CITY OF BEVERLY HILLS

PUBLIC WORKS SERVICES DEPARTMENT

MEMORANDUM

TO: PUBLIC WORKS COMMISSION

FROM: Trish Rhay, Assistant Director of Public Works Services – Utilities

Michelle Tse, Senior Management Analyst MST

DATE: January 22, 2015

SUBJECT: Water Enterprise Plan

ATTACHMENT: 1. Psomas Technical Memo dated January 15, 2015

INTRODUCTION

During the January 8, 2015 meeting, Psomas and City staff presented to the Commission their evaluation of nine water potential supply alternatives as part of the process for developing a Commission recommendation for the City's Water Enterprise Plan ("Plan"). A January 22, 2015 Public Works Commission Special Meeting was scheduled to further discuss this item.

This report provides clarification on the objectives of the Water Enterprise Plan, a review of the water supply alternatives and analysis, and recommendations by Psomas and City staff on next steps.

DISCUSSION

The purpose of the Water Enterprise Plan was to establish a planning document that identifies the options that make up the City's water supply portfolio and identifies strategies for achieving a more reliable water supply. Consideration of alternatives for the water portfolio include an evaluation of several factors such as cost, risk, and system reliability (with system reliability being a more important factor).

The Commission is going through a three phase process to develop their Plan recommendation to be considered by the City Council. The three phases of the process are outlined in further detail below. In Phase 1, Psomas identified nineteen (19) alternatives through a collaborative workshop with the Commission and City staff. The initial evaluation of these 19 alternatives resulted in a recommendation to focus efforts and proceed with additional detailed studies for the following nine (9) alternatives:

Table 1: Nine Water Alternatives

Alternative	Water Source Alternative	Category
1	Metropolitan Water District (MWD)	Supply
2	Water Banking	Insurance
3*	Conservation - Tailored to Unique City of Beverly Hills Characteristics	Conservation
4	Groundwater - Develop Central Basin	Supply

	(CB) Wells	
5*	Conservation – Comply with SBx7-7	Conservation
6	Drought Insurance;	Insurance
7	Potable Water Exchanges;	Insurance
8	Ocean Desalination	Supply
9	Groundwater – Develop Hollywood Basin (HB)	Supply
** Conservation efforts to comply with SBx7-7 and programs tailored to the unique City characteristics are considered one option for discussion purposes.*		

The Commission is currently in Phase 2 of the Plan development process. This second phase began with a more detailed discussion of the 9 alternatives, which took place during the January 8, 2015 meeting. The goal of the discussion was for the Commission to identify the alternatives that should move forward into a 10 year financial analysis.

Of the 9 alternatives presented, City staff and Psomas developed a "scenario" based recommendation which was presented to the Commission at the January meeting. For the purposes of the Plan development, a "scenario" is any combination of the nine alternatives that could potentially become the City's water portfolio. City staff and Psomas is recommending Alternatives 1, 2, 3, 4 and 5 from the table above. Based on the analysis, this scenario was proposed because each of these alternatives has been shown to be the most cost effective alternative in the categories of supply, insurance and conservation.

The purpose of the January 22nd meeting is for the Commission to select the proposed scenario and/or other scenarios that should move into the financial analysis, which is Phase 3. In preparation for the January 22nd meeting, Commissioners were asked to submit any Plan-related questions in advance so that staff and Psomas can prepare accordingly. Responses to the Commission questions are included in the Psomas Technical Memo as Attachment 1.

Below is a quick summary of each of the nine alternatives. The Commission also received copies of the PowerPoint presentation given on January 8th that provides more details on each of the alternatives.

1. Metropolitan Water District ("MWD")

In most years, MWD's water supply has been very reliable, with only three previous periods of cutbacks in allocated water (10% in 1976-77 and in 2007-09, and 17% in 1987-92). However, the ongoing drought has reduced MWD's available supplies and lessened its reliability as a dependable water supply source. With that in mind, it is prudent for the City to continue to include MWD in its water portfolio, but seek additional water supply alternatives aimed at increasing the City's overall system reliability.

2. Water Banking

Water banking is the practice of purchasing water for storage in an aquifer owned by a third party, and retrieving the City owned water when needed to buffer short term water shortage issues within MWD or our local supply water. The approach is to invest in a groundwater storage bank to address a potential two year shortage of 3,400 AF. This would provide the City with reserves in the event MWD supplies are severely impacted by a lengthy drought. Subject to the availability of purchased water (to place into the bank), this program can be set up within two years.

3. Conservation – Tailored to Unique Beverly Hills Characteristics
This alternative entails instituting a conservation goal beyond the results of SBx7-7. The analysis is that the conservation savings are likely to decline if the plan was to implement a conservation goal beyond the regulatory requirement. However, the conservation goal would be re-evaluated annually and could be used to augment City's efforts in future years.

4. Groundwater – Develop Central Basin ("CB") Wells
Develop approximately 1,700 AFY of new groundwater in the unadjudicated portion of the CB near Interstate 10 approximately four miles from Beverly Hills. Developing new wells in this area will be considerably more economical than developing new wells in the HB due primarily to anticipated low production rates in the HB (approximately 200-300 gallons per minute (gpm) per well vs. about 800 gpm in the CB). Developing three new CB wells including retaining a design consultant; acquiring land for an initial site; drilling a pilot test hole that will be converted to a production well; addressing CEQA requirements; acquiring land for, designing, drilling, and equipping two additional production wells; designing expanded treatment facilities and transmission pipelines; constructing all of the above facilities; and testing and permitting all three wells and treatment facilities will take approximately seven to eight years. When a preliminary cost analysis was completed, the costs for groundwater development in the Central Basin was more effective than in the Hollywood Basin.

5. Conservation – Comply with SBx7-7
Meet current established SBx7-7 conservation goals by 2020 and strive to achieve additional conservation beyond mandated goals. Implementing a multi-pronged strategy including public/quasi-public analytic engagement programs (for parks, schools, civic center, greenbelts, hotels, etc.), residential analytic engagement programs, system loss reduction and operations programs, and enhanced rebate programs, the City should be able to realize nearly 1,200 AF in additional conservation over the next five years. All of the aforementioned conservation programs can be commenced over a six to twelve month period.

6. Drought Insurance
This option, like water banking, allows for a block of water to be available to the City of Beverly Hills that is not dependent on MWD or the City's local ground water supply. However, unlike banking, the City would not own the water. The City would simply be paying an insurance agreement for a third party to provide their water to the City when needed.

7. Potable Water Exchange This alternative proposes to drill wells in the Central Basin that are far enough from the City that it would be more cost effective to coordinate with Los Angeles Department of Water and Power ("LADWP") to utilize their conveyance system. This would involve pumping and treating water out of a new City well and directing the water into the nearest LADWP water system. In exchange for the additional water, LADWP would provide the City with a proportional amount of water from their closest connections to serve the City.

8. Ocean Desalination
At this time, other cities along the California coast are either in conceptual or planning phases to establish an ocean desalination facility. While this alternative may yield potential benefits by providing a "drought proof" supply, baseload capacity, and not requiring direct operational responsibility, the City would have to consider MWD system surcharges, as well as the cost of purchase irrespective of need. There are also legal and political sensitivities with this issue.

9. Groundwater – Develop Hollywood Basin
This item is related to additional deep groundwater development in the Hollywood Basin. The Hollywood Basin current has 800 to 1,200 Acre Feet per Year ("AFY") in production. It is estimated that the maximum production for this basin is ~2,500 AFY total. Further development would require six to eight wells at 200 GPM, 24,000 feet of pipeline and an upgrade of existing treatment plant to increase throughput. The projected cost per acre foot of this alternative is from $2720 – 3327/AF. This cost is approximately twice the cost of groundwater production in the Central Basin.

Next Steps: Phase 3 – Financial Analysis
Phase 3 of the recommendation process will begin once the scenarios are defined The goal of the financial analysis is the following:

- Forecast the spending pattern of any given scenario over the next 10 years
- Evaluate how water rates will be impacted
- Explore financing options, such as capacity fee revenue offsets and grant funding opportunities

Once the financial analysis is complete, the Commission will be asked again to review the scenario(s) and develop their final recommendation to the Council. The review of the financial analysis will be presented to the Commission in March.

Overall Project Timeline
At the January 13, 2015 Formal Meeting, the City Council received a presentation on the status of the Plan's development. The presentation included details on the process the Commission has been going through during the past last 8 months. The City Council was very supportive with the Plan's progress and directed staff to bring the final plan recommendation to the City Council by April.

Based on Council's directive, the Commission would need to solidify the recommendation for City Council's consideration no later than March 12, 2015. The Plan project schedule is listed below.

January 22, 2015	**Public Works Commission ("PWC") Special Meeting** Continue discussions on alternatives; PWC makes recommendation on scenario(s).
Late Jan – Early Feb.	Staff and Psomas begin work on Financial Plan based on PWC recommendation from Jan. 22 meeting.
February 12, 2015	**PWC Regular Meeting** Staff to provide PWC with a status update on the Financial Plan.
Mid-Feb – March	Staff and Psomas continue to work on Financial Plan.
Late Feb/Early March	**PWC Special Meeting** (Recommended to discuss Financial Plan)
March 12, 2015	**PWC Regular Meeting** Final PWC discussion and final recommendation based on Financial Plan.

April 7, 2015	Presentation to City Council (Final recommendation) - *Council report drafts due March 26, 2015* - *Final reports and attachments due April 1, 2015*

FISCAL IMPACT

For planning purposes, the preliminary cost estimates included in this report were calculated using the American Association of Cost Estimators ("AACE") industry standard. These guidelines suggest using (-30%) and +50%) for the low and high ends of the range, respectively. Costs for each of the 9 alternatives is included in the Psomas Technical Memo (Attachment 1), along with the total cost for the proposed scenario. Project costs will be further refined when a feasibility study is completed. The feasibility study would further develop the project scope to generate better cost estimates.

RECOMMENDATION

Staff has preliminarily proposed the following for the Commission's consideration. Based on City staff's work with Psomas, a 25% non-MWD sourced supply reliability target is the recommendation for the Plan's ten year plan window. To achieve this target, at minimum, the following water portfolio scenario is recommended for Phase 3, the financial analysis:

- Metropolitan Water District (water supply)
- Water Banking (insurance)
- Groundwater – Develop Central Basin Wells (water supply)
- Conservation – Comply with SBx7-7 and a tailored program for unique City characteristics (conservation)

Psomas and City staff believe that the combination of these 4 alternatives make up a diversified portfolio that covers water insurance, conservation, and projects to expand the City's water supply to increase reliability in the most cost effective manner.

Psomas and City staff are seeking Commission's direction on the following:

1. Whether the scenario with the 4 recommended alternatives, as currently understood, is the appropriate combination of alternatives to move forward with the financial analysis

2. Whether there are other scenarios that would be appropriate to move forward with the financial analysis.

Once scenarios have been defined, staff and Psomas will complete a financial analysis and present its findings with the Commission at a final workshop likely to occur in late February. The financial analysis will indicate whether the combination of alternatives is feasible. Since the development of the Plan is an iterative process, revisions to the scenarios could be considered in the final workshop if the initial recommendation of the alternatives are not financially feasible.

PSOMAS

TECHNICAL MEMORANDUM NO. 4

To: Trish Rhay and Steve Bucknam

From: Harvey R. Gobas, PE

Date: January 15, 2015

Subject: Ten-Year Estimated Costs for Nine Shortlisted Alternatives Including a Summary of Recommended Portfolio Costs

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In response to questions from the Public Works Commissioners received earlier this week, we have created a series of spreadsheets identifying the estimated costs over the next ten years for the recommended Water Enterprise Plan portfolio as well as for the other short-listed alternatives that are not included in our recommendations.

In considering the actual costs that would be incurred for each of the nine shortlisted alternatives, we have assumed three percent compounded annual inflation over the ten year period and have escalated costs by that factor for each year. All of the costs also now include projected operation and maintenance expenditures. Given the preliminary nature of these estimates, we have also provided high and low ranges for the projected costs utilizing the widely accepted guidelines established by the American Association of Cost Estimators (AACE). Those guidelines suggest using (-30%) and (+50%) for the low and high ends of the range, respectively, for planning level projects in which no preliminary or final engineering design has been performed.

Additionally, we have created 10-year cost spreadsheets for MWD water purchases and for staffing. The MWD costs are based on MWD's currently adopted 10-year rates and thus, do not include any additional inflation factor. We have escalated the staffing costs by three percent per year, but have not applied the AACE high and low range factors to them. Please also note the staffing costs include 10 of the recommended 11 positions. The eleventh position (Water Conservation Coordinator) has been included with the Water Conservation Cost Table.

The overall, 10-year escalated costs for the recommended portfolio are summarized below. Detailed copies of the respective spreadsheets are also attached for your review. We will be summarizing this information and look forward to answering any related questions at the Special Public Works Commission meeting scheduled for January 22, 2015.

Recommended Portfolio Options	Sum of 10-Year Escalated Costs (Rounded)
Water Conservation (including Water Conservation Coordinator)	$3,700,000
Water Banking	$7,800,000
Groundwater Development (La Brea Sub-Basin)	$37,900,000
MWD Water Purchases	$105,700,000
Staffing	$12,900,000
Subtotal of Recommended Portfolio Options	$168,000,000
Subtotal Less MWD and Staffing	$49,400,000
Low Range Cost (-30% except for MWD and Staffing)	$153,200,000
High Range Cost (+50% except for MWD and Staffing)	$192,700,000

Annual Cost Summary For Recommended Portfolio[1]

	FISCAL YEAR										Total
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
Water Conservation	$ 499,500	$ 418,953	$ 429,930	$ 311,700	$ 321,051	$ 330,683	$ 340,603	$ 350,822	$ 361,346	$ 372,187	$ 3,736,775
Water Banking	$ 2,720,000	$ 43,775	$ 1,262,471	$ 1,300,345	$ 47,834	$ 49,269	$ 50,747	$ 1,099,753	$ 1,132,746	$ 55,453	$ 7,762,394
Groundwater Development (LBSB)	$ 200,000	$ 2,446,000	$ 1,777,000	$ 2,841,000	$ 9,792,000	$ 9,390,000	$ 2,924,000	$ 2,766,000	$ 2,849,000	$ 2,934,000	$ 37,919,000
MWD Water Purchases	$ 10,723,750	$ 10,814,963	$ 10,234,680	$ 10,378,185	$ 10,551,264	$ 10,928,540	$ 11,360,160	$ 9,816,804	$ 10,231,146	$ 10,653,948	$ 105,693,440
Staffing	$ 725,000	$ 746,750	$ 1,510,722	$ 1,556,043	$ 1,602,725	$ 1,650,806	$ 1,700,330	$ 1,105,657	$ 1,138,826	$ 1,172,991	$ 12,909,850
Total	$ 14,868,250	$ 14,470,440	$ 15,214,802	$ 16,387,274	$ 22,314,874	$ 22,349,298	$ 16,375,841	$ 15,139,035	$ 15,713,064	$ 15,188,579	**$ 168,021,458**
									Subtotal (less MWD and Staffing)		**$ 49,418,168**
									Low Cost[2]	(- 30 %)	**$ 153,196,007.43**
									High Cost[2]	(+ 50%)	**$ 192,730,541.89**

[1] Costs are escalated at 3% annually, compounded with the exception of MWD Water Purchases which use MWD's currently adopted 10-year rates.

[2] Low and High Cost range calculated on sub-total of Water Conservation, Water Banking, and Groundwater Development only with MWD Water Purchase and Staffing Costs (no range applied) added directly.

Water Conservation Program Costs

	FISCAL YEAR										Total
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
Water Conservation											
Capital Programs	$ 359,500	$ 274,753	$ 281,404	$ 158,719	$ 163,480	$ 168,385	$ 173,436	$ 178,639	$ 183,998	$ 189,518	
Staffing	$ 140,000	$ 144,200	$ 148,526	$ 152,982	$ 157,571	$ 162,298	$ 167,167	$ 172,182	$ 177,348	$ 182,668	
O&M[1]	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Total	$ 499,500	$ 418,953	$ 429,930	$ 311,700	$ 321,051	$ 330,683	$ 340,603	$ 350,822	$ 361,346	$ 372,187	**$ 3,736,775**
Captial Programs Backup											
Waterfluence	$ 7,500	$ 4,750	$ 3,250	$ 3,250	$ 3,250	$ 3,250	$ 3,250	$ 3,250	$ 3,250	$ 3,250	
Triton	$ 72,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	
TaKaDu[2]	$ 180,000	$ 120,000	$ 120,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Enhanced Rebates	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	
Totals (2015 Dollars)	$ 359,500	$ 266,750	$ 265,250	$ 145,250	$ 145,250	$ 145,250	$ 145,250	$ 145,250	$ 145,250	$ 145,250	**$ 1,908,250**
Escalated Totals	$ 359,500	$ 274,753	$ 281,404	$ 158,719	$ 163,480	$ 168,385	$ 173,436	$ 178,639	$ 183,998	$ 189,518	**$ 2,131,831**
									Low Cost	(- 30 %)	**$ 1,492,282**
									High Cost	(+ 50%)	**$ 3,197,747**
Annual Inflation	3.0%										
Cost Escalation Factor	1.000	1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	

[1] Assumes O&M for Water Conservation Programs is minor with exception of Water Conservation Coordinator and O&M to repair leaks discovered utilizing TaKaDu or similar system would be incurred anyway, but would just be more efficient.

[2] Assumes TaKaDu or similar program would justify itself, or not, after 3 years and if continued would not be allocated to WEP after this time.

Water Banking Annual Estimate of Costs

			FISCAL YEAR										Total
			2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
Total in Storage		AF			1,700	3,400	3,400	3,400	3,400	1,700			
Draw		AF/Yr								1,700	1,700		
Replacement water		AF											
Initial Water Purchase					1,700	1,700							
Total Shares	1700												
Buy in Cost	$1,600	/Share	$ 2,720,000										
Initial Water Purchase	$600	/AF			$ 1,082,118	$ 1,114,582							
Initial Put Cost	$75	/AF			$ 135,265	$ 139,323							
O&M	$25	/Share		$ 43,775	$ 45,088	$ 46,441	$ 47,834	$ 49,269	$ 50,747	$ 52,270	$ 53,838	$ 55,453	
Draw Take	$75	/AF								$ 156,809	$ 161,513		
Power	$85	/AF								$ 177,717	$ 183,048		
Treat	$341	/AF								$ 712,958	$ 734,347		
Replacement Water	$440	/AF											
Replacement Put	$75	/AF											
Total Annual Costs			$ 2,720,000	$ 43,775	$ 1,262,471	$ 1,300,345	$ 47,834	$ 49,269	$ 50,747	$ 1,099,753	$ 1,132,746	$ 55,453	**$ 7,762,394**
											Low Cost	(- 30 %)	**$ 5,433,675.45**
											High Cost	(+ 50%)	**$ 11,643,590.25**
Annual Inflation	3.0%												
Cost Escalation Factor			1.000	1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	

[1] Original unit costs are in 2015 Dollars. All other costs are inflated at 3% per year starting in 2016.

[2] Unit costs based on estimates provided by the Willow Springs Water Storage Bank

[3] Based on having a significant reduction in supply caused by drought condition once each decade

[4] Similar Costs to those incurred in years 1 - 10, will also ne incurred in years 11 - 20 and 12 - 30.

Water Drought Insurance Annual Estimate of Costs

				FISCAL YEAR										Total
				2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
Insurance Water		AF		3400	3400	3400								
Draw on Insurance		AF					3400							
Term in years	4	Yrs												
Annual Fee	120	AF/Yr												
Water Insurance	3400	AF												
Loan Fee	$600	/AF												
Pay back Fee	$660	/AF												
Power	$85	/AF												
Wheeling	$257	/AF												
Treatment	$341	/AF												
Annual Fee				$ 408,000	$ 420,240	$ 432,847	$ 445,833							
Loan Fee				$ 2,040,000										
Energy Cost (est.)							$ 315,798							
MWD Wheeling Cost							$ 954,825							
MWD Treatment Cost							$ 1,266,908							
Bank Pay Back Cost										$ 2,679,453				
Total Annual Costs				$ 2,448,000	$ 420,240	$ 432,847	$ 2,983,363	$ -	$ -	$ 2,679,453	$ -	$ -	$ -	**$ 8,963,904**
Total Costs inflated over 10 years			$ 17,927,808									Low Cost	(- 30 %)	**$ 6,274,733**
Total Water Obtained			$ 3,400 Acre Feet									High Cost	(+ 50%)	**$ 13,445,856**
Annual Inflation	3.0%													
Cost Escalation Factor				1.000	1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	

[1] Original unit costs are in 2015 Dollars. All other costs are inflated at 3% per year starting in 2016.

[2] Unit costs based on estimates provided by the Willow Springs Water Storage Bank and program limited to four year term.

[3] Water is to be repaid within 3 years of draw.

[4] Based on having a significant reduction in supply caused by drought condition once each decade

Water Spot Loan Estimate of Costs

					FISCAL YEAR										Total
					2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
Loan water Available	3400	AF													
Draw on Loan		AF						3400							
Term in years	4	Yrs													
Loan Fee	$1,100	AF													
Water, af	3400	AF													
Pay back Fee	$660	/AF													
Power	$85	/AF													
Wheeling	$257	/AF													
Treatment	$341	/AF													
Loan Fee					$ 3,740,000										
Energy Cost (est.)								$ 315,798							
MWD Wheeling Cost								$ 954,825							
MWD Treatment Cost								$ 1,266,908							
Bank Pay Back Cost											$ 2,679,453				
Total Annual Costs					$ 3,740,000			$ 2,537,531			$ 2,679,453				$ 8,956,984
Total Costs inflated over 10 years				$ 17,913,968									Low Cost	(- 30 %)	$ 6,269,889
Total Water Obtained				$ 3,400 Acre Feet									High Cost	(+ 50%)	$ 13,435,476
Annual Inflation	3.0%														
Cost Escalation Factor		0.030			1.000	1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	

[1] Original unit costs are in 2015 Dollars. All other costs are inflated at 3% per year starting in 2016.

[2] Unit costs based on estimates provided by the Willow Springs Water Storage Bank and program limited to four year term.

[3] Water is to be repaid within 3 years of draw.

[4] Based on having a significant reduction in supply caused by drought condition once each decade

Water Insurance Annual Estimate of Costs - Exchange from Central Basin with LADWP

					FISCAL YEAR										Total
					2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
Production per well	1,000	gpm													
Annual Production	1,200	AF													
Land required	0.25	Acres													
Life of Wells for Production Estimate	40	Years													
Total production over life of wells	48000	AF													
CAPITAL COSTS															
Production Well:															
Purchase Water Rights in Main Central Basin	$15,000	per AF	1200	AFY	$18,540,000										
Land (cost per 0.25 acre)	$625,000	per 1/4 acre	1		$643,750										
Well installation & equipping	$2,500,000	per well	1					$1,406,886	$1,449,093						
Well permitting/Engineering	$375,000		1			$198,919	$204,886								
Forebay and Pump Station:															
Cost for Pump Station	$625,000	each	1					$703,443.01							
Permitting/Engineering for pipeline	$93,750		0				$81,955								
Pipeline:															
Cost for Pipeline	$250,000	$200 per foot	1000	LF					$289,819						
Permitting/Engineering for pipeline	$37,500		1					$42,207							
25% Contingencies in all costs	25%														
O & M COSTS															
Well O&M Cost (5% of Capital costs)		$1,075,000								$1,283,606	$1,322,114	$1,361,778	$1,402,631	$1,444,710	
Well Power Costs		$98,092								$117,126	$120,640	$124,259	$127,987	$131,827	
Forebay & Pump Station O&M Costs (5%)		$35,938								$42,911	$44,199	$45,525	$46,890	$48,297	
Forebay & Pump Station Power Costs ($)		$85,830								$102,486	$105,560	$108,727	$111,989	$115,348	
Pipeline O&M Costs (5% of Capital)		$14,375								$17,165	$17,679	$18,210	$18,756	$19,319	
WRD RA		$402,000								$480,009	$494,409	$509,242	$524,519	$540,254	
LADWP Wheeling @$200/AF		$300,000								$358,216	$368,962	$380,031	$391,432	$403,175	
Total Annual Costs					$19,183,750	$198,919	$286,841	$2,152,536	$1,738,911	$2,401,519	$2,473,564	$2,547,771	$2,624,204	$2,702,931	**$36,310,945**
													Low Cost	(- 30 %)	**$25,417,662**
													High Cost	(+ 50%)	**$54,466,418**
Annual Inflation	3.0%														
Cost Escalation Factor		0.03			1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	1.344	

[1] Original unit costs are in 2015 Dollars. All other costs are inflated at 3% per year starting in 2016.

[2] Estimate of first ten years of the project.

Groundwater Development Estimate of Costs

OPTION	ESTIMATED COST (2015 $)		FISCAL YEAR 2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	Total
La Brea Sub-Basin Groundwater	$23,850,000		Cost for Implementation ($)										
Feasibility Study	$500,000		200,000	300,000									$500,000
Land Acquisition/Pilot Well Study (1 well)	$3,000,000			2,000,000	1,000,000								$3,000,000
CEQA	$250,000			75,000	175,000								$250,000
Preliminary & Final Design	$1,300,000				500,000	800,000							$1,300,000
Final Land Acquisition	$2,000,000					1,800,000	200,000						$2,000,000
Pipeline Construction	$4,600,000						1,500,000	3,100,000					$4,600,000
RO Plant Upgrade	$7,000,000						5,000,000	2,000,000					$7,000,000
Well Construction (2 add'l wells)	$5,000,000						2,000,000	3,000,000					$5,000,000
System Permitting & Testing	$200,000								200,000				$200,000
	Capital Cost Sub-Total ($)		$ 200,000	$ 2,375,000	$ 1,675,000	$ 2,600,000	$ 8,700,000	$ 8,100,000	$ 200,000	$ -	$ -	$ -	$ 23,850,000
O&M (3,000 AFY GW)[1] Rate/Volume	$1,027/AF	2,190 AFY	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,249,130	$ 2,249,130	$ 2,249,130	$ 2,249,130	$ 8,996,520
Sub-Total (2015 dollars)	---	---	$ 200,000	$ 2,375,000	$ 1,675,000	$ 2,600,000	$ 8,700,000	$ 8,100,000	$ 2,449,000	$ 2,249,000	$ 2,249,000	$ 2,249,000	**$ 32,846,000**
Adjusted for Inflation	---	---	$ 200,000	$ 2,446,000	$ 1,777,000	$ 2,841,000	$ 9,792,000	$ 9,390,000	$ 2,924,000	$ 2,766,000	$ 2,849,000	$ 2,934,000	**$ 37,919,000**
												Low Cost (- 30 %)	**$ 26,543,300**
												High Cost (+ 150%)	**$ 56,878,500**
Annual Inflation		3.0%											
Cost Escalation Factor			1.000	1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	

OPTION	ESTIMATED COST (2015 $)		FISCAL YEAR 2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	Total
Hollywood Basin Groundwater	$33,350,000		Cost for Implementation ($)										
Feasibility Study	$600,000		300,000	300,000									$600,000
Land Acquisition/Pilot Well Study (2 wells)	$6,000,000			4,000,000	2,000,000								$6,000,000
CEQA	$250,000			75,000	175,000								$250,000
Preliminary & Final Design	$2,000,000				500,000	1,500,000							$2,000,000
Final Land Acquisition	$4,000,000					3,600,000	400,000						$4,000,000
Pipeline Construction	$4,800,000						2,500,000	2,300,000					$4,800,000
RO Plant Upgrade	$7,000,000						5,000,000	2,000,000					$7,000,000
Well Construction (4 add'l wells)	$8,500,000						3,000,000	5,500,000					$8,500,000
System Permitting & Testing	$200,000								200,000				$200,000
	Capital Cost Sub-Total ($)		$ 300,000	$ 4,375,000	$ 2,675,000	$ 5,100,000	$ 10,900,000	$ 9,800,000	$ 200,000	$ -	$ -	$ -	$ 33,350,000
O&M (1,500 AFY GW)[2] Rate/Volume	$1,572/AF	1,500 AFY	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,358,000	$ 2,358,000	$ 2,358,000	$ 2,358,000	$ 9,432,000
Sub-Total (2015 dollars)	---	---	$ 300,000	$ 4,375,000	$ 2,675,000	$ 5,100,000	$ 10,900,000	$ 9,800,000	$ 2,558,000	$ 2,358,000	$ 2,358,000	$ 2,358,000	**$ 42,782,000**
Adjusted for Inflation	---	---	$ 300,000	$ 4,506,000	$ 2,838,000	$ 5,573,000	$ 12,268,000	$ 11,361,000	$ 3,054,000	$ 2,900,000	$ 2,987,000	$ 3,077,000	**$ 48,864,000**
												Low Cost (- 30 %)	**$ 34,204,800**
												High Cost (+ 50%)	**$ 73,296,000**
Annual Inflation		3.0%											
Cost Escalation Factor			1.000	1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	

[1] La Brea Sub-Basin has maximum production capability of 3,000 AFY netting 2,340 AFY supply after Plant reject. However, O&M cost based on 2,190 AFY groundwater production netting 1,708 AFY. This volume along with 1.0 MGD net from existing HB shallow wells/Plant would provide 25% reliability.

[2] Hollywood Basin assumed capable of producing an additional 1,500 AFY (average sustainable) netting 1,170 AFY supply after Plant reject. This volume along with 1.0 MGD net from existing HB shallow wells/Plant would provide a total of 2,290 AFY or an approximate 20% reliability.

Estimated Unsubsidized Cost of Huntington Beach Desalinization Plant Water at CBH Service Connection

OPTION	Cost / AF	Cost Without $250/AF LRP	Summary 2015 Costs/AF	FISCAL YEAR[4] 2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	10-Year Total (Assuming plant on-line in 2020/21)
Quoted HB Desal Plant Cost[1]	$ 1,424	$ 1,674												
Plus MWD LRP Subsidy	$ 250													
Capital Component (assumed 1/2 of cost and not subject to escalation)			$ 837						$ 837	$ 837	$ 837	$ 837	$ 837	
Operating Component (subject to 3% CPI escalation)			$ 837						$ 999	$ 1,029	$ 1,060	$ 1,092	$ 1,125	
Pipelines (Regional South Delivery System)	$ 138	$ 138	$ 138						$ 138	$ 138	$ 138	$ 138	$ 138	
Wheeling through MWD System[2]														
System Access Rate	$ 243													
Water Stewardship Rate	$ 41	$ 445	$ 445						$ 531	$ 547	$ 564	$ 581	$ 598	
Power Costs	$ 161													
			Sub-Total ($/AF)						$ 2,506	$ 2,552	$ 2,599	$ 2,648	$ 2,698	
Annual Cost for Total AF Commitment of	1,700								$ 4,259,818	$ 4,337,887	$ 4,418,299	$ 4,501,123	$ 4,586,431	**$ 22,103,557**
												Low Cost	(- 30 %)	**$ 15,472,490**
												High Cost	(+ 50%)	**$ 33,155,336**
Annual Inflation	3.0%													
Cost Escalation Factor				1.000	1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	

[1] Source = 2013 Huntington Beach Plant Term Sheet

[2] May be avoidable with negotiations

[3] 3% escalation applied to operating and capital costs per term sheet (assumed annual cost split 50:50 between capital and operating costs)

[4] The absolute earliest the plant could come on-line is 2020/21; 10 yr cost total assumes plant is on-line in 2020/21 (last 5 years only)

MWD Purchase Costs

	FISCAL YEAR										Total
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
Water Supply Breakdown											
Total Water Demand (AF)	12,495	12,325	12,350	12,375	12,328	12,340	12,380	12,420	12,460	12,493	
Less Cumulative Conservation (AF)	195	630	850	1,010	1,140	1,180	1,180	1,180	1,180	1,180	
Less HB GW (AF)	800	400	1,120	1,120	1,120	1,120	1,120	1,120	1,120	1,120	
Less La Brea Sub-Basin (AF)	0	0	0	0	0	0	0	1,708	1,708	1,708	
MWD Supply Required (AF)	11,500	11,295	10,380	10,245	10,068	10,040	10,080	8,412	8,452	8,485	
MWD Tier 1 Treated Rate ($/AF)[1]	$933	$958	$986	$1,013	$1,048	$1,089	$1,127	$1,167	$1,211	$1,256	
Total MWD Purchase Cost	$ 10,723,750	$ 10,814,963	$ 10,234,680	$ 10,378,185	$ 10,551,264	$ 10,928,540	$ 11,360,160	$ 9,816,804	$ 10,231,146	$ 10,653,948	**$ 105,693,440**

[1] MWD rate is average of calendar year Full Service Tier 1 Treated Volumetric Cost ($/AF) from Attachment 10 to 4/8/2014 MWD Board Meeting Package. Inflation built into these rates.

Recommended Staffing

	FISCAL YEAR										Total
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
Ten Staff Positions[1]											
Project Manager 1	$ 175,000	$ 180,250	$ 185,658	$ 191,227	$ 196,964	$ 202,873	$ 208,959				
Project Manager 2	$ 175,000	$ 180,250	$ 185,658	$ 191,227	$ 196,964	$ 202,873	$ 208,959				
Project Manager 3	$ 175,000	$ 180,250	$ 185,658	$ 191,227	$ 196,964	$ 202,873	$ 208,959				
Water Resource Manager	$ 200,000	$ 206,000	$ 212,180	$ 218,545	$ 225,102	$ 231,855	$ 238,810	$ 245,975	$ 253,354	$ 260,955	
Water Treatment Operator 1			$ 141,100	$ 145,333	$ 149,693	$ 154,183	$ 158,809	$ 163,573	$ 168,480	$ 173,535	
Water Treatment Operator 2			$ 141,100	$ 145,333	$ 149,693	$ 154,183	$ 158,809	$ 163,573	$ 168,480	$ 173,535	
Water Treatment Operator 3			$ 141,100	$ 145,333	$ 149,693	$ 154,183	$ 158,809	$ 163,573	$ 168,480	$ 173,535	
Pump/Well Mechanic			$ 106,090	$ 109,273	$ 112,551	$ 115,927	$ 119,405	$ 122,987	$ 126,677	$ 130,477	
Pump/Well Electrician			$ 106,090	$ 109,273	$ 112,551	$ 115,927	$ 119,405	$ 122,987	$ 126,677	$ 130,477	
Water Distribution Operator			$ 106,090	$ 109,273	$ 112,551	$ 115,927	$ 119,405	$ 122,987	$ 126,677	$ 130,477	
Total Staffing Cost	$ 725,000	$ 746,750	$ 1,510,722	$ 1,556,043	$ 1,602,725	$ 1,650,806	$ 1,700,330	$ 1,105,657	$ 1,138,826	$ 1,172,991	**$ 12,909,850**
Annual Inflation	3.0%										
Cost Escalation Factor	1.000	1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	

[1] Water Conservation Coordinator included in Water Conservation Costs. Assumes Project Managers phased out or re-assigned as construction of facilities is completed.