Metropolitan Water District of Southern California

FISCAL YEARS 2016/17 and 2017/18 COST OF SERVICE FOR PROPOSED WATER RATES AND CHARGES

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EXECUTIVE SUMMARY

Metropolitan's current rate design was adopted by its Board of Directors in October 2001 through a lengthy and open process. The rate structure is designed in accordance with the Rate Structure Action Plan of December 12, 2000; the Composite Rate Structure framework of April 11, 2000; the Strategic Plan Policy Principles of December 14, 1999, and the Strategic Plan Steering Committee Guidelines of January 6, 2000. The Board adopted the rate structure on October 16, 2001. This report describes the rate structure in detail including the cost of service process that supports the proposed rates and charges for calendar years 2017 and 2018, which are based on the Proposed Biennial Budget for Fiscal Years 2016/17 and 2017/18 issued on February 9, 2016 (the "Biennial Budget").

The rate structure supports the strategic planning vision that Metropolitan is a regional provider of services, encourages the development of additional local supplies through programs such as recycling and conservation and accommodates a water transfer market. Through its regional services, Metropolitan ensures a baseline of reliability and quality for imported water deliveries in its service area. By unbundling its full-service water rate, Metropolitan provides transparency regarding its costs and a greater opportunity for member agencies to competitively manage their supplies and demands to meet future needs in a responsible and cost-effective manner.

Objectives

In accordance with the Strategic Plan Policy Principles, the rate structure is designed to accomplish the following:

Accountability. Define the linkage among costs, charges, and benefits through a cost of service approach consistent with industry guidelines.

Regional Provider. Ensure that regional services are provided to meet the existing and growth needs of member agencies.

Equity. Ensure that users, including member agencies and other entities, pay the same rates and charges for like classes of services and provide fair and reasonable allocation of costs through rates and charges.

Environmental Responsibility. Encourage wise environmental stewardship and effective demand management by funding conservation and recycling projects and programs, and using pricing to encourage investments in conservation and recycling and other economical local supplies.

Choice and Competition. Offer choices for services to member agencies and accommodate the development of a water transfer market.

Water Quality. Support source quality improvements and water treatment systems that are required to ensure safe drinking water and the feasibility of water recycling and groundwater management programs.

Financial Integrity. Establish a financial commitment from the member agencies that provides financial security for Metropolitan and does not transfer undue risk to member agencies, individually or as a whole.

DISTRICT OVERVIEW

District Profile

The Metropolitan Water District of Southern California (Metropolitan) is a metropolitan water district created in 1928 under authority of the Metropolitan Water District Act (California Statutes 1927, Chapter 429, as reenacted in 1969 as Chapter 209, as amended (the Act)). Metropolitan has 26 member public agencies and its primary purpose is to provide its members with a supplemental wholesale water supply service for domestic and municipal uses. To do so, Metropolitan imports water from the Colorado River and Northern California. Metropolitan also helps its member agencies develop increased water conservation, recycling, storage and other local resource programs.

Metropolitan is authorized to develop, store, and distribute water for domestic and municipal purposes and other beneficial uses if excess water is available, and may provide, generate, and deliver electric power within or without the state for the purpose of developing, storing, and distributing water. All powers, privileges and duties vested in or imposed upon Metropolitan are exercised and performed by and through its Board of Directors. Metropolitan is governed by a 38-member Board of Directors representing the 26 member agencies. Metropolitan directors are selected by their respective member agencies and some of those directors also serve on the governing body of their member agency. Board and committee meetings are open to the public and are broadcast on the Internet through Metropolitan's website, www.mwdh2o.com. A schedule of Board and committee meetings, as well as current and archived Board materials, is available at the same website.

Metropolitan was established to obtain an allotment of Colorado River water and to construct and operate the 242-mile Colorado River Aqueduct (CRA), which runs from an intake at Lake Havasu on the California-Arizona border, to an endpoint at Metropolitan's Lake Mathews reservoir in Riverside County. Metropolitan owns and operates an extensive portfolio of capital facilities including the CRA, 16 hydroelectric facilities, nine reservoirs, 830 miles of large-scale pipes, and five water treatment plants. Four of these treatment plants are among the 10 largest plants in the nation. In fact, Metropolitan is the largest distributor of treated drinking water in the United States.

In 1960, Metropolitan, followed by other public agencies, signed a long-term contract with the state Department of Water Resources (DWR) to participate in the State Water Project (SWP). The SWP is the largest state-built, user-financed water supply and transportation project in the country. Its facilities were constructed with several general types of financing, the repayment of which is made by the 29 agencies and districts that participate in the SWP through long-term contracts (the State Water Contractors). The State Water Contractors also pay for the operations, maintenance, power, and replacement costs of the SWP, as the State Water Contracts are the basis for all SWP construction and ongoing operations and DWR manages and operates the SWP. As the largest of the now 29 contractors, Metropolitan is entitled to slightly less than half of all SWP supplies. Water supplies from the SWP are conveyed to Metropolitan via the SWP's 444-mile California Aqueduct, which was made possible pursuant to Metropolitan's State Water Contract. The SWP serves urban and agricultural agencies from the San Francisco Bay area to Southern California.

To secure additional supplies, Metropolitan also has groundwater banking partnerships and water transfer arrangements within and outside of its service area. Metropolitan also provides financial incentives to its

member agencies for local investments in water management projects and programs. An increasing percentage of Southern California's water supply comes from these local resources, including conservation, water recycling and recovered groundwater.

To pay for its costs, the Act authorizes Metropolitan to: levy property taxes within its service area; establish water rates; impose charges for water standby and service availability; incur general obligation bonded indebtedness and issue revenue bonds, notes and short-term revenue certificates; execute contracts; and exercise the power of eminent domain for the purpose of acquiring property. In addition, Metropolitan's Board is authorized to establish terms and conditions under which additional areas may be annexed to Metropolitan's service area.

District Mission

The mission of Metropolitan is to provide its 5,200-square-mile service area with an adequate and reliable supply of high-quality water to meet present and future needs in an environmentally and economically responsible way.

Periodically the Board has reviewed its policies and mission to ensure they fit with the times. In Fiscal Year (FY) 2016/17, the General Manager intends to embark on a strategic review of Metropolitan's Mission and Programs.

Metropolitan Service Area

Metropolitan's service area comprises approximately 5,200 square miles and includes portions of the six counties of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura. When Metropolitan began delivering water in 1941, its service area consisted of approximately 625 square miles. Its service area has increased by 4,500 square miles since that time. The expansion was primarily the result of annexation of the service areas of additional member agencies. Metropolitan has historically provided between 40 and 60 percent of the water used annually within its service area.

The area served by Metropolitan represents the most densely populated and heavily industrialized portions of Southern California. Metropolitan estimates that approximately 18.5 million people lived in Metropolitan's service area in 2014, based on official estimates from the California Department of Finance and on population distribution estimates from the Southern California Association of Governments (SCAG) and the San Diego Association of Governments (SANDAG). Population projections prepared by SCAG in 2012 and SANDAG in 2010, as part of their planning process to update regional transportation and land use plans, show expected population growth of about 18 percent in Metropolitan's service area between 2010 and 2035. The 2010 Census population estimates are incorporated into SCAG's 2012 projections. The 2010 SANDAG regional growth projections do not incorporate the 2010 Census population estimates.

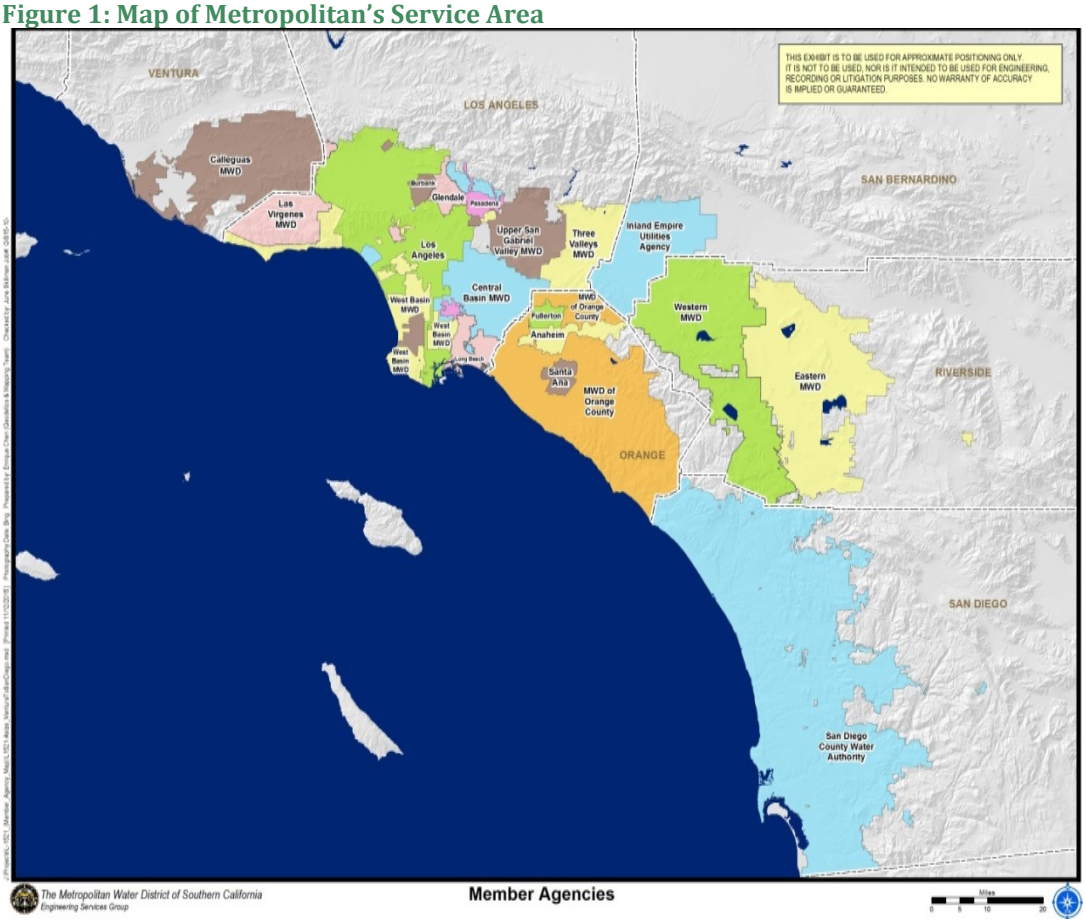
The economy of Metropolitan's service area is exceptionally diverse. In 2014, the economy of the six counties which contain Metropolitan's service area had a gross domestic product larger than all but fifteen nations of the world. The Six County Area economy ranked between Mexico ($1.28 trillion) and Indonesia ($888 billion), with an estimated gross domestic product (GDP) of just over $1.25 trillion. The Six County Area's gross domestic product in 2014 was larger than all states except California, Texas, and New York.

The climate in Metropolitan's service area ranges from moderate temperatures throughout the year in the coastal areas to hot and dry summers in the inland areas. Annual rainfall in an average year has historically been approximately 13 to 15 inches along the coastal area, up to 20 inches in foothill areas and less than 10 inches inland.

Service Area Map

Figure 1 below shows the area served by Metropolitan. It includes parts of six of the ten counties that comprise Southern California (Six County Area) consisting of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Although these counties comprise Metropolitan's service area, Metropolitan's territory does not encompass all of the area within each of the six counties.

Figure 1: Map of Metropolitan's Service Area



Organization Structure

Board of Directors

Metropolitan is governed by a 38-member Board of Directors. Each member public agency is entitled to have at least one representative on the Board, plus an additional representative for each full five percent of the total assessed valuation of property in Metropolitan's service area that is within the member public agency. Changes in relative assessed valuation do not terminate any director's term. Accordingly, the Board may, from time to time, have more or less than 38 directors.

The Board includes business, professional and civic leaders. Directors serve on the Board without compensation from Metropolitan. Voting is based on assessed valuation, with each member agency being entitled to cast one vote for each $10 million or major fractional part of $10 million of assessed valuation of property within the member agency, as shown by the assessment records of the county in which the member agency is located. The Board administers its policies through the Metropolitan Water District Administrative

Code (the Administrative Code), which the Board adopted in 1977. The Board periodically amends the Administrative Code to reflect new policies or changes in existing policies that occur from time to time.

Metropolitan's day-to-day management is under the direction of its General Manager, who serves at the pleasure of the Board, as do Metropolitan's General Counsel, General Auditor, and Ethics Officer. Metropolitan's organization chart is shown in Figure 2; Table 1 provides a listing of Metropolitan's Senior Management.

Figure 2: Metropolitan Organization Chart

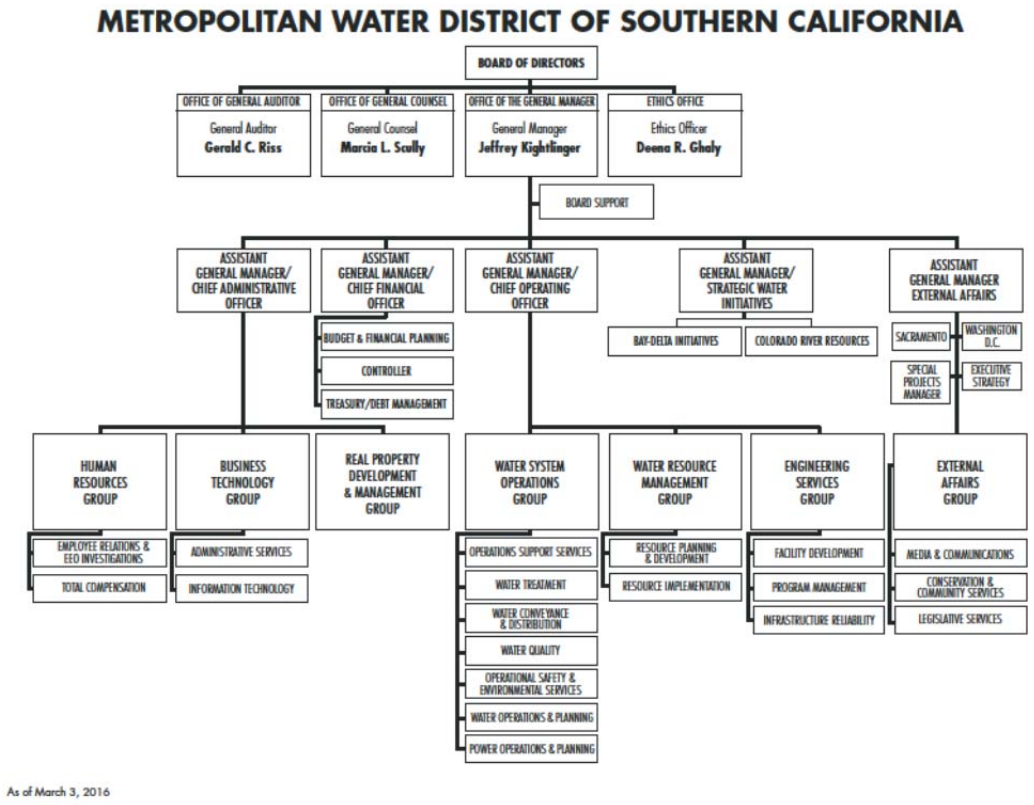


Table 1: Metropolitan Senior Management

Jeffrey Kightlinger	General Manager
Marcia Scully	General Counsel
Gerald Riss	General Auditor
Deena Ghaly	Ethics Officer
Gary Breaux	Assistant General Manager/Chief Financial Officer
Debra Man	Assistant General Manager/Chief Operating Officer
Roger Patterson	Assistant General Manager/Strategic Water Initiatives
Dee Zinke	Assistant General Manager/External Affairs
Fidencio Mares	Interim Assistant General Manager/Chief Administrative Officer
Dawn Chin	Board Executive Secretary

Member Agencies

Table 2 lists the 26 member agencies of Metropolitan which include 11 municipal water districts, 14 cities and one county water authority.

Table 2: Metropolitan Member Agencies

Municipal Water Districts	Cities	County Water Authority
Calleguas	Anaheim	San Diego
Central Basin	Beverly Hills	
Eastern	Burbank	
Foothill	Compton	
Inland Empire Utilities Agency	Fullerton	
Upper San Gabriel Valley	Glendale	
Western of Riverside County	Long Beach	
Las Virgenes	Los Angeles	
Orange County	Pasadena	
Three Valleys	San Fernando	
West Basin	San Marino	
	Santa Ana	
	Santa Monica	
	Torrance	

Metropolitan's Water Sales to Member Agencies

Due to Metropolitan's role as a supplemental supplier of imported water, Metropolitan's water sales are highly variable and unpredictable from year to year. In the past 20 years, water sales have been as high as 2.43 million acre-feet in FY 2003/04 and as low as 1.51 million acre-feet in FY 1997/98, as shown in Figure 3. Figure 3 includes total sales by fiscal year, including both untreated and treated water sales and SDCWA Exchange Water volumes. Variation occurs for many reasons. The demand for supplemental supplies is dependent on water use at the retail consumer level and the amount of local water supplies available to member agencies. Consumer demand and locally supplied water vary from year to year, resulting in variability in Metropolitan's water sales. Both economic growth and recessions can also lead to increases and decreases in demand. Weather also affects demands. Wet cool weather not only increases the availability of local supplies, it also decreases retail demands. Conversely, hot and dry weather results in significant increases in retail demand. In recent years, demands have been affected by drought, water use restrictions, economic conditions, and weather conditions. Member agencies also rely on Metropolitan during times of operational emergencies. Examples include: power outages, when member agencies need gravity-fed supplies to replace energy-dependent operations; water quality issues, such as when contaminants in groundwater force member agencies to shut down wells; and fires, when member agencies rely on Metropolitan for increased flows.

Based on the variability of supplemental wholesale water sales and unpredictability of future hydrologic conditions, sales projections are based on long-term average forecasts consistent with Metropolitan's latest Board-adopted Integrated Resources Plan (2015 IRP Update).

Figure 3: Historic Water Sales FY 1995-2015

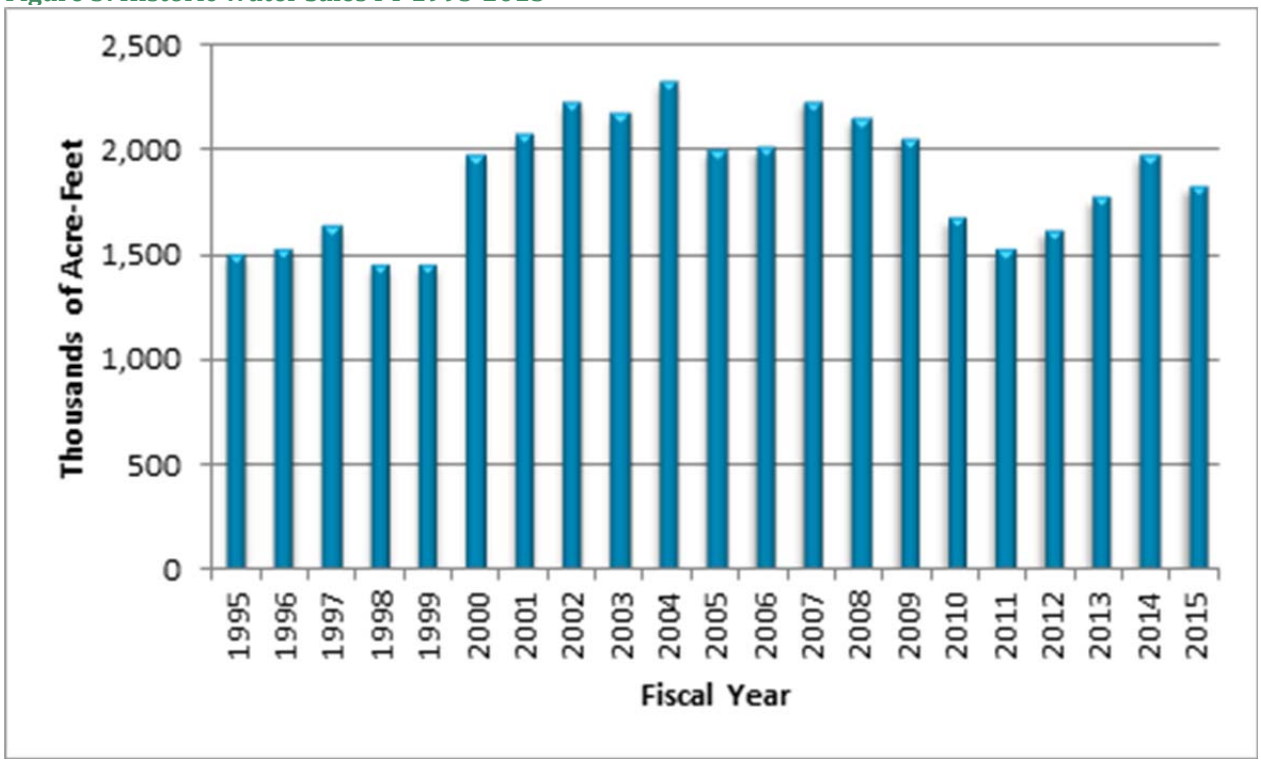


Table 3 identifies the amounts paid by member agency, including fixed charges and water sales, as well as the volume of water purchased by Metropolitan member agencies for FY 2015. Water sales includes treated, untreated, and SDCWA Exchange Water volumes.

Table 3: Metropolitan Water Sales to Member Agencies, Year Ended June 30, 2015
(Accrual Basis, Dollars in Thousands)*

Agency	Revenues				Water Sales	
	Fixed Charges ($ thousands)	Water Sales ($ thousands)	Total ($ thousands)	Percent of Total	AF	Percent of Total
Anaheim	$ 2,489	$ 11,991	$ 14,480	0.92%	17,945	0.94%
Beverly Hills	1,399	10,039	11,439	0.72%	11,092	0.58%
Burbank	1,375	10,577	11,953	0.76%	14,252	0.75%
Calleguas	12,417	87,860	100,277	6.34%	97,103	5.10%
Central Basin	6,124	36,229	42,353	2.68%	45,360	2.38%
Compton	271	0	271	0.02%	0	0.00%
Eastern	11,455	71,886	83,341	5.27%	89,737	4.71%
Foothill	1,171	7,519	8,690	0.55%	8,338	0.44%
Fullerton	1,238	7,508	8,745	0.55%	8,298	0.44%
Glendale	2,400	15,362	17,762	1.12%	16,954	0.89%
Inland Empire	6,999	34,744	41,743	2.64%	58,908	3.09%
Las Virgenes	2,533	20,433	22,965	1.45%	22,063	1.16%
Long Beach	3,832	41,689	45,520	2.88%	46,045	2.42%
Los Angeles	33,201	236,879	270,080	17.07%	355,368	18.66%
MWDOC	24,655	182,402	207,057	13.09%	227,482	11.94%
Pasadena	2,553	15,858	18,411	1.16%	17,820	0.94%
San Diego	47,194	323,540	370,734	23.44%	540,141	28.36%
San Fernando	57	89	146	0.01%	100	0.01%
San Marino	148	661	809	0.05%	731	0.04%
Santa Ana	1,447	7,936	9,383	0.59%	10,538	0.55%
Santa Monica	1,281	3,850	5,132	0.32%	4,258	0.22%
Three Valleys	7,962	46,650	54,612	3.45%	58,053	3.05%
Torrance	2,150	14,670	16,820	1.06%	16,205	0.85%
Upper San Gabriel	1,818	36,073	37,891	2.40%	56,410	2.96%
West Basin	14,485	102,221	116,706	7.38%	112,893	5.93%
Western	8,811	55,634	64,445	4.07%	68,386	3.59%
Total	**$ 199,465**	**$ 1,382,301**	**$ 1,581,766**	**100.00%**	**1,904,480**	**100.00%**

* Includes treated, untreated, and SDCWA Exchange Water volumes.

Due to differences in local supply resources and demand characteristics, usage profiles differ significantly among the member agencies. Table 4 summarizes the usage characteristics of the member agencies for the ten fiscal years ended 2014. As can be seen from this exhibit, individual agency purchases vary substantially from year to year, and the Metropolitan system accommodates usage behavior that varies widely among member agencies. The table shows that Metropolitan's sales can vary as much as ± 30 percent from average. This range of variability is not typical for a retail water utility, but does demonstrate the degree to which Metropolitan's commitments to meet supplemental demands can impact operations.

Table 4: Member Agency Water Usage Profiles
Calendar Years 2005-2014**

Agency	Average (AF)	Maximum (AF)	Minimum (AF)	Peak Day* (CFS)	Peak Day to Average Day
Anaheim	23,018	32,766	18,219	60.0	1.9
Beverly Hills	11,421	12,463	10,184	33.9	2.1
Burbank	14,499	18,121	9,814	36.1	1.8
Calleguas	115,191	131,073	95,335	263.8	1.7
Central Basin	60,796	113,536	30,394	130.7	1.6
Compton	2,292	3,066	943	7.7	2.4
Eastern	99,391	122,008	83,789	303.8	2.2
Foothill	10,075	12,261	7,827	25.4	1.8
Fullerton	11,501	19,676	8,450	37.4	2.4
Glendale	19,742	22,748	15,799	57.0	2.1
Inland Empire	70,633	86,883	56,827	176.2	1.8
Las Virgenes	22,678	26,738	20,065	56.0	1.8
Long Beach	37,515	50,364	26,980	72.9	1.4
Los Angeles	305,884	439,278	119,381	821.9	1.9
MWDOC	248,115	302,767	206,737	489.5	1.4
Pasadena	21,186	25,123	17,676	66.9	2.3
San Diego	531,485	677,665	406,975	1,177.5	1.6
San Fernando	206	901	0	6.5	23.0
San Marino	935	1,823	309	8.3	6.4
Santa Ana	14,715	21,811	10,826	30.7	1.5
Santa Monica	9,654	13,169	5,139	27.8	2.1
Three Valleys	67,234	74,439	61,799	178.6	1.9
Torrance	18,303	21,273	16,506	42.8	1.7
Upper San Gabriel	33,248	60,958	5,891	63.8	1.4
West Basin	127,018	145,075	111,867	276.5	1.6
Western	88,312	119,684	72,485	290.2	2.4
Total	**1,965,048**	**2,555,669**	**1,420,216**	**4,742.0**	**1.7**

*Peak Day from May 1 through September 30, excluding replenishment.

**Includes treated, untreated, and SDCWA Exchange Water volumes.

Metropolitan's Water Resources and Facilities

Metropolitan's total water system has been built over time to meet the widely differing needs of its member agencies and the sources of water available to Metropolitan. Some agencies have no local water resources and rely on Metropolitan for 100 percent of their annual water needs. Other agencies have adequate local surface supplies and storage and/or groundwater basins that provide them with the majority of their water supplies during wet and average years. However, during dry periods these agencies rely on Metropolitan to make up any shortfalls in local water supplies. Similar coordination challenges arise in managing water available from the SWP, the Colorado River, and water supply projects of Metropolitan.

Metropolitan's water delivery system is comprised of three basic conveyance and delivery components:

- SWP;
- CRA; and
- Distribution System.

The CRA and the California Aqueduct of the SWP convey imported water into the Metropolitan service area. This water is then delivered to Metropolitan's member agencies via a regional network of canals, pipelines, and appurtenant facilities, which constitute the Distribution System. Supply, treatment, and storage facilities augment the Distribution System.

Water Conveyance System

For purposes of this report, components of the conveyance system are considered to include only those major trunk facilities that transport water from primary supply sources to either regional storage facilities or feeder lines linked to the primary conveyance facilities. All other water transport facilities, including pipelines, feeders, laterals, canals and aqueducts, are considered to be distribution facilities. Distribution facilities can be further identified in that they generally have at least one connection to a member agency's local distribution system. Existing regional conveyance facilities include both the CRA and SWP facilities. Metropolitan's largest conveyance facility is the CRA. The CRA transports water from the Colorado River approximately 242 miles to its terminus at Lake Mathews in Riverside County. SWP facilities transport water from the Sacramento-San Joaquin Delta southward through a series of pumps, aqueducts, siphons, and tunnels that comprise the California Aqueduct. Conveyance facilities in or near Metropolitan's service area include the East Branch and West Branch of the California Aqueduct, the San Bernardino Tunnel, the Devil Canyon Power Plant, and the Santa Ana Valley Pipeline, which constitute the terminus of the reaches of the SWP facilities used and allocable to Metropolitan under its State Water Contract. A summary of conveyance facilities are presented in Table 5.

Table 5: Components of Metropolitan's Water Conveyance System

Facility Name	Design Capacity (cfs)
East Branch SWP to Devil Canyon (a)	1,500
West Branch SWP (a)	1,490
Santa Ana Valley Pipeline (a)	420
Colorado River Aqueduct	1,605
Inland Feeder	1,000

(a) The availability of additional capacity is dependent on the needs of other SWP Contractors.

Metropolitan's conveyance facilities deliver available water to meet regional supplemental water demands either through direct deliveries or through deliveries to storage for later use. The two most important factors considered in evaluating water conveyance needs are:

- Availability of water supplies; and
- Supplemental water demands, including both:
    - Consumptive demands; and
    - Deliveries to storage during water surplus periods.

Additional factors that are considered in modeling operational needs and planning for additional water conveyance facilities include:

- Water quality blend requirements,
- System reliability in an emergency or unusual supply year; and
- System flexibility under other-than-normal operating conditions.

Conveyance system planning and operational needs are evaluated using both 1) computer simulation models, which indicate how much imported water is available during a given year, and 2) a distribution system mass balance model, which indicates system capacity constraints. These models use available imported supplies based on historical hydrology, and then map these supplies over projected supplemental water demands on a monthly basis. Modeling results are analyzed to determine if shortages occur because of supply conveyance constraints or water supply constraints under various wet, dry, and normal conditions. The need for additional supply conveyance facilities is governed by the most restrictive of the conveyance constraints.

State Water Project (SWP)[1]

One of Metropolitan's two major sources of water is the SWP. The SWP is the largest state-built, multipurpose, user-financed water project in the country. It was designed and built primarily to deliver water, but also provides flood control, generates power for pumping, is used for recreation, and enhances habitat for fish and wildlife. The SWP provides irrigation water to 750,000 acres of farmland, primarily in the San Joaquin Valley, and provides municipal and industrial water to approximately 25 million of California's estimated 37 million residents.

The SWP consists of a complex system of dams, reservoirs, power plants, pumping plants, canals and aqueducts to deliver water. SWP water consists of water from rainfall and snowmelt runoff that is captured and stored in SWP conservation facilities and then delivered through SWP transportation facilities to water agencies and districts located throughout the Upper Feather River, Bay Area, Central Valley, Central Coast, and Southern California. Metropolitan receives water from the SWP through the California Aqueduct, which is 444 miles long, and at four delivery points near the northern and eastern boundaries of Metropolitan's service area. The SWP facilities are shown in Figure 4.

The capacity of the SWP to deliver water decreases with distance from the Banks Pumping Plant, located in the Sacramento-San Joaquin Delta, as water is delivered to Contractors through the South Bay Aqueduct and the Coastal Branch Aqueduct, and to turnouts in the San Joaquin Valley and Southern California. The design pumping capacity at Banks Pumping Plant is 10,670 cubic feet-per-second (cfs) but only 4,480 cfs at the Edmonston Pumping Plant, located at the base of the Tehachapi Mountains[2].

In addition to the supply of SWP water, the SWP is also used to convey transfers of SWP water and non-SWP water. SWP operations are closely coordinated and integrated with the federal Central Valley Project (CVP) and the San Luis Reservoir and San Luis Canal section of the California Aqueduct are shared SWP/CVP facilities. The SWP is also connected to other water sources upstream of the Sacramento-San Joaquin Delta, and along the California Aqueduct as it passes through Central Valley.

[1] For historical and current information regarding the SWP, refer to Bulletin 132, published periodically by DWR since 1963. The most recently published Bulletin is Bulletin 132-14 dated November 2015 and titled "Management of the California State Water Project".
[2] http://www.water.ca.gov/swp/swptoday.cfm

Figure 4: Facilities of the State Water Project

In 1960, Metropolitan signed the first water supply contract (as amended, the State Water Contract) with DWR. Metropolitan is one of 29 agencies that are participants in the SWP through long-term contracts for water service from DWR, and is the largest agency in terms of the number of people in its service area (approximately 18.5 million), the share of SWP water that it is entitled to pursuant to the State Water Contract (approximately 46 percent), and the percentage of total annual payments made to DWR by agencies with State Water Contracts (approximately 54 percent for 2014). Upon expiration of the State Water Contract term (currently in 2035), Metropolitan has the option to continue participation under

substantially the same terms and conditions. Metropolitan and other agencies with state water supply contracts are currently in negotiations with DWR to extend the State Water Contract. In June 2014, DWR and the State Water Contractors reached an Agreement in Principle (AIP) to extend the contract to 2085 and to make certain changes related to financial management of the SWP in the future. The AIP will serve as the "proposed project" for purposes of environmental review under the California Environmental Quality Act (CEQA). DWR issued a Notice of Preparation of an Environmental Impact Report (EIR) for the proposed project on September 14, 2014. Following CEQA review, a SWP amendment will be prepared. Such amendment will be subject to review by the Legislature.

State Water Contractors have contracted for delivery of water conserved and stored by the SWP and are each entitled to a portion of that total supply. Each year, DWR determines the percentage of the total contracted amount it estimates will be available to the State Water Contractors (the DWR allocation). Under a 100 percent allocation, Metropolitan would receive 1,911,500 acre-feet of SWP water. Late each year, DWR announces an initial allocation estimate for the upcoming year, but may revise the estimate throughout the year if warranted by developing precipitation and water supply conditions. In addition to SWP water, Metropolitan also obtains water from water transfers, groundwater banking and exchange programs delivered through the California Aqueduct. From calendar years 2004 through 2014, the total amount of water received by Metropolitan from the SWP varied from a low of 607,000 acre-feet in calendar year 2014 to a high of 1,800,000 acre-feet in 2004.

In calendar year 2013, DWR's allocation to State Water Contractors was 35 percent of contracted amounts, or 669,000 acre-feet of Metropolitan's 1,911,500 acre-foot contractual amount. In addition, Metropolitan began 2013 with approximately 281,000 acre-feet of carryover supplies from prior years. In calendar year 2014, DWR's allocation to SWP Contractors was five percent of contracted amounts, or 95,575 acre-feet. Metropolitan used all of its 223,000 acre-feet of carryover supplies from prior years, but was able to carry over 36,000 acre-feet of unused 2014 SWP supplies which were available for use in 2015.

For calendar year 2015, DWR's initial allocation estimate to SWP Contractors was announced on December 1, 2014, as 10 percent of contracted amounts. Due to December 2014 and February 2015 storm runoff and storage in the State's major reservoirs, this allocation was increased on January 15, 2015 to 15 percent of contracted amounts, and increased again on March 2, 2015 to 20 percent, or 382,000 acre-feet. On February 24, 2016, DWR announced that the initial allocation estimate for 2016 is 30 percent of contracted amounts, or 573,450 acre-feet. This allocation reflects low storage levels in the State's major reservoirs and federally mandated environmental restrictions which have been imposed upon water deliveries from the Bay Delta, including the biological opinions as discussed below. The final allocation for 2016 may yet be revised upward depending on precipitation and snowpack in the Northern Sierras.

DWR has altered the operations of the SWP to accommodate species of fish listed under the federal or California Endangered Species Acts (respectively, the Federal ESA and the California ESA and, collectively, the ESAs) and to comply with State Water Resources Control Board (SWRCB) regulations and decisions. These changes in project operations have adversely affected SWP deliveries.

SWP operational requirements may be further modified under new biological opinions for listed species under the Federal ESA or by the California Department of Fish and Game's issuance of incidental take authorizations under the California ESA. Additionally, new litigation, listings of additional species or new regulatory requirements could further adversely affect SWP operations in the future by requiring additional export reductions, releases of additional water from storage or other operational changes impacting water supply operations. Operational constraints likely will continue until long-term solutions to the problems in the Bay-Delta are identified and implemented. Metropolitan cannot predict the ultimate outcome of any of the litigation or regulatory processes but believes they could have a materially adverse impact on the operation of SWP pumps, Metropolitan's SWP supplies and Metropolitan's water reserves.

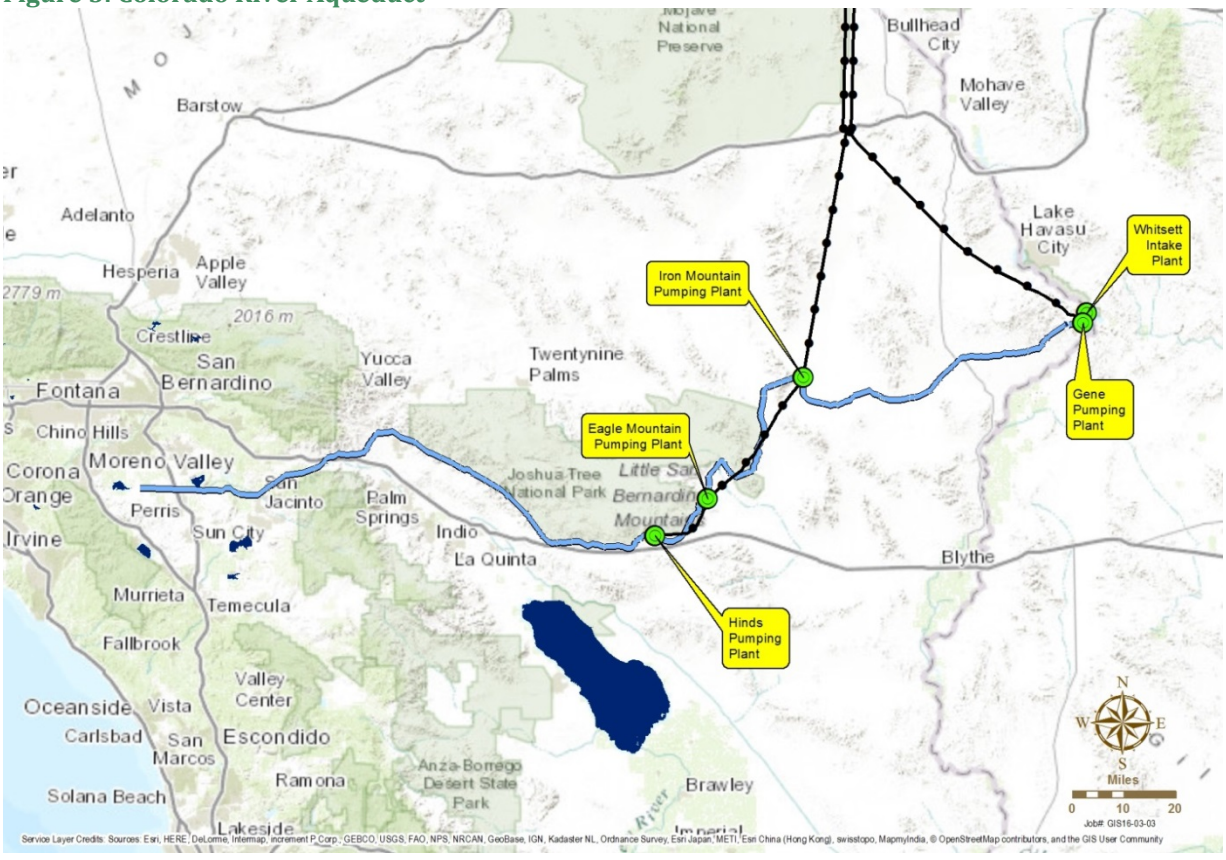
Colorado River Aqueduct (CRA)

The other major source of water for Metropolitan is the Colorado River and Colorado River Aqueduct (CRA). Metropolitan was established to obtain an allotment of Colorado River water, and its first mission was to construct and operate the CRA. The CRA consists of 5 pumping plants, 450 miles of high voltage power lines, 1 electric substation, 4 regulating reservoirs, and 242 miles of aqueducts, siphons, canals, conduits and pipelines terminating at Lake Mathews in Riverside County.

The Colorado River was Metropolitan's original source of water after Metropolitan's establishment in 1928. Metropolitan has a legal entitlement to receive water from the Colorado River under a permanent service contract with the Secretary of the Interior. Water from the Colorado River and its tributaries is also available to other users in California, as well as users in the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming (the Colorado River Basin States), resulting in both competition and the need for cooperation among these holders of Colorado River entitlements. In addition, under a 1944 treaty, Mexico has an allotment of 1.5 million acre-feet of Colorado River water annually except in the event of extraordinary drought or serious accident to the delivery system in the United States, in which event the water allotted to Mexico would be curtailed. Mexico also can schedule delivery of an additional 200,000 acre-feet of Colorado River water per year if water is available in excess of the requirements in the United States and the 1.5 million acre-feet allotted to Mexico.

The CRA, which is directly owned and operated by Metropolitan, transports water from the Colorado River approximately 242 miles to its terminus at Lake Mathews in Riverside County. The CRA is shown in Figure 5. Up to 1.25 million acre-feet of water per year may be conveyed through the CRA to Metropolitan's member agencies, subject to availability of Colorado River water for delivery to Metropolitan as described below.

Figure 5: Colorado River Aqueduct



California is apportioned the use of 4.4 million acre-feet of water from the Colorado River each year plus one-half of any surplus that may be available for use collectively in Arizona, California and Nevada. Under the 1931 priority system that has formed the basis for the distribution of Colorado River water made available to California, Metropolitan holds the fourth priority right to 550,000 acre-feet per year. This is the last priority within California's basic apportionment. In addition, Metropolitan holds the fifth priority right to 662,000 acre-feet of water, which is in excess of California's basic apportionment. Until 2003, Metropolitan had been able to take full advantage of its fifth priority right as a result of the availability of surplus water and water apportioned to Arizona and Nevada that was not needed by those states. However, during the 1990s Arizona and Nevada increased their use of water from the Colorado River, and by 2002 no unused apportionment was available for California. In addition, a severe drought in the Colorado River Basin reduced storage in system reservoirs, ending the availability of surplus deliveries to Metropolitan. As a result, California has been limited to 4.4 million acre-feet since 2003. Prior to 2003, Metropolitan could divert over 1.25 million acre-feet in any year, but since that time, Metropolitan's net diversions of Colorado River water have ranged from a low of nearly 633,000 acre-feet in 2006 to a high of approximately 1,176,000 acre-feet in 2014. Metropolitan has taken steps to augment its share of Colorado River water through agreements with other agencies that have rights to use such water.

The Quantification Settlement Agreement (QSA), executed by CVWD, IID and Metropolitan in October 2003, establishes Colorado River water use limits for IID and CVWD, and provides for specific acquisitions of conserved water and water supply arrangements for up to 75 years. The QSA and related agreements provide a framework for Metropolitan to enter into other cooperative Colorado River supply programs and set aside several disputes among California's Colorado River water agencies.

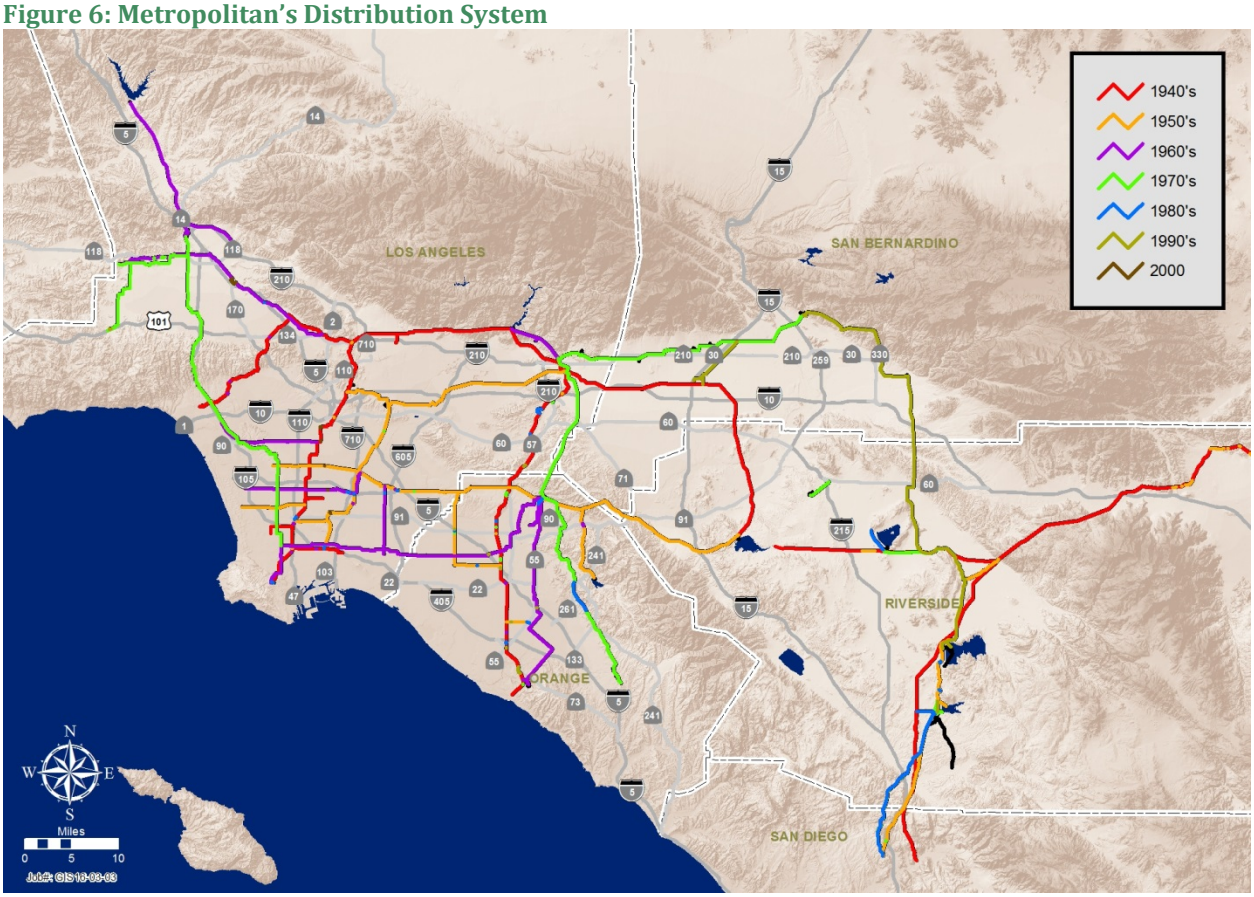
Specific programs under the QSA and related agreements include lining portions of the All-American and Coachella Canals, which conserve approximately 96,000 acre-feet annually. As a result, about 80,000 acre-feet of conserved canal lining water is delivered to the San Diego County Water Authority (SDCWA) by exchange with Metropolitan. Metropolitan also takes delivery of 16,000 acre-feet annually that will be made available for the benefit of the La Jolla, Pala, Pauma, Rincon and San Pasqual Bands of Mission Indians, the San Luis Rey River Indian Water Authority, the City of Escondido and the Vista Irrigation District, upon completion of a water rights settlement. Also included under the QSA is the delivery and exchange agreement between Metropolitan and CVWD that provides for Metropolitan, when requested, to deliver annually up to 35,000 acre-feet of Metropolitan's SWP contractual water to CVWD by exchange with Metropolitan's available Colorado River supplies. Metropolitan and CVWD also share in 105,000 acre-feet annually of water conserved by IID, with Metropolitan receiving no less than 85,000 acre-feet. In 2021, the transfer of water conserved annually by IID to SDCWA is expected to reach 205,000 acre-feet. With full implementation of the programs identified in the QSA, at times when California is limited to its basic apportionment of 4.4 million acre-feet per year, Metropolitan expects to be able to annually divert to its service area approximately 900,000 acre-feet of Colorado River water plus water from other water augmentation programs it develops, including the Palo Verde Irrigation District (PVID) program, which provides up to approximately 133,000 acre-feet of water per year.

Distribution System

All water transport facilities not specifically identified as part of the regional conveyance system are considered to be distribution facilities (Distribution System). While conveyance and aqueduct system components are regional in nature and do not link directly to local agency distribution systems, Distribution System facilities do ultimately connect to local agency systems. As a result, these facilities rely on conveyance and aqueduct facilities to import water from regional supply sources. The Distribution System is a complex network of facilities which routes water from the CRA and SWP to the member agencies. Beginning at the terminal delivery points of the CRA and SWP, Metropolitan's Distribution System includes approximately 775 miles of pipelines, feeders, and canals. The Distribution System includes components dating from the 1930's

up to the present day, as shown in Figure 6. Distribution System operations are coordinated from the Operations Control Center in Eagle Rock. The control center plans, schedules, and balances daily water operations in response to member agency demands and the operational limits of the system as a whole. Metropolitan's storage and treatment facilities augment the Distribution System. Metropolitan operates and maintains separate untreated and treated distribution facilities.

Figure 6: Metropolitan's Distribution System



Storage Facilities

Existing imported water storage available to the region consists of Metropolitan's raw water reservoirs, a share of the SWP's raw water reservoirs in and near the service area, and the portion of the groundwater basins used for conjunctive-use storage. Figure 7 shows the geographical location of Metropolitan's major storage facilities. Table 6 lists surface water storage facilities owned and operated by Metropolitan. With some limitations, these reservoirs can be used to help meet the region's water storage requirements. Total storage capacity currently available to Metropolitan in these existing reservoirs is about 1,041,830 acre-feet. Metropolitan's water storage is divided into three categories: emergency, regulatory, and drought carryover storage. Emergency storage capacity is intended to provide the Metropolitan service area with a 6 month supply of water (assuming typical hydrologic conditions) in the event of a major regional catastrophe isolating Southern California from its imported water supplies.

Regulatory storage requirements are based on historical reservoir cycling and known cycling targets intended to meet the delivery schedules of the member agencies. Drought carryover storage is intended to prevent water shortages during dry years and is evaluated using the computer simulation models, incorporating historic hydrologic data, projections of future demand, and information on currently available storage levels.

Figure 7: Metropolitan's Major Distribution System Storage Facilities

Table 6: Capacity of Metropolitan's Distribution System Storage Facilities

Storage Facilities	Capacity (Acre-feet)
Etiwanda Reservoir	400
Garvey Reservoir	1,610
Orange County Reservoir	212
Palos Verdes Reservoir	1,108
Live Oak Reservoir	2,500
Lake Mathews	182,000
Lake Skinner	44,000
Diamond Valley Lake	810,000
Total Storage Capacity	1,041,830

In addition to the storage facilities shown above, DWR owns and operates four major reservoirs in or near Metropolitan's service area as part of the SWP. Castaic Lake and Pyramid Lake are located on the West Branch of the California Aqueduct. Silverwood Lake and Lake Perris are on the East Branch of the California Aqueduct. Metropolitan pays for about 650,000 acre-feet of the total storage in these four DWR reservoirs.

Within these reservoirs, up to 220,000 acre-feet of additional storage is provided for by the Monterey Amendment to the State Water Contract[3].

Under a conjunctive-use groundwater program, groundwater basins are used to store imported supplies during years when water is abundant. The stored water is then used during shortages and emergencies, reducing demand on imported supplies. Consequently, groundwater conjunctive use enables member agencies to better capture surplus surface flows from the SWP and the CRA and reduce demand that would otherwise be placed on Metropolitan's system during dry periods.

Treatment Plants

In addition to raw water supply, Metropolitan provides treated water to supplement the potable water needs of its member agencies. Table 3 identifies Metropolitan's water treatment plants and related design capacities.

Metropolitan's Water Treatment Plants

Table 7: Water Treatment Plants

Water Treatment Plants	Design Capacity (cfs)
Diemer Filtration Plant	803
Jensen Filtration Plant	1,163
Mills Filtration Plant	248
Skinner Filtration Plant	930
Weymouth Filtration Plant	803
Total	3,947

Metropolitan's water treatment plants are listed in Table 7 and shown geographically in Figure 8. More than 60% of Metropolitan's demand for supplemental treated water is located in a region of the service area referred to as the "Central Pool". Agencies located partially or entirely within the Central Pool include Los Angeles, Orange, and Ventura Counties. Three existing Metropolitan treatment plants serve the Central Pool's treated water needs:

- The Jensen plant in Granada Hills;
- The Weymouth plant in La Verne; and
- The Diemer plant in Yorba Linda.

While some areas of the Central Pool are served by one plant, the three plants together also jointly serve a common area of the Central Pool referred to as the "Common Pool". The Mills plant and the Skinner plant do not serve the Common Pool, but serve areas in the eastern part of Metropolitan's service area.

[3] The Monterey Amendment is explained in further detail at Service Function Costs, Conveyance and Aqueduct: SWP.

Figure 8: Metropolitan's Treatment Plants' Geographical Location

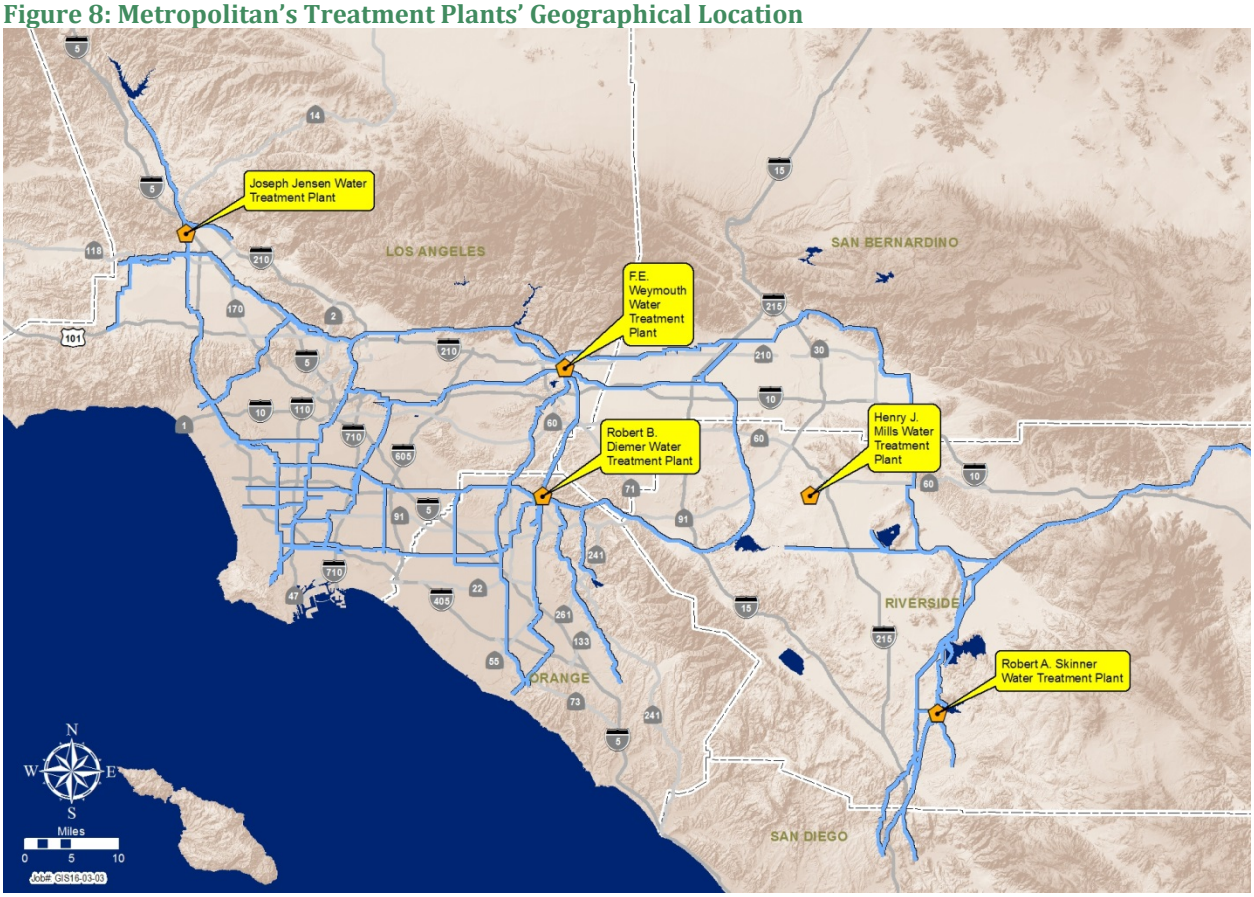


Table 8 shows Metropolitan's treated and untreated water sales by member agency for FY 2014/15. Approximately 47 percent of Metropolitan's water sales in FY 2014/15 were treated.

Table 8: Treated and Untreated Water Sales by Member Agency, FY 2015
Acre-Feet*

Agency	Treated (AF)	Untreated (AF)	Total (AF)
Anaheim	4,287	12,556	16,842
Beverly Hills	11,092		11,092
Burbank	6,901	7,350	14,252
Calleguas	96,608		96,608
Central Basin	30,345	15,015	45,360
Compton	0		0
Eastern	57,837	26,947	84,784
Foothill	8,104		8,104
Fullerton	8,298		8,298
Glendale	17,046		17,046
Inland Empire		58,908	58,908
Las Virgenes	22,064		22,064
Long Beach	46,045		46,045
Los Angeles	66,362	289,005	355,367
MWDOC	153,461	72,908	226,369
Pasadena	18,724		18,724
San Diego	105,649	434,492	540,141
San Fernando	100		100
San Marino	731		731
Santa Ana	5,353	4,952	10,305
Santa Monica	4,258		4,258
Three Valleys	39,799	19,049	58,847
Torrance	16,205		16,205
Upper San Gabriel	9,069	47,341	56,410
West Basin	112,893		112,893
Western	51,610	19,190	70,800
Total	**892,841**	**1,007,711**	**1,900,552**

* Includes treated, untreated, and SDCWA Exchange Water volumes.

Hydroelectric Facilities

Metropolitan's Distribution System has 16 small hydroelectric plants located throughout the service area. The plants are located in Los Angeles, Orange, Riverside, and San Diego Counties as shown in Figure 9. The combined generating capacity of these plants and the generating capacity at Diamond Valley Lake (DVL) are approximately 131 megawatts. Depending upon annual water deliveries, projected annual income for the next several years is expected to range between $12 million and $15 million.

Power from ten of the plants is sold to the DWR at a contract rate. Power from four plants is sold to the Southern California Public Power Authority based on a contract rate. Power generation from the Sepulveda Canyon Plant is sold to the Los Angeles Department of Water and Power based on a contract rate. Power from

the Etiwanda Power Plant has been sold to the Pacific Gas and Electric based on contract rates. Power generated by DVL is sold into the wholesale market.

Electricity generated by Metropolitan hydroelectric facilities is sold rather than used internally because of the costs and inefficiencies that would be associated with building an internal electric distribution network for transmitting the electricity throughout the Metropolitan system. The costs associated with contracting for such transmission services from others would be similarly prohibitive.

Figure 9: Metropolitan's Hydroelectric Facilities

CHALLENGES

Metropolitan faces a number of challenges in providing adequate, reliable and high quality supplemental water supplies for Southern California. These include, among others: (1) population growth within the service area; (2) increased competition for low-cost water supplies; (3) variable weather conditions; (4) increased environmental regulations; and (5) climate change. Metropolitan's resources and strategies for meeting these long-term challenges are set forth in its 2015 IRP Update, as updated from time to time. In addition, Metropolitan manages water supplies in response to the prevailing hydrologic conditions by implementing its Water Surplus and Drought Management (WSDM) Plan, and in times of prolonged or severe shortages, the Water Supply Allocation Plan.

Hydrologic conditions can have a significant impact on Metropolitan's imported water supply sources. For Metropolitan's SWP supplies, precipitation in California's northern Sierra Nevada during the fall and winter helps replenish storage levels in Lake Oroville, a key SWP facility. The subsequent runoff from the spring snowmelt helps satisfy regulatory requirements in the San Francisco Bay/Sacramento-San Joaquin River Delta (Bay-Delta) bolstering water supply reliability in the same year. The source of Metropolitan's Colorado River supplies is primarily the watersheds of the Upper Colorado River basin in the states of Colorado, Utah, and Wyoming. Although precipitation is primarily observed in the winter and spring, summer storms are common and can affect water supply conditions.

In 2015, California snowpack peaked in January at 17 percent of normal. This was the earliest peak and lowest snowpack in recorded history, resulting in the fourth year of drought in California. Storage levels in State reservoirs remain below normal, including storage levels in Lake Oroville, the principal SWP reservoir, and San Luis Reservoir, a critical reservoir south of the Bay-Delta. Consequently, the northern Sierra Nevada runoff for water year 2014/15 (October 1 – September 30) was 51 percent of normal. For calendar year 2015, the final SWP allocation for 2015 was 20 percent of contracted amounts. On February 24, 2016, DWR announced that the allocation estimate for 2016 is 30 percent of contracted amounts, or 573,450 acre-feet. DWR may increase or decrease allocations if warranted by the year's developing hydrologic and water supply conditions.

In 2015, the Upper Colorado River Basin snowpack peaked in March at 76 percent of normal. However, the Upper Colorado River Basin runoff measured 94 percent of normal due to above normal precipitation in the basin in May, June and July, which will avert Colorado River shortage conditions in 2016 and allowed Metropolitan to implement new water management programs in 2015.

The sea surface temperatures in 2015 signaled a very strong El Niño for 2016. Despite a dry February, hydrologic conditions are normal. As of mid-February 2016, storage levels in Lake Mead and Lake Powell are higher than 2015 and the snowpack in the Upper Colorado River Basin is 100 percent of normal.

Uncertainties from potential future temperature and precipitation changes in a climate driven by increased concentrations of atmospheric carbon dioxide also present challenges. Areas of concern to California water planners identified by researchers include: reduction in Sierra Nevada and Colorado Basin snowpack; increased intensity and frequency of extreme weather events; and rising sea levels resulting in increased risk of damage from storms, high-tide events, and the erosion of levees and potential cutbacks of deliveries of imported water. While potential impacts from climate change remain subject to study and debate, climate change is among the uncertainties that Metropolitan seeks to address through its planning processes.

Drought Response Actions

To offset reductions in SWP supplies and mitigate impacts of the California drought, Metropolitan has utilized supplies from the Colorado River and storage reserves, and is also encouraging responsible and efficient water use to lower demands.

Metropolitan is prepared to meet water demands in its service area through calendar year 2016 using a combination of SWP and CRA deliveries, storage reserves and supplemental water transfers and purchases. In 2015, the CRA was operated near capacity. Operations to distribute Colorado River supplies into areas normally served by SWP supplies began in 2014. These measures have offset the low 2015 SWP supply allocation. Approximately 120,000 acre-feet were withdrawn from dry-year storage reserves in the first six months of 2015, leaving 1.72 million acre-feet in storage reserves as of July 1, 2015. Metropolitan staff currently calculates that the overall storage reserve level as of December 31, 2015 was about 1.4 million acre-feet.

On April 1, 2015, Governor Brown issued an Executive Order (Order) calling for a 25 percent reduction in consumer water use in response to the historically dry conditions throughout the State of California. On February 2, 2016, the State Water Resources Control Board extended the reduction through October 2016. As a wholesale water agency providing a supplemental water supply to its member agencies, Metropolitan is not subject to the requirements of the Governor's Order, which applies to retail water agencies. However, Metropolitan's member agencies will need to reduce their water sales in order to comply with the Order. Metropolitan also relies upon its WSDM Plan to identify resource actions in times of shortage and its Water Supply Allocation Plan (WSAP) for equitable distribution of available water supplies in case of extreme shortages. On April 14, 2015, the Board declared the implementation of the WSAP at a Level 3 Regional Shortage Level for the allocation year, effective July 1, 2015 through June 30, 2016. Implementation of the WSAP at a Level 3 Regional Shortage Level and the Governor's Order are anticipated to reduce supplies delivered by Metropolitan to Metropolitan's member agencies in fiscal year 2015/16 to approximately 1.6 million acre-feet.

In addition, since Governor Brown's initial drought emergency proclamation in January 2014, Metropolitan has worked proactively with its member agencies to conserve water supplies in its service area. In February 2014, Metropolitan declared a Water Supply Alert, calling upon local cities and water agencies to immediately implement extraordinary conservation measures and institute local drought ordinances, and significantly expanded its water conservation and outreach programs and increased funding for conservation incentive programs by $60 million, for a total of $100 million for fiscal years 2014/15 and 2015/16. Metropolitan has also increased incentives for large landscape customers to convert from potable water to recycled water for irrigation. In May 2015, due to the strong response to the water conservation incentive programs, especially the turf replacement program, Metropolitan increased funding for these programs by $350 million, for total funding of $450 million over fiscal years 2014/15 and 2015/16. On May 26, 2015, Metropolitan's Board approved the funding for this increase from the remaining balance in the Water Management Fund of $140 million, the projected amounts over target financial reserve levels for fiscal year 2014/15 of $160 million, and the remaining balance in the Water Stewardship Fund of $50 million. This was a one-time only increase to the conservation incentive program, and it was expected to result in 172 million square feet of turf removed and water savings of 800,000 acre-feet over the next ten years. Funding of this program in future years will be determined by the Board as part of the biennial budget and rates setting process.

California WaterFix

Within the region's water portfolio, supplies from the SWP remain an essential baseline supply for Southern California. Water from Northern California delivered through the SWP has provided key supplies in wet years

to manage against dry years, and it is the only imported supply that can physically reach significant portions of Metropolitan's service area. These supplies face uncertainties in a changing climate and due to operational constraints in the ecologically struggling Sacramento-San Joaquin Delta. In calendar year 2014, Metropolitan and other State Water Contractors received only 5 percent of their contracted amounts. This was by far the lowest allocation ever delivered by the SWP and posed unprecedented challenges to Metropolitan's planning and operations.

In 2007, facing reliability challenges with its SWP supplies, Metropolitan established six benchmarks on what a long-term solution must achieve. The benchmarks are an instructive way to evaluate proposals that seek to provide water supplies and restore the Delta. The benchmarks in summary:

- Restore and protect SWP deliveries
- Improve export water quality
- Promote flexible pumping operations in a dynamic Delta environment
- Enhance Delta ecosystem fishery habitat
- Reduce seismic risks
- Reduce climate change risk

In April 2015, the Brown and Obama administrations proposed a revised path to protecting water supplies that are imported from Northern California while restoring the declining ecosystem of the Sacramento-San Joaquin Delta. The state- federal proposal identifies a new, preferred alternative within the Delta environmental review process that advances water system improvements as a stand-alone project while phasing in habitat restoration in a separate, but coordinated fashion.

Under the new proposal, state and federal agencies continue to work on a proposal to build three new water intakes on the Sacramento River. The water supply would be protected by construction of a modern 34-mile pipeline system transporting water from the intakes to the existing state and federal aqueducts in the southern Delta. Under the previous plan, the Bay Delta Conservation Plan (BDCP), this modernization project would have been permitted in conjunction with habitat restoration (Endangered Species Act, Section 10). Under the new state-federal proposal, California WaterFix and California EcoRestore, these water improvements would proceed as a stand-alone project under the same permitting mechanism as for the existing SWP and CVP (ESA, Section 7). Participating public water agencies would underwrite habitat restoration connected to construction mitigation. Scientific uncertainty about the future Delta and the impacts of climate change are the primary rationales to propose separate, but coordinated paths for water system and ecosystem improvements.

State and federal agencies recirculated modifications of the environmental documents for public review and comment in 2015.

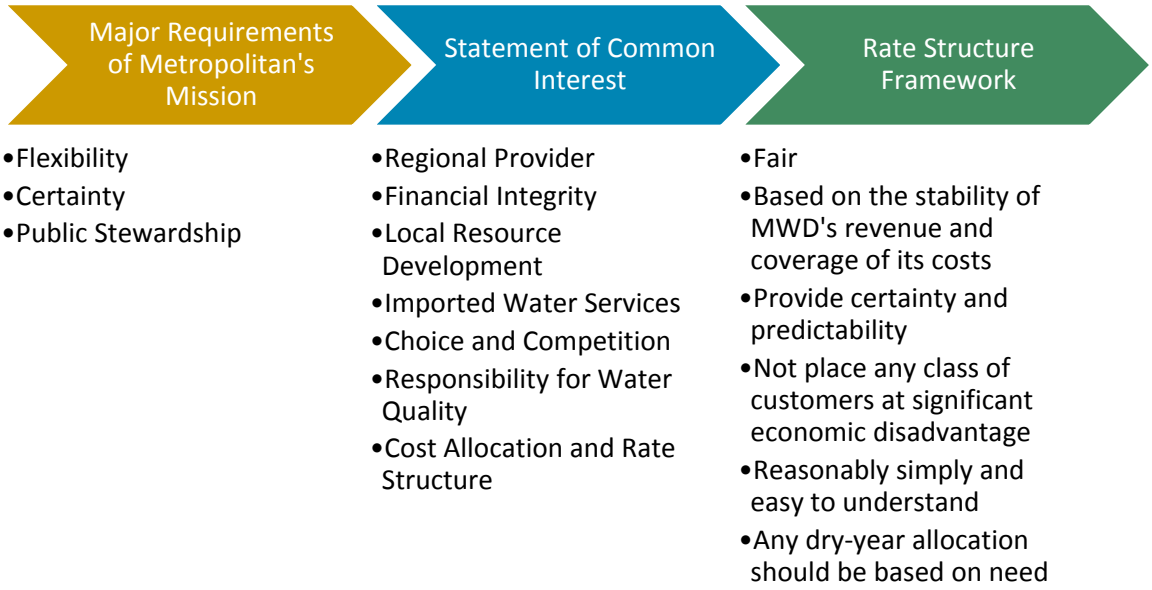
The public comment period ended on October 30, 2015. The final planning documents are expected to be completed in the fall of 2016.

RATE STRUCTURE

Framework

The Rate Structure Framework evolved through a comprehensive strategic planning process initiated in 1998. As depicted in the following figure, the first step of the process was to identify the "Major Requirements of Metropolitan's Mission," which was reflected in the Strategic Plan Policy Principles. The Statement of Common Interests formed the basis of Metropolitan's strategic plan to address these mission requirements. One of the most important common interests was "Cost Allocation and Rate Structure." In determining the most appropriate cost-of-service (COS) and rate structure, a set of pricing objectives, or guiding rate principles, was developed. These guiding rate principles defined Metropolitan's Rate Structure Framework by which various COS and rate-setting methodologies could be evaluated.

Development of the Rate Structure Framework



The strategic planning process which established the foundation of the Rate Structure Framework is discussed below.

Major Requirements of Metropolitan's Mission

As one of the first steps in the strategic planning process in 1998, the Board developed a list of three mission requirements in its Metropolitan vision statement – flexibility, certainty, and public stewardship:

- **Flexibility.** Metropolitan is aware of the legislative and economic pressures which make flexibility in providing water services for a changing demand and in a competitive water market paramount. Fair

compensation for wheeling through Metropolitan's conveyance systems is an essential element of Southern California's developing market.

- **Certainty.** The certainty that Metropolitan's water supply is reliable and that the COS is appropriate is of utmost importance to member agencies and their retailers who are endeavoring to provide not only water, but value to the residents in their service area.
- **Public Stewardship.** As public stewards of much of Southern California's water supply, Metropolitan and its member agencies are responsible for making certain that the water is provided in a cost-effective and environmentally sound manner.

Statement of Common Interests

From the strategic planning mission requirements, the Board developed a list of seven areas of common interest that formed the major focus elements of the Metropolitan strategic plan:

- **Regional provider.** This area includes the concerns of protecting regional infrastructure and providing service during drought periods. Regional water must be provided to meet the needs of the member agencies, and water supplies must be equitably allocated during drought periods based on the Water Surplus and Drought Management Plan principles.
- **Financial integrity.** It is a common interest of the members for Metropolitan to assure the financial integrity of the agency in all aspects of its operations.
- **Local resource development.** Metropolitan supports local resources development by working in partnership with its member agencies and by providing member agencies with financial incentives for water conservation and for local projects.
- **Imported water service.** Metropolitan is responsible for providing imported water to meet the committed needs of its member agencies.
- **Choice and competition.** After Metropolitan provides imported water for the member agencies' committed demands, a member agency can choose the most cost-effective additional water supplies for its customers. These choices include either Metropolitan, local resource development, market transfers, or some combination of these secondary options. Metropolitan and its member agencies can decide how to provide these additional supplies collaboratively while balancing local, imported, and market opportunities with affordability.
- **Responsibility for water quality.** Metropolitan must advocate source water quality and implement in-basin water quality for the imported water it supplies. This is necessary to guarantee compliance with primary drinking water standards and to meet the water quality requirements for water recycling and ground water replenishment.
- **Cost allocation and rate structure.** The framework for a revised rate structure will be established to address allocation of costs, financial commitment, unbundling of services, and fair compensation for services including wheeling, peaking, growth, and others.

Rate Structure Framework

A major element of common interest was *"Cost Allocation and Rate Structure."* In addressing this element a set of pricing objectives, or guiding rate principles, had to be developed to evaluate alternative COS and rate setting approaches, or methodologies. As a result, the Board adopted a set of rate principles which was defined as the *Rate Structure Framework.* The Rate Structure Framework provided the principles for the Strategic Planning Steering Committee to develop a preferred rate structure. The Rate Structure Framework includes the following principles:

- The rate structure should be *fair;*
- It should be based on the *stability* of Metropolitan's revenue and coverage of its costs;
- It should provide certainty and predictability;
- It should not place any class of customers at *significant economic disadvantage*;
- It should be reasonably *simple and easy to understand*; and
- Any dry-year allocation should be *based on need*.

The 2001 COS and rate structure was adopted by the Board to address the Rate Structure Framework.

Rate Structure Design

The elements of the rate structure, and the rates and charges for calendar year 2016, are summarized in Table 9 below:

Table 9: Rate Elements, Calendar Year 2016

Rate Design Elements	Functional Costs Recovered	Type of Charge	Rate or charge effective January 1, 2016
Tier 1 Supply Rate	Supply	Volumetric ($/af)	$156
Tier 2 Supply Rate	Supply	Volumetric ($/af)	$290
System Access Rate	Conveyance/Distribution (Average Capacity)	Volumetric ($/af)	$259
Water Stewardship Rate	Demand Management	Volumetric ($/af)	$41
System Power Rate	Power	Volumetric ($/af)	$138
Treatment Surcharge	Treatment	Volumetric ($/af)	$348
Capacity Charge	Peak Distribution Capacity	Fixed ($/cfs)	$10,900
Readiness-to-Serve Charge	Conv./Distr./Emergency Storage (Standby Capacity)	Fixed ($M)	$153

System Access Rate (SAR)

Purpose

The SAR recovers the cost of the Conveyance and Distribution System that is used on an average annual basis through a uniform, volumetric rate. All users (member agencies and third parties) pay the SAR for access to conveyance and distribution capacity in the Metropolitan system.

Implementation

The SAR is charged for each acre-foot of water transported by Metropolitan, regardless of the ownership of the water being transported. All users (member agencies and third-party wheelers) using the Metropolitan system to transport water pay the same SAR for the use of the system conveyance and distribution capacity used to meet average annual demands.

Water Stewardship Rate (WSR)

Purpose

The WSR provides a dedicated source of funding for conservation and local resources development through a uniform, volumetric rate. The WSR supports past and future conservation and local resources projects. Because of the uniform benefits conferred on all system users by investments in conservation and local resources, all users of Metropolitan's conveyance and distribution system pay the WSR.

Implementation

The WSR is charged to each acre-foot of water delivered by Metropolitan, regardless of the water being transported. All users (member agencies and third-party wheelers) benefit from the system capacity made available by investments in Demand Management Programs like Metropolitan's Conservation Credits Program and Local Resources Program. Therefore, all users pay the WSR.

System Power Rate (SPR)

Purpose

The SPR recovers the costs of energy required to pump water to Southern California through the SWP and CRA. The cost of power is recovered through a uniform, volumetric rate.

Implementation

The SPR is applied to all deliveries of Metropolitan water to member agencies. Wheeling parties pay for actual cost (not system average) of power needed to move the water. Member agencies engaging in wheeling transaction of up to one year pay the wheeling rate (consisting of the actual cost of power, SAR, WSR, and an administrative fee). Other wheeling transactions are pursuant to individual contracts. For example, a party wheeling water through the California Aqueduct would pay the variable power cost associated with using the SWP transportation facilities.

Treatment Surcharge

Purpose

The Treatment Surcharge recovers all of the costs of providing treatment capacity and operations through a uniform, volumetric rate per acre-foot of treated water sales.

Implementation

The Treatment Surcharge is charged to all treated water sales.

Capacity Charge

Purpose

The Capacity Charge provides a price signal to encourage agencies to reduce peak demands on the Distribution System and to shift demands that occur during the May 1 through September 30 period into the October 1 through April 30 period, resulting in more efficient utilization of Metropolitan's existing infrastructure and deferring capacity expansion costs.

Implementation

Each member agency will pay the Capacity Charge per cfs based on a three-year trailing maximum peak day demand. Each member agency's peak day is likely to occur on different days; therefore this measure approximates peak week demands on Metropolitan.

Readiness-To-Serve Charge (RTS)

Purpose

The RTS recovers the cost of the portion of system that is available to provide emergency service and available capacity during outages and hydrologic variability.

Implementation

The RTS is a fixed charge that is allocated among the member agencies based on a ten-fiscal-year rolling average of firm demands. Water transfers and exchanges are included for purposes of calculating the ten-year rolling average[4]. The Standby Charge will continue to be collected at the request of the member agency and applied as a direct offset to the member agency's RTS obligation.

Supply Rates

Purpose

The rate structure recovers supply costs through a two-tiered price structure. The Tier 1 Supply Rate is set to recover supply costs not recovered through the Tier 2 Supply Rate. The Tier 1 Supply Rate is calculated as the amount of the total supply revenue requirement that is not recovered by the Tier 2 Supply Rate divided by the estimated amount of Tier 1 water sales. The Tier 2 Supply Rate reflects Metropolitan's cost of procuring north of Delta water transfers. The Tier 2 Supply Rate encourages the member agencies and their customers to maintain existing local supplies and develop cost-effective local supply resources and conservation. The Tier 2 Supply Rate is charged to member agencies that have demands from Metropolitan that exceed their Tier 1 maximum. Both the Tier 1 Supply Rate and the Tier 1 Supply Rate are uniform, volumetric rates.

Implementation

Because the Tier 1 maximum is set at a total member agency level and not at a meter level, all system water delivered will be billed at the Tier 1 Supply Rate. Any water delivered that exceeds the Tier 1 maximum will be billed an additional amount equivalent to the difference between the Tier 2 and Tier 1 Supply Rates.

For member agencies without purchase orders and member agencies with purchase orders that accrue a cumulative Tier 2 obligation at the end of year five of the purchase order, the Tier 2 Supply Rate will be applied in the month where the Tier 1 maximum is surpassed on all applicable deliveries. Otherwise, any obligation to pay the Tier 2 Supply Rate will be calculated over the ten-year period, consistent with the calculation of any purchase order commitment obligation.

Purchase Order Option

Purpose

Purchase Orders were developed to establish a financial commitment from the member agency to Metropolitan in exchange for the ability to purchase more water at the lower Tier 1 Supply Rate. In November 2014, the Metropolitan Board approved new Purchase Orders effective January 1, 2015 through December 31, 2024. Twenty-one of the twenty-six member agencies have Purchase Orders, which commit the member agencies to purchase a minimum amount of supply from Metropolitan (the Purchase Order Commitment).

There is no annual minimum or maximum purchase commitment required by the Purchase Order. A member agency has the full ten-year term to fulfill the Purchase Order Commitment. In exchange for this commitment, the member agency can purchase an amount of firm water supply equal to 90 percent of its cumulative Base

[4] The SDCWA Exchange Water amounts are excluded from the calculation of the ten-year rolling average per the terms of the Amended and Restated Agreement Between the Metropolitan Water District of Southern California and the San Diego County Water Authority for the Exchange of Water.

Period Demand over the full ten years at the lower Tier 1 Supply Rate. An agency that determines that a Purchase Order is not in its best interest may purchase up to 60 percent of its Revised Base Firm Demand annually at the lower Tier 1 Supply Rate. The terms and conditions of the Purchase Order are uniform for all member agencies.

Implementation

The Base Period Demand was established for each member agency. Member agencies chose a base amount of (1) the member agency's Revised Base Firm Demand which is the highest fiscal year purchases during the 13-year period of fiscal year 1990 through fiscal year 2002, or (2) the highest year purchases in the most recent 12-year period of fiscal year 2003 through fiscal year 2014.

At the end of the Purchase Order Term, if the member agency has not purchased enough firm supply to meet its Purchase Order Commitment, it will be billed for the remaining balance of the Purchase Order Commitment at the average of the Tier 1 Supply Rate in effect during the Term. This payment may be prorated with interest evenly over the next 12 invoices.

If a member agency fulfills its Purchase Order Commitment prior to the end of the Purchase Order Term (e.g. purchased ten times 60 percent of the Initial Base Period Demand), then the member agency has met its obligation under the Purchase Order. The member agency may continue to purchase up to 90 percent of its cumulative Base Period Demand over the Term at the Tier 1 Supply Rate for the duration of the Purchase Order Term.

Although the maximum amount of water that can be purchased at the Tier 1 Supply Rate may increase over time if the agency's Base Period Demand increases, the Purchase Order Commitment is fixed for the entire Purchase Order Term and does not increase.

Water billed at the following rates or certified under the below programs will be counted toward the Purchase Order Commitment:

- Tier 1 Supply Rate
- Tier 2 Supply Rate
- Conjunctive Use sales.

The current bundled full service costs are shown in Table 10.

Table 10: Bundled Full Service Costs[5]

Rate Type	Type of Charge	Rate or charge effective January 1, 2016
Tier 1 Full Service Untreated Cost	Volumetric ($/af)	$594
Tier 2 Full Service Untreated Cost	Volumetric ($/af)	$728
Tier 1 Full Service Treated Cost	Volumetric ($/af)	$942
Tier 2 Full Service Treated Cost	Volumetric ($/af)	$1,076

The Tier 1 Full Service Untreated Cost consists of the following rate elements: The Tier 1 Supply Rate, the System Access Rate, the System Power Rate, and the Water Stewardship Rate.

[5] Nineteen of Metropolitan's member agencies have invoices prepared using bundled rates; seven of Metropolitan's member agencies have invoices prepared using the unbundled rate elements.

The Tier 2 Full Service Untreated Cost consists of the following rate elements: The Tier 2 Supply Rate, the System Access Rate, the System Power Rate, and the Water Stewardship Rate.

The Tier 1 Full Service Treated Cost consists of the following rate elements: The Tier 1 Supply Rate, the System Access Rate, the System Power Rate, the Water Stewardship Rate, and the Treatment Surcharge.

The Tier 2 Full Service Treated Cost consists of the following rate elements: The Tier 2 Supply Rate, the System Access Rate, the System Power Rate, the Water Stewardship Rate, and the Treatment Surcharge.

COST OF SERVICE

A Cost of Service (COS) study is a method to equitably allocate the revenue requirements of a utility between the various users of service. Costs of operating a utility are not accounted for on a specific user or service basis. Many costs are incurred for the joint benefit of all users, while other costs may benefit only the users of certain services. Metropolitan uses the COS methodology to functionalize, allocate and distribute costs to services provided. The unbundled rate structure is used to collect revenue based on the services provided to different member agencies.

AWWA Guidelines

The American Water Works Association (AWWA) is the professional association which, among other functions, identifies water industry standards for financial management and rate-setting practices. AWWA publishes a document on these topics in its Manual of Water Supply Practices series, which is the AWWA's Ml, Principles of Water Rates, Fees and Charges, Sixth Edition.

AWWA manual Ml Sixth Edition delineates a number of guidelines and principles that are intended to be observed in the broad development of cost of service and rate setting steps[6]. The COS process reflects the M1 Sixth Edition guidelines and principles, which were carefully considered in the conceptual design of the Metropolitan COS. Major AWWA guidelines and principles considered in the proposed COS approach are outlined below.

- One of the most effective methods used to accommodate the impact of rapidly increasing costs on rate design is the use of a "forward looking" or prospective rate period. This procedure is frequently used by government-owned utilities in determining COS. The COS follows this approach by incorporating budget data for upcoming fiscal years, using projected debt service and State Water Contract payment obligation data, and applying annual escalation factors to operations and maintenance costs.
- The purpose of performing functional assignment of costs is to express the utility's cost of service in terms that make it possible to allocate and then distribute costs to services in accordance with the costs of serving each class of customer, or in Metropolitan's case, each function type. In keeping with AWWA recommendations, the functional assignment and commodity/demand allocation modules of the COS allow identification of functional cost components at a level that allows the unbundling of Metropolitan's rates.
- The cash-needs approach to identifying revenue requirements is one of two methodologies endorsed by AWWA principles and is frequently used by government-owned utilities. The COS's revenue requirements module is consistent with this approach.
- In areas where seasonal usage patterns impose significant demands on the utility, consideration may be given to separate charges for such use. System costs associated with accommodating seasonal use may be recovered either through rates applied to separate metering for such services or through charges applied

[6] The majority of the M1 Sixth Edition is written for utilities providing retail service or combined retail and wholesale service. The distinction in practices for wholesale-only utilities is indirect; care must be taken to be attuned to these distinctions such that the guidelines are not incorrectly applied or misrepresented.

based on seasonal use. This principle is consistent with the conceptual design of the COS's allocation module.

General principles for establishing charges state that:

- Beneficiaries of a service should pay for that service.
- The level of service charges should be related to the cost of providing service.
- The price of services may be used to change user behavior and demand for the good or service.

The proposed COS process is consistent with these principles.

AWWA's M1 Sixth Edition provides rate-setting objectives as a basis for evaluating water utility rate designs. These objectives have all been considered in the development of the proposed COS process and resulting rates, fees and charges for service[7].

- Effectiveness in yielding total revenue requirements (full cost recovery).
- Revenue stability and predictability.
- Stability and predictability of the rates themselves from unexpected or adverse changes.
- Promotion of efficient resource use (conservation and efficient use).
- Fairness in the apportionment of total costs of service among the different ratepayers.
- Avoidance of undue discrimination (subsidies) within the rates.
- Dynamic efficiency in responding to changing supply and demand patterns.
- Freedom from controversies as to proper interpretation of the rates.
- Simple and easy to understand.
- Simple to administer.
- Legal and defendable.

It should be noted that there are circumstances in which some of these objectives can be in conflict with each other. For example, competing objectives could be conservation and revenue stability. To incentivize conservation, a utility might develop a rate structure that was 100 percent volumetric. To provide revenue stability, the same utility might develop a rate structure that was 100 percent fixed. Because of such conflict potential, all of the AWWA pricing objectives must be carefully balanced when selecting a preferred COS and rate setting approach.

Cost of Service

Prior to discussing the specific rates and charges that make up the rate structure, it is important to understand the cost of service process that supports the rates and charges. The AWWA M1 Sixth Edition renamed the steps in the COS process to: (1) identify which costs should be recovered through rates and charges (the revenue requirement); (2) organize costs into service functions (functionalize); (3) allocate service function costs on the basis for which the cost was incurred (allocate); and (4) distribute costs to rate elements (distribute). The process acronym is FAD: functionalize, allocate, distribute. The balance of this

[7] Manual of Water Supply Practices, M1, Principles of Water Rates, Fees and Charges, American Water Works Association, Sixth Edition, pg.4

report uses this nomenclature, while tailoring the process to Metropolitan's unique service obligations and member agency needs.

The purpose of sorting Metropolitan's costs in a manner that reflects the type of function (e.g., supply vs. conveyance), the characteristics of the cost (e.g., fixed or variable) and the reason why the cost was incurred (e.g., to meet peak or average demand) is to create logical cost of service "building blocks". The building blocks can then be arranged to design rates and charges with a reasonable nexus between costs and benefits.

Cost of Service Process

The general cost of service process involves the four basic steps outlined below.

Step 1 - Development of Revenue Requirements

In the revenue requirement step, the costs that Metropolitan must recover through rates and charges, after consideration of revenue offsets, are identified. The cash-needs approach, an accepted industry practice for government-owned utilities, has historically been used in identifying Metropolitan's revenue requirements[8]. Although the utility approach would be acceptable under AWWA guidelines, the cash-needs approach was applied for the purposes of this study. All of Metropolitan's costs fall under the broad categories of either Departmental Costs or General District Requirements. Departmental Costs include budgeted items identified with specific departments within Metropolitan. General District Requirements primarily consist of requirements associated with the CRA, SWP, Supply Programs, Demand Management Programs, and capital financing costs. General District Requirements also include reserve fund transfers required by bond covenants and Metropolitan's Administrative Code. Under the cash needs approach, revenue requirements include operating costs and annual requirements for meeting financed capital items (debt service and funding of the CIP from operating revenues).

Step 2 – Functionalization of Costs

To allow for the development of rates that properly reflect the costs of providing different service types (full service treated, full service untreated, and wheeling), revenue requirements should be categorized based on the operational functions served by each cost. In the functional assignment step, revenue requirements are assigned to different categories based on the operational functions served by each cost. The functional categories are identified in such a way as to allow the development of logical assignment bases. The functional categories used in the cost of service process include:

- Supply
- Conveyance and Aqueduct
- Storage
- Treatment
- Distribution
- Demand Management
- Administrative and General
- Hydroelectric

[8] The primary difference between the two methods is how capital-related costs are approached. The cash-needs approach uses debt service on bonds and capital funded from rates; the utility approach uses depreciation and a return on Rate Base or Investment.

These functional assignments reflect the unique services that Metropolitan provides and enable the ultimate unbundling of services consistent with the Strategic Plan Policy Principles. In order to provide more finite functional assignment, many of these functional categories are subdivided into more detailed sub-functions in the COS process. For example, costs for the Supply and Conveyance and Aqueduct functions are further subdivided into the sub-functions SWP, CRA, and Other. Similarly, costs in the Storage function are broken down into the sub-functions Emergency Storage, Drought Carryover Storage, and Regulatory Storage.

Step 3 - Allocation of Costs

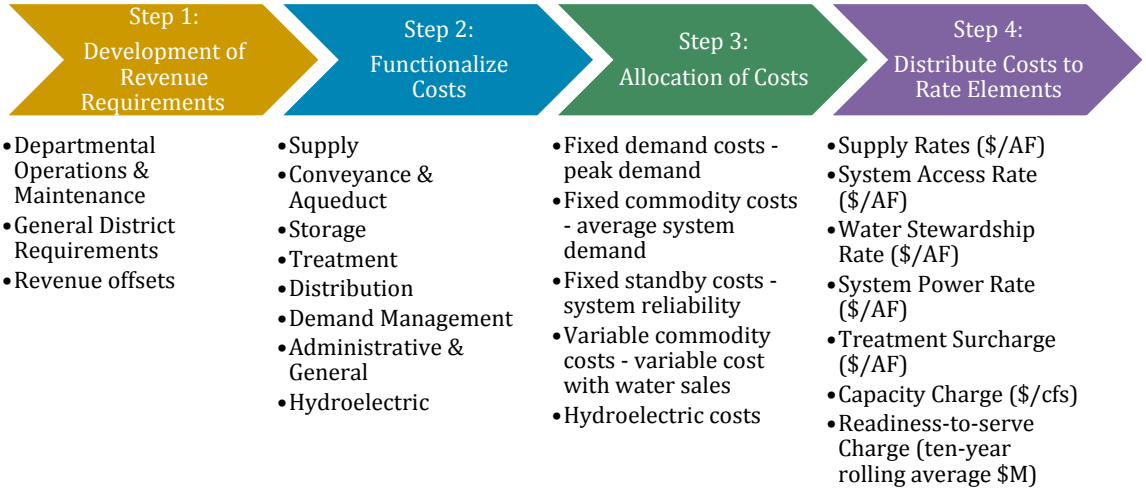
In the cost allocation step, functionalized costs are separated into categories according to their causes and behavioral characteristics. Proper cost allocation is critical in developing a rate structure that recovers costs in a manner consistent with the causes and behaviors of those costs. Under AWWA guidelines, cost allocation may be done using either the Base/Extra-Capacity approach or the Commodity/Demand approach. In the simplest sense, these approaches offer alternative means of distinguishing between utility costs incurred to meet average or base demands and costs incurred to meet peak demands. The Commodity/Demand approach was selected because it: (1) is best suited for systems where design criteria are focused on peaking patterns within a long-term time frame, such as maximum month and maximum week, (2) it works well in situations where complex cost relationships exist in the service area and attempting to allocate costs to maximum day and maximum hour functions would be complicated and often impractical, and (3) it allows for the development of the most appropriate COS classification bases because of the way Metropolitan's financial and operational data is organized. The Commodity/Demand approach was modified for its application to Metropolitan's rate structure by adding a separate cost allocation for costs related to Metropolitan's standby function. Analysis of system operating data indicated that a modified Commodity/Demand approach was most appropriate for developing Metropolitan's cost of service allocation bases.

Step 4 – Distribution to Rate Elements

The distribution of costs to the rate design elements depends on the purpose for which the cost was incurred and the manner in which the member agencies use the Metropolitan system. For example, costs incurred to meet average system demands are typically recovered by dollar per acre-foot rates and are distributed based on the volume of water purchased by each agency. Rates that are levied on the amount or volume of water delivered are commonly referred to as volumetric rates as the customer's costs vary with the volume of water purchased. Costs incurred to meet peak distribution demands (referred to in this report as demand costs) are recovered through a peaking charge (the Capacity Charge) and are distributed to agencies based on their peak summer demand behavior. Costs incurred to provide system reliability in the event of an emergency, major outage or hydrologic variability (referred to in this report as standby costs) are recovered through a Readiness-To-Serve Charge. Differentiating between costs for average, peak, and standby is just one example of how the COS process allows for the design of rates and charges to achieve overall customer equity and efficiency.

With regard to treatment-related costs, all costs, whether for average, peak, or standby, are recovered by dollar per acre-foot rates and are distributed based on the volume of treated water purchased. The following figure summarizes the Metropolitan COS process.

Cost of Service Process



Revenue Requirements

The estimated revenue requirements presented in this report are for FY 2016/17 and FY 2017/18. Throughout the report, the fiscal years are used as the "test years" to demonstrate the application of the cost of service process. Schedule 1 and Schedule 2 summarize the FY 2016/17 and FY 2017/18 revenue requirements, respectively, by the major budget line items used in Metropolitan's budgeting process.

Current estimates indicate Metropolitan's annual expenditures (including capital financing costs, but not construction outlays financed with bond proceeds) will total approximately $1.68 billion in FY 2016/17 and $1.70 billion in FY 2017/18. These expenditures support sales of 1.7 million-acre-feet (MAF) in each fiscal year, which are average demands based on the 2015 IRP Update, and assume a 50 percent allocation on the SWP, consistent with the ten-year average ending Calendar Year 2014, and approximately 1.0 MAF of diversions on the CRA.

The rates and charges do not have to cover this entire amount. Metropolitan generates a significant amount of revenue from interest income, hydroelectric power sales and miscellaneous income. These internally generated revenues are referred to as revenue offsets and are expected to generate about $41 million in FY 2016/17 and $46 million in FY 2017/18. It is expected that Metropolitan will also generate about $98 million in ad valorem property tax revenues (assuming that ad valorem tax rates are maintained at 0.0035 percent of assessed valuation) in FY 2016/17 and $100 million in FY 2017/18. Property tax revenues are used to pay for a portion of Metropolitan's general obligation bond debt service, and a portion of Metropolitan's obligation to pay for debt service on bonds issued to fund the SWP, and other SWP costs. The total revenue offsets are estimated to be about $139 million in FY 2016/17 and $146 million in FY 2017/18. Therefore, the revenue required from rates and charges is the difference between the total costs and the revenue offsets, or $1.58 billion in FY 2016/17 and $1.58 billion in FY 2017/18. Given an effective date of January 1, 2017 and January 1, 2018, respectively, the rates and charges recommended in this report, combined with rates and charges effective through December 31, 2016 will generate a total of $1.49 billion in FY 2016/17 and $1.55 billion in FY 2017/18.

All of Metropolitan's costs fall under the broad categories of Departmental Costs or General District Requirements. Departmental Costs include budgeted items identified with specific organizational groups.

General District Requirements consist of requirements associated with the CRA, SWP, Supply Programs, Demand Management Programs, and capital financing costs associated with the Capital Investment Plan (CIP). General District Requirements also include reserve fund transfers required by bond covenants and Metropolitan's Administrative Code.

Schedule 1: Revenue Requirements (by budget line item), FY 2016/17:

	Fiscal Year Ending 2017	% of Revenue Requirements (1)
Departmental Operations & Maintenance		
Office of the General Manager & Human Resources	$ 26,461,457	1.4%
External Affairs	16,779,558	0.9%
Water System Operations	212,359,971	11.5%
Chief Financial Officer	8,607,631	0.5%
Business Technology & Engineering Services	81,169,260	4.4%
Real Property Development & Mgmt	5,025,496	0.3%
Water Resource Management	15,606,840	0.8%
Ethics Department	1,277,212	0.1%
General Counsel	12,707,666	0.7%
Audit Department	2,918,005	0.2%
Total	**382,913,096**	**20.7%**
General District Requirements		
State Water Project	582,252,181	31.4%
Colorado River Aqueduct Power	46,604,698	2.5%
Supply Programs	78,687,589	4.2%
Demand Management	75,129,611	4.1%
Capital Financing Program	448,450,410	24.2%
Operating Equipment and Leases	34,745,389	1.9%
Increase (Decrease) in Required Reserves	65,100,000	3.5%
Total	**1,330,969,879**	**71.8%**
Revenue Offsets	**(138,853,153)**	**7.5%**
Net Revenue Requirements	**$ 1,575,029,822**	**100.0%**

(1) Given as a percentage of the absolute values of total dollars apportioned
Totals may not foot due to rounding

Schedule 2: Revenue Requirements (by budget line item), FY 2017/18:

	Fiscal Year Ending 2018	% of Revenue Requirements (1)
Departmental Operations & Maintenance		
Office of the General Manager & Human Resources	$ 26,449,350	1.4%
External Affairs	17,108,397	0.9%
Water System Operations	215,162,129	11.5%
Chief Financial Officer	8,719,501	0.5%
Business Technology & Engineering Services	77,341,996	4.1%
Real Property Development & Mgmt	5,099,621	0.3%
Water Resource Management	15,753,342	0.8%
Ethics Department	1,285,225	0.1%
General Counsel	12,865,168	0.7%
Audit Department	2,916,325	0.2%
Total	**382,701,054**	**20.5%**
General District Requirements		
State Water Project	599,405,919	32.1%
Colorado River Aqueduct Power	54,377,965	2.9%
Supply Programs	81,726,492	4.4%
Demand Management	75,943,062	4.1%
Capital Financing Program	464,100,066	24.9%
Operating Equipment and Leases	37,059,183	2.0%
Increase (Decrease) in Required Reserves	25,400,000	1.4%
Total	**1,338,012,686**	**71.7%**
Revenue Offsets	**(146,398,220)**	**7.8%**
Net Revenue Requirements	**$ 1,574,315,520**	**100.0%**

(1) Given as a percentage of the absolute values of total dollars apportioned
Totals may not foot due to rounding

Explanation of Departmental Costs

Departmental costs consist of salary and benefits, chemicals, and power, outside services, materials and supplies, association dues, insurance expenses, leases, property taxes, and operating equipment budgeted by the General Manager's Department, as well as the General Counsel, General Auditor, and Ethics Officer.

The FY 2016/17 Operations and Maintenance (O&M), or Departmental, budget, including operating equipment purchases, is $417.7 million. This is $0.9 million, or 0.2 percent, lower than the FY 2015/16 budget of $418.5 million. The FY 2017/18 O&M budget is $419.8 million, an increase of $2.1 million, or 0.5 percent, over the FY 2016/17 budget.

The proposed FY 2016/17 O&M budget includes $417.7 million for labor and benefits, water treatment chemicals, power, and solids handling, materials and supplies, professional services, and operating equipment purchases. This is $0.9 million, or 0.2 percent, lower than the FY 2015/16 budget of $418.5 million due primarily to an effort to control labor costs and equipment expenditures in an environment of lower water sales. Variable treatment costs are also lower due to less treated water sales. The total authorized personnel complement for the FY 2016/17 budget is 1,912 authorized positions, including 26 agency and district temporary full-time equivalents (FTEs), and reflects an increase of 1 net full-time position

from the FY 2015/16 budget. Incorporating unfunded positions and positions that are planned to be vacant for portions of the year, the total funded positions are 1,840 FTEs.

The proposed FY 2017/18 O&M budget is $419.8 million, an increase of $2.1 million, or 0.5 percent, compared to the FY 2016/17 budget. This increase is primarily due to merit increases for qualified employees, an increase in labor additive costs, and slight increase in chemical and power costs to operate the treatment plants due to slightly higher treated water sales. The total authorized personnel complement for FY 2017/18 is reduced by 2 FTEs to 1,910 positions, due to a decrease in temporary labor. Incorporating unfunded positions and positions that are planned to be vacant for portions of the year, the total funded positions are 1,841 FTEs.

The Departmental Budget is described in detail in the Biennial Budget document.

Explanation of General District Revenue Requirements

General District Requirements include costs for the SWP, CRA power, Supply Programs, Demand Management Programs, and the Capital Financing costs. Each of these areas is described in the following.

State Water Project

All costs of the State Water Contract capital expenditures and costs of the operations, maintenance, power and replacement (OMPR) associated with water conservation (supply) and transportation (delivery) are paid by the 29 State Water Contractors. Metropolitan recovers the costs associated with the State Water Contract through ad valorem property taxes, the System Access Rate, the System Power Rate, and the Readiness-to-Serve Charge.

Articles 22 through 26 of the State Water Contract provide that all costs DWR might incur to conserve and transport water to Metropolitan will be recovered from Metropolitan. Metropolitan is responsible for paying the costs necessary to conserve and transport SWP water regardless of whether Metropolitan receives any water at all. Only the Transportation Variable, which recovers power costs for pumping through SWP transportation facilities to Metropolitan, varies depending on the amount of water delivered to Metropolitan. In the event Metropolitan does not pay DWR, DWR can require Metropolitan to recover its SWP costs through property taxes. DWR has no recourse to go to the State General Fund to pay SWP costs. DWR has no exposure whatsoever for any revenue shortfall, cost changes, or the cost impacts of operational limitations; these risks are solely the Contractors risks.

Annually, the DWR reviews and redetermines the water supply and financial aspects of the SWP as required by the State Water Contract. The review and redetermination results in the annual Statement of Charges to the Contractors for each calendar year. The information that supports the Statement of Charges is published by the DWR as Appendix B to the appropriate Bulletin 132 (i.e., the Statement of Charges for Calendar Year 2016 is supported by Appendix B to Bulletin 132-15). DWR does not charge rates for water service. It does not develop a revenue requirement and then develop rates based on projected billing determinants for a calendar year. Rather, DWR apportions its costs to the Contractors based on their proportionate share of conservation (supply) costs (the Delta Water Charge) and transportation (delivery) costs (the Transportation Charge).

For FY 2016/17, budgeted State Water Contract costs are $582.3 million. For FY 2017/18, budgeted State Water Contract costs are $599.4 million. The expenditures for the SWP are described in detail in the Biennial Budget document.

Colorado River Aqueduct

Metropolitan owns, operates, and manages the CRA. Metropolitan is responsible for operating, maintaining, rehabilitating, and repairing the CRA, and is responsible for obtaining and scheduling energy resources adequate to power pumps at the CRA's five pumping stations.

In fiscal years 2016/17 and 2017/18, it is projected Metropolitan will receive annual CRA water diversions of approximately 1.0 MAF. The budgeted power costs for the CRA are $46.6 million in FY 2016/17 and $54.4 million in FY 2017/18.

The CRA costs for delivery and supply are reflected in the Departmental costs and in the costs of the appropriate service functions. The expenditures for CRA power are described in detail in the Biennial Budget document.

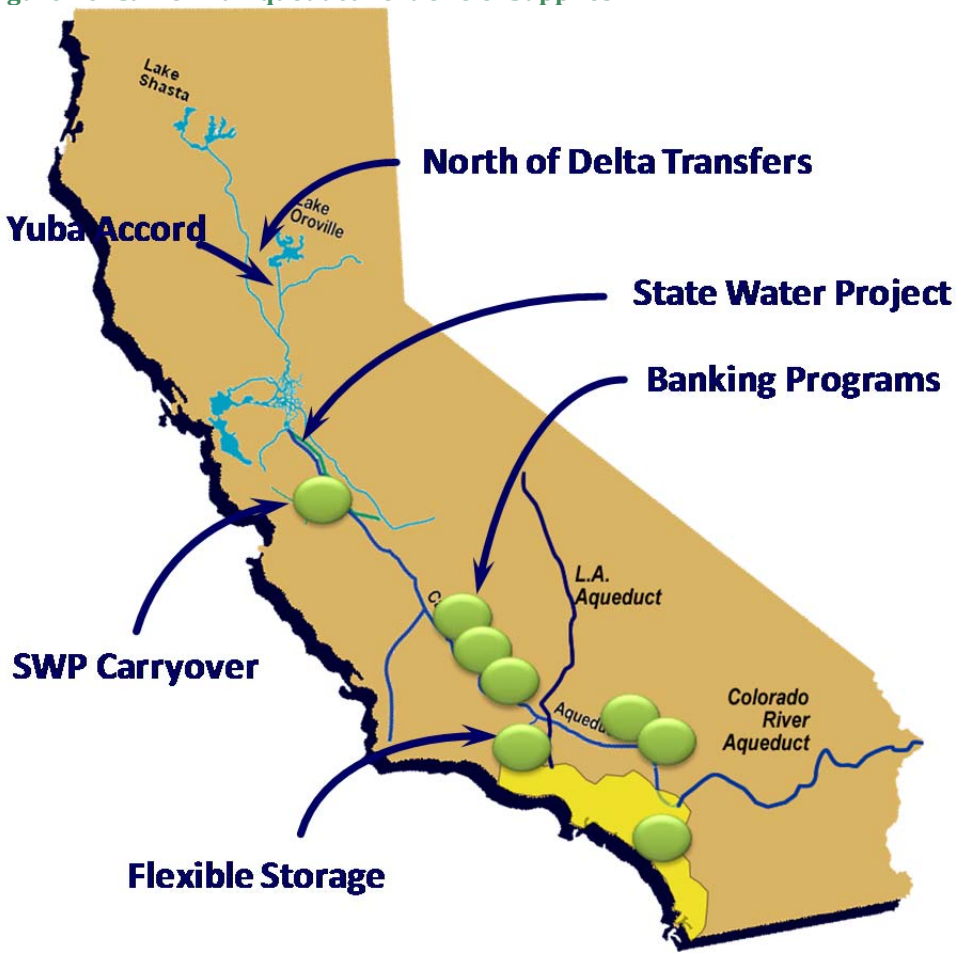
Supply Programs: SWP

Since adoption of the 1996 Integrated Resources Plan (1996 IRP) and subsequent updates, Metropolitan has developed and actively managed a portfolio of supplies to convey through the California Aqueduct, as shown in Figure 10. The geographical locations of the projects are indicated by the green dots; Metropolitan's service area is designated by the yellow highlighted area. Metropolitan submits delivery schedules to DWR for these supplies, and alters these schedules throughout the year based on changes in the availability of SWP and Colorado River water. The portfolio of supplies that Metropolitan has developed to be conveyed through the SWP since adoption of the Monterey Amendments and the 1996 IRP extend from north of the Delta to Southern California.

Since the Monterey Amendments, Metropolitan has secured one-year water transfer supplies through Metropolitan-only purchases, buyer coalition-purchases, and Governor Drought Water Banks. The most recent years in which these one-year transactions occurred were 2008 through 2010, and 2013. No purchases were made in 2011 or 2012 due to favorable water supply conditions. Most of the sellers were Sacramento Valley water users who are not Contractors. Other Contractors obtained one-year water transfers during this timeframe as well.

In addition to the above one-year water transfers, Metropolitan purchases long-term water transfer supplies through the Yuba Accord. The Yuba Accord has provided water to enhance SWP and CVP water supply reliability by offsetting Delta export reductions and providing dry year water supplies for participating SWP and CVP contractors. This water is Yuba River water developed by Yuba County Water Agency (YCWA) making reservoir releases or by YCWA's member units substituting groundwater for their surface water supplies; it is not SWP water.

Figure 10: California Aqueduct Portfolio of Supplies



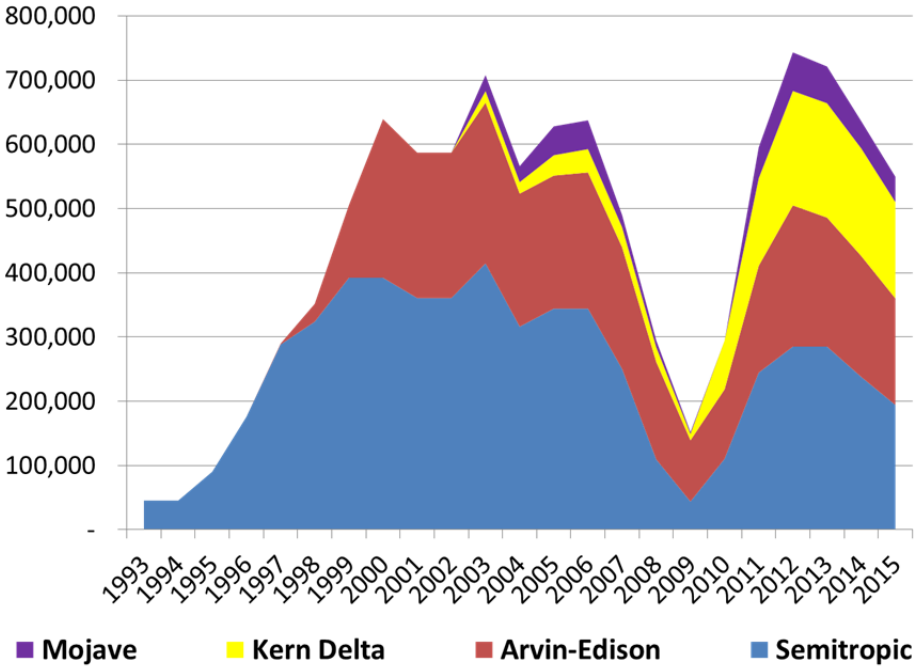
In addition to one-year transfers, and the Yuba Accord water, Metropolitan has developed groundwater storage agreements that allow Metropolitan to store available supplies in the Central Valley for return later. Metropolitan enters into point of delivery agreements with DWR to deliver water supplies from the SWP facilities to these storage programs. Metropolitan enters into introduction of local supplies agreements to return these water supplies to the SWP system for delivery to Metropolitan. Metropolitan's storage activities are shown in Figure 11, and demonstrate that a significant amount of water, which is not SWP Table A water in the year it is delivered, is managed by Metropolitan in these storage programs.

- Arvin-Edison Storage Program: under the agreement, Arvin-Edison Water Storage District stores water on behalf of Metropolitan. Up to 350,000 acre-feet can be stored; Arvin-Edison is obligated to return up to 75,000 acre-feet of stored water in any year to Metropolitan, upon request. The water is returned by direct groundwater pump-in and exchange of SWP supplies.
- Semitropic Storage Program: under the agreement, Metropolitan stores water in the groundwater basin underlying land within the Semitropic Water Storage District. The maximum storage capacity is 350,000 acre-feet. As of December 2014, the minimum annual yield to Metropolitan is 34,700 acre-feet, and the maximum annual yield is 236,200 acre-feet depending on the available unused capacity and the SWP allocation. The water is returned by direct groundwater pump-in and exchange of SWP supplies.
- Kern Delta Storage Program: under the agreement, Kern Delta Water District provides groundwater banking and exchange transfer to allow Metropolitan to store up to 250,000 acre-feet of SWP water in

wet years and take up to 50,000 acre-feet annually during droughts. The water is returned by direct groundwater pump-in or by exchange of surface water supplies.

- Mojave Storage Program: under the agreement, Mojave Water Agency provides groundwater banking and exchange transfers to allow Metropolitan to store up to 390,000 acre-feet for later return. The agreement allows Metropolitan to annually withdraw Mojave Water Agency's SWP contractual amounts, after accounting for local needs.
- Antelope Valley East Kern (AVEK) Storage and Exchange Program: under the agreement, AVEK provides at least 30,000 acre-feet over ten years of its unused SWP Table A amount to Metropolitan and Metropolitan, at its discretion, would return half of the exchange water to AVEK at the Banks pumping plant. Under the Storage Program, Metropolitan, at its discretion, could store at least 30,000 acre-feet of its SWP Table A amount or other supplies in the Antelope Valley Groundwater Basin in an account designated for Metropolitan.

Figure 11: SWP Groundwater Storage Programs, acre-feet



Metropolitan has developed exchanges and transfers with other Contractors to enhance supply flexibility. Some of these agencies have extensive groundwater supplies and are willing to exchange their SWP supplies.

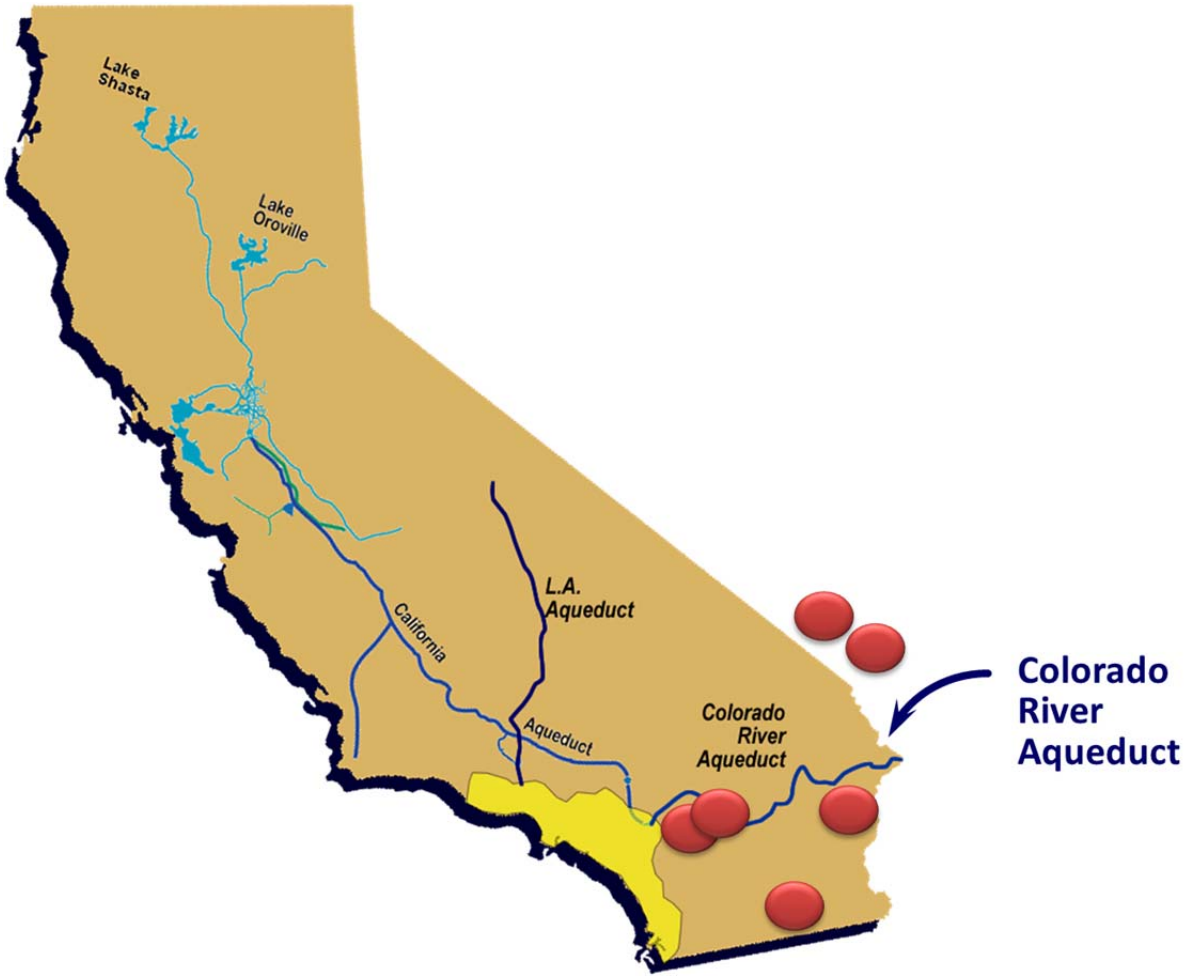
- San Bernardino Valley Municipal Water District: under the agreement, Metropolitan can exchange up to 11,000 acre-feet on an annual basis with the return negotiated.
- San Gabriel Valley Water District: under this agreement, Metropolitan delivers treated water to a San Gabriel Valley Water District subagency in exchange for twice as much untreated SWP supplies delivered into the groundwater basin that supplies this agency and Metropolitan subagencies. Metropolitan can purchase at least 5,000 acre-feet per year, in excess of the unbalanced exchange amount. There are no fees to put water into storage, or take water out of the storage account. This program has the potential to increase Metropolitan's reliability by providing 115,000 acre-feet through 2035.
- Desert Water Agency/Coachella Valley Water District Advance Delivery Program: under this program, Metropolitan delivers Colorado River water to the Desert Water Agency (DWA) and Coachella Valley

Water District (CVWD) in advance of the exchange for their SWP Contract Table A allocations. In addition to their Table A supplies, the agencies can take delivery of SWP supplies available under Article 21 and the Turn-back Pool Program, and non-SWP supplies separately acquired by each agency. These non-SWP supplies have included Yuba Accord water, drought water bank water, and San Joaquin Valley water. By delivering enough water in advance to cover Metropolitan's exchange obligations, Metropolitan is able to receive DWA and CVWD's available SWP supplies in years in which Metropolitan's supplies are insufficient without having to deliver an equivalent amount of Colorado River water.

Supply Programs: CRA

Since adoption of the 1996 IRP and subsequent updates, Metropolitan has developed and actively manages a portfolio of supplies to convey through the CRA. Metropolitan determines the delivery schedule of those resources throughout the year based on changes in the availability of SWP and of Colorado River water. Figure 12 shows the geographic location of the portfolio of additional CRA supplies, designated by the red dots, which Metropolitan has developed for diversion into the CRA since adoption of the 1996 IRP. These resources extend from Lake Mead to Southern California and provide supply to Metropolitan's service area, which is shown in the yellow highlighted area.

Figure 12: Colorado River Aqueduct Portfolio of Supplies



- Imperial Irrigation District/Metropolitan Conservation Program: Under a 1988 Conservation Agreement, Metropolitan has funded water efficiency improvements within the Imperial Irrigation District's (IID) service area in return for the right to divert the water conserved by those investments. Metropolitan provided funding for IID to construct and operate a number of conservation projects that have conserved up to 109,460 acre-feet of water per year that is then available to Metropolitan. In 2015, 107,820 acre-feet of conserved water is being conserved by IID and made available to Metropolitan. Execution of the Quantification Settlement Agreement (QSA) and other agreement amendments resulted in changes in the availability of water under the program. As a result of a 2014 IID-Metropolitan letter agreement, the amount of water conserved by IID has been quantified at 105,000 acre-feet per year beginning in 2016. Metropolitan is guaranteed at least 85,000 acre-feet per year, with the remainder of the conserved water being made available to the Coachella Valley Water District (CVWD), if needed under the 1989 Approval Agreement as amended.
- Palo Verde Land Management, Crop Rotation, and Water Supply Program: Under this program, participating landowners in the PVID are paid to reduce water use by not irrigating a portion of their land. A maximum of 35 percent of the participating lands within the Palo Verde Valley can be fallowed in any given year. This program saves up to 133,000 acre-feet of water in certain years, and a minimum of 33,000 acre-feet per year. The term of the program is 35 years. Fallowing began in 2005. In March 2009, Metropolitan and PVID entered into a supplemental emergency fallowing program within PVID that provided for the fallowing of additional acreage in 2009 and 2010. Since 2005, approximately 1 million acre-feet total of Colorado River water has been conserved. The volume of water that becomes available to Metropolitan is governed by the QSA and the Colorado River Water Delivery Agreement. Under these agreements:
    - Metropolitan must reduce its consumptive use of Colorado River water by that volume of consumptive use by PVID and holders of Priority 2 that is greater than 420,000 acre-feet in a calendar year, or
    - Metropolitan may increase its consumptive use of Colorado River water by that volume of consumptive use by PVID and holders of Priority 2 that is less than 420,000 acre-feet in a calendar year.

In both cases, each acre-foot of reduced consumptive use by PVID is an additional acre-foot that becomes available to Metropolitan.

- All-American and Coachella Canal Lining Projects: Metropolitan takes delivery of 16,000 acre-feet of water annually as a result of the All-American and Coachella Canal Lining Projects. Under federal law, that water will be made available for the benefit of the La Jolla, Pala, Pauma, Rincon and San Pasqual Bands of Mission Indians, pursuant to a pending settlement of their water rights claims in the San Luis River located in San Diego County.
- Southern Nevada Water Authority and Metropolitan Storage and Interstate Release Agreement: Under this 2004 agreement and a related Operational Agreement, the Southern Nevada Water Authority (SNWA) may offer a portion of its Colorado River water supplies to Metropolitan when there is space available in the CRA to receive the water. SNWA may call for return of the water in a future year, in which Metropolitan would reduce its Colorado River water order to return this water. In 2009, 2012, and 2015, Metropolitan, the Colorado River Commission of Nevada, and SNWA amended the related Operational Agreement dealing with volumes of water that may be stored or called at various times. The agreements can be terminated upon 90 days' notice following the return of the water stored by Metropolitan.
- Lower Colorado Water Supply Project: This project develops additional water supplies by pumping groundwater into the All-American Canal for delivery to IID. An equal volume of Colorado River

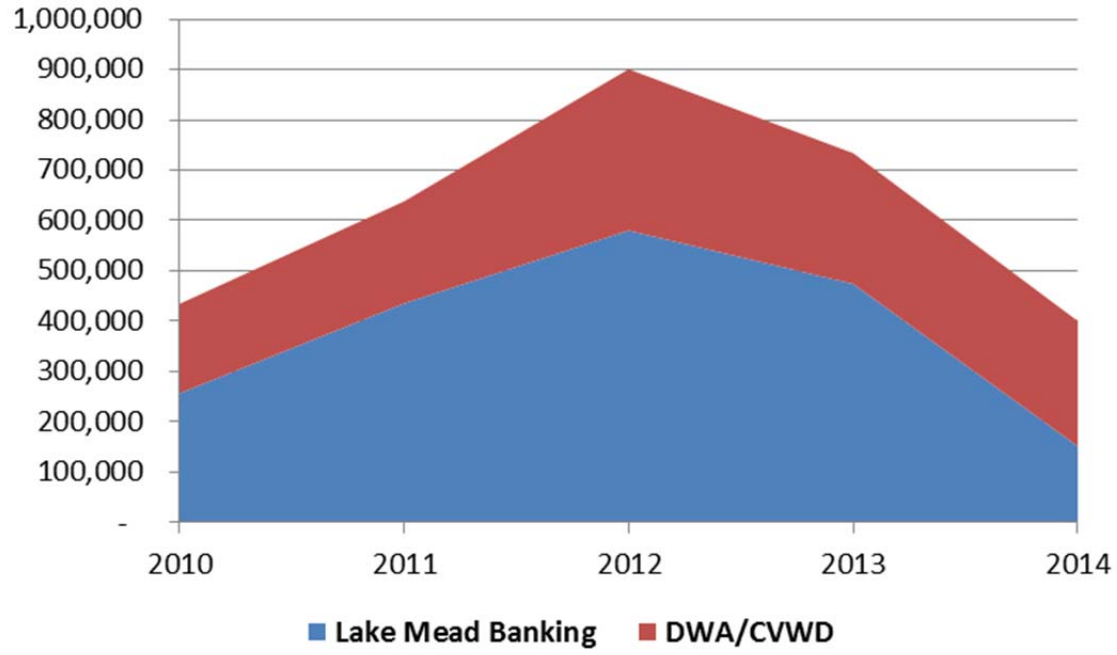
water is then made available for other water users along the river. Under a contract among Metropolitan, the City of Needles, and the United States Bureau of Reclamation, Metropolitan receives any excess unused water developed by the project. Metropolitan makes payments to a trust fund to develop a replacement project or to desalt the groundwater should the groundwater become too saline for discharge into the All-American Canal.

- Lake Mead Storage Program: In December 2007, Metropolitan entered into agreements to set forth the guidelines under which Intentionally Created Surplus (ICS) water is developed, and stored in and delivered from Lake Mead. The amount of water stored in Lake Mead must be created through extraordinary conservation, system efficiency, or tributary conservation methods. ICS is available for delivery in a subsequent year, with extraordinary conservation ICS subject to a one-time deduction to benefit the river system and annual evaporation losses. Extraordinary conservation methods used by Metropolitan to date are water saved by fallowing in the Palo Verde Valley, projects implemented with IID in its service area, and groundwater desalination. "System Efficiency ICS" can be created through the development and funding of system efficiency projects that save water that would otherwise be lost from the Colorado River. Metropolitan has participated in two projects to create System Efficiency ICS, and a third project to create ICS by conservation in Mexico:
    - Drop 2 (Warren H. Brock) Reservoir: Metropolitan contributed funds toward the Bureau of Reclamation's construction of an 8,000 acre-foot off-stream regulating reservoir near Drop 2 of the All-American Canal in Imperial County. This reservoir conserves about 70,000 acre-feet of water per year by capturing and storing otherwise non-storable flow. In return for its funding, Metropolitan received 100,000 acre-feet of water that was stored in Lake Mead, and has the ability to take delivery of up to 25,000 acre-feet of water in any single year. Besides the additional water supply, the new reservoir adds to the flexibility of Colorado River operations.
    - Yuma Desalting Plant: Metropolitan contributed to a one-year pilot operation of the Plant at one-third capacity to provide data regarding the long-term operation of the Plant. Metropolitan's yield from the pilot run of the project was 24,397 acre-feet.
    - In November 2012, Metropolitan executed agreements in support of a program to augment Metropolitan's Colorado River supply between 2013 and 2017 through an international pilot project in Mexico. Metropolitan's total share of costs will be $5 million for 47,500 acre-feet of project supplies. The costs will be paid between 2015 and 2017, and the conserved water will be credited to Metropolitan's intentionally-created surplus water account no later than 2017. In December 2013, Metropolitan and IID executed an agreement under which IID will pay half of Metropolitan's program costs, or $2.5 million, in return for half of the project supplies, 23,750 acre-feet.
- Hayfield Groundwater Storage Program: This program will allow Metropolitan to store Colorado River water in the Hayfield Groundwater Basin in eastern Riverside County for future withdrawal and delivery to the CRA. As of 2010, there was over 75,000 acre-feet in storage. Drought conditions in the Colorado River watershed have resulted in a lack of surplus supplies for storage. When water supplies become more plentiful, Metropolitan may pursue this program and develop storage capacity of about 400,000 acre-feet.
- Desert Water Agency/Coachella Valley Water District/Metropolitan Water Exchange and Advance Delivery Programs: Under these programs, Metropolitan delivers Colorado River water to the DWA and CVWD, in exchange for future deliveries by DWA and CVWD of an equal volume of their SWP supplies. By delivering enough water in advance to cover Metropolitan's exchange obligations, Metropolitan is able to

receive DWA and CVWD's available SWP supplies in years in which Metropolitan's supplies are insufficient to deliver an equivalent amount of Colorado River water[9].

Figure 13 shows the year-end balance in Metropolitan's Colorado River storage programs. The combined capacity of the Lake Mead Storage program and the DWA/CVWD advance delivery program is 2,300,000 acre-feet, plus the amount of water in storage in Lake Mead as a result of the Drop 2 Reservoir and Yuma Desalting Plant system efficiency projects.

Figure 13: Colorado River Storage Programs, acre-feet



In addition to the supply programs developed by Metropolitan, Metropolitan entered into an exchange agreement with the San Diego County Water Authority (SDCWA). On April 29, 1998, SDCWA and IID executed an agreement (the "IID-SDCWA Transfer Agreement") for SDCWA's purchase from IID of Colorado River water that is conserved within IID. An amendment to the IID-SDCWA Transfer Agreement, executed as one of the QSA related agreements, set the maximum transfer amount at 205,000 acre-feet in 2021, with the transfer gradually ramping up to that amount over an 18 year period, then stabilizing at 200,000 acre-feet per year beginning in 2023.

No facilities currently exist to deliver water directly from IID to SDCWA. Accordingly, in 1998, SDCWA entered into an exchange agreement with Metropolitan, pursuant to which SDCWA would have made available to Metropolitan at Lake Havasu on the Colorado River the conserved IID Colorado River water acquired by SDCWA from IID. Metropolitan would have delivered to SDCWA an equal volume of water from Metropolitan's supplies. The 1998 SDCWA-Metropolitan Exchange Agreement was conditioned upon the

[9] DWA has a SWP Table A contract right of 55,750 acre-feet per year and CVWD has a SWP Table A contract right of 138,350 acre-feet per year, for a total of 194,100 acre-feet per year. In addition to their Table A supplies, DWA and CVWD, subject to Metropolitan's written consent may by exchange take delivery of SWP supplies available under Article 21 of their SWP Contracts, the Turn-back Pool Program, and non-SWP supplies they may acquire and convey through SWP facilities. Under the Metropolitan-CVWD Delivery and Exchange Agreement for 35,000 Acre-feet, up to 35,000 acre-feet of Metropolitan's SWP Table A supply can be requested annually by CVWD for delivery by exchange.

State Legislature's appropriation of $235 million to Metropolitan for lining the earthen All-American and Coachella Valley Canals to conserve water that would otherwise seep into the soil. Upon completion of the canal lining, Metropolitan had the rights to the estimated 77,700 acre-feet per year of conserved water for 110 years (Canal Lining Water).

In 2003, SDCWA and Metropolitan amended their exchange agreement, pursuant to which Metropolitan assigned the rights to the Canal Lining Water for 110 years and the $235 million in state funding to SDCWA in exchange for SDCWA's agreement to pay for deliveries of water exchanged for the Canal Lining Water and IID transfer water based on the conveyance rates charged to Metropolitan's member agencies.

The budget for the Supply Programs is $78.7 million in FY 2016/17 and $81.7 million in FY 2017/18. The expenditures for the Supply Programs are described in detail in the Biennial Budget document.

Demand Management Programs

Demand Management costs are Metropolitan's expenditures for funding local water resource development programs and water conservation programs. These Demand Management Programs incentivize the development of local water supplies and the conservation of water to reduce the need to import water to deliver to Metropolitan's member agencies. These programs are implemented below the delivery points between Metropolitan's and its member agencies' distribution systems and, as such, do not add any water to Metropolitan's supplies. Rather, the effect of these downstream programs is to produce a local supply of water for the local agencies and to reduce demands by member agencies for water imported through Metropolitan's system.

Demand Management Programs reduce the use of and burden on Metropolitan's distribution and conveyance system, which, in turn, helps reduce the capital, operating, maintenance and improvement costs associated with these facilities. For example, local water resource development and conservation has deferred the need to build additional infrastructure such as the Central Pool Augmentation Project tunnel and pipeline, completion of San Diego Pipeline No. 6, the West Valley Interconnection, and the completion of the SWP East Branch expansion. Overall, the decrease in demand resulting from these projects is estimated to defer the need for projects between four and twenty-five years at a savings of approximately $2.8 billion in 2015 dollars. The programs also free up capacity in Metropolitan's system to convey both Metropolitan water, and water from other non-MWD sources.

In addition to reducing Metropolitan's costs for operating the distribution and conveyance system, Metropolitan also pursues conservation and local water resource development because it has uniquely been directed to do so by the state Legislature. In 1999, then Governor Davis signed SB 60 (Hayden) into law. SB 60 amended the Metropolitan Water District Act to direct Metropolitan to increase conservation and local resource development. No other water utility in California, public or private, has been specifically identified by the state Legislature and directed to pursue water conservation and local water resource development.

Metropolitan's Demand Management programs also support the region's compliance with the requirements of SB X7-7. In 2009, the state Legislature passed SB X7-7, which was enacted to reduce urban per capita water use by 20 percent by December 31, 2020. Urban retail water suppliers are not eligible for state water grants or loans unless they comply with the water conservation requirements of the legislation. Demand Management programs help the region achieve urban per capita water use reductions.

Demand Management costs also support the Strategic Plan Policy Principles approved by Metropolitan's Board on December 14, 1999. These principles represent the Board's vision that Metropolitan is a regional provider of wholesale water services. In this capacity, Metropolitan is the steward of regional infrastructure and the regional planner responsible for coordinated drought management and the collaborative development of additional supply reliability and necessary capacity expansion. Through these regional services, Metropolitan ensures a baseline level of reliability and quality for service in its service area.

The expenditures for the Demand Management Program are $75. 1 million in FY 2016/17 and $75.9 million in FY 2017/18, and are described in more detail in the Biennial Budget document.

Capital Financing Costs

Capital financing costs are Metropolitan's expenditures for Revenue Bond debt service, General Obligation bond debt service, debt administration costs, the funding of capital expenditures from current operating revenues, or Pay-As-You-Go (PAYGo), and State Revolving Fund (SRF) Loan payments.

Budgeted amounts for Capital Financing represent the expenditures for existing and future debt service, anticipated debt administration costs to support the debt portfolio, and lower PAYGo amounts to support a lower Capital Investment Plan. Metropolitan generally incurs long-term debt to finance projects or purchase assets which will have useful lives equal to or greater than the related debt. Revenue supported debt can be authorized by Metropolitan's Board of Directors.

- **Revenue Bond Debt Service:** Includes the annual principal and interest payments for Metropolitan's outstanding and estimated future Revenue Bond debt service costs. Revenue bonds are used to finance the majority of Metropolitan's CIP. Long-term interest rates are assumed to be 4.5 percent for fixed bonds.
- **G.O. Bond Debt Service:** Includes Metropolitan's currently outstanding General Obligation (GO) bond interest and principal payments. In the long-term, it is assumed that no additional GO debt is issued to finance the CIP.
- **Debt administration costs:** Includes liquidity, remarketing, and broker-dealer fees.
- **PAYGo from Annual Operating Revenues:** Current policy calls for 60 percent of Metropolitan's capital costs to be funded from current revenues. The PAYGo program is projected to generate $120 million per year through the service class rates for this purpose over the next two fiscal years. As the annual capital expenditures increase over the next ten years, PAYGo will increase, debt service costs will decrease as outstanding debt is paid down, thereby making room within the cost structure to absorb the increased costs associated with the California WaterFix, if applicable.

Expenditures for Capital Financing are $448.5 million in FY 2016/17 and $464.1 million in FY 2017/18. The Capital Financing costs are described in more detail in the Biennial Budget document.

Required Reserves

Metropolitan's Administrative Code and provisions of the revenue bond covenants require that reserves be held in certain funds at certain times. Therefore, as costs increase, reserves also increase to meet the Administrative Code and revenue bond covenants requirements. This line item reflects current policy requiring O&M fund and SWC contract fund balances at the beginning of each year. The increase in Required Reserves is $65.1 million in FY 2016/17 and $25.4 million in FY 2017/18.

Functional Costs

Several major functions result in the delivery of full service water to Metropolitan's member agencies. These include the supply itself, the conveyance capacity and energy used to move the supply, storage of water, distribution of supplies within Metropolitan's system, and treatment of these supplies. Metropolitan's rate structure recovers the majority of the cost of these functions through rates and charges.

The functional categories developed for Metropolitan's cost of service process are consistent with the AWWA rate setting guidelines. A standard chart of accounts for utilities is provided in the AWWA publication

"Financial Management for Water Utilities: Principles of Finance, Accounting, and Management Controls". Figure 5-2, page 46, lists Operation and Maintenance (O&M) Expense Accounts. As noted, these are Expense Accounts, which provide the means by which O&M and capital financing costs are functionalized for COS. Because all water utilities are not identical, the functional categories used in the COS reflect, as they should, Metropolitan's unique physical, financial, and institutional characteristics, as permitted under the AWWA guidelines. Metropolitan has modified these functional categories as follows:

Pumping: Metropolitan functionalizes its pumping costs for the SWP and the CRA to a Conveyance and Aqueduct subaccount.

Customer Accounts, Customer Service and Sales Promotion: These are not applicable as Metropolitan is not a retail utility.

Storage: Metropolitan provides significant emergency storage, dry-year supply and regulatory services, and functionalizes costs to Storage to reflect Metropolitan's unique physical and operational reliability services.

Demand Management: Metropolitan incurs expenditures to support its Demand Management program, as described throughout this document.

Hydroelectric: Metropolitan has developed recovery generation facilities throughout its distribution system and recovers the costs and revenues from this investment in its COS.

A key goal of functional allocation is to maximize the degree to which rates and charges reflect the costs of providing different types of service. For functional allocation to be of maximum benefit, two criteria must be kept in mind when establishing functional categories.

- The categories should correlate charges for different types of service functions with the costs of providing those different types of functions; and
- Each function should include reasonable allocation bases by which costs may be allocated.

Each of the functions developed for the cost of service process is described below.

Supply

This function includes costs for those SWP and CRA facilities and programs that relate to maintaining and developing supplies to meet the member agencies' demands.

Metropolitan has a contractual right to a proportionate share of the project water that DWR determines is available for allocation to the Contractors. This determination is made each year based on existing supplies in storage, forecasted hydrology, and other factors. Available project water is then allocated to the Contractors in proportion to the amounts set forth in Table A of their State Water Contracts (Table A Allocation). The costs of the SWP supply are paid pursuant to Metropolitan's State Water Contract.

DWR's Delta Water Charge recovers the Capital and Minimum Operation, Maintenance, Power and Replacement (OMP&R) costs for the facilities that conserve and create the actual water supply of the SWP. The Delta Water Charge is based on Contractors' cumulative Table A Allocations, which is approximately 46 percent for Metropolitan, regardless of whether it receives any Table A water in a year.

Under its contract with the federal government, Metropolitan has a fourth priority to 550,000 acre-feet per year of Colorado River water, less certain use by higher priority holders and Indian tribes in California. Metropolitan also holds a fifth priority for an additional 662,000 acre-feet per year that exceeds California's 4.4 million acre-foot normal year basic apportionment, 38,000 acre-feet under the sixth priority during the term of the Colorado River Water Delivery Agreement, and another 180,000 acre-feet per year when surplus flows are available. Metropolitan can obtain water under the fourth, fifth, and sixth priorities from:

- Water unused by the California holders of priorities 1 through 3;
- Water saved by extraordinary conservation and crop rotation programs; or,
- When the U.S. Secretary of the Interior makes available:
    - Surplus water, Intentionally Created Surplus water, and/or
    - Water apportioned to, but unused by, Arizona and Nevada.

In fiscal years 2016/17 and 2017/18 it is projected that Metropolitan will receive annual CRA water diversions of approximately 1.0 MAF.

The costs of the CRA supply portfolio developed by Metropolitan are paid by Metropolitan. The CRA supply portfolio is supported by Water Resource Management labor, materials and supplies, outside services and professional services. The CRA supply portfolio activities benefit from Water Resource Management support services and management supervision, as well as Administrative and General activities of Metropolitan.

Metropolitan's supply related costs include investments in the Conservation Agreement with the IID, the PVID Program, and other CRA supply programs previously described. SWP programs include the Kern Delta Program, Semitropic Water Storage Program, Yuba Accord Program, Arvin-Edison Water Storage Program, Mojave Storage Program, AVEK Transfer and Storage Program, and others as previously described. Costs for programs within Metropolitan's service area, such as Conjunctive Use Programs, are also included.

Metropolitan finances past, current and future capital improvements associated with the supply portfolio capital assets and capitalizes investments IID/Metropolitan Conservation Program, the PVID Land Management, Crop Rotation, and Water Supply Program, the Kern Delta Storage Program, Semitropic Storage Program, and the Arvin-Edison Storage Program as Participation Rights.

Conveyance and Aqueduct

This function includes the capital, operations, maintenance, and overhead costs for SWP and CRA facilities that convey water to Metropolitan's internal distribution system. Variable power costs for the SWP and CRA are also considered to be Conveyance and Aqueduct costs but are separately reported under a "power" sub-function. Conveyance and Aqueduct facilities can be distinguished from Metropolitan's other facilities primarily by the fact that they do not typically include direct connections to the member agencies. For purposes of this study, the Inland Feeder Project functions as an extension of the SWP East Branch and is therefore considered a Conveyance and Aqueduct facility as well.

Conveyance and Aqueduct: SWP[10]

Contractors are participants in the SWP through long-term contracts with DWR. The State Water Contractors participate in the SWP system in exchange for payments made according to their maximum annual water entitlements, whether or not that water is actually made available, and the portions of the SWP system required for delivering water to each Contractor. Thus, in addition to water supply, the SWP is also used to convey transfer supplies between: Contractors, Contractors and non-SWP entities, or between non-SWP entities. SWP operations are closely coordinated and integrated with CVP. San Luis Reservoir and the San Luis Canal section of the California Aqueduct are shared SWP/CVP facilities. The SWP is also connected

[10] For historical and current information regarding the SWP, refer to Bulletin 132, published periodically by DWR since 1963. The most recently published Bulletin is Bulletin 132-14, dated November 2015 and titled, "Management of the California State Water Project."

to other water sources upstream of the Sacramento-San Joaquin Delta, and along the California Aqueduct as it passes through the Central Valley.

The capacity of the SWP to deliver water decreases with distance from the Banks Pumping Plant, located in the Sacramento-San Joaquin Delta, as water is delivered to Contractors through the South Bay Aqueduct and the Coastal Branch Aqueduct, and to turnouts in the San Joaquin Valley and Southern California. The design pumping capacity at Banks Pumping Plant is 10,670 cubic feet-per-second (cfs) but only 4,480 cfs at the Edmonston Pumping Plant, located at the base of the Tehachapi Mountains.

Since inception, the State Water Contract provided Contractors the ability to use the SWP to convey non-SWP water under certain circumstances. Specifically, Article 18(c)(2) of the original SWC addressed situations where there is a shortage in the supply of water made available under the contract and stated, "[T]he District, at its option, shall have the right to use any of the project transportation facilities which by reason of such permanent shortage in the supply of project water to be made available to the District are not required for delivery of project water to the District, to transport water procured by it from any other source: [p]rovided, [t]hat such use shall be within the limits of the capacities provided in the project transportation facilities for service to the District under this contract ….". However, Article 18(c)(2) only applied in the event a permanent shortage was declared by DWR and it was unclear how costs would be charged for using SWP facilities to transport non-project water. In 1994, the Contractors and DWR negotiated the Monterey Amendments to the State Water Contract, including Article 55, which made explicit the Contractors' rights to use the portion of the SWP conveyance system necessary to deliver water to them (their "reaches") also includes the right to convey non-SWP water at no additional cost as long as capacity exists. Power is charged at the SWP average power rate. The Monterey Amendments also expanded the ability to carryover SWP water in SWP storage facilities, allowed Contractors to store water in groundwater storage facilities outside a Contractor's service area for later use, and permitted certain Contractors to borrow water from terminal reservoirs. These amendments, approved by Metropolitan's Board in 1995, provide the means for individual Contractors to increase supply reliability through water transfers and storage outside their service areas.

The impact of the Monterey Amendments on SWP operations is shown in Tables 11 and 12 below, which are based on information supplied by DWR[11]. In the 5 calendar years ending in 2014, only 57.5 percent of the SWP deliveries to Metropolitan were Table A water delivered in the year it is paid for. Fully 42.5 percent of the deliveries were for non-Table A water. Non-SWP water comprised 12 percent of Metropolitan's deliveries from the SWP. For the other Contractors, 48 percent of the SWP deliveries were what one would consider "supply", or Table A water delivered in the year it is paid for; 52 percent of the deliveries are for non-Table A water. Non-SWP water transported by the other Contractors comprised 23.5 percent of their deliveries from the SWP. Non-Contractors using the SWP to wheel transfer supplies comprised 3 percent of all deliveries through the SWP. Fully 21 percent of the deliveries on the SWP were for non-SWP water.

[11] DWR, Water Deliveries Section, State Water Project Analysis Office, September 29, 2015.

Table 11: State Water Project Water Management Activities, CY 2010 through 2014, Acre-Feet

SWP Deliveries--Acre-feet

	Metropolitan				Other SWP Contractors					Non-SWC Agencies	Total Deliveries [4]
	(a)	(b)	(c)	(d) = (a) + (b) + (c)	(e)	(f)	(g)	(h) = (e) + (f) + (g)	(i) = (d) + (h)	(j)	(k) = (i) + (j)
	Table A [1]	Other SWP [2]	Non-SWP [3]	Total MWD	Table A [1]	Other SWP [2]	Non-SWP [3]	Total Other SWC	Total SWC	Non-SWP	
2010	639,537	352,831	265,720	1,258,088	687,734	361,796	353,346	1,402,876	2,660,964	148,982	2,809,946
2011	857,794	596,204	145,907	1,599,905	1,220,286	596,713	179,850	1,996,849	3,596,754	49,731	3,646,485
2012	906,009	302,488	10,010	1,218,507	934,470	454,249	245,202	1,633,921	2,852,428	82,473	2,934,901
2013	613,271	145,147	113,469	871,887	471,421	392,336	372,772	1,236,529	2,108,416	68,083	2,176,499
2014	59,181	223,675	114,032	396,888	25,418	170,325	485,811	681,554	1,078,442	62,097	1,140,539
Total	3,075,792	1,620,345	649,138	5,345,275	3,339,329	1,975,419	1,636,981	6,951,729	12,297,004	411,366	12,708,370

[1] Table A delivered and not exchanged or transferred or stored

[2] Other SWP = SWP Exchanges, Transfers, Carryover Storage, Flexible Storage, Article 21, Pool A/B, settlement

[3] Non-SWP = banking, non-SWP transfers and exchanges, Dry Year Purchase Program, local water, general conveyance water, operations exchange

[4] Does not include "Local non-SWP Water Supply Contractors", i.e. Feather River parties with senior water rights

Table 12: State Water Project Water Management Activities, CY 2010 through 2014, percentages

SWP Deliveries--Percentages

	=(a) / (d)	= ((b) + (c)) / (d)	= (c) / (d)	= (e) / (h)	= ((f) + (g)) / (h)	= (g) / (h)	= (j) / (k)	=((c)+ (g)+(j)) / (k)
	MWD Table A	MWD Non-Table A	MWD Non-SWP	Other Contractors Table A	Other Contractors Non-Table A	Other Contractors Non-SWP	Non SWC to Total	Total non-SWP to Total
2010	50.8%	49.2%	21.1%	49.0%	51.0%	25.2%	5.3%	27.3%
2011	53.6%	46.4%	9.1%	61.1%	38.9%	9.0%	1.4%	10.3%
2012	74.4%	25.6%	0.8%	57.2%	42.8%	15.0%	2.8%	11.5%
2013	70.3%	29.7%	13.0%	38.1%	61.9%	30.1%	3.1%	25.5%
2014	14.9%	85.1%	28.7%	3.7%	96.3%	71.3%	5.4%	58.0%
Total	57.5%	42.5%	12.1%	48.0%	52.0%	23.5%	3.2%	21.2%

The SWP has transformed from being a transporter of SWP water to a transporter of other water sources as well for Metropolitan, other State Water Contractors, and non-Contractors. The reason for this is quite simple: the SWP has allocated only 41 percent on average of the water due to State Water Contractors in the 5 calendar years ending 2014, and only 49 percent on average in the 10 years ending 2014. The State Water Contractors have a significant investment in the costs of operating, maintaining and financing the SWP, and have developed creative programs to develop additional supplies and improved supply reliability by using the SWP as a transportation system. Specifically, during times of shortage or low SWP supply allocations, Metropolitan uses the SWP facilities to transport non-SWP water, which is water it has acquired through use of non-SWP sources, to its service area. When Metropolitan conveys non-project water, it is using the SWP transportation facilities in transactions that have nothing to do with SWP water supply. The ability to move non-SWP water through the SWP facilities, either as a result of purchases of non-SWP water or withdrawals from banking programs, enhances Metropolitan's operational flexibility and contributes to regional system reliability from which all member agencies benefit.

In addition, Metropolitan has, from time to time, used its capacity in the SWP to wheel non-Metropolitan water to its member agencies. Examples include water delivered to Santa Margarita Water District (1,665.2 acre-feet net in 1998-2000) and Irvine Ranch Water District (1,000 acre-feet in 2015), sub-agencies of the Municipal Water District of Orange County, and for the San Diego County Water Authority (23,077 acre-feet in 2008 and 15,520 acre-feet net in 2009).

The costs of the SWP conveyance facilities are paid pursuant to Metropolitan's State Water Contract. DWR's Transportation Charge recovers the costs associated with the various aqueduct reaches that deliver project

water to the Contractors. The Capital and fixed OMP&R portions of the SWP Transportation Charge recover costs from the Contractors based on the accumulation of allocated costs for each aqueduct reach to each Contractor. Unlike the Delta Water Charge, which is uniform for a unit of Table A water, the allocation of these portions of the Transportation Charge will vary based on the aqueduct segments needed to deliver water to a specific Contractor. The further a Contractor is from the Delta and the greater its capacity in the transportation facilities, the greater its allocation of the Capital and fixed OMP&R Transportation Charges. Payment of the Transportation Charge entitles Contractors to the right to use their capacity in the SWP facilities for transportation of SWP or non-SWP water, on a space available basis, under the SWC. A Contractor that participates in the repayment of a particular reach, or segment of the SWP, has already paid the costs of using that reach for the conveyance of water supplies through the Transportation Charge. On average, Metropolitan pays approximately 63 percent of the total transportation costs, both capital and OMP&R, of the SWP.

Conveyance and Aqueduct: CRA

The CRA has also transformed from being mainly a "supply" source to a provider of delivery service. Specifically, Metropolitan uses the CRA to:

- transport water made available as a result of cooperative programs implemented through agreements with other water agencies, either in the year made available or in a subsequent year as intentionally-created surplus from Lake Mead storage to its service area;
- recharge water in a groundwater basin so that it can subsequently plan to recover it for delivery to Metropolitan's service area; and
- exchange water with and deliver water in advance to other water agencies.

When Metropolitan conveys water made available as a result of cooperative programs implemented through agreements with other water agencies, to recharge water and subsequently recover it, or to exchange water with or deliver water in advance to other agencies, it is by definition using the CRA as a transportation facility. The ability to convey such water through the CRA facilities enhances Metropolitan's operational flexibility and contributes to regional system reliability for the benefit of all member agencies. Metropolitan's total calendar year CRA water management activities from 2010 through 2014 are shown in Table 13.

Table 13: CRA Water Management Activities in Acre-Feet, CY 2010 through 2014

CRA Water Management Activities--Acre-Feet

	(a)	(b)	(c)	(d)	(e)	(f)	(g) = (a) / (f)	= ((f) - (a)) / (f)
	Priority 4 & 5	IID/MWD	PVID	Other, including Storage (to)/from	MWD Exchange w SDCWA	Total Net Diversions	Priority 4 & 5 to Total	Non Priority 4 and 5 to Total
2010	815,525	97,000	148,600	(113,571)	151,507	1,099,061	74.2%	25.8%
2011	485,178	99,940	122,200	(151,571)	143,243	698,990	69.4%	30.6%
2012	467,166	93,677	73,700	(85,285)	186,861	736,119	63.5%	36.5%
2013	545,087	98,307	32,750	156,315	180,256	1,012,715	53.8%	46.2%
2014	484,937	84,305	43,010	383,959	180,123	1,176,334	41.2%	58.8%
Total	2,797,893	473,229	420,260	189,847	841,990	4,723,219	59.2%	40.8%

(a) Use by holders of Indian Miscellaneous present perfected rights and use by holders of Priorities 1, 2, and 3b above 420,000 acre-feet absent the Metropolitan-PVID Land Management, Crop Rotation, and Water Supply Program have been deducted from the Priority 4 supply of 550,000 acre-feet.

In the 5 calendar years ending 2014, approximately 59 percent of the CRA diversions to Metropolitan represent Metropolitan's entitlements under the Seven Party Agreement system. The remaining 41 percent represents volumes of Colorado River water moved through other programs. Metropolitan periodically transports water for Tijuana, Mexico through the CRA. Recent amounts are 5,482 acre-feet in calendar year 2008, 5,152 acre-feet in calendar year 2009, and 102 acre-feet in calendar year 2012.

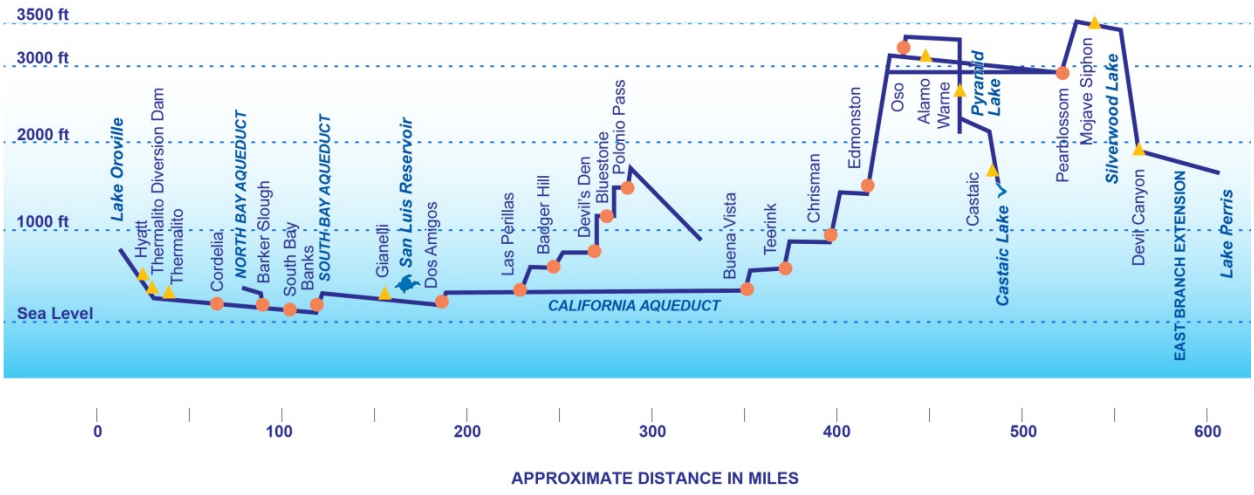
With regard to use as a transportation facility, the CRA differs from the SWP's California Aqueduct in that the capacity of the CRA is uniform through its entire length. The CRA was designed to move a relatively uniform volume of water through its entire length, and Metropolitan relies on the entire length to move water. There are no "reaches", or segments of the aqueduct, that are associated with deliveries to take-out points. The 4 regulating reservoirs are small, so water cannot be "batched" like the SWP, where pumps are cycled on and off to take advantage of cheaper time periods of the day to use electricity. Unlike the SWP, each CRA pump is uniformly sized at 225 cfs; none are variable speed pumps. This means the pumps are either operating at 225 cfs of capacity or are off at 0 cfs.

The costs of the CRA itself are paid by Metropolitan directly, as it operates the CRA. Metropolitan incurs capital and operations and maintenance expenditures to support the CRA activities. The costs of the CRA activities include labor, materials and supplies, outside services to provide repair and maintenance, and professional services. The CRA activities benefit from Water System Operations support services and management supervision, as well as Administrative and General activities of Metropolitan. Metropolitan finances past, current and future capital improvements on the CRA, and capitalizes those improvements as assets. The costs of Metropolitan's capital financing activities are apportioned to service functions, such as the CRA. Over the next 5 years, approximately 17 percent of the CIP is for CRA capital projects.

Conveyance and Aqueduct: SWP Power

In addition to the charges for supply (the Delta Water Charge capital and OMP&R) and Transportation (Transportation Capital and OMP&R), DWR also charges for the power needed to deliver project water throughout the system. Two charges recover these power costs: the variable OPMR portion of the Transportation Charge (Variable Charge) and the Off Aqueduct Power Facilities (OAPF) charge. Because the State Water Contracts are cost recovery contracts, DWR invoices Contractors on an estimated basis for any calendar year, and then provides credits in later years once cost true-ups are finished.

Figure 14: Pumping Lift and Recovery Generation Facilities, SWP



The Variable Charge includes the annually estimated cost of purchased power including capacity and energy, cost of SWP power generation facilities, program costs to offset annual fish losses at the Banks Pumping Plant, purchased transmission services, and credits for sales of ancillary services and excess SWP system power

sales. The various lifts and recovery generation facilities of the SWP are shown in Figure 14; the orange circles indicate pumps to lift water, and the yellow triangles indicate recovery generation facilities.

The Variable Charge is calculated on the basis of the energy required to pump an acre-foot of water to its take-out point multiplied by the system energy rate, less energy from the recovery generation plants. The system energy rate is a system-wide average rate calculated as the net cost of energy--total costs less revenues--divided by the net energy required to pump all water. That rate is applied to each acre-foot of water delivered to SWP customer based on the power required to pump the water to designated delivery points on the system. DWR can adjust the system energy rate as the calendar year progresses in order to reflect actual costs.

The OAPF charge recovers the debt service and environmental remediation costs of power generation facilities not on the aqueduct, namely Reid Gardner Unit 4 and debt service associated with the South Geysers and Bottle Rock geothermal plants. The OAPF rate is calculated as the total annual estimated costs divided by the total energy required to pump all water. Recovery energy is not considered in this calculation. Each Contractor's charge is the OAPF rate times the energy required to pump the Contractor's water order.

The SWP uses low-cost hydroelectric and recovery generation resources, but they only provide about 50 percent of the SWP energy needs in an average water year. The SWP relies on the wholesale market and contractual resources with exposure to market price volatility for as much as 30 to 35 percent of its needs, using other contractual resources to fill in the difference.

The SWP energy required to move water to Metropolitan is related to the transportation on the East Branch through Devil Canyon and on the West Branch through Castaic. Because Metropolitan moves the largest amount of water on the SWP and Metropolitan's delivery points on the East and West Branch are at or near the southern extreme of the SWP, Metropolitan pays approximately 70 percent of the SWP power costs. The cost of power per acre-foot to Metropolitan's delivery points on the East and West Branches are shown in Table 14.

Table 14: Cost of SWP Power for Metropolitan Terminal Delivery Points, $ per Acre-Foot

	CY 2011	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016 Initial
East Branch	$197.34	$224.27	$230.27	$280.07	$241.16	$267.57
West Branch	$170.79	$210.93	$215.61	270.03	$226.58	$257.02

The SWP energy costs are impacted by the energy policies of the state of California. The SWP is acquiring renewable resources, primarily solar to date, to meet its obligation to reduce greenhouse gas emissions. The SWP energy costs are also impacted by the increasing cost of using the California Independent System Operator's (CAISO) grid to deliver power from its generating sources and the wholesale power market to its pumping loads. The SWP does not own high voltage transmission facilities and must use the CAISO grid to move power; the SWP is the largest payer of the CAISO transmission access rates. Finally, the SWP has an obligation to acquire and surrender emissions allowances for the generating facilities the SWP owns, primarily the Lodi Energy Center.

Conveyance and Aqueduct: CRA Power

Metropolitan operates five pumping plants on the CRA, which are shown in Figure 15.

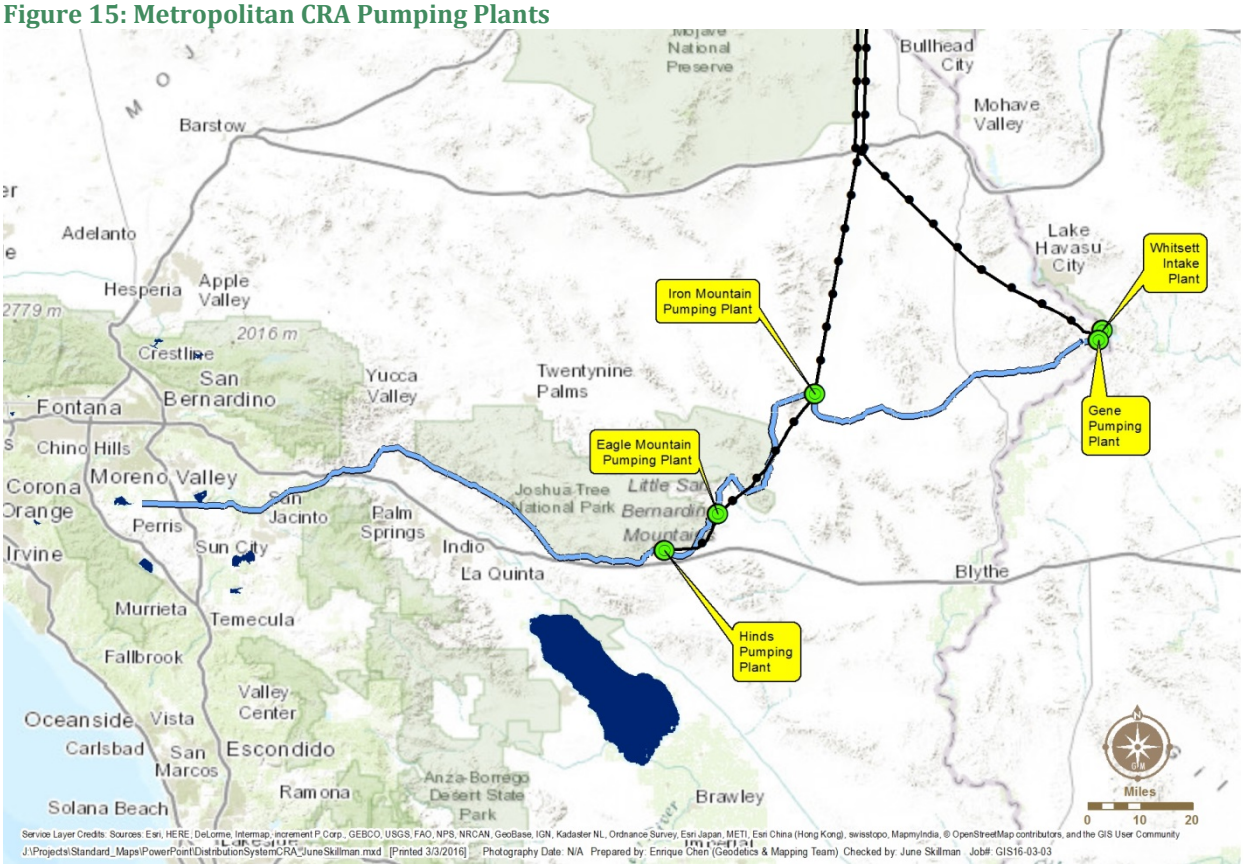
Water enters the aqueduct system from Lake Havasu at the Whitsett Intake Pumping Plant (Intake). It is then pumped to its highest elevation of 1,807 feet above sea level at the Hinds Pumping Plant (Hinds), which is about 126 miles west of Intake. Five pumping plants lift the water a total of 1,617 feet to the Hinds Pumping Plant. From Hinds, the water flows 116 miles by gravity to Lake Mathews.

Metropolitan currently has four basic sources of power available to meet CRA energy requirements: Hoover Power, Parker Power, Benefit Energy from Southern California Edison (SCE), and wholesale purchases from entities in the Western United States.

Under a contract between the United States, Department of Energy, Western Area Power Administration, and Metropolitan, Metropolitan currently has a right to an annual firm energy entitlement of 1,291,000 megawatt-hours (MWh) generated at the Hoover Dam power plant. This contract expires in 2017; a follow-on contract is in the process of negotiations. The cost charged to Metropolitan for Hoover power is based on the revenue required by the Bureau of Reclamation to operate and maintain the power plant. This source of power has historically been at a lower cost than power purchased at market rates.

Metropolitan funded the total cost of construction of Parker Dam and incidental facilities, and 50 percent of the construction cost of the Parker Power plant. In consideration for this funding, Metropolitan is entitled in perpetuity to 50 percent of the capacity and energy of the four Parker generating units, which is approximately 54 MW of capacity. Parker power is also cost-based.

Figure 15: Metropolitan CRA Pumping Plants



Metropolitan has a Service and Interchange Agreement (SCE Agreement) with SCE that provides services and benefits to both parties. The SCE Agreement expires in 2017. Under the SCE Agreement, SCE can dispatch Metropolitan's Hoover Dam and Parker Dam power entitlements and utilize excess transmission capacity on Metropolitan's CRA transmission system. SCE in return must meet Metropolitan's CRA energy and reliability requirements on a continuous basis. SCE must also provide Benefit Energy.

Benefit Energy is the energy SCE provides to Metropolitan in consideration of the benefits SCE receives under the SCE Agreement. There is no charge for this energy. The amount of Benefit Energy available annually depends on the amount of water diverted through the CRA, and thereby the amount of energy used. Because SCE is obligated to meet the energy and reliability requirements of the CRA, SCE benefits if the CRA is not

operating at full capacity. The relationship between the amount of Benefit Energy provided and pumping load is inverse: the more Metropolitan pumps, the less Benefit Energy SCE provides. Therefore, under a high diversion scenario, Metropolitan receives slightly less Benefit Energy to meet pumping loads than would be realized under a lower diversion scenario. The minimum amount of Benefit Energy provided annually by SCE is 200,000 MWh. The SCE Agreement sets maximum and minimum amounts of Benefit Energy that can be allocated monthly. Benefit Energy can only be used to meet off-peak energy requirements. A follow-on contract to the SCE Agreement is in the process of negotiations.

Metropolitan's current basic energy resource mix is very cost effective but is not sufficient to pump Metropolitan's Colorado River water supplies in all years. The current energy resource mix is sufficient to pump approximately 600 thousand-acre-feet (TAF) to 750 TAF of Colorado River water through the length of the CRA annually. For that reason, Metropolitan is required to purchase supplemental power to transport Colorado River water supplies in some years.

Metropolitan requires any party seeking to wheel non-Metropolitan water through its CRA to purchase, or arrange for Metropolitan to purchase, the power supplies required to pump that water. The additional pumping reduces the amount of Benefit Energy available to Metropolitan under the SCE Agreement. To compensate for this loss of Benefit Energy to Metropolitan, an additional 317 kilowatt-hours per acre-foot of water pumped must be provided to Metropolitan. Furthermore, any Colorado River water that is pumped through Metropolitan's CRA is diverted above Parker Dam and cannot generate energy for Metropolitan's use at the Parker Dam Power plant. To compensate for this loss, an additional 32 kilowatt-hours per acre-foot are required to make Metropolitan whole for undertaking to pump non-Metropolitan water through the CRA that would otherwise have flowed through the Parker Power plant. In total, 2,349 kilowatt-hours (or 2.349 MWh) of energy must be provided to Metropolitan to convey each acre-foot of non-Metropolitan water supplies through the CRA.

Supplemental power can be purchased to pump non-Metropolitan water through the CRA. The market rate for electric energy prices is regularly tracked and published for various regions in California. Metropolitan uses the Platt's Market Report index and the California Independent System Operator (CAISO) Open Access Same-time Information System (OASIS) Day Ahead Locational Marginal Price as reflective of the supplemental power costs for electric energy used for its pumping plants on the CRA. The regional index applicable to energy sold for use on the CRA is designated as "South-of-Path 15", or SP15.

Any party seeking to pump non-Metropolitan water through the CRA would have to purchase, or arrange for Metropolitan to purchase on its behalf, supplemental power. The market costs for purchases of power for the CRA are reflected in the SP15 index published by Platt's Market Report or the CAISO OASIS Day Ahead Locational Marginal Price. Because Metropolitan utilizes the pumping capacity on the CRA for its own water supplies during off-peak hours to minimize its costs, the pumping of non-Metropolitan wheeled water would occur during on-peak hours and the on-peak price index published in Platt's Market Report or the CAISO OASIS Day Ahead Locational Marginal Price is indicative of the price that would be paid to pump non-Metropolitan water.

Table 15: Cost of CRA Power Sources, $ per Megawatt-hour (MWh)

	FY 2010/11	FY 2011/12	FY 2012/13	FY 2013/14	FY 2014/15
Hoover[1]	$16.81	$17.26	$18.60	$29.74	$15.84
Parker[1]	$20.13	$17.27	$9.33	$12.41	$13.55
SP15, off-peak[2]	$23.73	$23.44	$33.15	$40.24	$33.15
SP15, on-peak[3]	$37.53	$33.45	$45.38	$50.90	$40.68

[1]Information from Annual Reports for years 2011, 2012, 2013, 2014, and 2015

[2]SP15, off-peak is used to determine the market value of Benefit Energy. Benefit Energy is available to Metropolitan for use only during off-peak hours. Thus, to the extent Benefit Energy is not available to meet Metropolitan's off-peak energy needs, Metropolitan must purchase off-peak power.

[3]SP15, on-peak is used to determine the market value of Metropolitan sales of excess energy, if any. SP15, on-peak is also used to determine the pumping costs associated with pumping non-Metropolitan water.

Metropolitan from time to time sells excess energy into the wholesale market and realizes revenues, which offset the total cost of energy as reflected in the System Power Rate. If Metropolitan were to deliver additional water through the CRA, these sales become a lost opportunity. The on-peak price index published in Platt's Market Report or the CAISO OASIS Day Ahead Locational Marginal Price is indicative of the price that Metropolitan could realize by selling excess energy.

Table 16: South-of-Path 15 On-Peak Energy Prices

	CY 2011	CY 2012	CY 2013	CY 2014	CY 2015
January	$ 37.13	$ 28.73	$ 46.15	$ 49.53	$ 35.70
February	$ 38.13	$ 29.05	$ 46.45	$ 71.85	$ 31.88
March	$ 32.72	$ 24.85	$ 51.39	$ 52.06	$ 30.73
April	$ 36.01	$ 29.33	$ 56.34	$ 51.19	$ 29.03
May	$ 34.91	$ 31.36	$ 51.49	$ 51.85	$ 28.11
June	$ 36.98	$ 31.43	$ 47.77	$ 50.90	$ 37.01
July	$ 41.20	$ 36.46	$ 51.74	$ 53.18	$ 39.27
August	$ 42.25	$ 44.32	$ 45.44	$ 50.47	$ 39.02
September	$ 41.53	$ 41.99	$ 48.91	$ 51.49	$ 38.00
October	$ 34.78	$ 42.81	$ 42.82	$ 49.06	$ 35.55
November	$ 34.49	$ 39.84	$ 44.13	$ 49.28	$ 30.22
December	$ 32.59	$ 38.77	$ 52.14	$ 41.80	$ 29.83

MWh = megawatt-hour, or 1,000 kilowatt-hours

As key contracts expire in 2017, namely Hoover and the SCE Agreement, Metropolitan's resource mix and costs will likely change. Metropolitan has an obligation to acquire and surrender emissions allowances for the energy generated out-of-state and imported into California. As these factors continue to develop, Metropolitan may face increased exposure to both on- and off-peak wholesale energy prices

Storage

Storage costs include the capital financing, operating, maintenance, and overhead costs for Diamond Valley Lake, Lake Mathews, Lake Skinner, and five smaller regulatory reservoirs within the Distribution System. Metropolitan's larger storage facilities are operated to provide: (1) emergency storage in the event of an earthquake or similar system outage; (2) drought storage that produces additional supplies during times of shortage; and (3) regulatory storage to balance system demands and supplies and provide for operating flexibility. To reasonably allocate the costs of storage capacity among member agencies, the storage function is categorized into sub-functions of emergency, drought, and regulatory storage.

Table 17: Functional Allocation of Metropolitan Storage Facilities

Storage Facilities	Functional Allocations		
	Emergency	Drought	Regulatory
Diamond Valley Lake	50%	45%	5%
Other Regulatory			100%
Lake Skinner	77%		23%
Lake Mathews	44%		56%
Semi-Tropic		100%	
Arvin-Edison		100%	
CRA Off-Stream		100%	
Groundwater Conjunctive Use		100%	

(a) DVL allocations are based on modeled changes in year-end reservoir levels (2004-2009) as relative to capacity and emergency storage criteria

(b) Lake Skinner and Lake Matthews allocation percentages are derived from Southern California's Integrated Water Resources Plan, March 1996, Volume 2 "Metropolitan's System Overview", Section 4, p. 10, Table 4-3.

Treatment

This function includes capital financing, operating, maintenance, and overhead costs for Metropolitan's five treatment plants and is considered separately from other costs so that the treatment function may be priced separately.

Distribution

This function includes capital financing, operating, maintenance, and overhead costs for the Distribution System of feeders, canals, pipelines, laterals, and other appurtenant works. The Distribution System facilities are distinguished from Conveyance and Aqueduct facilities at the point of connection to the SWP, Lake Mathews (CRA), and other major turnouts along the CRA facilities. Examples include the Rialto Pipeline; the Etiwanda Pipeline; the Foothill Feeder; the Sepulveda Feeder; the Santa Monica Feeder; the Upper, Middle, and Lower Feeders; and the San Diego Pipelines No.1, No. 2, No. 3, No. 4, and No. 5.

Demand Management

A separate demand management service function has been used to clearly identify the cost of Metropolitan's incentives in local resources like conservation, recycling, and desalination.

Metropolitan increased the emphasis on Demand Management programs after the devastating drought of the early 1990's. Metropolitan's 1996 Integrated Resources Plan identified the Preferred Resource Mix as the resource plan that achieved the region's reliability goal of providing the full capability to meet all retail-level demands during foreseeable hydrologic events, represented the least-cost sustainable resources plan, met the region's water quality objectives, was balanced and diversified and minimized risks, and was flexible, allowing for adjustments should future conditions change.

The Preferred Resource Mix included locally developed water supplies and conservation, and recognized that regional participation was important to achieve their development. Additional imported supplies frequently have relatively lower development costs, but can create a large cost commitment for regional infrastructure to transport and store those imported supplies. On the other hand, local projects, like those designed to recycle water or increase groundwater production, may have higher development costs but require little or no additional infrastructure to distribute water supplies to customers. This trade-off between relatively lower-cost imported supplies requiring large regional infrastructure investments and relatively higher-cost local supply development requiring less additional local infrastructure was an important consideration in the development of the Preferred Resource Mix. A strategy of aggressively investing in imported water supply would lead to higher costs for the region because of the larger investments required in infrastructure.

Demand Management Programs decrease and avoid operating and capital maintenance and improvement costs, such as costs for repair of and construction of additional or expanded water conveyance, distribution, and storage facilities. Investments in demand side management programs like conservation, water recycling, and groundwater recovery help defer the need for additional conveyance, distribution, and storage facilities. The programs also free up capacity in Metropolitan's system to convey both Metropolitan water, and water from other non-Metropolitan sources.

Metropolitan's 1996 Integrated Resource Plan included an analysis of future demand scenarios and their effect on infrastructure requirements. A comparison of capital infrastructure costs with and without Demand Management Programs showed a difference of around $2 billion. In other words, the ability to meet demand through local Demand Management Programs resulted in an anticipated $2 billion in capital cost savings. A sensitivity analysis further showed that a 5% increase or decrease in demand had a correlative effect on when Metropolitan would need to incur capital infrastructure costs. Since then, Metropolitan has seen the benefits materialize. Metropolitan has been able to defer the need to build additional infrastructure such as the Central Pool Augmentation Project tunnel and pipeline, completion of San Diego Pipeline No. 6, the West Valley Interconnection, and the completion of the SWP East Branch expansion. Overall, the decrease in demand resulting from these projects is estimated to defer the need for projects between four and twenty-five years at a savings of approximately $2.8 billion in 2015 dollars.

Since 1996, the Integrated Resources Plan has been updated three times, in 2004, 2010, and 2015, reaffirming long-term sustainability of the region's water supply through implementation of conservation and local resource development.

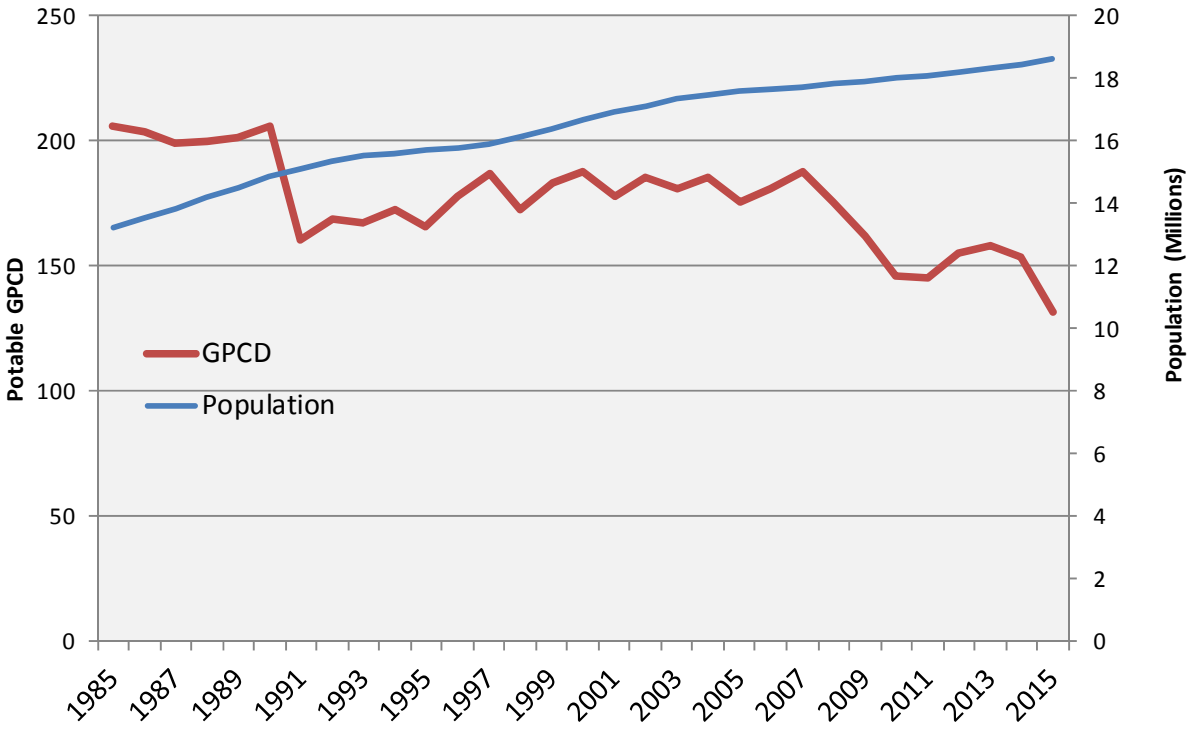
Demand management is an important part of Metropolitan's resource management efforts. Metropolitan's incentives in these areas contribute to savings for all users of the system in terms of lower capital costs that would otherwise have been required to expand and maintain the system.

Demand Management: SB-60

In September 1999, Governor Gray Davis signed SB 60 (Hayden) into law. SB 60 amended the Metropolitan Water District Act to direct Metropolitan to increase "sustainable, environmentally sound, and cost-effective water conservation, recycling, and groundwater storage and replenishment measures." SB 60 also requires Metropolitan to hold an annual public hearing to review its urban water management plan for adequacy in achieving an increased emphasis on cost-effective conservation and local water resource development, and to invite knowledgeable persons from the water conservation and sustainability fields to these hearings. Finally, Metropolitan is required to annually prepare and submit to the Legislature a report on it progress in achieving the goals of SB 60. SB 60 specifically indicated that no reimbursement was required by legislation because Metropolitan, as a local agency, has the authority to levy service charges, fees or assessments sufficient to pay for the program or level of service mandated by SB 60. No other water utility in California, public or private, has been specifically identified by the state Legislature and directed to pursue water conservation and local water resource development.

In fiscal year 2014/15 alone, Metropolitan's service area achieved 1.5 million acre-feet of water savings from conservation, recycled water and groundwater recovery programs. Figure 16 below compares population in millions on the right axis and gallons per capita daily (GPCD) water is on the left axis. While the population has increased to approximately 18.5 million, GPCD water use has decreased to approximately 125 GPCD. These reductions derived from programs for which Metropolitan paid incentives, as well as code-based conservation achieved through legislation, building and plumbing codes and ordinances, and reduced consumption resulting from changes in water pricing. Cumulatively, since 1990 Metropolitan has invested almost $1 billion and Metropolitan's service area has achieved 17.9 million acre-feet of water savings. These water savings reduce per capita water demands, allowing Metropolitan to serve a growing population with existing supplies and without constructing additional facilities for imported water.

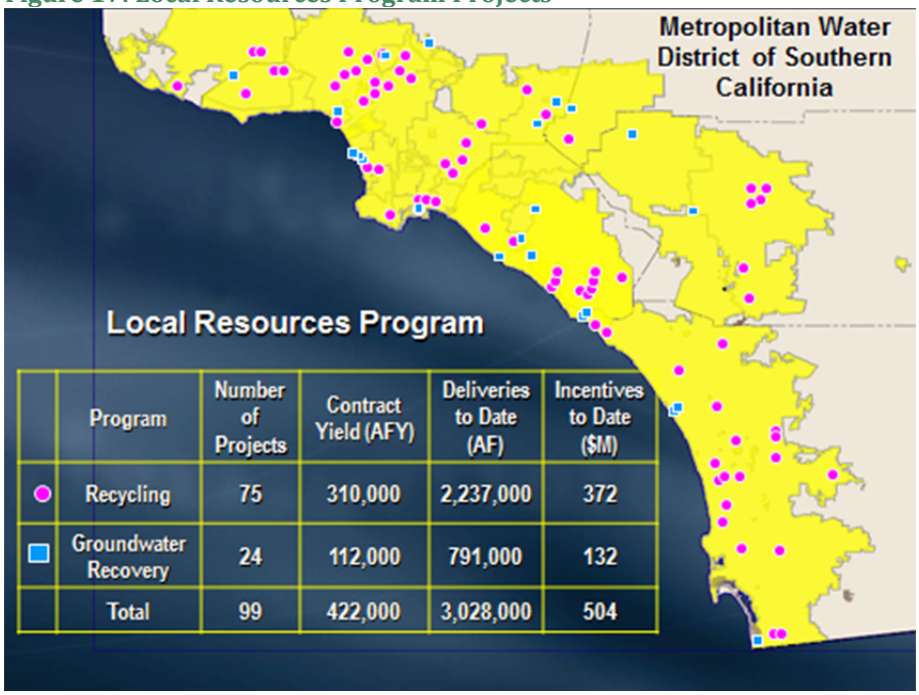
Figure 16: Population and Per Capita Daily Water Use



Metropolitan's Conservation Credits Program provides incentives to residents and businesses for use of water-efficient products and qualified water-saving activities. Rebates have been provided to residential customers for turf removal and purchasing of high-efficiency clothes washers and toilets. Rebates are also provided to businesses and institutions for water-saving devices. In fiscal year 2014/15, the Conservation Credits Program achieved 944,000 acre-feet of saved water through new and existing conservation initiatives funded with incentives and maintained through plumbing codes. Cumulatively, through fiscal year 2014/15 the Conservation Credits Program has achieved over 2.2 million acre-feet of water savings.

Metropolitan provides financial incentives through its Local Resources Program for the development and use of recycled water and recovered groundwater for the participants. The Local Resources Program consists of 75 recycling projects and 24 groundwater recovery projects located throughout Metropolitan's service area, of which 85 projects are in operation, as shown in Figure 17. From the Local Resources Program's inception in 1982 through FY 2014/15, Metropolitan has paid out about $372 million in incentives to produce about 2.2 million acre-feet of recycled water. Metropolitan also provided approximately $132 million to produce 791,000 acre-feet of recovered degraded groundwater for municipal use.

Figure 17: Local Resources Program Projects



	Program	Number of Projects	Contract Yield (AFY)	Deliveries to Date (AF)	Incentives to Date ($M)
●	Recycling	75	310,000	2,237,000	372
■	Groundwater Recovery	24	112,000	791,000	132
	Total	99	422,000	3,028,000	504

Demand Management: SB X7-7

SB X7-7 mandated a new requirement to lower urban per capita water use 20 percent by December 31, 2020. Enacted by the state Legislature and signed into law by Governor Schwarzenegger as part of a historic package of water reforms in November 2009, the "20x2020" plan gave local communities flexibility in meeting this target while accounting for previous efforts in conservation and recycling. The Legislature found that reducing water use through conservation and regional water resources management would result in protecting and restoring fish and wildlife habitats, reducing dependence on water through the Delta, and providing significant energy and environmental benefits. Metropolitan coordinates closely with its member agencies to achieve these targets both at a retail agency level in compliance with legislative requirements, and as a region in achieving a true 20 percent reduction in per-capita water use.

Metropolitan provides incentives under both the Conservation Credits Program and the Local Resources Program. The incentives developed were based on the benefits of the programs. The financial benefits of these programs to Metropolitan continue to be the reduction in capital investments due to a deferral and/or downsizing of *regional* infrastructure to import water, and the reduction in Operations and Maintenance expenditures needed to distribute, store and treat imported water. These benefits occur year-round regardless of hydrologic conditions because once a large capital project is deferred, the savings are permanent. Additional benefits of local water management programs are realized during droughts or emergencies when imported supplies are scarcer. The greatest economic benefit associated with developing local resources is the downsizing of Metropolitan's regional capital investment plan needed to deliver additional imported water to member agencies.

Projects that have been deferred or downsized due to the conservation and local resource development include the Central Pool Augmentation Project tunnel and pipeline, completion of San Diego Pipeline No. 6, the West Valley Interconnection, and the completion of the SWP East Branch expansion.

The incentives must be adequate to cause member agencies to construct local resource development. The Local Resources Program was conceived in 1982. The easiest, most cost-effective projects have already been

implemented. Future projects are more difficult to site and are more costly to develop. Member agencies have indicated that cost is the predominant constraint and that financial assistance is needed, especially in early years. In 2014, the Metropolitan Board increased the Local Resources Program incentives to account for the impact of inflation and the increase in the average unit cost of projects since the Local Resources Program was approved.

Administrative and General (A&G)

These costs occur in each of the Groups' departmental budgets and reflect overhead costs that cannot be directly functionalized. The COS process allocates A&G costs to the service functions based on the labor costs of non-A&G dollars allocated to each function.

Hydroelectric

Hydroelectric costs include the capital financing, operating, maintenance, and overhead costs incurred to operate the 16 small hydroelectric plants located throughout the water distribution system.

Functional Assignment Bases

The functional assignment bases are used to assign costs that make up the Revenue Requirement into the various service functions. The primary functional assignment bases used in the cost-of-service process are listed below.

- Direct assignment
- Net Book Value plus Work-In-Progress
- Prorating in proportion to other allocations
- Manager analysis
- Prior year results

Schedule 3 summarizes the total dollar amounts assigned, including the absolute value of Revenue Offsets (rather than showing Revenue Offsets as a reduction to costs), using each of the above types of assignment bases, for FY 2016/17 and FY 2017/18. It assigns both total Revenue Requirements before Revenue Offsets and Revenue Offsets by summing the items before assigning dollars to the primary functional assignment bases.

To ensure the correct amount has been assigned, the Revenue Requirement is restated at the bottom portion of each fiscal year chart.

Schedule 3: Summary of Functional Assignments by Type of Assignment Basis, FY 2016/17 and FY 2017/18

Primary Functional Assignment Bases		Estimated for FY 2017	% of Assigned Dollars
Direct Assignment	$	1,101,685,506	59.5%
Net Book Value/Work in Progress		491,757,203	26.5%
Prorating		70,234,689	3.8%
Manager Analysis		33,342,998	1.8%
Prior-Year Results		77,028,144	4.2%
Other		78,687,589	4.2%
Total Dollars Allocated	**$**	**1,852,736,129**	**100.0%**
Portion of Above Assignment Relating to:			
Revenue Requirements before Offsets		1,713,882,976	
Revenue Offsets		138,853,153	
Total Dollars Assigned	**$**	**1,852,736,129**	
Net Revenue Requirements			
Revenue Requirements before Offsets		1,713,882,976	
Revenue Offsets		(138,853,153)	
Net Revenue Requirements	**$**	**1,575,029,822**	

Totals may not foot due to rounding

Primary Functional Assignment Bases		Estimated for FY 2018	% of Assigned Dollars
Direct Assignment	$	1,100,005,274	58.9%
Net Book Value/Work in Progress		503,990,274	27.0%
Prorating		69,491,964	3.7%
Manager Analysis		33,726,719	1.8%
Prior-Year Results		78,171,238	4.2%
Other		81,726,492	4.4%
Total Dollars Allocated	**$**	**1,867,111,961**	**100.0%**
Portion of Above Assignment Relating to:			
Revenue Requirements before Offsets		1,720,713,740	
Revenue Offsets		146,398,220	
Total Dollars Assigned	**$**	**1,867,111,961**	
Net Revenue Requirements			
Revenue Requirements before Offsets		1,720,713,740	
Revenue Offsets		(146,398,220)	
Net Revenue Requirements	**$**	**1,574,315,520**	

Totals may not foot due to rounding

Each of the primary assignment bases is discussed in detail in the remainder of this section. Discussion of each assignment basis includes examples of costs assigned using that particular basis.

(a) Direct assignment

Direct assignment makes use of a clear and direct connection between a revenue requirement and the function being served by that revenue requirement. Directly assigned costs typically include: costs associated with specific treatment plants; purely administrative costs; and certain distribution and conveyance departmental costs. Examples of costs that are directly assigned to specific functional categories are given below.

- Water System Operations Group departmental costs for treatment plants are directly assigned to treatment.
- Transportation Capital and OMP&R charges for State Water Contract are directly assigned to conveyance SWP.

(b) Net Book Value Plus Work-In-Progress

Capital financing costs, including debt service and funding replacements and refurbishments from operating revenues, comprise about 28 percent in FY 2016/17 and 29 percent in FY 2017/18 of Metropolitan's annual revenue requirements. One approach would be to assign payments on each debt issue in direct proportion to specific project expenditures made using bond proceeds and assign PAYGo expenditures in a similar fashion. But, this approach would result in a high degree of volatility in relative capital cost assignments from year to year.

The approach used in this analysis is one widely used in water industry cost of service studies. Capital and debt-related costs PAYGo are allocated on the basis of the net book values of fixed assets plus work in progress for assets under construction within each functional category. This approach produces capital cost assignments that are consistent with the functional distribution of assets. Also, since the assignment basis is tied to fixed asset records rather than debt payment records, the resulting assignments are more reflective of the true useful lives of assets. Use of net book values as an assignment basis provides an improved matching of functional costs with asset lives. A listing of fixed asset net book values summarized by asset function is shown in Schedule 4 for FY 2016/17 and FY 2017/18.

Schedule 4: Net Book Value and Work in Progress Assignment Base, FY 2016/17 and FY 2017/18

Functional Categories	NBV for FY 2017	% of Total NBV
Source of Supply	$ 26,837,790	0.3%
Conveyance & Aqueduct	1,718,481,988	21.1%
Storage	2,005,190,993	24.7%
Treatment	2,541,457,418	31.3%
Distribution	1,399,091,907	17.2%
Administrative & General	323,680,017	4.0%
Hydroelectric	117,923,624	1.5%
Total Fixed Assets Net Book Value	**$ 8,132,663,738**	**100.0%**

Totals may not foot due to rounding

Functional Categories	NBV for FY 2018	% of Total NBV
Source of Supply	$ 26,956,288	0.3%
Conveyance & Aqueduct	1,721,625,421	21.1%
Storage	1,974,847,640	24.2%
Treatment	2,542,059,665	31.1%
Distribution	1,468,515,134	18.0%
Administrative & General	321,024,887	3.9%
Hydroelectric	113,543,153	1.4%
Total Fixed Assets Net Book Value	**$ 8,168,572,190**	**100.0%**

Totals may not foot due to rounding

In most instances, the cost-of-service process uses net book value plus work-in-progress to develop assignment bases for debt and capital costs. Examples of revenue requirements assignments using these net book value and work-in-progress assignments follow.

- Revenue Bond Debt Service: assigned using Net Book Value plus Work In Progress.
- Annual deposit of operating revenue to replacement and refurbishment fund: assigned using Net Book Value plus Work In Progress.

To calculate the relative percentage of fixed assets in each functional category, Metropolitan staff conducted a detailed analysis of historical accounting records and built a database of fixed asset accounts that contains records for all facilities currently in service and under construction. Each facility was sorted into the major service function that best represented the facilities primary purpose and was then further categorized into the appropriate sub-functions described earlier.

(c) Pro-rating in proportion to other assignments

Utility COS studies frequently contain line items for which it would be difficult to identify an assignment basis specific to that line item. In these cases, the most logical assignment basis is often a pro-rata blend of assignment results calculated for other revenue requirements in the same departmental group, or general category. Reasonable pro-rata allocations are based on a logical nexus between a cost and the purpose which it serves. For example: Human Resources Section costs are allocated using all labor costs, since Human Resources spends its time and resources attending to the labor force.

(d) Manager analyses

The functional interrelationships of some organizational units are developed with extensive input from the organization's managers. In these cases, managers use their firsthand knowledge of the organization's internal operations to generate a functional analysis of departmental costs. For example, Fleet Services Unit costs are assigned to treatment, storage, conveyance, and distribution based on vehicle count by location.

(e) Prior year results

If available, accounting data for the prior fiscal year by appropriation are used to functionalize Departmental O&M costs for several units or sections. Many of the appropriations parallel the service functions used in the COS. For example, Conveyance and Distribution Section costs are assigned to distribution, hydroelectric, and conveyance functions based on the prior year accounting data by appropriation.

A summary of the functional assignment results is shown in Schedules 5 through 8. Schedules 5 and 6 provide a breakdown of the revenue requirement for FY 2016/17 and FY 2017/18, respectively, into the major service functions and sub-functions prior to the redistribution of administrative and general costs. Schedules 7 and 8 serve as a cross-reference summarizing how the budget line items are distributed among the service functions for FY 2016/17 and FY 2017/18, respectively. The largest functional component of Metropolitan's revenue requirement is the Conveyance and Aqueduct function, which constitutes approximately 36 percent of the assigned revenue requirement in FY 2016/17 and 38 percent in FY 2017/18. Schedule 9 summarizes the budget line items distributed among the service functions by sub-function for both FY 2016/17 and FY 2017/18.

Schedule 5: Revenue Requirement (by function), FY 2016/17

Functional Categories	Fiscal Year Ending 2017	% of Assigned Dollars (1)
Source of Supply		
CRA	$ 59,158,087	3.7%
SWP	151,268,474	9.5%
Other Supply	16,575,328	1.0%
Total	**227,001,889**	**14.3%**
Conveyance & Aqueduct		
CRA		
CRA Power (net of sales)	57,409,334	3.6%
CRA All Other	48,398,382	3.1%
SWP		
SWP Power	156,238,002	9.9%
SWP All Other	229,643,078	14.5%
Other Conveyance & Aqueduct	81,077,617	5.1%
Total	**572,766,412**	**36.2%**
Storage		
Storage Costs Other Than Power		
Emergency	57,458,007	3.6%
Drought	48,158,095	3.0%
Regulatory	16,529,265	1.0%
Wadsworth plant pumping/generation	(542,600)	0.0%
Total	**121,602,768**	**7.7%**
Treatment		
Jensen	47,324,980	3.0%
Weymouth	50,550,130	3.2%
Diemer	55,062,596	3.5%
Mills	28,346,951	1.8%
Skinner	55,251,424	3.5%
Total	**236,536,081**	**14.9%**
Distribution	158,960,785	10.0%
Demand Management	79,046,520	5.0%
Hydroelectric	(4,052,964)	0.3%
Administrative & General	183,168,331	11.6%
Total Functional Assignment:	**$ 1,575,029,822**	**100.0%**

(1) Given as a percentage of the absolute values of total dollars Assigned.
Totals may not foot due to rounding

Schedule 6: Revenue Requirement (by function), FY 2017/18

Functional Categories	Fiscal Year Ending 2018	% of Assigned Dollars (1)
Source of Supply		
CRA	$ 59,365,455	3.7%
SWP	154,376,944	9.7%
Other Supply	16,830,737	1.1%
Total	**230,573,135**	**14.5%**
Conveyance & Aqueduct		
CRA		
CRA Power (net of sales)	62,979,105	4.0%
CRA All Other	49,868,619	3.1%
SWP		
SWP Power	160,918,681	10.1%
SWP All Other	235,725,928	14.8%
Other Conveyance & Aqueduct	82,293,001	5.2%
Total	**591,785,334**	**37.2%**
Storage		
Storage Costs Other Than Power		
Emergency	58,299,540	3.7%
Drought	48,867,269	3.1%
Regulatory	16,727,132	1.1%
Wadsworth plant pumping/generation	(568,925)	0.0%
Total	**123,325,016**	**7.8%**
Treatment		
Jensen	48,160,664	3.0%
Weymouth	53,513,910	3.4%
Diemer	55,934,669	3.5%
Mills	28,941,284	1.8%
Skinner	55,695,778	3.5%
Total	**242,246,305**	**15.2%**
Distribution	166,878,331	10.5%
Demand Management	82,391,648	5.2%
Hydroelectric	(7,243,142)	0.5%
Administrative & General	144,358,893	9.1%
Total Functional Assignment:	**$ 1,574,315,520**	**100.0%**

(1) Given as a percentage of the absolute values of total dollars Assigned.
Totals may not foot due to rounding

Schedule 7: Functional Revenue Requirements (by budget line item), FY 2016/17

Fiscal Year Ending 2017	Source of Supply	Conveyance & Aqueduct	Storage	Treatment	Distribution	Demand Management	Hydro Electric	Administrative & General	Total $ Assigned
Departmental Operations & Maintenance									
Office of the General Manager & Human Resources	$ 1,204,442	$ 9,723,918	$ 769,484	$ 3,996,370	$ 3,579,839	$ 359,188	$ 193,155	$ 6,635,060	$ 26,461,457
External Affairs	-	-	-	-	-	2,649,786	-	14,129,772	16,779,558
Water System Operations	12,136,560	40,808,676	3,156,126	83,095,984	68,827,104	7,714	3,525,049	802,758	212,359,971
Chief Financial Officer	-	-	-	-	-	-	-	8,607,631	8,607,631
Business Technology & Engineering Services	2,332,907	10,828,107	9,039,465	17,052,973	11,943,620	665,327	805,565	28,501,294	81,169,260
Real Property Development & Mgmt	-	-	5,025,496	-	-	-	-	-	5,025,496
Water Resource Management	8,927,081	-	-	-	1,554,868	5,124,892	-	-	15,606,840
Ethics Department	-	-	-	-	-	-	-	1,277,212	1,277,212
General Counsel	-	-	-	-	-	-	-	12,707,666	12,707,666
Audit Department	-	-	-	-	-	-	-	2,918,005	2,918,005
Total Departmental O&M	24,600,990	61,360,701	17,990,571	104,145,327	85,905,431	8,806,907	4,523,769	75,579,399	382,913,096
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
General District Requirements	-	-	-	-	-	-	-	-	-
State Water Project	141,310,716	440,941,465	-	-	-	-	-	-	582,252,181
Colorado River Aqueduct Power	-	46,604,698	-	-	-	-	-	-	46,604,698
Supply Programs	78,687,589	-	-	-	-	-	-	-	78,687,589
Demand Management	-	-	-	-	-	70,727,111	-	-	70,727,111
Capital Financing Program	1,403,087	89,842,676	104,831,896	140,140,753	89,144,846	-	6,165,077	16,922,074	448,450,410
Other Operating Costs	4,995,561	914,641	273,412	1,419,984	1,271,983	127,626	68,632	25,673,551	34,745,389
Increase (Decrease) in Required Reserves	-	-	-	-	-	-	-	65,100,000	65,100,000
Total General District Requirements	226,396,953	578,303,480	105,105,308	141,560,737	90,416,829	70,854,737	6,233,709	112,098,125	1,330,969,879
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
Revenue Offsets	(23,996,054)	(66,897,769)	(1,493,111)	(9,169,984)	(17,361,475)	(615,125)	(14,810,443)	(4,509,193)	(138,853,153)
	-	-	-	-	-	-	-	-	-
Net Revenue Requirements	**$ 227,001,889**	**$ 572,766,412**	**$ 121,602,768**	**$ 236,536,081**	**$ 158,960,785**	**$ 79,046,520**	**$ (4,052,964)**	**$ 183,168,331**	**$ 1,575,029,822**

Totals may not foot due to rounding

Schedule 8: Service Function Revenue Requirements (by budget line item), FY 2017/18

Fiscal Year Ending 2018	Source of Supply	Conveyance & Aqueduct	Storage	Treatment	Distribution	Demand Management	Hydro Electric	Administrative & General	Total $ Assigned
Departmental Operations & Maintenance									
Office of the General Manager & Human Resources	$ 1,197,895	$ 9,739,941	$ 740,052	$ 3,970,387	$ 3,592,476	$ 358,928	$ 192,263	$ 6,657,409	$ 26,449,350
External Affairs	-	-	-	-	-	2,691,414	-	14,416,983	17,108,397
Water System Operations	12,250,590	41,209,427	3,196,007	84,137,658	69,958,213	7,806	3,587,004	815,425	215,162,129
Chief Financial Officer	-	-	-	-	-	-	-	8,719,501	8,719,501
Business Technology & Engineering Services	2,344,674	9,921,627	7,782,556	15,704,969	11,520,264	676,414	729,596	28,661,896	77,341,996
Real Property Development & Mgmt	-	-	5,099,621	-	-	-	-	-	5,099,621
Water Resource Management	9,010,168	-	-	-	1,565,005	5,178,170	-	-	15,753,342
Ethics Department	-	-	-	-	-	-	-	1,285,225	1,285,225
General Counsel	-	-	-	-	-	-	-	12,865,168	12,865,168
Audit Department	-	-	-	-	-	-	-	2,916,325	2,916,325
Total Departmental O&M	24,803,327	60,870,994	16,818,237	103,813,014	86,635,958	8,912,731	4,508,863	76,337,930	382,701,054
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
General District Requirements	-	-	-	-	-	-	-	-	-
State Water Project	144,768,424	454,637,495	-	-	-	-	-	-	599,405,919
Colorado River Aqueduct Power	-	54,377,965	-	-	-	-	-	-	54,377,965
Supply Programs	81,726,492	-	-	-	-	-	-	-	81,726,492
Demand Management	-	-	-	-	-	73,915,312	-	-	73,915,312
Capital Financing Program	1,469,405	93,846,939	107,650,249	144,427,940	93,016,942	-	6,189,312	17,499,279	464,100,066
Other Operating Costs	5,147,274	1,043,942	301,714	1,618,700	1,464,628	146,332	78,384	27,258,209	37,059,183
Increase (Decrease) in Required Reserves	-	-	-	-	-	-	-	25,400,000	25,400,000
Total General District Requirements	233,111,595	603,906,340	107,951,963	146,046,640	94,481,570	74,061,644	6,267,696	72,185,238	1,338,012,686
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
Revenue Offsets	(27,341,786)	(72,992,001)	(1,445,184)	(7,613,349)	(14,239,197)	(582,727)	(18,019,701)	(4,164,275)	(146,398,220)
	-	-	-	-	-	-	-	-	-
Net Revenue Requirements	**$ 230,573,135**	**$ 591,785,334**	**$ 123,325,016**	**$ 242,246,305**	**$ 166,878,331**	**$ 82,391,648**	**$ (7,243,142)**	**$ 144,358,893**	**$ 1,574,315,520**

Totals may not foot due to rounding

Schedule 9: Revenue Requirement by sub-function and budget line item, FY 2016/17 and FY 2017/18

Fiscal Year Ending 2017	Supply			Conveyance & Aqueduct					Storage				Treatment	Distribution	Demand Mgt.	Hydro	Total
	CRA	SWP	Other	CRA power	CRA other	SWP power	SWP other	Other C&A	Emergency	Drought	Regulatory	Power					
Dept. Operations & Maintenance	6,957,017	8,651,419	8,992,554	4,123,894	39,572,259	-	10,255,867	7,408,681	8,429,231	7,308,712	2,252,628	-	104,145,327	85,905,431	8,806,907	4,523,769	307,333,698
General District Requirements																	
State Water Project																	-
Capital	-	39,221,127	-	-	-	(183,272)	106,098,939	-	-	-	-	-	-	-	-	-	145,136,794
O&M	-	102,089,589	-	-	-	157,637,087	177,388,711	-	-	-	-	-	-	-	-	-	437,115,387
Colorado River Aqueduct Power	-	-	-	46,604,698	-	-	-	-	-	-	-	-	-	-	-	-	46,604,698
Supply Programs	52,541,383	24,563,916	1,582,290	-	-	-	-	-	-	-	-	-	-	-	-	-	78,687,589
Demand Management	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70,727,111	-	70,727,111
Capital Financing Program	-	-	1,403,087	7,057,950	8,588,590	-	-	74,196,136	49,347,855	41,112,637	14,371,405	-	140,140,753	89,144,846	-	6,165,077	431,528,336
Other Operating Costs	120,043	149,133	4,726,384	69,539	614,160	-	127,211	103,731	128,049	111,503	33,860	-	1,419,984	1,271,983	127,626	68,632	9,071,838
Revenue Offsets	(460,357)	(23,406,711)	(128,986)	(446,748)	(376,627)	(1,215,814)	(64,227,650)	(630,930)	(447,127)	(374,757)	(128,628)	(542,600)	(9,169,984)	(17,361,475)	(615,125)	(14,810,443)	(134,343,961)
Admin. & General	8,780,126	22,450,967	2,460,077	5,386,943	7,019,855	12,581,628	33,250,344	10,584,664	6,503,091	7,147,529	2,104,367	(43,695)	29,698,786	21,817,011	11,731,928	1,694,709	183,168,331
Net Revenue Requirement	**67,938,213**	**173,719,442**	**19,035,405**	**62,796,277**	**55,418,237**	**168,819,630**	**262,893,422**	**91,662,281**	**63,961,099**	**55,305,624**	**18,633,632**	**(586,295)**	**266,234,866**	**180,777,796**	**90,778,448**	**(2,358,255)**	**1,575,029,822**

Totals may not foot due to rounding

Fiscal Year Ending 2018	Supply			Conveyance & Aqueduct					Storage				Treatment	Distribution	Demand Mgt.	Hydro	Total
	CRA	SWP	Other	CRA power	CRA other	SWP power	SWP other	Other C&A	Emergency	Drought	Regulatory	Power					
Dept. Operations & Maintenance	7,021,375	8,732,283	9,049,668	4,141,501	39,895,070	-	10,327,626	6,506,798	7,879,535	6,855,009	2,083,693	-	103,813,014	86,635,958	8,912,731	4,508,863	306,363,123
General District Requirements																	
State Water Project																	-
Capital	-	39,427,340	-	-	-	(264,940)	108,550,019	-	-	-	-	-	-	-	-	-	147,712,419
O&M	-	105,341,085	-	-	-	162,321,743	184,030,673	-	-	-	-	-	-	-	-	-	451,693,500
Colorado River Aqueduct Power	-	-	-	54,377,965	-	-	-	-	-	-	-	-	-	-	-	-	54,377,965
Supply Programs	52,626,936	27,508,959	1,590,597	-	-	-	-	-	-	-	-	-	-	-	-	-	81,726,492
Demand Management	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73,915,312	-	73,915,312
Capital Financing Program	-	-	1,469,405	7,970,409	9,617,924	-	-	76,258,605	50,690,985	42,234,533	14,724,731	-	144,427,940	93,016,942	-	6,189,312	446,600,787
Other Operating Costs	137,016	170,154	4,840,104	79,789	708,329	-	146,197	109,628	141,352	123,348	37,014	-	1,618,700	1,464,628	146,332	78,384	9,800,974
Revenue Offsets	(419,871)	(26,802,877)	(119,038)	(3,590,559)	(352,703)	(1,138,122)	(67,328,587)	(582,030)	(412,332)	(345,621)	(118,305)	(568,925)	(7,613,349)	(14,239,197)	(582,727)	(18,019,701)	(142,233,945)
Admin. & General	7,206,198	18,739,363	2,043,034	4,023,215	5,801,415	8,058,388	27,492,960	7,948,961	4,212,770	5,931,854	1,544,674	(28,490)	22,273,424	17,615,948	10,001,279	1,493,901	144,358,893
Net Revenue Requirement	**66,571,652**	**173,116,307**	**18,873,770**	**67,002,320**	**55,670,034**	**168,977,069**	**263,218,888**	**90,241,961**	**62,512,310**	**54,799,122**	**18,271,806**	**(597,415)**	**264,519,729**	**184,494,279**	**92,392,927**	**(5,749,241)**	**1,574,315,520**

Totals may not foot due to rounding

Allocated Costs

In the cost allocation step, functionalized costs are further categorized based on the causes and behavioral characteristics of these costs. An important part of the allocation process is identifying which costs are incurred to meet average demands versus peak demands and which costs are incurred for standby. As with the functional assignment process, the proposed allocation process is consistent with AWWA guidelines, but has been tailored to meet Metropolitan's specific operational structure and service environment.

Two methods are discussed in the AWWA M1 Manual, Principles of Water Rates, Fees and Charges. These two methods are the Commodity/Demand method and the Base/Extra Capacity method.

In the simplest sense, these approaches offer alternative means of distinguishing between utility costs incurred to meet average or base demands and costs incurred to meet peak demands. The Commodity/Demand method allocates costs that vary with the amount of water produced to the commodity category with all other costs associated with water production allocated to the demand category. In the Base/Extra Capacity method, costs related to average demand conditions are allocated to the base category, and capacity costs associated with meeting above average demand conditions are allocated to the extra capacity category.

The Commodity/Demand approach was modified for its application to Metropolitan's rate structure by adding a separate cost allocation for costs related to standby. Analysis of system operating data indicated that a modified Commodity/Demand approach was most appropriate for developing Metropolitan's cost of service allocation bases.

A modified Commodity/Demand approach is the most appropriate for Metropolitan's cost of service needs because this approach is best suited for systems that are not designed to meet maximum-day or maximum-hour demands or provide flows for fire-fighting requirements. Metropolitan's system is designed to meet weekly demand peaks rather than daily or hourly peaks. It is also designed to provide available capacity to meet operation flexibility and reliability for emergencies, outages, and hydrologic variability.

Allocation categories used in the analysis include:

- Fixed Demand costs
- Fixed Commodity costs
- Fixed Standby costs
- Variable Commodity costs
- Hydroelectric costs

Fixed Demand costs are incurred to meet peak demands. Only the *direct* capital financing costs were included in the Fixed Demand allocation category. A portion of capital financing costs was included in the Fixed Demand allocation category because in order to meet peak demands additional physical capacity is designed into the system and, therefore, additional capital costs are incurred.

Variable Commodity costs vary with the amount of water produced, and include costs of chemicals, most power costs, and other O&M cost components that increase or decrease in relation to the volume of water supplied. Fixed Commodity costs include fixed operations and maintenance, and comprise the balance of Metropolitan's O&M expenses. Fixed Commodity costs also include capital financing costs associated with meeting average demands. Fixed Commodity costs do not vary with the amount of water produced.

Fixed standby costs relate to Metropolitan's role in ensuring system reliability during emergencies such as an earthquake, an outage of a major facility like the CRA, and hydrologic variability due to weather variances locally or in the two major supply basins Metropolitan relies on. Only the *direct* capital financing costs were

included in the Fixed Standby allocation category. The Fixed Standby costs identified include the emergency storage capacity within the system, and the available capacity within the conveyance and distribution systems.

An additional component used in Metropolitan's cost allocation process is the Hydroelectric component. While not a part of most water utilities' cost allocation procedures, the Hydroelectric allocation component is necessary to segregate revenue requirements carried from the hydroelectric function established in the functional assignment process. Hydroelectric revenue requirements are ultimately recovered in the distribution system portion of the System Access Rate. Any net revenues generated by the hydroelectric operations offset the distribution costs and reduce the System Access Rate. All users of the distribution system benefit proportionately from the revenue offset provided by the sale of hydroelectric energy.

Schedules 10 and 11 provide the allocation percentages used to distribute the capital financing service function costs into Fixed Demand, Fixed Commodity and Fixed Standby service allocation categories for FY 2016/17 and FY 2017/18, respectively.

All of the capital financing costs functionalized to Supply are allocated as Fixed Commodity costs. Because these particular supply costs have been incurred to provide an amount of annual reliable system yield and not to provide peak demand delivery capability or standby service, they are reasonably treated as Fixed Commodity costs.

Costs for the Conveyance and Aqueduct (C&A) service function are allocated into Fixed Commodity, Fixed Demand and Fixed Standby categories. Because the capital costs for C&A were incurred to meet all three allocation categories, an analysis of C&A capacity usage for the test year was used to determine that 52 percent of the available conveyance capacity varies with the quantity of water produced, and is allocated to Fixed Commodity. A system peak factor[12] of 1.3 was applied to the annual usage to determine that 15 percent of available capacity is used to meet peak monthly deliveries to the member agencies, and is allocated to Fixed Demand. The remaining portion of C&A, about 33 percent, is allocated to Fixed Standby. The same allocation percentages are applied to the CRA, SWP, and Other (Inland Feeder) Conveyance and Aqueduct sub-functions. The allocation shares reflect the system average use of conveyance capacity and not the usage of individual facilities. All of the Conveyance and Aqueduct energy costs for pumping water to Southern California are allocated as Variable Commodity costs and, therefore, are not shown in Schedule 6 because they carry through the allocation step.

Storage service function costs for emergency, drought and regulatory storage are also distributed to the allocation categories based on the type of service provided. Emergency storage costs are allocated as 100 percent Fixed Standby. Emergency storage is a prime example of a cost Metropolitan incurs to ensure the reliability of deliveries to the member agencies. In effect, through the emergency storage capacity in the system, Metropolitan is "standing by" with available capacity and water supply to provide service in the event of a catastrophe such as a major earthquake that disrupts regional conveyance capacity for an extended period of time. Drought carryover storage serves to provide reliable supplies by carrying over surplus supplies from periods of above normal precipitation and snow pack to drought periods when supplies decrease. Drought storage creates supply and is one component of the portfolio of resources that result in a reliable amount of annual system supplies. As a result, drought storage is allocated as a Fixed Commodity cost, in the same manner as Metropolitan's supply costs. Regulatory storage within the Metropolitan system provides operational flexibility in meeting peak demands and flow requirements, essentially increasing the physical distribution capacity. Therefore, regulatory storage is allocated in the same manner as Distribution costs.

[12] Peak monthly deliveries to the member agencies average about 28 percent more than the average monthly deliveries.

Distribution service function costs were allocated as Fixed Commodity by using projected sales data for the test year. During this period, 43 percent of the system distribution capacity is associated with the quantity of water delivered, and is allocated to Fixed Commodity. Distribution service function costs were allocated to Fixed Demand by using three years of recorded non-coincident peaks. The difference between the three-year average non-coincident peak and the fixed commodity flows divided by the system capacity, or 36 percent of the distribution capacity, was used to meet non-coincident peak day demands, and is allocated to Fixed Demand. Although the Metropolitan Distribution System has a great deal of operational flexibility, the total amount of distribution capacity was limited to the historical peak non-coincident[13] peak day flow of all the member agencies. The remaining 21 percent of distribution capacity is associated with Standby service, and is allocated to Fixed Standby.

Treatment service function costs were allocated to Fixed Commodity by using projected treated deliveries to the member agencies for the test year. The Treatment Fixed Demand calculation uses the system non-coincident peak factor applied to the test year usage; the remaining capacity is associated with Fixed Standby service. Total treated water capacity of 3,947 cfs, which is the total design capacity of all the treatment plants, was used in the calculation. General and Administrative costs have been assigned to the allocation categories by service function based on the ratio of allocated non-A&G service function costs to total non-A&G service function costs.

[13] The term "non-coincident" means that the peak day for each agency may or may not coincide with the peak day for the system. A non-coincident approach is used in the rate design to capture the different operating characteristics of the member agencies. The sum of the member agency peak day demands is used as a proxy for peak week.

Schedule 10: Allocation Percentages, FY 2016/17

Fiscal year ending 2017 Function	Allocation Percentages Fixed Commodity	Fixed Demand	Fixed Standby	Total % Allocated	Comments
Source of Supply					
Colorado River Aqueduct	100%	0%	0%	100%	Supply costs allocated as fixed commodity
State Water Project	100%	0%	0%	100%	Supply costs allocated as fixed commodity
Conveyance & Aqueduct					
Colorado River Aqueduct	52%	15%	33%	100%	Demand percentage represents amount of system conveyance capacity used to meet peak demands. Commodity percentage represents amount of capacity that is a function of the amount of water delivered. Standby percentage is the remaining conveyance capacity. SWP, CRA, and Other are treated the same due to the use of a uniform system-wide System Access Rate.
State Water Project	52%	15%	33%	100%	
Other	52%	15%	33%	100%	
Storage					
Emergency	0%	0%	100%	100%	Allocated as Standby (recovered by RTS)
Drought	100%	0%	0%	100%	Allocated as fixed commodity (recovered by Supply Rates)
Regulatory	43%	36%	21%	100%	Allocated the same way as distribution.
Treatment	29%	28%	44%	100%	Demand percentage represents amount of system treatment capacity used to meet peak demands. Commodity percentage represents amount of capacity that is a function of the amount of treated water delivered. Standby percentage is the remaining treatment capacity. The same allocations is applied to all five treatment plants due to the use of a uniform system-wide Treatment Surcharge.
Distribution	43%	36%	21%	100%	Demand percentage represents amount of system distribution capacity used to meet peak demands. Commodity percentage represents amount of capacity that is a function of the amount of water delivered. Standby percentage is the remaining distribution capacity. The same allocations is applied to all distribution facilities due to the use of a uniform system-wide System Access Rate.

Totals may not foot due to rounding

Schedule 11: Allocation Percentages, FY 2017/18

Fiscal year ending 2018 Function	Allocation Percentages Fixed Commodity	Fixed Demand	Fixed Standby	Total % Allocated	Comments
Source of Supply					
Colorado River Aqueduct	100%	0%	0%	100%	Supply costs allocated as fixed commodity
State Water Project	100%	0%	0%	100%	Supply costs allocated as fixed commodity
Conveyance & Aqueduct					
Colorado River Aqueduct	52%	15%	33%	100%	Demand percentage represents amount of system conveyance capacity used to meet peak demands. Commodity percentage represents amount of capacity that is a function of the amount of water delivered. Standby percentage is the remainding conveyance capacity. SWP, CRA, and Other are treated the same due to the use of a uniform system-wide System Access Rate.
State Water Project	52%	15%	33%	100%	
Other	52%	15%	33%	100%	
Storage					
Emergency	0%	0%	100%	100%	Allocated as Standby (recovered by RTS)
Drought	100%	0%	0%	100%	Allocated as fixed commodity (recovered by Supply Rates)
Regulatory	43%	36%	21%	100%	Allocated the same way as distribution.
Treatment	29%	28%	43%	100%	Demand percentage represents amount of system treatment capacity used to meet peak demands. Commodity percentage represents amount of capacity that is a function of the amount of treated water delivered. Standby percentage is the remaining treatment capacity. The same allocations is applied to all five treatment plants due to the use of a uniform system-wide Treatment Surcharge.
Distribution	43%	36%	21%	100%	Demand percentage represents amount of system distribution capacity used to meet peak demands. Commodity percentage represents amount of capacity that is a function of the amount of water delivered. Standby percentage is the remaining distribution capacity. The same allocations is applied to all distribution facilities due to the use of a uniform system-wide System Access Rate.

Totals may not foot due to rounding

FY 2016/17 Service Function Revenue Requirements (by allocation category)

A summary of cost allocation results for FY 2016/17 is shown in Schedules 12 and 13. The allocation of the service function costs results in about 6 percent, or $97 million of the total revenue requirements, being allocated to the Fixed Demand allocation category. This amount represents a reasonable estimate of the annual fixed capital financing costs incurred to meet peak demands (plus the allocated administrative and general costs). A portion of Metropolitan's property tax revenue is allocated to C&A Fixed Demand costs and is used to pay for the general obligation bond debt service allocated to the C&A costs, and other SWP costs. This revenue offsets the amount that needs to be recovered through rates.

About 67 percent of the revenue requirement ($1,059 million) is allocated as Fixed Commodity. These fixed capital and operating costs are incurred by Metropolitan to meet annual average service needs and are typically recovered by a combination of fixed charges and volumetric rates. Fixed capital costs allocated to the Fixed Standby category total about $179 million and account for about 11 percent of the revenue requirements. Standby service costs are commonly recovered by a fixed charge allocated on a reasonable representation of a customer's need for standby service. The Variable Commodity costs for power on the conveyance and aqueduct systems, and power, chemicals and solids handling at the treatment plants change with the amount of water delivered to the member agencies. These costs are allocated as Variable Commodity costs, total about $243 million, and account for about 15 percent of the total revenue requirement. Because of the variable nature of these costs, it is appropriate to recover them through volumetric rates.

FY 2017/18 Service Function Revenue Requirement (by allocation category)

A summary of cost allocation results for FY 2017/18 is shown in Schedule 14 and 15. The allocation of the service function costs results in about 6 percent, or $98 million of the total revenue requirements, being allocated to the Fixed Demand allocation category. This amount represents a reasonable estimate of the annual fixed capital financing costs incurred to meet peak demands (plus the allocated administrative and general costs). A portion of Metropolitan's property tax revenue is allocated to C&A Fixed Demand costs and is used to pay for the general obligation bond debt service allocated to the C&A costs, and other SWP costs. This revenue offsets the amount that needs to be recovered through rates.

About 67 percent of the revenue requirement ($1,057 million) is allocated as Fixed Commodity. These fixed capital and operating costs are incurred by Metropolitan to meet annual average service needs and are typically recovered by a combination of fixed charges and volumetric rates. Fixed capital costs allocated to the Fixed Standby category total about $179 million and account for about 11 percent of the revenue requirements. Standby service costs are commonly recovered by a fixed charge allocated on a reasonable representation of a customer's need for standby service. The Variable Commodity costs for power on the conveyance and aqueduct systems, and power, chemicals and solids handling at the treatment plants change with the amount of water delivered to the member agencies. These costs are allocated as Variable Commodity costs, total about $246 million, and account for about 16 percent of the total revenue requirement. Because of the variable nature of these costs, it is appropriate to recover them through volumetric rates.

Schedule 12: Revenue Requirements by sub-function and allocation category, FY 2016/17

Fiscal Year Ending 2017	Supply			Conveyance & Aqueduct					Storage				Treatment	Distribution	Demand Mgt.	Hydro	Total
	CRA	SWP	Other	CRA power	CRA other	SWP power	SWP other	Other C&A	Emergency	Drought	Regulatory	Power					
Fixed Demand																	
engineering factors					14.7%		14.7%	14.7%			36.3%		27.6%	36.3%			
SWP Capital					-		15,566,984	-			-		-	-			15,566,984
Capital Financing					1,260,130		-	10,886,160			5,219,786		38,716,958	32,377,975			88,461,009
A&G less Offsets					71,893		(8,775,246)	451,321			550,853		3,506,385	(3,007,663)			(7,202,457)
Total fixed demand					1,332,023		6,791,738	11,337,482			5,770,638		42,223,343	29,370,312			96,825,536
					-		-	-			-		-	-			-
Fixed Commodity																	
engineering factors		100.0%	100.0%	100.0%	52.4%		52.4%	52.4%		100.0%	42.6%		28.8%	42.6%			
Capital Financing		-	1,403,087	7,057,950	4,500,464		-	38,879,144		41,112,637	6,124,321		40,330,164	37,988,749			177,396,517
SWP Capital		39,221,127	-	-	-		55,596,372	-		-	-		-	-			94,817,499
SWP O&M		102,089,589	-	-	-		177,388,711	-		-	-		-	-			279,478,300
Dept. O&M	6,957,017	8,651,419	8,992,554	4,123,894	39,572,259		10,255,867	7,408,681	8,429,231	7,308,712	2,252,628		79,815,054	85,905,431	8,806,907		278,479,656
Supply Programs	52,541,383	24,563,916	1,582,290	-	-		-	-	-	-	-		-	-	-		78,687,589
Demand Management	-	-	-	-	-		-	-	-	-	-		-	-	70,727,111		70,727,111
Other Operating Costs	120,043	149,133	4,726,384	69,539	614,160		127,211	103,731	128,049	111,503	33,860		1,419,984	1,271,983	127,626		9,003,206
A&G less Offsets	8,319,769	(955,743)	2,331,091	1,669,908	6,405,693		(2,530,486)	6,885,343	1,123,001	6,772,772	1,100,598		18,612,095	9,183,042	11,116,803		70,033,886
Total fixed commodity	67,938,213	173,719,442	19,035,405	12,921,292	51,092,576		240,837,674	53,276,899	9,680,281	55,305,624	9,511,407		140,177,298	134,349,206	90,778,448		1,058,623,765
Fixed Standby																	
engineering factors	-	-	-		32.9%		32.9%	32.9%	100.0%		21.1%		43.6%	21.1%			-
SWP Capital	-	-	-		-		34,935,583	-	-		-		-	-			34,935,583
Capital Financing	-	-	-		2,827,996		-	24,430,831	49,347,855		3,027,298		61,093,631	18,778,122			159,505,733
A&G less Offsets	-	-	-		165,642		(19,671,574)	2,617,070	4,932,963		324,289		(2,423,035)	(1,719,844)			(15,774,489)
Total fixed standby	-	-	-		2,993,638	-	15,264,009	27,047,901	54,280,818		3,351,587		58,670,596	17,058,278			178,666,826
Variable Commodity																	
SWP Power	-	-	-	-	-	157,453,815	-	-	-		-		-	-			157,453,815
CRA Power	-	-	-	46,604,698	-	-	-	-	-		-		-	-			46,604,698
Variable Treatment	-	-	-	-	-	-	-	-	-		-		24,330,273	-			24,330,273
A&G less Offsets	-	-	-	3,270,287	-	11,365,815	-	-	-		-	(586,295)	833,357	-			14,883,163
Total variable commodity	-	-	-	49,874,985	-	168,819,630	-	-	-		-	(586,295)	25,163,630	-			243,271,950
Hydroelectric	-	-	-	-	-	-	-	-	-		-	-	-	-		10,757,478	10,757,478
A&G less Offsets	-	-	-	-	-	-	-	-	-		-	-	-	-		(13,115,733)	(13,115,733)
Total hydroelectric	-	-	-	-	-	-	-	-	-		-	-	-	-		(2,358,255)	(2,358,255)
Total Costs	**67,938,213**	**173,719,442**	**19,035,405**	**62,796,277**	**55,418,237**	**168,819,630**	**262,893,422**	**91,662,281**	**63,961,099**	**55,305,624**	**18,633,632**	**(586,295)**	**266,234,866**	**180,777,796**	**90,778,448**	**(2,358,255)**	**1,575,029,822**

Totals may not foot due to rounding

Schedule 13: Service Function Revenue Requirements (by allocation category), FY 2016/17

Fiscal year ending 2017 Functional categories (by sub-Fuction)	Fixed Demand	Fixed Commodity	Fixed Standby	Variable Commodity	Hydroelectric	Total allocated
Source of Supply						
CRA	$ -	$ 67,938,213	$ -	$ -	$ -	$ 67,938,213
SWP	-	173,719,442	-	-	-	173,719,442
Other Supply	-	19,035,405	-	-	-	19,035,405
Subtotal: Source of Supply	-	260,693,060	-	-	-	**260,693,060**
	-	-	-	-	-	-
Conveyance & Aqueduct	-	-	-	-	-	-
CRA	-	-	-	-	-	-
CRA Power	-	12,921,292	-	49,874,985	-	62,796,277
CRA All Other	1,332,023	51,092,576	2,993,638	-	-	55,418,237
SWP	-	-	-	-	-	-
SWP Power	-	-	-	168,819,630	-	168,819,630
SWP All Other	6,791,738	240,837,674	15,264,009	-	-	262,893,422
Other Conveyance & Aqueduct	11,337,482	53,276,899	27,047,901	-	-	91,662,281
Subtotal: Conveyance & Aqueduct	19,461,243	358,128,441	45,305,548	218,694,615	-	**641,589,847**
	-	-	-	-	-	-
Storage	-	-	-	-	-	-
Storage Costs Other Than Power	-	-	-	-	-	-
Emergency	-	9,680,281	54,280,818	-	-	63,961,099
Drought	-	55,305,624	-	-	-	55,305,624
Regulatory	5,770,638	9,511,407	3,351,587	-	-	18,633,632
Storage Power	-	-	-	(586,295)	-	(586,295)
Subtotal: Storage	5,770,638	74,497,312	57,632,405	(586,295)	-	**137,314,060**
	-	-	-	-	-	-
Water Quality	-	-	-	-	-	-
CRA	-	-	-	-	-	-
SWP	-	-	-	-	-	-
Other	-	-	-	-	-	-
Subtotal: Water Quality	-	-	-	-	-	**-**
	-	-	-	-	-	-
Treatment	42,223,343	140,177,298	58,670,596	25,163,630	-	**266,234,866**
	-	-	-	-	-	-
Distribution	29,370,312	134,349,206	17,058,278	-	-	**180,777,796**
Demand Management	-	90,778,448	-	-	-	**90,778,448**
Hydroelectric	-	-	-	-	(2,358,255)	**(2,358,255)**
Total Costs Allocated	**$ 96,825,536**	**$ 1,058,623,765**	**$ 178,666,826**	**$ 243,271,950**	**$ (2,358,255)**	**$ 1,575,029,822**
Totals may not foot due to rounding						
	6.1%	67.2%	11.3%	15.4%	-0.1%	100.0%

Schedule 14: Revenue Requirements by sub-function and allocation category, FY 2017/18

Fiscal Year Ending 2018	Supply			Conveyance & Aqueduct					Storage				Treatment	Distribution	Demand Mgt.	Hydro	Total
	CRA	SWP	Other	CRA power	CRA other	SWP power	SWP other	Other C&A	Emergency	Drought	Regulatory	Power					
Fixed Demand																	
engineering factors					14.7%		14.7%	14.7%			36.3%		27.8%	36.3%			
SWP Capital					-		15,926,610	-			-		-	-			15,926,610
Capital Financing					1,411,155		-	11,188,769			5,348,116		40,090,371	33,784,345			91,822,756
A&G less Offsets					34,571		(9,494,501)	91,483			339,598		2,027,665	(2,863,580)			(9,864,764)
Total fixed demand					1,445,726		6,432,109	11,280,252			5,687,713		42,118,036	30,920,764			97,884,602
					-		-	-			-		-	-			-
Fixed Commodity																	
engineering factors		100.0%	100.0%	100.0%	52.4%		52.4%	52.4%		100.0%	42.6%		28.9%	42.6%			
Capital Financing		-	1,469,405	7,970,409	5,039,840		-	39,959,889		42,234,533	6,274,890		41,760,804	39,638,829			184,348,599
SWP Capital		39,427,340	-	-	-		56,880,750	-		-	-		-	-			96,308,090
SWP O&M		105,341,085	-	-	-		184,030,673	-		-	-		-	-			289,371,758
Dept. O&M	7,021,375	8,732,283	9,049,668	4,141,501	39,895,070		10,327,626	6,506,798	7,879,535	6,855,009	2,083,693		79,482,741	86,635,958	8,912,731		277,523,987
Supply Programs	52,626,936	27,508,959	1,590,597	-	-		-	-	-	-	-		-	-	-		81,726,492
Demand Management	-	-	-	-	-		-	-	-	-	-		-	-	73,915,312		73,915,312
Other Operating Costs	137,016	170,154	4,840,104	79,789	708,329		146,197	109,628	141,352	123,348	37,014		1,618,700	1,464,628	146,332		9,722,590
A&G less Offsets	6,786,327	(8,063,515)	1,923,996	1,479,914	5,333,245		(9,048,198)	5,653,762	815,121	5,586,233	886,451		15,509,035	7,882,818	9,418,552		44,163,741
Total fixed commodity	66,571,652	173,116,307	18,873,770	13,671,613	50,976,484		242,337,049	52,230,075	8,836,009	54,799,122	9,282,048		138,371,279	135,622,232	92,392,927		1,057,080,569
Fixed Standby																	
engineering factors	-	-	-		32.9%		32.9%	32.9%	100.0%		21.1%		43.3%	21.1%			-
SWP Capital	-	-	-		-		35,742,659	-	-		-		-	-			35,742,659
Capital Financing	-	-	-		3,166,929		-	25,109,948	50,690,985		3,101,725		62,576,766	19,593,768			164,240,120
A&G less Offsets	-	-	-		80,895		(21,292,929)	1,621,686	2,985,316		200,320		(3,004,928)	(1,642,486)			(21,052,125)
Total fixed standby	-	-	-		3,247,824	-	14,449,730	26,731,634	53,676,301		3,302,045		59,571,838	17,951,283			178,930,654
Variable Commodity																	
SWP Power	-	-	-	-	-	162,056,803	-	-	-		-		-	-			162,056,803
CRA Power	-	-	-	54,377,965	-	-	-	-	-		-		-	-			54,377,965
Variable Treatment	-	-	-	-	-	-	-	-	-		-		24,330,273	-			24,330,273
A&G less Offsets	-	-	-	(1,047,258)	-	6,920,267	-	-	-		-	(597,415)	128,303	-			5,403,896
Total variable commodity	-	-	-	53,330,707	-	168,977,069	-	-	-		-	(597,415)	24,458,576	-			246,168,936
Hydroelectric	-	-	-	-	-	-	-	-	-		-	-	-	-		10,776,559	10,776,559
A&G less Offsets	-	-	-	-	-	-	-	-	-		-	-	-	-		(16,525,800)	(16,525,800)
Total hydroelectric	-	-	-	-	-	-	-	-	-		-	-	-	-		(5,749,241)	(5,749,241)
Total Costs	**66,571,652**	**173,116,307**	**18,873,770**	**67,002,320**	**55,670,034**	**168,977,069**	**263,218,888**	**90,241,961**	**62,512,310**	**54,799,122**	**18,271,806**	**(597,415)**	**264,519,729**	**184,494,279**	**92,392,927**	**(5,749,241)**	**1,574,315,520**

Totals may not foot due to rounding

Schedule 15: Service Function Revenue Requirements (by allocation category), FY 2017/18

Fiscal year ending 2018 Functional categories (by sub-Fuction)	Fixed Demand	Fixed Commodity	Fixed Standby	Variable Commodity	Hydroelectric	Total allocated
Source of Supply						
CRA	$ -	$ 66,571,652	$ -	$ -	$ -	$ 66,571,652
SWP	-	173,116,307	-	-	-	173,116,307
Other Supply	-	18,873,770	-	-	-	18,873,770
Subtotal: Source of Supply	-	258,561,729	-	-	-	**258,561,729**
	-	-	-	-	-	-
Conveyance & Aqueduct	-	-	-	-	-	-
CRA	-	-	-	-	-	-
CRA Power	-	13,671,613	-	53,330,707	-	67,002,320
CRA All Other	1,445,726	50,976,484	3,247,824	-	-	55,670,034
SWP	-	-	-	-	-	-
SWP Power	-	-	-	168,977,069	-	168,977,069
SWP All Other	6,432,109	242,337,049	14,449,730	-	-	263,218,888
Other Conveyance & Aqueduct	11,280,252	52,230,075	26,731,634	-	-	90,241,961
Subtotal: Conveyance & Aqueduct	19,158,088	359,215,221	44,429,188	222,307,776	-	**645,110,272**
	-	-	-	-	-	-
Storage	-	-	-	-	-	-
Storage Costs Other Than Power	-	-	-	-	-	-
Emergency	-	8,836,009	53,676,301	-	-	62,512,310
Drought	-	54,799,122	-	-	-	54,799,122
Regulatory	5,687,713	9,282,048	3,302,045	-	-	18,271,806
Storage Power	-	-	-	(597,415)	-	(597,415)
Subtotal: Storage	5,687,713	72,917,179	56,978,346	(597,415)	-	**134,985,824**
	-	-	-	-	-	-
Water Quality	-	-	-	-	-	-
CRA	-	-	-	-	-	-
SWP	-	-	-	-	-	-
Other	-	-	-	-	-	-
Subtotal: Water Quality	-	-	-	-	-	**-**
	-	-	-	-	-	-
Treatment	42,118,036	138,371,279	59,571,838	24,458,576	-	**264,519,729**
	-	-	-	-	-	-
Distribution	30,920,764	135,622,232	17,951,283	-	-	**184,494,279**
Demand Management	-	92,392,927	-	-	-	**92,392,927**
Hydroelectric	-	-	-	-	(5,749,241)	**(5,749,241)**
Total Costs Allocated	**$ 97,884,602**	**$ 1,057,080,569**	**$ 178,930,654**	**$ 246,168,936**	**$ (5,749,241)**	**$ 1,574,315,520**
Totals may not foot due to rounding						
	6.2%	67.1%	11.4%	15.6%	-0.4%	100.0%

Distribution of Costs: Rates and Charges

Use of System-Wide (Postage Stamp) Rates

Metropolitan's rate structure consists of unbundled rate elements designed to provide transparency regarding the cost of specific functions to member agencies (system access, untreated water supplies, water treatment, etc.). The rates for each of these unbundled rate elements are uniform across Metropolitan's entire regional service area; they do not vary by member agency and they do not vary by geographic zone or distance.

In the utility industry, system-wide rates that are the same for all customers are referred to as "postage stamp" rates. Under a postage stamp rate design approach, every customer pays the same average rate for a service regardless of whether the cost caused by, or the benefit derived by, a customer for a given transaction varies from the average. The postage stamp rate design approach stands in contrast to alternative rate design approaches such as distance sensitive pricing schemes that attempt to develop rates applicable to specific geographic zones.

Metropolitan's system is not a point-to-point service, but an interconnected regional system. In order to balance the local concerns within the region, Metropolitan has long maintained postage stamp rates. In fact, Metropolitan has used uniform postage stamp rates since it started delivering water in 1942. Under the postage stamp approach, an agency develops an average rate for a service, as opposed to a point-to-point rate based on each customer's specific use, and all customers receiving that service pay the average rate. This allows the agency to establish non-discriminatory rates that match the cost of providing the service to a customer class. A postage stamp approach is especially appropriate for an interconnected regional system because it allows the agency to develop reliable alternatives to point-to-point service. Metropolitan's uniform, postage stamp rate structure has allowed it to develop an interconnected regional conveyance and distribution system with the ability to deliver supplies from the SWP, the CRA, and its storage portfolio throughout its vast and diverse service area. Metropolitan's conveyance and distribution system can deliver water from both the SWP and CRA to almost every member agency. This flexibility benefits all member agencies. Uniform, postage stamp rates provide a region-wide funding mechanism to recover the costs of Metropolitan's integrated system, help ensure economies of scale, and result in lower costs for all of Metropolitan's member agencies. Given Metropolitan's integrated system, it is not logical to do otherwise.

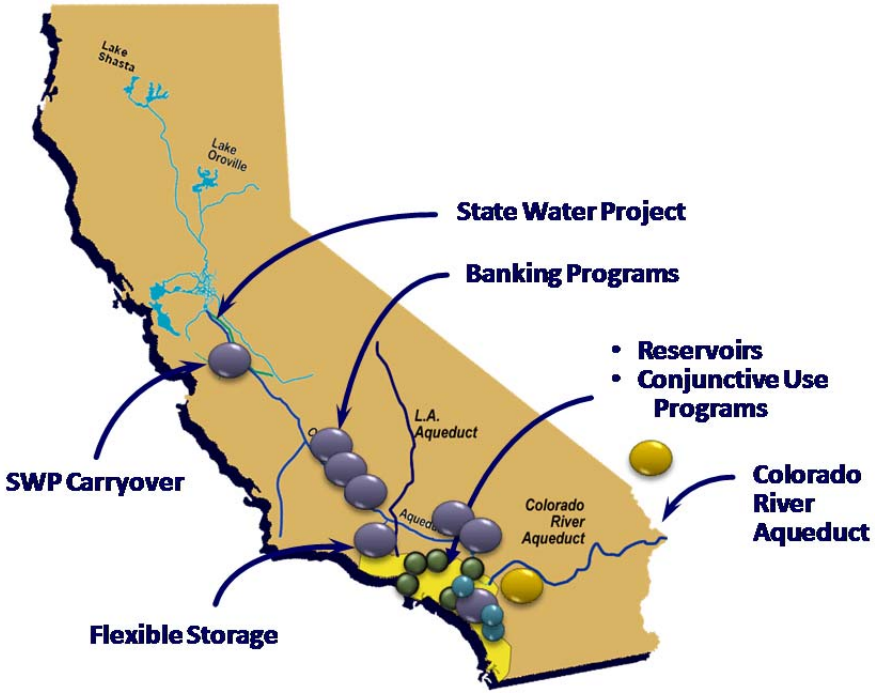
Metropolitan's system draws on diverse supply sources, transports water across a large part of the State, distributes water in six counties, and serves an area home to 18.5 million residents. The 2007 Integrated Area Study (IAS), emphasized regional system flexibility as a key component of overall reliability.[14] Metropolitan must maintain operational flexibility—the ability to respond to short-term changes in regional water supply, water quality, treatment requirements, and member agency demands. And it must maintain delivery flexibility—the ability to maintain partial to full water supply deliveries during planned and unplanned facility outages. Metropolitan is also required by state statute to have the objective, to the extent determined to be reasonable and practical, to deliver a blend of water constituting at least 50 percent of SWP water. (MWD Act, Sec. 136.) Each of Metropolitan's integrated conveyance, distribution and storage assets contributes to regional system reliability. It is fair and reasonable, therefore, to expect member agencies to share the cost of

[14] 2007 Integrated Area Study, Report No. 1317, pg. 2-10.

developing and maintaining these assets because all member agencies benefit from regional system reliability.

Operational flexibility has been achieved by creating an interconnected regional delivery network integrating the SWP and the CRA conveyance systems with the Distribution System. This integrated network allows Metropolitan to incorporate supply from the SWP and the CRA with a diverse portfolio of geographically dispersed storage programs, including the Central Valley groundwater storage programs, carryover storage in San Luis Reservoir, flexible storage capacity in Castaic Lake and Lake Perris, Lake Mead storage, the DWCV Advanced Delivery account, in-basin surface storage in DVL and Lake Mathews, and in-basin groundwater Conjunctive Use Programs. This integrated, regional network allows Metropolitan to move supplies throughout the system in response to service demands, supply availability and operational needs, and is shown in Figure 18.

Figure 18: Metropolitan Facilities, Supplies and Storage Portfolio



System flexibility and integration is easily demonstrated. In a year with a high SWP allocation, SWP supplies can be moved from the West Branch down into the Central Pool as far as western Orange County; on the East Branch, moving SWP supplies results in high SWP blends for eastern areas all the way into south San Diego County, with relatively little Colorado River water delivered to the Skinner area. In a year with a low SWP allocation, Colorado River water will dominate; this impact is mitigated by blending Colorado River water with SWP supplies stored in DVL. Under normal operations these CRA supplies can be pushed as far west as the Santa Monica Feeder.

Figure 19: Operating Flexibility and Regional System Reliability: SWP Integration

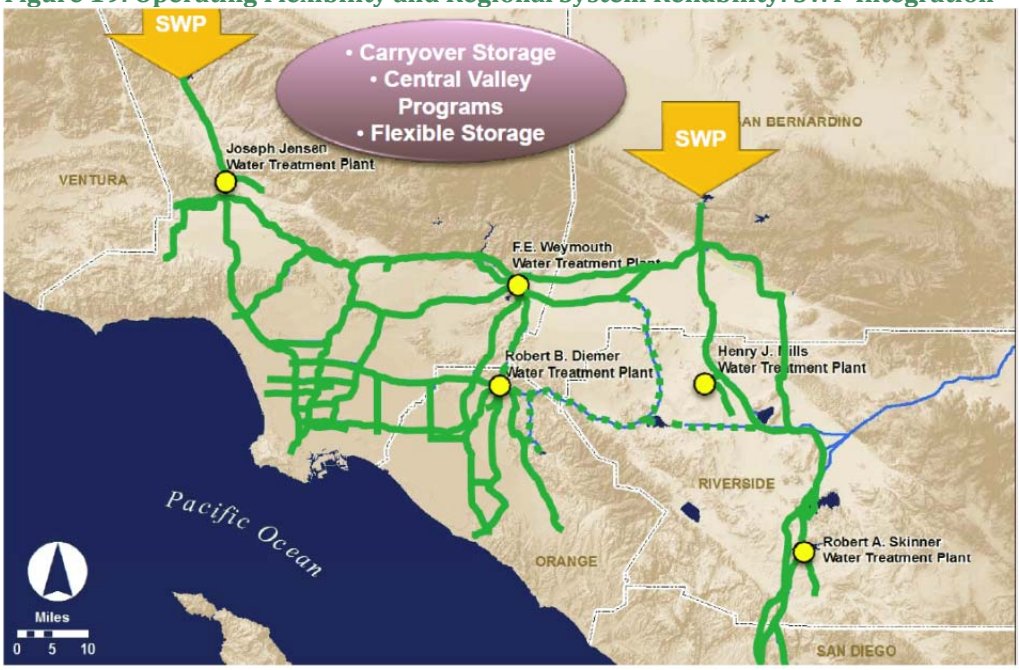
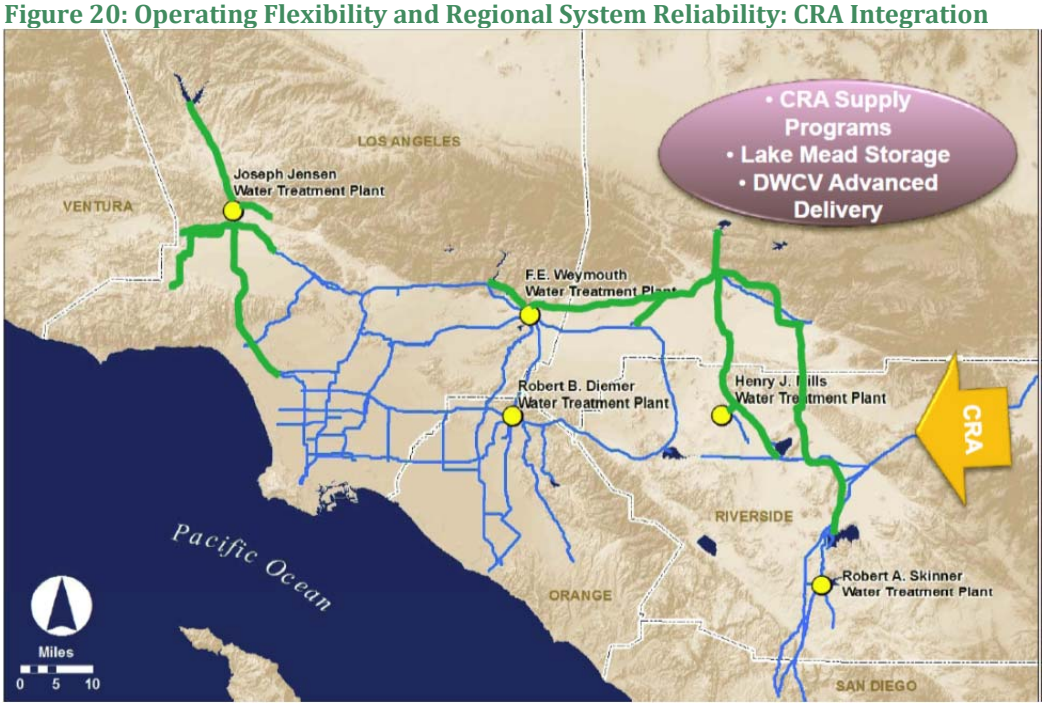


Figure 19 shows the portion of the Metropolitan service area served by SWP supplies and storage programs highlighted in green. Figure 20, Operating Flexibility and Regional System Reliability: CRA Integration, shows the portion of the Metropolitan service area served by CRA supplies and storage programs highlighted in blue for a normal year.

Figure 20: Operating Flexibility and Regional System Reliability: CRA Integration



The integrated conveyance and distribution network that Metropolitan has developed to serve the member agencies enables water supplies from multiple sources to be delivered throughout its service area to provide regional reliability. In 2014, the SWP allocation was a historically low 5 percent. Metropolitan re-operated its system to move CRA water all the way west to deliver to the areas south, west and east of the Jensen treatment plant, which are normally served with SWP water.

Metropolitan's operational flexibility developed over time to where Metropolitan now has substantial operational flexibility to accommodate short-term changes in water supply, treatment, and demands. This is the result of having multiple water supplies and the ability to blend the supplies, robust treatment processes, and large storage capacities in multiple treated and untreated water reservoirs.

Delivery flexibility helps mitigate the impacts of regional facility outages. Metropolitan's delivery flexibility also developed over time. The 2007 IAS reported that 260 of 344 service connections, or 76 percent, had full back-up capability for single failures within Metropolitan's Distribution System. In the event of a treatment plant outage, 299 of 344 service connections, or 87 percent, had full back-up capability[15].

The same flexibility principles inform development and operation of Metropolitan's storage functionality. Metropolitan's ability to shift among resources in its storage portfolio in order to enhance the regional reliability of Metropolitan's imported water service in the face of so many changing conditions is the result of its integrated, flexible operating system, consisting of the entitlement to use the SWP conveyance and the CRA and the Distribution System. Metropolitan is able to accomplish system reliability and operational flexibility while accommodating outages, managing to water quality goals, minimizing the risk of invasive species infestation and maintaining emergency storage reserves.

Metropolitan's integrated, flexible system directly benefits all agencies as to all services, including wheeling and exchange services. Wheeling and exchange transactions benefit from a robust and flexible system, including Metropolitan's right to use SWP facilities. Metropolitan's integrated, flexible system makes deliveries of wheeled and exchanged water possible as Metropolitan delivers this water from whatever source or sources and by whatever delivery path is determined by Metropolitan. Given the operating flexibility of Metropolitan's system, Metropolitan allocates costs in a way that allows it to develop and maintain such a flexible system. And every member agency is served by this system flexibility.

The vast majority of utilities operate under an implicit regulatory compact, which provides the exclusive service area in exchange for the obligation to serve. Metropolitan's system is a wholesale system and provides only "supplemental" supplies. Metropolitan is a wholesaler that has no exclusive right to serve in its service area. To the degree a member agency has local resources, develops local resources, implements conservation, or otherwise reduces demands, that member agency does not require Metropolitan's services. Moreover, member agencies are free to acquire supplies from other sources. Indeed, Metropolitan's Board has adopted the concept of "direct access", or customer choice for supplier, to accommodate a water transfer market.[16] Unbundled, postage stamp rates ensure that agencies that use Metropolitan's system to move non-Metropolitan

[15] 2007 Integrated Area Study, Report No. 1317, pp. 2-10 and 2-11.
[16]The Metropolitan Board adopted Strategic Plan Policy Principles on December 14, 1999, consisting of seven principles, presented on page 5.

water pay a fair and reasonable share of the relevant system costs, including the cost of facilities, power and conservation programs that help ensure capacity.

Metropolitan maintains an unbundled rate structure based on types of functions creating the costs, which provides transparency. Member agencies pay rates based on the services they use (full service treated, full service untreated, or wheeling), and agencies that use the same service pay the same rate. Agencies that purchase full service water pay for supply, whereas agencies that do not purchase full service water pay no supply costs. Agencies that take treated full service water cover treatment costs, whereas agencies that take untreated full service water pay no treatment costs. An agency that wheels a third party's water through Metropolitan's system pays wheeling costs, but no supply costs. In fact, Metropolitan provides incentives for conservation and local resource development so member agencies do not have to take full service or wheeling services from Metropolitan. Agencies that use a combination of services pay costs based *only* on the specific services they use.

This is an important distinction in the context of not having an exclusive service area. A water agency with an exclusive service area has more certainty in its revenues because it has no competition for its services. Metropolitan does have competition for its services. Therefore Metropolitan has developed its unbundled rate structure in a fair and reasonable manner to ensure that system users pay for the services they use and the benefits they enjoy. Fair and reasonable rates that reflect applicable costs avoid negatively impacting the rates and charges paid by member agencies who do not acquire their own supplies to move through Metropolitan's interconnected delivery network. This is particularly true with regard to member agencies exercising choice of supplier. Compared to other water systems, Metropolitan's system is used to move significant amounts of non-Metropolitan supplies.

Customer Class

Metropolitan, a wholesaler, serves one class of customers: its member agencies. These wholesale customers use Metropolitan's facilities differently and, therefore, receive different services from Metropolitan. These services are used to provide raw water, treated water, or wheeling services. Therefore, Metropolitan's service types are full service treated water service, full service untreated water service, and wheeling service, and the level of rate unbundling is appropriate given Metropolitan's mission to act regionally. By ensuring that charges recover only for functions involved in the applicable service, no cross-subsidy of costs exists. Metropolitan's COS process and resulting unbundled rate structure ensures that its wholesale customers pay for only those services they elect to receive.

Distributed Costs to Services

Schedules 16 and 17 provide a cross-reference between the allocated function costs and their distribution to the rate design elements for FY 2016/17 and FY 2017/18, respectively. The specifics of each rate design element are discussed in detail in the following section.

Schedule 16: Allocated Service Function Revenue Requirements (Distributed to rate design element): FY 2016/17

Fiscal year ending 2017	Rate Design Elements							
Service Function by Allocation Category	**Supply Rates**	**System Access Rate**	**Water Stewardship Rate**	**System Power Rate**	**Capacity Charge**	**Readiness-to-Serve Charge**	**Treatment Surcharge**	**Total Costs**
Supply								
Fixed Demand	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Fixed Commodity	260,693,060	-	-	-	-	-	-	260,693,060
Fixed Standby	-	-	-	-	-	-	-	-
Variable Commodity	-	-	-	-	-	-	-	-
Hydroelectric	-	-	-	-	-	-	-	-
Subtotal: Supply	260,693,060	-	-	-	-	-	-	260,693,060
	-	-	-	-	-	-	-	-
Conveyance and Aqueduct	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	-	19,461,243	-	19,461,243
Fixed Commodity	-	358,128,441	-	-	-	-	-	358,128,441
Fixed Standby	-	-	-	-	-	45,305,548	-	45,305,548
Variable Commodity	-	-	-	218,694,615	-	-	-	218,694,615
Hydroelectric	-	-	-	-	-	-	-	-
Subtotal: Conveyance and Aqueduct	-	358,128,441	-	218,694,615	-	64,766,791	-	641,589,847
	-	-	-	-	-	-	-	-
Storage	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	5,770,638	-	-	5,770,638
Fixed Commodity	55,305,624	19,191,688	-	-	-	-	-	74,497,312
Fixed Standby	-	-	-	-	-	57,632,405	-	57,632,405
Variable Commodity	(586,295)	-	-	-	-	-	-	(586,295)
Hydroelectric	-	-	-	-	-	-	-	-
Subtotal: Storage	54,719,330	19,191,688	-	-	5,770,638	57,632,405	-	137,314,060
	-	-	-	-	-	-	-	-
Treatment	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	-	-	42,223,343	42,223,343
Fixed Commodity	-	-	-	-	-	-	140,177,298	140,177,298
Fixed Standby	-	-	-	-	-	-	58,670,596	58,670,596
Variable Commodity	-	-	-	-	-	-	25,163,630	25,163,630
Hydroelectric	-	-	-	-	-	-	-	-
Subtotal: Treatment	-	-	-	-	-	-	266,234,866	266,234,866
	-	-	-	-	-	-	-	-
Distribution	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	29,370,312	-	-	29,370,312
Fixed Commodity	-	134,349,206	-	-	-	-	-	134,349,206
Fixed Standby	-	-	-	-	-	17,058,278	-	17,058,278
Variable Commodity	-	-	-	-	-	-	-	-
Hydroelectric	-	(2,358,255)	-	-	-	-	-	(2,358,255)
Subtotal: Distribution	-	131,990,951	-	-	29,370,312	17,058,278	-	178,419,541
	-	-	-	-	-	-	-	-
Demand Management	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	-	-	-	-
Fixed Commodity	-	-	90,778,448	-	-	-	-	90,778,448
Fixed Standby	-	-	-	-	-	-	-	-
Variable Commodity	-	-	-	-	-	-	-	-
Hydroelectric	-	-	-	-	-	-	-	-
Subtotal: Demand Management	-	-	90,778,448	-	-	-	-	90,778,448
	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	35,140,950	19,461,243	42,223,343	96,825,536
Fixed Commodity	315,998,684	511,669,335	90,778,448	-	-	-	140,177,298	1,058,623,765
Fixed Standby	-	-	-	-	-	119,996,230	58,670,596	178,666,826
Variable Commodity	(586,295)	-	-	218,694,615	-	-	25,163,630	243,271,950
Hydroelectric	-	(2,358,255)	-	-	-	-	-	(2,358,255)
Total	**$ 315,412,389**	**$ 509,311,080**	**$ 90,778,448**	**$ 218,694,615**	**$ 35,140,950**	**$ 139,457,473**	**$ 266,234,866**	**$ 1,575,029,822**
Totals may not foot due to rounding								
	20.0%	32.3%	5.8%	13.9%	2.2%	8.9%	16.9%	100.0%

Schedule 17: Allocated Service Function Revenue Requirements (Distributed to rate design element): FY 2017/18

Fiscal year ending 2018	Rate Design Elements							
Service Function by Allocation Category	**Supply Rates**	**System Access Rate**	**Water Stewardship Rate**	**System Power Rate**	**Capacity Charge**	**Readiness-to-Serve Charge**	**Treatment Surcharge**	**Total Costs**
Supply								
Fixed Demand	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Fixed Commodity	258,561,729	-	-	-	-	-	-	258,561,729
Fixed Standby	-	-	-	-	-	-	-	-
Variable Commodity	-	-	-	-	-	-	-	-
Hydroelectric	-	-	-	-	-	-	-	-
Subtotal: Supply	258,561,729	-	-	-	-	-	-	258,561,729
	-	-	-	-	-	-	-	-
Conveyance and Aqueduct	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	-	19,158,088	-	19,158,088
Fixed Commodity	-	359,215,221	-	-	-	-	-	359,215,221
Fixed Standby	-	-	-	-	-	44,429,188	-	44,429,188
Variable Commodity	-	-	-	222,307,776	-	-	-	222,307,776
Hydroelectric	-	-	-	-	-	-	-	-
Subtotal: Conveyance and Aqueduct	-	359,215,221	-	222,307,776	-	63,587,275	-	645,110,272
	-	-	-	-	-	-	-	-
Storage	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	5,687,713	-	-	5,687,713
Fixed Commodity	54,799,122	18,118,057	-	-	-	-	-	72,917,179
Fixed Standby	-	-	-	-	-	56,978,346	-	56,978,346
Variable Commodity	(597,415)	-	-	-	-	-	-	(597,415)
Hydroelectric	-	-	-	-	-	-	-	-
Subtotal: Storage	54,201,707	18,118,057	-	-	5,687,713	56,978,346	-	134,985,824
	-	-	-	-	-	-	-	-
Treatment	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	-	-	42,118,036	42,118,036
Fixed Commodity	-	-	-	-	-	-	138,371,279	138,371,279
Fixed Standby	-	-	-	-	-	-	59,571,838	59,571,838
Variable Commodity	-	-	-	-	-	-	24,458,576	24,458,576
Hydroelectric	-	-	-	-	-	-	-	-
Subtotal: Treatment	-	-	-	-	-	-	264,519,729	264,519,729
	-	-	-	-	-	-	-	-
Distribution	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	30,920,764	-	-	30,920,764
Fixed Commodity	-	135,622,232	-	-	-	-	-	135,622,232
Fixed Standby	-	-	-	-	-	17,951,283	-	17,951,283
Variable Commodity	-	-	-	-	-	-	-	-
Hydroelectric	-	(5,749,241)	-	-	-	-	-	(5,749,241)
Subtotal: Distribution	-	129,872,991	-	-	30,920,764	17,951,283	-	178,745,038
	-	-	-	-	-	-	-	-
Demand Management	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	-	-	-	-
Fixed Commodity	-	-	92,392,927	-	-	-	-	92,392,927
Fixed Standby	-	-	-	-	-	-	-	-
Variable Commodity	-	-	-	-	-	-	-	-
Hydroelectric	-	-	-	-	-	-	-	-
Subtotal: Demand Management	-	-	92,392,927	-	-	-	-	92,392,927
	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-
Fixed Demand	-	-	-	-	36,608,478	19,158,088	42,118,036	97,884,602
Fixed Commodity	313,360,852	512,955,510	92,392,927	-	-	-	138,371,279	1,057,080,569
Fixed Standby	-	-	-	-	-	119,358,816	59,571,838	178,930,654
Variable Commodity	(597,415)	-	-	222,307,776	-	-	24,458,576	246,168,936
Hydroelectric	-	(5,749,241)	-	-	-	-	-	(5,749,241)
Total	**$ 312,763,436**	**$ 507,206,269**	**$ 92,392,927**	**$ 222,307,776**	**$ 36,608,478**	**$ 138,516,904**	**$ 264,519,729**	**$ 1,574,315,520**
Totals may not foot due to rounding								
	19.9%	32.2%	5.9%	14.1%	2.3%	8.8%	16.8%	100.0%

Proof of Revenue

FY 2016/17

Schedule 18 shows the Proof of Revenue for FY 2016/17. Based on expected sales of 1.70 MAF, the expected revenues would be about $52.9 million lower than the total revenue requirement, if the rates and charges were in effect the entire test year period. The cost-of-service allocation assuming a full twelve months of revenue is used to allocate costs among the various rate elements, but should not be interpreted as over- or under-collection during a given fiscal year. However, because the recommended rates do not take effect until January 1, 2017, the expected revenues for FY 2016/17 will be about $87.5 million lower than the total revenue requirement in FY 2016/17. The total revenue requirement includes a $41.8 million increase in the required reserves for the Revenue Remainder Fund. Deposits to the Treatment Surcharge Stabilization Fund are $6.7 million in FY 2016/17. Accounting for these adjustments, the required draw from reserves is about $52.4 million in FY 2016/17.

FY 2017/18

Schedule 19 shows the Proof of Revenue for FY 2017/18. Based on expected sales of 1.70 MAF the expected revenues would be about $7.5 million higher than the total revenue requirement, if the rates and charges were in effect the entire test year period. The cost-of-service allocation assuming a full twelve months of revenue is used to allocate costs among the various rate elements, but should not be interpreted as over- or under-collection during a given fiscal year. However, because the recommended rates do not take effect until January 1, 2018, the expected revenues for FY 2017/18 will be about $26.1 million lower than the total revenue requirement in FY 2017/18. The total revenue requirement includes a $10.1 million increase in the required reserves for the Revenue Remainder Fund. Draws from the Treatment Surcharge Stabilization Fund are $3.2 million in FY 2017/18. Accounting for these adjustments, the required draw from reserves is about $12.9 million in FY 2017/18.

Schedule 20 summarizes the rates and charges that would be effective on January 1, 2017 and January 1, 2018 using the assumptions and methodology of this report. Member agency impacts will vary depending upon an agency's RTS allocation, capacity charge and relative proportions of treated and untreated Tier 1 and Tier 2 purchases.

Schedule 18: FY 2016/17 Proof of Revenue ($ millions)

Proof of Revenue FY2017 if Rates Effective for Full Test Year

Rate Elements	Revenue Requirements	% Over (Under) Collected		Revenues if Rates Effective July 1st	Billing Determinant	Unit Rate
	$M	$M	%	$M	MAF	$/AF
Supply	315.4	(9.9)	-3%	305.5	1.52	201.0
System Access Rate	509.3	(18.0)	-4%	491.3	1.70	289.0
Water Stewardship Rate	90.8	(2.4)	-3%	88.4	1.70	52.0
System Power Rate	218.7	(7.9)	-4%	210.8	1.70	124.0
Treatment Surcharge	266.2	(8.8)	-3%	257.4	0.82	313.0
Readiness-to-serve Charge	139.5	(4.5)	-3%	135.0		
Capacity Charge	35.1	(1.4)	-4%	33.7		
Total	**1,575.0**	**(52.9)**	**-3%**	**1,522.1**		

Totals may not foot due to rounding

Proof of Revenue FY2017 if Rates Effective January 1st

Rate Elements	Revenue Requirements	% Over (Under) Collected		Revenues if Rates Effective Jan 1st
	$M	$M	%	$M
Supply	315.4	(48.2)	-15%	267.2
System Access Rate	509.3	(46.2)	-9%	463.1
Water Stewardship Rate	90.8	(12.7)	-14%	78.1
System Power Rate	218.7	5.3	2%	224.0
Treatment Surcharge	266.2	6.7	3%	272.9
Readiness-to-serve Charge	139.5	4.5	3%	144.0
Capacity Charge	35.1	3.2	9%	38.3
Total	**1,575.0**	**(87.5)**	**-6%**	**1,487.5**

Totals may not foot due to rounding

Schedule 19: FY 2017/18 Proof of Revenue ($ millions)

Proof of Revenue FY2018 if Rates Effective for Full Test Year

Rate Elements	Revenue Requirements	% Over (Under) Collected		Revenues if Rates Effective July 1st	Billing Determinant	Unit Rate
	$M	$M	%	$M	MAF	$/AF
Supply	312.8	1.8	1%	314.5	1.50	209.0
System Access Rate	507.2	1.1	0%	508.3	1.70	299.0
Water Stewardship Rate	92.4	1.1	1%	93.5	1.70	55.0
System Power Rate	222.3	2.1	1%	224.4	1.70	132.0
Treatment Surcharge	264.5	(0.1)	0%	264.4	0.83	320.0
Readiness-to-serve Charge	138.5	1.5	1%	140.0		
Capacity Charge	36.6	0.0	0%	36.6		
Total	**1,574.3**	**7.5**	**0%**	**1,581.8**		

Totals may not foot due to rounding

Proof of Revenue FY2018 if Rates Effective January 1st

Rate Elements	Revenue Requirements	% Over (Under) Collected		Revenues if Rates Effective Jan 1st
	$M	$M	%	$M
Supply	312.8	(5.0)	-2%	307.7
System Access Rate	507.2	(8.3)	-2%	498.9
Water Stewardship Rate	92.4	(1.7)	-2%	90.7
System Power Rate	222.3	(5.4)	-2%	216.9
Treatment Surcharge	264.5	(3.2)	-1%	261.3
Readiness-to-serve Charge	138.5	(1.0)	-1%	137.5
Capacity Charge	36.6	(1.4)	-4%	35.2
Total	**1,574.3**	**(26.2)**	**-2%**	**1,548.1**

Totals may not foot due to rounding

Schedule 20: Rates and Charges Summary

Effective January 1st	2016	2017	2018
Tier 1 Supply Rate ($/AF)	$156	$201	$209
Tier 2 Supply Rate ($/AF)	$290	$295	$295
System Access Rate ($/AF)	$259	$289	$299
Water Stewardship Rate ($/AF)	$41	$52	$55
System Power Rate ($/AF)	$138	$124	$132
Full Service Untreated Volumetric Cost ($/AF)			
Tier 1	$594	$666	$695
Tier 2	$728	$760	$781
Treatment Surcharge ($/AF)	$348	$313	$320
Full Service Treated Volumetric Cost ($/AF)			
Tier 1	$942	$979	$1,015
Tier 2	$1,076	$1,073	$1,101
Readiness-to-Serve Charge ($M)	$153	$135	$140
Capacity Charge ($/cfs)	$10,900	$8,000	$8,700

System Access Rate (SAR)

The SAR is a volumetric[17] system-wide rate charged on each acre-foot of water that is conveyed through Metropolitan's interconnected regional delivery network, including Metropolitan's right to use SWP facilities for conveyance of SWP and non-SWP water. All system users (member agency or third party) pay the SAR to use Metropolitan's interconnected regional delivery network. The SAR would increase to $289 per acre-foot in 2017 primarily due to increased State Water Contract Transportation (conveyance) costs and $299 per acre-foot in 2018, primarily due to lower draws from Reserves. The SAR recovers the cost of providing conveyance and distribution capacity to meet average annual demands.

The SAR recovers, among other costs, the capital, operating, maintenance, and overhead costs associated with the interconnected regional delivery network necessary to deliver water to meet member agencies' average annual demands, which include the costs of conveyance facilities (facilities outside of Metropolitan's service area) and distribution facilities (facilities within Metropolitan's Distribution System).

Metropolitan's delivery network costs are treated the same whether they were incurred for the SWP or the CRA. The fact that, unlike the CRA, Metropolitan does not hold legal title to the SWP facilities and does not operate the SWP facilities is immaterial for purposes of cost functionalization for the COS and rate determination process.

[17] A volumetric rate is a charge applied to the actual amount of water delivered.

Metropolitan, like the other State Water Contractors, is obligated to pay all operating expenses and capital costs incurred by the SWP to provide the contractual supply and transportation services. The expenses include all unexpected expenses resulting from operational issues and changes in regulations. DWR charges Metropolitan based on estimated expenses and has the right to charge Metropolitan for any expenses beyond the estimates. The State Water Contractors carry all of the financial risk, and must pay any costs without any regard for Metropolitan's own cash flows. By allocating costs, DWR does not bear any of these risks; the risks fall to the State Water Contractors. Metropolitan was even responsible for paying for the SWP costs during the extended original construction period, years before Metropolitan received any SWP water. This is also not something typical of a supply contract and hence supportive of Metropolitan's cost functionalization process.

Metropolitan is also responsible for managing its SWP supply and transportation resources. Metropolitan determines what water to store and deliver in any year from its resource portfolio. On October 1 prior to the beginning of the Calendar Year, Metropolitan must provide its initial water order, plus any variations requested by DWR. The planning for this water order begins as early as the preceding July. A considerable amount of strategy goes in to determining which resource Metropolitan will dispatch when and deliver where to maximize resources. Examples of issues that Metropolitan must consider when managing SWP resources include:

- the level of the Table A allocation, and the amount of Table A supply available to Metropolitan, Desert Water Agency (DWA) and Coachella Valley Water District CVWD;
- shaping deliveries to the order to accommodate Article 21 (surplus water), turnback pool water (Table A allocation not needed by a Contractor) or Article 56 (b) water (water rescheduled due to system outages) if available;
- the amount of Carryover water in San Luis Reservoir, and the timing and location of need;
- the maximum input and withdrawal capacities of the Central Valley Storage programs, depending on whether Metropolitan is storing or withdrawing from these programs, and considering the level of water stored;
- the availability or need to refill Flexible Storage in Castaic and Perris Reservoirs;
- the availability of water transfer supplies; and,
- the supply conditions on the Colorado River.

Metropolitan, not DWR, is responsible for determining how, when or where to deliver any of the supply sources Metropolitan has that can be conveyed on the SWP. As a result of the execution of Monterey Amendments, the SWP can convey SWP water and non-SWP water, and can be used by non-State Water Contractors; it is, therefore, appropriate to consider the SWP as part of Metropolitan's interconnected regional delivery network. The volume of water delivered under arrangements, other than the contracts for delivery of water with the DWR, is also not determinative of the cost treatment; the ability to move *any* volume is what is relevant to the functionalization of Metropolitan's costs.

Like the SWP costs, Metropolitan fully pays the operating and capital costs of the CRA maintenance, operations and supply portfolio and the risks fall on Metropolitan.

Metropolitan uses the CRA for the conveyance of its multiple CRA resources. It is responsible for determining what water to store and deliver in any year from its resource portfolio. Prior to the beginning of the calendar year, Metropolitan must provide its Plan for the Creation of Extraordinary Conservation ICS to the Bureau of Reclamation in June and its best estimate of monthly diversion

requirements in September. The amount of Extraordinary Conservation ICS which Metropolitan plans to create is deducted from the total supply available for diversion. In October or November, Reclamation staff conducts a consultation with Metropolitan prior to Reclamation's Regional Director making an annual determination of Metropolitan's estimated water requirements for the ensuing calendar year to the end that deliveries of Colorado River water to Metropolitan will not exceed those reasonably required for beneficial use. Reclamation provides Metropolitan with a notice of the Regional Director's determination regarding Metropolitan's proposed diversion and beneficial use of Colorado River water for the calendar year. A considerable amount of strategy is employed to determine which resources Metropolitan will dispatch and deliver to maximize use of the resources. Examples of issues that Metropolitan must consider when managing CRA resources include:

- the magnitude of the SWP Table A allocation, and the amount of Table A supply available to Metropolitan, DWA and CVWD;
- the amount of SWP surplus, turnback pool, and carryover water;
- the amount of ICS water that can be accessed;
- the amount of water in the DWA/CVWD advance delivery account; and,
- the Colorado River supply conditions and the projection of the likelihood of Lake Mead shortage, normal, and surplus conditions in future years.

Metropolitan is responsible for determining how, when and where to deliver any of the supply sources Metropolitan has that can be transported by the CRA. Metropolitan also uses the CRA to convey non-Metropolitan water to non-member agencies: the temporary emergency wheeling of Mexican Treaty Waters of the Colorado River for Tijuana. Given that the CRA can deliver water as a result of the execution of agreements apart from Metropolitan's 1930 contract for delivery of water, 1931 supplementary contract for delivery of water, 1946 contract merging the rights of the City of San Diego and Metropolitan, and 1987 contract for delivery of surplus flows from the Colorado River with the Department of the Interior, and that it is capable of delivering water to other water agencies , it is appropriate to consider the CRA as part of Metropolitan's interconnected regional delivery network. The volume of water delivered under arrangements, other than the contracts for delivery of water with the Department of the Interior, is also not determinative of the cost treatment; the ability to move *any* volume is what is relevant to the functionalization of Metropolitan's costs.

Metropolitan's Conveyance and Aqueduct and Distribution System form a single integrated system for all imported water, which is available to Metropolitan for the conveyance of SWP and CRA water, as well as water supply obtained from supply programs and other water transfers. Metropolitan's rights and ownership of the facilities create regional system flexibility to maintain operating flexibility and delivery flexibility and meet Metropolitan's mission as a public steward of water resources. Metropolitan's member agencies and all residents of Metropolitan's service area benefit from the integration of the SWP and CRA as Metropolitan's Conveyance and Aqueduct facilities, as it allows Metropolitan to meet varying regional demands, accommodate outages, manage water quality goals, maintain emergency storage reserves, and minimize the risk of invasive species infestation.

The treatment of Metropolitan's Conveyance and Aqueduct facilities as one integrated system for purposes of rate-setting is not uncommon or novel. The Federal Energy Regulatory Commission (FERC), for example, recognizes the practice of rolling the costs of transmission facilities into a single rate when the facilities are part of an integrated system. The practice is recognized regardless of legal ownership of (or entitlements in) a particular facility.

Benefits

The SAR benefits include: (1) support of a regional approach; (2) accommodates a water transfer market that does not unfairly advantage one user over another; (3) provides a clear linkage between costs and benefits; and (4) establishes a simple approach to recovering the costs of conveyance and distribution functions.

The SAR supports a regional approach through the uniform, postage stamp rate. This region-wide funding mechanism helps ensure economies of scale and low costs for all of Metropolitan's member agencies.

The SAR is a cost-based rate. By providing a non-discriminatory rate to all parties that wish to use available system capacity to move water anywhere in the Metropolitan service area, the uniform SAR creates the opportunity for a fair and efficient water transfer market to develop. In keeping with the spirit of a regional provider approach, the SAR is uniform throughout the service area. Member agencies that receive full service water from Metropolitan will pay the exact same cost for access to the system as a customer that obtains supply from another supply source.

Metropolitan charges member agencies receiving full service water from Metropolitan the same costs for system access as it charges a party receiving wheeling service. Charging all users the same price for access to essential facilities is a basic principle of regulatory economics. The SAR provides a clear linkage between costs and benefits. The cost of service process clearly identifies the costs that are recovered by the SAR. The service function revenue requirements for conveyance and aqueduct and distribution are identified and then allocated into commodity (average use), demand (peak use), and standby (emergency and available capacity) related costs.

Only commodity-related costs are allocated to the SAR. The SAR is an easily understood approach. The SAR is a uniform, volumetric per acre-foot rate and is straightforward for both Metropolitan and the member agencies to implement and administer.

Water Stewardship Rate (WSR)

The WSR is a volumetric, system-wide rate charged on each acre-foot of water that moves through the Metropolitan system. The WSR will increase to $52 per acre-foot in 2017 primarily due to higher Demand Management Programs costs and no funds in the Water Stewardship Fund to use to mitigate the rate impact. The WSR increases to $55 per acre-foot in 2018, primarily due to higher Demand Management costs and lower draws from Reserves. The WSR recovers the costs of providing financial incentives for existing and future investments in local resources including conservation and recycled water. These incentive payments are identified as the Demand Management service function in the cost of service process. Demand management costs are allocated as 100 percent fixed commodity costs. All system users (member agency or third parties) will pay the same proportional costs for existing and future conservation and recycling investments.

Benefits

The WSR provides significant benefits including (1) support of a regional approach, and (2) providing a dedicated source of funding for the development of local resources.

Investments in conservation, recycling, and groundwater recovery reduce and defer system capacity expansion and maintenance costs; create available space in Metropolitan's networked conveyance system to be used to complete water transfers; decrease the region's overall dependence on imported water supplies from environmentally sensitive areas like the Bay-Delta; and increase the overall level of water supply reliability in Southern California. Because conservation measures and local resource investments reduce the overall level of dependence on the imported water system, more capacity is available in existing facilities for a longer period of time. The space in the system made available by conservation and recycling is open to all system users. The deferral and reduction of facility expansion costs made possible by investments in conservation, recycling and groundwater recovery benefit all users of conveyance and distribution capacity in the same proportion through a lower uniform System Access Rate. Similar to the public benefit charges implemented in the electric and natural gas industries in California after "open access" (customer choice of supplier) was implemented, the regional and statewide benefits of demand management are assessed to all users of the Metropolitan system, regardless of the source of the imported water supply.

The benefits of Demand Management Programs are recognized by section 130.5 of the MWD Act, enacted by SB 60 (Stats. 1999, ch. 414), which requires Metropolitan to "place increased emphasis on sustainable, environmentally sound, and cost-effective water conservation, recycling, and groundwater storage and replenishment measures." Because Metropolitan is mandated under SB 60 to fund Demand Management Programs like conservation and recycling, it is appropriate to recover the costs of supporting these programs on all water moved through the system.

Demand Management Program costs are not supply costs. Supply costs reflect Metropolitan's costs of supplies, facilities and programs that develop supplies that Metropolitan is then able to move through its conveyance and Distribution System and sell to its member agencies to generate revenue. Examples include the Delta Water Charge on the SWP (both Capital and Operations and Maintenance costs), Metropolitan's Central Valley Storage Programs, water transfers, and projects and programs to create Intentionally Created Surplus on the Colorado River. Demand Management Programs do not produce supplies that Metropolitan is able to move through its conveyance and Distribution System and sell to generate revenue. In fact, Metropolitan's Demand Management Programs result in a reduction in demand for imported water supplies. It is this reduced demand that defers or avoids capital costs to build, expand, or maintain conveyance and distribution facilities. Notably, although Metropolitan has been able to defer the need to build additional conveyance and distribution facilities as a result of Demand Management Programs, it has not reduced the water *supply* Metropolitan receives from either the SWP or the CRA. Metropolitan continues to take delivery of the full amounts of imported water supplies available, and in years when supplies exceed demands Metropolitan maintains storage programs to retain its full available entitlements for future dry years.

Without investments in Demand Management Programs such as conservation and recycling, Metropolitan would have to build and maintain additional system capacity and charge a higher System Access Rate to recover the cost of this additional capacity. If Metropolitan did not levy the Water Stewardship Rate on all system users, Metropolitan would be sending a signal that encourages local agencies to seek out third party water transfers to avoid the cost of investments in conservation and local resources. Such a signal would have the perverse result of encouraging greater dependence on imported water supplies, which is the very outcome that legislative mandates have sought to avoid. In addition, greater dependence on imported water supplies could move forward the need to expand system capacity, thereby increasing costs to all member agencies purchasing imported water.

Because of the regional benefits conferred on all system users by investments in conservation and local resources, all users of Metropolitan's conveyance and distribution system pay the Water Stewardship Rate. The reliability benefits provided by regional investments in conservation and local resources are shared by all member agencies. The benefits of a reliable supply produced by the local resource investment are shared among all the member agencies by reducing member agency demands for imported water which can then be stored for use during other years when supplies may be low, demands are high, or emergencies or events impinge on operations.

System Power Rate (SPR)

The SPR is a volumetric, system-wide rate charged on each acre-foot of Metropolitan supplies moving through the Metropolitan system. SPR would decrease to $124 per acre-foot in 2017, primarily due to lower State Water Contract power costs as the result of favorable wholesale market prices for natural gas to run natural gas-fired generation and a favorable market for renewable power contracts. The SPR would then increase to $132 per acre-foot in 2018, due to higher State Water Contract power costs and higher CRA supplemental power purchases. The SPR is a volumetric rate that recovers the costs of pumping water to Southern California. The SPR recovers the cost of power for both the SWP and CRA.

Wheeling parties pay for actual cost (not system average) of power needed to move the water. Member agencies engaging in wheeling transaction of up to one year pay the wheeling rate. Other wheeling transactions are pursuant to individual contracts. For example, water wheeled through the California Aqueduct would pay the variable power cost associated with using the SWP transportation facilities.

Benefits

The primary benefit of the SPR is that it clearly identifies Metropolitan's average cost of power.

Treatment Surcharge

The Treatment Surcharge is a system-wide volumetric rate charged on water treated by Metropolitan. The Treatment Surcharge recovers the cost of providing treated water service, including commodity, demand and standby-related costs as determined in the COS for all five treatment plants. The Treatment Surcharge would decrease to $313 per acre-foot in 2017, due to lower PAYGo to fund the CIP and lower capital and O&M costs attributed to treatment through more accurate functionalization of costs. The Treatment Surcharge would then increase to $320 per acre-foot in FY 2018, due to lower draws from Reserves.

Treatment Fixed Charge Option

A proposal for a fixed Treatment charge has been provided to the Board. The proposal is COS-based, as it uses the information from Metropolitan's COS to identify the costs allocated to Fixed Demand and Fixed Standby that could be recovered through a fixed charge. The proposal aligns the fixed charge with the service commitment and investment Metropolitan has made in the capacity and treatment processes at its five treatment plants. A fixed charge would ensure that a portion of Metropolitan's treatment costs, of which 91 percent are fixed, were covered regardless of volumes sold, improving revenue stability.

The proposed fixed treatment charge would recover the Fixed Demand and Fixed Standby costs, which are approximately 38 percent of the Treatment Revenue Requirement in FY 2016/17 and FY 2017/18, or $97.5 million and $101.7 million in total, respectively.

The remaining Treatment Revenue Requirement, approximately 62 percent, would be recovered through a volumetric rate of $195 per acre-foot effective January 1, 2017 and $197 per acre-foot effective January 1, 2018.

Options for developing fixed charges include:

- Two fixed charges. The first is apportioned to member agencies based on the average treated water sales by member agency for the most recent ten fiscal years (ten-year rolling average) and recovers the Fixed Standby allocated costs. The second is apportioned to member agencies based on the maximum summer day treated demand on the treatment plants between May 1 and September 30 for a three-calendar year period, calculated for each member agency, and recovers the Fixed Demand allocated costs. The calculation is non-coincident, meaning the peak day will differ for each member agency.
- A fixed charge that is apportioned to member agencies based on the higher of the average treated water sales by member agency for fiscal years 1998 through 2007, or the most recent ten fiscal years (ten-year rolling average). This proposal would maintain a minimum amount for each member agency on a go-forward basis. This fixed charge would recover the combined Fixed Standby allocated costs and Fixed Demand allocated costs in one fixed charge.

The consultant report supporting the methodology to address a treated water fixed charge is included in Attachment 1.

Benefits

There are several primary benefits provided by the treatment surcharge. First, only treated water users pay for the costs of treatment. Second, by averaging the costs of providing treated water service over the entire system the regional economies of scale are preserved.

Capacity Charge

The Capacity Charge would decrease to $8,000 per cubic-foot-second of capacity during calendar year 2017. The decrease is due to the decrease in PAYGo funding of the CIP and lower peak demands on the system. The Capacity Charge would increase to $8,700 per cubic-foot-second of capacity during calendar year 2018, due to lower draws on Reserves. The Capacity Charge is charged on the maximum summer day demand placed on the distribution system between May 1 and September 30 for a three-calendar year period, calculated for each member agency. The calculation is non-coincident, meaning the peak day will differ for each member agency. The sum of the member agency non-coincident peak day is a proxy for peak week demands, which is the design criteria for the Metropolitan Distribution system. The three-year period ending December 31, 2015 is used to charge the Capacity Charge effective January 1, 2017 through December 31, 2017. Demands measured for the purposes of billing the Capacity Charge include all firm demands including wheeling service and exchange.

The Capacity Charge is intended to pay for the cost of peaking capacity on Metropolitan's Distribution System, while providing an incentive for local agencies to decrease their use of the Metropolitan system to meet peak demands and to shift demands into lower use time periods particularly October through

April. Over time, a member agency will benefit from local supply investments and operational strategies that reduce its peak demand on the system in the form of a lower total Capacity Charge. The estimated Capacity Charge to be paid by each member agency in calendar year 2017 is included in Schedule 19.

Benefits

The Capacity Charge provides several benefits including: (1) increasing the overall efficiency of water use; (2) improving the fair allocation of costs among member agencies based upon the demand imposed by each agency; and (3) providing a source of fixed revenue.

The Capacity Charge will improve the overall efficiency of water use by encouraging local agencies to invest in cost effective local storage and resources to avoid using the Metropolitan system to meet peak day demands. In addition, significant regional savings can be realized through the deferral of expensive capacity expansion.

Schedule 21: Capacity Charge (by member agency)

Calendar Year 2017 Capacity Charge					
	Peak Day Demand (cfs) (May 1 through September 30) Calendar Year				Rate ($/cfs): $8,000
AGENCY	2013	2014	2015	3-Year Peak	Calendar Year 2017 Capacity Charge
Anaheim	31.3	34.0	33.7	34.0	$272,000
Beverly Hills	30.8	30.6	25.5	30.8	$246,400
Burbank	19.7	22.6	10.0	22.6	$180,800
Calleguas	228.7	240.8	175.5	240.8	$1,926,400
Central Basin	73.6	61.0	51.4	73.6	$588,800
Compton	2.9	0.0	0.1	2.9	$23,200
Eastern	262.1	239.4	177.2	262.1	$2,096,800
Foothill	18.9	19.9	14.9	19.9	$159,200
Fullerton	20.0	22.2	15.3	22.2	$177,600
Glendale	44.9	43.7	33.2	44.9	$359,200
Inland Empire	153.9	144.0	94.8	153.9	$1,231,200
Las Virgenes	43.2	46.1	42.8	46.1	$368,800
Long Beach	66.9	67.8	61.3	67.8	$542,400
Los Angeles	767.1	782.5	600.9	782.5	$6,260,000
MWDOC	379.4	443.1	293.0	443.1	$3,544,800
Pasadena	52.5	48.5	36.9	52.5	$420,000
San Diego CWA	967.4	1138.2	960.7	1,138.2	$9,105,600
San Fernando	4.9	0.0		4.9	$39,200
San Marino	6.1	7.3	4.7	7.3	$58,400
Santa Ana	19.6	17.5	15.6	19.6	$156,800
Santa Monica	22.7	15.2	11.7	22.7	$181,600
Three Valleys	178.6	152.8	108.1	178.6	$1,428,800
Torrance	34.1	33.5	28.2	34.1	$272,800
Upper San Gabriel	16.1	40.4	79.1	79.1	$632,800
West Basin	230.2	217.5	178.5	230.2	$1,841,600
Western MWD	197.7	179.7	137.7	197.7	$1,581,600
Total	**3,873.3**	**4,048.3**	**3,190.8**	**4,212.1**	**$33,696,800**

Totals may not foot due to rounding

The Capacity Charge also improves the equitable distribution of costs among the member agencies. Agencies that have relatively high peak to average ratios will bear a greater share of the costs of providing peak distribution capacity. The Capacity Charge also increases the portion of Metropolitan's fixed costs that are recovered by fixed charges.

Readiness-to-Serve Charge

The RTS recovers the costs providing emergency storage capacity and available capacity to meet outages and hydrologic variability. The RTS will decrease by $18 million to $135 million in calendar year 2017, due primarily to lower PAYGo which outweighs the increase in State Water Contract Transportation (conveyance) costs recovered by the RTS. The RTS increases to $140 million in calendar year 2018 due to lower draws from Reserves.

The RTS is allocated to the member agencies based on each agency's proportional share of a ten-year rolling average of all firm demands, including water transfers and exchanges that use Metropolitan system capacity. A ten-year rolling average leads to a relatively stable RTS allocation that reasonably represents an agency's potential long-term need for available capacity under different hydrologic conditions. Member agencies that so choose may have a portion of their total RTS obligation offset by Standby Charge collections collected by Metropolitan on behalf of the member agency. The estimated RTS for each member agency for calendar year 2015 is shown in Schedule 22.

Benefits

The RTS provides two major benefits. These include: (1) a better matching of costs and benefits; and (2) a SAR that recovers only those costs associated with providing average annual service.

The proposed RTS matches costs and benefits in two ways. First, the RTS will recover the amount of emergency storage and available capacity costs needed to maintain reliable deliveries during outages and service interruptions and during periods of hydrologic variability, as identified in the COS, that is not paid for by ad valorem property tax revenues. Second, the proposed RTS allocates the emergency storage and available capacity costs among the member agencies in a manner that better represents each agency's potential need for standby service. The RTS uses a ten-year rolling average of demands. A long-term rolling average like the ten-year measure is a simple and reasonable representation of an agency's potential need for available capacity under a range of hydrologic conditions.

Schedule 22: Readiness-to-Serve Charge (by member agency)

Calendar year 2017 RTS charge			
			Water rate $78.74/acre-foot
Member Agency	Rolling Ten-Year Average Firm Deliveries (Acre-Feet) FY2005/06 - FY2014/15	RTS Share	12 months @ $135 million per year (1/17-12/17)
Anaheim	20,890	1.22%	$ 1,644,773
Beverly Hills	11,386	0.66%	896,470
Burbank	12,817	0.75%	1,009,197
Calleguas MWD	109,124	6.36%	8,592,062
Central Basin MWD	51,539	3.01%	4,058,007
Compton	1,924	0.11%	151,513
Eastern MWD	98,628	5.75%	7,765,612
Foothill MWD	9,790	0.57%	770,791
Fullerton	9,668	0.56%	761,240
Glendale	19,594	1.14%	1,542,739
Inland Empire Utilities Agency	60,811	3.55%	4,788,020
Las Virgenes MWD	22,750	1.33%	1,791,215
Long Beach	34,316	2.00%	2,701,881
Los Angeles	312,096	18.20%	24,573,320
Municipal Water District of Orange County	221,545	12.92%	17,443,662
Pasadena	21,181	1.24%	1,667,686
San Diego County Water Authority	367,123	21.41%	28,905,959
San Fernando	82	0.00%	6,480
San Marino	931	0.05%	73,288
Santa Ana	12,605	0.74%	992,442
Santa Monica	9,252	0.54%	728,501
Three Valleys MWD	65,261	3.81%	5,138,444
Torrance	18,130	1.06%	1,427,500
Upper San Gabriel Valley MWD	22,143	1.29%	1,743,477
West Basin MWD	125,379	7.31%	9,871,876
Western MWD	75,617	4.41%	5,953,847
MWD Total	1,714,580	100.00%	$ 135,000,000

Totals may not foot due to rounding

Purchase Order

Purchase Orders were developed to establish a financial commitment from the member agency to Metropolitan in exchange for the ability to purchase more water at the lower Tier 1 Supply Rate. In November 2014, the Metropolitan Board approved new Purchase Orders effective January 1, 2015 through December 31, 2024. Twenty-one of the twenty-six member agencies have Purchase Orders, which commit the member agencies to purchase a minimum amount of supply from Metropolitan (the Purchase Order Commitment) over a ten-year period.

There is no annual minimum or maximum purchase commitment required by the Purchase Order. A member agency has the full ten-year term to fulfill the Purchase Order Commitment. In exchange for this commitment, the member agency can purchase an amount of firm water supply equal to 90 percent of its cumulative Base Period Demand over the full ten years at the lower Tier 1 Supply Rate. An agency that determined that a Purchase Order is not in its best interest may purchase up to 60 percent of its Revised Base Firm Demand annually at the lower Tier 1 Supply Rate. The terms and conditions of the Purchase Order are uniform for all member agencies.

The Base Period Demand was established for each member agency. Member agencies chose a base amount of (1) the member agency's Revised Base Firm Demand which is the highest fiscal year purchases during the 13-year period of fiscal year 1990 through fiscal year 2002, or (2) the highest year purchases in the most recent 12-year period of fiscal year 2003 through fiscal year 2014.

At the end of the Purchase Order Term, if the member agency has not purchased enough firm supply to meet its Purchase Order Commitment, it will be billed for the remaining balance of the Purchase Order Commitment at the average of the Tier 1 Supply Rate in effect during the Term. This payment may be prorated with interest evenly over the next 12 invoices.

If a member agency fulfills its Purchase Order Commitment prior to the end of the Purchase Order Term, (e.g. purchased ten times 60 percent of the Initial Base Period Demand) then the member agency has met its obligation under the Purchase Order. The member agency may continue to purchase up to 90 percent of its cumulative Base Period Demand over the Term at the Tier 1 Supply Rate for the duration of the Purchase Order Term.

Although the maximum amount of water that can be purchased at the Tier 1 Supply Rate may increase over time if the agency's Base Period Demand increases, the Purchase Order Commitment is fixed for the entire Purchase Order Term and does not increase.

Tier 1 Supply Rate

The Tier 1 Supply Rate is a volumetric rate charged on Metropolitan water sales that are within a member agency's Tier 1 maximum. The Tier 1 Supply Rate would increase to $201 per acre-foot in 2017, due to increasing State Water Contract Delta Charges and increased Supply Program costs. The Tier 1 Supply Rate would increase to $209 per acre-foot in 2018, due to increasing State Water Contract Delta Charges and increased Supply Program costs. The Tier 1 Supply Rate supports a regional approach through the uniform, postage stamp rate. The Tier 1 Supply Rate is calculated as the amount of the total supply revenue requirement that is not recovered by the Tier 2 Supply Rate divided by the estimated amount of Tier 1 water sales.

Tier 2 Supply Rate

The Tier 2 Supply Rate is a volumetric rate that reflects Metropolitan's cost of purchasing water transfers north of the Delta. The Tier 2 Supply Rate is charged on Metropolitan water sales that exceed a member agency's Tier 1 maximum. The Tier 2 Supply Rate encourages the member agencies and their customers to maintain existing local supplies and develop cost-effective local supply resources and conservation. The Tier 2 Supply Rate would increase to $295 per acre-foot in 2017 and remain at $295 per acre-foot in 2018. At an expected average sales level of 1.7 million acre-feet in both fiscal years, it is estimated that no supply will be sold at the Tier 2 Supply Rate in either fiscal year.

Benefits

The use of the Tier 2 Supply Rate provides several benefits including, efficient resource management and clear price signals to accommodate a water transfer market. By pricing supplies that exceed 90 percent of a member agency's Base demand at a price reflecting Metropolitan's supply cost, a price incentive exists to encourage efficient regional resource management. Member agencies will be encouraged to invest in cost-effective conservation measures and local resources like water recycling. Metropolitan has

historically set its water rates with the primary objective of recovering cost. The Tier 2 Supply Rate is a pricing tool designed specifically for the purpose of creating a greater incentive for member agencies to make economic resource management decisions.

The Tier 2 Supply Rate will reflect Metropolitan's cost of acquiring transfers from north of the Delta. In so doing, Metropolitan will be competing in the water transfer market along with other providers of imported water supplies. If other providers of imported supply can develop additional supply at a lower cost than Metropolitan's Tier 2 Supply Rate, the water transfer market will expand to meet the region's increasing demands. All users of the Metropolitan system will pay the same for access to conveyance and distribution capacity through the SAR and for the benefits of the regional Demand Management Programs through the WSR.

Sales

Staff estimates of water sales used for developing the rate recommendation were based on current member agency demands and information and an expectation that demands will trend to levels expected under normal weather conditions. Table 18 summarizes projected water sales by service type for FY 2016/17 and FY 2017/18.

Table 18: FY Sales, by Type

Fiscal Year Ending	2017	2018
Sales and Exchange by Treatment Type		
Treated Firm Sales	822	826
Untreated Firm Sales	698	679
Untreated Exchange	180	195
Total Sales and Exchange	**1,700**	**1,700**
Firm Sales by Type		
Tier 1	1,520	1,505
Tier 2	-	-
Total Firm Sales	**1,520**	**1,505**

ATTACHMENT 1: Treated Water Fixed Charge Technical Paper

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Treated Water Cost Recovery Alternatives

March 14, 2016

RAFTELIS
FINANCIAL CONSULTANTS, INC

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March 14, 2016

Ms. June Skillman
Budget and Financial Planning Manager
Metropolitan Water District of Southern California
700 North Alameda Street
Los Angeles, CA 90012 - 2944

Subject: Treated Water Cost Recovery Alternatives

Dear Ms. Skillman,

Raftelis Financial Consultants, Inc. (RFC) is pleased to provide this report detailing our study of and recommendations for treated water cost recovery and for alternatives to the current treated water surcharge used by the Metropolitan Water District of Southern California (Metropolitan).

This report summarizes RFC's key findings and discusses the methodologies we utilized to develop our recommendations. It has been a pleasure working with you and other members of the Metropolitan Staff. Thank you for the support provided during the course of this study.

Sincerely,

RAFTELIS FINANCIAL CONSULTANTS, INC.

Richard D. Giardina, CPA
Executive Vice President

John Wright, CPA
Senior Consultant

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SECTION 1: INTRODUCTION

1.1 PURPOSE OF THE CONSULTING ENGAGEMENT

On October 26, 2015, the Metropolitan Water District of Southern California (Metropolitan) engaged Raftelis Financial Consultants, Inc. (RFC) to develop potential alternatives and recommend, as appropriate, changes to Metropolitan's existing treated water surcharge which is currently assessed as a 100% volumetric rate per acre foot (AF) of treated water purchases by a member agency. The primary objective of the study was to identify and analyze alternative treated water cost recovery mechanisms that:

- Comply with industry standard cost of service principles
- Better align treated water cost recovery from member agencies with service commitments and treated water infrastructure capital investments made by Metropolitan
- Achieve a level of fixed revenue recovery that does not vary with treated water sales

1.2 BOARD/MEMBER AGENCY PRESENTATIONS

RFC made three separate presentations at Metropolitan on potential modifications to the treated water rate design. These presentations were made at the:

- Member Agency Manager's Meeting: January 15, 2016
- Finance and Insurance Committee Meeting: February 23, 2016
- Finance and Insurance Committee Meeting: March 7, 2016

Copies of the presentation materials are included in Attachment A to this report.

SECTION 2: EXISTING TREATED WATER SURCHARGE

2.1 TREATED WATER SURCHARGE REVENUE REQUIREMENT

The existing structure of the treated water surcharge, along with all of Metropolitan's existing rates, was first implemented in January 2003, after an extensive strategic planning process that culminated in the development of Rate Structure Framework. Metropolitan's treatment function cost includes capital financing, operating, maintenance and overhead costs for its five treatment plants and is considered separately from other system or functional costs so that separate rates for treated water service may be developed. The fiscal year (FY) 2016-2017 treated water net revenue requirement is $257 million as shown in Table 1.

Table 1: FY 2016-2017 Treated Water Revenue Requirement Components ($ Millions)

Cost	Revenue Requirement	Percent of Total
Direct O&M at Water Treatment Plants	$59	23%
Indirect O&M (Water System Operations, IT, Eng., HR)	46	18%
Administrative and General (Legal, Finance, Audit, Ethics)	30	12%
Capital Costs (Debt Service, PAYGO Capital)	140	54%
LESS: Revenue Offsets / Decline in Reserves	-18	-7%
Total Net Revenue Requirement	**$257**	**100%**

2.2 TREATED WATER SURCHARGE COST ALLOCATIONS

The cost components presented in Table 1 above are allocated to specific cost parameters as part of Metropolitan's comprehensive cost of service study process. These specific cost parameters are:

- **Fixed Demand Costs** are fixed capital costs associated with debt service and rate-financed capital investments incurred to provide treatment capacity available to meet treated water peak demands.

- **Fixed Standby Costs** are fixed capital costs associated with debt service and rate-financed capital investments incurred to provide standby treatment services.

- **Fixed Commodity Costs** include treated water operations and maintenance and capital financing costs that are not related to meeting peak demands or standby service costs.

» **Variable Commodity Costs** are costs such as chemicals and electric power costs that tend to vary directly with the volume of water supplied.

Table 2 presents the actual allocation of the FY 2016-2017 treatment revenue requirement to each specific cost parameter.

Table 2: FY 2016-2017 Treated Water Cost Allocations ($ Millions)

Cost Parameter	Revenue Requirement	% of Total
Fixed Commodity Costs	$135	53%
Fixed Capital Costs		
Fixed Demand	41	16%
Fixed Standby	57	22%
Total Fixed Capital Costs	98	38%
Total Fixed Costs	233	91%
Variable Costs	24	9%
Total Net Revenue Requirement	**$257**	**100%**

2.3 TREATED WATER SURCHARGE RATE DESIGN

The cost allocation process shown in Table 2 notwithstanding, Metropolitan recovers its entire treatment revenue requirement via a volumetric rate per AF. The units of service used in the rate calculation are the forecasted test-year (FY 2016 – 2017) treated water sales to member agencies, expressed on an AF basis – 822,000 AF. The forecasted test-year water sales of 822,000 AF was allocated to each member agency based on the percentage of actual water purchases by member agencies for FY 2014 – 2015. Table 3 illustrates the Treated Water Surcharge calculation for the FY 2016 - 2017 test year – $313 per AF.

Table 3: FY 2016-2017 Treated Water Surcharge Rate Calculation

Description	Amount
Treated Water Net Revenue Requirement	$257,479,354
Forecasted Treated Water Sales (AF)	822,000
Treated Water Surcharge ($/AF)	$313

Table 4 shows the hypothetical treated water surcharge for each Metropolitan member agency for test-year FY 2016-2017 under the existing treatment surcharge (referred to as "Status Quo" in Table 4 and throughout the balance of this report). These revenue requirement estimates have been termed as being "hypothetical" because the illustrated revenue requirement outcomes are based on estimates of member agency treated water purchases. Actual FY 2016-2017 treated water purchases may differ from those shown in Table 4.

Table 4: FY 2016-2017 Member Agency Treated Water Revenue Requirement

FY 2016/17 Status Quo Treatment Surcharge (100% Volumetric) (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)						
Member Agency	Projected Test Year Treated Water Sales AF	 %	x	Total Revenue Requirement	=	Member Agency Revenue Requirement
Anaheim	3,947	0.48%	x	$257,479,354	=	$1,236,208
Beverly Hills	10,212	1.24%	x	257,479,354	=	3,198,735
Burbank	6,354	0.77%	x	257,479,354	=	1,990,241
Calleguas	88,943	10.82%	x	257,479,354	=	27,860,023
Central Basin	27,937	3.40%	x	257,479,354	=	8,750,956
Compton	0	0.00%	x	257,479,354	=	87
Eastern	53,248	6.48%	x	257,479,354	=	16,679,159
Foothill	7,461	0.91%	x	257,479,354	=	2,337,078
Fullerton	7,639	0.93%	x	257,479,354	=	2,392,937
Glendale	15,693	1.91%	x	257,479,354	=	4,915,618
Inland Empire	0	0.00%	x	257,479,354	=	0
Las Virgenes	20,314	2.47%	x	257,479,354	=	6,362,979
Long Beach	42,391	5.16%	x	257,479,354	=	13,278,470
Los Angeles	61,097	7.43%	x	257,479,354	=	19,137,588
MWDOC	141,285	17.19%	x	257,479,354	=	44,255,500
Pasadena	17,238	2.10%	x	257,479,354	=	5,399,667
San Diego CWA	97,266	11.83%	x	257,479,354	=	30,467,286
San Fernando	92	0.01%	x	257,479,354	=	28,723
San Marino	673	0.08%	x	257,479,354	=	210,923
Santa Ana	4,929	0.60%	x	257,479,354	=	1,543,796
Santa Monica	3,920	0.48%	x	257,479,354	=	1,227,816
Three Valleys	36,641	4.46%	x	257,479,354	=	11,477,206
Torrance	14,919	1.81%	x	257,479,354	=	4,673,233
Upper San Gabriel	8,350	1.02%	x	257,479,354	=	2,615,453
West Basin	103,936	12.64%	x	257,479,354	=	32,556,355
Western MWD	47,515	5.78%	x	$257,479,354	=	$14,883,317
TOTAL	822,000	100.00%				$257,479,354
				Unit Cost per AF		$313

2.4 DECLINING WATER SALES AND THE EXISTING SURCHARGE

As part of Metropolitan's fundamental mission, it must stand ready to meet the treated water base load, peak load, and emergency standby demands of its 26 member agencies. This includes member agencies who, due to a variety of reasons including the development of their own local treated water supplies, have significantly reduced their annual treated water purchases from Metropolitan. To fulfill this mission Metropolitan in fact made significant investments in treatment capacity based on the actual demands of the member agencies. As shown in Figure 1, Metropolitan

increased its installed water treatment capacity from approximately 3,000 cubic feet per second (cfs) in 1995 to 4,000 cfs in 1997. This increase in water treatment plant capacity was entirely appropriate given that member agency annual non-coincident peak demands during the period of approximately 2003 - 2007 equaled or exceeded 3,000 cfs.

Metropolitan has invested in the water treatment capacity to serve the demands of ***all*** member agencies ***regardless*** of the amount of treated water they purchase in any given year. Unfortunately, due to the 100% volumetric nature of the existing treated water surcharge, many member agencies do not necessarily pay their ***proportionate share*** of Metropolitan water treatment costs. In a retail service arrangement the customer base is largely if not entirely "captive", i.e., without service provider options. Such a service relationship (retail service) is less likely to result in the magnitude of under-utilized capacity that Metropolitan has experienced.

In Metropolitan's situation many member agencies have treated water alternatives and have exercised these options. This, in combination with a 100% volumetric treated water cost recovery mechanism, results in the current misalignment in the service provided and revenues collected across the 26 member agencies. If this situation persists, Metropolitan may have no option but to reduce the treated water service commitment it provides to member agencies from the perspective of both peak demand and emergency standby capacity. This could potentially entail the decommissioning of significant amounts of "stranded" water treatment assets. This will raise even more complex questions regarding how the unrecovered costs of stranded water treatment assets should be apportioned among member agencies.

A simple example for a hypothetical member agency illustrates this cost recovery dilemma. Assume that Metropolitan invested in additional treatment plant capacity in 2006 based, at least in part, on a demand forecast from a member agency indicating that their treated water purchases would increase from 50,000 AF in 2006 to 100,000 AF in 2017 and that Metropolitan invests in treatment capacity to meet this demand. If the member agency's demand forecast was perfectly accurate and they purchase 100,000 AF of treated water in 2017, the member agency will make a proportionate contribution to the recovery of the Metropolitan's water treatment costs.

Now assume that after Metropolitan has invested in capacity, the member agency purchases only 50,000 AF from Metropolitan in 2017. In this situation, the member agency would not be making a proportionate contribution to the recovery of the costs Metropolitan incurs to maintain 100,000 AF of water treatment capacity for the member agency. The resulting cost recovery shortfall must be borne by other member agencies who continue to purchase all, or at least the vast majority, of their required treated water supplies from Metropolitan.

This situation creates a misalignment between the recovery of costs from member agencies and the investments in treated water capacity made by Metropolitan to maintain the service commitment embodied in its organizational mission (i.e., to stand ready to meet the base load, peak load, and emergency standby demands of member agencies). Under the existing 100% volumetric treated water surcharge, as the number of member agencies bypass the Metropolitan treated water system

this misalignment will only worsen. Specifically, the cost of water treatment capacity built to serve all member agencies will increasingly and disproportionally be borne by the limited number of member agencies who remain on Metropolitan's treated water system.

The magnitude of the long-term decline in Metropolitan's treated water demands is shown in Figure 1. This figure compares actual member agency treated water purchases from Metropolitan, expressed on an annual average and summer non-coincident peak day basis, to projected treated water peak demands developed in Metropolitan's 1996 Integrated Resource Plan (IRP). As show in Figure 1, actual member agency treated water purchases have declined significantly since approximately 2007 and are far below the forecast treated water sales in Metropolitan's 1996 IRP.

Figure 1: Comparison of Forecast vs. Actual Treated Water Sales

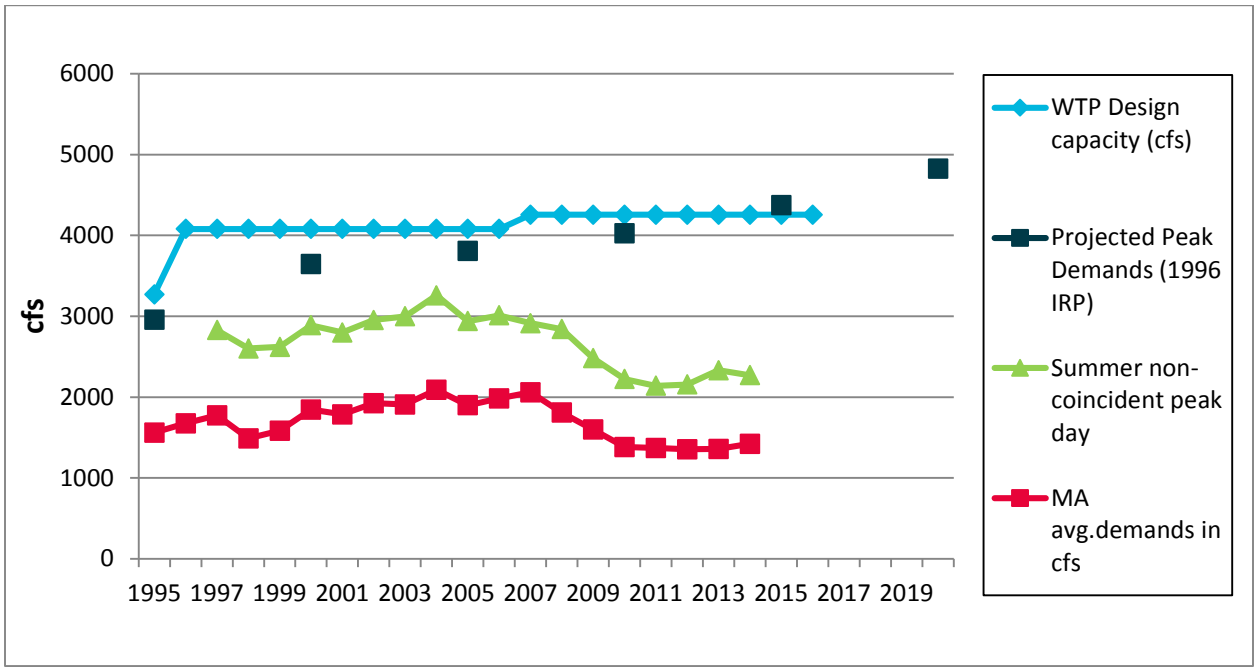
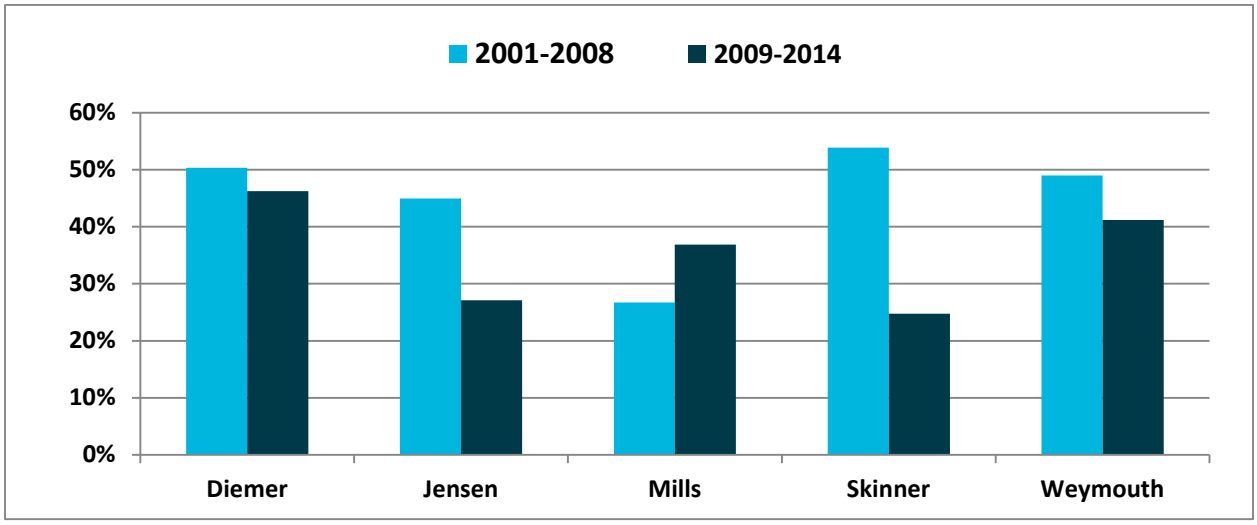


Figure 2 demonstrates the level of excess capacity at Metropolitan's existing water treatment plants due to the long-term decline in Metropolitan treated water sales. The figure compares the Metropolitan treatment plant capacity factors, expressed as the ratio of actual demand to installed capacity, during the period 2001 - 2008 vs. the period 2009 - 2014. As shown in Figure 2, capacity factors at Metropolitan's Jensen and Skinner water treatment plants fell significantly during the period 2009 - 2014.

Figure 2: Water Treatment Plant Capacity Factors



SECTION 3: PROPOSED TREATED WATER SURCHARGE MODIFICATIONS

3.1 FIXED REVENUE RECOVERY VIA A MINIMUM CHARGE

As noted in Section 1.1., the primary objective of this project was to analyze potential alternative treated water rate designs featuring a minimum charge cost recovery mechanism that:

- Comply with industry standard cost of service principles
- Better align treated water cost recovery from member agencies with service commitments and treated water infrastructure capital investments made by Metropolitan
- Achieve a level of fixed revenue recovery that does not vary with treated water sales

RFC recommends the implementation of a treated water surcharge featuring the use of a minimum charge intended to achieve the above objectives. From a conceptual perspective, minimum charges are designed to ensure that the providers of wholesale utility services receive a level of fixed cost recovery to compensate them for the investments they make to construct and maintain a specific level of system capacity *regardless of the actual demands imposed by customers in any given year*. For example, the implementation of a minimum charge as part of Metropolitan's treated water surcharge would allow Metropolitan to receive a level of fixed cost recovery even as treated water sales decline from year-to-year. Stated differently, the use of a minimum charge can serve to have those member agencies for whom treatment capacity was built, pay for that capacity whether or not they use it.

Minimum charges can be implemented in a variety of ways. Perhaps the most common approach is through the use of "take-or-pay" contracts that require the customers of wholesale utility service providers to pay for a specific minimum level of service regardless of their actual water demands. Essentially minimum and take-or-pay approaches are used to ensure that the customer pays for the capacity that was specifically built to serve them. In this way, costs are recovered in a proportional and fully equitable manner from all customers. Specifically, both the current demand-related variable costs customers impose on the wholesale provider's system are recovered. Also recovered are the long-term fixed costs they cause the wholesale service provider to incur through the construction of capacity-related assets specifically designed to meet there actual and/or forecast demands.

As part of this consulting engagement RFC surveyed the wholesale service providers listed in Table 5. Each of these service provides featured the use of some form of fixed revenue recovery as part of their wholesale rate structures as do, in RFC's experience, most wholesale providers. Metropolitan with its 100% volumetric treated water surcharge, is certainly an exception in how it recovers its fixed capacity-related costs from the member agencies.

Table 5: Wholesale Water Service Providers Surveyed by RFC

Massachusetts Water Resource Authority, MA	Great Lakes Water Authority, MI
North Texas Municipal Water District, TX	Jordon Valley Water Conservancy District, UT
Upper Trinity Regional Water District, TX	Dallas Water Utilities, TX
San Francisco Public Utilities Commission, CA	Portland Water Bureau, OR

3.2 KEY INPUTS: MINIMUM CHARGE RATE DESIGN PROCESS

To develop a minimum charge-based rate design, two key inputs must be determined. They are the units of service associated with the minimum charge and specific cost components and/or the level of fixed revenue recovery to be obtained from the minimum charge.

Determination of Minimum Charge Units of Demand: The first critical rate design input is the determination of the units of demand for the minimum purchase amount. RFC believes the appropriate method for establishing this minimum purchase amount for Metropolitan's revised treated water surcharge is to compare the average of actual direct treated water sales made to each member agency during the 10-year period 1998 - 2007 to the most recent 10-year rolling average of treated water sales (TYRA). The *greater* of these two amounts is then selected to establish the units of service used in the determination of the fixed charge.

RFC selected the 10-year period 1998 - 2007 as part of the minimum charge units of service determination because in 2007, Metropolitan made its last significant investment in water treatment plant capacity. This addition of 110 MGD for module 7 at the Skinner water treatment plant was made by Metropolitan in response to both the actual demands of the member agencies and the demand forecasts developed as part of 1996 IRP process (see Figure 1). It is clear from Figure 1 that up to approximately 2007 there was a strong link or connection between member agency water purchases and Metropolitan's capacity to meet those demands.

As noted previously, Figure 1 clearly shows that Metropolitan increased its installed water treatment capacity from approximately 3,000 cfs in 1995 to 4,000 cfs in 1997. This increase in water treatment plant capacity was clearly appropriate given that member agency annual non-coincident peak demands during the period of approximately 2003 - 2007 equaled or exceeded 3,000 cfs. The 1996 IRP demand forecasts could not have anticipated the widespread development of local treated water supplies by member agencies and other factors that may have contributed to the reduction in treated water sales to member agencies. As a result, they (the demand forecasts) provide a direct rationale for why Metropolitan made investments to construct and maintain its existing level of water treatment plant capacity.

Figure 3 summarizes the 2-part test recommended by RFC to determine the minimum units of service needed for RFC's recommended treated water minimum methodology.

Figure 3: Determining Minimum Charge Units of Service

2-Part Test for Determining Fixed Charge Minimum Units of Demand for Each Member Agency

Greater of average annual AF:

1. Most recent or current TYRA of Treated Water Sales *OR*
2. Average of 1998 – 2007 Treated Water Sales*

*2007 was the last significant Metropolitan treatment plant capacity addition

Determination of the Amount of Fixed Revenue Recovery: The second critical rate design input in the determination of a minimum charge is the amount of fixed revenue recovery to be obtained via the minimum charge. RFC believes the appropriate level of fixed revenue recovery to be obtained from a treated water minimum charge is the sum of water treatment fixed demand and fixed standby costs. As noted in Section 2.2, these two cost parameters reflect the fixed capital associated with debt service and rate-financed capital investments incurred to meet Metropolitan's peak demand and standby capital cost requirements. For FY 2016-2017, they total approximately $98 million, or 38% of Metropolitan's total $257 million treated water revenue requirement (see Table 2 in Section 2.2).

Under RFC's proposal, the net remaining treated water revenue requirement of approximately $160 million, or approximately 62% will continue to be recovered based on the current volumetric $/AF rate based on the forecast of member agency test-year direct treated water sales. Figure 4 illustrates this proposed cost recovery spilt.

Figure 4: Proposed Treated Water Revenue Recovery Percentages

- **Volumetric Revenue Recovery = 62%**

$$\frac{Revenue\ Requirement}{Treated\ Water\ Sales} = \$/AF\ Volumetric\ Rate$$

- **Fixed Revenue Recovery = 38%**

$$Revenue\ Requirement * Proportional\ Demand = \$\ Annual\ Fixed\ Charge$$

3.3 DETAILED CALCULATION OF RFC'S PROPOSED MINIMUM CHARGE

Table 6 shows the calculation of the current 100% volumetric treated water surcharge (the Status Quo Surcharge) followed by the revised components under RFC's proposal to incorporate a fixed charge/minimum charge.

Table 6: Calculation of RFC's Proposed Treated Water Surcharge

Status Quo Treatment Surcharge ($/AF)	
Total Treatment Revenue Requirement	$257,479,354
Forecast Treated Water Sales (AF) - See Table 4 in Section 2.3	822,000
Treated Surcharge ($/AF)	$313
Treatment Fixed Annual Charge ($/AF) - 38% Revenue Recovery	
Fixed Demand	$40,822,844
Fixed Standby	56,724,561
Total Fixed Charge Revenue Requirement	$97,547,405
% of Total Revenue Requirement	37.9%
Fixed Charge Units of Service (AF) - See Table 7	1,341,701
Annual Fixed Charge ($/AF)	$73
Treatment Volumetric Rate ($/AF) - 62% Revenue Recovery	
Net Remaining Revenue Requirement	$159,931,949
% of Total Revenue Requirement	62.1%
Forecast Treated Water Sales (AF) - See Table 4 in Section 2.3	822,000
Volumetric Rate ($/AF)	$195

Table 7 shows the member agency revenue requirement impacts associated with RFC's proposed minimum charge calculation and the units of demand referenced in Table 6 above. On Table 7 RFC has highlighted in yellow the acre-feet value (the units of service) that is used in the determination of each member agency's proportionate share of the Fixed Charge Revenue Requirement.

Table 7: Minimum Charge Revenue Requirement

FY 2016/2017 Member Agency Fixed Charge Revenue Requirement (38% Revenue Recovery) (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)								
Member Agency	Average 1998 - 2007 Treated Water Sales (AF)	TYRA 2006 - 2015 Treated Water Sales (AF)	Units Used in Fixed Charge Calculation	% of Total	x	Total Fixed Charge Revenue Requirement	=	Member Agency Annual Fixed Revenue Requirement
Anaheim	13,134	12,126	13,134	0.98%	X	$97,547,405	=	$954,911
Beverly Hills	13,008	11,386	13,008	0.97%	x	97,547,405	=	945,725
Burbank	12,816	10,089	12,816	0.96%	x	97,547,405	=	931,758
Calleguas	112,585	114,712	114,712	8.55%	x	97,547,405	=	8,340,091
Central Basin	67,191	46,198	67,191	5.01%	x	97,547,405	=	4,885,071
Compton	3,514	1,924	3,514	0.26%	x	97,547,405	=	255,451
Eastern	73,423	73,323	73,423	5.47%	x	97,547,405	=	5,338,173
Foothill	11,623	9,933	11,623	0.87%	x	97,547,405	=	845,074
Fullerton	11,513	11,072	11,513	0.86%	x	97,547,405	=	837,031
Glendale	25,094	19,585	25,094	1.87%	x	97,547,405	=	1,824,421
Inland Empire	0	0	0	0.00%	x	97,547,405	=	0
Las Virgenes	22,106	22,810	22,810	1.70%	x	97,547,405	=	1,658,376
Long Beach	44,267	36,397	44,267	3.30%	x	97,547,405	=	3,218,416
Los Angeles	79,762	87,950	87,950	6.56%	x	97,547,405	=	6,394,377
MWDOC	244,203	204,975	244,203	18.20%	x	97,547,405	=	17,754,580
Pasadena	21,779	21,181	21,779	1.62%	x	97,547,405	=	1,583,398
San Diego CWA	251,381	156,458	251,381	18.74%	x	97,547,405	=	18,276,450
San Fernando	387	206	387	0.03%	x	97,547,405	=	28,135
San Marino	1,041	931	1,041	0.08%	x	97,547,405	=	75,664
Santa Ana	15,788	13,331	15,788	1.18%	x	97,547,405	=	1,147,853
Santa Monica	12,627	9,252	12,627	0.94%	x	97,547,405	=	918,014
Three Valleys	49,467	41,833	49,467	3.69%	x	97,547,405	=	3,596,498
Torrance	21,052	18,130	21,052	1.57%	x	97,547,405	=	1,530,565
Upper San Gabriel	13,963	7,346	13,963	1.04%	x	97,547,405	=	1,015,173
West Basin	145,421	125,668	145,421	10.84%	x	97,547,405	=	10,572,734
Western MWD	61,511	63,538	63,538	4.74%	x	$97,547,405	=	4,619,464
TOTAL	1,328,654	1,120,354	1,341,701	100.00%				$97,547,405
						Annual Fixed Charge ($/AF)		$73

Table 8 calculates the estimate change in each member agency's revenue requirement under RFC's proposed minimum charge treated water surcharge with fixed revenue recovery and the existing 100% volumetric treated water surcharge (referred to as "Status Quo" in Table 8).

Table 8: Member Agency Revenue Requirement Comparison

Summary of FY 2016/2017 Member Agency Treatment Revenue Requirement Impacts (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)						
Member Agency	Status Quo Treated Water Surcharge	Proposed Rate Design				
		Fixed Charge Revenue Requirement	Volumetric Revenue Requirement	Total Revenue Requirement	$ Difference From Status Quo	% Difference From Status Quo
Anaheim	$1,236,208	$954,911	$767,864	$1,722,775	$486,567	39%
Beverly Hills	3,198,735	945,725	1,986,877	2,932,602	(266,132)	-8%
Burbank	1,990,241	931,758	1,236,228	2,167,985	177,745	9%
Calleguas	27,860,023	8,340,091	17,305,107	25,645,198	(2,214,825)	-8%
Central Basin	8,750,956	4,885,071	5,435,611	10,320,681	1,569,725	18%
Compton	87	255,451	54	255,505	255,418	> 100%
Eastern	16,679,159	5,338,173	10,360,172	15,698,345	(980,813)	-6%
Foothill	2,337,078	845,074	1,451,664	2,296,738	(40,340)	-2%
Fullerton	2,392,937	837,031	1,486,361	2,323,392	(69,545)	-3%
Glendale	4,915,618	1,824,421	3,053,310	4,877,732	(37,886)	-1%
Inland Empire	0	0	0	0	0	0%
Las Virgenes	6,362,979	1,658,376	3,952,331	5,610,707	(752,272)	-12%
Long Beach	13,278,470	3,218,416	8,247,852	11,466,268	(1,812,202)	-14%
Los Angeles	19,137,588	6,394,377	11,887,212	18,281,589	(855,999)	-4%
MWDOC	44,255,500	17,754,580	27,489,072	45,243,652	988,152	2%
Pasadena	5,399,667	1,583,398	3,353,975	4,937,373	(462,295)	-9%
San Diego CWA	30,467,286	18,276,450	18,924,595	37,201,045	6,733,759	22%
San Fernando	28,723	28,135	17,841	45,976	17,253	60%
San Marino	210,923	75,664	131,014	206,678	(4,245)	-2%
Santa Ana	1,543,796	1,147,853	958,921	2,106,774	562,978	36%
Santa Monica	1,227,816	918,014	762,651	1,680,665	452,849	37%
Three Valleys	11,477,206	3,596,498	7,129,006	10,725,505	(751,701)	-7%
Torrance	4,673,233	1,530,565	2,902,754	4,433,319	(239,914)	-5%
Upper San Gabriel	2,615,453	1,015,173	1,624,575	2,639,748	24,295	1%
West Basin	32,556,355	10,572,734	20,222,209	30,794,944	(1,761,412)	-5%
Western MWD	14,883,317	4,619,464	9,244,694	13,864,158	(1,019,159)	-7%
TOTAL	$257,479,354	$97,547,405	$159,931,949	$257,479,354	$0	0%

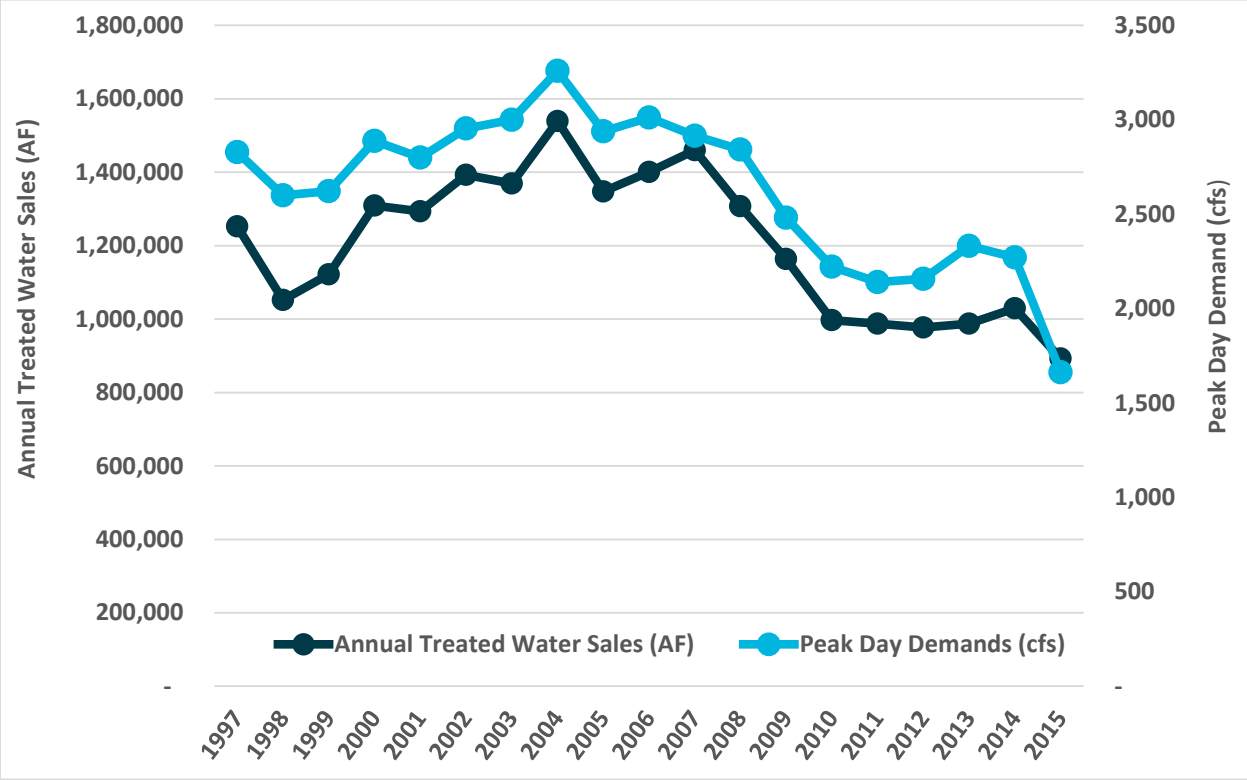
3.4 QUESTIONS REGARDING RFC'S PROPOSED TREATED WATER SURCHARGE

RFC's presented its proposed treated water surcharge at the Member Agency Manager's Meeting on January 15, 2016. At this meeting, RFC was asked two specific questions regarding its proposal and these questions are discussed below.

Why Doesn't RFC Include Peak Demands in its Minimum Charge Calculation? As discussed previously, RFC's proposed treated water surcharge compares member agency average annual direct treated water purchases during the period 1998 - 2007 against their most recent TYRA and uses the greater of the two values. RFC believes that peak demands are incorporated within these two metrics because member agency's non-coincident peak demands contribute to their annual treated water purchases. To confirm this hypothesis, Metropolitan Staff conducted an analysis of the mathematical correlation between member agency annual direct treated water purchases to their non-coincident peak demands. The result of this analysis produced a statistically significant

correlation coefficient of 0.95 which confirms RFC's hypothesis that the use of average annual direct treated water sales within the minimum charge calculation does effectively reflect member agency peak water usage characteristics. Figure 5 provides a graphical representation of the Metropolitan Staff analysis.

Figure 5: Correlation between Annual Water Purchases and Peak Water Demand



Notwithstanding Figure 5's demonstration of the strong correlation between member agency annual treated water purchase volumes and their non-coincident peak day demands, some members of the Board have expressed continuing interest in minimum charge rate that includes a peaking component. This alternative to RFC's recommended treated water surcharge rate design with a minimum is discussed more fully below.

Do Member Agencies Ever Stop Paying RFC's Proposed Minimum Charge? Under RFC's proposal, member agencies will continue to pay a minimum charge as long as Metropolitan continues to have an annual treated water revenue requirement AND for as long as Metropolitan is obligated to provide demand and standby service to a member agency. Thus, absent an "agreement" to discontinue the provision of demand and standby service, each member agency will continue to pay the minimum charge on a perpetual basis. Going forward with the RFC recommended minimum charge proposal or the alternative described below, Metropolitan and the member agencies should work cooperatively to assess current and future water treatment capacity in light of member agency decisions to continue to pursue development of local treated water supplies.

However, and in response to member agency concerns that the minimum charge does not end, RFC developed an alternative calculation based on the use of both the current TYRA of member agency direct treated water purchases and the maximum peak day demands of each member agency over the most recent three-year period *without any minimum purchase requirement.* This alternative has been labelled the "TYRA with Peaking and No Minimum" alternative.

Under this approach member agencies could avoid paying the treated water surcharge if they have no purchase volumes for a period of ten years. While this is not RFC's preferred approach it certainly can be considered a middle ground or compromise between the current 100% volumetric method and the RFC minimum method. Nonetheless, this is not RFC's preferred alternative because, while member agencies would be required to contribute in a fixed manner for the next ten years, it does not solve the dilemma of the misalignment between the recovery of costs from member agencies and the investments in treated water capacity made by Metropolitan to maintain the service commitment embodied in its organizational mission (i.e., to stand ready to meet the base load, peak load, and emergency standby demands of member agencies).

Specifically, cost recovery for the treated water revenue requirement will continue to be increasingly and disproportionally borne by the limited number of member agencies who remain on Metropolitan's treated water system. However, the "TYRA with Peaking and No Minimum" alternative would still provide member agencies with an incentive to pursue local treated water investments while providing Metropolitan some measure of fixed charge revenue as Metropolitan considers the potential for "right-sizing" its treated water capacity and the associated service commitment it makes to member agencies. In this regard, the "TYRA with Peaking and No Minimum" is somewhat of an analog of Metropolitan's current Readiness-To-Service charge which is based on a TYRA with no minimum.

Table 9 shows the member agency revenue requirement impacts associated with the use of the current Status Quo method, the RFC recommended treated water surcharge rate design with a minimum, and the "TYRA with Peaking and No Minimum" alternatives. The "TYRA with Peaking and No Minimum" alternative is based on member agency average annual treated water sales for the period FY 2005 - 2006 through FY 2014 - 2015 and the maximum member agency average non-coincident peak day treated water demand recorded during the most recent three-year period FY 2012 - 2013 through FY 2014 - 2015.

Table 9: Revenue Requirement Summary by Alternative

FY 2016/2017 Member Agency Revenue Requirement Impacts (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)			
Member Agency	**Status Quo Treated Water Surcharge**	**Minimum: > of 1998-2007 OR 2006-2015 TYRA**	**2006 - 2015 TYRA and 2013 - 2015 Max Day Peak (NO MINIMUM)**
Anaheim	$1,236,208	$1,722,775	$1,938,655
Beverly Hills	3,198,735	2,932,602	3,082,526
Burbank	1,990,241	2,167,985	2,127,710
Calleguas	27,860,023	25,645,198	27,227,242
Central Basin	8,750,956	10,320,681	9,013,566
Compton	87	255,505	146,555
Eastern	16,679,159	15,698,345	17,477,333
Foothill	2,337,078	2,296,738	2,289,889
Fullerton	2,392,937	2,323,392	2,420,474
Glendale	4,915,618	4,877,732	4,800,440
Inland Empire	0	0	0
Las Virgenes	6,362,979	5,610,707	5,989,741
Long Beach	13,278,470	11,466,268	11,231,573
Los Angeles	19,137,588	18,281,589	19,904,000
MWDOC	44,255,500	45,243,652	44,140,525
Pasadena	5,399,667	4,937,373	5,310,949
San Diego CWA	30,467,286	37,201,045	32,672,978
San Fernando	28,723	45,976	110,708
San Marino	210,923	206,678	300,429
Santa Ana	1,543,796	2,106,774	1,964,334
Santa Monica	1,227,816	1,680,665	1,613,329
Three Valleys	11,477,206	10,725,505	11,399,499
Torrance	4,673,233	4,433,319	4,395,266
Upper San Gabriel	2,615,453	2,639,748	2,351,389
West Basin	32,556,355	30,794,944	30,460,636
Western MWD	14,883,317	13,864,158	15,109,607
Total	**$257,479,354**	**$257,479,354**	**$257,479,354**

3.5 OTHER OPTIONS ANALYZED BY RFC

As discussed above, RFC calculated several alternative treated water surcharge methodologies – all having some fixed revenue component. The first, which is fully developed in Section 3.3 is RFC's recommended treated water surcharge featuring a minimum charge. The second, as discussed in Section 3.4, is a treated water surcharge based on the current TYRA of member agency direct treated water purchases without a minimum. In addition to these alternatives, RFC also analyzed, and presented to the Board, the member agency revenue requirement impacts of other treated water proposals including a minimum charge that reflected a member agencies non-coincident peak demands and a 20-year rolling average without a minimum charge. The results of these options are summarized in Attachment B.

ATTACHMENT A:

PRESENTATIONS

MWD Manager's Meeting

Consideration of Alternative Treatment Cost Recovery Mechanism

January 15, 2016

Objectives-Goals

- Objective – Fixed Charge Concept
  - Cost of Service
  - Align charges with service commitment/investment
  - Cost recovery – revenue stability

Treatment Fixed Charge Concept

- 39% of total Treatment revenue requirements
  - Cost of Service Based: Sum of Treatment Demand and Standby costs
  - Used to develop fixed or demand charge

Fixed Cost Recovery - An Industry Perspective

- Cost-of-service considerations – What is the cost of providing standby service; on-demand service?
- Declining water use driving trend to increase in fixed cost recovery – fixed revenues

Align Charges with Service Commitment/Investment

- MWD is the treated water service provider for Member Agencies
- MWD service obligation – be capable of meeting average and peak day treated water demands of Member Agencies
- Investment in treatment capacity designed to meet the needs of Member Agencies
- Meet average and peak day demands AND provide standby and on-demand capacity

Treatment Fixed Charge Concept
($ millions)

FY 2014/15 Treatment Revenue Requirement		
Direct O&M at WTPs		$70
Indirect O&M (WSO, IT, Eng., HR)		49
A&G (Legal, Finance, Audit, Ethics)		24
Capital Costs (Debt, PAYGO)	57% of Total	177
LESS: Revenue Offsets (Prop. Tax, Interest)		-10
TOTAL Net Revenue Requirement		$310

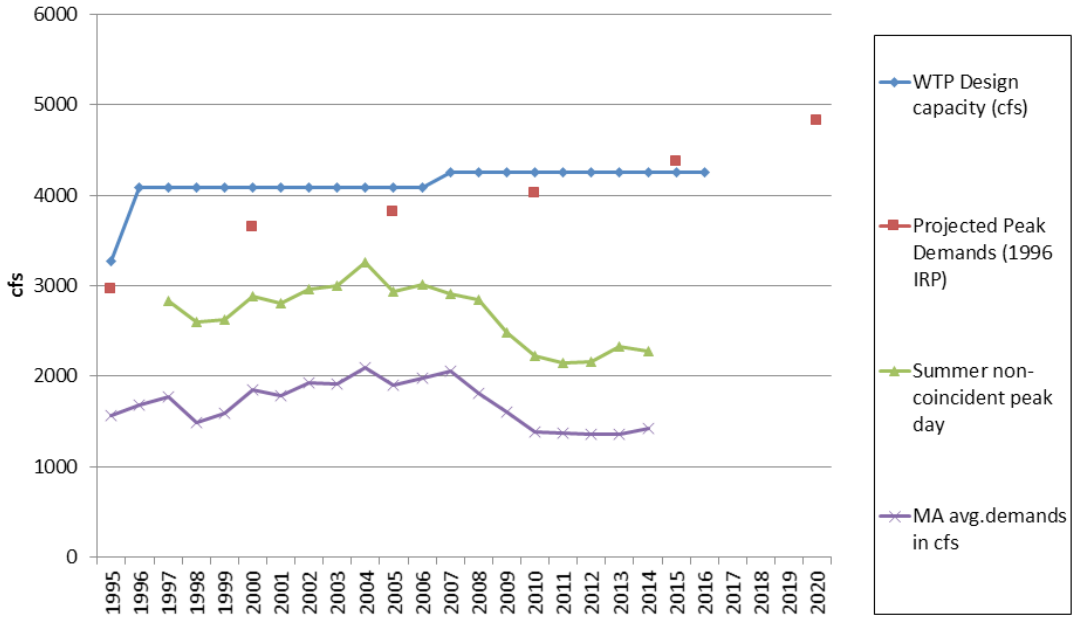
Treatment Fixed Charge Concept
($ millions)

FY 2014/15 Treatment Revenue Requirement		**$310 (100%)**
Variable		**$30 (10%)**
Fixed		**$280 (90%)**
Commodity	$160	
Demand	$54	39% of Total
Standby	$66	

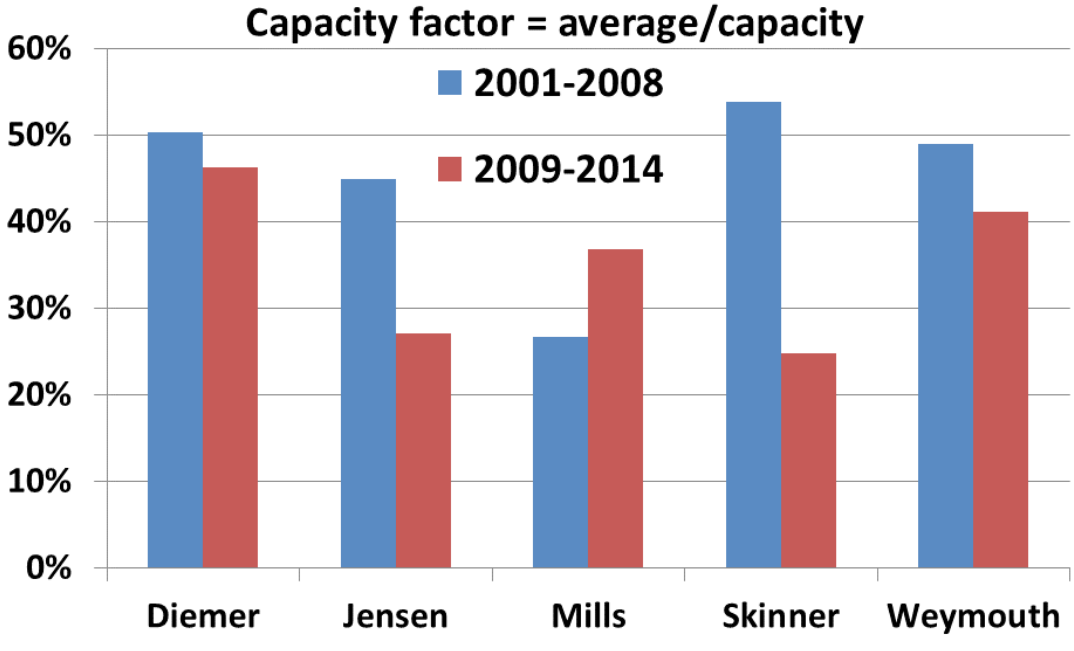
Current Treatment Surcharge: 100% Volumetric Cost Recovery

- $\frac{Revenue\ Requirement}{Treated\ Water\ Sales} = \$/AF\ Volumetric\ Rate$
  - Demand and Standby treatment capacity and reduced treated water sales revenue
  - Potential for Member Agencies to stop using the MWD treatment system and make no contribution to Standby and Demand-related costs
  - MWD retains the obligation to serve Member Agencies

Long-Term Treated Water Demand Has Not Materialized



WTP Utilization Has Declined



Align Charges with Service Commitment/Investment

Cost of Service principles, i.e., pay for the service provided:

Member Agencies pay only when taking treated water and in effect require all system users to bear the cost burden for standby or on-demand capacity.

MWD has invested in treatment capacity to serve the Member Agencies, but today does not require the beneficiaries of standby or on-demand capacity to pay anything for the cost of this dedicated capacity.

Fixed Cost Recovery Cost-of-Service Perspective

- Standby or on-Demand service – "…rate charged should reflect the cost of having capacity reserved and available for the customer."(1)
  - Fixed Demand Charge – reflect peaking costs and demands
  - Consumption Rate

(1) AWWA M1 Principles of Water Rates, Fees, and Charges, Sixth Edition

Fixed Revenue Recovery is Common

Agency	Wholesale Cost Recovery
Massachusetts Water Resource Authority, MA	Customers are assessed a fixed annual amount based on their proportional share of the previous year's demand. FY 2015 assessment = $3,239 per million gallons. Fixed revenue recovery = 100%.
North Texas Municipal Water District, TX	Customers pay on a volumetric basis. Fixed costs are recovered under take-or-pay contracts based on the higher of estimated test-year demand or the maximum volume of water used in any previous year. FY 2016 fixed charge = $1.88 per kgal. Estimated fixed revenue recovery = 85%.
Upper Trinity Regional Water District, TX	Customers pay their proportionate share of demand costs under take-or-pay contracts based on a minimum daily volume equal to 18% of their highest peak day demand in the preceding five-year period. FY 2015 annual demand charge = $388,110 per MGD. Estimated fixed revenue recovery under minimum take-or-pay contracts = 78%.
San Francisco Public Utilities Commission, CA	4 wholesale customers are subject to a take-or-pay requirement specifying a minimum annual volume they must purchase. Estimated fixed revenue recovery from wholesale customers under minimum take-of-pay contracts = 24%.

Fixed Revenue Recovery is Common

Agency	Wholesale Cost Recovery
Great Lakes Water Authority, MI	60% of the annual revenue requirement is estimated to be recovered through a fixed demand charge; 40% recovered through volumetric rates.
Jordon Valley Water Conservancy District, UT	Each wholesale customer has a contracted take-or-pay minimum purchase volume. Estimated fixed revenue recovery from wholesale customers under minimum take-or-pay contracts = 100%.
Dallas Water Utilities, TX	Wholesale customers pay a fixed demand charge and a volumetric rate. The demand charge is based on the higher of current year demand or the average of the previous five years. Demand charge is $243,453 per mgd per year and the volumetric rate is $0.4305 per kgal. Estimated fixed charge revenue from wholesale customers = 60%.
Portland Water Bureau, OR	Wholesale customers specify a minimum annual "guaranteed purchase quantity" as well as seasonal and daily peaking factor. If actual peaking factors exceed those specified, customers must pay a surcharge. Fixed revenue recovery from wholesale customers under minimum take-of-pay contracts = 100%

Current Treatment Surcharge: 100% Volumetric Cost Recovery

- $$\frac{Revenue\ Requirement}{Treated\ Water\ Sales} = \$/AF\ Volumetric\ Rate$$

  - Demand and Standby treatment capacity and reduced treated water sales revenue
  - Potential for Member Agencies to stop using the MWD treatment system and make no contribution to Standby and Demand-related costs
  - MWD retains the obligation to serve Member Agencies

FY 2014/15 Treatment Revenue Requirement
(Hypothetical Pro Forma – For Example Only)

Status Quo Treated Surcharge ($/AF)	
Test-Year Treatment Revenue Requirement	$310,084,182
Forecast Test-Year Treated Water Sales (AF)	910,000
Treated Surcharge ($/AF)	$341

FY 2014/15 Status Quo Treatment Surcharge (100% Volumetric) (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)						
Member Agency	Projected Test-Year Treated Water Sales (AF)	% of Projected Test-Year Treated Water Sales	x	Total Revenue Requirement	=	Member Agency Revenue Requirement
Anaheim	1,394	0.15%	x	310,084,182	=	$475,123
Beverly Hills	10,287	1.13%	x	310,084,182	=	3,505,190
Burbank	7,797	0.86%	x	310,084,182	=	2,656,917
Calleguas	103,189	11.34%	x	310,084,182	=	35,161,981
Central Basin	30,024	3.30%	x	310,084,182	=	10,230,683
Compton	38	0.00%	x	310,084,182	=	13,108
Eastern	61,274	6.73%	x	310,084,182	=	20,879,356
Foothill	8,662	0.95%	x	310,084,182	=	2,951,477
Fullerton	7,761	0.85%	x	310,084,182	=	2,644,683
Glendale	17,988	1.98%	x	310,084,182	=	6,129,593
Inland Empire	0	0.00%	x	310,084,182	=	0
Las Virgenes	21,012	2.31%	x	310,084,182	=	7,159,725
Long Beach	32,137	3.53%	x	310,084,182	=	10,950,676
Los Angeles	94,789	10.42%	x	310,084,182	=	32,299,550
MWDOC	157,070	17.26%	x	310,084,182	=	53,522,042
Pasadena	20,425	2.24%	x	310,084,182	=	6,959,936
San Diego CWA	101,073	11.11%	x	310,084,182	=	34,440,783
San Fernando	54	0.01%	x	310,084,182	=	18,502
San Marino	1,400	0.15%	x	310,084,182	=	476,901
Santa Ana	9,147	1.01%	x	310,084,182	=	3,116,883
Santa Monica	5,218	0.57%	x	310,084,182	=	1,777,998
Three Valleys	43,866	4.82%	x	310,084,182	=	14,947,472
Torrance	15,219	1.67%	x	310,084,182	=	5,185,916
Upper San Gabriel	3,087	0.34%	x	310,084,182	=	1,051,768
West Basin	106,930	11.75%	x	310,084,182	=	36,436,440
Western MWD	50,158	5.51%	x	310,084,182	=	17,091,478
Total	910,000	100.00%				$310,084,182
				Unit Cost per AF		$341

Proposed Treatment Rate Design: Volumetric + Fixed Revenue Recovery

- Volumetric Revenue Recovery = 61%

$$\frac{Revenue\ Requirement}{Treated\ Water\ Sales} = \$/AF\ \ Volumetric\ Rate$$

- Fixed Revenue Recovery = 39%

$$Revenue\ Requirement\ *\ Proportional\ Demand = \$\ Annual\ Fixed\ Charge$$

Proposed Treatment Rate Design: Volumetric + Fixed Revenue Recovery

2-Part Test for Minimum Demand

Greater of:

1. TYRA of Treated Water Sales *OR*
2. Average of 1998 – 2007 Treated Water Sales

2007 was the last significant treatment plant capacity addition

FY 2014/15 Treatment Revenue Requirement

Hypothetical Pro Forma For Example Only

Status Quo Treatment Surcharge ($/AF)	
Total Treatment Revenue Requirement	$310,084,182
Forecast Treated Water Sales (AF)	910,000
Treated Surcharge ($/AF)	$341
Treatment Fixed Annual Charge ($/AF)	
Fixed Demand	$53,774,185
Fixed Standby	65,975,221
Total Fixed Charge Revenue Requirement	$119,749,406
% of Total Revenue Requirement	38.6%
Fixed Charge Units of Service (AF)	1,370,672
Annual Fixed Charge ($/AF)	$87
Treatment Volumetric Rate ($/AF)	
Net Remaining Revenue Requirement	$190,334,776
% of Total Revenue Requirement	61.4%
Forecast Treated Water Sales (AF)	910,000
Volumetric Rate ($/AF)	$209

FY 2014/2015 Member Agency Fixed Charge Revenue Requirement (39% Revenue Recovery)

(HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)

Member Agency	AVG. 1998 - 2007 Treated Water Sales (AF)	TYRA 2004 - 2013 Treated Water Sales (AF)	Units Used in Fixed Charge Calculation	% of Total	x	Total Fixed Charge Revenue Requirement	=	Annual Fixed Revenue Requirement
Anaheim	13,134	15,048	15,048	1.10%	X	$119,749,406	=	$1,314,649
Beverly Hills	13,008	11,524	13,008	0.95%	x	119,749,406	=	1,136,435
Burbank	12,816	11,349	12,816	0.93%	x	119,749,406	=	1,119,651
Calleguas	120,052	119,878	120,052	8.76%	x	119,749,406	=	10,488,423
Central Basin	67,191	52,462	67,191	4.90%	x	119,749,406	=	5,870,169
Compton	3,628	2,653	3,628	0.26%	x	119,749,406	=	316,958
Eastern	79,560	76,095	79,560	5.80%	x	119,749,406	=	6,950,756
Foothill	11,763	10,904	11,763	0.86%	x	119,749,406	=	1,027,643
Fullerton	11,513	12,534	12,534	0.91%	x	119,749,406	=	1,095,037
Glendale	25,094	20,503	25,094	1.83%	x	119,749,406	=	2,192,327
Inland Empire	0	0	0	0.00%	x	119,749,406	=	0
Las Virgenes	22,106	22,889	22,889	1.67%	x	119,749,406	=	1,999,727
Long Beach	45,747	38,621	45,747	3.34%	x	119,749,406	=	3,996,727
Los Angeles	78,265	88,977	88,977	6.49%	x	119,749,406	=	7,773,525
MWDOC	251,567	231,004	251,567	18.35%	x	119,749,406	=	21,978,241
Pasadena	21,742	21,669	21,742	1.59%	x	119,749,406	=	1,899,477
San Diego CWA	251,298	186,827	251,298	18.33%	x	119,749,406	=	21,954,763
San Fernando	310	291	310	0.02%	x	119,749,406	=	27,047
San Marino	1,041	1,002	1,041	0.08%	x	119,749,406	=	90,922
Santa Ana	15,788	15,677	15,788	1.15%	x	119,749,406	=	1,379,323
Santa Monica	12,627	11,001	12,627	0.92%	x	119,749,406	=	1,103,136
Three Valleys	50,214	45,208	50,214	3.66%	x	119,749,406	=	4,386,930
Torrance	21,052	18,845	21,052	1.54%	x	119,749,406	=	1,839,211
Upper San Gabriel	13,963	10,147	13,963	1.02%	x	119,749,406	=	1,219,888
West Basin	145,424	131,404	145,424	10.61%	x	119,749,406	=	12,705,079
Western MWD	55,888	67,342	67,342	4.91%	x	119,749,406	=	5,883,360
Total	1,344,787	1,223,851	1,370,672	100.00%				$119,749,406
						Annual Fixed Charge ($/AF)		$87

FY 2014/2015 Member Agency Volumetric Revenue Requirement (61% Volumetric)

(HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)

Member Agency	Projected Test-Year Treated Water Sales (AF)	% of Projected Test-Year Treated Water Sales	x	Total Revenue Requirement	=	Revenue Requirement
Anaheim	1,394	0.15%	X	$190,334,776	=	$291,638
Beverly Hills	10,287	1.13%	x	190,334,776	=	2,151,543
Burbank	7,797	0.86%	x	190,334,776	=	1,630,860
Calleguas	103,189	11.34%	x	190,334,776	=	21,583,003
Central Basin	30,024	3.30%	x	190,334,776	=	6,279,762
Compton	38	0.00%	x	190,334,776	=	8,046
Eastern	61,274	6.73%	x	190,334,776	=	12,816,092
Foothill	8,662	0.95%	x	190,334,776	=	1,811,665
Fullerton	7,761	0.85%	x	190,334,776	=	1,623,350
Glendale	17,988	1.98%	x	190,334,776	=	3,762,445
Inland Empire	0	0.00%	x	190,334,776	=	0
Las Virgenes	21,012	2.31%	x	190,334,776	=	4,394,757
Long Beach	32,137	3.53%	x	190,334,776	=	6,721,705
Los Angeles	94,789	10.42%	x	190,334,776	=	19,825,995
MWDOC	157,070	17.26%	x	190,334,776	=	32,852,710
Pasadena	20,425	2.24%	x	190,334,776	=	4,272,123
San Diego CWA	101,073	11.11%	x	190,334,776	=	21,140,320
San Fernando	54	0.01%	x	190,334,776	=	11,357
San Marino	1,400	0.15%	x	190,334,776	=	292,730
Santa Ana	9,147	1.01%	x	190,334,776	=	1,913,194
Santa Monica	5,218	0.57%	x	190,334,776	=	1,091,364
Three Valleys	43,866	4.82%	x	190,334,776	=	9,175,005
Torrance	15,219	1.67%	x	190,334,776	=	3,183,200
Upper San Gabriel	3,087	0.34%	x	190,334,776	=	645,593
West Basin	106,930	11.75%	x	190,334,776	=	22,365,286
Western MWD	50,158	5.51%	x	190,334,776	=	10,491,031
Total	910,000	100.00%				$190,334,776
				Volumetric $/AF		$209

Summary of FY 2014/2015 Member Agency Treatment Revenue Requirement Impacts (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)						
		Proposed Rate Design				
Member Agency	Status Quo Treated Water Surcharge	Fixed Charge Revenue Requirement	Volumetric Revenue Requirement	Total Revenue Requirement	$ Difference From Status Quo	% Difference From Status Quo
Anaheim	$475,123	$1,314,649	$291,638	$1,606,288	$1,131,165	238%
Beverly Hills	3,505,190	1,136,435	2,151,543	3,287,979	(217,211)	-6%
Burbank	2,656,917	1,119,651	1,630,860	2,750,511	93,594	4%
Calleguas	35,161,981	10,488,423	21,583,003	32,071,426	(3,090,555)	-9%
Central Basin	10,230,683	5,870,169	6,279,762	12,149,931	1,919,248	19%
Compton	13,108	316,958	8,046	325,005	311,896	2379%
Eastern	20,879,356	6,950,756	12,816,092	19,766,848	(1,112,507)	-5%
Foothill	2,951,477	1,027,643	1,811,665	2,839,309	(112,169)	-4%
Fullerton	2,644,683	1,095,037	1,623,350	2,718,387	73,704	3%
Glendale	6,129,593	2,192,327	3,762,445	5,954,772	(174,820)	-3%
Inland Empire	0	0	0	0	0	0%
Las Virgenes	7,159,725	1,999,727	4,394,757	6,394,483	(765,241)	-11%
Long Beach	10,950,676	3,996,727	6,721,705	10,718,432	(232,244)	-2%
Los Angeles	32,299,550	7,773,525	19,825,995	27,599,520	(4,700,030)	-15%
MWDOC	53,522,042	21,978,241	32,852,710	54,830,952	1,308,910	2%
Pasadena	6,959,936	1,899,477	4,272,123	6,171,601	(788,335)	-11%
San Diego CWA	34,440,783	21,954,763	21,140,320	43,095,083	8,654,299	25%
San Fernando	18,502	27,047	11,357	38,404	19,901	108%
San Marino	476,901	90,922	292,730	383,652	(93,249)	-20%
Santa Ana	3,116,883	1,379,323	1,913,194	3,292,518	175,635	6%
Santa Monica	1,777,998	1,103,136	1,091,364	2,194,500	416,502	23%
Three Valleys	14,947,472	4,386,930	9,175,005	13,561,934	(1,385,538)	-9%
Torrance	5,185,916	1,839,211	3,183,200	5,022,411	(163,504)	-3%
Upper San Gabriel	1,051,768	1,219,888	645,593	1,865,480	813,712	77%
West Basin	36,436,440	12,705,079	22,365,286	35,070,366	(1,366,074)	-4%
Western MWD	17,091,478	5,883,360	10,491,031	16,374,390	(717,088)	-4%
TOTAL	$310,084,182	$119,749,406	$190,334,776	$310,084,182	$0	0%

Summary

- Recommended Fixed-Minimum and Volume Method
  - Acknowledge treatment cost of service to serve Member Agencies - Standby and Demand-related costs
  - Reflect shift in MWD's role from a 100% baseload to a combination of baseload/standby demand
  - Extend current Readiness-to-Serve Concept to treatment
  - Enhance treatment and total system fixed revenue recovery to the benefit of Member Agencies

Finance and Insurance Committee Meeting

Consideration of Alternative Treatment Cost Recovery Mechanism

February 23, 2016

Objectives-Goals

- Objective – Fixed Charge Concept
  - Cost of Service
  - Align charges with service commitment/investment
  - Cost recovery – revenue stability

Treatment Fixed Charge Concept

- 38% of total Treatment revenue requirements
  - Cost of Service based: sum of Treatment Demand and Standby costs
  - Used to develop fixed or demand charge

Fixed Cost Recovery - An Industry Perspective

- Cost-of-service considerations – What is the cost of providing on-demand service and standby service;?
- Declining water use driving trend to increase fixed cost recovery – fixed revenues

Align Charges with Service Commitment/Investment

- MWD is the treated water service provider for Member Agencies
- MWD service obligation – be capable of meeting average and peak week treated water demands of Member Agencies
- Investment in treatment capacity designed to meet the needs of Member Agencies
- Meet average and peak week demands AND provide on-demand and standby capacity

Treatment Fixed Charge Concept
($ millions)

FY 2016/17 Treatment Revenue Requirement		
Direct O&M at WTPs		$59
Indirect O&M (WSO, IT, Eng., HR)		46
A&G (Legal, Finance, Audit, Ethics)		30
Capital Costs (Debt, PAYGO)	54% of Total	140
LESS: Revenue Offsets / Decline in Reserves		-18
TOTAL Net Revenue Requirement		$257

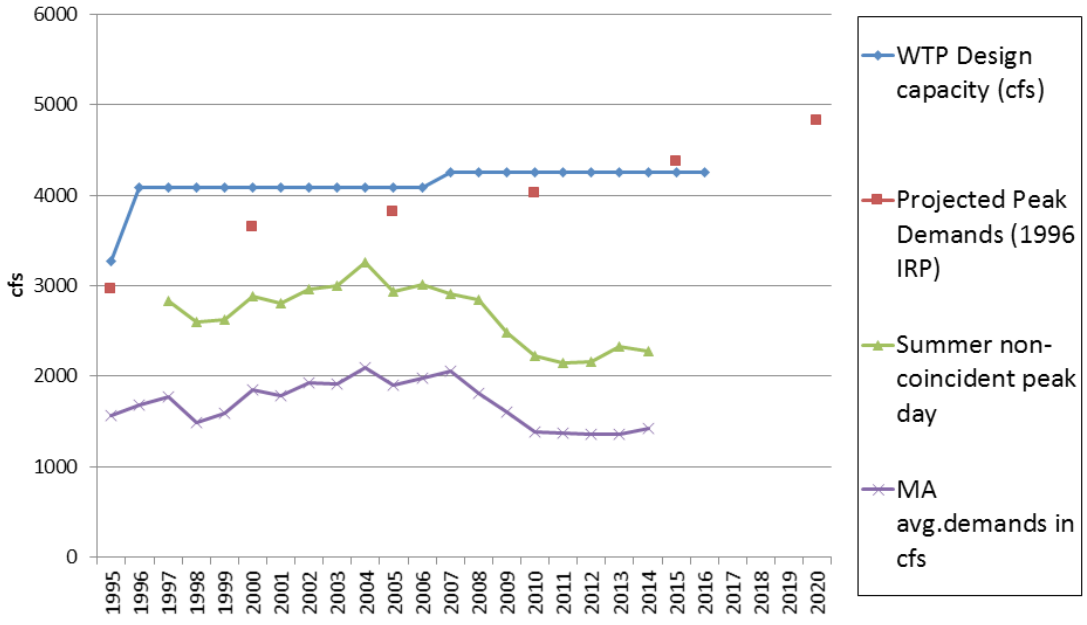
Treatment Fixed Charge Concept
($ millions)

FY 2016/17 Treatment Revenue Requirement		$257 (100%)
Variable		**$24 (9%)**
Fixed		**$233 (91%)**
Commodity	$135	
Demand	$41	38% of Total
Standby	$57	

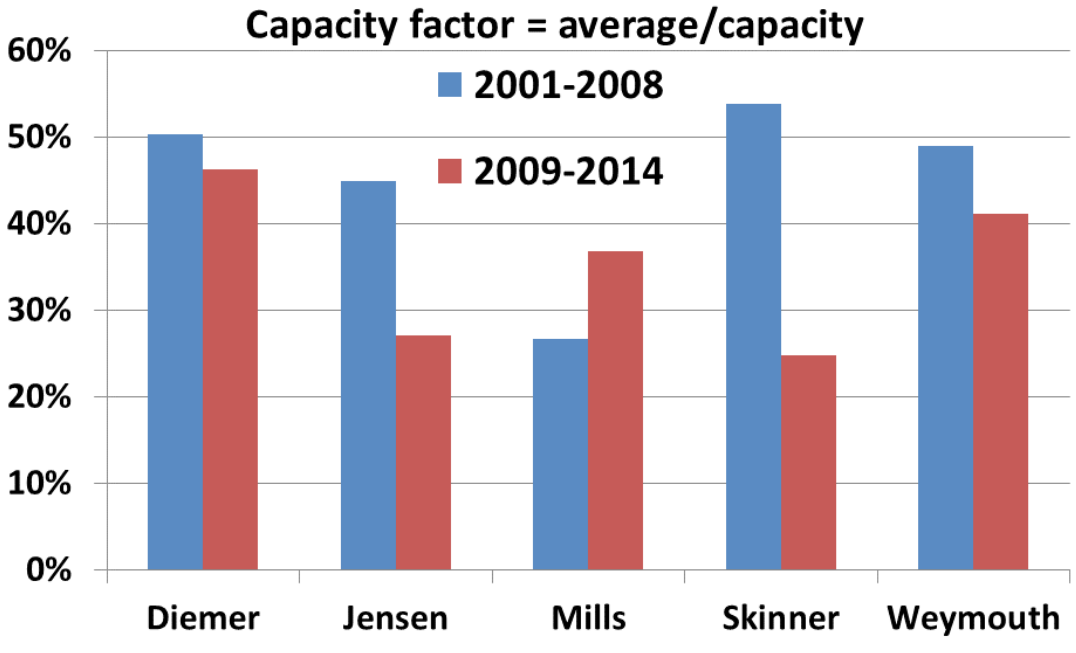
Current Treatment Surcharge: 100% Volumetric Cost Recovery

- $\frac{Revenue\ Requirement}{Treated\ Water\ Sales} = \$/AF\ Volumetric\ Rate$
  - Demand and Standby treatment capacity and reduced treated water sales revenue
  - Potential for Member Agencies to stop using the MWD treatment system and make no contribution to Demand and Standby-related costs
  - MWD retains the obligation to serve Member Agencies

Long-Term Treated Water Demand Has Not Materialized



WTP Utilization Has Declined



Align Charges with Service Commitment/Investment

Cost of Service principles, i.e., pay for the service provided:

Member Agencies pay only when taking treated water and in effect require all system users to bear the cost burden for demand or standby capacity

MWD has invested in treatment capacity to serve the Member Agencies, but today does not require the beneficiaries of demand or standby capacity to pay anything for the cost of this dedicated capacity; for the cost of this service

Fixed Cost Recovery Cost-of-Service Perspective

- Demand or standby service – "…rate charged should reflect the cost of having capacity reserved and available for the customer."(1)
  - Fixed Demand Charge – reflect peaking costs and demands
  - Consumption Rate

(1) AWWA M1 Principles of Water Rates, Fees, and Charges, Sixth Edition

Fixed Revenue Recovery is Common

Agency	Wholesale Cost Recovery
Massachusetts Water Resource Authority, MA	Customers are assessed a fixed annual amount based on their proportional share of the previous year's demand. FY 2015 assessment = $3,239 per million gallons. Fixed revenue recovery = 100%.
North Texas Municipal Water District, TX	Customers pay on a volumetric basis. Fixed costs are recovered under take-or-pay contracts based on the higher of estimated test-year demand or the maximum volume of water used in any previous year. FY 2016 fixed charge = $1.88 per kgal. Estimated fixed revenue recovery = 85%.
Upper Trinity Regional Water District, TX	Customers pay their proportionate share of demand costs under take-or-pay contracts based on a minimum daily volume equal to 18% of their highest peak day demand in the preceding five-year period. FY 2015 annual demand charge = $388,110 per MGD. Estimated fixed revenue recovery under minimum take-or-pay contracts = 78%.
San Francisco Public Utilities Commission, CA	4 wholesale customers are subject to a take-or-pay requirement specifying a minimum annual volume they must purchase. Estimated fixed revenue recovery from wholesale customers under minimum take-of-pay contracts = 24%.

Fixed Revenue Recovery is Common

Agency	Wholesale Cost Recovery
Great Lakes Water Authority, MI	60% of the annual revenue requirement is estimated to be recovered through a fixed demand charge; 40% recovered through volumetric rates.
Jordon Valley Water Conservancy District, UT	Each wholesale customer has a contracted take-or-pay minimum purchase volume. Estimated fixed revenue recovery from wholesale customers under minimum take-or-pay contracts = 100%.
Dallas Water Utilities, TX	Wholesale customers pay a fixed demand charge and a volumetric rate. The demand charge is based on the higher of current year demand or the average of the previous five years. Demand charge is $243,453 per mgd per year and the volumetric rate is $0.4305 per kgal. Estimated fixed charge revenue from wholesale customers = 60%.
Portland Water Bureau, OR	Wholesale customers specify a minimum annual "guaranteed purchase quantity" as well as seasonal and daily peaking factor. If actual peaking factors exceed those specified, customers must pay a surcharge. Fixed revenue recovery from wholesale customers under minimum take-of-pay contracts = 100%

Current Treatment Surcharge: 100% Volumetric Cost Recovery

- $$\frac{Revenue\ Requirement}{Treated\ Water\ Sales} = \$/AF\ Volumetric\ Rate$$

  - Demand and Standby treatment capacity and reduced treated water sales revenue
  - Potential for Member Agencies to stop using the MWD treatment system and make no contribution to Demand and Standby-related costs
  - MWD retains the obligation to serve Member Agencies

FY 2016/17 Treatment Revenue Requirement
(Hypothetical Pro Forma – For Example Only)

Status Quo Treated Surcharge ($/AF)	
Treatment Revenue Requirement	$257,479,354
Forecasted Treated Water Sales (AF)	822,000
Treated Surcharge ($/AF)	$313

FY 2016/17 Status Quo Treatment Surcharge (100% Volumetric) (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)						
Member Agency	Projected Test Year Treated Water Sales AF	 %	x	Total Revenue Requirement	=	Member Agency Revenue Requirement
Anaheim	3,947	0.48%	x	$257,479,354	=	$1,236,208
Beverly Hills	10,212	1.24%	x	257,479,354	=	3,198,735
Burbank	6,354	0.77%	x	257,479,354	=	1,990,241
Calleguas	88,943	10.82%	x	257,479,354	=	27,860,023
Central Basin	27,937	3.40%	x	257,479,354	=	8,750,956
Compton	0	0.00%	x	257,479,354	=	87
Eastern	53,248	6.48%	x	257,479,354	=	16,679,159
Foothill	7,461	0.91%	x	257,479,354	=	2,337,078
Fullerton	7,639	0.93%	x	257,479,354	=	2,392,937
Glendale	15,693	1.91%	x	257,479,354	=	4,915,618
Inland Empire	0	0.00%	x	257,479,354	=	0
Las Virgenes	20,314	2.47%	x	257,479,354	=	6,362,979
Long Beach	42,391	5.16%	x	257,479,354	=	13,278,470
Los Angeles	61,097	7.43%	x	257,479,354	=	19,137,588
MWDOC	141,285	17.19%	x	257,479,354	=	44,255,500
Pasadena	17,238	2.10%	x	257,479,354	=	5,399,667
San Diego CWA	97,266	11.83%	x	257,479,354	=	30,467,286
San Fernando	92	0.01%	x	257,479,354	=	28,723
San Marino	673	0.08%	x	257,479,354	=	210,923
Santa Ana	4,929	0.60%	x	257,479,354	=	1,543,796
Santa Monica	3,920	0.48%	x	257,479,354	=	1,227,816
Three Valleys	36,641	4.46%	x	257,479,354	=	11,477,206
Torrance	14,919	1.81%	x	257,479,354	=	4,673,233
Upper San Gabriel	8,350	1.02%	x	257,479,354	=	2,615,453
West Basin	103,936	12.64%	x	257,479,354	=	32,556,355
Western MWD	47,515	5.78%	x	$257,479,354	=	14,883,317
TOTAL	**822,000**	**100.00%**				**$257,479,354**
				Unit Cost per AF		**$313**

Proposed Treatment Rate Design: Volumetric + Fixed Revenue Recovery

- Volumetric Revenue Recovery = 62%

$$\frac{Revenue\ Requirement}{Treated\ Water\ Sales} = \$/AF\ \ Volumetric\ Rate$$

- Fixed Revenue Recovery = 38%

$$Revenue\ Requirement\ *\ Proportional\ Demand = \$\ Annual\ Fixed\ Charge$$

Proposed Treatment Rate Design: Volumetric + Fixed Revenue Recovery

2-Part Test for Minimum Demand

Greater of:

1. TYRA of Treated Water Sales *OR*
2. Average of 1998 – 2007 Treated Water Sales

2007 was the last significant treatment plant capacity addition

FY 2016/17 Treatment Revenue Requirement

Hypothetical Pro Forma For Example Only

Status Quo Treatment Surcharge ($/AF)	
Total Treatment Revenue Requirement	$257,479,354
Forecast Treated Water Sales (AF)	822,000
Treated Surcharge ($/AF)	$313
Treatment Fixed Annual Charge ($/AF)	
Fixed Demand	$40,822,844
Fixed Standby	56,724,561
Total Fixed Charge Revenue Requirement	$97,547,405
% of Total Revenue Requirement	37.9%
Fixed Charge Units of Service (AF)	1,341,701
Annual Fixed Charge ($/AF)	$73
Treatment Volumetric Rate ($/AF)	
Net Remaining Revenue Requirement	$159,931,949
% of Total Revenue Requirement	62.1%
Forecast Treated Water Sales (AF)	822,000
Volumetric Rate ($/AF)	$195

FY 2016/2017 Member Agency Fixed Charge Revenue Requirement (38% Revenue Recovery)

(HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)

Member Agency	AVG. 1998 - 2007 Treated Water Sales (AF)	TYRA 2006 - 2015 Treated Water Sales (AF)	Units Used in Fixed Charge Calculation	% of Total	x	Total Fixed Charge Revenue Requirement	=	Member Agency Annual Fixed Revenue Requirement
Anaheim	13,134	12,126	13,134	0.98%	X	$97,547,405	=	$954,911
Beverly Hills	13,008	11,386	13,008	0.97%	x	97,547,405	=	945,725
Burbank	12,816	10,089	12,816	0.96%	x	97,547,405	=	931,758
Calleguas	112,585	114,712	114,712	8.55%	x	97,547,405	=	8,340,091
Central Basin	67,191	46,198	67,191	5.01%	x	97,547,405	=	4,885,071
Compton	3,514	1,924	3,514	0.26%	x	97,547,405	=	255,451
Eastern	73,423	73,323	73,423	5.47%	x	97,547,405	=	5,338,173
Foothill	11,623	9,933	11,623	0.87%	x	97,547,405	=	845,074
Fullerton	11,513	11,072	11,513	0.86%	x	97,547,405	=	837,031
Glendale	25,094	19,585	25,094	1.87%	x	97,547,405	=	1,824,421
Inland Empire	0	0	0	0.00%	x	97,547,405	=	0
Las Virgenes	22,106	22,810	22,810	1.70%	x	97,547,405	=	1,658,376
Long Beach	44,267	36,397	44,267	3.30%	x	97,547,405	=	3,218,416
Los Angeles	79,762	87,950	87,950	6.56%	x	97,547,405	=	6,394,377
MWDOC	244,203	204,975	244,203	18.20%	x	97,547,405	=	17,754,580
Pasadena	21,779	21,181	21,779	1.62%	x	97,547,405	=	1,583,398
San Diego CWA	251,381	156,458	251,381	18.74%	x	97,547,405	=	18,276,450
San Fernando	387	206	387	0.03%	x	97,547,405	=	28,135
San Marino	1,041	931	1,041	0.08%	x	97,547,405	=	75,664
Santa Ana	15,788	13,331	15,788	1.18%	x	97,547,405	=	1,147,853
Santa Monica	12,627	9,252	12,627	0.94%	x	97,547,405	=	918,014
Three Valleys	49,467	41,833	49,467	3.69%	x	97,547,405	=	3,596,498
Torrance	21,052	18,130	21,052	1.57%	x	97,547,405	=	1,530,565
Upper San Gabriel	13,963	7,346	13,963	1.04%	x	97,547,405	=	1,015,173
West Basin	145,421	125,668	145,421	10.84%	x	97,547,405	=	10,572,734
Western MWD	61,511	63,538	63,538	4.74%	x	$97,547,405	=	4,619,464
TOTAL	**1,328,654**	**1,120,354**	**1,341,701**	**100.00%**				**$97,547,405**
						Annual Fixed Charge ($/AF)		**$73**

FY 2016/2017 Member Agency Volumetric Revenue Requirement (62% Volumetric)

(HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)

Member Agency	Projected Test-Year Treated Water Sales AF	%	x	Total Revenue Requirement	=	Member Agency Revenue Requirement
Anaheim	3,947	0.48%	X	$159,931,949	=	$767,864
Beverly Hills	10,212	1.24%	x	159,931,949	=	1,986,877
Burbank	6,354	0.77%	x	159,931,949	=	1,236,228
Calleguas	88,943	10.82%	x	159,931,949	=	17,305,107
Central Basin	27,937	3.40%	x	159,931,949	=	5,435,611
Compton	0	0.00%	x	159,931,949	=	54
Eastern	53,248	6.48%	x	159,931,949	=	10,360,172
Foothill	7,461	0.91%	x	159,931,949	=	1,451,664
Fullerton	7,639	0.93%	x	159,931,949	=	1,486,361
Glendale	15,693	1.91%	x	159,931,949	=	3,053,310
Inland Empire	0	0.00%	x	159,931,949	=	0
Las Virgenes	20,314	2.47%	x	159,931,949	=	3,952,331
Long Beach	42,391	5.16%	x	159,931,949	=	8,247,852
Los Angeles	61,097	7.43%	x	159,931,949	=	11,887,212
MWDOC	141,285	17.19%	x	159,931,949	=	27,489,072
Pasadena	17,238	2.10%	x	159,931,949	=	3,353,975
San Diego CWA	97,266	11.83%	x	159,931,949	=	18,924,595
San Fernando	92	0.01%	x	159,931,949	=	17,841
San Marino	673	0.08%	x	159,931,949	=	131,014
Santa Ana	4,929	0.60%	x	159,931,949	=	958,921
Santa Monica	3,920	0.48%	x	159,931,949	=	762,651
Three Valleys	36,641	4.46%	x	159,931,949	=	7,129,006
Torrance	14,919	1.81%	x	159,931,949	=	2,902,754
Upper San Gabriel	8,350	1.02%	x	159,931,949	=	1,624,575
West Basin	103,936	12.64%	x	159,931,949	=	20,222,209
Western MWD	47,515	5.78%	x	$159,931,949	=	9,244,694
TOTAL	**822,000**	**100.00%**				**$159,931,949**
				Volumetric $/AF		**$195**

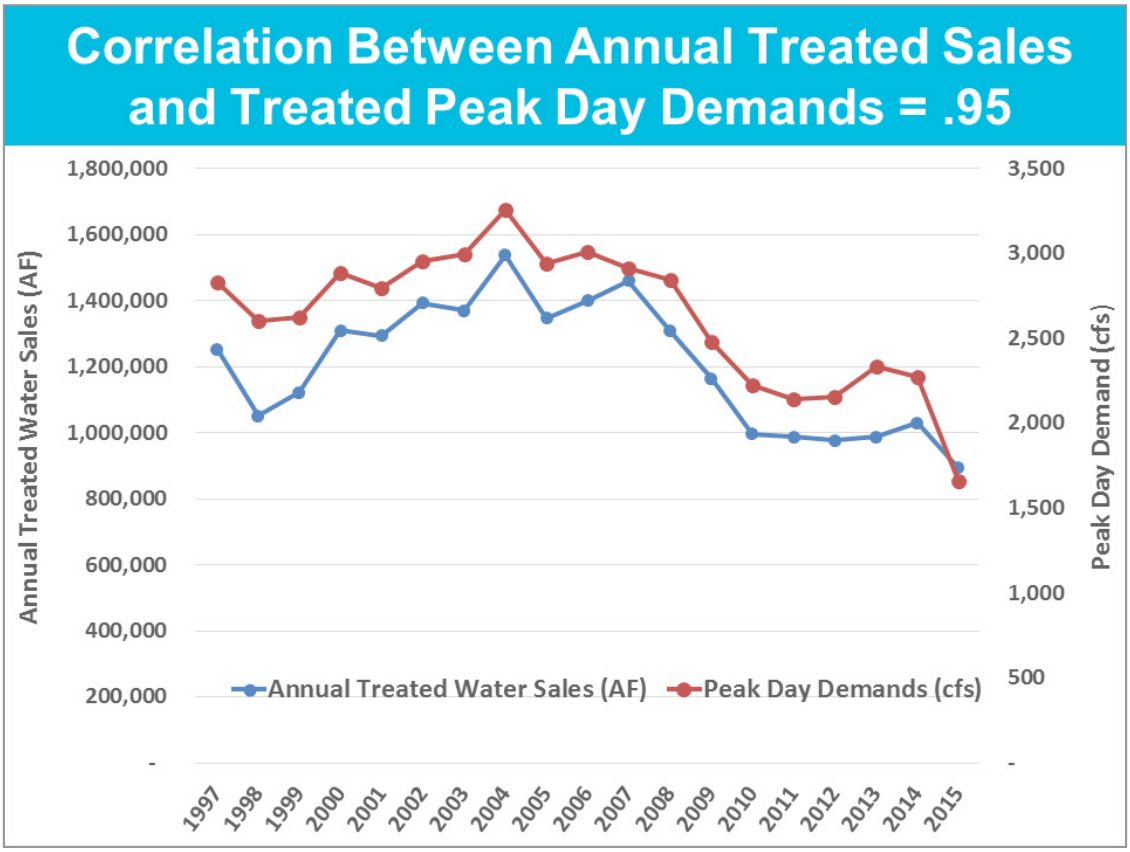
Summary of FY 2016/2017 Member Agency Treatment Revenue Requirement Impacts (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)						
		Proposed Rate Design				
Member Agency	Status Quo Treated Water Surcharge	Fixed Charge Revenue Requirement	Volumetric Revenue Requirement	Total Revenue Requirement	$ Difference From Status Quo	% Difference From Status Quo
Anaheim	$1,236,208	$954,911	$767,864	$1,722,775	$486,567	39%
Beverly Hills	3,198,735	945,725	1,986,877	2,932,602	(266,132)	-8%
Burbank	1,990,241	931,758	1,236,228	2,167,985	177,745	9%
Calleguas	27,860,023	8,340,091	17,305,107	25,645,198	(2,214,825)	-8%
Central Basin	8,750,956	4,885,071	5,435,611	10,320,681	1,569,725	18%
Compton	87	255,451	54	255,505	255,418	> 100%
Eastern	16,679,159	5,338,173	10,360,172	15,698,345	(980,813)	-6%
Foothill	2,337,078	845,074	1,451,664	2,296,738	(40,340)	-2%
Fullerton	2,392,937	837,031	1,486,361	2,323,392	(69,545)	-3%
Glendale	4,915,618	1,824,421	3,053,310	4,877,732	(37,886)	-1%
Inland Empire	0	0	0	0	0	0%
Las Virgenes	6,362,979	1,658,376	3,952,331	5,610,707	(752,272)	-12%
Long Beach	13,278,470	3,218,416	8,247,852	11,466,268	(1,812,202)	-14%
Los Angeles	19,137,588	6,394,377	11,887,212	18,281,589	(855,999)	-4%
MWDOC	44,255,500	17,754,580	27,489,072	45,243,652	988,152	2%
Pasadena	5,399,667	1,583,398	3,353,975	4,937,373	(462,295)	-9%
San Diego CWA	30,467,286	18,276,450	18,924,595	37,201,045	6,733,759	22%
San Fernando	28,723	28,135	17,841	45,976	17,253	60%
San Marino	210,923	75,664	131,014	206,678	(4,245)	-2%
Santa Ana	1,543,796	1,147,853	958,921	2,106,774	562,978	36%
Santa Monica	1,227,816	918,014	762,651	1,680,665	452,849	37%
Three Valleys	11,477,206	3,596,498	7,129,006	10,725,505	(751,701)	-7%
Torrance	4,673,233	1,530,565	2,902,754	4,433,319	(239,914)	-5%
Upper San Gabriel	2,615,453	1,015,173	1,624,575	2,639,748	24,295	1%
West Basin	32,556,355	10,572,734	20,222,209	30,794,944	(1,761,412)	-5%
Western MWD	14,883,317	4,619,464	9,244,694	13,864,158	(1,019,159)	-7%
TOTAL	**$257,479,354**	**$97,547,405**	**$159,931,949**	**$257,479,354**	**$0**	**0%**

Proposed Treatment Rate Design: Volumetric + Fixed Revenue Recovery

2-Part Test for Minimum Demand

<u>Questions – Concerns from 1-15-16 Manager's Meeting</u>:

1. How are peak demands captured?
2. Minimum forever?



Revenue Requirement Impacts of Peaking Factors in the Minimum Charge				
Member Agency	**Minimum: > of 1998-2007 OR 2006 - 2015 TYRA**	**Minimum: > of 1998 - 2007 OR 2006 - 2015 TYRA AND 2013 - 2015 Peaking**	**$ Difference**	**% Difference**
Anaheim	$1,722,775	$1,880,003	$157,228	9%
Beverly Hills	2,932,602	3,056,005	123,402	4%
Burbank	2,167,985	2,158,712	(9,274)	0%
Calleguas	25,645,198	26,269,066	623,868	2%
Central Basin	10,320,681	9,515,216	(805,465)	-8%
Compton	255,505	197,671	(57,833)	-23%
Eastern	15,698,345	16,869,107	1,170,761	7%
Foothill	2,296,738	2,278,411	(18,326)	-1%
Fullerton	2,323,392	2,346,647	23,255	1%
Glendale	4,877,732	4,869,738	(7,994)	0%
Inland Empire	0	0	0	---
Las Virgenes	5,610,707	5,799,214	188,506	3%
Long Beach	11,466,268	11,260,314	(205,954)	-2%
Los Angeles	18,281,589	19,169,363	887,774	5%
MWDOC	45,243,652	44,086,858	(1,156,794)	-3%
Pasadena	4,937,373	5,159,315	221,942	4%
San Diego CWA	37,201,045	35,379,254	(1,821,791)	-5%
San Fernando	45,976	116,636	70,660	154%
San Marino	206,678	297,300	90,623	44%
Santa Ana	2,106,774	1,956,865	(149,909)	-7%
Santa Monica	1,680,665	1,678,702	(1,963)	0%
Three Valleys	10,725,505	11,372,852	647,347	6%
Torrance	4,433,319	4,367,355	(65,964)	-1%
Upper San Gabriel	2,639,748	2,569,783	(69,965)	-3%
West Basin	30,794,944	30,246,079	(548,865)	-2%
Western MWD	13,864,158	14,578,887	714,729	5%
TOTAL	**$257,479,354**	**$257,479,354**	**$0**	**0%**

FY 2016/2017 Member Agency Revenue Requirement Impacts (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)					
		Option #1	Option #2	Dollar Difference from Status Quo	
Member Agency	Status Quo Treated Water Surcharge	Minimum: > of 1998-2007 OR 2006-2015 TYRA	Minimum > of 1998-2007 OR 2006-2015 TYRA AND 2013-2015 PEAKING	Option #1	Option #2
Anaheim	$1,236,208	$1,722,775	$1,880,003	$486,567	$643,795
Beverly Hills	3,198,735	2,932,602	3,056,005	(266,132)	(142,730)
Burbank	1,990,241	2,167,985	2,158,712	177,745	168,471
Calleguas	27,860,023	25,645,198	26,269,066	(2,214,825)	(1,590,957)
Central Basin	8,750,956	10,320,681	9,515,216	1,569,725	764,260
Compton	87	255,505	197,671	255,418	197,585
Eastern	16,679,159	15,698,345	16,869,107	(980,813)	189,948
Foothill	2,337,078	2,296,738	2,278,411	(40,340)	(58,666)
Fullerton	2,392,937	2,323,392	2,346,647	(69,545)	(46,290)
Glendale	4,915,618	4,877,732	4,869,738	(37,886)	(45,880)
Inland Empire	0	0	0	0	0
Las Virgenes	6,362,979	5,610,707	5,799,214	(752,272)	(563,765)
Long Beach	13,278,470	11,466,268	11,260,314	(1,812,202)	(2,018,156)
Los Angeles	19,137,588	18,281,589	19,169,363	(855,999)	31,776
MWDOC	44,255,500	45,243,652	44,086,858	988,152	(168,642)
Pasadena	5,399,667	4,937,373	5,159,315	(462,295)	(240,353)
San Diego CWA	30,467,286	37,201,045	35,379,254	6,733,759	4,911,968
San Fernando	28,723	45,976	116,636	17,253	87,913
San Marino	210,923	206,678	297,300	(4,245)	86,378
Santa Ana	1,543,796	2,106,774	1,956,865	562,978	413,069
Santa Monica	1,227,816	1,680,665	1,678,702	452,849	450,887
Three Valleys	11,477,206	10,725,505	11,372,852	(751,701)	(104,354)
Torrance	4,673,233	4,433,319	4,367,355	(239,914)	(305,878)
Upper San Gabriel	2,615,453	2,639,748	2,569,783	24,295	(45,670)
West Basin	32,556,355	30,794,944	30,246,079	(1,761,412)	(2,310,277)
Western MWD	14,883,317	13,864,158	14,578,887	(1,019,159)	(304,430)
Total	**$257,479,354**	**$257,479,354**	**$257,479,354**	**$0**	**$0**

Minimum Forever?

- Under Status Quo and All Approaches, service levels should be re-defined in conjunction with treatment plant capacity decisions

Recommended Approach

- Volume Rate and Fixed Charge Based on a Minimum
  - Appropriate assignment of demand and standby capacity costs
- Peaking Could be Considered as Part of the Fixed Charge Determination

Status Quo

- Maintain Current 100% Volumetric Treatment Cost Recovery

Summary

- Recommended Fixed-Minimum and Volume Method
  - Acknowledge treatment cost of service – Demand and Standby-related costs
  - Enhance treatment and total system fixed revenue recovery

Finance and Insurance Committee Meeting

Consideration of Alternative Treatment Cost Recovery Mechanism

March 7, 2016

Objectives-Goals

- Objective – Fixed Charge Concept
  - Cost of Service
  - Align charges with service commitment/investment
  - Cost recovery – revenue stability

Proposed Treatment Rate Design: Volumetric + Fixed Revenue Recovery

Requests for other options:

1. Consider Option with 10-Year Rolling Average (TYRA) without minimum
2. Consider Option with 20-Year Rolling Average without minimum

FY 2016/2017 Member Agency Revenue Requirement Impacts (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)				
Member Agency	Status Quo Treated Water Surcharge	Option #1 (Recommended) Minimum: 1998-2007 or 2006-2015 TYRA	Option #2 10-Year Rolling Average (NO PEAKING AND NO MINIMUM)	Option #3 20-Year Rolling Average (NO PEAKING AND NO MINIMUM)
Anaheim	$1,236,208	$1,722,775	$2,786,746	$2,495,432
Beverly Hills	3,198,735	2,932,602	2,616,652	2,629,901
Burbank	1,990,241	2,167,985	2,318,683	2,448,567
Calleguas	27,860,023	25,645,198	26,363,194	23,767,709
Central Basin	8,750,956	10,320,681	10,617,247	12,437,723
Compton	87	255,505	442,249	585,364
Eastern	16,679,159	15,698,345	16,851,081	14,829,949
Foothill	2,337,078	2,296,738	2,282,696	2,274,101
Fullerton	2,392,937	2,323,392	2,544,479	2,210,902
Glendale	4,915,618	4,877,732	4,501,063	4,879,318
Inland Empire	0	0	0	0
Las Virgenes	6,362,979	5,610,707	5,242,161	4,725,845
Long Beach	13,278,470	11,466,268	8,364,652	8,803,533
Los Angeles	19,137,588	18,281,589	20,212,754	17,529,276
MWDOC	44,255,500	45,243,652	47,107,360	47,182,284
Pasadena	5,399,667	4,937,373	4,867,711	4,461,015
San Diego CWA	30,467,286	37,201,045	35,957,147	42,941,871
San Fernando	28,723	45,976	47,357	52,031
San Marino	210,923	206,678	213,919	211,602
Santa Ana	1,543,796	2,106,774	3,063,695	2,946,052
Santa Monica	1,227,816	1,680,665	2,126,389	2,241,734
Three Valleys	11,477,206	10,725,505	9,614,021	9,755,570
Torrance	4,673,233	4,433,319	4,166,662	4,227,608
Upper San Gabriel	2,615,453	2,639,748	1,688,265	2,149,456
West Basin	32,556,355	30,794,944	28,880,956	29,031,907
Western MWD	14,883,317	13,864,158	14,602,217	12,660,604
Total	**$257,479,354**	**$257,479,354**	**$257,479,354**	**$257,479,354**

Recommended Approach

- Volume Rate and Fixed Charge Based on a Minimum
  - Appropriate assignment of demand and standby capacity costs

Status Quo

- Maintain Current 100% Volumetric Treatment Cost Recovery

Summary

- Recommended Fixed-Minimum and Volume Method
- Option – 10-Year Rolling Average
- Option – 20-Year Rolling Average

ATTACHMENT B:

OTHER TREATMENT SURCHARGE RATE DEISGN OPTIONS ANALYZED BY RFC

FY 2016/2017 Member Agency Revenue Requirement Impacts (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)					
Member Agency	Status Quo Treated Water Surcharge	Option #1 Minimum: > of 1998-2007 OR 2006-2015 TYRA	Option #2 Minimum > of 1998-2007 OR 2006-2015 TYRA AND 2013-2015 PEAKING	Dollar Difference from Status Quo Option #1	 Option #2
Anaheim	$1,236,208	$1,722,775	$1,880,003	$486,567	$643,795
Beverly Hills	3,198,735	2,932,602	3,056,005	(266,132)	(142,730)
Burbank	1,990,241	2,167,985	2,158,712	177,745	168,471
Calleguas	27,860,023	25,645,198	26,269,066	(2,214,825)	(1,590,957)
Central Basin	8,750,956	10,320,681	9,515,216	1,569,725	764,260
Compton	87	255,505	197,671	255,418	197,585
Eastern	16,679,159	15,698,345	16,869,107	(980,813)	189,948
Foothill	2,337,078	2,296,738	2,278,411	(40,340)	(58,666)
Fullerton	2,392,937	2,323,392	2,346,647	(69,545)	(46,290)
Glendale	4,915,618	4,877,732	4,869,738	(37,886)	(45,880)
Inland Empire	0	0	0	0	0
Las Virgenes	6,362,979	5,610,707	5,799,214	(752,272)	(563,765)
Long Beach	13,278,470	11,466,268	11,260,314	(1,812,202)	(2,018,156)
Los Angeles	19,137,588	18,281,589	19,169,363	(855,999)	31,776
MWDOC	44,255,500	45,243,652	44,086,858	988,152	(168,642)
Pasadena	5,399,667	4,937,373	5,159,315	(462,295)	(240,353)
San Diego CWA	30,467,286	37,201,045	35,379,254	6,733,759	4,911,968
San Fernando	28,723	45,976	116,636	17,253	87,913
San Marino	210,923	206,678	297,300	(4,245)	86,378
Santa Ana	1,543,796	2,106,774	1,956,865	562,978	413,069
Santa Monica	1,227,816	1,680,665	1,678,702	452,849	450,887
Three Valleys	11,477,206	10,725,505	11,372,852	(751,701)	(104,354)
Torrance	4,673,233	4,433,319	4,367,355	(239,914)	(305,878)
Upper San Gabriel	2,615,453	2,639,748	2,569,783	24,295	(45,670)
West Basin	32,556,355	30,794,944	30,246,079	(1,761,412)	(2,310,277)
Western Metropolitan	14,883,317	13,864,158	14,578,887	(1,019,159)	(304,430)
TOTAL	**$257,479,354**	**$257,479,354**	**$257,479,354**	**$0**	**$0**

FY 2016/2017 Member Agency Revenue Requirement Impacts (HYPOTHETICAL PRO FORMA - FOR EXAMPLE ONLY)				
Member Agency	Status Quo Treated Water Surcharge	Option #1 (Recommended) Minimum: > of 1998-2007 OR 2006-2015 TYRA	Option #2 10-Year Rolling Average (NO PEAKING AND NO MINIMUM)	Option #3 20-Year Rolling Average (NO PEAKING AND NO MINIMUM)
Anaheim	$1,236,208	$1,722,775	$2,786,746	$2,495,432
Beverly Hills	3,198,735	2,932,602	2,616,652	2,629,901
Burbank	1,990,241	2,167,985	2,318,683	2,448,567
Calleguas	27,860,023	25,645,198	26,363,194	23,767,709
Central Basin	8,750,956	10,320,681	10,617,247	12,437,723
Compton	87	255,505	442,249	585,364
Eastern	16,679,159	15,698,345	16,851,081	14,829,949
Foothill	2,337,078	2,296,738	2,282,696	2,274,101
Fullerton	2,392,937	2,323,392	2,544,479	2,210,902
Glendale	4,915,618	4,877,732	4,501,063	4,879,318
Inland Empire	0	0	0	0
Las Virgenes	6,362,979	5,610,707	5,242,161	4,725,845
Long Beach	13,278,470	11,466,268	8,364,652	8,803,533
Los Angeles	19,137,588	18,281,589	20,212,754	17,529,276
MWDOC	44,255,500	45,243,652	47,107,360	47,182,284
Pasadena	5,399,667	4,937,373	4,867,711	4,461,015
San Diego CWA	30,467,286	37,201,045	35,957,147	42,941,871
San Fernando	28,723	45,976	47,357	52,031
San Marino	210,923	206,678	213,919	211,602
Santa Ana	1,543,796	2,106,774	3,063,695	2,946,052
Santa Monica	1,227,816	1,680,665	2,126,389	2,241,734
Three Valleys	11,477,206	10,725,505	9,614,021	9,755,570
Torrance	4,673,233	4,433,319	4,166,662	4,227,608
Upper San Gabriel	2,615,453	2,639,748	1,688,265	2,149,456
West Basin	32,556,355	30,794,944	28,880,956	29,031,907
Western MWD	14,883,317	13,864,158	14,602,217	12,660,604
Total	**$257,479,354**	**$257,479,354**	**$257,479,354**	**$257,479,354**