



MWD

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

***Skinner Service Area Study
2003 Update***

February 2004

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MWD Skinner Service Area Study Update 2003

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Executive Summary

This report updates the June 2002 *Skinner Service Area Study*, covering the period from July 2002 through December 2003 and provides information regarding facilities needed to meet raw as well as treated water demands. The principal short-term and long-term recommendations of this study are summarized below.

Short-term recommendations

- Metropolitan will reevaluate the construction schedule of regional facilities consistent with Metropolitan's System Overview Study and capital investment policies, if local capital facility plans of the Skinner member agencies change significantly in the future.
- By the end of 2004, Metropolitan will complete a Riverside County Treated Water Supply Study that will address utilization of excess capacity at the Mills Treatment Plant and the potential need for the Central Pool Augmentation Water Treatment Plant to meet Riverside County demands.
- Metropolitan will continue to provide support, as needed, to SDCWA staff for its rate impact study and other planning activities.
- Metropolitan will continue to hold monthly operations meetings between Metropolitan and the affected member agencies in the Skinner service area to coordinate operational strategies to meet peak demands.
- Metropolitan and SDCWA will implement the Surface Storage Operating Agreement with SDCWA to alleviate peaks on the Skinner FP.
- Metropolitan will continue publication of the bi-monthly Skinner Area Update to keep Metropolitan and member agency staff abreast of planning and operational issues.
- Metropolitan will continue to distribute the daily operational status report the Skinner agencies.

Long-term recommendations

- Because of Metropolitan's role as the regional supplier of supplemental water and due to the potential shortfall of regional treatment capacity identified under the sensitivity analysis, Metropolitan should immediately begin the evaluating

alternatives to meet projected demands in the southwestern Riverside and San Diego counties. Metropolitan shall prepare a report discussing the alternatives planned considering relevant local conveyance and treatment actions and critical milestones by December 2004. The alternatives shall consider the construction and operation of additional treatment capacity in Riverside County by Metropolitan in or about 2012.

- Metropolitan and the Skinner member agencies should continue to coordinate on the long-term treatment capacity need for the Skinner service area.
- When Metropolitan constructs additional treatment capacity, additional conveyance capacity to deliver treated water to meet demands in southwestern Riverside and San Diego counties will be required. Metropolitan should immediately proceed with design of the remaining portions of San Diego Pipeline 6, within Riverside County, and the necessary modifications for conversion of San Diego Pipeline 3 to treated water service to coincide with the completion of the new treatment capacity. SDCWA should schedule its portion of San Diego Pipeline 6 to coincide with the completion of Metropolitan's portion of San Diego Pipeline 6 and proceed with necessary design and acquisition of right-of-way contemporaneous with Metropolitan's actions.

Although Skinner service area treated water demands during the summer of 2003 were not as high as those in the summer of 2002, raw water demands in 2003 have been comparable to those in 2002. Also, the outlet conduit flow on August 13, 2003, of 1,490 cfs, set a new record, and the peak Robert A. Skinner Filtration Plant (Skinner FP) effluent on July 10, 2002, of 820 cfs (530 MGD) was comparable to the record of 821 cfs set on July 20, 2000.

While implementing both the short-term and long-term recommendations of the Skinner service area studies, Metropolitan and the affected member agencies have continued to manage peak demands at the Skinner FP. With implementation of the Skinner FP expansion (Module 7) as well as implementation of the long-term recommendations of this study, Metropolitan will continue to reliably meet the firm water demands of its member agencies in the Skinner service area.

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Background

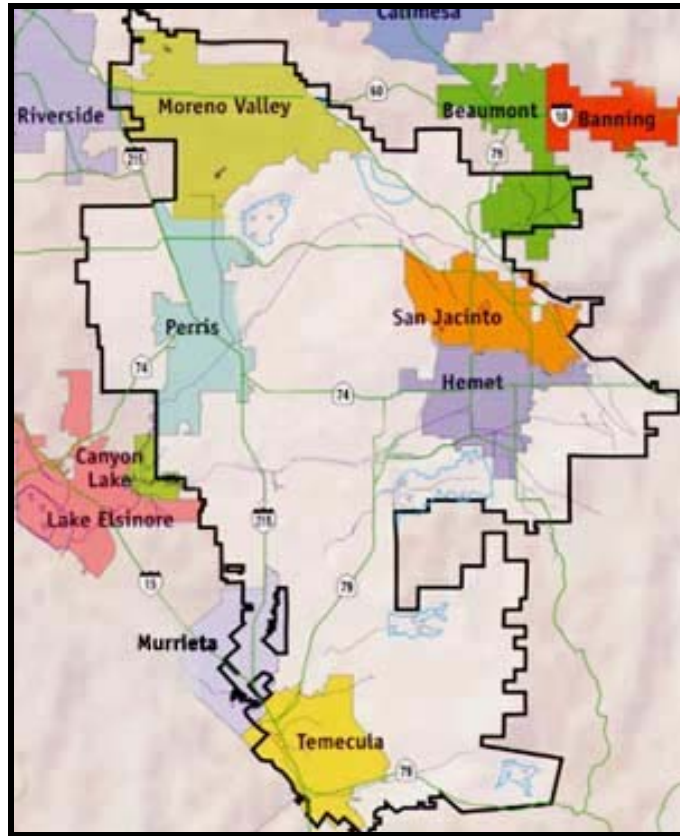
The R.A. Skinner Filtration Plant (Skinner FP) began operation in 1976 to supply treated water to Riverside and San Diego Counties. Metropolitan's member agencies that receive water from the Skinner FP include Eastern Municipal Water District (EMWD), Western Municipal Water District of Riverside County (WMWD) and San Diego County Water Authority (SDCWA). The Skinner FP is supplied with raw water from Lake Skinner and the San Diego Canal. The plant filters water through three conventional and three direct filtration modules. The California Department of Health Services (CDHS) has permitted operation of the Skinner FP at a design capacity of 520 million gallons per day (MGD), or 804 cubic feet per second (cfs) under normal operating conditions. The usable design capacity of the Skinner FP is limited to 765 cfs because approximately 40 cfs of backwash water must be returned to the head of the plant for treatment. Metropolitan may request that the Skinner FP be allowed to operate above its rated capacity, based on a number of factors including influent water quality, effluent water quality and filter loading rates. The absolute maximum flow rate CDHS will allow through the Skinner FP is 1,000 cfs; however, this flow rate has never been achieved under field operating conditions. Based on several years of operational experience, Metropolitan has achieved a maximum effluent flow rate of 820 cfs (530 MGD).

Eastern Municipal Water District Service Area

EMWD provides water to the cities of Hemet, San Jacinto, Moreno Valley, Perris, and portions of Murrieta, Temecula, Riverside, and unincorporated areas of Riverside County. Metropolitan delivers both treated and untreated water to EMWD, with treated water delivered from both the Henry J. Mills Filtration Plant (Mills FP) and from Skinner FP. EMWD provides water to Rancho California Water District (RCWD) in the Temecula area. The EMWD service area is divided by EMWD into four sub-areas covering the western region of Riverside County. Division of the four sub-areas is based on location, water resources, water demands, and other factors. Interconnected transmission pipelines allow for limited operational flexibility to move water between sub-areas. EMWD is one of five member agencies that comprise the Santa Ana

Watershed Project Authority (SAWPA). Figure 1 illustrates the service area boundary of EMWD.

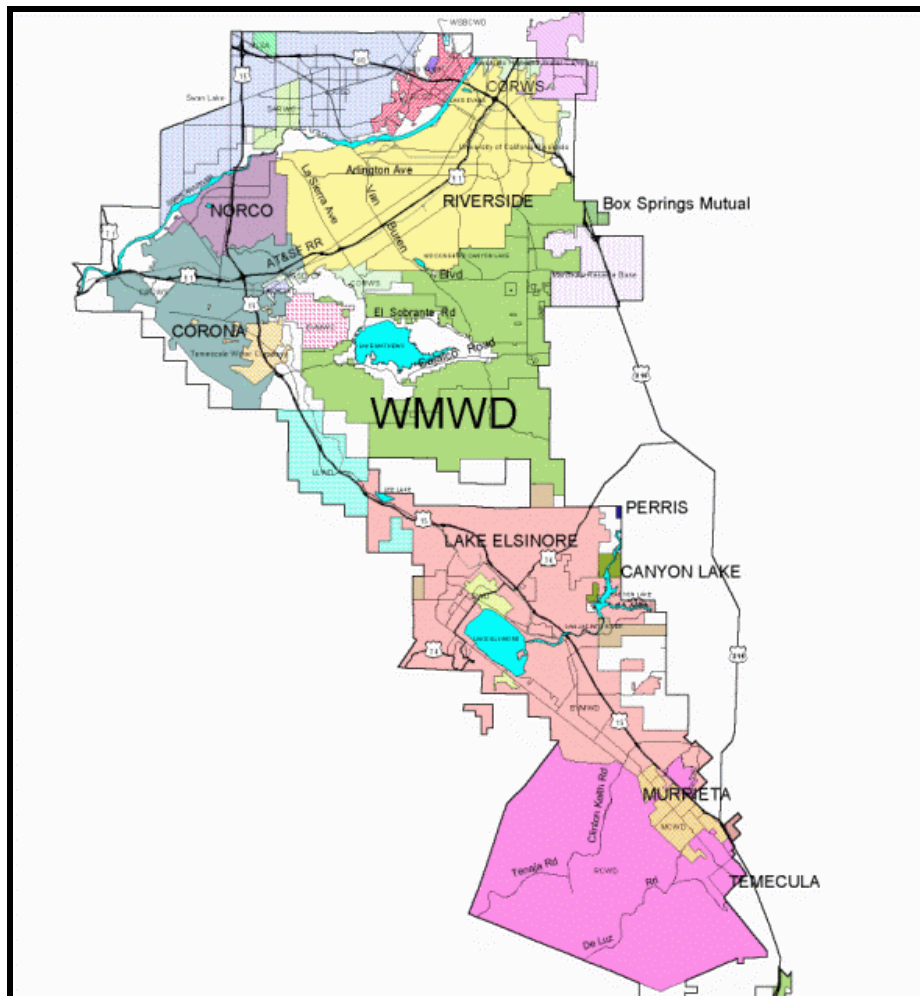
Figure 1. EMWD's Service Area



Western Municipal Water District of Riverside County Service Area

WMWD provides water to the cities of Corona, Norco, and Riverside, and the unincorporated areas of El Sobrante, Eagle Valley, Temescal Creek, Woodcrest, Lake Mathews, and March Air Force Base. WMWD also provides water to Elsinore Valley Municipal Water District (EVMWD) and RCWD. Metropolitan delivers both treated and untreated water, with treated water delivered from both Mills FP and Skinner FP. WMWD is also a member of SAWPA. Figure 2 illustrates the service area boundary of WMWD.

Figure 2. WMWD's Service Area



San Diego County Water Authority Service Area

SDCWA provides service to 23 member agencies. Metropolitan delivers both treated and untreated water to SDCWA via five pipelines utilizing nine service connections. Figure 3 illustrates SDCWA's service area and member agencies.

Figure 3. SDCWA's Service Area



San Diego County Hydrology

During most of the winter, through March, SDCWA's member agencies rely on rainfall to fill their reservoirs, minimizing imported deliveries to storage. The highest precipitation occurs in the months of January through March. Thus, reservoir managers historically delay taking delivery of imported water until the middle to end of March before

purchasing Seasonal Storage Service water for reservoir storage, in anticipation of filling their reservoirs from the season's precipitation. During dry hydrology, the current mode of reservoir operations leaves little time for complete reservoir storage, resulting in low storage supplies for the following summer. Table 1 presents the San Diego Airport average monthly precipitation.

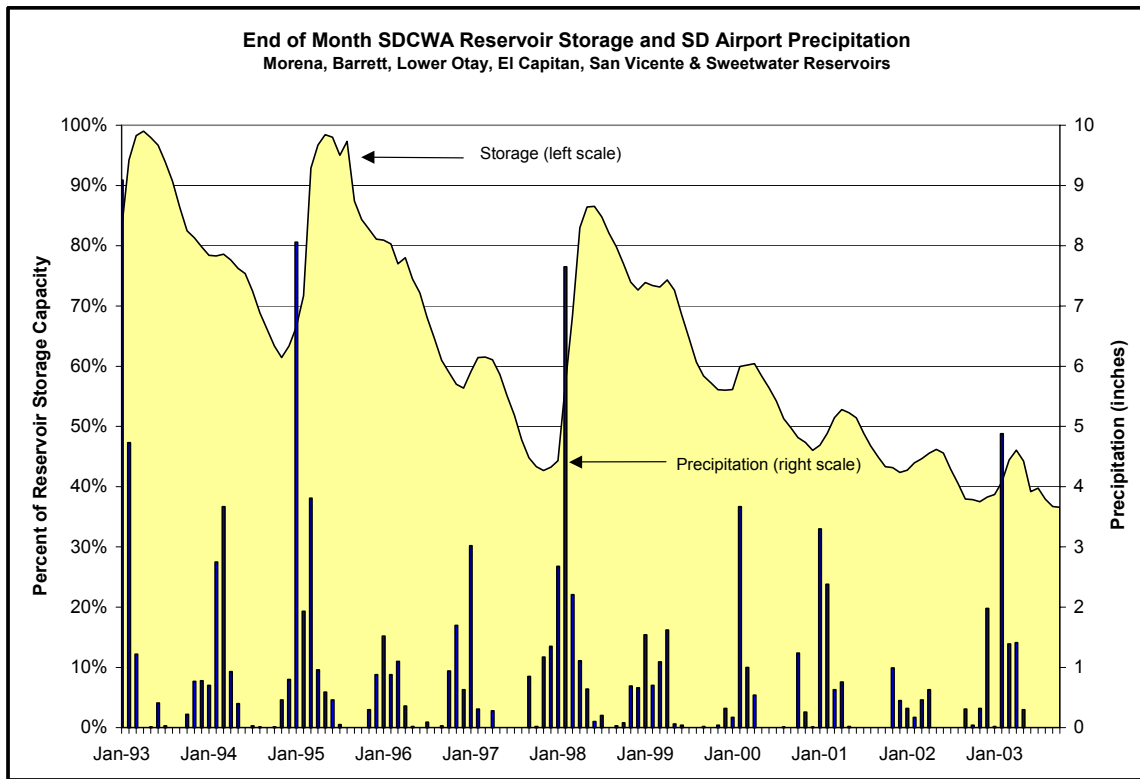
Table 1. San Diego Average Airport Average Monthly Precipitation

SD Airport Normal Precipitation, inches (1961-2000) ¹			
Jan	2.08	Jul	0.03
Feb	1.83	Aug	0.07
Mar	1.90	Sep	0.21
Apr	0.74	Oct	0.35
May	0.17	Nov	1.20
Jun	0.08	Dec	1.41

Figure 4 illustrates the percent capacity of six of San Diego's major reservoirs and local precipitation. The current cumulative storage has dropped to levels lower than the levels experienced during the 1986-1992 droughts, which is of major concern due to the peaking demands anticipated at the Skinner FP during the summer months.

¹ Data taken from National Weather Service website: www.wrh.noaa.gov

Figure 4. End of Month SDCWA Reservoir Storage and SD Airport Precipitation



Skinner Service Area Treatment Plant and Conveyance Capabilities

Skinner FP Capacity

During the summer of 2003, Metropolitan staff attended a series of workshops with SDCWA and its member agencies. As a result of questions that arose at these workshops, Metropolitan crafted a letter to SDCWA to clarify the current and future capacity of the Skinner FP with Module 7 online under both normal and maximum demand conditions. Please see Appendix D for copies of correspondence between Metropolitan and SDCWA.

The short-term maximum capacity of the Skinner FP, based on operational experience, is 530 MGD (net effluent production). This flow is based on coincident meter readings over a 24-hour period on July 10, 2002. The maximum short-term net effluent capacity of the Skinner FP had been previously reported as 550 MGD (580 MGD total production), in a letter addressed to SDCWA, dated September 8, 2003. The discrepancy occurred because the 550 MGD value for net effluent capacity was based on non-coincident readings over the same 24-hour period for the three treated water effluent master meters, i.e., the 550 MGD value was computed based on maximum daily flow meter readings that did not occur simultaneously over a 24-hour period. It should be emphasized that this value should not be used for planning purposes because it is a short-term maximum that occurred under a favorable set of conditions, e.g., good water quality.

Table 2 presents the Skinner FP capacities. Design capacity is defined as the reliable nominal capacity under all anticipated water quality conditions and routine operating procedures. Approximately 5 percent of the plant influent flow is recycled for backwashing purposes. The short-term maximum capacity is defined as the absolute maximum throughput potential of the facility, as limited by the hydraulic grade requirements of the filtration plant, source water quality, or the maximum allowable filtration rate of 10 gallons per minute per square foot. Several years of operational experience have indicated that, under ideal conditions, the short-term maximum capacity of the plant is approximately 580 MGD or 550 MGD of net effluent production.

Table 2. Skinner FP Capacity

Skinner FP Capacity		
	MGD	cfs
Design, net effluent	495	765
Short-Term Max	530	820
Design, w/Module 7, net effluent	600	928
Short-Term Max	655	1,014

Re-rating of San Diego Pipeline 4

Based on actual treated water deliveries during peak demand periods the last two summers, Metropolitan's Engineering staff reevaluated the capacity of SD Pipeline 4. The design capacity of SD Pipeline 4 where it leaves the Skinner FP was 430 cfs. As designed, 50 cfs of that capacity was designated for delivery in Riverside County, and the remaining 380 cfs was for delivery to SDCWA. Over the years, however, the combined constructed capacity of the service connections on SD Pipeline 4 has grown to 665 cfs. Two concerns have been stated regarding attempting to operate the pipeline at such a high capacity. The first concern is simply whether there is sufficient pressure to deliver that much water through the pipeline. Experience has shown that, depending on plant flows and how the water is distributed through the member agency's system, high flow rates in the pipeline cannot be maintained. The second concern is the potential deterioration of the pipeline lining due to high flow velocities.

On June 18, 2002, actual flow through SD Pipeline 4 peaked at about 580 cfs leaving the plant. At that time, 105 cfs was being delivered to RCWD, and 475 cfs was being delivered to SDCWA. In order to maintain this flow, the Skinner FP had to operate at 820 cfs, 7 percent over its net design effluent capacity. However, because the plant was able to maintain short-term operations at this high level, no loss or decrease in service to the member agencies occurred. It has therefore been ascertained that the ability to maintain high flows in SD Pipeline 4 is more directly related to Skinner FP operations and the level of water in the clearwell than to pipeline configuration and operation.

At a flow rate of 580 cfs (105 to RCWD and 475 to SDCWA), the highest velocity in SD Pipeline 4 is 12.9 feet per second. This velocity should not cause any damage to the lining of SD Pipeline 4. Metropolitan's Engineering staff has therefore approved a re-rating of the delivery capacity of SD Pipeline 4 as follows:

Skinner FP to approx. Station 1700 (below RCWD)	580 cfs
Station 1700 to approx. Station 2113 (SD-7)	475 cfs

It is recommended that periodic inspections of the interior of SD Pipeline 4 be performed to ensure the integrity of the cement mortar lining.

Conveyance Pipeline Capacities

The conveyance facility capacities that serve the Skinner Service Area are provided in Table 3.

Table 3. Treated Water Conveyances

Treated Water Conveyance, cfs		
	<u>At the Plant</u>	<u>At the County Line</u>
Pipeline 1	85	85
Pipeline 2	95	95
Pipeline 4	580	475
Pipeline 3 Bypass	100	
Auld Valley Pipeline	100	
Total	960	655
Raw Water Conveyance, cfs		
	<u>At the Plant</u>	
Pipeline 3	262	
Pipeline 5	474	
Total	736	
Pipeline 6	600	

Skinner Service Area Operations; July 2002 - October 2003

The Skinner service area includes Metropolitan's service territory in San Diego County and portions of Riverside County and is defined as the area that receives treated water service almost entirely from the Skinner FP. The Skinner service area includes all of SDCWA, the southern Perris Valley, Temecula and Hemet area within the boundary of EMWD, and Murrieta, Canyon Lake and southern Lake Elsinore area within the boundary of WMWD. During low demand periods, some of EMWD's demand in the southern Perris Valley area can be met by the Mills FP, but distribution system constraints do not allow Mills FP water to reach this area during peak demand periods.

Metropolitan Water District

As recommended in the initial *Skinner Filtration Plant Study*, dated January 2001, operational meetings have continued to be held with representatives from the three Skinner area member agencies and RCWD. These meetings have focused on Skinner area operational issues, providing real-time updates on flow conditions, system operations, shutdowns and water quality. This forum has also provided an opportunity to discuss shutdowns planned by Metropolitan and the member agencies, allowing a more focused coordination of the shutdowns or outages.

Metropolitan continues to produce a daily operational status report that is distributed to member agencies and Metropolitan staff. This report provides information to the agencies that allows them to use the flexibility in their systems in order to manage the peaking on the Skinner FP.

Metropolitan also met with water treatment plant operators in the SDCWA service area in March 2003 to discuss water treatment and water quality issues common to both Metropolitan and San Diego County agencies.

In August of 2002, RCWD began taking delivery of water at Service Connection EM-20, which is located on the Pipeline 3 Bypass. The Pipeline 3 Bypass was completed in February 2002. RCWD has completed the construction of a new booster station that will allow them to increase the deliveries from EM-20 by approximately 40 cfs. This will

allow RCWD to take more water from EM-20 on the Pipeline 3 Bypass and free up additional capacity on Pipeline 4 on peak days.

In October 2003, Metropolitan began some pre-deliveries of water to the SDCWA under the Surface Storage Operating Agreement. Metropolitan entered into this storage agreement with SDCWA to store water in SDCWA service area reservoirs prior to the completion of Module 7 at the Skinner FP to alleviate short-term peaks on the Skinner FP. The agreement allows Metropolitan to deliver raw water to reservoirs during the low demand months, from November to May, and allows SDCWA to withdraw stored water according to a pre-determined schedule during the high demand summer period from June to September. There are two types of withdrawals allowed under the agreement. "schedule water" is pre-scheduled in an annual operating plan and "call water" is available to Metropolitan on an immediate basis. Both Schedule Water and Call Water are withdrawn from storage and treated by local facilities to reduce the peak at the Skinner FP. In 2003, Metropolitan, SDCWA and its participating member agencies convened an Operating Committee, according to the provisions of the agreement, and developed a schedule that would provide for approximately 70,000 acre feet (AF) of imported water to be stored in the SDCWA service area during the winter of 2003-04 for use in the summer of 2004. Approximately 4,000 AF of the 70,000 AF would be Call Water.

On August 13, 2003, the outlet conduit flow from Lake Skinner peaked at 1,490 cfs, a new all-time high flow, as shown in the Skinner FP Operation Status report in Appendix A. Plant effluent flow from the Skinner FP reached 820 cfs on July 10, 2002, which is slightly below the record high of 821 cfs set on July 20, 2000. These record-high water deliveries in the Skinner service area, experienced since 2002, continue to highlight the need for Module 7 at the Skinner FP to meet future demands and to increase treatment plant reliability.

Figure 5 and Figure 6 illustrate the 24-hr average flows in the Skinner Area for the past 3 years. Figure 5 depicts daily effluent flow from the Skinner FP and Figure 6 shows the raw water flows delivered from the Skinner complex.

Figure 5. Skinner Filtration Plant Average Daily Effluent Flow

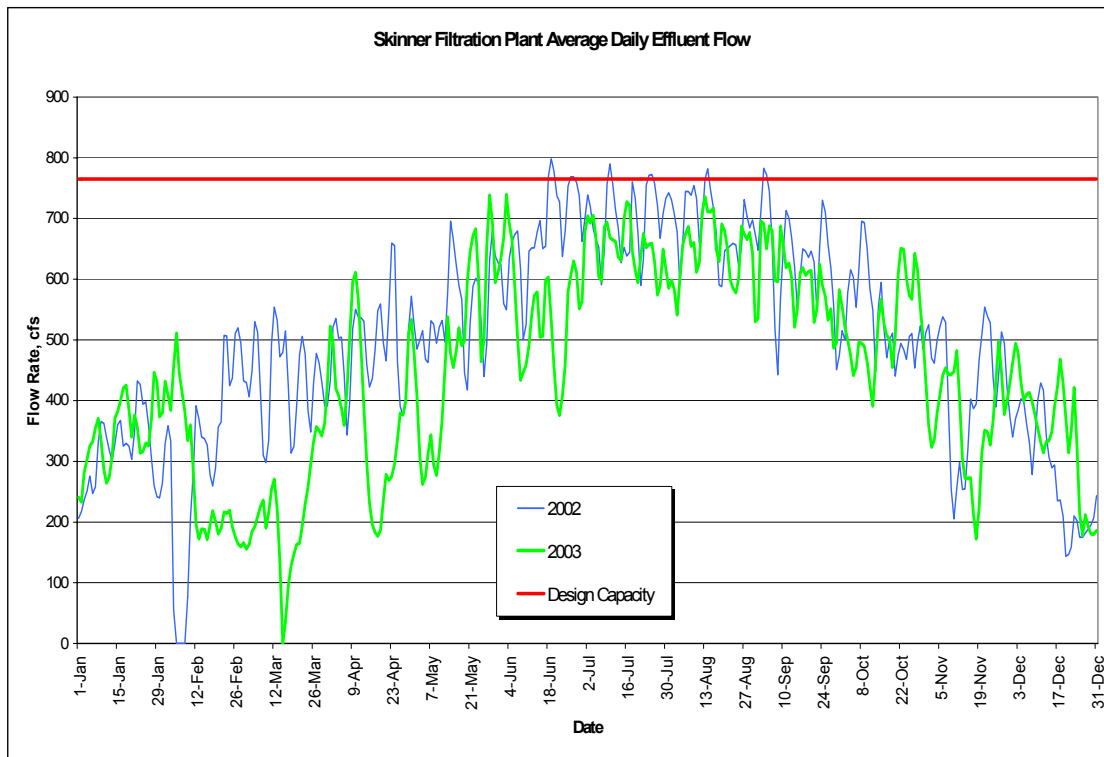


Figure 6. Skinner Average Daily Raw Water Deliveries

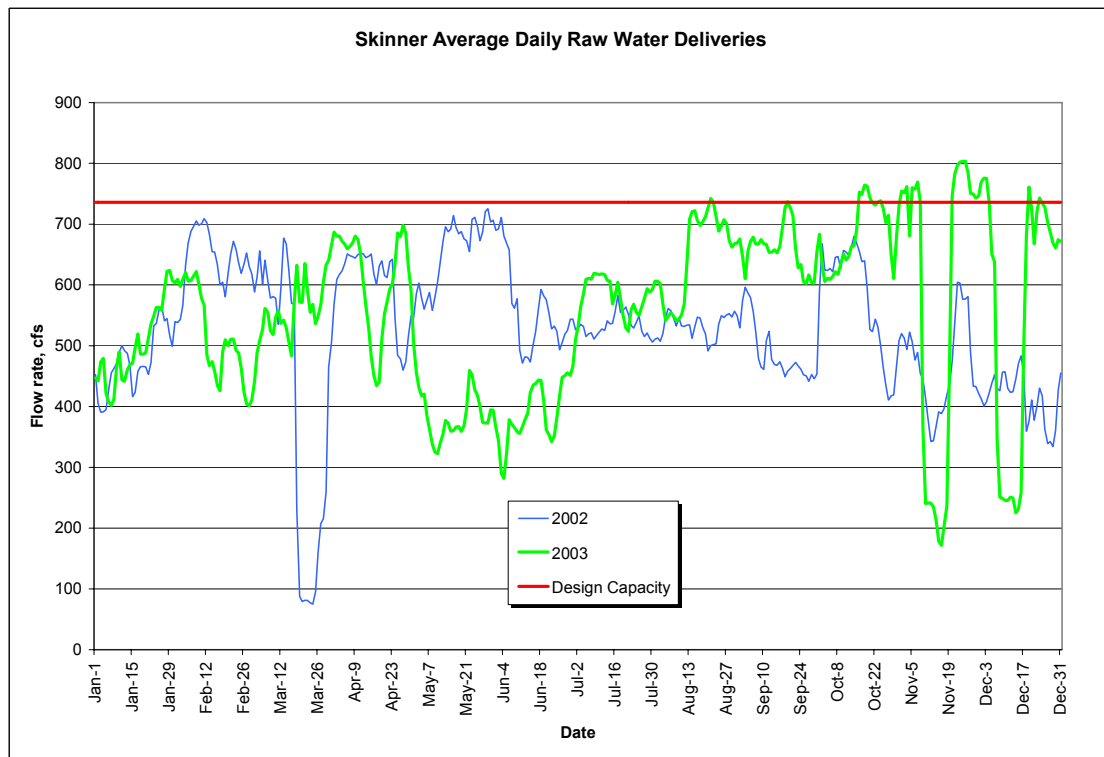


Figure 7 illustrates the 15-minute effluent flow from the Skinner FP. The graph represents the highest three-month period in calendar year 2002. There were approximately 24 days during the summer of 2002, in which the Skinner FP operated at or above design capacity; however, the duration of these flows varied from 15 minutes to 24 hours.

Figure 7. Skinner FP Average 15 minute Effluent Flows

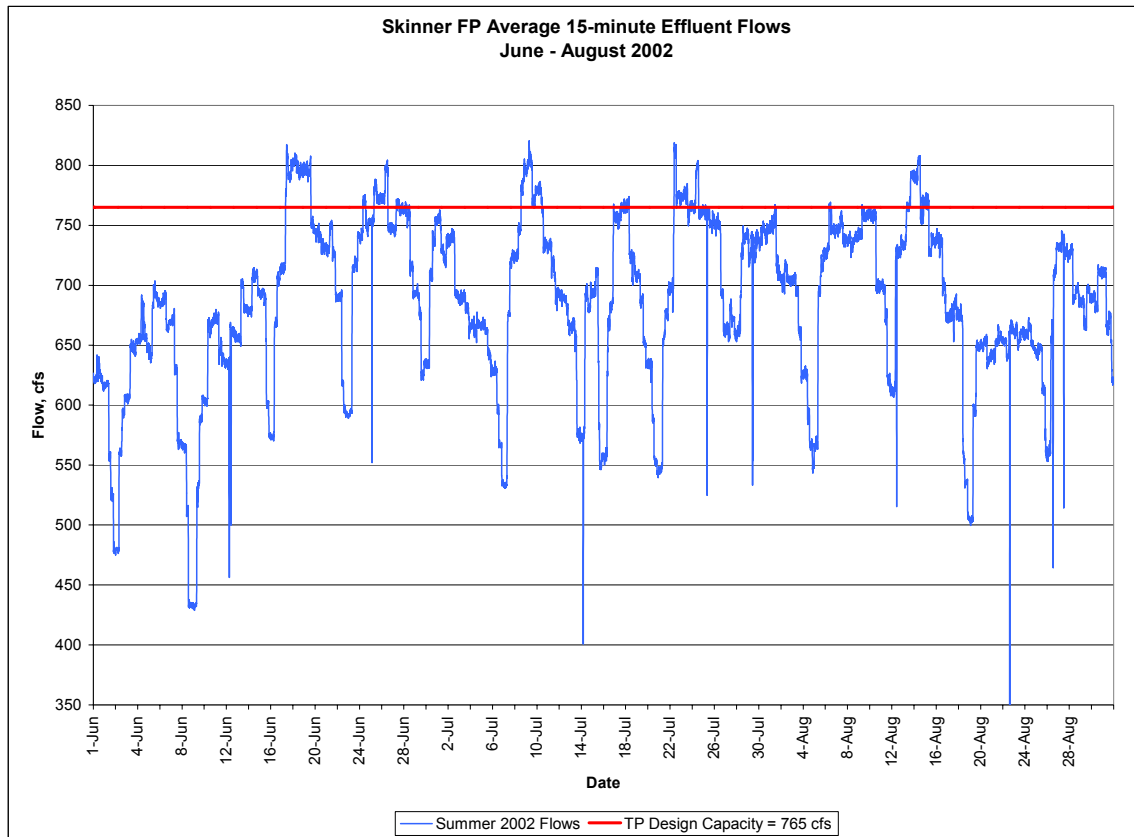
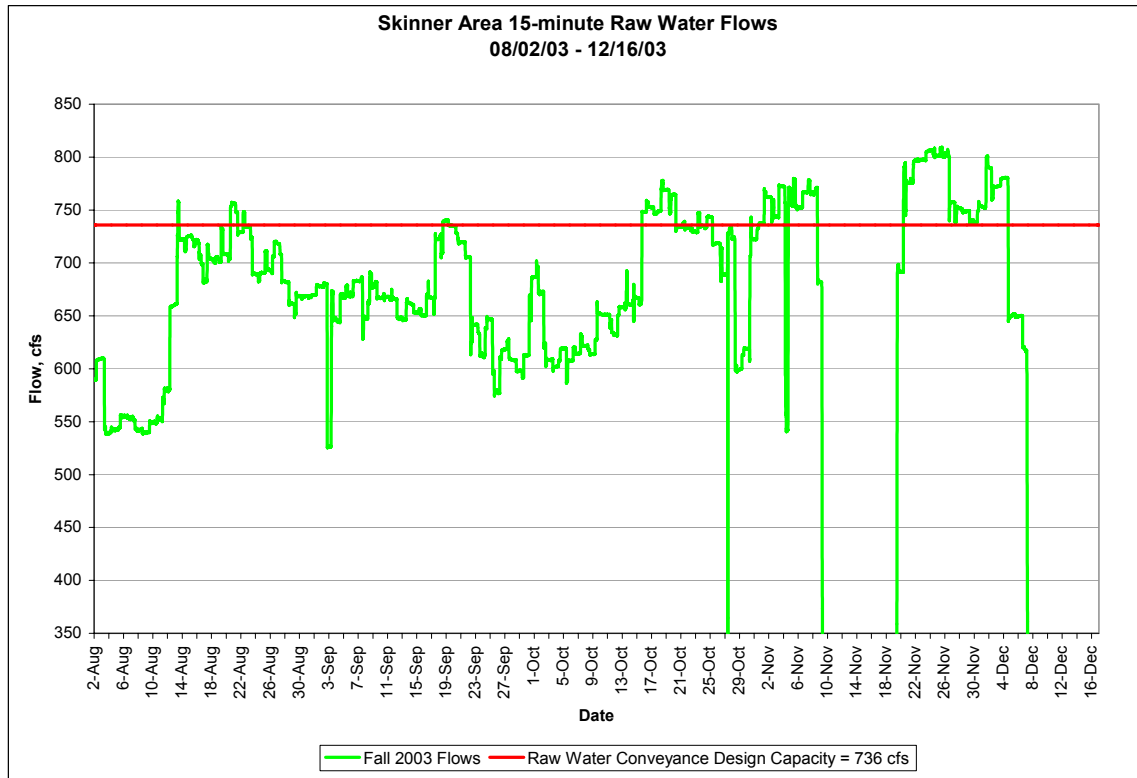


Figure 8 illustrates the 15-minute raw water flow from the Skinner service area. The graph represents the highest four-month period in calendar year 2003. There were approximately 42 days during the fall of 2003, in which the total flows through Pipelines 3 and 5 exceeded the design conveyance capacity. The high flows can be attributed in part to high demands because of the below normal precipitation in August, September, and October. The high flows in November and December were due to high demands as well as to initiating deliveries to SDCWA's reservoirs to fulfill requirements set forth in the Surface Storage Operating Agreement. The duration of these high flows varied from 4 to 24 hours.

Figure 8. Skinner Area 15-Minute Raw Water Flows



San Diego County Water Authority

The Skinner FP provides a supplemental source of treated water for SDCWA. On an annual basis, approximately 45 percent of SDCWA's demand on Metropolitan is for treated water. During dry years, however, treated water deliveries during peak periods constitute a greater percentage of the total demand. In 2000 and 2002, the average maximum day treated water delivery to SDCWA was 53 percent of the total delivery. The service connections that deliver water to the SDCWA are summarized in Appendix C.

June 2003 - SDCWA Board Adoption of Treated Water Shortage Allocation Plan

SDCWA's Shortage Allocation Plan (SAP) will effectively manage the short-term treatment capacity needs of the region and was implemented immediately to reduce treated water demand peaks during hot, dry periods. The SAP was developed by both SDCWA member agency operating heads and general managers. The SAP has several components including early notification, voluntary reallocation of available treated water, and provisions for mandatory cutbacks to all agencies receiving treated water from SDCWA. The SAP outlines; 1) an enhanced, cooperative voluntary effort to avoid peak occurrences; and 2) if voluntary measures were not successful, a SDCWA-controlled allocation process.

I. 95 Percent Notification

Notification is made to SDCWA member agencies when SDCWA reaches 95 percent of Metropolitan's net treated water delivery capacity (approximately 725 cfs). An e-mail notification will be sent to all agency operating heads and general managers notifying them of the 95 percent level and request that they employ maximum conservation efforts and operational efficiency of all distribution facilities. [Note: The 95 percent level may be a rate lower than 725 cfs if Skinner FP modules are out of service or if contact time requirements limit flow.]

II. Voluntary Reallocation of Treated Water Flows

If treated water demands exceed delivery capacity, SDCWA would complete the following:

1. Coordinate with the Skinner Area Operations Group (SDCWA, Metropolitan, EMWD, and WMWD) and attempt to meet the needs of all agencies through negotiation.
2. Contact SDCWA member agency operating heads to ensure water treatment plants are operating at maximum capability.
3. Contact SDCWA member agencies with large treated water storage facilities and request they reduce flows and begin taking additional treated water from their reservoirs.

If the voluntary reallocation process does not result in adequate treated demand reductions, SDCWA would begin mandatory treated water reductions.

III. Mandatory Treated Water Reduction

SDCWA Operations staff will calculate the percentage of treated water shortage from Metropolitan and reduce flow to all treated water SDCWA member agencies by the same percentage. The percentage reduction will be made by total agency treated demands, calculated from initial delivery totals, prior to voluntary reductions. SDCWA will activate the Emergency Operations Center and provide 24-hour Operations Center staffing as long as mandatory treated water reductions are in place.

September 2003 - Summer 2003 Shortage Allocation Plan Update

Table 4 presents a summary of the 95 Percent Notification events for the Summer 2003. SDCWA operating heads and general managers were notified at the time of the event, per SDCWA's SAP.

Table 4. 95 Percent Notification Events Summer 2003

Date	Percent of Capacity	Comments
Wednesday, 8/13/03 (PM)	96.9%	Failure of SDCWA P-3 Pump at Miramar
Saturday, 8/16/03 (AM)	95.4%	No abnormal conditions
Tuesday, 9/2/03	100%	Miramar Plant Emergency

SDCWA Conservation Efforts

SDCWA operates a number of effective long-term water conservation programs. There are programs for residential and commercial water customers that target both indoor and outdoor water use. New programs are added when there are significant water savings. A total water savings of almost 30,500 AF was realized during fiscal year 2002-03 because of these efforts.

SDCWA conservation staff strives to ensure that the role of urban water conservation remains consistent in the Bay/Delta Process. SDCWA continues to meet implementation standards for best management practices (BMPs) for water conservation that has grown out of that process. SDCWA staff also plays an active role on the [California Urban Water Conservation Council](#), which is charged with monitoring statewide progress in implementing the BMPs.

SDCWA released its 2000 Urban Water Management Plan (UWMP), which updates both SDCWA's 1995 UWMP and the 1997 Water Resources Plan (WRP). Water conservation, also referred to as demand management, is one of the lowest-cost resources available to SDCWA and its member agencies.

SDCWA's residential Ultra-Low-Flush Toilet (ULFT) Voucher Incentive Program is the most prominent of the BMPs in operation during the year. Water customers receiving a voucher of up to \$75 per toilet replaced over 31,000 toilets in fiscal year 2002-03.

Vouchers must be used at the time of purchase. After-purchase rebates are not available. SDCWA, its participating member agencies, and Metropolitan provide funding. Honeywell DMC Services, Inc. administers the program in close cooperation with SDCWA staff and member agencies.

SDCWA added high-efficiency clothes washers (HEW) for residential customers to the growing list of devices available through the Voucher Incentive Program. Vouchers worth \$125 must be used at the time of purchase. After-purchase rebates are not available. SDCWA, its member agencies, Metropolitan and the California Department of Water Resources funded this program and provided point-of-purchase discounts for 8,620 HEWs. Honeywell DMC Services, Inc. administers the program in close cooperation with SDCWA staff and member agencies.

SDCWA has also focused on instilling a strong water-efficiency ethic through a comprehensive school education program that presents the SDCWA's conservation message to more than 100,000 area students and teachers each year. SDCWA's school education programs include:

- An innovative, captivating magic show that teaches more than 40,000 elementary school students each year about the water cycle and the need to conserve water.
- Classroom presentations that reach more than 10,000 third-, fourth- and fifth-grade students throughout the county each year.
- Xeriscape gardening workshops for teachers at the Water Conservation Garden about low-water-use gardening and how to set up a garden in their schools.
- Development and sponsorship of the award winning Splash Science Mobile Lab (operated in partnership with the San Diego County Office of Education). The Splash Lab is a fully staffed mobile science unit that brings a "field trip" to more than 15,000 elementary students throughout the county each year.

Table 5 summarizes recent calendar year deliveries as well as average maximum day flows for the treated and untreated service connections to SDCWA.

Table 5. SDCWA Service Connection Deliveries and Average Maximum Flows

Service Connection	Calendar Year	Total Volume (AF)	Peak-Day Average (CFS)	Peak Day Date
SD-01A TREATED	2000	34,814	88.0	09/13/00
	2001	30,618	81.0	10/03/01
	2002	40,964	91.0	09/24/02
	2003	39,453	90.7	08/17/03
SD-01B TREATED	2000	34,085	88.0	09/13/02
	2001	29,591	82.0	10/03/01
	2002	40,407	90.7	09/19/02
	2003	38,720	91.0	09/10/03
SD-02 TREATED	2000	3,534	11.0	8/01/00
	2001	3,244	11.0	09/26/01
	2002	4,173	14.6	09/04/02
	2003	4,015	12.9	08/20/03
SD-05 TREATED	2000	0	0.0	N/A
	2001	724	9.0	10/31/01
	2002	2,118	9.0	01/21/02
	2003	2,782	10.9	07/01/03
SD-07 TREATED	2000	186,351	411.0	08/01/00
	2001	183,208	408.0	07/22/01
	2002	200,986	438.8	06/19/02
	2003	171,007	416.6	06/03/03
SD-08 TREATED	2000	4,707	8.0	09/03/00
	2001	4,592	8.0	08/15/01
	2002	4,735	9.2	09/08/02
	2003	4,679	9.2	03/12/03
SD-09 TREATED	2000	88.1	8.0	05/29/00
	2001	795.4	8.0	11/01/01
	2002	1,965	9.0	07/10/02
	2003	3,021	9.2	08/09/03
SD-03 UNTREATED	2000	122,063	285.0	04/04/00
	2001	137,752	282.0	10/18/01
	2002	144,065	287.9	02/17/02
	2003	150,212	286.7	02/08/03
SD-11 UNTREATED	2000	206,285	296.0	06/28/00
	2001	197,202	280.0	06/04/01
	2002	222,221	506.7	04/03/02
	2003	235,818	498.0	11/24/03

Eastern Municipal Water District

Treated Water Service Connections

EMWD treated connections supplied by the Skinner FP include EM-13, located on SD Pipeline 4, and EM-17, located on the Auld Valley Pipeline. Appendix B is a schematic of the Skinner service area showing member agency service connections. Table 6 represents calendar year historic deliveries, in acre-feet, for EMWD's treated and untreated service connections. The table summaries provided in this update report are presented in a calendar year format to clearly identify summer periods for a given year. Service connection EM-13 provides water to RCWD for domestic and agricultural use. Service connection EM-17 provides water to both EMWD as well as WMWD. EMWD began delivering water to the Murrieta County Water District (MCWD) in WMWD's service area in the summer of 2002. It is anticipated that MCWD's annual demand will not exceed 1,500 acre-feet (AF) annually until 2010.

The northern portion of EMWD's service area is supplied by the Mills FP through service connection EM-12, while the Skinner FP serves the southern portions of EMWD. The flow rate at EM-12, however, is limited by the conveyance capacity in EMWD's pipeline. Thus, increasing demands on EM-12 in the Perris Valley, in excess of this conveyance capacity, are supplied through deliveries from the Skinner FP. The Mills FP offers additional flow availability but this is constrained by EMWD's maximum conveyance capacity leaving the plant.

Local area reservoir storage includes Lake Hemet and Vail Lake. Lake Hemet has a capacity of 14,000 AF and is owned and operated by Lake Hemet MWD. The only source of water to Lake Hemet is natural runoff. The lake is utilized to meet agricultural demands during seasons of normal and above-normal precipitation. Vail Lake has a capacity of 49,370 AF and is operated by RCWD. Vail Lake relies on natural runoff as its source water. RCWD utilizes the lake for groundwater replenishment and currently has no plans for treatment facilities.

Raw Water Service Connections

Eastern serves its 10-MGD Perris filtration plant from EM-04 directly off the Colorado River Aqueduct, (CRA) and plans to serve a new 10-MGD membrane filtration plant from EM-14, off the Lakeview Pipeline, by 2006. Raw water deliveries, treated by each of these filtration plants, will relieve some treated water demand on the Skinner FP by reducing demand at EM-17.

RCWD operates a groundwater recharge program located in the Pauba Valley adjacent to Temecula Creek downstream of Vail Lake. RCWD uses two sources of water for recharge: local run-off captured in Vail Lake when available; and purchased Metropolitan raw water in-lieu of, or as a supplement to local runoff. Purchased Metropolitan raw water is taken through the EM-19 turnout off of SD Pipeline 5 at Santiago and Vallejo Avenue, just east of I-15 in the City of Temecula, and conveyed approximately 8 miles through a 48-inch diameter pipeline to the Pauba Valley spreading basins.

In general, the recharge program supplements natural recharge for the benefit of the entire groundwater basin. However, there are four recovery wells located directly within the limits of the spreading basins that the DHS considers to be under the direct influence of the raw surface water recharge, and thus fall under the requirements of the Surface Water Treatment Rule. EM-19 has a rated capacity of 40 cfs. RCWD takes water at a relatively consistent, uninterrupted rate of 20 to 30 cfs to meet minimum depth-to-groundwater requirements, to match recovery well withdrawal rates, as well as to provide recharge benefits to the groundwater basin downstream of the spreading basins. Table 6 summarizes the deliveries to EM-19 as well as the maximum day demands during the summer period.

Table 6. EMWD Service Connection Deliveries and Average Maximum Flows

Service Connection	Calendar Year	Total Volume (AF)	Peak-Day Average (CFS)	Peak Day Date
EM-13 TREATED	2000	9,895	40.0	08/18/00
	2001	7,488	35.0	08/07/01
	2002	12,328	40.7	07/10/02
	2003	7,531	30.1	09/16/04
EM-17 TREATED	2000	19,410	59.0	08/18/00
	2001	20,196	60.0	08/07/01
	2002	25,971	75.8	07/10/02
	2003	26,733	87.2	08/05/03
EM-20 TREATED	2000	N/A	N/A	N/A
	2001	N/A	N/A	N/A
	2002	6,068	34.0	09/03/02
	2003	8,847	30.0	08/16/04
EM-19 UNTREATED	2000	21,206	30.0	07/01/00
	2001	16,525	20.0	08/12/01
	2002	17,125	39.9	01/29/02
	2003	16,206	25.3	12/30/04

Western Municipal Water District of Riverside County

WMWD currently has the following plans for shifting demand from the Skinner FP to the Mills FP.

- WMWD is working with EVMWD to provide 20 cfs or more to EVMWD through the Mills Gravity Pipeline. This operation would provide a demand shift from Skinner FP to Mills FP, depending on internal distribution system links within EVMWD. Thus far, EVMWD has tested the system to determine the maximum flow rate achievable from Mills FP without system upgrades and found it can receive 21 cfs through the Mills pipeline. It may be possible to shift demand up to 30 cfs from Skinner FP to Mills FP with some internal system upgrades, such as a pump station in the vicinity of Cajalco Road and Interstate 15 to push the water from the terminus of the Mills Gravity Pipeline, uphill through the EVMWD pipeline to the main EVMWD service area.

- WMWD is working with all wholesale agencies in its service area to minimize the use of treated imported water for landscape irrigation. WMWD's ongoing program includes its demonstration garden and brochures and speaker's bureau to promote water wise landscaping. WMWD provides all new homebuilders with information to have available in their model homes and to be handed out to prospective homebuyers.
- WMWD is working with EVMWD to test injection wells for replenishment of groundwater basins in the EVMWD area. Water would be supplied by WMWD through the Mills Gravity Pipeline for injection during winter months for production during summer months. Pilot testing is underway to determine the rates of injection and production and quantity that could be stored. If field test results continue to be positive, WMWD and EVMWD plan to propose a groundwater storage program, to be considered under Metropolitan's conjunctive use principles, to provide additional peaking production capability in the Skinner service area.

Treated and Raw Water Service Connections

Table 7 summarizes deliveries to the WMWD service area for treated and raw water service connections.

Table 7. WMWD Service Connection Deliveries and Average Maximum Flows

Service Connection	Calendar Year	Total Volume (AF)	Peak-Day Average (CFS)	Peak Day Date
WR-26 TREATED	2000	10,767	35.6	09/16/00
	2001	9,061	35.6	08/01/01
	2002	10,167	35.4	07/16/02
	2003	8,802	30.6	09/16/03
WR-28 TREATED	2000	8,820	35.1	09/16/00
	2001	7,957	41.8	08/01/01
	2002	10,718	39.4	07/17/02
	2003	6,038	31.2	08/20/03
WR-34 UNTREATED	2000	N/A	N/A	N/A
	2001	N/A	N/A	N/A
	2002	15	N/A	N/A
	2003	5,432	10.4	04/03/03

In the past, peak deliveries to SDCWA and WMWD have created hydraulic constraints on WR-26 and WR-28, limiting deliveries to about 60 cfs for the two connections (80 cfs total connected capacity).

The raw water deliveries to WMWD's area are met mostly from the CRA, as well as the Lower Feeder supplied by Lake Mathews. However, WR-25 is an existing raw water service connection located on SD Pipeline 3 with a capacity of 25 cfs. The connection is currently inactive, but RCWD will consider activating WR-25 once SD Pipeline 3 is converted to treated water.

In January 2003 service connection WR-34 was brought online. The facility was installed as a result of a Cooperative Water Resources Management Agreement (CWRMA) between RCWD and the United States Marine Corps, Camp Pendleton, to resolve long-standing water rights issues between the primary upper (RCWD) and lower (Pendleton) Santa Margarita Watershed water rights holders. The CWRMA provides for RCWD to discharge raw water into the Santa Margarita River to try and restore natural pre-development flows in the river system. RCWD is required to discharge throughout the year, the amount varying by month and by hydrological conditions. The discharge regime typically can vary from 2 to 12 cfs. The connection has a maximum capacity rating of 15 cfs.

Planned Facilities Status

Metropolitan Water District

San Diego Pipeline 3 Bypass

Phase 1 of the San Diego Pipeline 3 Bypass, which connects the finished water effluent conduit to the bypass, was completed in March 2003. Phase 2 will consist of the construction required to facilitate the conversion of San Diego Pipeline 3 from raw to treated water conveyance. Phase 2 needs to be completed to coincide with the construction of the southern reach of San Diego Pipeline 6 or the conversion of Pipeline 3 to treated water service.

San Diego Pipeline 6, North Reach

Project Background

Metropolitan's Board of Directors approved the Final Environmental Impact Report (FEIR) for SD Pipeline 6 in May 1993. The SD Pipeline 6 project includes construction of a 600-cfs, 10-foot diameter raw water pipeline. A turnout in Temecula will deliver 80-cfs to RCWD and 520 cfs will go to SDCWA. Additionally, SD Pipeline 3 will be converted to treated water service. Completion of the SD Pipeline 6 project and Phase 2 of the SD Pipeline 3 Bypass would result in new total treated water conveyance capacities as shown in Table 8. In 1993, it was determined that without additional conveyance capacity, there would be significant deficits in seasonal and short-term supply delivery by SDCWA beginning in 1998. Since that time, additional analyses were conducted, including the Integrated Resources Plan (IRP) and the Rate Refinement Process (RRP), that resulted in a series of revised completion dates for SD Pipeline 6, first from 1998 to 2000, then to 2002, and finally to 2005. In 1995, all design work was deferred.

Table 8. Treated Water Conveyance with Pipeline 6

Treated Water Conveyance w/ Pipeline 6, cfs		
	At the Plant	At the County Line
Pipeline 1	85	85
Pipeline 2	95	95
Pipeline 4	580	475
Pipeline 3	240	240
Pipeline 3 Bypass	120	
Auld Valley Pipeline	100	
Total	1,220	895
Raw Water Conveyance w/ Pipeline 6, cfs		
	At the Plant	
Pipeline 5	474	
Pipeline 6	600	
Total	1,074	

Subsequently, SDCWA, in conjunction with its member agencies, began to implement various storage, conveyance and treatment projects and, at SDCWA's request, the online date for SD Pipeline 6 was deferred to 2008. In December 1997, SDCWA recommended that Metropolitan proceed only with ongoing coordination with developers and local agencies to ensure necessary rights-of-way could be secured. In 1998, both Metropolitan's and SDCWA's Capital Improvement Programs were adjusted to reflect an online date of 2008. More recently, as a result of the development of their Regional Water Facilities Master Plan, described below, SDCWA has determined that the additional treated and raw water conveyance capacity provided by the SD Pipeline 6 project will not be needed before 2015. This ongoing delay, however, has had an impact on RCWD. RCWD has based infrastructure planning and construction in the Temecula area on the completion of SD Pipeline 6. RCWD has determined that the 80-cfs groundwater replenishment connection, to be located on SD Pipeline 6 (relocated EM-19 turnout) in Temecula, is needed no later than the summer of 2008.

In October 2002, in accordance with a written request from the four Skinner area agencies, Metropolitan's Board authorized moving forward with design of the first seven miles of SD Pipeline 6, designated the North Reach, with an online date of June 2006.

In November 2003, Metropolitan's Board certified the Supplemental EIR for the North Reach. Metropolitan is proceeding with final design of the project and has begun acquisition of the temporary easements. Metropolitan is scheduled to advertise the pipeline construction for bid in July 2004. The remaining portions of SD Pipeline 6 remain on-hold pending final determination of an online date and subsequent Metropolitan Board authorization.

Skinner Filtration Plant Module 7

In July 2003, Metropolitan's Board certified the Skinner FP Programmatic EIR and authorized final design of Skinner Expansion No. 4. The Skinner Expansion No. 4 will include addition of the 110 MGD Module No. 7; a 34-MGD Washwater Reclamation Plant No. 3; new and consolidated chemical tank farms and feed systems; sludge handling facilities expansion; new water pumping stations; and related work. The online date for all of Skinner Expansion No. 4 is late 2006, with Module No. 7 online by mid 2006. Temporary facilities will be provided as needed to test and commission Module No. 7.

Metropolitan staff identified the need for several procurement and construction contracts to most efficiently implement the Skinner Expansion No. 4 project. The initial contract consists of pre-purchase of approximately 320 linear feet of 78-inch-diameter steel pipe. The 78-inch-diameter pipe will be part of the Module No. 7 influent piping and installed within the Skinner FP site preparation contract in Spring 2004. Award of the site preparation construction contract is scheduled for February 2004. Final design of Module 7 and associated utilities is proceeding and award of the Module 7 construction package is scheduled for June 2004. Final design of the Washwater Reclamation Plant No. 3 is proceeding with award of the WWRP 3 construction package scheduled for February 2005. Final design of the chemical tank farms and feed systems will start in early 2004 with award of this construction package scheduled for January 2005.

Evaluation of Available Capacity at the Mills FP for Riverside County Demand

EMWD and WMWD are already considering options for shifting demand from the Skinner FP to the Mills FP when and where feasible. Metropolitan staff, as well as the

member agencies, will further evaluate increased utilization of available capacity at the Mills FP in a Riverside County Area Study.

San Diego County Water Authority

SDCWA is in the process of developing a Regional Water Facilities Master Plan (RWFMP) that will provide water supply and conveyance facility alternatives to meet projected demands through the year 2035. Three alternatives for future imported water supply are included in the draft plan. They are 1) “North” – continued and increased reliance on Metropolitan via the Skinner FP and SD Pipeline 6; 2) “West” – a large regional desalination plant; 3) “East” – a new pipeline connecting directly to the Colorado River; and 3). SDCWA’s currently identified online date for SD Pipeline 6 in the draft master plan under alternative 1 is 2015. At its November 2003 meeting, SDCWA’s Board selected alternative 2 as the preferred alternative for water supply and facility planning purposes. The RWFMP will be finalized following further Board consideration of rate and other financial impact analysis.

In support of Metropolitan’s decision, in October 2002, to move forward with the North Reach of SD Pipeline 6, SDCWA’s Board Chairman wrote a letter to Metropolitan’s Board Chairman stating that the SDCWA will need SD Pipeline 6 at some point in the future. SDCWA also stated that it would give Metropolitan sufficient notice before requesting a revised SD Pipeline 6 online date.

SDCWA Treated Water Enhancement Study

The SDCWA’s peak treated water demands during the hottest, driest days of the year are currently exceeding available treatment plant capacity. On several occasions during the summer months of 2000 and 2002, daily demands exceeded the combined treatment plant capacity available to the regional system. This focused study of water treatment needs and options was initiated in January 2003, following the draft RWFMP. The purpose of this study was to quantify short-term demands (through the year 2015) and the need for supplemental treated water capacity. The needs were developed for the entire SDCWA service area and for each of five delivery areas. San Diego County requires about 1,300 MGD of treatment capacity in order to provide a 15 percent margin

of safety by 2015. This compares to 1,136 MGD of regional treatment capacity, which is expected to be available. This leaves a capacity shortfall of about 160 MGD needed just to meet 2015 demands. The need is even more acute between now and 2010 with reserve capacities at less than 5 percent. The planned Encina seawater desalination plant would provide 50 MGD by 2010, so the remaining 110 MGD needed by 2015 must be developed by the strategies discussed below.

The SDCWA has identified and is pursuing five strategies to meet the future treated water capacity issue. These strategies are:

1. Draw on existing treated water storage
2. Conduct further analyses of the potential to use the Red Mountain Reservoir and pumping into SD Pipeline 4.
3. Regional use of surplus water treatment plant capacity
4. The Padre Dam Pump Station project should be implemented.
5. Expansion of existing water treatment plants
6. The Olivenhain WTP 50-MGD expansion would not have sufficient demand for effective annual operation. A smaller expansion could prove to be beneficial, but has not been evaluated at this time. The Weese WTP expansion of 50 MGD (to a 75-MGD total capacity) may not be possible if the plant is required to de-rate its filtration capacity as was required of the Escondido-Vista facility.
7. Construction of new water treatment plants
8. The Crossover options offer the best site to meet the total need of 100 MGD at a location where the plant can operate efficiently based upon the geographic allocation of demands. It also provides the best compatibility with the SDCWA's Emergency Storage Project, because it enhances that program by delivering treated water during the 2-month design condition. More technical evaluation must be done to further clarify the plant processes, layout, and hydraulics to refine the concept for the Crossover WTP. A further evaluation of membrane versus conventional treatment should be conducted. This evaluation should include capital and operating cost refinement; recent trends indicate that these costs will continue to decrease. A lifecycle cost comparison should be made. A Dissolved Air

Flotation (DAF) pilot study should be undertaken on the anticipated mix of SWP and CRA water. The DAF process was successfully piloted for the South San Joaquin Irrigation District by using Ondeo Degremont's high-rate AquaDAF clarification technology. Turbidity and total organic carbon (TOC) removal efficiencies were evaluated with effluent turbidities running consistently below 0.5 nephelometric turbidity unit (ntu) and TOC removals rates of 25 to 40 percent. A pre-design report should be prepared once a decision is made whether to use a membrane or conventional treatment process.

Emergency Storage Project

Currently, imported water from Metropolitan is used to meet between 75 and 95 percent of the SDCWA's water demand. Because the pipelines that carry water to San Diego cross several major fault lines along the way, an earthquake could interrupt San Diego County's imported water supply for up to six months. Some communities could be without water within three to four days. In 1998, SDCWA addressed the county's emergency water storage shortfall by initiating the Emergency Storage Project (ESP). After reviewing 57 sites, evaluating 32 alternatives and completing a rigorous environmental review process, SDCWA identified a system of reservoirs, interconnected pipelines and pumping stations designed to meet the county's projected emergency water storage needs through the year 2030.

The ESP will connect existing sources of water, assuring that water flows throughout the system even in the event a disaster disrupts the region's imported water supply. The project will also provide an additional 90,100 acre-feet of stored water. The ESP is part of SDCWA's Capital Improvement Program to enhance and increase the operational flexibility of its water delivery system.

The Emergency Storage Project includes:

- A new 318 foot-high dam and 24,000 acre-foot reservoir at Olivenhain MWD
- A pipeline connecting the new Olivenhain Reservoir to SDCWA's Second Aqueduct
- A pipeline connecting the new reservoir in Olivenhain with Lake Hodges
- An increased San Vicente Dam, by 54 feet, to provide an additional 52,100 acre-feet of storage
- A pipeline connecting San Vicente Reservoir to the Water SDCWA's Second Aqueduct
- Five new pump stations
- Related facilities

Facilities will be constructed in four phases:

- Phase One (1998 – 2003): Olivenhain Projects
- Phase Two (2002 – 2006): San Vicente Projects
- Phase Three (2004 – 2008): Lake Hodges Projects
- Phase Four (2008 - 2010): San Vicente Dam Raise

Member Agencies – Water Treatment Plant Expansions

The San Diego region has added treatment capacity in recent years with expansions at the Helix WD's Levy WTP and City of San Diego's Alvarado Water Treatment Plant (WTP), along with startup of a new treatment plant by Olivenhain MWD. However, near-term and long-term needs for additional capacity remain. Table 9 presents a summary of all plants available to meet the peak treated water needs for SDCWA's service area. The total is labeled as "Effective Regional WTP Capacity." These numbers reflect the net estimated usable capacity at each plant. In some cases, the capacity is less than the plant's rated capacity. This reduction usually reflects either a limitation on the delivery capacity away from the plant (e.g., Alvarado WTP) or a limitation in the demand that can be met by the facility (e.g., early years of operation for the Levy plant). A 5

percent decrease in capacity has also been assumed for the larger facilities to account for filter backwashes. Figure 9 illustrates this data in graphic form.

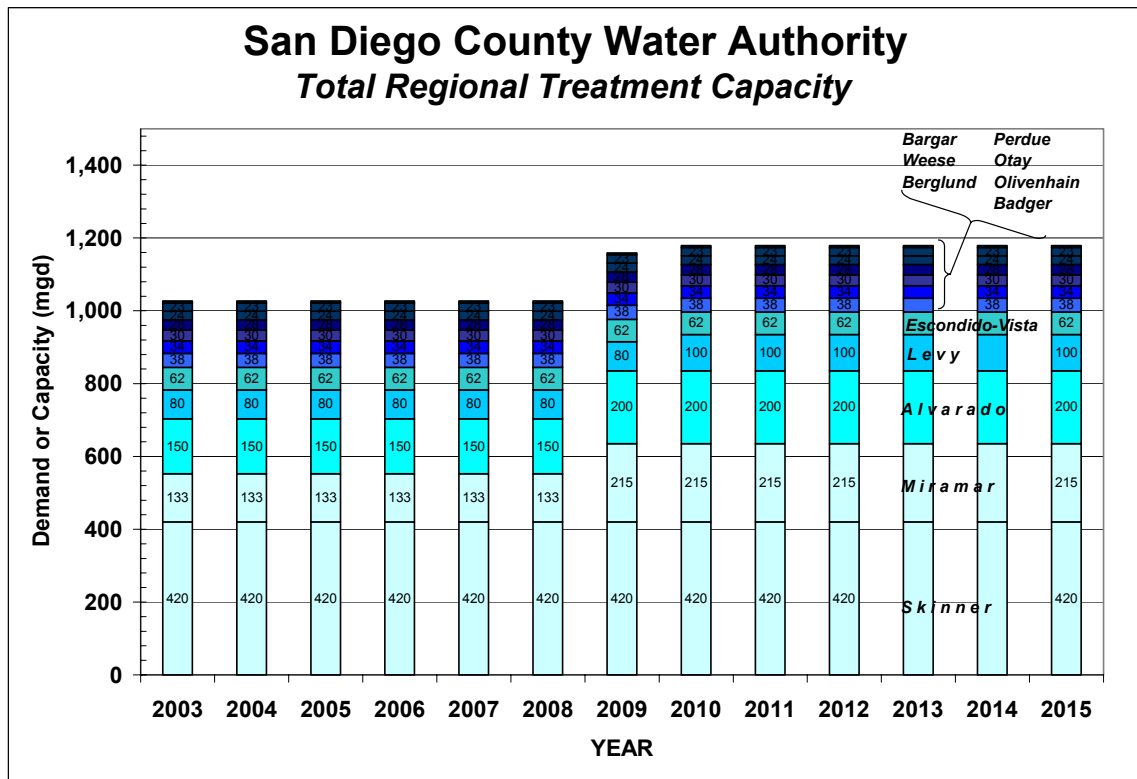
Table 9. Existing and Forecasted Plant Capacities with SDCWA Service Area

Total Capacity	MGD			
	2003	2005	2010	2015
Skinner	420	420	420	420
Weese	23	23	23	23
Olivenhain	34	34	34	34
Badger	38	38	38	38
Miramar	133	133	215	215
Alvarado	150	150	200	200
Perdue	28	28	28	28
Otay	30	30	30	30
Berglund	24	24	24	24
Escondido-Vista	62	62	62	62
Levy	80	80	100	100
Bargar	5	5	5	5
Total Regional WTP Capacity	1,027	1,027	1,179	1,179
Effective Capacity	2003	2005	2010	2015
Skinner	420	420	420	420
Weese	23	23	23	23
Olivenhain	34	34	34	34
Badger	38	38	38	38
Miramar	133	133	148	155
Alvarado	130	130	141	147
Perdue	28	28	28	28
Otay	30	30	30	30
Berglund	24	24	24	24
Escondido-Vista	62	62	62	62
Levy	80	80	100	100
Bargar	5	5	5	5
Effective Regional WTP Capacity	1,007	1,007	1,052	1,066

Assumptions:

1. Effective capacity for Weese, Badger, Miramar, Alvarado, Perdue, and Escondido-Vista WTPs is 5 percent less than the rated capacity to account for filter backwash.
2. Otay and Levy WTP capacity is limited in 2005 due to get-away capacity; it is rated to 95 percent to account for filter backwash thereafter.

Figure 9. SDCWA Total Regional Treatment Capacity



In addition, a reserve capacity of 10 to 15 percent of total peak demand is generally advised, allowing for possible inaccuracy in demand forecasts or the possibility that some of the region’s capacity might not be available when needed.

Miramar WTP is scheduled to undergo construction to expand the facility beginning in 2003 and continuing through 2009. Miramar WTP may operate at lower capacities than shown in the table, particularly during times of construction. The capacity available from Skinner FP is shown as 420 MGD, which is consistent with the capacity of the aqueduct pipelines used to deliver treated water into the region, with SD Pipeline 4 re-rated, and does not represent the plant’s total capacity.

Seawater Desalination Efforts

As discussed earlier, SDCWA is currently developing the Carlsbad Seawater Desalination Project, which would be constructed adjacent to the Encina Power Station. This project would be the largest seawater desalination plant in the Western Hemisphere, producing 50 million gallons per day (56,000 acre-feet annually) of fresh water. This new water source will supply up to ten percent of SDCWA region's water needs. Environmental compliance activities began in 2003.

The proposed Carlsbad desalination plant would be similar to other reverse osmosis facilities being constructed around the world including new operating plants in Tampa, Florida, and Trinidad that are demonstrating the new cost efficiencies provided by the latest seawater desalination technology.

In addition to development of the Carlsbad Seawater Desalination Project, SDCWA is evaluating other coastal locations that may be suitable for the siting of a regional seawater desalination facility. For example, SDCWA is currently evaluating the feasibility of locating a seawater desalination plant adjacent to the South Bay Power Plant in Chula Vista. Other coastal sites are also being evaluated from the San Onofre Nuclear Generating Station at the north end of San Diego County to the Mexican Border at the southern end of the county.

Surface Storage Operating Agreement

Metropolitan, SDCWA, and participating SDCWA member agencies have entered into a Surface Storage Operating Agreement (Agreement) for a five-year term, effective September 1, 2003. Under the Agreement principles, Metropolitan can store up to 70,000 AF in SDCWA agency reservoirs. This water will be delivered between November 1 and May 31 for use between June 1 and October 31. The Agreement calls for preparation of annual operating plan, whereby Metropolitan, SDCWA and its member agencies develop a coordinated schedule of withdrawals to occur between June 1 and October 31. In addition to this "schedule water", SDCWA and its member agencies will also make available to Metropolitan, on 24-hour notice, a pre-determined

amount of "call water" for the purpose of alleviating peaks at the Skinner FP. SDCWA will coordinate reservoir operations with its participating agencies, providing Metropolitan with a single point-of-contact.

Also under these principles, SDCWA has agreed to request 100 percent of its system design capacity, or 1,296 cfs; thus, SDCWA is not subject to the Peaking Surcharge. Metropolitan has agreed to provide a credit of \$70/AF for "schedule water" withdrawn, and a credit of \$105/AF for "call water" withdrawn. These credits will be applied to the applicable Tier 1 or Tier 2 rates.

Eastern Municipal Water District

Due to declining groundwater levels in the Hemet/San Jacinto area, EMWD may be supplementing water supply to this area with treated Skinner FP water. The existing conveyance facilities allow up to 18 cfs to be delivered. EMWD has proposed temporary booster pumping to be in place by summer 2004 to increase conveyance capacity to approximately 30 cfs to account for any unexpected interruptions in well capacity in the Hemet/San Jacinto area. The need for this secondary supply source will be reduced upon completion of the proposed Hemet membrane filtration plant.

RCWD constructed a pipeline that connects to the SD Pipeline 3 Bypass at service connections EM-20, which came online in August 2002. Although the requested connected capacity of EM-20 is 100 cfs, initial demands have been in the range on 20-30 cfs. Beyond the 100-cfs design capacity at EM-20, RCWD has an additional 5-cfs of capacity in its pipeline. When SD Pipeline 3 is converted to treated water service, up to 120 cfs could be available to RCWD at EM-20 depending on demands and system hydraulics.

10-MGD Perris Microfiltration Plant

EMWD also completed a new 10-MGD membrane Perris Filtration Plant to treat Colorado River Water (CRW) in the spring (April/May) of 2003. The Perris FP plant is served from service connection EM-04 directly off the CRA. The plant is used to meet

demands in the Moreno Valley and Perris areas. An expansion of the Perris filtration plant to 20-MGD is currently under design and is expected to be online in 2007.

Planned 10-MGD Treatment Plant

A new 10-MGD membrane filtration plant in the City of Hemet is currently under design and is expected to be online in 2006. This plant will be served via the Lakeview Pipeline at EM-14, and will relieve some treated water demand on the Skinner FP.

Desalter

EMWD's 3-MGD Menifee desalter plant to treat groundwater came online in March 2003, and serves to reduce the demand for treated water at EM-17.

Western Municipal Water District

Proposed Surface Storage Operating Agreement

Western is currently negotiating with Metropolitan and EVMWD to implement a surface storage agreement at Canyon Lake. EVMWD has just completed improvements at its Canyon Lake water filtration facility and is now capable of delivering 5-MGD for normal operation and could increase that capacity to 9-MGD for "call water" to offset peaks on the Skinner FP. Canyon Lake capacity is 12,000 acre-feet with 5,000 acre-feet of that capacity available for water supply. Western, EVMWD, and Metropolitan will complete the construction of service connection WR-31 by the end of 2003 to provide a direct means of delivery of State Project water to Canyon Lake. At a flow rate of 50 cfs from WR-31, 5,000 acre-feet could be delivered to Canyon Lake in approximately 50 days. This rapid fill of the lake allows deliveries to be made after the rainy season and before the peak summer season thereby reducing the risk of spill.

Other

WMWD is also working with EMWD to provide emergency interconnections across the WMWD/EMWD boundary to deliver Mills FP water to EMWD's service area. The connections will allow Mills FP water to be used in-lieu of Skinner FP water during emergency events. The interconnections will provide flows up to 10-cfs.

WMWD has a long-range plan to construct the Riverside Corona Feeder, which will be a 6- to 8-foot diameter pipeline that will have the capability of delivering 40,000 acre-feet annually of potable groundwater from the Bunker Hill basin in San Bernardino to WMWD's customers in the Santa Ana River region. The plan is to replenish the Bunker Hill Basin with State Water Project (SWP) water purchased from Metropolitan in years of abundant supply for use in drought years. Western is currently receiving significant Federal support for the project and anticipates it will receive Federal funding on the basis that the project will reduce demand on the Colorado River in times of drought. The project will help shift loads from Mills FP, thereby allowing further load shifting between Mills FP and Skinner FP in times of drought.

Rancho California Water District

RCWD has four storage reservoirs under construction that will provide 20.7 million gallons of additional capacity to the current total storage capacity of 114 million gallons. Construction of these reservoirs should help to reduce the intra-day peaks that the Skinner FP is currently serving.

RCWD's planned connection is to come online concurrently with the North Reach of SD Pipeline 6 is service connection EM-21, which will have a rated capacity of 80 cfs. Once service connection EM-21 is activated, service connection EM-19 will be abandoned.

Demand Projection Update

For water distribution and treatment facility analyses, Metropolitan uses projected dry-year water demands that occur during hot and dry climatic conditions. When these conditions occur, peak demands for imported water are highest. Metropolitan's IRP process led to a reliability goal of providing adequate supply for its member agencies to meet peak week retail demands. In order for retail level peak week demands to be met, Metropolitan plans to meet maximum day wholesale demands on its system. Metropolitan's Administrative Code recognizes the need for flow changes within a 24-hour period. The Administrative Code states that changes in rate of flow through any service connection serving a member public agency will be limited to ten percent above and below the previous 24-hour average rate of flow except when a specific request for a change in rate that would exceed such limitations has been made to the District; subject to certain conditions (Metropolitan Administrative Code § 4504). In areas where high peaking demands occur, Metropolitan encourages development of additional local storage to reduce peaks on the Metropolitan system.

For facility analyses, annual demand projections are converted to maximum day demands through use of historic peaking data. These maximum day demands are then used to determine the size and implementation schedule of new facilities. The demands utilized in this study were compiled jointly by Metropolitan and member agency staff.

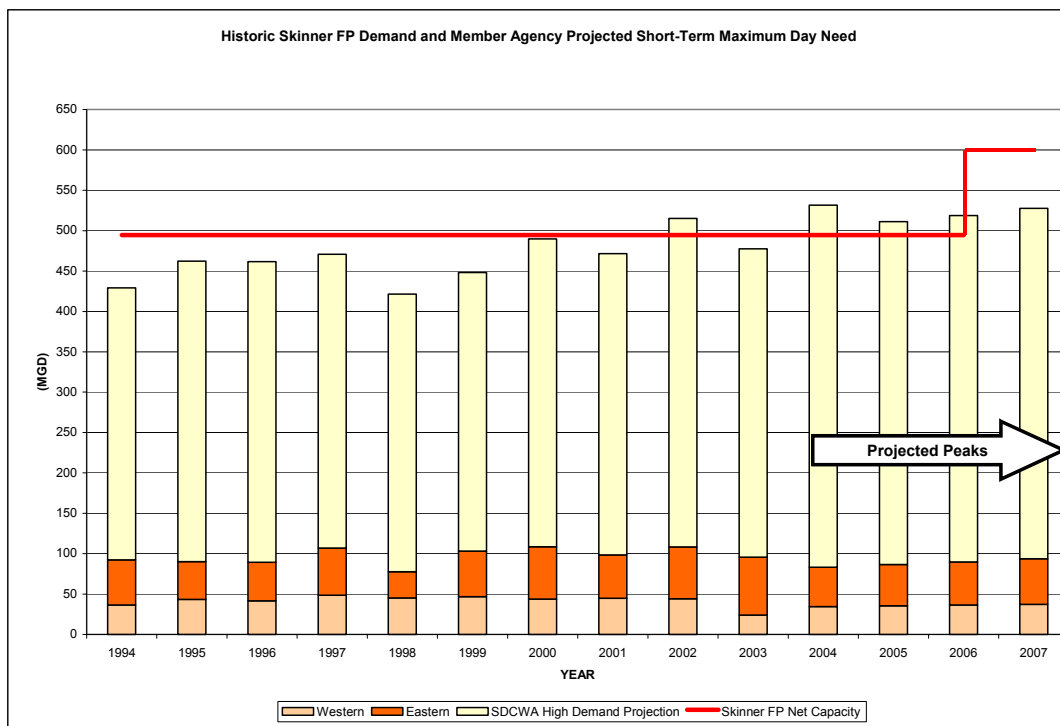
Short-Term Member Agency Demand Estimates and Peak Factors

To assist Metropolitan in planning short-term operations, member agencies submit five-year estimates of treated and raw water demands on Metropolitan. For facility planning purposes, the forecasted annual demands are converted to maximum daily demands by multiplying the average annual demand by a peak factor based on historic data. Because dry-year hydrology is used in the planning process, peak factors are calculated from historic data during locally dry periods. The years 2000 and 2002 were selected as representative dry years for peak factor calculation because the local hydrology was relatively dry in the Riverside/San Diego region during those years. Peak factors are

developed by dividing the historic daily peak demand of a service connection (or group of service connections representing an agency, or a facility such as a treatment plant) by the historic annual demand converted to an average daily flow. For example, in 2000, the average annual flow rate of the Skinner FP was 434 cfs. The daily peak (24-hour average) delivery was 679 cfs. This results in a peak factor of 1.57 for the Skinner FP. The peak factor for the Skinner FP in 2002 was 1.59; the average peak factor used herein is 1.58 for both short-term and long-term planning.

Figure 10 shows Skinner FP capacity, and both the historical actual maximum-day demand and the member agency five-year projected maximum-day demands. As illustrated in the figure, the member agencies expect that in 2004 and 2005 peak demands could exceed the net capacity of the Skinner FP. In these years, short-term projected demands can be met by maintaining maximum production from the Skinner FP and utilizing the short-term operating strategies outlined later in this report. Once Module 7 is online in 2006, the short-term peak demands can be met.

Figure 10. Historic Skinner FP Demand and Member Agency Projected Short-Term Need

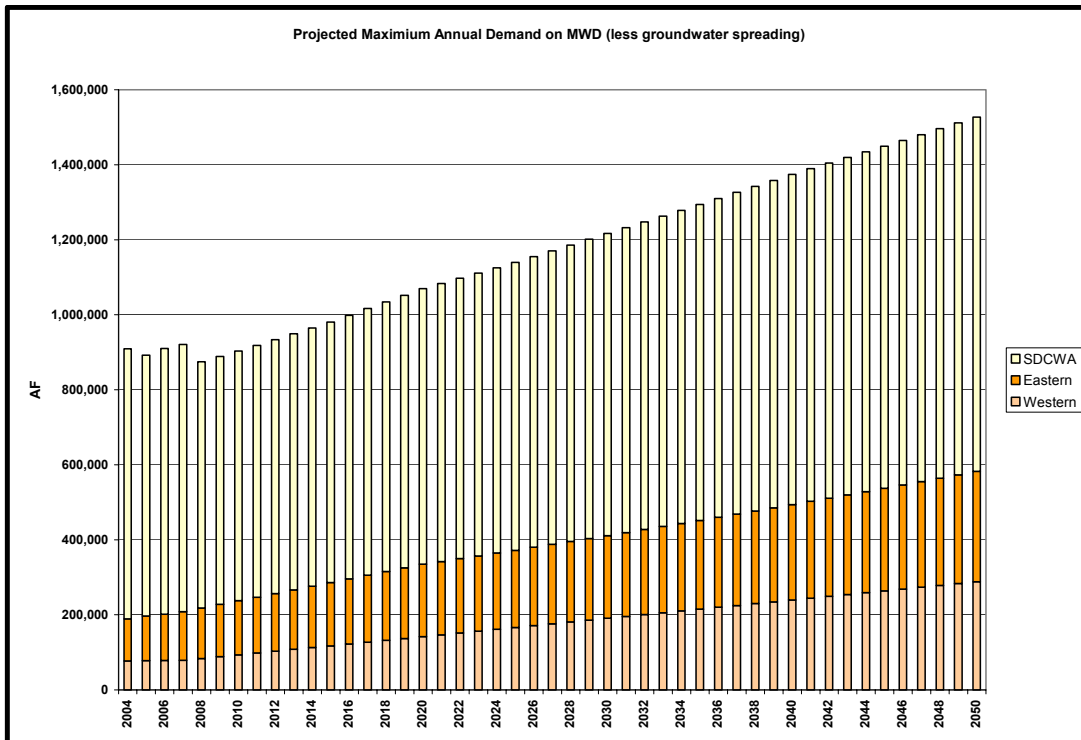


Long-Term Demand Projections

The Southern California Association of Governments (SCAG) and San Diego Association of Governments (SANDAG) projections currently used by Metropolitan (SCAG 1998 Regional Transportation Plan and SANDAG 2020 Forecast) extend to 2020. Metropolitan contracted with the Center for Continuing Study of the California Economy (CCSCE) and SCAG to produce extended demand projections to 2050. CCSCE developed unofficial projections for the six counties served by Metropolitan from national projections produced by the US Census Bureau. Member agency demographics for 2050 were then derived using SCAG's GIS-based allocation models. Demographics for interim years such as 2025 were interpolated from the 2020 SCAG/SANDAG projections and the 2050 estimates developed by CCSCE. Beyond 2020, the level of local resources in Metropolitan's service area was assumed to remain fixed at 2020 levels; consequently, additional need for imported water would be translated as a demand that Metropolitan would supply.

The maximum projected demand on Metropolitan in the Riverside/San Diego county region is expected to increase from approximately 910 TAF in 2004 to 1.1 MAF in 2020 and 1.5 MAF in 2050, as shown on Figure 11 on Page 41.

Figure 11. Projected Maximum Annual Demand (Less Groundwater Spreading)



The abrupt decrease in projected demands seen in 2008 is due to the planned online date for SDCWA’s seawater desalination plant. The annual demands presented in Figure 11 are converted to flow rates and used to calculate maximum day demands in the Skinner FP service area as discussed above.

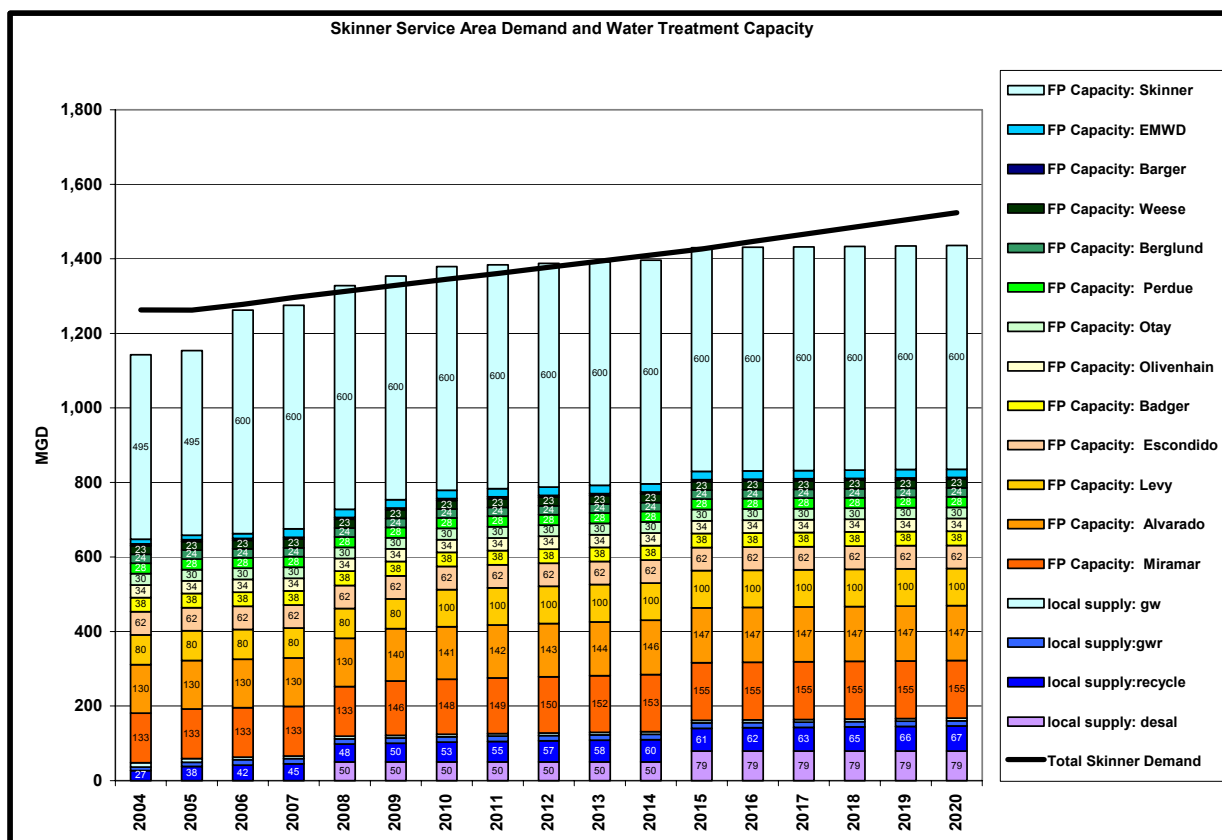
Treatment Plant Capacity in the Skinner Service Area

To determine the adequacy of regional and local agency facilities to meet area peak treated water demands, projected maximum day-demands (worst-case hydrology) were compared with the capacity of existing and proposed water treatment facilities. The demand line shown on Figure 12 is comprised of the retail level demand of SDCWA and of EMWD’s and WMWD’s demand on Skinner FP (the Skinner FP service area total water demand). This demand is supplied by the Skinner FP in Riverside County, and a combination of the Skinner FP, local water treatment plants and local supplies (ocean desalination, reclaimed water, groundwater, recovered groundwater and surface water)

in San Diego County. The 100-MGD Module 7 expansion of the Skinner FP is accounted for in 2006.

Figure 12 illustrates that there is currently a significant shortage of regional treatment capacity. Over the next two years, there is a potential shortfall of approximately 100 MGD under the worst-case hydrology. Expansion of the Skinner FP in 2006 almost eliminates the shortfall. Implementation of SDCWA's ocean desalination program and construction or expansion of local water treatment plants meets regional needs for treated water from 2008 through 2013. In 2015, a planned 25-MGD increase in SDCWA's desalination capacity meets growing demands for one additional year, until 2016 when demands again exceed treatment capacity. Throughout the period from 2008 through 2015, even though capacity is shown to be more or less meeting demands, the margin is so close that any minor change to peaking factors, online dates, or other assumptions could result in an unacceptable shortfall between capacity and demand.

Figure 12. Skinner Service Area Demand and Water Treatment Capacity

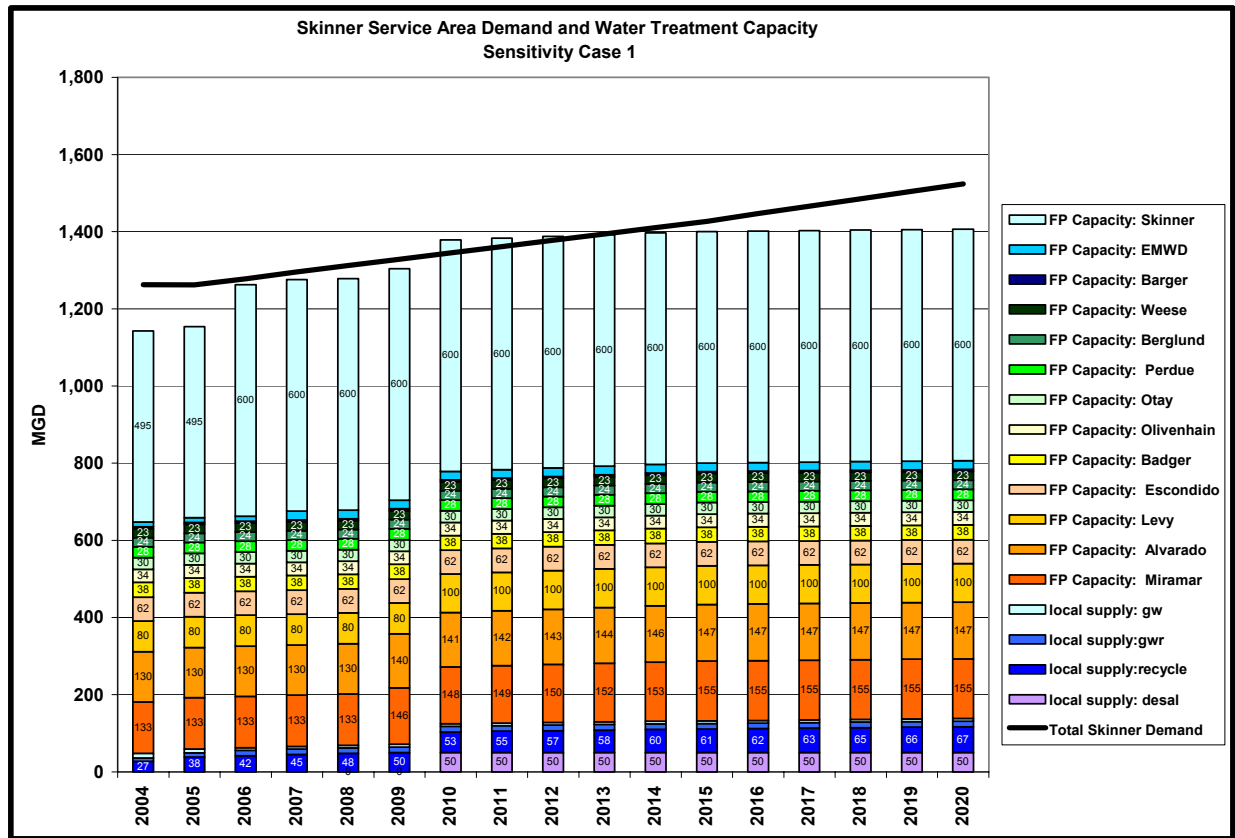


Sensitivity Analyses

To examine the needs of the region under various conditions, two sensitivity cases were prepared. The first sensitivity case assumes that implementation of ocean desalination in San Diego County would be delayed two years until 2010, and that the second phase of desalination facilities would not be constructed, so regional ocean desalination capacity would remain at 50 MGD. This case is shown on Figure 13.

Figure 13 illustrates the importance of SDCWA completing its ocean desalination program on schedule. If the ocean desalination program is not operational until 2010, a small deficit in overall treatment capacity continues until 2010. Also, Figure 13 indicates that additional treatment capacity for the Skinner service area will once again be needed by the summer of 2013 to offset the growing shortfall between capacity and demand.

Figure 13. Skinner Service Area Demand and Water Treatment Capacity Sensitivity Case 1



The second sensitivity case assumes that ocean desalination in San Diego County would not be implemented, and that the Miramar and Alvarado water treatment plants are not expanded in 2009. This case is shown on Figure 14.

Figure 14. Skinner Service Area Demand and Water Treatment Capacity Sensitivity Case 2

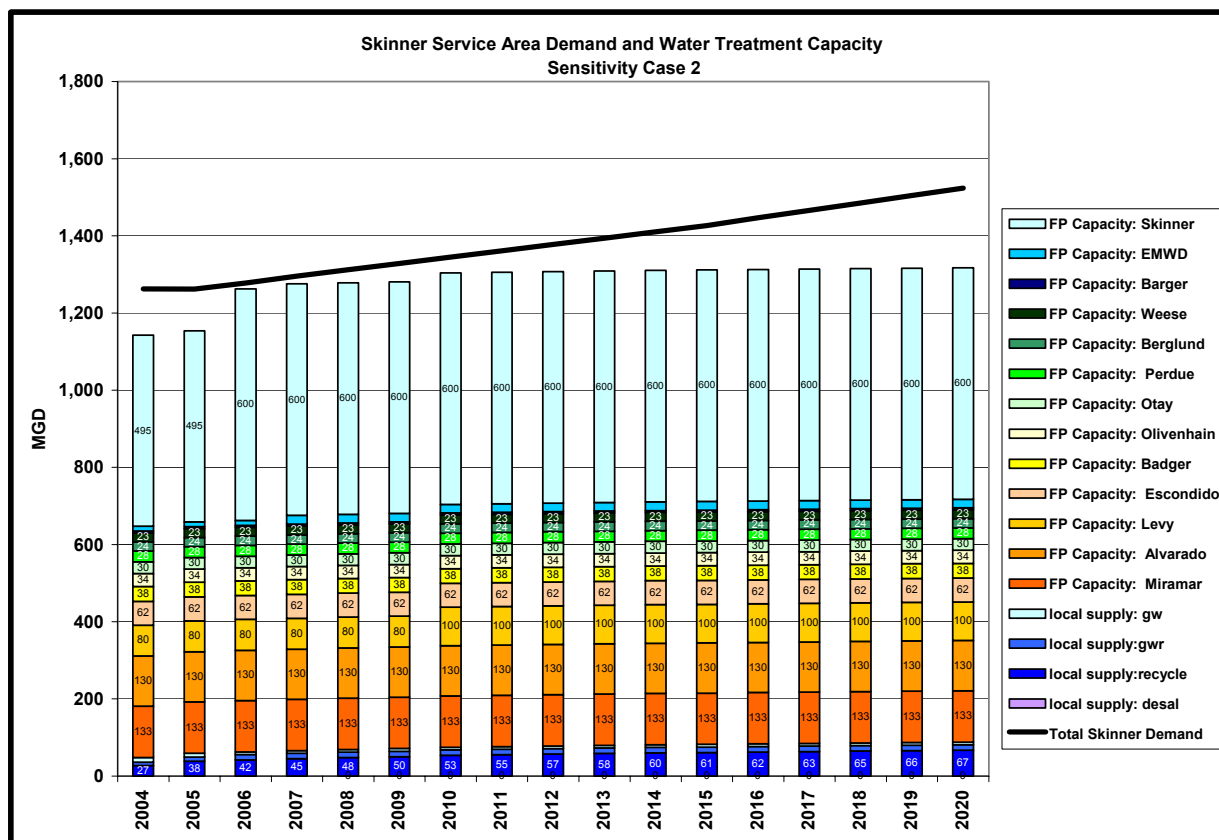


Figure 14 indicates that if the local projects slated for construction are not implemented, the Skinner service area, even with construction of Module 7, will not have sufficient treatment capacity from 2004 on under the worst-case hydrology.

As one alternative to meeting the treated water shortfall, as described previously, SDCWA is currently evaluating the option to construct a new 100-MGD regional water treatment plant within its service area. The most recently identified online date for this plant is 2008. However, the ongoing rate analysis and other financial impacts need to be completed before SDCWA can proceed, which could delay the project. Additionally, raw water conveyance to supply a new plant will not be available until SD Pipeline 6 is online. If implemented, SDCWA’s regional treatment plant, in conjunction with the San Vicente Pipeline, could continue to defer its need for additional imported treated water and offset the regional shortfall in treatment capacity. Another alternative to meet the

treated water shortfall is for Metropolitan to construct additional treatment and conveyance facilities. Full implementation of a new Metropolitan treatment plant and related conveyance pipelines, including San Diego Pipeline 6, will require approximately nine years.

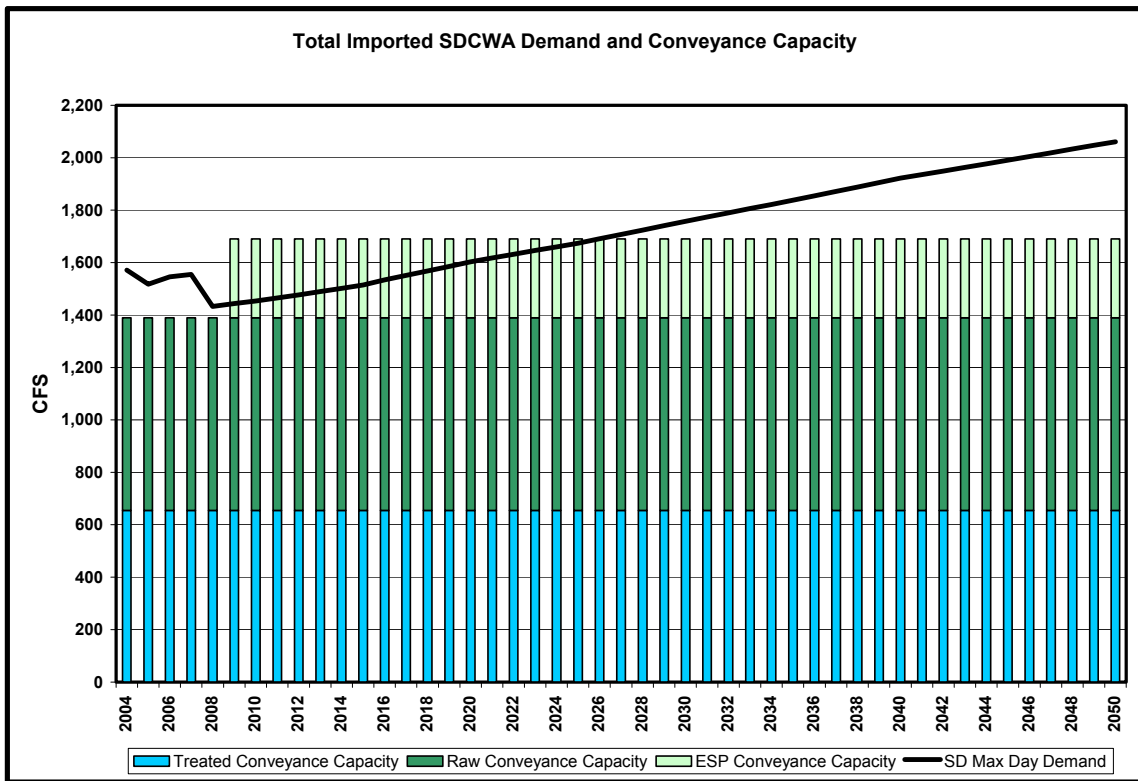
The planning and environmental analysis for either of these alternatives would need to begin immediately in order to avoid, or at least minimize, the treatment capacity shortfalls identified in Figures 12, 13, and 14.

San Diego Pipeline 6 Schedule

Based on the current demand forecast and facility construction schedules, the need for SD Pipeline 6 was reevaluated. Since the 2002 *Skinner Service Area Update*, Metropolitan has revised the assumptions used for planning based on operating conditions of its pipelines. The capacity of the treated water pipelines used in planning now matches the observed operating capacity of 655 cfs to SDCWA. Figure 15 illustrates the need for SD Pipeline 6 under maximum demand conditions.

Projected maximum demands indicate there is an immediate need for additional conveyance capacity to SDCWA between now and 2009 that even completion of the desalination plant does not completely address. However, because the Skinner service area has not experienced the maximum-demand hydrology modeled in Figure 15, all firm demands to date have been met. The indicated 300 cfs increase in capacity in 2009 results from the completion of the San Vicente Pipeline connecting San Vicente Reservoir to the raw water conveyance system near the Miramar vent structure. This additional capacity would reduce raw water demands on Metropolitan by up to 300 cfs for short periods during the summer, depending on how SDCWA schedules deliveries to its reservoirs. Assuming that SDCWA maximizes use of conveyance capacity to balance treated water demands, and once the San Vicente Pipeline is online, the need for additional conveyance capacity to SDCWA is deferred until 2026.

Figure 15. Total Imported SDCWA Demand and Conveyance Capacity

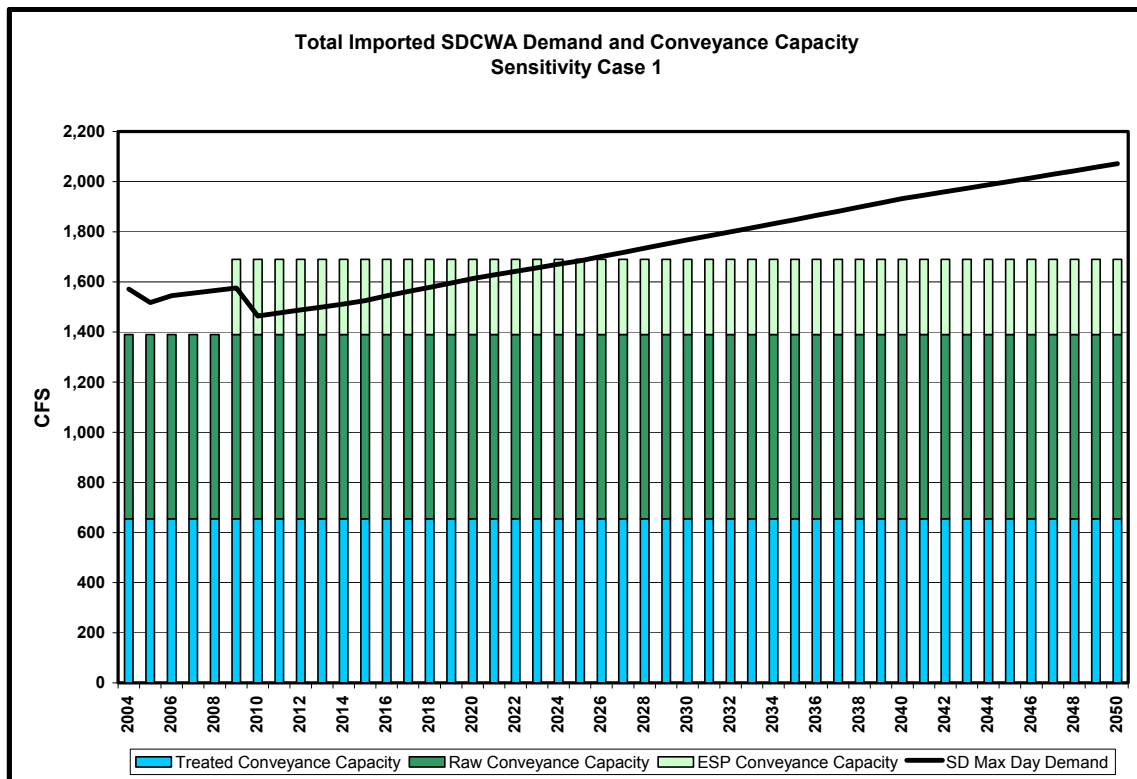


Sensitivity Analyses

The analysis for projected conveyance facility needs were also evaluated under two sensitivity cases similar to those used in the treatment capacity analysis. The first case assumes that ocean desalination in San Diego County would be delayed two years until 2010, and that the second phase of desalination facilities would not be constructed. This first case is shown on Figure 16.

Figure 16 illustrates that a two-year delay in SDCWA’s desalination project increases the magnitude of the need for additional conveyance capacity until the San Vicente Pipeline is online in 2009. Once the tunnel is in service, the need for more conveyance capacity is deferred until 2026.

Figure 16. Total Imported SDCWA Demand and Conveyance Capacity Sensitivity Case 1



The second sensitivity case assumes that ocean desalination in San Diego County would not be implemented, and is shown on Figure 17. Figure 17 indicates the same increased shortfall until the San Vicente Tunnel is online in 2009. However, the need for more conveyance capacity is moved forward to 2017. In all three conveyance capacity analyses, it should be noted that full implementation of SD Pipeline 6 could require up to approximately nine years.

Figure 17. Total Imported SDCWA Demand and Conveyance Capacity Sensitivity Case 2

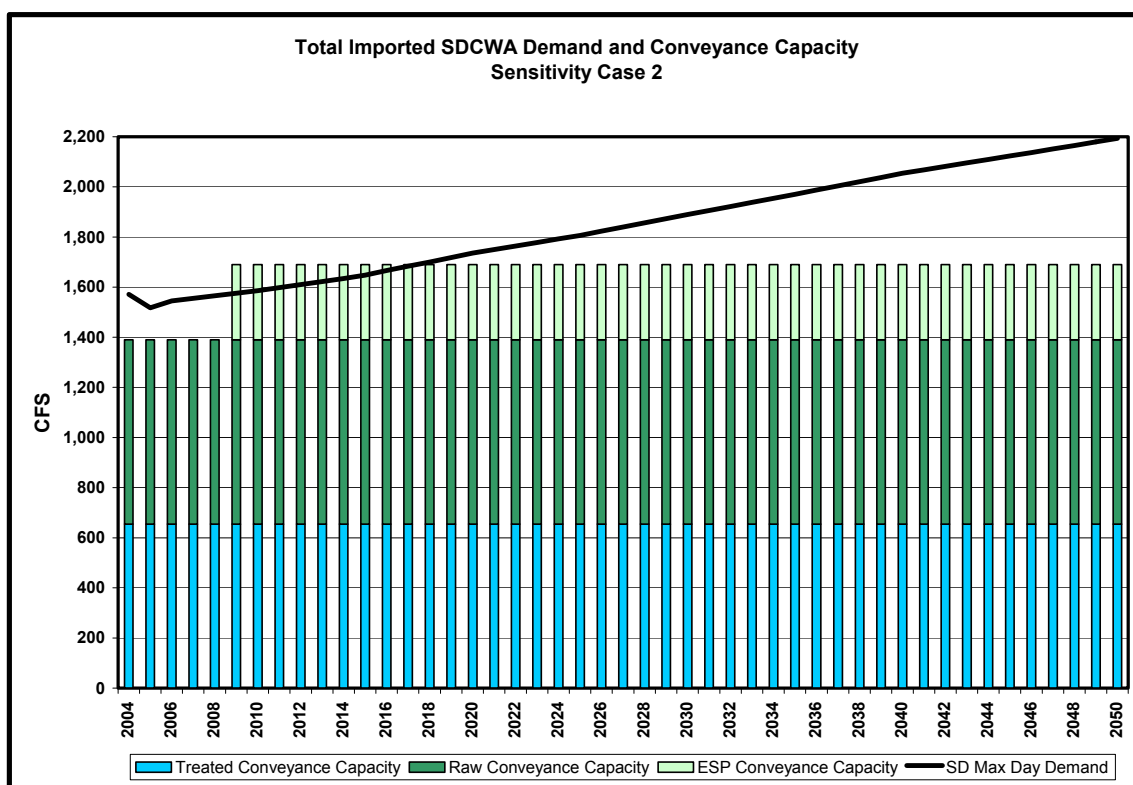


Figure 17 indicates the need for additional conveyance capacity until the San Vicente Pipeline is operable in 2009. Once the tunnel is in service, the need for more conveyance capacity is deferred until 2017.

Finally, it is important to note that a conveyance capacity constraint also exists on the upstream side of Lake Skinner. The San Diego Canal is the major transmission facility into Skinner area, and has a design capacity of 1,700 cfs. It is projected that under the

worst-case hydrology, maximum day total Skinner area imported demands could exceed capacity of the San Diego Canal beginning in 2004. This shortfall in conveyance capacity is temporary; however, until SDCWA completes the San Vicente Pipeline in 2009. The San Vicente Pipeline will enable the use of storage from San Vicente Reservoir to offset the need for deliveries through the San Diego Canal, and will provide 300 cfs of conveyance capacity. The need for additional conveyance capacity in the San Diego Canal varies depending upon the amount of desalination capacity brought online by SDCWA. If no desalination is capacity is implemented, it is projected that conveyance capacity between Diamond Valley Lake and the Skinner area will be needed in 2016. If desalination is implemented as planned, additional capacity will be required in 2021.

Metropolitan is current evaluating additional conveyance capacity to the Skinner service area, either in the form of another canal or pipeline, possibly from Diamond Valley Lake.

Short-Term Operating Strategies

The following short-term strategies are to ensure that Metropolitan continues to meet firm water demands in the Skinner service area until Module 7 is brought online in 2007.

- Surface Storage Operating Agreement – Metropolitan and SDCWA will work cooperatively to implement the provisions of this agreement for the next five years for the purpose of alleviating peaks on the Skinner FP. Metropolitan deliveries will be made to storage in the winter months for withdrawal by the SDCWA participating agencies in the summer months. The majority of the water will be “schedule water”, and will be withdrawn according to the jointly planned schedule. At those times that the Skinner FP reaches design capacity, “call water” can be requested by Metropolitan’s Operations Control Center on immediate notice for an immediate increase in withdrawal from local storage and use of local treatment plant capacity.
- Ongoing Skinner Agencies Operator’s Coordination Meetings – Metropolitan and the Skinner agencies should continue to meet on a regular basis to ensure that the affected member agencies are aware of daily system demands and the operational strategies available in times of peak demand. This group should continue to work even more closely at the sub-agency level on demand management and to coordinate the optimization of local treatment plant facilities along with the Skinner FP.

Water Quality Issues

Water Quality Regulations

The Safe Drinking Water Act requires the U.S. Environmental Protection Agency to set regulations that protect consumers from microbial pathogens and disinfection by-products (DBPs). As part of this legislation, two new regulations were implemented on January 1, 2002. These regulations include the Interim Enhanced Surface Water Treatment Rule (IESWTR) and Stage 1 of the Disinfectants/ Disinfection By-Product (D/DBP) Rule.

Interim Enhanced Surface Water Treatment Rule

The primary purpose of the IESWTR is to improve the physical removal of *Cryptosporidium*, a disinfection-resistant pathogen. This objective is attained by decreasing existing plant effluent turbidity standards and implementing new reporting requirements for individual filter effluent turbidity. The Skinner FP meets this rule by optimizing the coagulation and filtration processes.

Stage 1 Disinfectants/Disinfection By-Products Rule

Stage 1 of the D/DBP Rule contains two main provisions relevant to Metropolitan: (1) maximum contaminant levels (MCLs) for DBPs; and (2) a treatment technique to control DBP precursors.

The D/DBP rule lowered the existing MCL for trihalomethanes from 100 micrograms per liter ($\mu\text{g/L}$) to 80 $\mu\text{g/L}$. New MCLs were established for haloacetic acids ([HAA5](60 $\mu\text{g/L}$ as the sum of five haloacetic acids), bromate (10 $\mu\text{g/L}$), and chlorite [1.0 milligrams per liter (mg/L)]. Compliance with the new trihalomethane and haloacetic acid MCLs are based on a running annual average of samples collected throughout the distribution system. Compliance with the chlorite and bromate MCLs will be based on samples collected at the plant effluent.

In addition to the new MCLs, Stage 1 of the D/DBP rule requires that conventional filtration plants use enhanced coagulation to remove DBP precursors (i.e., total organic

carbon or TOC). Conventional filtration plants can either remove TOC or meet a range of alternative criteria. For Metropolitan's source waters, these criteria include either controlling THMs to <40 µg/L and HAA5 to <30 µg/L, maintaining low specific ultraviolet absorbance (SUVA) in coagulated/settled water, or demonstrating that source waters are non-amenable to enhanced coagulation. Note that the direct Skinner FP (without sedimentation basins) must comply with the new DBP MCLs, but does not need to comply with the treatment technique component.

The Skinner FP (conventional treatment plant only) is currently being operated in a manner that eliminates the need to implement enhanced coagulation. The Skinner FP maintains a source of treated water SUVA less than 2.0 L/mg-m. The SUVA of State Project water (SPW) is always above 2.0 L/mg-m, whereas the SUVA of CRW is always below this value. This operation mode requires weekly adjustments to the blend of SPW and CRW entering Lake Skinner and, on occasion, elevated coagulant dosages.

Future Regulations

Proposed future regulations include the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) and Stage 2 of the D/DBP Rule. These regulations are not expected to be enforced until 2010. The LT2ESWTR increases control of disinfectant resistant pathogens. The Stage 2 D/DBP Rule further limits DBP exposure by phasing out the geographical averaging of DBP levels to comply with the MCLs. This regulation will eventually require utilities to meet MCLs at each distribution sample location on a running annual average. It is expected that the precursor removal requirements from the Stage 1 D/DBP Rule would be maintained. It is expected that the LT2ESWTR or Stage 2 of the D/DBP rule will not require further significant capital expenditures at the Skinner FP.

Perchlorate

The main source of perchlorate entering the Colorado River originates from manufacturing facilities near the city of Las Vegas, Nevada. Ammonium perchlorate, a principal component of solid rocket fuel, has permeated into groundwater aquifers from manufacturing sites in the Las Vegas Basin and flows into Lake Mead due to the hydraulic gradient of this region. Perchlorate detected in Colorado River supplies has been traced to these sources. A groundwater remediation effort is ongoing to substantially reduce perchlorate loading to the Las Vegas Basin.

Perchlorate is a health concern because it interferes with thyroid uptake of iodide. Impaired thyroid function may affect metabolism in adults and impair neuropsychological development in the fetus and newborns. There is currently no enforceable drinking water standard for perchlorate. The CDHS established a non-enforceable, advisory Action Level of 4 µg/L in January 2002. California's Office of Environmental Health Hazard Assessment released a draft Public Health Goal of 2 - 6 µg/L in March 2002.

Historical data show that perchlorate levels in Metropolitan's treated waters are subject to wide changes, primarily associated with the percent blending of SPW. Blending CRW with SPW reduces the level of perchlorate; however, the amount of permissible blending is dictated by competing criteria such as the need to (1) comply with the Stage 1 D/DBP Rule; (2) meet Metropolitan's salinity objective of 500 mg/L annual average; and (3) optimize resource management issues such as water demand, and the availability of SWP supplies, and (4) operational constraints such as available SWP conveyance capacity.

Fluoridation

The addition of fluoride treatment at the Skinner FP was approved by Metropolitan's Board of Directors this past year and the chemical feed system is currently in design. Construction is scheduled to be completed and the system operational in the fourth quarter of 2006. Raw water delivered from Lake Skinner will not be fluoridated.

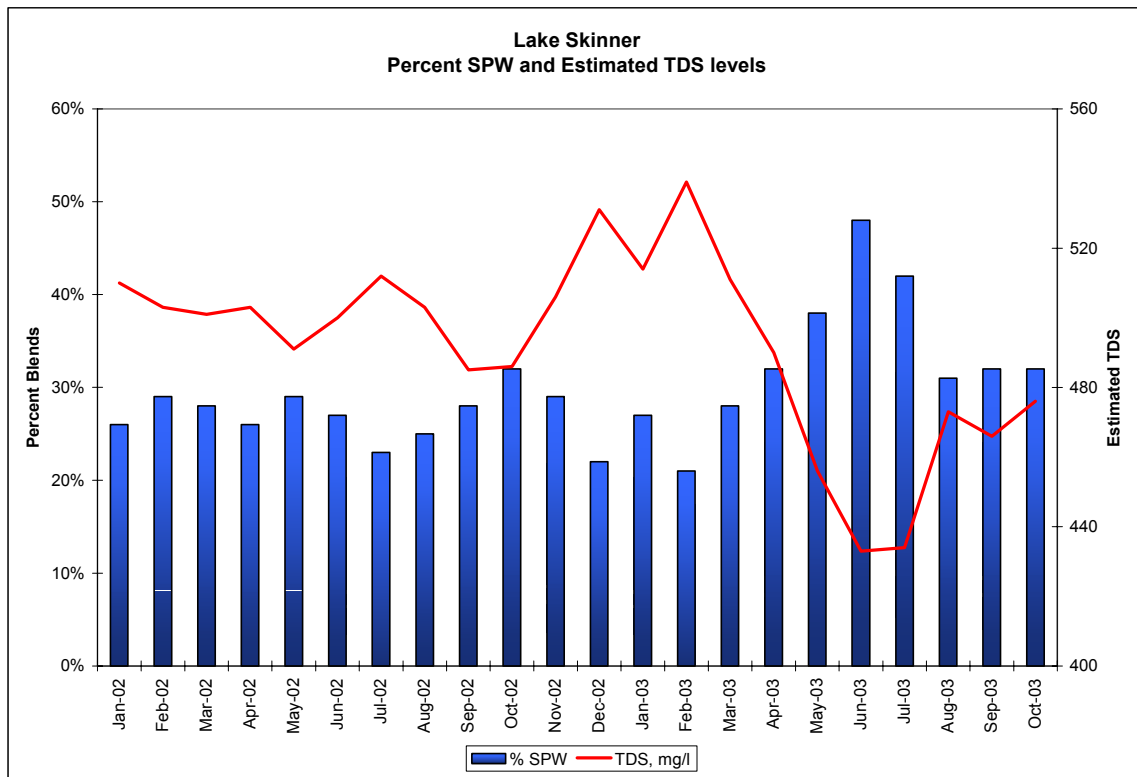
Blending

The blending of source waters entering Lake Skinner achieves multiple water quality and water resource objectives. In general, the benefits of increasing the SPW percentage include decreased salinity, decreased perchlorate concentrations, and greater flexibility to manage both State Water Project and Colorado River supplies. Drawbacks to increasing the SPW percentage include additional DBP formation and additional treatment costs to minimize DBP formation.

New treatment technologies (ozone and chlorine dioxide) were studied this past year in order to reduce the trade-offs described above. Ozone was selected and approved by the Board and will be installed at Skinner FP in 2007. Until the ozone retrofit is implemented, however, a careful balance between competing water quality goals must be attained. This balance is achieved by weekly monitoring and adjusting both SWP blends and the amount of coagulant added. Capital improvements to the existing solids handling facilities will improve the ability of Skinner FP to add more coagulants and will allow a higher blend of SPW to be treated. These facilities will be completed in mid 2004.

Figure 18 illustrates how the percent SPW in Lake Skinner varied during the calendar years 2002 and 2003. The graph also shows that with the higher SPW blend, and thus lower percentage of CRW, the salinity (TDS) in Lake Skinner was reduced.

Figure 18. Lake Skinner Percent SPW and Estimated TDS Levels



Conclusions

Clearly, there is little that can be done, in the short-term, in the form of facility construction by Metropolitan to offset the immediate treatment capacity shortfall to the region given current project status and construction timeframes. The construction of Module 7 at Skinner and the North Reach of San Diego Pipeline 6, combined with implementation of projects by the other Skinner area agencies, are essential in order to meet growing maximum-day demands for treated water.

Based on the analysis presented on Figure 14, additional treatment facilities will be needed to meet long-term treated water demands in the Skinner service area sometime between 2007 and 2020. If SDCWA's construction schedule for new facilities slips, the currently identified treated water shortfall under worst-case hydrology conditions will continue to grow. If SDCWA constructs a new 100-MGD regional treatment plant, and implements both phases of its desalination program, along with completion of the San Vicente Pipeline/Tunnel the region's worst-case hydrology demands can be met through about 2020. If Metropolitan constructs new treatment and conveyance capacity in the Skinner service area, Metropolitan would need to begin the planning and environmental process immediately in order to minimize the treatment capacity shortfall identified on Figure 14.

This study group has developed the following long-term conclusions:

1. The demand projection analysis performed for this study reveals that additional treatment capacity is needed in the region by no later than 2013. This need is based on the expansion of the Skinner FP in 2006, implementation of SDCWA's ocean desalination program and local water treatment plant expansions. Based on the worst-case scenario of the sensitivity analysis performed, the treatment capacity deficiency that now exists will continue, even with Module 7 online, until additional treatment plant capacity is brought online. The conclusion is that Metropolitan's Board and the member agencies continue to monitor progress on capital improvement projects and plan to meet any treatment capacity shortfall no later than the year 2013.

If Metropolitan's Board decides to proceed with a regional treatment facility to meet the shortfall, such a facility would be located to provide benefits to member agencies in both Riverside and San Diego counties.

If the SDCWA decides to build additional treatment plant capacity in its service area, then additional raw water conveyance is not needed from the Skinner complex when treatment facilities are operational, due to the particular configuration of SDCWA's internal distribution system. As was indicated in SDCWA's letter to Metropolitan's Chairman of the Board of Directors, dated September 30, 2002, SDCWA would like Metropolitan to proceed with implementation of the north reach of SD Pipeline 6 and believes that SD Pipeline 6 will be needed at some point in the future. SDCWA has committed to Metropolitan to provide sufficient notice in order for Metropolitan to design and construct the south reach on SD Pipeline 6.

2. Analysis performed for this study also reveals that additional treated water conveyance is needed from the Skinner facility to SDCWA's service area when Metropolitan brings additional treatment capacity online. The conclusion is that this addition of treated water conveyance could be achieved by the conversion of SD Pipeline 3 from raw water conveyance to treated water conveyance and the completion of SD Pipeline 6.
3. Analyses performed for this study reveal that there is a need for additional conveyance capacity to supply the SDCWA service area under the maximum demand scenario, between now and 2009, when the SDCWA San Vicente Pipeline is completed, and then again from as early as 2016 to 2021, based on the sensitivity analysis. Although, at this time, SDCWA cannot utilize additional raw water capacity available to its service area due to internal constraints in its distribution system, these internal constraints are being addressed in SDCWA's RWFMP. These efforts along with utilization of SDCWA's San Vicente Pipeline could mitigate a portion of the identified conveyance capacity shortfall to SDCWA.

4. This study concludes that Metropolitan's Board should authorize staff to evaluate increased utilization of available capacity at the Mills FP for the purpose of off-setting treated water demand on the Skinner FP in a Riverside County Area Study. This increased utilization of available capacity, if implemented by 2012, may enable the affected member agencies to offset demands on the Skinner FP until the time when additional treatment capacity in Riverside County is brought online.

Recommendations

Short-Term

1. Metropolitan will reevaluate the construction schedule of regional facilities consistent with Metropolitan's System Overview Study and capital investment policies, if local capital facility plans of the Skinner member agencies change significantly in the future. Metropolitan will continue to monitor progress on local capital facility projects and plans in the Skinner service area.
2. Metropolitan will complete a Riverside County Treated Water Supply Study that will address utilization of excess capacity at the Mills FP and the potential need for the Central Pool Augmentation water treatment plant to meet Riverside County demands.
3. Metropolitan will continue to provide support, as needed, to SDCWA staff for its rate impact study and other planning activities.
4. Metropolitan will continue to hold the Skinner agencies operator's coordination meetings on a regular basis. The efforts of this group during the summers of 2002 and 2003, during brief periods of high demand on the Skinner FP, have proved to be successful in coordinating operations to meet member agency demands. This group has worked closely with its sub-agencies on demand management and to coordinate the optimization of local treatment plant capacity along with the Skinner FP and the raw water conveyance system.
5. Metropolitan and SDCWA should coordinate efforts, through the Operating Committee, to implement the Surface Storage Operating Agreement to alleviate peaks on the Skinner FP.
6. Metropolitan will continue to develop and distribute the bi-monthly Skinner Area Update to the Skinner agencies and their sub-agencies as requested. This regularly distributed publication provides timely updates on operational status to

facilitate meeting agency demands, and on capital investment project schedules to ensure meeting reliability goals.

7. Metropolitan will continue to distribute the daily operational status report to the Skinner agencies.

Long-Term

1. Because of Metropolitan's role as the regional supplier of supplemental water and due to the potential shortfall in regional treatment capacity identified under the sensitivity analyses, Metropolitan should immediately begin evaluating alternatives for regional facilities to meet projected demands in southwestern Riverside and San Diego Counties. Metropolitan shall prepare a report discussing the alternatives planned considering relevant local conveyance and treatment actions and critical milestones by December 2004. The alternatives shall consider the construction and operation of additional treatment capacity in Riverside County by Metropolitan in or about 2012.
2. Metropolitan and the Skinner member agencies should continue to coordinate on the long-term treatment capacity need for the Skinner service area. Development of member agency treatment facilities may alleviate the need or decrease the size of additional Metropolitan treatment capacity for the Skinner service area.
3. When Metropolitan constructs additional treatment capacity, additional conveyance capacity to deliver treated water to meet demands in southwestern Riverside and San Diego counties will be required. Metropolitan should immediately proceed with design of the remaining portions of SD Pipeline 6, within Riverside County, and the necessary modifications for conversion of SD Pipeline 3 to treated water service to coincide with the completion of the new water treatment capacity. SDCWA should schedule its portion of SD Pipeline 6 to coincide with the completion of Metropolitan's portion of SD Pipeline 6 and proceed with necessary design and acquisition of right-of-way contemporaneous with Metropolitan's actions.

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Appendix A R.A. Skinner Filtration Plant Operational Status — New Record

8/13/2003 8:18

8:18

Member Agency Flows - cfs [Flow Capacities]

Treated Water

SDCWA		
SD-01A	81	[85]
SD-01B	81	[95]
SD-2	12	[20]
SD-9	9	[20]
SD-8	7	[30]
SD-5	5	[25]
SD-7	350	[450]
Total	545	

EMWD		
EM-17	65	[100]

Rancho Water		
WR-26	30	[40]
WR-28	25	[40]
EM-13	30	[40]
EM-20	30	[]
Total	115	

Raw Water

SDCWA		
SD-3	280	[280]
SD-11	450	[500]

Rancho Water		
EM-19	25	[40]

FWR Demand	
	2
Positive value = FWR filling	

Treated Water Total 725 cfs

Raw Water Total 755 cfs

Total Outlet Conduit Flow	1489.5 cfs
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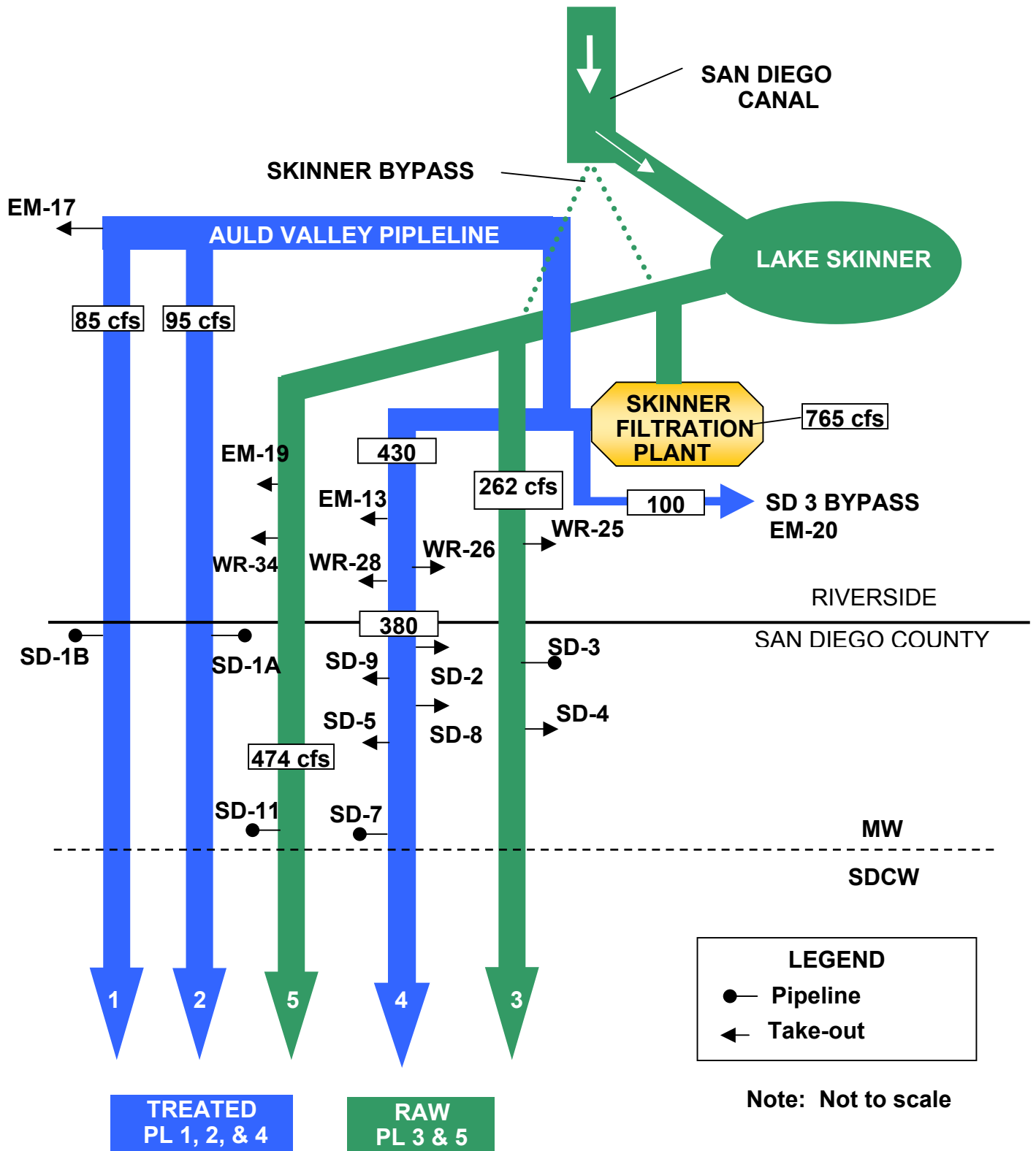
Plant Status Design Capacity - 520 mgd

Influent Design Capacity	Current Return Water	Unavailable Filters	Current Net Plant Production	Current % of Capacity
520 mgd	24 mgd	0	493 mgd	95%
804 cfs	37 cfs	0 cfs	762 cfs	

Available Plant Production
26 mgd
40 cfs

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Appendix B Skinner Area Schematic



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**Appendix C
Table C-1**

Delivery Facilities to San Diego County Water Authority			
Connection	Capacity (cfs)	Pipeline Number	Water Type
SD-01A	125	1 & 2	Treated
SD-01B	125	1 & 2	Treated
SD-02	20	4	Treated
SD-03	300	3	Untreated
SD-05	25	4	Treated
SD-07	450	4	Treated
SD-08	30	4	Treated
SD-09	20	4	Treated
SD-11	700	5	Untreated

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Appendix D

Correspondence - Skinner Filtration Plant Capacity and Skinner Study Update



MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Executive Office

September 8, 2003

Maureen Stapleton, General Manager
San Diego County Water Authority
4677 Overland Avenue
San Diego, CA 92123

Dear Ms. Stapleton:

R. A. Skinner Filtration Plant Capacity

The purpose of this letter is to clarify the production capacity of the R. A. Skinner Filtration Plant. Recent comments made at member agency general manager meetings and in newspaper articles indicate that this issue needs clarification.

As stated in our current California Department of Health Services (CDHS) Operating Permit No. 04-92-011 dated October 1992, the Skinner plant has a two-tiered filtration plant capacity rating system, consisting of:

1. Design Capacity. The design capacity of the Skinner plant is 520 million gallons per day (MGD). This is defined as the reliable nominal capacity under all anticipated water quality conditions and routine operating procedures. Approximately 5 percent of the plant influent flow is recycled for backwashing purposes; therefore, the net effluent production for the member agencies when operating at design capacity is 495 MGD.
2. Maximum Capacity. The maximum permitted capacity of the Skinner plant is 649 MGD. This is defined as the absolute maximum throughput potential of the facility, as limited by either the hydraulic limitations of the filtration plant or the maximum allowable filtration rate of 10 gallons per minute per square foot. Although the maximum permitted capacity is 649 MGD, the Skinner plant has never operated at this rate. Several years of operational experience have indicated that under ideal conditions, the maximum capacity of the plant is approximately 580 MGD (or 550 MGD of net effluent production).

The Skinner plant may be operated above the design capacity (520 MGD) and up to the maximum capacity (580 MGD) during times when such operation is necessary to meet peak demands. Criteria have been established by agreement between Metropolitan and CDHS for operation above the design capacity. These criteria include additional operation, monitoring, and reporting requirements. In addition, favorable raw water quality conditions must exist and all process equipment must be in service in order to operate above the design capacity.

700 N. Alameda Street, Los Angeles, California 90012 • Mailing Address: Box 54153, Los Angeles, California 90054-0153 • Telephone (213) 217-6000

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Maureen Stapleton, General Manager

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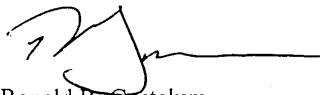
September 8, 2003

Metropolitan is required to notify CDHS in "a reasonable time frame" when the plant has been operated above the specified design capacity. To date, the plant has successfully operated above 520 MGD on numerous occasions.

Metropolitan is confident that it can continue to successfully operate the Skinner plant above the design capacity of 520 MGD prior to Module 7 becoming operational. Until that time, it will be critical that all affected parties continue their close communication and regional perspective. Once Module 7 is on-line, I believe we can still achieve benefits by maintaining the present cooperative and coordinated operating practices.

If you would like to discuss this issue further, please call me at (213) 217-6211 or Jill Wicke, of my staff, at (213) 217-6306.

Very truly yours,



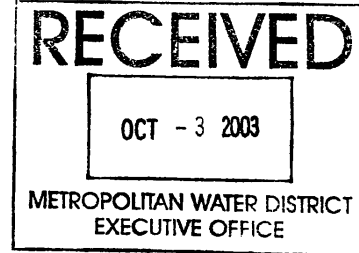
Ronald R. Gastelum
Chief Executive Officer

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cc: Gary Eaton, SDCWA
Richard Pyle, SDCWA
San Diego County Water Authority Member Agencies
Eastern MWD
Western MWD



September 30, 2003



Mr. Ronald Gastelum
 Chief Executive Officer
 Metropolitan Water District of Southern California
 PO Box 54153
 Los Angeles, CA 90054-0153

RE: Skinner Area Study Update

Dear Ron:

The San Diego County Water Authority (Water Authority) wants to take the opportunity to compliment you and your staff for taking the initiative to update the Skinner Area Study. The previous versions of this study have been very helpful in identifying the need for additional facilities in the Skinner service area. One of the results has been your aggressive pursuit of the expansion of the Robert F. Skinner Water Filtration Plant (Skinner Plant). You and your staff also deserve compliments for the speed with which actions have been taken related to the Skinner Plant expansion. The Water Authority continues to support this important effort and encourage Metropolitan Water District of Southern California (Metropolitan) to continue their efforts to expand the Skinner Plant.

The Water Authority is scheduled to complete the Regional Water Facilities Master Plan (Master Plan) by the end of the calendar year. This report provides a road map for construction of the facilities needed to serve the San Diego Region to the year 2030. Completion of this effort will provide valuable input to the Skinner Study, particularly regarding the Water Authority's needs for treated water beyond the next Skinner Plant expansion.

A finding of the Master Plan is the need for 100 million gallons per day (mgd) of additional water treatment capacity for the San Diego Region by the year 2010. We anticipate that 50 mgd would be provided by an initial phase of seawater desalination and the other 50 mgd from a regional water treatment plant. The 100 mgd assumes that the Skinner Plant expansion and a number of our member agency projects, including water treatment plant expansions, are completed on schedule.

There has been and will continue to be intense discussion concerning demand estimates and the amount of water treatment capacity needed for the San Diego Region. While it is possible that these continuing discussions may result in a change in our current 100 mgd estimate, the continued need for the Skinner Plant expansion is clear.

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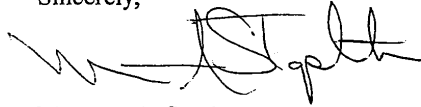
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Mr. Ronald Gastelum
September 30, 2003
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The Water Authority looks forward to continuing discussions on the Skinner Area Study with Metropolitan and it's affected member agencies.

Sincerely,



Maureen A. Stapleton
General Manager

MAS/JAE/RCP:rl

Set via FedEx

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