

Fallbrook Public Utilities District Master Plan (Draft)

Prepared by District Staff

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Chapter 1 – Water Supplies

1.0 Background

The Fallbrook Public Utilities District (District) currently relies on over 95% of water supplies from imported water. Development of local potable supplies is currently a high priority for the District, with a focus on development of supplies from the Santa Margarita River. The goal of these supplies is to help provide the District some autonomy over water supply decisions and to develop lower cost local supplies as imported water costs continue to escalate. The District holds three water right permits on the Santa Margarita River and has been able to utilize one of these water rights permits by transferring the permit to Lake Skinner, which allows for the Metropolitan Water District of Southern California (MWD) to treat runoff into Lake Skinner and wheel the water to the District. The District is also working with Camp Pendleton (CPEN) to resolve longstanding litigation over the other Santa Margarita River water rights in order to provide the District with water supplies from the River. The only other source of potable supply for the District is one groundwater well near Red Mountain Reservoir.

In addition to potable supplies, the District has been producing and selling recycled water since 1991. Currently on average about 30% of wastewater treated by the District each year is sold as recycled water. After improvements are completed at the WWTP to improve the reliability of the recycled water system, the District will continue to look at expanding the number of users. A summary of the overall mix of District water supplies from 2005 – 2010 is shown in Figure 1-1. As shown in Figure 1-1 Imported water from SDCWA remains the primary supply.

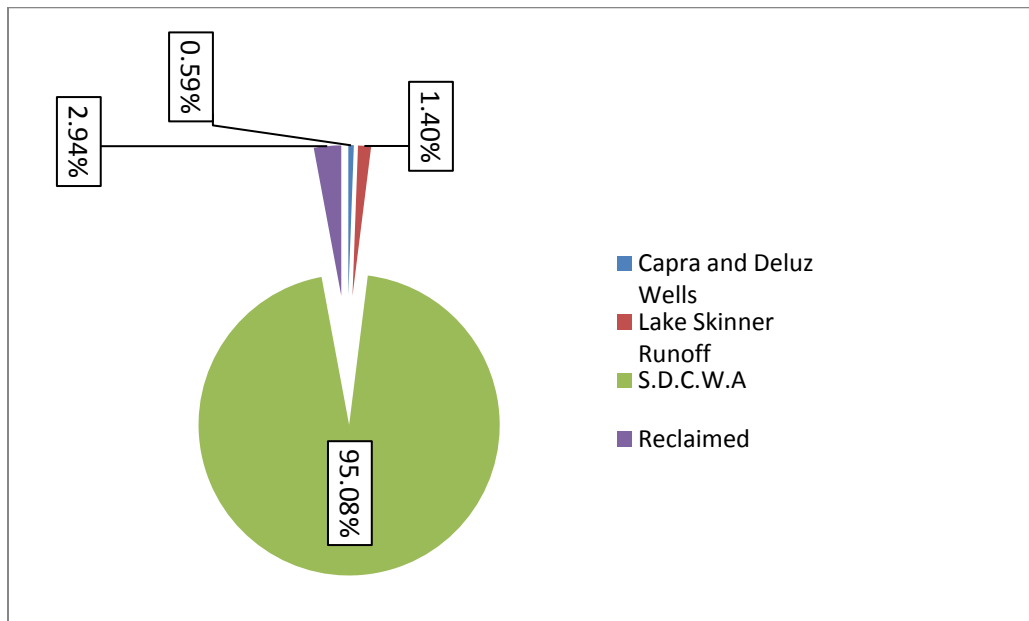


Figure 1-1 : District Water Supply Mix 2005-2010

1.1 Historical Water Supplies

FPUD was organized in 1922 and began supplying water in 1925. Originally the District relied 100% on water diverted from the Santa Margarita River. A small pump directly diverted water from the river. The District licensed this diversion in 1931. This diversion continued through 1970 when the pump was washed out during floods. It was never reconstructed and the license was revoked due to lack of use. The District also constructed groundwater wells outside of the District boundaries in the San Luis Rey basin in what is now part of the Rainbow MWD near Gird and Interstate 76. This operation continued until 1954 when imported water was made available from the San Diego County Water Authority (SDCWA) at lower cost and the operation of the wells was discontinued. No water rights were ever obtained for these wells and the District no longer owns the wells or the property. In 1990 the District took over the Deluz water District which held a set of groundwater wells on Deluz Creek. The District operated these wells until 1995 when operations were stopped due to water quality problems. The wells are still owned by the District but have not been maintained and require significant rehabilitation. No water rights were ever obtained for these wells. In 1991 the District acquired the an existing well near Red Mountain Reservoir (Capra Well). The well has been in operation by the District since 1991, except for necessary shutdowns during 2009 and 2010 during construction of the UV facility at Red Mountain Reservoir. Figure 1-2 summarizes the water supply sources utilized by the District from 1925 to 2010.

Year	Santa Margarita River Diversion	San Luis Rey Groundwater Wells	Capra and Deluz Wells	Lake Skinner Runoff	SDCWA	Reclaimed	Total Production
1925	2.3						2.3
1926	11.3						11.3
1927	12.2						12.2
1928	15.3						15.3
1929	21.7						21.7
1930	21.3						21.3
1931	21.6						21.6
1932	24.6						24.6
1933	45.2						45.2
1934	70.5						70.5
1935	59.2						59.2
1936	84.5						84.5
1937	79.1						79.1
1938	98						98
1939	106.7	33.7					140.4
1940	140.7	298.3					439
1941	126.5	878.4					1004.9
1942	191.1	841.4					1032.5
1943	228.7	853.9					1082.6

Year	Santa Margaritta River Diversion	San Luis Rey Groundwater Wells	Capra and Deluz Wells	Lake Skinner Runoff	SDCWA	Reclaimed	Total Production
1944	139	882.3					1021.3
1945	157	1186.7					1343.7
1946	63	372.2					435.2
1947	94	0					94
1948	58	1601.9			2330.2		3990.1
1949	208	2599.8			1821.4		4629.2
1950	343.6	1375.6			4073		5792.2
1951	858.2	2218.6			3467		6543.8
1952	856	2641			2146		5643
1953	1746.5	1499.6			4565		7811.1
1954	875	10.6			6630		7515.6
1955	1065				7107		8172
1956	999.5				7479		8478.5
1957	1309.6				5539		6848.6
1958	950				7103		8053
1959	861.7				9746		10607.7
1960	215.9				7445		7660.9
1961	248.7				10938		11186.7
1962	168.9				8938		9106.9
1963	102.7				10557		10659.7
1964	75.2				11193		11268.2
1965	242.5				9814		10056.5
1966	23.3				11462		11485.3
1967	0.2				9701		9701.2
1968	396.9				12118		12514.9
1969	129.7				9008		9137.7
1970					11910		11910
1971					11465		11465
1972					13356		13356
1973					11221.5		11221.5
1974					21742		21742
1975					11584		11584
1976					13477		13477
1977					12378		12378
1978					11265		11265
1979					12344		12344

Year	Santa Margaritta River Diversion	San Luis Rey Groundwater Wells	Capra and Deluz Wells	Lake Skinner Runoff	SDCWA	Reclaimed	Total Production
1980					12895		12895
1981					14411		14411
1982					10472		10472
1983					9948		9948
1984					13060		13060
1985					12830		12830
1986					12001		12001
1987					11414		11414
1988					12465		12465
1989					14893		14893
1990					17779		17779
1991			158		12574	12.9	12744.9
1992			224.1		13374	12.4	13610.5
1993			268.3		12675	5.7	12949
1994			213.2		12825	51.4	13089.6
1995			170		12168.3	393	12731.3
1996			176		13246.2	651	14073.2
1997			127		14452.6	860	15439.6
1998			74		11859.1	620	12553.1
1999			147		15877.9	700	16724.9
2000			171		16150.3	634	16955.3
2001			165		14797.1	468	15430.1
2002			157		17857.1	408	18422.1
2003			135		16583.0	353	17071
2004			134		18170.6	397	18701.6
2005			138	1261	15202.5	365	16966.5
2006			178	106	18298.3	485	19067.3
2007			140	0	20451.9	423	21014.9
2008			133	16	15102.8	521	15772.8
2009			0	0	14617.5	675	15292.5
2010			0	20	11757.1	477	12254.1

Figure 1-2: District Water Supplies (1925 – 2010)

Since 1947 the District has been in litigation with the federal government for development of the three District owned water rights on the Santa Margarita River. In 1986 on appeal, the federal judge ordered that Camp Pendleton and FPUJ jointly develop a physical solution that allows equitable use of the water available in the Santa Margarita River. Both parties pursued development of a dam and water supply project with the Bureau of Reclamation, which was abandoned in 1987 due to environmental concerns. Since that time, the parties have pursued a groundwater storage project which would expand facilities on Camp Pendleton to divert river flows to subsurface storage and deliver water to FPUJ. The parties have recently made progress on this effort and are in the process of developing a joint Environmental Impact Report/Statement (EIR/EIS) in conjunction with the Bureau of Reclamation that will be completed in 2013. The project is anticipated to be completed by 2015/16.

The District initiated recycled water development in 1990 by agreeing to supply the California Department of Transportation (Caltrans) irrigation water for landscaping along Interstate 76 from the District's Ocean Outfall which runs from the Wastewater Plant in Fallbrook to the ocean. Over the years the District added nurseries, home owner associations and athletic field customers to the system. The District currently serves 12 users from a recycled distribution system in Fallbrook and 2 users off the outfall including Caltrans.

1.3 Water Supply Development

The District continues to explore the following alternatives for water supply development:

1. Groundwater
2. Lake Skinner Runoff Water
3. Santa Margarita River Conjunctive Use Project
4. Reclaimed Water

1.3.1 Groundwater

The District peak year of groundwater production was 1949 in which 2,600 AF were produced from wells the District owned outside its service area in the the San Luis Rey Basin. This was over 50% of the Districts needs that year. Groundwater production capabilities were significantly limited after the District abandoned these facilities in 1954 when upstream agricultural uses resulted in poorer water quality and imported water from SDCWA was plentiful and inexpensive. Since the San Luis Rey well facilities are outside the District, and no water rights were developed it is likely not feasible to recover this lost groundwater production. Much of the groundwater in the Santa Margarita River Basin and San Luis River Basin is subject to water rights appropriations for larger diversions as the State has determined that the surface flows and groundwater flows are connected in these basins which gives the State jurisdiction over these flows. As these basins are fully appropriated, this makes it difficult to acquire new groundwater sources in these basins.

Within the District boundaries there are no substantial groundwater aquifers, which is why the original San Luis Rey facilities were constructed outside the District boundaries. As shown on the attached Figure 1-3, which was developed by the San Diego County Water Authority (San Diego County Water

Authority, 2010), the District's Service area does not overly any significant groundwater basins. The District overlay's geology that is primarily fractured rock, which is similar to the majority of San Diego County. Unlike traditional alluvial aquifers, fractured rock has limited pore space for water storage and is generally not suitable for large volumes of storage and diversion (California Department of Water Resources, 2011).

Currently, the District's only groundwater supply is a single well that produces up to 170 AFY of groundwater. This well is also adjacent to Red Mountain Reservoir which has a permeable asphalt liner, so the Capra well is likely influenced by some underflow from the reservoir. The District also owns three wells in Deluz, but the District stopped operation of the Deluz wells in 1995 due to water quality concerns. These wells had produced up to 100 AFY of additional groundwater supplies. As imported water costs continue to rise, it may be economical to rehabilitate these wells and install well head treatment to address the water quality issues. Since the wells pump from a small alluvium basin adjacent to the river, there are potential water rights implications of operating these wells, so the District would need to ensure that downstream users (Camp Pendleton) would not object to initiating operation of the wells. Due to the lack of alluvial aquifers underlying of the District service area, development of groundwater would not significantly reduce imported water needs, but it continues to play a minor role in diversifying supplies. In order for the District to maximize potential groundwater supplies, the District should explore bringing the Deluz wells back into service.

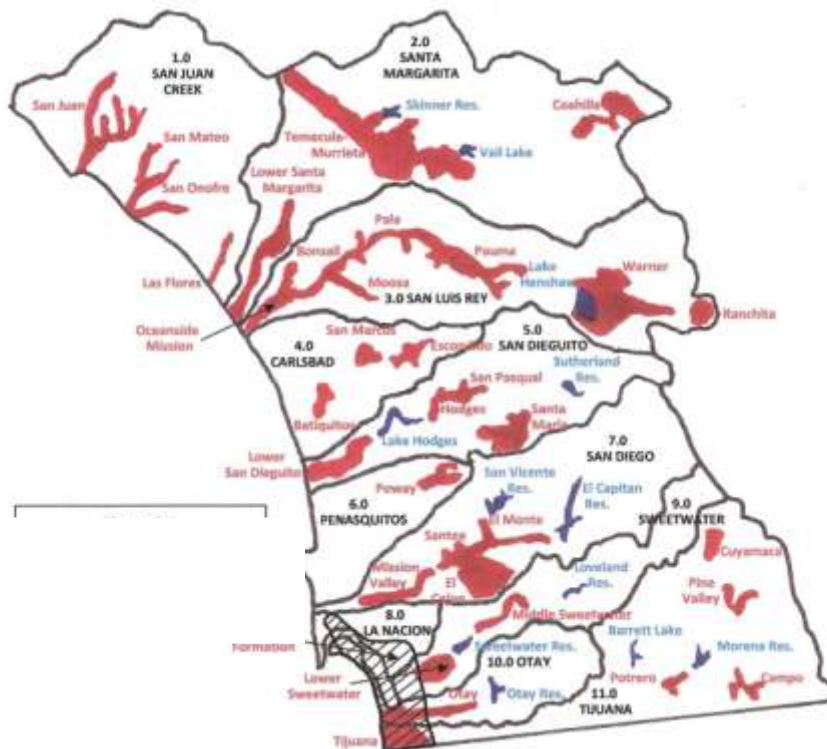


Figure 1-3 Groundwater Basins in San Diego County (From Proposed Guidelines for Salinity/Nutrient Management Planning in the San Diego Region)

1.3.2 Lake Skinner

In 2005, the District relocated a water rights permit from the District property on the Santa Margarita River to Lake Skinner. The District had a water rights permit but no mechanism for storage and diversion and MWD had a mechanism for storage and diversion, but no water rights permit. By relocating the permit, the District could store and deliver imported water from Lake Skinner. In 2005, when the District finalized all the required approvals to receive local runoff water from Lake Skinner it was estimated that every ten years a large wet year would produce up to 10,000 AF of runoff so the average amount of water would be 1,000 AFY. Based on actual deliveries from MWD to the District from Lake Skinner from 2005 – 2011, the amount of water available has been much less than projected and has averaged only 241 AFY. Not all of the runoff into the lake is available to the District. There is an amount that must be released to protect downstream water rights and an amount that must be released based on environmental requirements. Based on a review of historical data, if FPUD has relocated their permit to Skinner since 1975, the annual estimated diversion would have been 733 AFY on average, with the majority of water coming in a few very wet years (See Figure 1-4).

Water Year	Lake Skinner Precipitation, inches	Computed Local Runoff, acre feet	Required Release, acre feet	Projected FPUD Diversion, acre feet
1975	9.97	15	14	0
1976	8.13	3	3	0
1977	4.08	3	3	0
1978	NR	NR	NR	NR
1979	NR	NR	NR	NR
1980	19.40	13,162	1,334	10,000
1981	8.31	802	377	421
1982	13.36	495	338	157
1983	19.50	1,652	681	957
1984	4.23	91	80	10
1985	9.17	145	119	19
1986	13.15	269	221	47
1987	7.99	4	4	0
1988	10.02	0	0	0
1989	5.83	0	0	0
1990	6.96	0	0	0
1991	14	938	133	805
1992	14	0	0	0
1993	26	8487	1339	7149

1994	13	1010	557	438
1995	20	3218	932	2286
1996	8	35	88	0
1997	10	4	4	0
1998	24	1746	487	1258
1999	6	6	6	0
2000	7	4	4	0
2001	9	0	0	0
2002	3	0	0	0
2003	15	0	0	0
2004	7	0	0	0
2005	23	3935	770	3166
2006	8	398	292	106
2007	3	0	0	0
2008	14	163	132	16
2009	9	0	0	0
2010	13	176	156	20
2011	18	735	451	285
Average	11.5	1071	243	775

- Values in Italics are projected based on data, values from 2006 to 2010 are actual. Diversions started part way through 2005.

Figure 1-4 – District Lake Skinner Diversions (Actual and Projected)

The District in conjunction with MWD is currently working on improving the accuracy of the quantification of runoff into the Lake. In addition, the District will be exploring modifications to the required release for environmental concerns since the past adopted release criteria has been overridden by concerns over Quagga mussel control. These efforts should result in the District maximize the availability of this resource which provides a lower cost water supply.

1.3.3 Santa Margarita River Conjunctive Use Project

The Santa Margarita Conjunctive Use project would provide the “physical solution” to settle the long standing water rights litigation between the United States Government and the District. The project would expand existing diversion facilities on Camp Pendleton to capture large storm events and recharge the aquifers on Camp Pendleton. This stored groundwater would then be pumped by Camp Pendleton and delivered to the District. Figure 1-5 shows the proposed project facilities which include facilities to divert surface flows on Camp Pendleton, groundwater recharge ponds, groundwater production facilities, groundwater treatment and distribution piping and pump stations to deliver water to Red Mountain Reservoir. Once the water is delivered to Red Mountain Reservoir it would blend with other imported supplies and then be delivered to District customers. The amount of water available will be based on the amount of runoff into the river for each year type. A determination of the hydrological

Range of Winter-time Streamflow (AF)	Hydrologic Condition	Number of Years Hydrologic Condition Occurs During MY 1-50
> 57,700	VW - Very Wet	9
57,699 to 14,700	AN - Above Normal	15
14,699 to 7,600	BN - Below Normal	14
< 7,599	VD - Very Dry	5
2 or more Very Dry Years in a row	ED – Extreme Drought	7

Note 1: Winter-time streamflow calculated as the total October 1 through April 30 Santa Margarita River streamflow at the point of diversion. This hydrologic condition is based on future streamflow, including corrections for diversions and augmentations.

Note 2: The “Extreme Drought” condition only occurs following the second consecutive Very Dry year. While there is a volume cut off for VW, AN, BN, and VD, there is an antecedent condition required for the Extreme Drought condition.

Figure 1-6: Delineation of Hydrologic Condition Based on Future Winter-time Streamflow for the 50-Year Model Period

Month	Water Year Type				
	ED	VD	BN	AN	VW
May	0	0	60	600	740
June	0	0	60	600	650
July	0	0	60	500	550
August	0	0	60	400	450
September	0	0	60	300	350
October	0	0	150	230	350
November	0	0	150	230	400
December	0	115	150	360	500
January	0	115	150	450	550
February	0	115	150	455	590
March	0	115	150	495	590
April	0	120	100	500	600
TOTAL	0	580	1300	5120	6320

Figure 1-7: Proposed Deliveries to Fallbrook PUD Based On The 50-year Model Period and Hydrological Year Type (Acre-Feet per Month)

1.3.4 Reclaimed Water

The District started serving reclaimed water in 1991. The recycled sales peaked in 1997 at 860 AFY and has varied from 350 AFY to 675 AFY over the last few years. A summary of annual sales is summarized in Figure 1-8. The wide fluctuations in annual recycled sales does not trend with water sales or rainfall conditions and is currently not completely understood.

Year	Recycled Sales (AFY)
1991	12.9
1992	12.4
1993	5.7
1994	51.4
1995	393
1996	651
1997	860
1998	620
1999	700
2000	634
2001	468
2002	408
2003	353
2004	397
2005	365
2006	485
2007	423
2008	521
2009	675
2010	477

Figure 1-8 – District Recycled Sales

The District is currently not expanding the recycled water system until key improvements are completed at the WWTP to improve reliability of the recycled system. The District had identified a potential of 150 AF of additional recycled demands and is completing a more comprehensive evaluation of potential recycled users as identified in Chapter 2.

1.3 Projected Water Demands and Supplies

As outlined in the District’s 2010 Urban Water Management Plan (UWMP) which is based on water demand projections from the San Diego Association of Governments (SANDAG), the District expects water demands to increase from 12,320 AFY in 2010 to 18,313 in 2035 or by approximately 240 AFY annually. The District’s goal is to add another 3,100 AFY or local supply through the conjunctive use

project and 150 AFY of recycled supplies. A summary of the projected demand and planned water supplies based on the UWMP are outlined in Figure 1-9.

Projected water supply sources	2010	2015	2020	2025	2030	2035
Imported Water	11,757	10,029	10,904	12,145	13,284	14,074
Groundwater supplier: Santa Margarita River	0	3,100	3,100	3,100	3,100	3,100
Groundwater supplier: local wells in Fallbrook	0	100	100	100	100	100
Surface diversions: rainfall into Lake Skinner	20	300	300	300	300	300
Recycled water	543	611	639	689	739	739
Total	12,320	14,140	15,043	16,334	17,523	18,313

Figure 1-9: Planned Sources of Water Available to the District (Average Year)– AF/Y

As identified in the District’s 2010 Urban Water management Plan under drought conditions the District’s water needs will be met primarily from imported water from the SDCWA and continued recycled supplies. The other supplies for FPUD are largely tied to local rainfall and are not drought proof supplies. These supplies will help protect against cutbacks when conditions result in cutbacks in imported supplies. However; if drought conditions exist in both the Santa Margarita Basin and imported water basins, the District will not receive local supplies, so the District will continue to rely on SDCWA for water supplies during extended droughts that occur in both local and imported water basins.

References

California Department of Water Resources, 2011; www.water.ca.gov/drought/docs/water_facts_1.pdf.

San Diego County Water Authority, 2010; Proposed Guidelines for Salinity/Nutrient Management Planning in the San Diego Region.

Fallbrook Public Utilities District, 2010; Urban Water Management Plan.