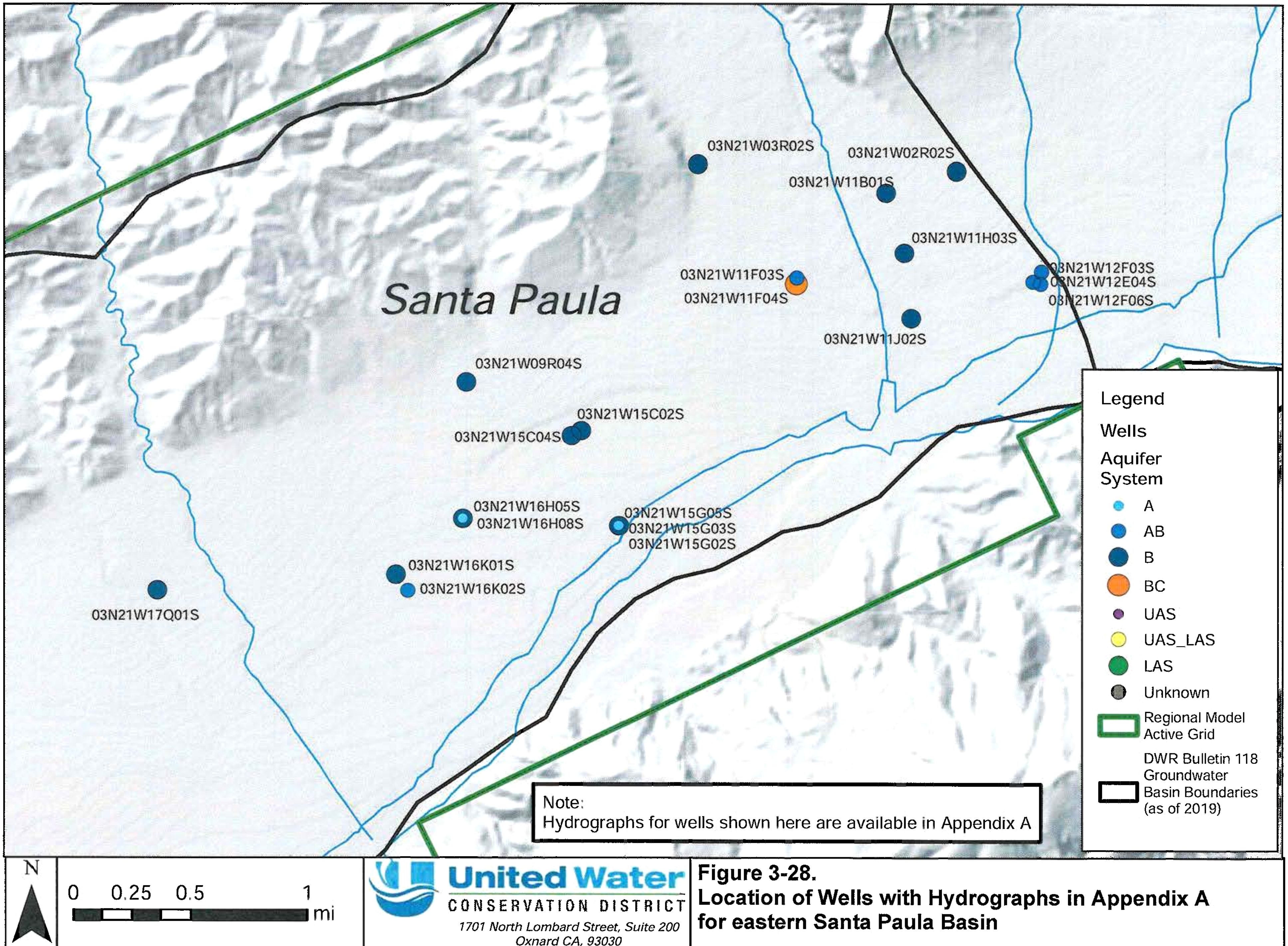

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Figure 3-28.
Location of Wells with Hydrographs in Appendix A for eastern Santa Paula Basin

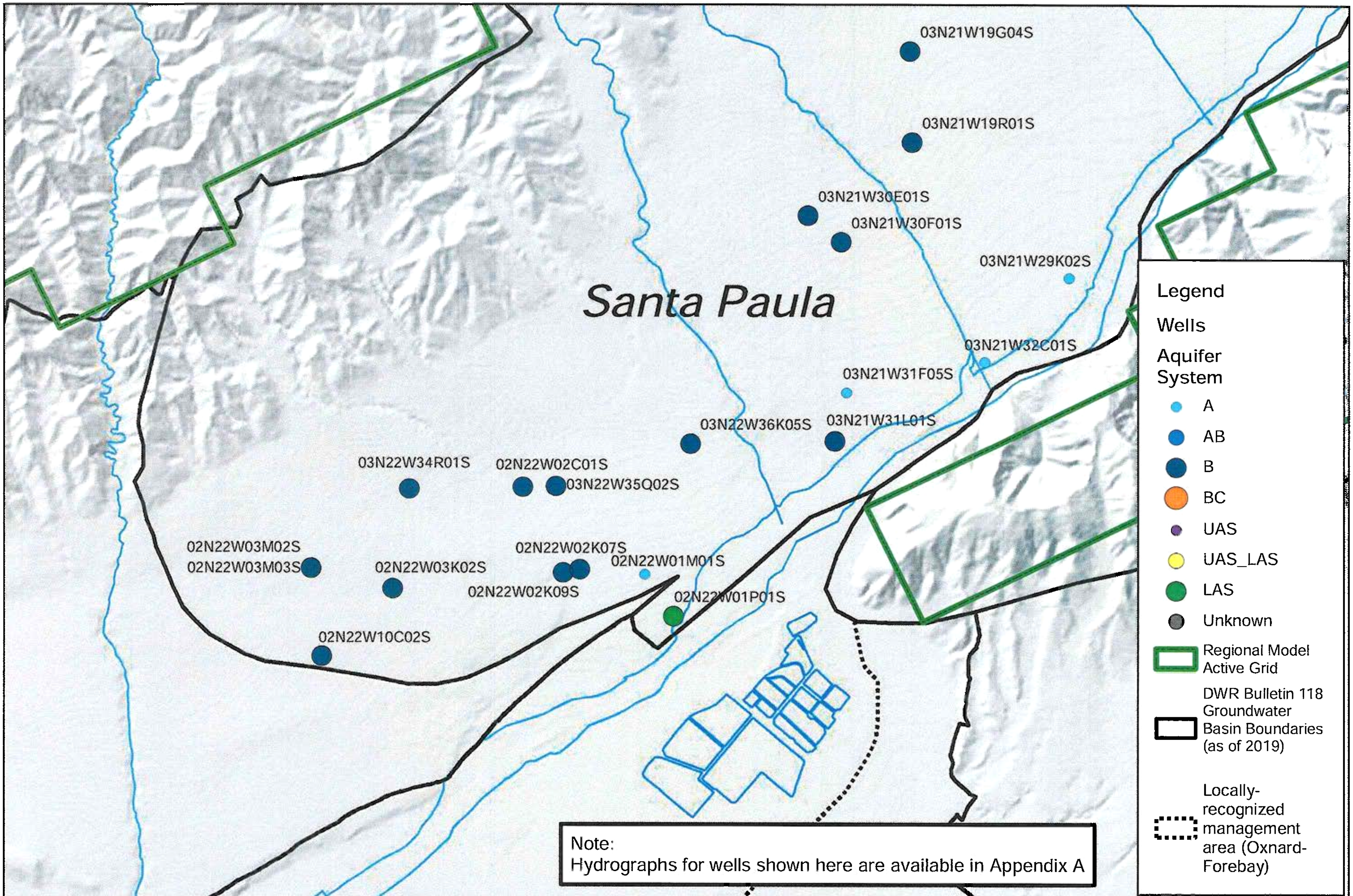

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Figure 3-29.
Location of Wells with Hydrographs in Appendix A for western Santa Paula Basin

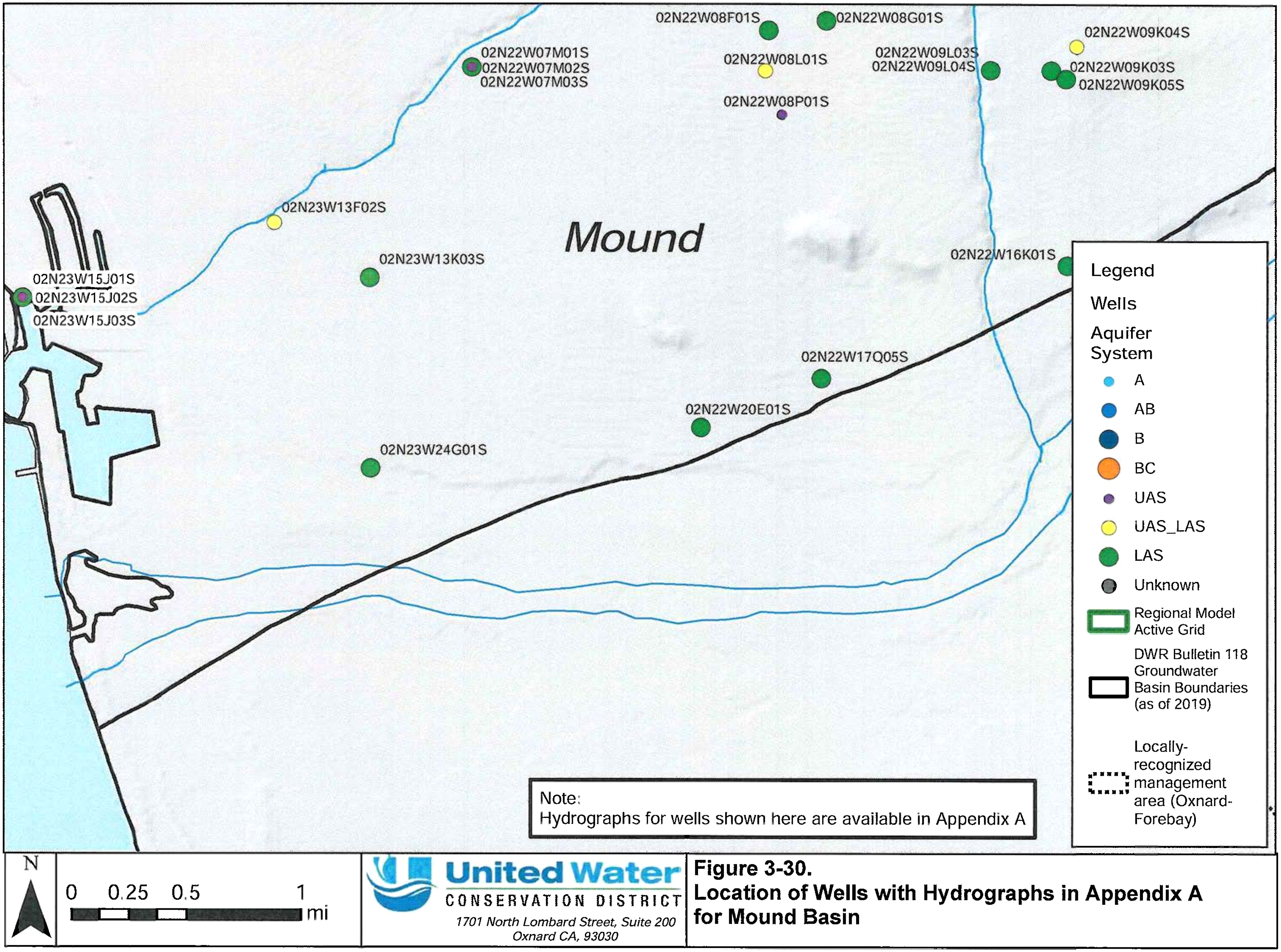

Figure 3-30.
Location of Wells with Hydrographs in Appendix A for Mound Basin

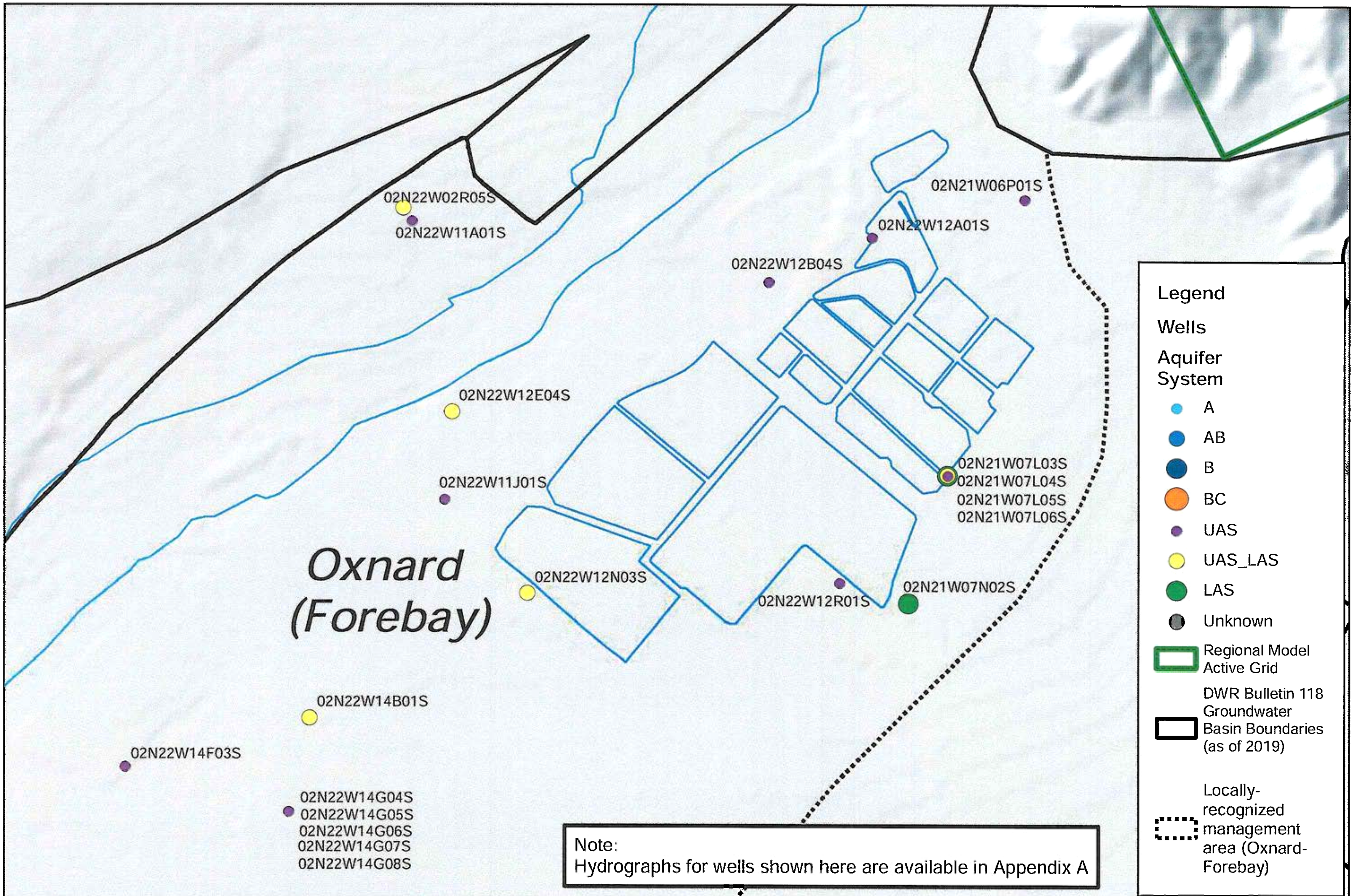

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Figure 3-31.
Location of Wells with Hydrographs in Appendix A for eastern Oxnard (Forebay) Basin

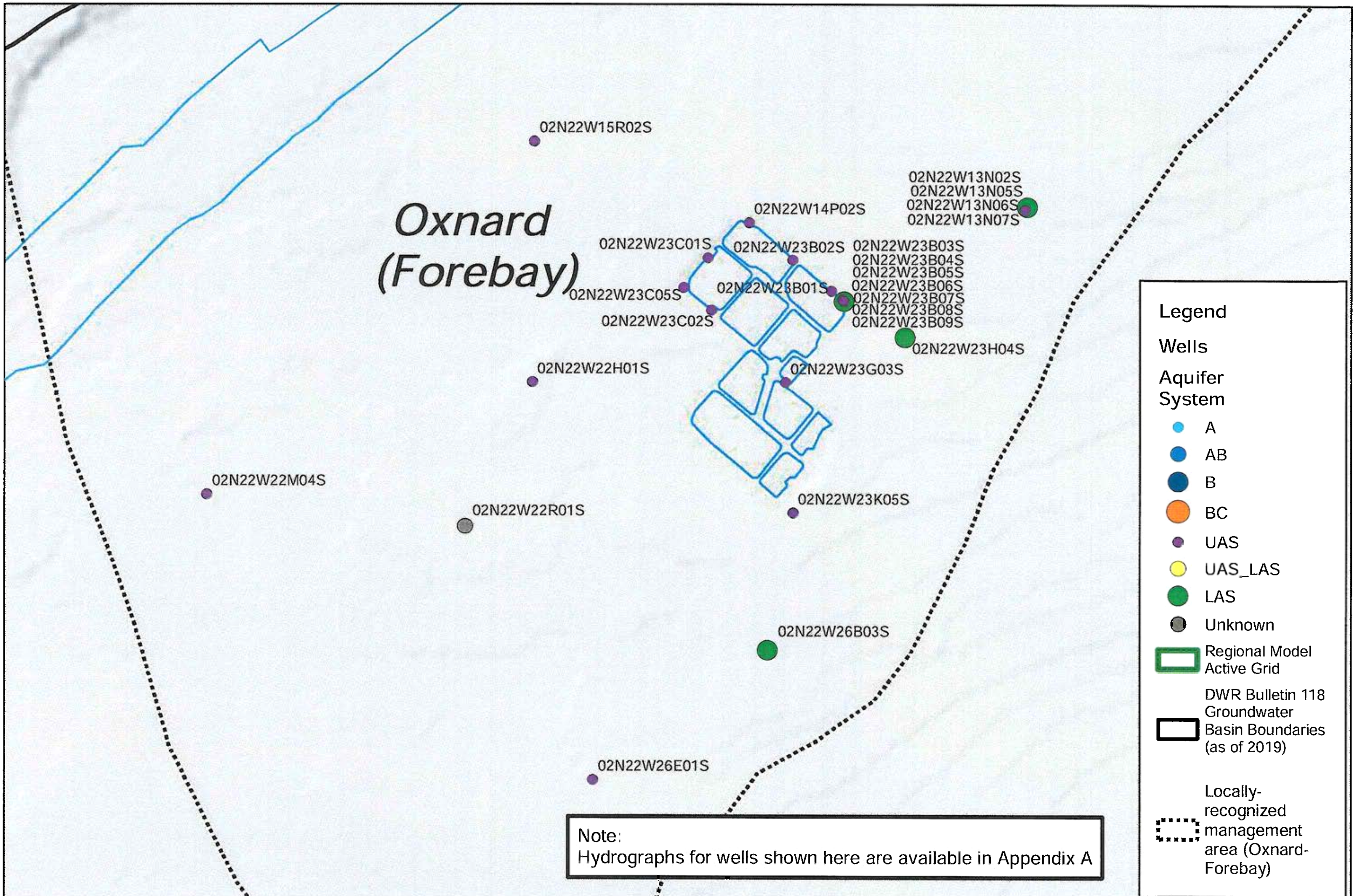

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Figure 3-32.
Location of Wells with Hydrographs in Appendix A for western Oxnard (Forebay) Basin

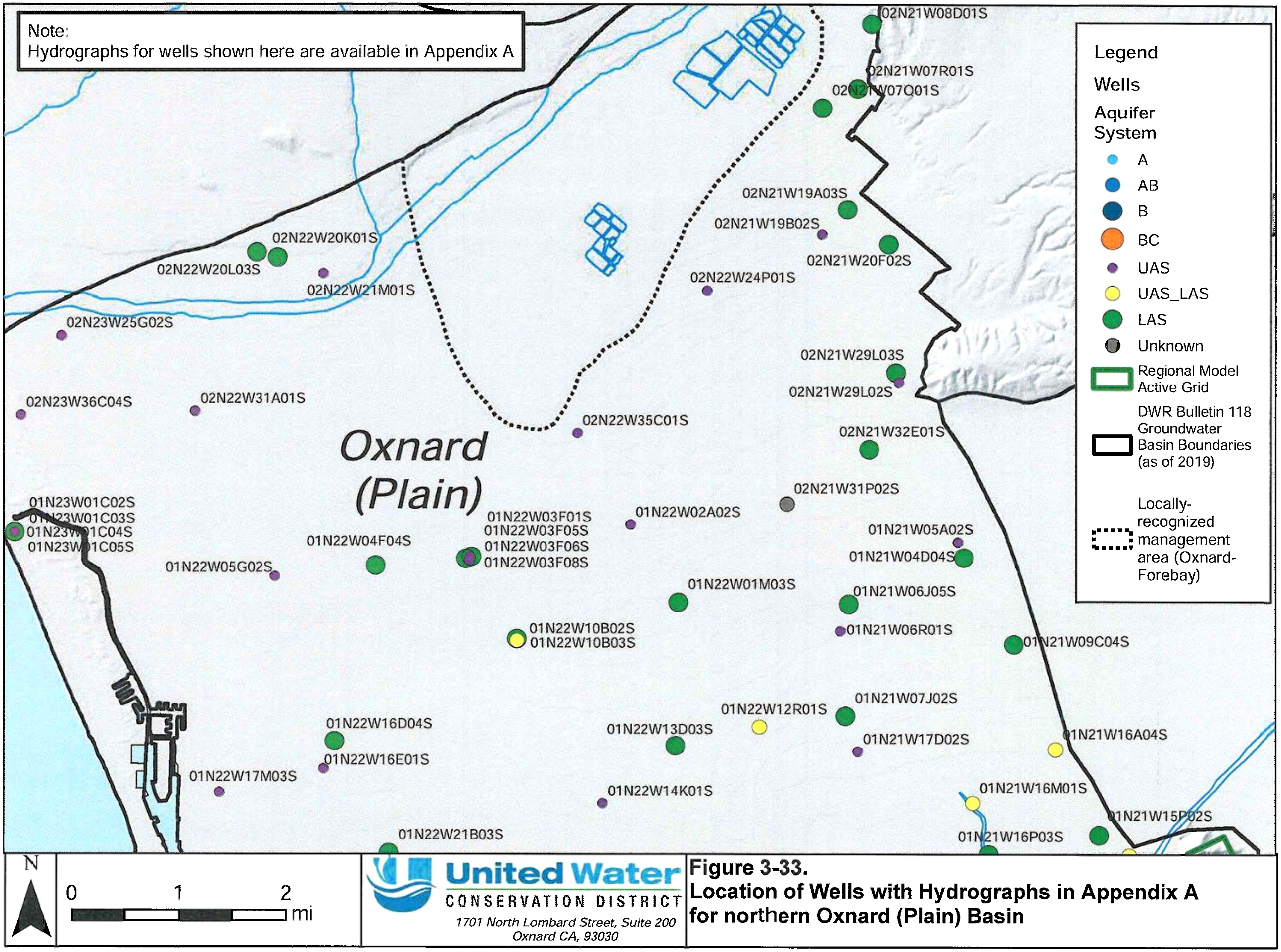

Figure 3-33.
Location of Wells with Hydrographs in Appendix A for northern Oxnard (Plain) Basin

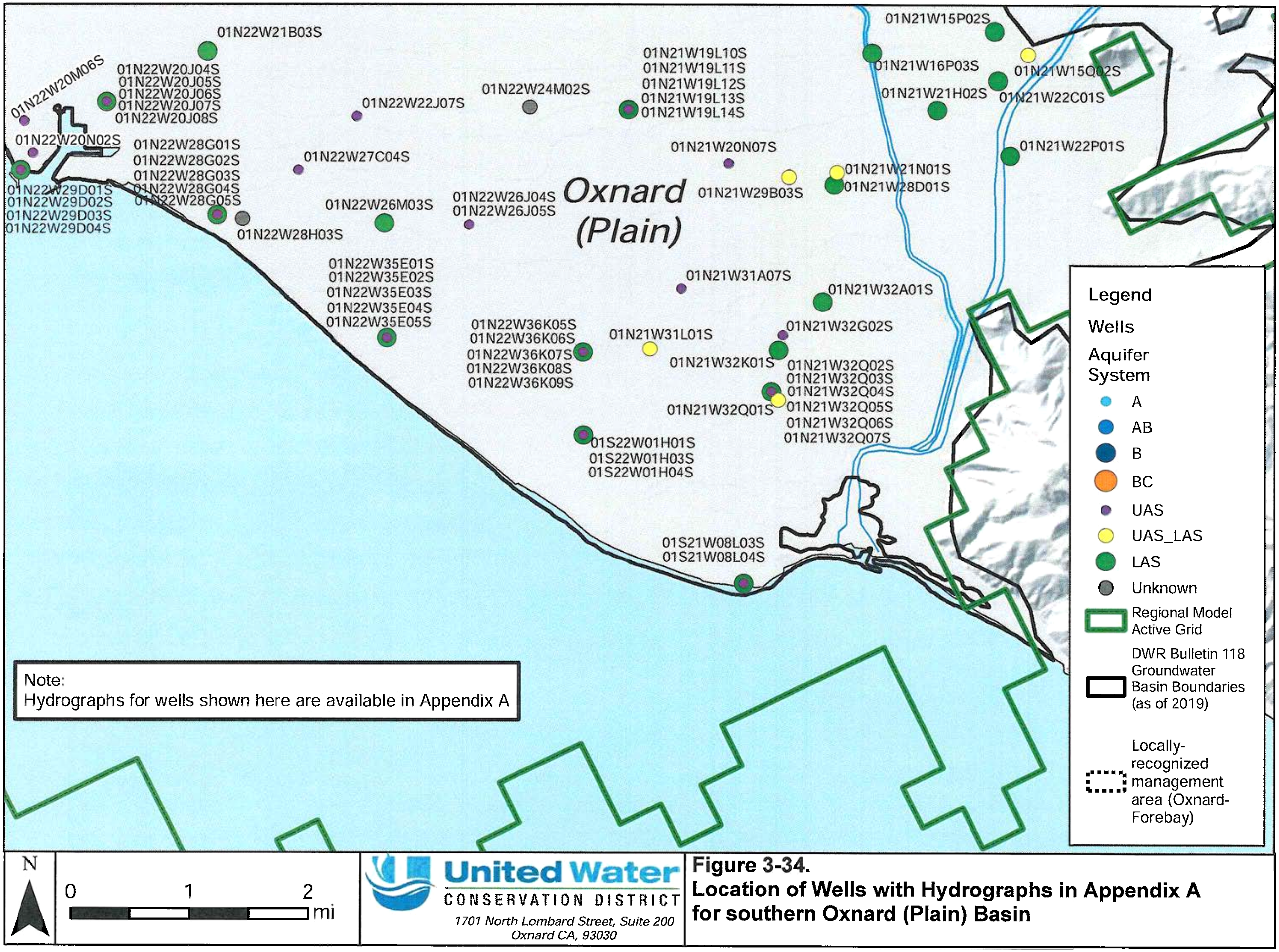

Figure 3-34.
Location of Wells with Hydrographs in Appendix A for southern Oxnard (Plain) Basin

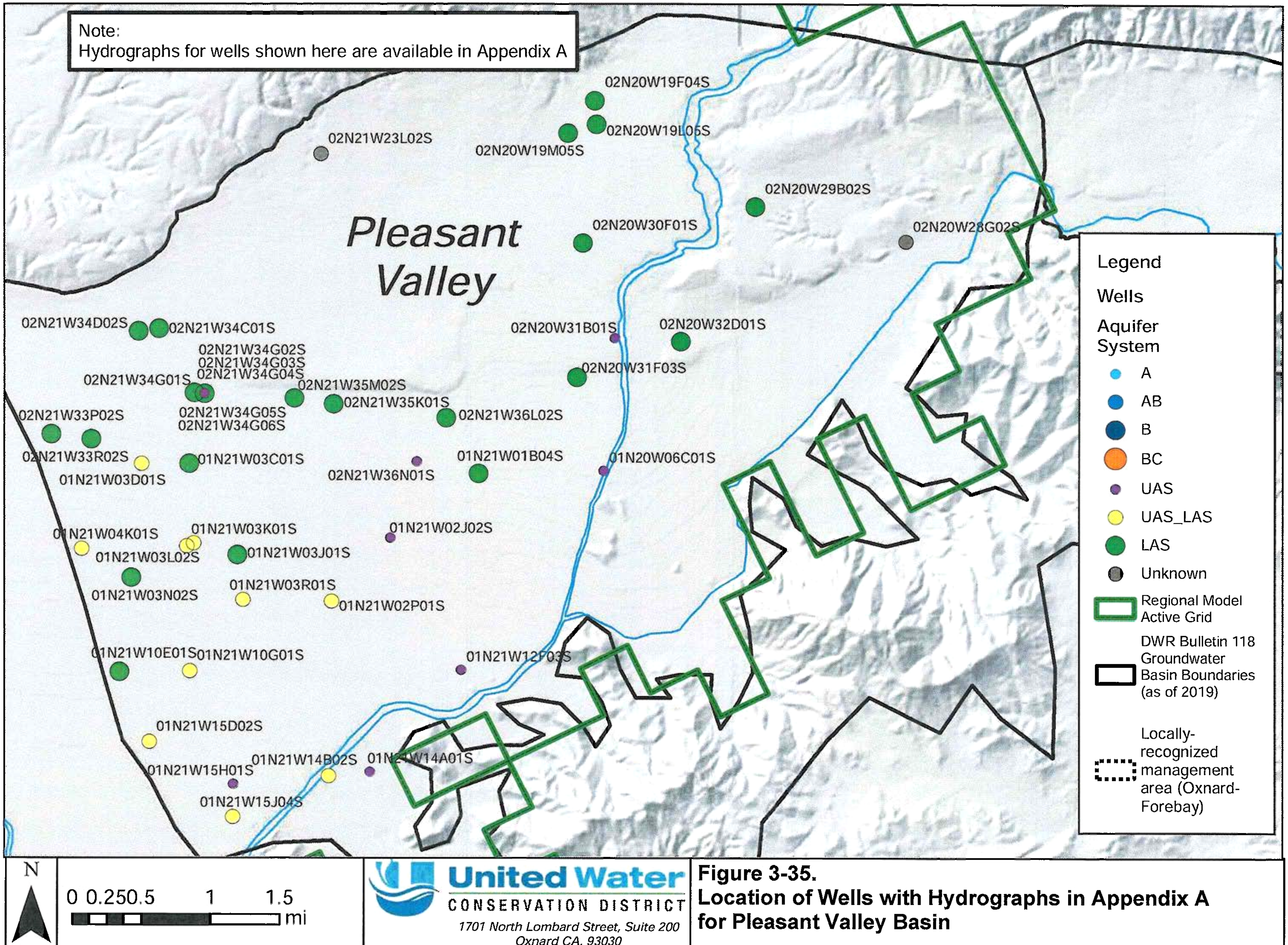

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Figure 3-35.
Location of Wells with Hydrographs in Appendix A for Pleasant Valley Basin

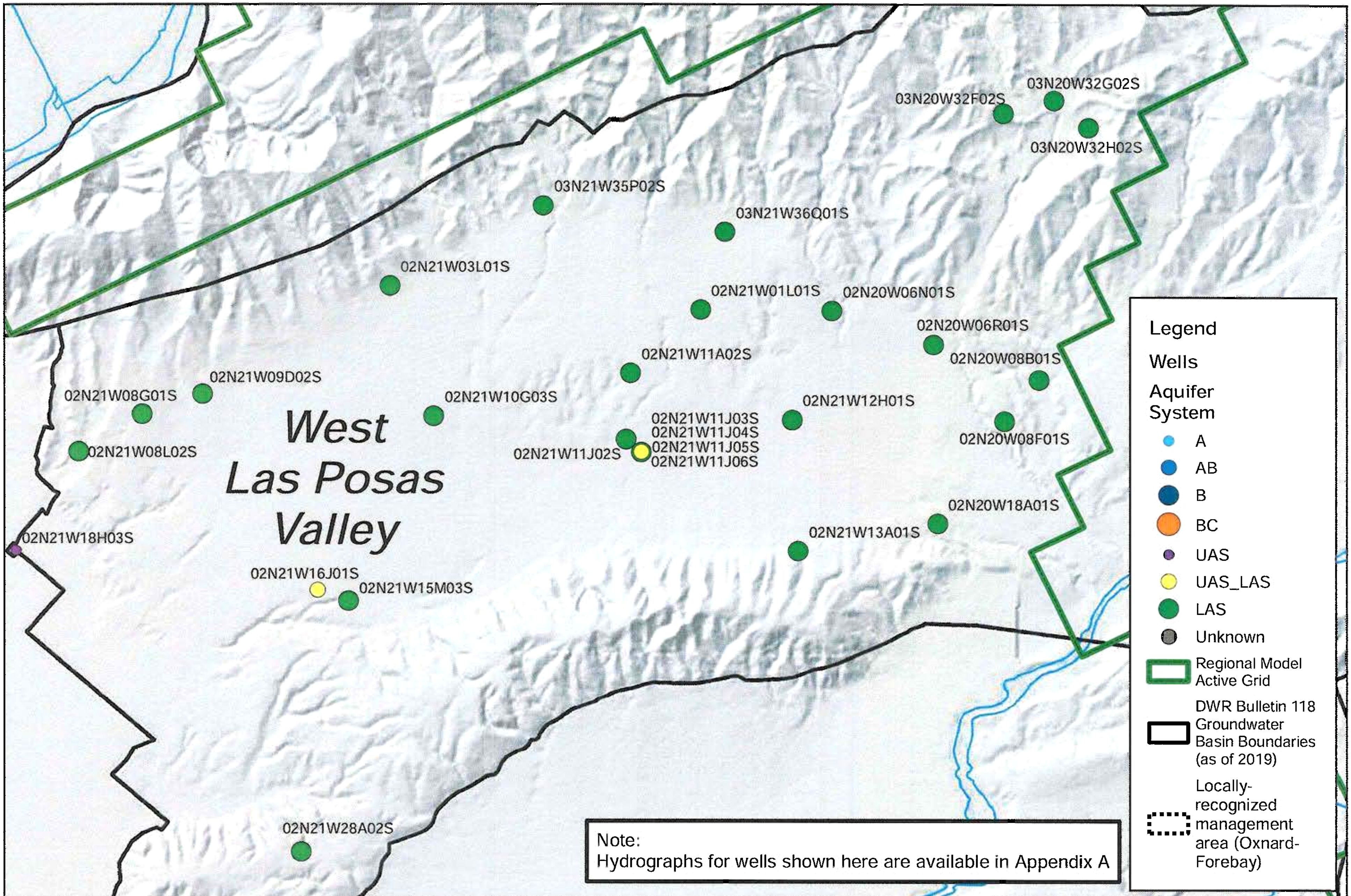

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Figure 3-36.
Location of Wells with Hydrographs in Appendix A for West Las Posas Valley Basin

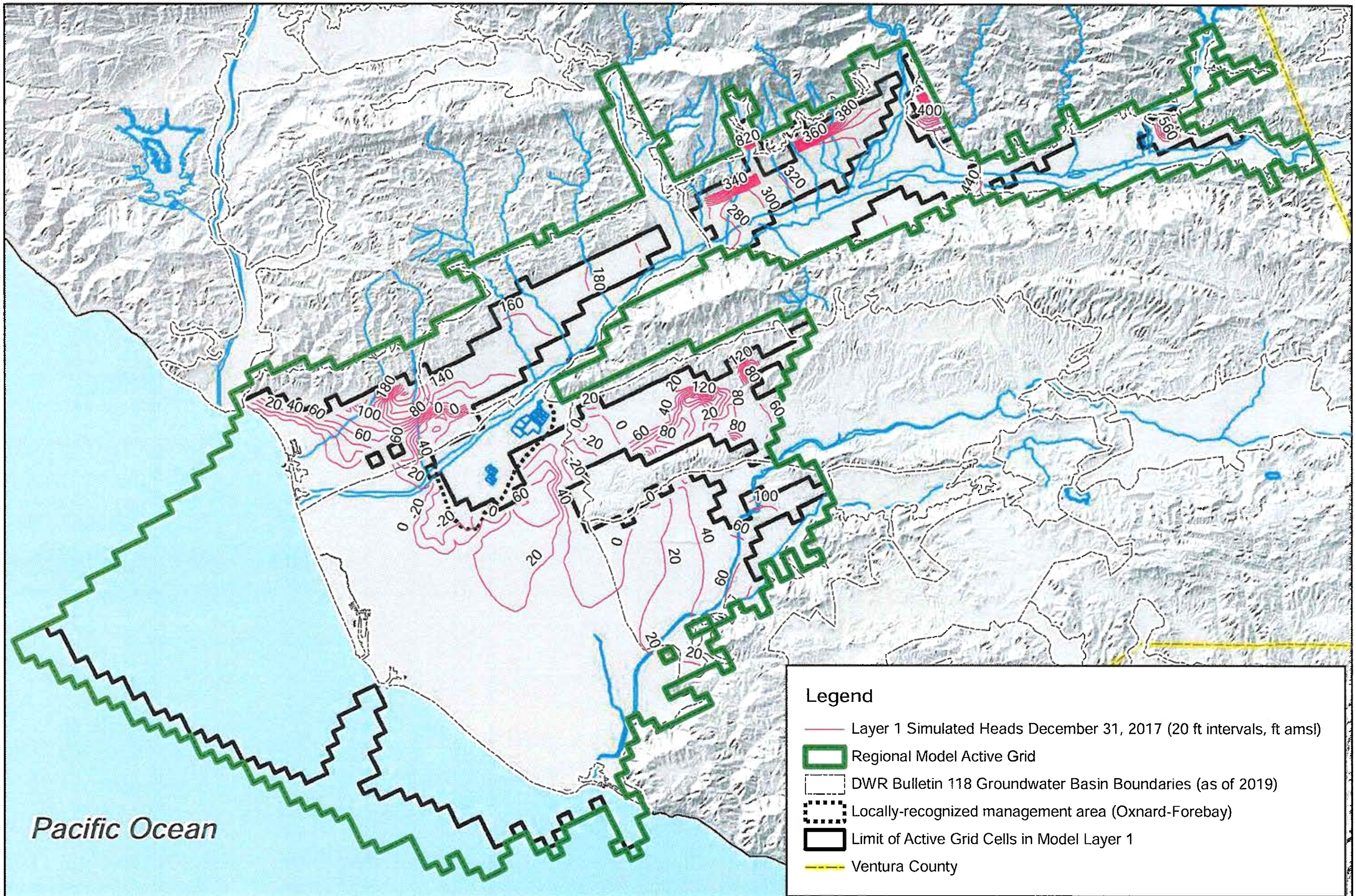

Figure 3-37. December 2017 Simulated Head Contours of Model Layer 1

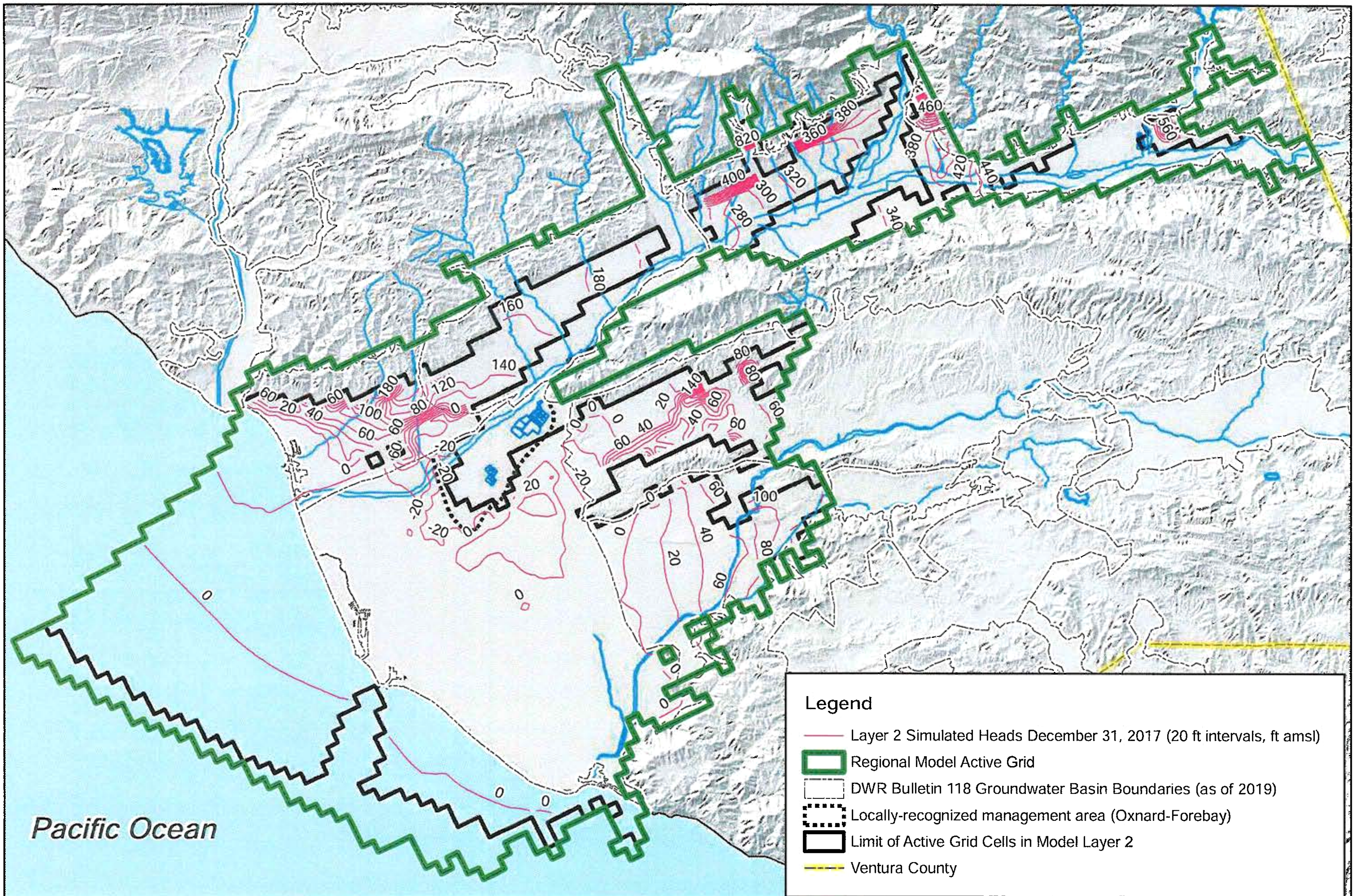

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Figure 3-38.
December 2017 Simulated Head Contours of Model Layer 2

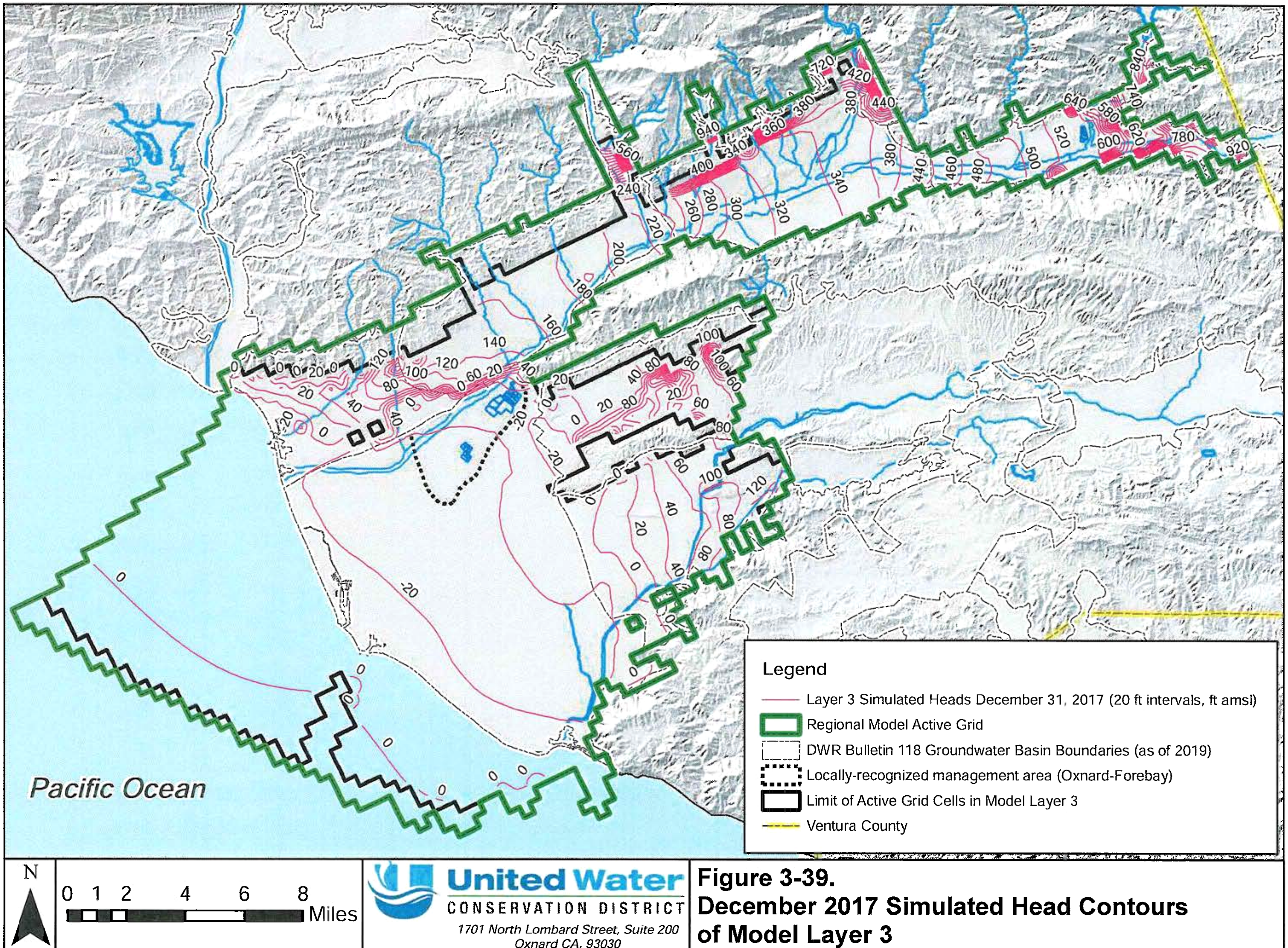

Figure 3-39.
December 2017 Simulated Head Contours of Model Layer 3

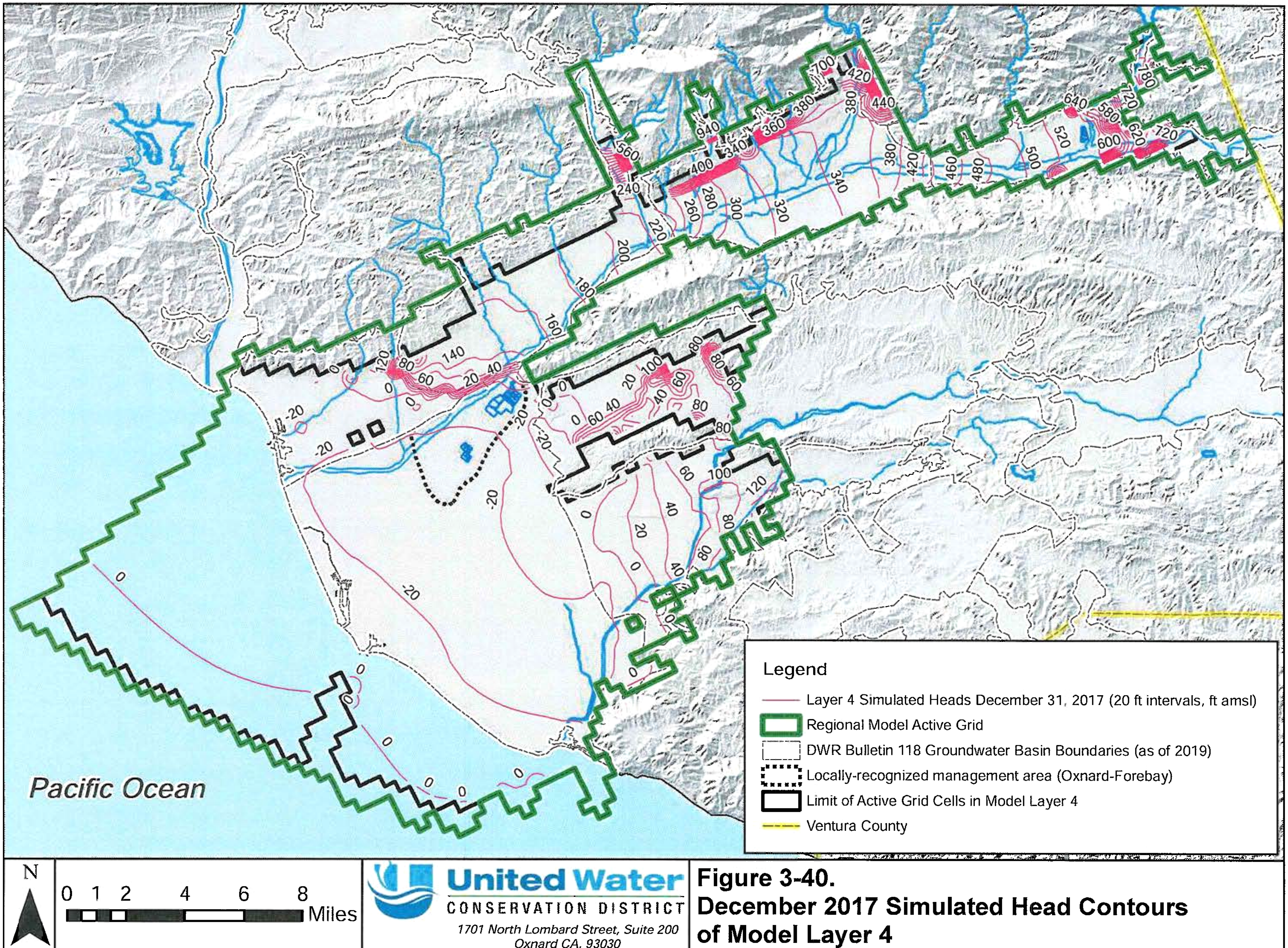

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Figure 3-40. December 2017 Simulated Head Contours of Model Layer 4