City of Santa Cruz and Soquel Creek Water District
Collaborating to conserve, protect and create reliable water resources

DESALINATION TASK FORCE MEMORANDUM

TO: DESALINATION TASK FORCE

FROM: PROGRAM MANAGERS

SUBJECT: scwd^2 DESALINATION PROGRAM PRELIMINARY COST ESTIMATE

DATE: OCTOBER 17, 2012

RECOMMENDATION: That the Task Force review and comment on the preliminary cost estimate.

BACKGROUND: At its June 20, 2012 meeting the Task Force requested that staff provide an updated cost estimate for design and construction of the **scwd^2** Regional Seawater Desalination Project. While a fiscal year budget estimate has been reviewed by the Task Force each spring to understand the level of effort and expenditures, this will be the first time the Task Force will focus on the cost estimate from the standpoint of design and construction of the entire project.

DISCUSSION: The attached spreadsheet shows current estimates for each project component along with overhead charges that would be incurred by City and District staff for continued administration of the project. Estimates are shown by fiscal year for each component, as fiscal year totals and for each agency based on the cost splits described in the 2007 and 2010 Agreements. The estimate begins in fiscal year 2014/2015, following a vote on the project, and assumes completion of the project in fiscal year 2017/2018.

Cost estimating has varying levels of accuracy based on the level of design. The various components of this project range in their respective level of design from about 10% (infrastructure) to ~30% (treatment facility). As a result, the estimate should be viewed as a range as opposed to a definitive figure. For example, as described in the Preliminary Design Report for the Treatment Facility, the accuracy range for the facility is -15% to +25%. A cost estimate of $60M should be viewed as a range of ~$52M - ~$76M.

It is typical estimating practice to apply an "Estimate Contingency." These range from ~5% to ~50% based again on the level of design. This contingency accounts for uncertainties associated with the level of design; siting; permitting; environmental conditions or constraints; economic conditions; and availability of equipment, labor and materials. An Estimate Contingency has been applied to the two major components, Intake Facility (30%) and Treatment Facility (20%). This has not been applied to the infrastructure but rather conservative unit costs have been used to similarly account for unknowns.

In addition to these two estimating practices (applying an accuracy range and estimate contingency), the following assumptions were made in developing the attached.

Intake Facility Cost estimates for the intake facility were developed to include on-shore pipeline work from the pump station to the treatment facility. This was done for equity in comparing the various intake alternatives that had longer on-shore reaches and/or deeper pump stations. The construction cost estimate was inflated by a 30% construction contingency as well as a 35% allowance to account for design and construction management fees. These are typical factors for this level of design. However, for the purposes of the attached estimate, the on-shore pipeline was removed and is shown under Infrastructure: Intake, and the 35% allowance was removed and appears as separate line items. Furthermore, the cost estimate is based on current (2011) dollars and therefore does not account for increases (or decreases) due to inflation. However, this is likely accounted for in conservative unit cost assumptions as well as the 30% construction contingency.

Treatment Facility This cost estimate includes an estimating contingency of 20%, consistent with this level of design. An annual escalation factor of 3% was used to project the construction cost to a midpoint of construction of Dec 2016. In the last five years (starting in January 2007), the annual construction escalation published in the Engineering News Record Construction Cost Index (ENR CCI) has ranged from -1.4% to +8.5% and has averaged 3.35%.

Property Costs Property costs for the intake facility were estimated at $250,000 - $750,000 depending upon size of parcel and location. Several parcels under consideration are currently owned by the City. Property costs for the treatment facility were estimated at $1,000,000/acre.

Greenhouse Gas Reduction Projects It is yet to be determined which projects and/or programs will be implemented to achieve the goal of net carbon neutrality. A placeholder amount of $2,000,000 has been placed in Permit Conditions to account for all permit conditions. At this time it is difficult to make a more accurate estimate.

Cost Sharing Costs for design and construction of the project as a whole are split 59%/41% as per the 2010 Agreement. Costs for outstanding studies and fees retain the 50%/50% cost sharing.

Other Design and construction management costs are assumed at 10% of construction; a typical estimating assumption.

As has been reported earlier, cost estimates for this project were first developed in 2002 when Carollo Engineers completed the “Evaluation of Regional Water Supply Alternatives” for the City and the District. This was a conceptual level evaluation that considered a range in production capacity of 2-6 million gallons per day and resulted in cost estimates ranging from $26M - $53M. This range likely accounts for an expected accuracy range of -30% to +50%. A placeholder of $35M was used.

To understand the implications of early estimating due to inflation, using approximately five years at 8% (the period between 2002 and 2007) and then further inflate at 3% to 2016, results in a range in 2016 dollars of ~$84M - $120M. It is not unreasonable to assume costs to increase by a similar rate of inflation.

There are several issues that require further attention.

1. Strong consideration should be given to delivering the intake system through the design-build delivery model. Design of a marine intake system will require the expertise from those with construction experience. As a result, it could be difficult for the traditional design-bid-build model to work successfully.
2. Some if not all of the pipeline work may be combined into single design and subsequent construction contracts. Due to the similarity in design and construction of pipelines, and in particular given the physical vicinity of the brine and intake lines, it may be prudent to combine these components.
3. Further consideration should be given to timing of each element. As is currently shown, all construction begins in fiscal year 2015/2016. This may be challenging to fund and to implement from a project management perspective.

Staff will continue to evaluate different delivery models, evaluate different timing and sequencing of design and construction, and keep apprised of funding opportunities including grants.

There is a lot of work related to the design of all of the components. While the range of estimating accuracy will narrow and the estimating contingency will shrink, the rate of inflation will no doubt have some impact.

FISCAL IMPACT: At this point, the entire project preliminary cost estimate is summarized as follows.

Total ~$114,000,000; City $65,000,000; District $48,000,000

As per the first Memorandum of Agreement, each agency shall contribute 50% for costs associated with evaluating, studying and permitting the program. The proposed Agreement Endorsing Recommendations of the Joint Task Force establishes a 41%/59% District/City cost share for construction, and purchase of property.

Attachments: Cost Estimate

		2014-15			2015-16			2016-17			2017-18		
		Total	City of SC Portion	SqCWD Portion	Total	City of SC Portion	SqCWD Portion	Total	City of SC Portion	SqCWD Portion	Total	City of SC Portion	SqCWD Portion
Design & Construction													
Project Management - City	**$3,048,000**		**$762,000**			**$762,000**			**$762,000**			**$762,000**	
Program Advisor, KJ		$ 400,000	$ 200,000	$ 200,000	$ 400,000	$ 200,000	$ 200,000	$ 400,000	$ 200,000	$ 200,000	$ 400,000	$ 200,000	$ 200,000
Technical Advisor, Dietrich		$ 50,000	$ 25,000	$ 25,000	$ 50,000	$ 25,000	$ 25,000	$ 50,000	$ 25,000	$ 25,000	$ 50,000	$ 25,000	$ 25,000
Labor, etc		$ 312,000	$ 156,000	$ 156,000	$ 312,000	$ 156,000	$ 156,000	$ 312,000	$ 156,000	$ 156,000	$ 312,000	$ 156,000	$ 156,000
Project Management - SqCWD	**$560,000**		**$140,000**			**$140,000**			**$140,000**			**$140,000**	
Labor, etc		$ 140,000	$ 70,000	$ 70,000	$ 140,000	$ 70,000	$ 70,000	$ 140,000	$ 70,000	$ 70,000	$ 140,000	$ 70,000	$ 70,000
Project Management - Grant(s)	**$80,000**		**$20,000**			**$20,000**			**$20,000**			**$20,000**	
Grant Administrator		$ 20,000	$ 10,000	$ 10,000	$ 20,000	$ 10,000	$ 10,000	$ 20,000	$ 10,000	$ 10,000	$ 20,000	$ 10,000	$ 10,000
Subtotal, Project Mgmt	**$ 3,688,000**	**$ 922,000**	**$ 461,000**	**$ 461,000**	**$ 922,000**	**$ 461,000**	**$ 461,000**	**$ 922,000**	**$ 461,000**	**$ 461,000**	**$ 922,000**	**$ 461,000**	**$ 461,000**
Cost Sharing Factor			*50%*	*50%*		*50%*	*50%*		*50%*	*50%*		*50%*	*50%*
Intake Facility	**Estimate**		**$1,500,000**			**$12,000,000**			**$11,000,000**				
Property Purchase	$ 500,000	$500,000	$250,000	$250,000									
Design (incls survey, geotech,)	$ 2,000,000	$1,000,000	$500,000	$500,000	$1,000,000	$500,000	$500,000						
Construction	$ 20,000,000				$10,000,000	$5,900,000	$4,100,000	$10,000,000	$5,900,000	$4,100,000			
Encumbrance: FY15/16	$ 2,000,000				$1,000,000	$590,000	$410,000	$1,000,000	$590,000	$410,000			
Subtotal for Intake Facility	**$ 24,500,000**	**$1,500,000**	**$750,000**	**$750,000**	**$ 12,000,000**	**6,990,000**	**5,010,000**	**$ 11,000,000**	**6,490,000**	**4,510,000**			
Cost Sharing Factor			*50%*	*50%*		*59%*	*41%*		*59%*	*41%*			
Treatment Plant	**Estimate**		**$6,750,000**			**$21,416,667**			**$20,166,667**			**$20,166,667**	
Property Purchase	$ 5,500,000	$ 5,500,000	$ 2,750,000	$ 2,750,000									
Energy Offset Projects (TBD)								$ -	$ -	$ -	$ -	$ -	$ -
Design (CDM, PO 2011)	$ 2,500,000	$ 1,250,000	$ 625,000	$ 625,000	$ 1,250,000	$ 625,000	$ 625,000						
Encumbrance: FY15/16	$ 55,000,000				$ 18,333,333	$ 10,816,667	$ 7,516,667	$ 18,333,333	$ 10,816,667	$ 7,516,667	$ 18,333,333	$ 10,816,667	$ 7,516,667
Encumbrance: FY15/16	$ 5,500,000				$ 1,833,333	$ 1,081,667	$ 751,667	$ 1,833,333	$ 1,081,667	$ 751,667	$ 1,833,333	$ 1,081,667	$ 751,667
Subtotal, Treatment Plant	**$ 68,500,000**	**$ 6,750,000**	**$ 3,375,000**	**$ 3,375,000**	**$ 21,416,667**	**$ 12,523,333**	**$ 8,893,333**	**$ 20,166,667**	**$ 11,898,333**	**$ 8,268,333**	**$ 20,166,667**	**$ 11,898,333**	**$ 8,268,333**
Cost Sharing Factor			*50%*	*50%*		*59%*	*41%*		*59%*	*41%*		*59%*	*41%*
Infrastructure: Intake	**Estimate**		**$227,500**			**$1,251,250**			**$1,251,250**				
Encumbrance: FY13/14	$ 227,500	$ 227,500	$ 113,750	$ 113,750									
Encumbrance: FY15/16	$ 2,275,000				$ 1,137,500	671,125	466,375	$ 1,137,500	671,125	466,375			
Encumbrance: FY15/16	$ 227,500				$ 113,750	67,113	46,638	$ 113,750	67,113	46,638			
Subtotal, Intake Pipeline	**$ 2,730,000**	**$227,500**	**$113,750**	**$113,750**	**1,251,250**	**738,238**	**513,013**	**1,251,250**	**738,238**	**513,013**			
Cost Sharing Factor			*50%*	*50%*		*59%*	*41%*		*59%*	*41%*			
Infrastructure: Brine	**Estimate**		**$227,500**			**$1,251,250**			**$1,251,250**				
Encumbrance: FY13/14	$ 227,500	$ 227,500	$ 113,750	$ 113,750									
Encumbrance: FY15/16	$ 2,275,000				$ 1,137,500	671,125	466,375	$ 1,137,500	671,125	466,375			
Encumbrance: FY15/16	$ 227,500				$ 113,750	67,113	46,638	$ 113,750	67,113	46,638			
Subtotal , Brine Pipeline	**$ 2,730,000**	**$227,500**	**$113,750**	**$113,750**	**1,251,250**	**738,238**	**513,013**	**1,251,250**	**738,238**	**513,013**			
Cost Sharing Factor			*50%*	*50%*		*59%*	*41%*		*59%*	*41%*			
Infrastructure: Intertie	**Estimate**		**$650,000**			**$3,575,000**			**$3,575,000**				
Design	$ 650,000	$ 650,000	$ 325,000	$ 325,000									
Construction	$ 6,500,000				$ 3,250,000	$ 1,917,500	$ 1,332,500	$ 3,250,000	$ 1,917,500	$ 1,332,500			
Construction Management	$ 650,000				$ 325,000	$ 191,750	$ 133,250	$ 325,000	$ 191,750	$ 133,250			

		2014-15			2015-16			2016-17			2017-18		
		Total	City of SC Portion	SqCWD Portion	Total	City of SC Portion	SqCWD Portion	Total	City of SC Portion	SqCWD Portion	Total	City of SC Portion	SqCWD Portion
Subtotal, Intertie	**$ 7,800,000**	**$ 650,000**	**$ 325,000**	**$ 325,000**	**$ 3,575,000**	**$ 2,109,250**	**$ 1,465,750**	**$ 3,575,000**	**$ 2,109,250**	**$ 1,465,750**			
Cost Sharing Factor			*50%*	*50%*		*59%*	*41%*		*59%*	*41%*			
CEQA	**Estimate**		**$200,000**										
RMMT	$ 200,000	$ 200,000	$ 100,000	$ 100,000									
Subtotal, CEQA	**$ 200,000**	**$ 200,000**	**$ 100,000**	**$ 100,000**									
Cost Sharing Factor			*50%*	*50%*									
Permitting	**Estimate**		**$750,000**			**$2,000,000**							
Permitting Services	$ 750,000	$ 750,000	$ 375,000	$ 375,000									
Permit Conditions	$ 2,000,000				$ 2,000,000	$ 1,180,000	$ 820,000						
Subtotal, Permitting Services	**$ 2,750,000**	**$ 750,000**	**$ 375,000**	**$ 375,000**	**$ 2,000,000**	**$ 1,180,000**	**$ 820,000**						
Cost Sharing Factor			*50%*	*50%*		*59%*	*41%*						
Other	**Estimate**		**$300,000**										
Update Watershed Sanitary Survey	$ 100,000	$ 100,000	$ 50,000	$ 50,000									
Update Intake Study	$ 100,000	$ 100,000	$ 50,000	$ 50,000									
Update Dilution Study	$ 100,000	$ 100,000	$ 50,000	$ 50,000									
Subtotal, Other	**$ 300,000**	**$ 300,000**	**$ 150,000**	**$ 150,000**									
Cost Sharing Factor			*50%*	*50%*									
Subtotal for All Tasks	$ 113,198,000	$ 11,527,000	$ 5,763,500	$ 5,763,500	$ 42,416,167	$ 24,740,058	$ 17,676,108	$ 38,166,167	$ 22,435,058	$ 15,731,108	$ 21,088,667	$ 12,359,333	$ 8,729,333