

## OFFICE OF PUBLIC ACCOUNTABILITY



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Date: August 24, 2017

Council File No. 17-0930

To: Honorable Nury Martinez, Councilmember  
Chairperson, Energy, Climate Change and Environmental Justice Committee  
Honorable Paul Koretz, Councilmember, Vice-Chairperson  
Honorable Paul Krekorian, Councilmember  
Honorable Gilbert A. Cedillo, Councilmember  
Honorable Mitch O'Farrell Councilmember  
Honorable David Ryu, Councilmember

From: Frederick H. Pickel, Ph.D., Executive Director/Ratepayer Advocate   
Grant E. Hoag, P.E., Utility Rate and Policy Specialist 

Subject: California WaterFix Cost to City Ratepayers

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### SUMMARY

The analysis in this report finds that under a wide array of cost and water demand possibilities, the WaterFix to upgrade the Sacramento Delta water export system is affordable to City of Los Angeles households. Specifically, the WaterFix is estimated to cost the median single family resident household an average of \$1.73 per month. The current City median single family resident household water bill is approximately \$60 per month. This analysis also finds that long-term City policies to expand local water supplies, while maintaining access to imported water from the Metropolitan Water District of Southern California (MWD), will minimize the WaterFix costs to Los Angeles ratepayers.

### BACKGROUND

This report by the City of Los Angeles Office of Public Accountability/Ratepayer Advocate (OPA) responds to an analysis requested by Council motion on August 16, 2017 in Council File 17-0930. The report also updates a prior OPA report of May 7, 2014. This updated report estimates the costs for the WaterFix upgrades to a single family resident household served by the Department of Water and Power (DWP).

The WaterFix is a Sacramento Delta water export system upgrade project consisting of three new water intakes on the Sacramento River north of the Delta. These are tied to three North Tunnels running 14 miles and connecting to twin Main Tunnels running south another 30 miles, to an expanded Clifton Court Forebay and pumping station. The WaterFix will isolate the Sacramento River exports from the Sacramento Delta. The WaterFix will improve water quality

and will increase export reliability through operational flexibility accessing both the Sacramento River and the Southern Delta, using a “big gulp, little sip” water intake strategy. This strategy exports higher volumes during the heavier river flows, such as the springtime runoff period, and lesser exports when needed to minimize Delta environmental impacts.

The Delta exports are pumped from the Clifton Court Forebay to the California Aqueduct, which is maintained by the State Department of Water Resources (DWR). The California Aqueduct serves both the State Water Project (SWP) and certain Central Valley Project<sup>1</sup> (CVP) water contractors. The DWR also manages the SWP, while the United States Bureau of Reclamation manages the CVP. Together, they deliver water to the Silicon Valley, the Santa Barbara region, the San Joaquin Valley and to Southern California water agencies based on their contractual water allocations and actual supplies available each year.

The WaterFix costs can be fully funded from the SWP and CVP water contractors, including MWD, as recipients of the upgraded and more reliable water system. While no public vote is required for WaterFix approval and funding, it is subject to regulatory proceedings and the resolution of anticipated lawsuits. In late June and July 2017, the WaterFix received Federal and State Endangered Species Act approvals. Additional authorizations and permits remain to be finalized (e.g. from the U.S. Bureau of Reclamation and various State environmental agencies). A special MWD Board Meeting is scheduled for September 26, 2017 to discuss support for the WaterFix.

WaterFix cost and water exchange-related agreements among the water contractors in the SWP and the CVP remain to be negotiated, and contractors have yet to opt-into or opt-out of the WaterFix project. Most urban water contractors agree that the WaterFix will be an integral and indivisible part of the California water delivery systems, and that its cost should be distributed in proportion to the volume of contracted supplies. However, certain CVP agricultural water contractors have priority (senior) rights to reliable water supplies that could reduce their benefits from WaterFix. Also, some agricultural contractors are concerned that funding the WaterFix will severely increase their costs of farming, to the detriment of their land values. Both of these factions seek different WaterFix cost sharing. Among the SWP contractors, a variety of bilateral agreements exist. For example, there is a water storage and exchange agreement between MWD and the Coachella Valley Water District (a SWP contractor) that improves MWD’s water reliability to its members. During the past drought, there were many such agreements among SWP and CVP contractors, and the water supply market continues to evolve.

The City of Los Angeles is a member agency in MWD, which is a SWP contractor, and receives a

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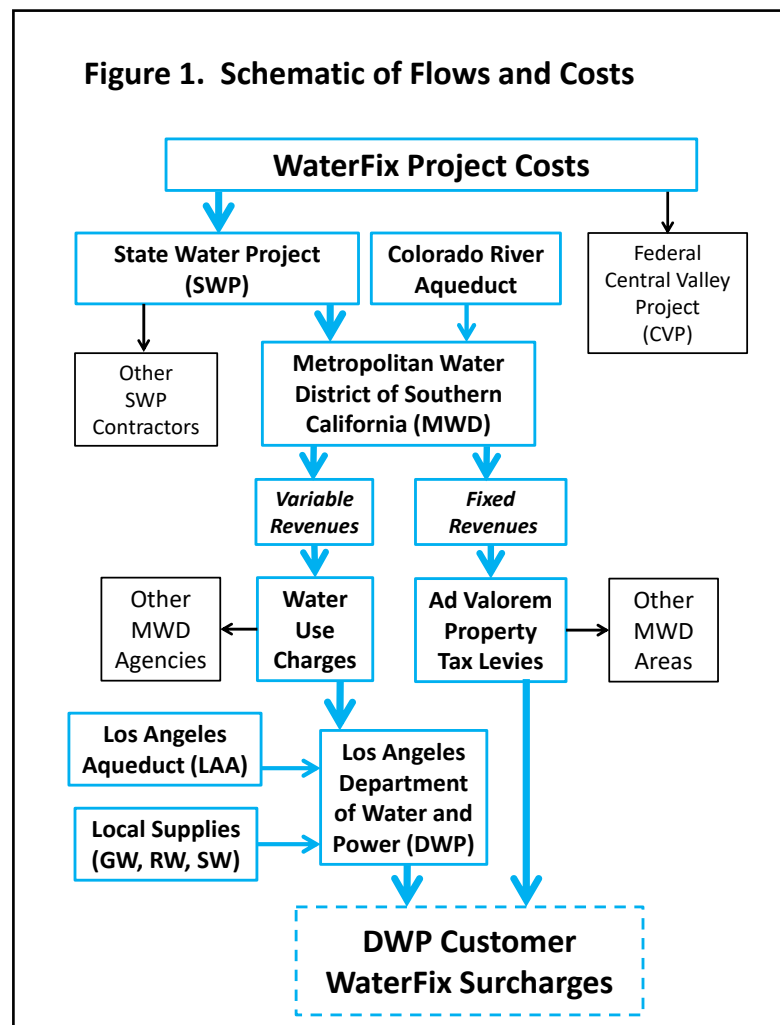
<sup>1</sup> The CVP referenced herein includes the Delta-Mendota Canal.

portion of Delta exports. The City’s Department of Water and Power (DWP) has projected that its historical reliance on imported MWD supplies will diminish significantly, and is likely to average 13% in the future. Based on these projections, by 2040 only a small amount of the WaterFix-related flows, estimated at an average of 2.1%, can be proportionally allocated to the City. OPA’s analysis and conclusions are based on variations around the key “Baseline” assumptions of the proportion of WaterFix-related costs in the City’s sources of water supply.

**ANALYSIS**

This report analyzes the WaterFix costs to City residents. Under three alternative long-term and persistent water supply conditions, the annualized WaterFix costs are proportioned to the end users. This is illustrated in Figure 1. The WaterFix costs are divided between the CVP and SWP, then among MWD and other SWP contractors, then averaged with MWD’s Colorado Aqueduct supply volume, and finally spread to DWP versus MWD’s other member agencies. DWP and MWD planning documents contain projections of year 2040 water demands and sources of supplies. Since the WaterFix project will be completed after 2030 but before 2040, OPA has used the year 2040 to estimate long-term persistent average conditions, with water supplies equaling demands. Moreover, by 2040, the WaterFix facilities are projected to have been in operation for seven years, so annualized WaterFix costs in the year 2040 better represent averaged costs of WaterFix over its service life, compared to either the beginning or the end.

Revenue sources for the OPA-defined WaterFix “surcharge” to retail customers include both MWD fixed property tax levies in the SoCal region that support bonded debt, and DWP variable water service charges; the flow of these allocations are also illustrated in Figure 1. MWD’s tax levies generate fixed revenues based on property



assessed values, while variable water sale revenues are proportional to the volume of water purchased by each MWD member agency. DWP's revenue sources under their existing rates are solely from variable water sales. A WaterFix surcharge is the sum of a fixed MWD tax levy to a single family residential property, plus the variable DWP water charge to that household.

A median single family residence is used herein as an index for estimating the WaterFix surcharge, while actual surcharges will also be proportionally collected from multi-family and other water customers. Due to a wide range of estimated costs, water deliveries and other allocations, this report describes a probabilistic range of surcharges per household, rather than a single "best guess" Baseline value.

The key elements and findings of this analysis are as follows:

1. **WaterFix Costs.** Project costs range from \$18 to \$26 billion, in 2024 dollars, based on the costs estimated in 2014 dollars using a 3% per year inflationary escalation rate. The cost includes construction, inflation, contingencies, land, environmental mitigation, engineering and project management.
2. **MWD Water.** OPA's range of long-term average Delta exports is from 3.8 to 5.3 million acre-feet per year (MAFY) allocated between the SWP and CVP, with a Baseline ratio of 55%/45%. Also, the SWP "Table A" allocations (see Table A-8) assigns to MWD a 47% portion of SWP supplies. As such, 26% of the WaterFix costs can be allocated to MWD. In the hypothetical worst case persistently dry scenario in Alternative 2, CVP demands are presumed to drop by 30% when certain contractors elect not participate in the WaterFix-related flows, and the 55%/45% ratio changes to 68%/32%. In addition, the remaining CVP contractors would have a 30% reduction in their allocated unit costs.
3. **DWP Water.** In the planning year 2040, an estimated 2.7% to 21% of MWD's annual water supply will be purchased by DWP. In the DWP portfolio of supplies, MWD imported water will vary from 12% to 61% of the total City water demand of 0.57 MAFY, depending on wetter versus dryer climatic conditions of Alternatives 1 and 2. Based on proportional allocations in the Baseline calculations, by 2040 only 2.1% of DWP's water supplies will originate from Sacramento Delta exports.
4. **MWD Property Taxes.** MWD's current property tax rate of 0.0035% generated a total of \$90 million in FY 2016-17, with 20% of these revenues from properties within the City of Los Angeles. By 2040 these tax levies will generate between \$114 and \$186 million per year, which OPA assumes will solely fund a portion of the future WaterFix debt service costs. This assessed value levy on a median Los Angeles single family dwelling property is the equivalent of \$0.78 to \$1.26 per month, in 2017 dollars.
5. **Annualized WaterFix Costs.** The share of WaterFix costs to MWD in 2040 dollars is in a range of \$267 to \$864 million per year, in 2040 dollars. This range of costs is due to the

differing extreme assumptions in project costs, bonding terms, CVP contractor supply participation and cost allocation levels. The total volume of Delta exports has little effect on these annualized costs.

6. **WaterFix Surcharges.** The WaterFix-related charges, after offsetting property tax proceeds, are \$62 to \$408 per AF of MWD water delivered to DWP and other MWD member agencies, in the year 2040. The direct DWP WaterFix surcharge to water ratepayers is \$0.09 to \$3.05 monthly per City single family residence with a median monthly water usage of 10 HCF, in 2017 dollars.

The total WaterFix surcharge, including both MWD property tax levies and DWP water charges, to the City's median single family residence totals \$0.87 to \$4.31 per month, in 2017 dollars. The best case wet climate Alternative 1 results in the lowest surcharge using optimistic assumptions for high water supply volumes, low project costs with the great bond terms and the lowest property tax levies. The worst case dry climate Alternative 2 assumptions result in the highest surcharge, but use low water supplies with some contractors opting-out of WaterFix, high project costs with bad financing terms, the high tax levies and a reduced share of costs for CVP (agricultural) contractors.

7. **Other Financial Issues.** Not included in the analysis summarized in Table 1, but relevant for discussion are several alternative calculations:
  - **Double Project Costs.** A 100% WaterFix project cost overrun (a 100% contingency) would increase the total WaterFix cost to \$29 Billion, in 2040 dollars. In this case, the existing Baseline surcharge (with a 36% contingency) would increase from \$1.16 to \$1.26 per month, in 2017 dollars. This increase consists of DWP's monthly surcharge on 10 HCF billing units rising 58% from \$0.18 to \$0.29, plus MWD's unchanged property tax levy of \$0.97 per month on the City's median assessed value SFR houses.
  - **No Property Taxes.** Generally, bonded debt is more attractive to investors, and tax levies supporting debt decrease customer bill volatility and conservation signals. Eliminating WaterFix-related property taxes and using revenues collected solely from volumetric "money follows water" costs charged directly by MWD to its member agencies including DWP, would drop the WaterFix surcharge to \$0.29 per month, in 2017 dollars.<sup>2</sup>
  - **MWD California WaterFix Finance and Cost Allocation Findings.** On August 10, 2017 MWD issued its third WaterFix White Paper regarding financing and cost

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<sup>2</sup> At this time, DWP has an inclining block four-tier rate structure to encourage water conservation that provides little customer bill stabilization from weather-driven supply and demand volatility. With no fixed component, the DWP WaterFix unit surcharges could swing by many multiples from wet to dry years.

sharing among the state’s water contractors. A comparison of their assumptions and findings with this report finds that the normalized OPA Baseline surcharge finding is within 10% of MWD’s Base Case.

**FINDINGS**

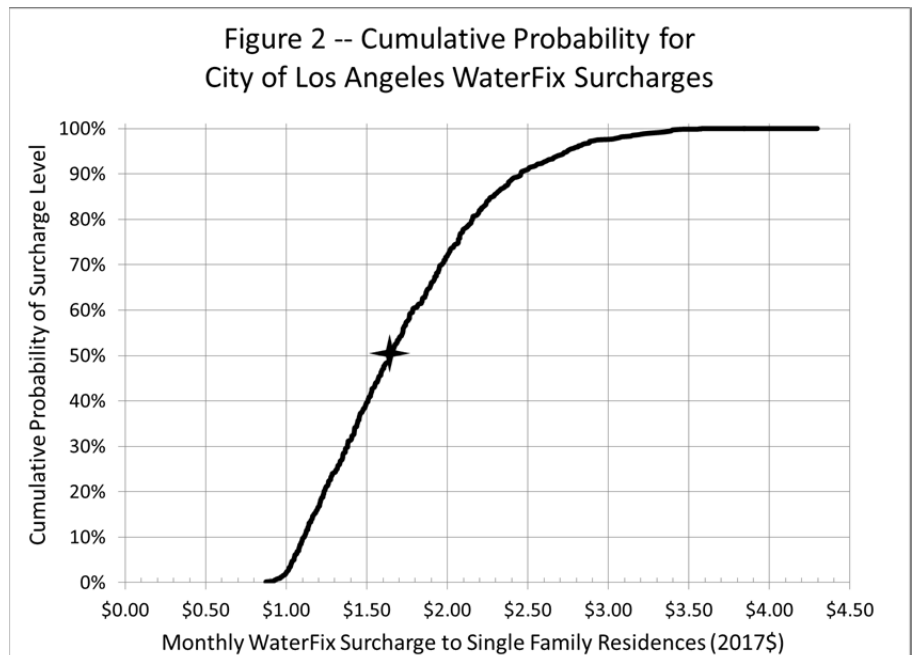
As shown in the Table 1, much of the WaterFix costs are allocated in property taxes, with the remainder as part of a DWP water service charge. The high proportion of taxes to charges is

Description	Surcharges in 2017 Dollars				
	Lowest	Baseline	Median	Average	Highest
LADWP Water Surcharge (\$/month)	\$0.09	\$0.18	\$0.65	\$0.73	\$3.05
MWD Property Tax (\$/month-SFR)	\$0.78	\$0.97	\$1.00	\$1.00	\$1.26
Total Monthly Surcharge	\$0.87	\$1.16	\$1.65	\$1.73	\$4.31
Standard Deviation (+/-)				\$0.53	

The surcharge is based on a house with median assessed value and a median monthly water use of 10 HCF. Surcharges are in 2017 dollars. Analysis variables are randomized in 600 modeling runs to develop the probabilistic median, average and standard deviation values.

due to the projection that by the year 2040, 20% of MWD taxes but only 3.6% of MWD water charges will be collected from the City.

This analysis uses a variety of assumptions and values. There are seven independent variables: WaterFix costs and deliveries, Los Angeles Aqueduct (LAA) supplies, local water supplies, MWD property tax revenues, bond interest rates, and CVP versus SWP contractor cost sharing. The 13 total variables in the analysis all have assumed probabilistic ranges, with the extremes represented by the lowest



and highest surcharges described above in Alternatives 1 and 2. As shown in Figure 2, the median expected surcharge is \$1.65 per month.

This updated report is consistent with the original OPA report on May 7, 2014 to the City's Energy and Environment Committee. The OPA originally estimated the household surcharge, excluding a range of Delta ecosystem improvements, at a range from \$0.47 to \$3.42 per month, in 2014 dollars.

While this report identifies the range of WaterFix Surcharges to City residents, it does not evaluate other important issues regarding the City's future water supply.<sup>3</sup>

## **CONCLUSION**

This analysis finds that, under an array of costs and of water demand scenarios, the WaterFix is affordable to City single family residence households. The analysis also found that maximizing DWP's use of local and other City-owned water supplies reduces the City's reliance on MWD imported water purchases, which can lower the future WaterFix costs to the City's households and businesses.

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<sup>3</sup> This report does not attempt to place a value on the reliability-based benefits of the WaterFix to the City. Other studies have opined that the WaterFix investment is economically beneficial, based on its improvement in the reliability and quality of water deliveries. The cost effectiveness of the WaterFix is not evaluated. This report does not analyze the financial differences between imported water purchases and local water supply costs.

cc: The Honorable Los Angeles City Council  
The Honorable Eric Garcetti, Mayor  
The Board of Water and Power Commissioners  
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**APPENDIX**

**CALIFORNIA WATERFIX COST TO CITY RATEPAYERS -- TECHNICAL ANALYSIS**

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## INTRODUCTION

This attachment provides the technical analysis of WaterFix costs to the City of Los Angeles. The analysis provides a range of values as an estimate of the WaterFix project cost impacts (surcharges), rather than relying on a single Baseline estimate. The analysis consists of eight tables describing the WaterFix costs, the water use by several agencies, and the range of surcharges. This analysis does not address single year weather volatility effects on regional water supply and demands, which are managed by MWD and DWP water in storage; the values used in this analysis represents persistent, stable long-term water delivery targets set equal to projected average demands, without changes to water in storage.

## DESCRIPTIONS OF TABLES

This section provides details regarding the individual tables.

**Table A-1. WaterFix Capital Costs: \$18 to \$26 Billion.** The WaterFix project costs range from \$17.7 to an OPA projected \$26.2 billion, in 2024 dollars. On July 10, 2017, the Metropolitan Water District of Southern California (MWD) issued a White Paper titled Modernizing the System: California WaterFix Infrastructure. It identifies a range of WaterFix capital costs from \$12.4 to \$14.9 billion in 2014 dollars. The range includes construction costs from \$8.9 to \$9.5 billion and contingency costs from \$0.8 to \$7.1 billion. The \$18.7 billion Baseline value includes a 36% contingency factor, which per Aldea Services LLC represents a confidence interval well above 75%. MWD's financing and cost allocation white paper uses a single project cost, with the 36% contingency, for an equivalent total cost of \$21.2 billion in 2024 dollars. OPA has increased the 36% contingency to 75% for the worst case Alternative 2.

The WaterFix costs include the following elements: construction cost, project contingency or confidence interval costs, land costs, environmental mitigation costs, engineering costs, construction management and project management costs. As itemized in Table A-1, the "all-in" WaterFix program costs in 2024 dollars includes both \$796 million in environmental mitigation and inflationary escalations from 2014 to 2024 (mid-construction) at 3% per year.

**Table A-2. MWD Water Supplies: 25% To 33% of Delta Exports.** MWD estimates that the Delta facility Baseline export has a long-term persistent average yield of 4.9 million acre-feet per year (MAFY), by the year 2040. The State Water Project (SWP) and certain Central Valley Project (CVP) contractors, including those on the Delta-Mendota Canal, have water allocations from Sacramento Delta exports. With minimal variation, SWP currently has an allocation of 55% of

the water supply flows from the Clifton Court Forebay, and MWD has an allocation of 47% of SWP deliveries.

However, the future persistent long-term average WaterFix exports are difficult to predict. In an Alternative 2 persistently dry future, OPA has projected the exports are down to 3.8 MAFY; in an Alternative 1 wet climate, exports are 5.3 MAFY. In addition, OPA has introduced into Alternative 2 a hypothetical reduction in CVP (agricultural) contractor deliveries of 30%, as described in Table A-5. The CVP Contractors currently use approximately 45% of Delta exports, including the CVP Exchange and Settlement Contractors with senior (priority) supply rights at 24% of the CVP entitlement. As a result, the OPA uses a range of 25% to 33% for MWD's proportional supply allocation from the State Delta diversion facilities.

**Table A-3. DWP Water Supplies: 1.2% To 9.2% from the California Aqueduct.** Department of Water and Power (DWP) 2015 Urban Water Management Plan (UWMP) projects for the planning year 2040, a reliable water supply of 0.57 MAFY will serve the City's needs, regardless of future climate conditions. The UWMP supports the Mayor's ED-5 water supply objectives, and is based on a supply portfolio from multiple water sources. The multiple City sources of potable water supplies include (1) local water from augmented groundwater (GW), (2) recycled water offsets, (3) Los Angeles Aqueduct (LAA) supplies from the Owens Valley, and (4) MWD purchased water imports from the Colorado River and SWP.

The Baseline projection of DWP's water portfolio includes persistent MWD purchases of 0.075 MAFY. From this volume, a 2.1% proportion originates from the Delta. However, OPA projects that persistent, reliable imported water purchases from MWD can be between 12% to 61% (0.07 to 0.35 MAFY), with a Baseline 13%, of the total DWP supply portfolio, depending on DWP's success in securing other sources of supply, and future climate conditions.

**Table A-4. MWD Taxes for WaterFix: \$0.78 To \$1.26 Monthly for City Households.** MWD's current property taxing authority is 0.0035% of the assessed valuation of secured properties. In FY 2016-17 the tax generated \$90 million, which MWD used for servicing existing debt. The properties within the City of Los Angeles were a 20% share of those taxes, or \$18 million. As the SWP bonds will be paid off by 2035, the OPA has assumed that MWD will use its taxing authority in support of new bonds for its share of WaterFix facility costs, at the same 0.0035% rate. By 2040, MWD taxes should increase to \$114 to \$186 million per year from a 2% per year growth rate in property values, and OPA presumes that these taxes will, in effect, offset much of the WaterFix volumetric surcharges otherwise billed to MWD member agencies. The year 2017 property tax levy is \$0.97 per month equivalent for a median single family residence household in the City. For Alternatives 1 and 2, that current value is adjusted down by 20% and up by 30%.

In the year 2040 the ad valorem tax revenues from properties within the City of Los Angeles are projected to remain at approximately 20% of MWD's total tax revenues. In contrast, the Baseline projection is that the City's share of MWD water deliveries will decline to 13% of the total demands for MWD supplies.

**Table A-5. WaterFix Annualized Costs: \$1.1 To \$2.3 Billion per Year.** The OPA estimates that the WaterFix proportional costs to MWD member agencies is in a range of \$108 to \$520 per acre-foot (AF), with a Baseline of \$181 per AF, in 2040 dollars, or \$92 per AF, in 2017 dollars, before offsetting MWD property tax revenues. MWD's current tier 1 untreated water rate is \$666 per AF. The Baseline WaterFix costs represent a 14% increase in average MWD costs. Due to DWP's large water portfolio and plan to minimize use of MWD supplies, the WaterFix cost impacts on City residents are projected to be less than those to MWD.

The major differences between MWD and OPA projected costs are that the OPA includes regional growth in water demands to year 2040, while MWD does not, and OPA uses a 5% interest rate on bonds, while MWD uses 4%. Also, OPA costs are developed for the year 2040, in contrast to MWD's year 2033. Included in Alternative 2 calculations is the hypothetical possibility of a 30% discount in WaterFix surcharges to CVP (agricultural) contractors (presumably in exchange for lower supply reliability during shortage conditions), while MWD did not address this possibility. Note that this hypothetical discount is coupled to the Alternative 2 reduction in CVP water demands of 30%, as described previously in Table A-2.

**Table A-6. WaterFix Surcharges to City Single Family Resident Households: \$0.87 To \$4.31 per Month.** The total monthly surcharge to City single family residence households for the WaterFix is between \$0.87 and \$4.31, in 2017 dollars. In contrast, the 2017 median DWP water service bill to single family residents is approximately \$60 per month. This range is based on the assumptions and calculations in the prior tables including the fixed 0.0035% MWD ad valorem property tax levy, combined with the variable DWP water service surcharge. The DWP surcharge is based on the water demand of 10 HCF billing units per month for median City single family residence customers, and recovers DWP's WaterFix costs of \$4.1 to \$141 million per year in 2040 dollars. These values are reduced to year 2017 dollars using a 3% annual inflation rate.

**Table A-7. Variables Affecting Charge.** The range of WaterFix costs are bracketed by Alternative 1 and 2 extremely low and high surcharges possibilities. To determine a likely (average and median) surcharge, possible values are estimated from the range of alternative values for each of 13 variable assumptions, as well as their probabilities. A randomized mix of the seven independent variables is used to evaluate the probabilities within that extreme range. Shown in sections A and B of the table are the ranges for each variable, with Section C listing the

probabilities, as selected by the OPA. The seven independent variables are: project costs, Delta water exports, LAA water deliveries, DWP local water supplies, MWD assessed valuation property tax revenues, bond interest rates, and CVP versus SWP contractor WaterFix cost sharing. Some of the variables have uniform distributions while others have discrete probabilities. Using 600 iterations of randomly generated numbers, the OPA developed the median, average and standard deviation of the possible surcharges, as well as the cumulative probability curve.

**Table A-8. California State Water Project Contractors Table A.** As previously described in Table A-2, the SWP water contractors have water supply contracts with the DWR that define maximum annual water supply entitlements. The attached SWP Table A Summary lists the current annual amounts of all 29 contracts. Typically, actual yearly water supplies are delivered at approximately 65% of the Table A values. Most (97%) of the SWP contractors receive water from the California Aqueduct; these contractors, plus the CVP contractors, are funding the WaterFix costs. As shown, MWD has 1.9 of the 4.1 MAFY (47%) of the SWP supplies delivered using the California Aqueduct.

**Table A-1. WaterFix Capital Costs**

WaterFix Project Elements	Aldea Services Costs Estimates & Confidence Intervals			Jacobs Enginng	Baseline Case	5RMK Base
	Lowest - 25%	50%	75%		5RMK Base with 36% Contingency	with OPA 75% Contingency
	Alt. 1 Lower Cost					Alt. 2 Higher Cost (a)
Base Construction & Engineering Cost (2014\$)	\$9,499	\$9,499	\$9,499	\$8,860	\$9,499	\$9,499
Contingency (% of Base Costs)	9%	10%	12%	36%	36%	75%
Risk Costs/Contingency	\$815	\$972	\$1,160	\$3,152	\$3,378	\$7,124
Project & Const. Mgmt./Engineering	\$1,920	\$1,920	\$1,920	\$1,920	\$1,920	\$1,920
Land (with 20% contingency)	\$146	\$146	\$146	\$146	\$146	\$146
<b>Total Project (2014\$)</b>	<b>\$12,380</b>	<b>\$12,538</b>	<b>\$12,725</b>	<b>\$14,079</b>	<b>\$14,943</b>	<b>\$18,690</b>
Environmental Mitigation (2014\$)	\$796				\$796	\$796
Inflation of 2014\$ Costs to 2024\$	\$4,531				\$5,413	\$6,702
<b>Total Project Cost Alternatives (2024\$)</b>	<b>\$17,708</b>				<b>\$21,152</b>	<b>\$26,188</b>

All values are in million dollars.

Source: July 10, 2017, Modernizing the System: California WaterFix Infrastructure White Paper No. 1, The Metropolitan Water District of Southern California. The environmental mitigation is for localized remediation of project-related impacts.

Inflation is 3% per year using annual compounding. The midpoint of construction expenditures is the year 2024. The WaterFix Project is online in 2033.

(a) The Alternative 2 highest cost worst case contingency is projected by OPA in the probabilistic analysis.

**Table A-2. MWD Water Supplies and Demands**

	WaterFix Alternatives		
	Alt 1 Persistently Wet Climate	Baseline	Alt 2 Persistently Dry Climate
<b>Year 2040 Average Cost Sharing based on Flows</b>			
<b>MWD (share of Delta WaterFix Exports)</b>	<b>25%</b>	<b>26%</b>	<b>33%</b>
Other SWP Contractors	30%	29%	36%
Total SWP Contractors	55%	55%	68%
Total CVP Contractors (a)	45%	45%	32%
Total State Water Delta Exports	100%	100%	100%
MWD Share of SWP Flow (b)	46%	47%	48%
<b>Year 2040 Persistent Average Flow Allocations (AFY)</b>			
MWD Persistent Supply from SWP (b, net of storage)	1,340,000	1,270,000	1,230,000
Supply to Other SWP Contractors	1,570,000	1,425,000	1,340,000
Total SWP Contractors (b)	2,910,000	2,695,000	2,570,000
Total CVP Contractors (b, c)	2,390,000	2,205,000	1,190,000
Persistent Delta WaterFix Allocations (c, d)	5,300,000	4,900,000	3,760,000
<b>MWD 2040 Persistent long-term Demand for Imported Waters (Equal to Sources of Supply)</b>			
SWP Supplies	1,340,000	1,270,000	1,230,000
Colorado River Supplies (e, CRA)	1,138,000	830,000	430,008
Total MWD Annual Persistent Sales (b, f)	2,478,000	2,100,000	1,660,008

Values may not foot due to rounding.

The values herein are net of water to/from storage, and represents persistent, stable long-term reliability targets supporting projected demands.

a. The Alternative 2 worst case persistently dry climate includes a hypothetical 30% drop in CVP demands due to water supply cost increases to price-sensitive CVP agricultural contractors.

b. 2015 MWD UWMP 2015 pgs. A.3-46 1.2 MAF persistent long term post 2030 Delta Source of Supply Solution. The State Water Project Final Delivery Capability Report Jul 2015 Table 5-1 lists SoCal area SWP contractor max Table A delivery at 2.6 MAFY, and MWD median deliveries at 65% of max Table A (1.7 MAFY). MWD 2015 UWMP Table A.3-7 (pg. A.3-57) identifies the 2040 multiple dry years California Aqueduct supply as 0.79 MAFY, including the WaterFix; the persistent deliveries in the dry climate will exceed this multi-year shortage condition. Per Bay-Delta Initiatives Manager, MWD, 23 Feb 2017, SWP contractor deliveries are stable at 46% to MWD, 3% SWP above Delta and 50% for other SWP contractors.

c. July 20, 2017, Modernizing the System: California WaterFix Operations White Paper, Figure 5, MWD

d. 9/16 MWD Brochure: Why a California Water Fix? Average Annual Yield = 4.9 MAFY. The deliveries are identified as 4.7 to 5.3 MAFY operating range. MWD's lowest value for Delta exports with WaterFix is 4.7 MAFY, which OPA has reduced by 20% to 3.8 MAFY for the worst case persistent dry conditions.

e. MWD 2015 UWMP - Year 2040 average year supplies from the Colorado River Aqueduct (CRA) are ~0.9 MAFY. Minimum water supply under Metropolitan's Priority 4 senior rights apportionment of Colorado River water (0.55 MAFY) has been continuously delivered since 1939.

f. The total MWD Annual Persistent Sales are projected to grow from the current (2015) 1.7 MAFY to 1.85 MAFY by 2025, per Page 2 of the Attachment 2, to the Ten-Year Financial Forecast of the 2016/17 and 2017/18 Biannual Budget. The MWD 2015 UWMP Table A.1-5 projects an annualized increase in total demands to 2040 of 0.6% for the LA County versus a 1.0% growth for all of the MWD service area. This analysis presumes that MWD total normal sales growth in demand is 0.8% per year for the next 25 years, or 2.1 MAFY in 2040.

**Table A-3. DWP Water Supplies**

<b>LADWP Long-term Persistent Annual Source of Supplies (AFY, 2040)</b>	<b>Alt. 1 Wet Climate - Less MWD</b>	<b>Baseline</b>	<b>Alt. 2 Dry Climate - More MWD</b>
	<b>Reliance</b>		<b>Reliance</b>
MWD Imported Water Purchases (a)	66,000	74,930	345,000
LA Aqueduct (LAA, b)	295,130	286,200	50,600
Local GW, RW & Transfers (b)	204,470	204,470	170,000
Net DWP Supplies and Sales (c)	565,600	565,600	565,600
<b>DWP Portion of WaterFix Exports (d, 2040)</b>	<b>1.6%</b>	<b>2.1%</b>	<b>15%</b>
DWP Portion of MWD's Water Deliveries	2.7%	3.6%	21%
MWD Portion of DWP Total Supply	12%	13%	61%

Values may not foot due to rounding.

The sources of supply are net of water to/from storage, as supply herein represents persistent, stable long-term demands.

a. Certain City areas requiring 66,000 AFY have access only to MWD water. Per the 2015 DWP UWMP 2040 Exhibit 11F, the MWD supplies of 310,530 AFY for single dry years is increased to represents a long-term dryer California climate with more City dependence on MWD supplies.

b. Wet and Baseline cases presume successful development of all future local supplies. The dryer case alternative presumes a shortfall in local supply development and lower LAA supplies.

c. Source: 2015 DWP UWMP 2040 demands (Exhibit 11F & H)

d. DWP's presumed proportion of WaterFix (supplies) uses the ratios of DWP to MWD supplies and the SWP to Delta export volumes.



**Table A-4. MWD Taxes for WaterFix**

Description	Assessed Valuation (\$ billion)	MWD Ad Valorem Tax Rate (b)	Taxes to MWD (\$ million)
City Area (FY 2016-17, a)	\$521	0.0035%	\$18
Other Areas in the MWD Service Area	\$2,062	0.0035%	\$72
Total MWD Service Area (FY 2016-17, a)	\$2,583	0.0035%	\$90
City to Total MWD Service Area Ratio	20%		20%
DWP's Share of MWD's Total Member Agency Water Deliveries (2040)			<u>Ratio of Supply</u>
Alt. 1 Wet Climate - Less MWD Reliance			2.7%
Baseline			3.6%
Alt. 2 Dry Climate - More MWD Reliance			21%
MWD Property Tax Revenues in FY 2016-17 (\$ million/year)		\$90	
MWD Reported Annualized Growth in AV Revenues 2016 to 2026 (a, b)	2.0%		
Equivalent Growth in AV Revenues from FY 2016-17 to 2040		158%	
MWD Property Tax Revenues in 2040 (\$ million/year, Baseline)		<u>\$143</u>	
	<u>Alt. 1 Lower Ad Valorem</u>	<u>Baseline</u>	<u>Alt. 2 Higher Ad Valorem</u>
<b>MWD Property Tax Revenues in 2040</b>	<b>Property Taxes</b>	<b>Property Taxes</b>	<b>Property Taxes</b>
Range of Tax Levy Revenues for Alternatives	80%	100%	130%
<b>Projected Property Tax Revenues (2040\$, \$ million/year)</b>	<b>\$114</b>	<b>\$143</b>	<b>\$186</b>
		<u>Median Value House in City</u>	
<b>Surcharges Collected Using MWD's Assessed Valuation Taxing Authority</b>		<b>Median Value House in City</b>	
One SFR Household Property Taxable Assessed Valuation (2016, c)		\$323,400	
Projected Annualized Inflation in Assessed Value (d)		3.0%	
One SFR Household Property Taxable Assessed Valuation (2017\$)		\$333,116	
MWD Ad Valorem Tax Rate (b)		0.0035%	
Monthly Equivalent Tax Levy on City SFR in 2017\$ (\$/month-SFR house)		\$0.97	
Monthly Equivalent Tax Levy on City SFR in 2040\$ (\$/month-SFR house)		\$1.92	
	<u>Alt. 1 Lower</u>	<u>Baseline</u>	<u>Alt. 2 Higher</u>
<b>MWD Property Tax Levies to City SFR Houses for WaterFix Bonded Debt Service</b>	<b>MWD AV Tax Levy</b>	<b>Median MWD AV Tax Levy</b>	<b>MWD AV Tax Levy</b>
Range of Assessed Valuation Levies (% of median City SFR)	80%	100%	130%
<b>Monthly Levy on SFRs in 2017\$ (\$/month-SFR house equivalent, d)</b>	<b>\$0.78</b>	<b>\$0.97</b>	<b>\$1.26</b>

Values may not foot due to rounding.

a. July 17, 2017, City Council File No. 17-0654 - Metropolitan Water District of Southern California Rate Setting Practices and Approaches. The current tax levies include \$15 million for MWD bonds and \$75 million for State Water Project bonds. Source: Ad Valorem (AV) Growth rate of 2% is from 2016 to 2025 per the MWD 2016/17 and 2017/18 Biennial Budget, Attachment 2. This annual growth rate is used for 2017 to 2040. The projected SFR AV growth in the City is estimated at 1 percent per year above the total MWD service area. Per California Municipal Statistics, Inc., in FY 2016-17 SFR AV in the City was 53% of the AV of all properties.

b. The April 2016 MWD Board Letter 8-1 proposed ten-year forecast and adopted a resolution finding that continuing an ad valorem tax rate of 0.0035% for fiscal year 2015/16 is essential to MWD's fiscal integrity. This rate is projected by OPA to be unchanged for the WaterFix bond financing period.

c. 7/9/2017 HdL Companies, for 589,991 single family residences in 2016 Los Angeles; values are net of exemptions and for secured properties only. The avg. sale price of City SFRs in FY 2015-16 was \$550,000.

d. Values in 2017 dollars use a 3% per year inflation rate on future costs.

**Table A-5. WaterFix Annualized Costs**

Description	Alt. 1 Best	Alt. 2	
	Case	Baseline	Worst Case
Project Costs Mid-construction (\$ million, 2024\$)	\$17,708	\$21,152	\$26,188
Bonded Debt Interest Rates (True Interest Cost)	4.0%	5.0%	7.0%
Annual Bonded Debt Service from 2023 to 2062 (a)	\$968	\$1,381	\$2,220
Annual O&M Costs (2040\$, b)	\$89	\$89	\$89
Total Annual Cost (\$ Million/year, 2040\$)	\$1,056	\$1,470	\$2,309
SWP Share of California Aqueduct WaterFix Volume	55%	55%	68%
CVP Rate compared to Average WaterFix Rate (c)	100%	100%	70%
SWP Share of WaterFix Costs (\$ million/year)	\$581	\$808	\$1,799
SWP Share of WaterFix Costs (\$M/year)	\$581	\$808	\$1,799
MWD Use of the SWP, by Volume	46%	47%	48%
MWD Share of WaterFix Costs (\$ million/year, 2040\$, d)	\$267	\$381	\$864
<b>Unit Cost Statistics for Information Only (FYI)</b>			
<i>WaterFix Annual Cost (\$ Million/year)</i>	\$1,056	\$1,470	\$2,309
<i>Total Volume (SWP &amp; CVP) using WaterFix (AFY)</i>	5,300,000	4,900,000	3,760,000
<i>Average WaterFix Cost (\$/AFY, 2040\$)</i>	\$199	\$300	\$614
<i>Average SWP Contractor Charge for WaterFix (\$/AF, 2040\$)</i>	\$200	\$300	\$700
<i>Avg CVP Contractor Charge for WaterFix (\$/AF, 2040\$, c)</i>	\$199	\$300	\$429
<i>MWD Annual Costs for WaterFix (\$ million/year, 2040\$, d)</i>	\$267	\$381	\$864
<i>MWD Member Agency Demands (AFY in Year 2040, Avg)</i>	2,478,000	2,100,000	1,660,008
<i>MWD WaterFix costs per Acre Foot (\$/AF, 2040\$)</i>	\$108	\$181	\$520
<i>MWD WaterFix costs per Acre Foot (\$/AF, 2017\$, e)</i>	\$55	\$92	\$264
<i>MWD Tier 1 Full Service Untreated Cost (\$/AF, 2017\$)</i>	\$666	\$666	\$666
<i>MWD WaterFix Cost Increase</i>	8%	14%	40%
<i>MWD Annual Costs for WaterFix (\$ million/year, 2040\$, d)</i>	\$267	\$381	\$864
<i>70% of costs allocated to residents per MWD</i>	\$187	\$267	\$605
<i>Total Households Served by MWD throughout SoCal (2040)</i>	7,332,000	7,332,000	7,332,000
<i>Avg. MWD WaterFix Charge per Household (\$/month-HH, 2040\$)</i>	\$2.13	\$3.03	\$6.87
<i>Avg. MWD WaterFix Charge per Household (\$/month-HH, 2017\$)</i>	\$1.08	\$1.54	\$3.48

Values may not foot due to rounding.

a. SCWC 2/2012 Bay Delta Conservation Plan with Conservation Benefits and Financial Strategies, by PFM Group. The bonds have 40 year terms from 2023 to 2062, a cost of issuance (COI) of \$8M and capitalized interest for two years. The COI and cap interest costs add 8%, 12% and 13% to the project.

b. Annual O&M Costs are \$40 million per year in 2014\$, plus 3%/year inflation from 2014 to 2040.

c. OPA higher cost alternative presumes that CVP agricultural contractors will reduce demand by 70%, and will receive an interruptible supply rate at 70% of the average rate.

d. For comparison, per the MWD 2016/17 and 2017/18 Biennial Budget, "Metropolitan's share of the costs for the California Water Fix is expected to be about \$246 million by 2025/26." That year includes the full level of annual capital and O&M costs.

e. The 2040 dollars are adjusted to 2017 using a 3% per year inflation rate.

**Table A-6. WaterFix Surcharges to City Single Family Resident Households**

Description	Alt. 1 Best		Alt. 2 Worst
	Case	Baseline	Case
Total Annual MWD Cost for WaterFix (\$ million/year, 2040\$)	\$267	\$381	\$864
Less MWD taxes for WaterFix Debt Payments (\$million/year)	(\$114)	(\$143)	(\$186)
Net Annual MWD Variable Cost for WaterFix (\$ million/year, 2040\$)	\$153	\$238	\$678
MWD Member Agency Projected Demand (AFY, 2040 Average)	2,478,000	2,100,000	1,660,008
MWD Variable Surcharge to MWD Agencies (\$ per AF, 2040\$)	\$62	\$113	\$408
<b>DWP Volumetric Surcharges for WaterFix Costs</b>			
MWD Variable Cost to All Member Agencies (\$ per AF)	\$62	\$113	\$408
DWP Purchases of MWD Water (AFY)	66,000	74,930	345,000
DWP Cost based on Use of MWD Supplies (\$ Million per year)	\$4.1	\$8.5	\$140.9
DWP Projected Water Sales (MHCF per year w/ 5% losses, 2040, b)	234	234	234
Unit DWP Cost for WaterFix (\$/HCF, 2040\$)	\$0.017	\$0.036	\$0.602
Unit DWP Surcharge for WaterFix (\$/HCF, 2017\$)	\$0.009	\$0.018	\$0.305
Current DWP Tier 1 Water Rate (\$/HCF, Fall 2017)	\$5.671	\$5.671	\$5.671
WaterFix Surcharge	0.2%	0.3%	5.4%
<b>Total WaterFix Charge to City SFR Households (2040\$)</b>			
Unit DWP Cost for WaterFix (\$/HCF, 2040\$)	\$0.017	\$0.036	\$0.602
Water Use for City Single Family Residence (HCF/month-house)	10	10	10
DWP WaterFix Variable Cost per SFR (\$/month, 2040\$)	\$0.17	\$0.36	\$6.02
MWD Taxes to SFR for WaterFix Costs (\$/month, Table 5, 2040\$)	\$1.54	\$1.92	\$2.50
Total Monthly WaterFix Charge in 2040 Dollars (\$/month -SFR)	\$1.71	\$2.28	\$8.52
<b>Total Monthly WaterFix Surcharge to Median City Single Family Residence (\$/month, 2017\$, a)</b>			
DWP WaterFix Variable Cost per SFR (\$/month)	\$0.09	\$0.18	\$3.05
MWD Direct AV Taxes to City SFR for WaterFix Costs (\$/month)	\$0.78	\$0.97	\$1.26
Total Monthly WaterFix Surcharge in 2017 Dollars (\$/month)	\$0.87	\$1.16	\$4.31
Current DWP Typical 10 HCF Water Bill (\$/month-SFR Schedule A Tiers 1 & 2 Fall 2017)	\$59.97	\$59.97	\$59.97
WaterFix Surcharge on DWP Customer Bill	1.4%	1.9%	7.2%

Values may not foot due to rounding.

a. The 2040 dollars are converted to 2017 dollars using a 3% per year inflation rate. The projected water usage is 10 HCF per month.

b. Non-revenue water is estimated at 5% of supplies for calculating unit rates.

**Table A-7. Variables Affecting Charge and Tax Values**

Description	Alt. 1 Lowest Surcharge	Baseline	Alt. 2 Highest Surcharge	Independent Variable	Random Variable Calculation	
					Result	Selection of Random Variable
<b>A. Alternatives: Variable Values Used</b>						
Discount Rate (% per year)		3%				OPA Selection for All Alts
1: WaterFix Capital Cost (\$M)	\$17,708	\$21,152	\$26,188	Yes	\$20,893	Uniform Distribution
2: California Aqueduct Deliveries (AFY)	5,300,000	4,900,000	3,760,000	Yes	4,900,000	Discrete Probability
3: CVP (AG) Contractor Deliveries (AFY)	2,390,000	2,205,000	1,190,000	No - See A2	2,205,000	B3 * A2 Result
4: SWP Contractor Deliveries (AFY)	2,910,000	2,695,000	2,570,000	No - See A2	2,695,000	A2 Result - A3 Result
5: MWD Avg. Supply & Demand (SWP & CRA, AFY)	2,478,000	2,100,000	1,660,008	No - See A2	2,100,000	Function of A2 Selection
6: MWD Use of the SWP Supplies (AFY)	1,340,000	1,270,000	1,230,000	No - See A2	1,270,028	A4 Result * B6 Result
7: DWP Supply from LAA (AFY)	295,130	286,200	50,600	Yes	272,055	Uniform Distribution
9: DWP Supply from Local GW & RW (AFY)	204,470	204,470	170,000	Yes	175,605	Uniform Distribution
10: MWD AV Tax Revenues (\$ Million per year)	\$114	\$143	\$186	Yes	\$169	Uniform Distribution
11: LA City SFR AV Tax (\$ per month)	\$1.54	\$1.92	\$2.50	No - See A10	\$2.27	Function of A10 Selection
12: Debt Interest Rates (TIC)	4.0%	5.0%	7.0%	Yes	4.0%	Uniform Distribution
<b>B. Alternatives: Percentages of Values Used</b>						
	Alt 1 Percentage	Baseline Percentage	Alt 2 Percentage	Independent Variable	Random No. Gen. Result	Notes
2: California Aqueduct Deliveries		Values Independently Set in each Alternative				
3: CVP (AG) Contractor Deliveries (% of Alt. Var. A2)	45%	45%	32%	No - See A2	45%	Share of A2 Alternative
4: SWP Contractor Deliveries (1- % of Alt. Var. A2)	55%	55%	68%	No - See A2	55%	A2 Result - A3 Result
5: MWD Member Agency Total Demand (SWP & CRW)	118%	100%	79%	No - See A2	100%	B2 Selected Alt Controls
6: MWD Use of the SWP Supplies	46%	47%	48%	No - See A2	47%	B2 Selected Alt Controls
10: MWD AV Tax Revenues for WaterFix	80%	100%	130%	No - See A10	118%	OPA Selection
11: LA City Single-family Dwelling AV Tax	80%	100%	130%	No - See A10	118%	OPA Selection
13: CVP Rates as Percentage of SWP Contractor Rates	100%	100%	70%	Yes	70%	Discrete Probability
<b>C. Alternative Values - Probabilities for each Alternative Used (a)</b>						
	Alt 1 Probability	Baseline Probability	Alt 2 Probability	Cumulative Probability	Random No. Generator (a)	Notes
2: California Aqueduct Deliveries	20%	60%	20%	100%	62%	OPA Selected Probabilities
3: CVP (AG) Contractor Deliveries (% of Alt. Var. A2)	20%	50%	30%	100%	Same as C2	OPA Selected Probabilities
5: MWD Member Agency Total Demand (SWP & CRW)	33.3%	33.3%	33.3%	100%	Same as C2	Same as A2 Selection
6: MWD Use of the SWP Supplies	33.3%	33.3%	33.3%	100%	Same as C2	Same as A2 Selection
13: CVP Rates as Percentage of SWP Contractor Rates	20%	50%	30%	100%	94%	Uniform Distribution

The three alternatives are designed to create cost extremes from combining highest costs with lowest deliveries, and lowest costs with highest deliveries. The most likely outcome is within these two extremes.

The seven independent variables are: 1: WaterFix Capital Cost, 2: California Aqueduct Delivery, 7: LAA supplies, 9: DWP Local Sources of Supply, 10: MWD AV Tax Revenues, 12. Bonded Debt Interest Rates, and 13. CVP rates lower than SWP Contractor rates.

a. The value shown in Section C. represents the selected percentage to be contrasted with the cumulative probabilities of the three alternatives.

**Table A-8. California State Water Project Contractors Table A**

Contractor	Maximum as of 1/2016 (AFY)	Percentage of Table A	
		Total	Served from California Aqueduct
<b>Upper Feather River</b>			
County of Butte	27,500	0.7%	no
Plumas County Flood Control & Water Conservation District	2,700	0.1%	no
City of Yuba	9,600	0.2%	no
<b>Subtotal</b>	<b>39,800</b>	<b>1.0%</b>	
<b>North Bay Area</b>			
Napa County Flood Control & Water Conservation District	29,025	0.7%	no
Solano County Water Agency	47,756	1.1%	no
<b>Subtotal</b>	<b>76,781</b>	<b>1.8%</b>	
<b>South Bay Area</b>			
Alameda County Flood Cont & Water Conser Dist, Zone 7	80,619	1.9%	2.0%
Alameda County Water District	42,000	1.0%	1.0%
Santa Clara Valley Water District	100,000	2.4%	2.5%
<b>Subtotal</b>	<b>222,619</b>	<b>5.3%</b>	<b>5.5%</b>
<b>San Joaquin Valley</b>			
Oak Flat Water District	5,700	0.1%	0.1%
County of Kings	9,305	0.2%	0.2%
Dudley Ridge Water District	45,350	1.1%	1.1%
Empire West Side Irrigation District	3,000	0.1%	0.1%
Kern County Water Agency	982,730	24%	24%
Tulare Lake Basin Water Storage District	87,471	2.1%	2.2%
<b>Subtotal</b>	<b>1,133,556</b>	<b>27%</b>	<b>28%</b>
<b>Central Coast (Flood Control &amp; Water Conservation Districts)</b>			
San Luis Obispo County	25,000	0.6%	0.6%
Santa Barbara County	45,486	1.1%	1.1%
<b>Subtotal</b>	<b>70,486</b>	<b>1.7%</b>	<b>1.7%</b>
<b>Southern California</b>			
Antelope Valley-East Kern Water Agency	144,844	3.5%	3.6%
Castaic Lake Water Agency	95,200	2.3%	2.3%
Coachella Valley Water District	138,350	3.3%	3.4%
Crestline-Lake Arrowhead Water Agency	5,800	0.1%	0.1%
Desert Water Agency	55,750	1.3%	1.4%
Littlerock Creek Irrigation District	2,300	0.1%	0.1%
<b>Metropolitan Water District of Southern California</b>	<b>1,911,500</b>	<b>46%</b>	<b>47%</b>
Mojave Water Agency	85,800	2.1%	2.1%
Palmdale Water District	21,300	0.5%	0.5%
San Bernardino Valley Municipal Water District	102,600	2.5%	2.5%
San Gabriel Valley Municipal Water District	28,800	0.7%	0.7%
San Geronio Pass Water Agency	17,300	0.4%	0.4%
Ventura County Watershed Protection District	20,000	0.5%	0.5%
<b>Subtotal</b>	<b>2,629,544</b>	<b>63%</b>	<b>65%</b>
<b>Served from California Aqueduct</b>	<b>4,056,205</b>		<b>100%</b>
<b>Total State Water Project</b>	<b>4,172,786</b>	<b>100%</b>	

The SWP water contractors have water supply contracts with the California Department of Water Resources that define annual water supply allocations.

The Central Valley Project Contractors have a maximum quantity of 3.3 MAFY when contrasted to the SWP maximum of 4.1 MAFY of supplies from the California Aqueduct. The CVP Exchange and Settlement Contractors represent approximately 44% of this CVP right, or 20% of total Delta exports. The CVP facilities include the Delta-Mendota Canal.

## REFERENCES

This report was prepared using a variety of supporting documents, including:

- July 10, 2017, *Modernizing the System: California WaterFix Infrastructure White Paper*, Metropolitan Water District of Southern California
- July 20, 2017, *Modernizing the System: California WaterFix Operations White Paper*, Metropolitan Water District of Southern California
- August 10, 2017, *Modernizing the System: California WaterFix Finance and Cost Allocation White Paper*, Metropolitan Water District of Southern California
- April 27, 2016, *Urban Water Management Plan 2015*, Los Angeles Department of Water and Power, Report
- June 2016, *Urban Water Management Plan, 2015*, Metropolitan Water District of Southern California, Report
- July 17, 2017, Council File No. 17-0654 - Metropolitan Water District of Southern California Rate Setting Practices and Approaches, City of Los Angeles
- Senior Staff, February 23, 2017, Metropolitan Water District of Southern California, Telephone Discussion
- July 7, 2017, *City of Los Angeles Secured Single Family Residence Parcel Valuation Data*, HdL Companies, Database Summary Request
- July 1, 2015, *State Water Project Delivery Capability Report July 2015*, California Department of Water Resources
- February 25, 2014, *Review Status of BDCP Cost Allocations*, Metropolitan Water District of Southern California, Presentation by the Special Committee on Bay-Delta
- September 2016, *Why a California Water Fix?*, Metropolitan Water District of Southern California, Brochure
- December 22, 2016, *Bay Delta Conservation Plan/California WaterFix Final Environmental Impact Report/Environmental Impact Statement*, California Department of Water Resources, Federal Bureau of Reclamation
- February 9, 2016, *Ten-Year Financial Forecast*, Metropolitan Water District of Southern California, Board Presentation of Proposed Biannual Budget
- July 2016, *Biannual Budget 2016/17 and 2017/18*, Metropolitan Water District of Southern California
- February 2012, *Bay Delta Conservation Plan with Conservation Benefits and Financial Strategies*, Southern California Water Committee, PFM Group Presentation
- November 2016, *Update on California WaterFix*, Metropolitan Water District of Southern California, Special Committee on Bay-Delta, Presentation

## **GLOSSARY**

2014\$: Year 2014 Dollars

AF: Acre-Foot

AFY: Acre-Feet per Year

Alt: Alternative

AV: Ad Valorem

City: City of Los Angeles

CVP: Central Valley Project

CRA: Colorado River Aqueduct

DWP: City of Los Angeles Department of Water and Power

Gen: Generator

GW: Groundwater

HCF: Hundred Cubic Feet (one billing unit)

MHCF: Million Hundred Cubic Feet

LAA: Los Angeles Aqueduct

MAF: Million Acre-Feet

MAFY: Million Acre-Feet per Year

MWD or MWDSC: Metropolitan Water District of Southern California

No: Number

O&M: Operations and Maintenance

OPA: Office of Public Accountability/Ratepayer Advocate

RW: Recycled Water

SFR: Single Family Resident (dwelling)

SoCal: Southern California

SW: Stormwater

SWP: State Water Project

TIC: True Interest Cost

UWMP: Urban Water Management Plan

w/: with

YR: Year