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**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

In the Matter of the Application of California-American Water Company (U 210 W) for a Certificate of Public Convenience and Necessity to Construct and Operate its Coastal Water Project to Resolve the Long-Term Water Supply Deficit in its Monterey District and to Recover All Present and Future Costs in Connection Therewith in Rates.

Application 04-09-019
(Filed September 20, 2004;
Amended July 14, 2005)

**REBUTTAL TESTIMONY OF LYNDEL W. MELTON, P.E.
ON BEHALF OF MARINA COAST WATER DISTRICT**

FRIEDMAN DUMAS & SPRINGWATER LLP
MARK FOGELMAN
DERRICK N.D. HANSEN
STEFANIE A. ELKINS
San Francisco, CA 94105
Telephone: (415) 834-3800
Facsimile: (415) 834-1044
Email: mfogelman@friedumspring.com
Email: dhansen@friedumspring.com
Email: selkins@friedumspring.com

Attorneys for
MARINA COAST WATER DISTRICT

May 27, 2010

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EXHIBITS

- LWM-14: April 15, 2010 Project Cost Comparison**
- LWM-15: Unified Financing Model Inputs**
- LWM-16: May 19, 2010 Trussell Technical Memorandum No. 11**

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ON BEHALF OF MARINA COAST WATER DISTRICT

I. Introduction

Q1. Please state your name and business address.

A1. My name is Lyndel W. Melton, and my business address is 2001 N. Main Street, Suite 400, Walnut Creek, CA 94596.

Q2. By whom are you employed and in what capacity?

A2. I work for RMC Water and Environment (formerly known as Raines, Melton and Carella), a firm that specializes in California water resource projects. I am a founding Principal of RMC and a Senior Vice President.

Q3. Are you the same Lyndel W. Melton whose Direct Testimony was served on the parties in this proceeding on June 24, 2009.

A3. Yes, I am.

Q4. Are there any aspects of the Direct Testimony served on June 24, 2009 that have changed or are otherwise in need of being updated?

A4. Yes, there are. In particular, the issues of cost, financing, and implementation have evolved since the June 24, 2009 Direct Testimony was served, all of which are

1 addressed in this Testimony. This Testimony also addresses the Testimony and
2 Comments submitted by the Division of Ratepayer Advocates, the Bureau of
3 Reclamation, and the Monterey Peninsula Water Management District.
4

5 **II. Project Costs**

6 Q5. Can you describe the components of the Regional Desalination Project?

7 A5. The Regional Desalination Project includes facilities owned by the Monterey
8 County Water Resources Agency (MCWRA), specifically the Brackish Source
9 Water Wells and the MCWRA Brackish Source Water Pipeline; facilities owned
10 by the Marina Coast Water District (MCWD), specifically the MCWD Brackish
11 Source Water Pipeline, the Desalination Plant, the MCWD Outfall Facilities, and
12 the MCWD Product Water Pipeline to the Delivery Point; and certain MRWPCA
13 Outfall Facilities owned by the Monterey Regional Water Pollution Control
14 Agency (MRWPCA). MCWD will construct the Brine Receiving Facilities along
15 with the connection to the MWPCA outfall pipeline, although MRWPCA will own
16 this connection facility. Collectively, these facilities are defined in Article 3 of the
17 Water Purchase Agreement (WPA) as the Project Facilities. The Regional
18 Desalination Project also includes facilities that will be owned by California
19 American Water (CAW), specifically the Transmission Pipeline downstream of the
20 CAW Delivery Point, the Terminal Reservoir, Monterey Pipeline, Valley Greens
21 Pump Station, and Aquifer Storage and Recovery (ASR) facilities. The CAW
22 Facilities downstream of the Delivery Point are part of the Regional Desalination
23 Project, but are not included in the Project Facilities as defined in the WPA. The
24 CAW Facilities would be the same for any of the three desalination projects that
25 were considered in the FEIR, i.e., the Regional Desalination Project, the North
26 Marina Project, and the Moss Landing Project. Since the CAW Facilities are
27 discussed in the Rebuttal Testimony of F. Mark Schubert of CAW, since their
28

1 effects on the cost of water will be the same regardless of the desalination
2 alternative selected, and since the costs of those facilities will not be included in
3 the price of water under the WPA, I will exclude the CAW Facilities from
4 subsequent discussions of cost and facilities in my testimony.
5

6 Q6. Have you updated the cost estimates since your previous testimony?

7 A6. Yes, the cost estimates have been updated in the following manner. At the July 7-
8 8, 2009 Workshops held in San Francisco, ALJ Minkin asked the Parties, and
9 particularly CAW and MCWD, to coordinate on cost estimating assumptions made
10 for the CWP project alternatives, and reconcile as many differences in assumptions
11 as possible so that an “apples to apples” comparison of the costs of the various
12 project alternatives could be presented. ALJ Minkin asked the Parties to prepare
13 and submit a cost comparison exhibit after the costs differences had been vetted.
14 The Cost Comparison Exhibit was submitted on August 14, 2009. The Cost
15 Comparison Exhibit was jointly submitted by CAW and MCWD.
16

17 Subsequently, an updated Project Cost Comparison dated April 15, 2010 was
18 prepared and submitted in response to a data request from the Division of
19 Ratepayer Advocates (DRA). The following explains in general changes that have
20 been made to the August 14, 2009 Cost Comparison Exhibit, as shown in the April
21 15, 2010 Project Cost Comparison, based on updated information and further
22 refinement of the Regional Desalination Project:

- 23 • Increased the total length of the MCWRA and MCWD Brackish Source
24 Water Pipelines from 13,000 ft to 21,000 feet based on an updated
25 alignment required to avoid potential land severance issues and potential
26 need for condemnation of lands owned by the Armstrong Trust
- 27 • Added a Brine Receiving Facility at MRWPCA for mitigation of impacts of
28 brine disposal on the MRWPCA outfall

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- Added two test wells (one vertical and one slant well)
- Added a Brackish Source Water Receipt Point Meter, the CAW Meter, and MCWD Meter
- Moved ownership of the Product Water Pipeline downstream of the Delivery Point from MCWD to CAW as described in the WPA
- Added a 3 MG brine holding tank and receiving station for potential temporary storage of brine during storm events when the ocean outfall reaches peak capacity and brine disposal is not allowed under the Outfall Agreement between MCWD and MRWPCA
- Updated the cost for purchase of outfall capacity for brine disposal based on the Outfall Agreement between MCWD and MRWPCA
- Added the Project Administration and Oversight Expenses as defined in the WPA
- Added the Start-up and Acceptance Costs as defined in the WPA
- Added the Pre-Effective Date Costs and Expenses as defined in the WPA
- Added the MCWD Buy-in from Fees contribution to the project as defined in the WPA
- Added “Litigation associated with Land Condemnation and Groundwater Transfer out of Zone 2C” costs associated with the North Marina Project.
- Increased the Environmental Mitigation Measures Cost for the Moss Landing Alternative due to concerns with open ocean intake and the need for the pipelines to cross sensitive habitat.
- Escalated Costs to mid-point of construction (at 4% annually over 38 months for construction, and 8 months for implementation and ROW)

- The interest rate for public bond financing was adjusted to 4.75% to reflect the current municipal bond market.

Q7. Why was a 4% annual rate used to escalate project costs and how does this compare to what DRA is recommending?

A7. The 4% rate was established using the Engineering News Record Construction Cost Index (ENR CCI) from the San Francisco, CA index from 2004 to 2009. The San Francisco index was used to establish a more accurate local index instead of using a state or national index. It is a standard practice to use the ENR CCI to determine escalation rates and a five year time frame was used to average the fluctuations rates have seen over the last few years, as seen in Table 1 below.

Table 1: San Francisco CCI Index

	SAN FRANCISCO CCI INDEX	CCI % CHANGE FROM PREVIOUS YEAR
AUG-04	8,088.25	
AUG-05	8,298.84	2.6%
AUG-06	8,618.03	3.8%
AUG-07	9,095.57	5.5%
AUG-08	9,363.07	2.9%
AUG-09	9,737.88	4.0%
	AVERAGE	3.8%

For municipal utilities the CCI is a more widely used escalation than the DRA energy cost of service escalation rates referenced on page 2-17 in the DRA April

1 30, 2010 Testimony. This topic is also addressed in Section D of the Rebuttal
2 Testimony of F. Mark Schubert of CAW.

3
4 Q8. Why was an interest rate of 4.75% utilized?

5 A8. An annual interest rate of 4.75% was utilized based upon the potential for obtaining
6 project financing at that approximate rate. The Project Cost Comparison also
7 provided analyses of the effects of obtaining State Revolving Fund (SRF) loans at
8 approximately 2.5% annual interest with a term of 20 years. We have updated the
9 financing analysis using the Unified Financing Model, as described later in my
10 testimony, including consideration of other interest rates.

11
12 Q9. In the WPA there is reference to an Exhibit C. What is Exhibit C?

13 A9. Exhibit C (which is an exhibit appended to the WPA) was created to establish an
14 upper cost limit that was included in the WPA. It differs from the Proposed
15 Regional Desalination Project costs shown in the April 15, 2010 Project Cost
16 Comparison. The basis for the Exhibit C costs is included in the April 15, 2010
17 Project Cost Comparison. The costs included in Exhibit C assume that the intake
18 facilities will include all slant wells, that there will be a different connection point
19 for introduction of the desalinated water in the MCWD distribution system that
20 requires a 12,750 foot long, 24-inch diameter MCWD tie-in pipeline, that there will
21 be no MCWD buy-in fees, and that the costs will be at the high end of the cost
22 estimating accuracy range as established by the Association for the Advancement
23 of Cost Engineering (AACE). The resulting cost estimate included in Exhibit C is
24 \$240 million for the most probable cost, and \$282 million at the high end of the
25 accuracy range. These costs include all costs of the Regional Desalination Project
26 except the costs of the CAW Facilities (i.e., they include the costs to deliver
27 desalinated water to the Delivery Point, or, otherwise stated, all project costs
28 upstream of the Delivery Point). The Exhibit C costs in the WPA also include \$15

1 million for the Reserve Fund Payment Account and the costs of obtaining
2 indebtedness, bringing the total Exhibit C costs in the WPA to \$297 million.
3 However, those latter two cost items will be replaced by financing costs from the
4 Unified Financing Model described later in my testimony.
5

6 Q10. What are the updated estimated costs for the Project Facilities?
7

8 A10. Based on the changes described in the response above, the updated capital and
9 operations and maintenance cost estimates are summarized in Table 1, and is
10 presented in greater detail in Exhibit LWM-14. These are the same capital and
11 operations and maintenance cost estimates shown in the April 15, 2010 Project
12 Cost Comparison for these alternatives.

13 For the Project Facilities cost estimate in the table below, the following
14 assumptions are made:

- 15 • Total Water Production and basis for O&M costs: 10,120 AFY
- 16 • Groundwater water offset to MCWD: 1,320 AFY (15% of 8,800 AFY)
- 17 • Groundwater offset charge: \$148.50/AF
- 18 • Total Cost of Water is based on water delivered to CAW: 8,800 AFY
- 19
- 20

21 For the Exhibit C cost estimate in the table below, the following assumptions are
22 made:

- 23 • Total Water Production and basis for O&M costs: 9,600 AFY
- 24 • Groundwater water offset to MCWD: 800 AFY (9% of 8,800 AFY)
- 25 • Groundwater offset charge: \$148.50/ AF
- 26 • Total Cost of Water is based on water delivered to CAW: 8,800 AFY
- 27
- 28

Table 2: Project Facilities Estimated Cost

	Proposed Regional Project	Basis of Exhibit C
Capital Costs		
Intake Wells (Vertical Wells) and Pipeline	\$17,400,000	\$26,300,000
Desalination Facility	\$95,100,000	\$95,100,000
Product Water Pipeline (To Tie-in Structure)	\$13,700,000	\$18,700,000
Base Construction Cost	\$126,200,000	\$140,100,000
Post -Effective Date Implementation Costs	\$21,800,000	\$25,500,000
Project Administration and Oversight Expenses	\$3,000,000	\$3,000,000
Start-up and Acceptance Costs	\$4,000,000	\$4,000,000
Pre-Effective Date Costs and Expenses	\$14,000,000	\$14,000,000
MRWPCA Outfall Capacity Charge	\$3,000,000	\$,000,000
ROW Easements and Land Acquisition	\$2,000,000	\$2,000,000
Environmental Mitigation Measures Costs	\$2,000,000	\$2,000,000
Capital Costs (Excluding Contingency)	\$176,000,000	\$193,600,000
Project Contingency (25%)	\$42,300,000	\$46,700,000
MCWD Buy-In From Fees	\$(22,000,000)	
Most Probable Capital Cost with Contingency	\$196,300,000	\$240,300,000
Total Annual O&M	\$12,900,000	\$12,500,000
Revenue from GW Offset Sales to MCWD	\$196,000	\$119,000

Q11. The DRA states in its Comments on the Proposed Settlement Agreement, April 30, 2010, that the price of \$148 per acre-foot that MCWD pays for the groundwater offset water is inequitable. (DRA April 30, 2010 Comments, Section B.1., page 5.) Please explain the groundwater offset charge in more detail.

A11. There are two aspects to be considered in response to this question. First, we assume that a percentage of the water extracted from the intake wells, whether vertical or slant wells, will consist of water from the Salinas Basin. The Monterey County Water Resources Agency Act prohibits exportation of groundwater from the Salinas Basin. Thus, to the extent that the product water is shown to contain

1 groundwater that has originated from the Salinas Basin, such groundwater must be
2 kept within Zone 2C, the official designation of the lands overlying the Salinas
3 Basin. From a practical viewpoint, that means a portion of the product water must
4 be delivered to either MCWD for use by its municipal water users or MCWRA for
5 use in the Castroville Seawater Intrusion Project (CSIP) system to offset any
6 withdrawal of Salinas Basin groundwater. However, neither MCWRA via CSIP
7 nor MCWD has need for additional water supplies at the current time. MCWRA
8 has recently completed in excess of \$100 million in capital improvements over the
9 last 15 years to ensure a reliable water supply for the Salinas Valley, including
10 users within the CSIP distribution system service area. MCWD has no immediate
11 need for the groundwater offset water because it already has an adequate, reliable
12 water supply for its current customers, including up to 6,600 AFY of groundwater
13 supply for the re-development of the former Fort Ord. As a result, neither
14 MCWRA nor MCWD has a present need for additional water supply.

15
16 The second point is establishing the value associated with the MCWD Agreed
17 Allocation. If the MCWD Agreed Allocation water is instead delivered to CSIP, it
18 is highly unlikely that the MCWRA would be willing to pay anything for the water,
19 if it agreed to take the water at all. Further information regarding their need for
20 and/or acceptance of additional supplies can be found in the Rebuttal Testimony of
21 Mr. Stephen Collins. If the MCWD Agreed Allocation is delivered to MCWD,
22 MCWD has agreed to pay for the water at a cost equivalent to MCWD's current
23 cost of pumping groundwater, which in 2009 will have been \$148.49 per acre-foot,
24 MCWD will pay a rate equal to its then-current cost of pumping groundwater until
25 the time when MCWD must use product water to fill a need for an additional water
26 supply for the redevelopment of the former Fort Ord. At that time, the desalinated
27 water would have value to MCWD as a new supply, over and above their current
28

1 cost of groundwater, and MCWD would then pay the full cost of water for its
2 proportionate share in accordance with the terms of the WPA. Another benefit of
3 sending the groundwater offset water to MCWD rather than to CSIP is that MCWD
4 has agreed to adjust its groundwater pumping operations to rely on groundwater
5 during the summer so that CAW can receive the full 10 mgd flow rate from the
6 Desalination Plant during CAW's peak demand period. As a result, MCWD will
7 accept the groundwater offset during the winter months when CAW demands are
8 lower, conferring a huge benefit on CAW ratepayers and allowing for a smaller-
9 sized desalination plant capable of meeting CAW's peak demand. Any extra
10 operational costs incurred by MCWD in adjusting its MCWD Agreed Allocation
11 water have not been included at this time.

12
13 Q12. In the Direct Testimony of David J. Stoldt dated April 30, 2010 (page 6, Q&A 7),
14 MPWMD stated that there are additional benefits for which MCWD should pay,
15 including, in part, that MCWD will receive refurbished wells, that MCWD will
16 avoid costs for remediating an existing well, and that MCWD will receive new
17 groundwater monitoring which benefits MCWD's system. Can you comment on
18 this?

19 A12. MCWD does not benefit from the items described in Q&A 7 of David Stoldt's
20 testimony because: (a) MCWD will not be receiving refurbished wells – the intake
21 wells will be owned and operated by the MCWRA and are not part of the MCWD
22 system of groundwater wells; (b) MCWD will not avoid the costs for remediating
23 its existing wells: MCWD has an ongoing program to remediate existing wells to
24 ensure a reliable supply for their customers, it will still be relying totally on its
25 groundwater wells for its summertime supply, and its accepting the MCWD
26 Agreed Allocation water during the winter will not reduce its well remediation
27 program; and (c) There is already an existing groundwater monitoring program
28

1 adequate for protection of the MCWD wells; additional groundwater monitoring
2 information would not confer a direct benefit on MCWD.

3
4 Q13. Please discuss the issue raised by MPWMD regarding TCE contamination with the
5 MCWD groundwater supply.

6 A13. MCWD's Central Marina wells (Wells 10, 11 & 12) draw groundwater from the
7 900-foot aquifer. The known contaminant plume in the former Fort Ord, which
8 contains trichloroethylene (TCE), has not been detected since the wells were first
9 drilled (Well 10, 1982; Well-11, 1985; Well-12, 1989) through the latest sampling
10 in 2009. MCWD's three supply wells located in the former Fort Ord (Wells 29, 30,
11 & 31) draw water from the lower 180-foot and the 400-foot aquifers. Low-level
12 TCE, below the maximum contaminant level (MCL) or drinking water standard,
13 was first detected in Well 29 in 2001, Well 30 in 2006 and recently in Well 31 in
14 2009. The Central Marina and Fort Ord systems were interconnected in 2005 and
15 depending on water demand, water pumped from designated wells is mixed in the
16 sand tank and supplies water to the distribution systems. Low levels of TCE have
17 been detected in the sand tank in 2007 through 2009 and the MCWD is closely
18 monitoring the TCE levels in these wells and the sand tank each quarter.
19 To date, all MCWD supply wells consistently meet all drinking water standards set
20 by the USEPA and the California Department of Public Health (CDPH).

21
22 The US Army has ongoing remediation programs and based on past monitoring
23 data, the Army's groundwater treatment systems are effective in containing the
24 contaminated groundwater and have demonstrated reduction of TCE. The Army
25 will continue to operate these treatment facilities until the concentrations of
26 contaminants throughout the aquifers meet the safe drinking water standards. If,
27 despite the Army's best efforts, the TCE levels rise above the MCL, the Army may
28

1 take several actions, which may include establishing treatment system(s) at the
2 drinking water supply well itself (wellhead treatment). Details for the type of
3 treatment used to remove TCE can be found in the Rebuttal Testimony of Rhodes
4 Trussell.
5

6 Q14. Are there other costs associated with the Regional Desalination Project?
7

8 A14. The estimates presented in Table 2 and 3 do not include the costs of the CAW
9 Facilities that are common to any of the desalination alternatives, i.e., the Terminal
10 Reservoir, Seaside Basin ASR wells and pump station, Seaside Pipeline, Monterey
11 Pipeline, and Valley Greens Pump Station. The costs of these facilities are
12 discussed in the Rebuttal Testimony of F. Mark Schubert of CAW.

13 Q15. How does the cost of the Project Facilities compare to the cost of the North Marina
14 and Moss Landing Alternatives?

15 A15. To compare the four alternatives (Regional Project, Exhibit C, North Marina, and
16 Moss Landing) we used the updated April 2010 cost estimates as described in A6.
17 The Capital Costs and O&M costs are to the Delivery Point and exclude the CAW
18 Facilities as shown in Table 3. These cost comparisons do not incorporate
19 consideration of the significant reduction in costs that can be achieved through
20 application and receipt of federal grants and low interest SRF loans.
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Table 3: Comparison Cost Estimates of Project Alternatives

	Regional Project	Basis of Exhibit C	North Marina	Moss Landing
Escalated Capital Costs				
Intake Wells (Vertical Wells) and Pipeline	\$17,400,000	\$26,300,000	\$23,200,000	\$2,000,000
Desalination Facility	\$95,100,000	\$95,100,000	\$98,500,000	\$119,700,000
Product Water Pipeline (To CAW Delivery Point)	\$13,700,000	\$18,700,000	\$13,700,000	\$31,100,000
Base Construction Cost	\$126,200,000	\$140,100,000	\$135,400,000	\$152,800,000
Post -Effective Date Implementation Costs	\$21,800,000	\$25,500,000	\$23,400,000	\$25,400,000
Project Administration and Oversight Expenses	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000
Start-up and Acceptance Costs	\$4,000,000	\$4,000,000	\$4,000,000	\$4,000,000
Pre-Effective Date Costs and Expenses	\$14,000,000	\$14,000,000	\$14,000,000	\$14,000,000
MRWPCA Outfall Capacity Charge	\$3,000,000	\$3,000,000	\$3,000,000	\$-
ROW Easements and Land Acquisition	\$2,000,000	\$2,000,000	\$2,400,000	\$4,800,000
Environmental Mitigation Measures Costs	\$2,000,000	\$2,000,000	\$2,000,000	\$10,000,000
Litigation associated with Land Condemnation and Groundwater Transfer out of Zone 2C			\$5,000,000	
Capital Costs (Excluding Contingency)	\$176,000,000	\$193,600,000	\$192,200,000	\$214,000,000
Project Contingency (25%)	\$42,300,000	\$46,700,000	\$46,300,000	\$51,800,000
MCWD Buy-In From Fees	\$(22,000,000)			
Most Probable Capital Cost with Contingency	\$196,300,000	\$240,300,000	\$239,000,000	\$266,000,000
Total Annual O&M	\$12,900,000	\$12,500,000	\$13,300,000	\$13,000,000
Revenue from GW Offset Sales	\$196,020	\$118,800	\$-	\$-

The capital cost and annual operating cost are two of the inputs into calculating the unit cost of water in terms of \$/AFY. Based only on those two items, one might expect that the unit costs of water for Exhibit C and the North Marina project to be similar. However,

1 the cost of water (\$/AFY) is also highly dependent on the financing terms of the project.
2 Because the cost of financing for the Exhibit C project is lower than that of the North
3 Marina, the net cost of water for the Exhibit C is substantially lower than the North
4 Marina project as shown in the Project Financing section of my rebuttal testimony.
5

6 **III. Project Financing**

7 Q16. Have you read Mr. Thomas Gaffney's Direct Testimony, dated June 24, 2009?

8 A16. Yes, I have.
9

10 Q17. Do you have any comments regarding that testimony?

11 A17. Yes. Extensive additional work related to the financing of the Regional
12 Desalination Project has been undertaken since the time of preparation of that
13 testimony and Mr. Gaffney's June 24, 2009 Direct Testimony is now superseded
14 by the information contained in this testimony.
15

16 Q18. Has a financing plan been developed for the Project Facilities?

17 A18. A financing plan for the Project Facilities is in the process of being developed.
18

19 Q19. Based on your current understanding of the financing alternatives, can you describe
20 how the Financing Plan is related to the Project Facilities?

21 A19. The Financing Plan will provide the basis for obtaining the funds necessary to
22 construct and initiate operation of the Project Facilities.
23

24 Q20. And how will these funds be obtained?

25 A20. Fundamental to the Financing Plan is the objective of obtaining the least cost
26 financing available to MCWRA and MCWD. It is anticipated that MCWRA and
27 MCWD will issue bonded indebtedness, borrow from the State Revolving Loan
28

1 Fund (SRF), and/or obtain grant funding in order to obtain the funds necessary to
2 construct the Project Facilities for which each of these two agencies is responsible,
3 as defined in the WPA – with MCWRA obtaining financing for the MCWRA
4 Brackish Source Water Wells and MCWRA Brackish Source Water Pipeline; and
5 MCWD obtaining financing for the MCWD Brackish Source Water Pipeline, the
6 Desalination Plant, the MCWD Outfall Facilities, and the MCWD Product Water
7 Pipeline to the Delivery Point.
8

9 Q21. And the overall plan to provide the funds for construction of the facilities described
10 above will be called the “Financing Plan”?

11 A21. Yes.
12

13 Q22. Please describe the current status of the Financing Plan.

14 A22. As I stated above, the Financing Plan is in the process of being prepared. Three
15 approaches are currently being evaluated for obtaining the funds necessary to
16 construct the Project Facilities. The first alternative (Alternative 1) is for the
17 MCWRA and MCWD, through the California Pollution Finance Authority
18 (CPFA), to issue Private Activity Bonds (PABs) to fund the entire indebtedness
19 necessary for construction of the Project Facilities, the interest on the indebtedness
20 during construction, and the reserve funds required to sell these PABs. The second
21 alternative (Alternative 2) is to have MCWRA and MCWD issue the PABs directly
22 in tranches as the funds are needed for construction. This alternative, if available,
23 would result in a reduced level of interest during construction, which in turn would
24 result in a lower overall cost of water from the Regional Desalination Project. The
25 third alternative (Alternative 3) is for MCWRA and MCWD to issue bonds through
26 the CPFA necessary to provide the initial funding for the Project Facilities and to
27 borrow from the SRF loan facility in tranches during construction as the funds are
28

1 needed. This use of SRF funding in tranches could also be used as part of
2 Alternative 2.

3
4 Q23. Earlier you mentioned grant funding. Can you describe how this funding will be
5 obtained?

6 A23. Both Agencies are Public Entities and as such, are eligible for both State and
7 Federal grants for projects of this type. Both Agencies have initiated applications
8 for grants contingent on approval of the Regional Desalination Project.

9
10 Q24. Can grant funding be incorporated into all of the financing alternatives?

11 A24. Yes, any grants received will reduce the indebtedness necessary to construct the
12 Regional Desalination Project. Our conversations to date with representatives of
13 the U.S. Bureau of Reclamation, one potential source of grant funding under its
14 Title XVI Grant Program, have indicated we could receive up to 25% grant funding
15 for project packages up to a total grant amount of \$20 million in grants per project
16 package. By project package I mean, for example, the MCWRA-owned Brackish
17 Source Water Wells and MCWRA Brackish Source Water Pipeline as one package,
18 the MCWD-owned Desalination Plant as another package, the MCWD-owned
19 Product Water Pipeline as another project package, and potentially the CAW
20 Facilities as another project package. Under this scenario, the grants associated
21 with MCWRA and MCWD would provide the benefit of reduced cost of water to
22 all recipients of project water, including CAW ratepayers, while the grant
23 associated with the CAW Facilities would provide benefit to CAW ratepayers only.

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25 Q25. What impact will the reduction in indebtedness have on the ratepayers of CAW and
26 MCWD?

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A25. By reducing the indebtedness, the annual debt payment will be reduced which will reduce the cost of providing the desalinated water to the customers of CAW and MCWD.

Q26. Can you explain why you have not recommended a single alternative at this time?

A26. It is prudent to have flexibility when financing a project of this size and duration. Market conditions can vary as can investor interest in PABs. Federal and State legislation can also impact the alternatives. For example, legislation is currently under consideration in the Federal House of Representatives to remove the State Volume Cap for water projects (limiting the amount of PABs that can be issued in the State of California per year). Passage of this legislation will allow us to more fully consider Alternative 2.

Q27. What is the basis upon which you will make your recommendation?

A27. The Alternative or combination of Alternatives that will be recommended will be primarily evaluated based on the cost of the funding including the rate of interest, the term, and the reserve requirements and the restrictions and flexibility associated with the Alternative in addition to the total amount.

Q28. When do you expect that the recommendation will be made?

A28. Towards the end of 2010 or shortly after the issuance of a Certificate of Public Convenience and Necessity (CPCN).

Q29. Are there other sources of funding for the Project Facilities?

A29. Yes, MCWD has agreed in the Water Purchase Agreement (WPA) to advance to the funding of the Project Facilities any funds it receives from the Fort Ord Redevelopment Authority (FORA) for water augmentation and any funds received

1 from building permits associated with water augmentation for capital desalination
2 facilities. These funds have been defined as MCWD Buy-in from Fees.

3
4 Q30. Is there an estimate of the amount of funding associated with the MCWD Buy-in
5 From Fees contribution?

6 A30. Yes. MCWD has estimated that \$22 million can be provided to fund the project
7 from these sources.

8
9 Q31. Will these MCWD funds be available for construction funding?

10 A31. Possibly, but since this source of funding is dependent on the rate of redevelopment
11 on the former Fort Ord, we recommend that it be used to reduce indebtedness when
12 received.

13
14 Q32. Will there be an impact on the ratepayers of CAW or MCWD with this
15 contribution from MCWD?

16 A32. Similar to grant funding, contributions from MCWD which reduce indebtedness,
17 the MCWD Buy-in from Fees will reduce the annual debt payment and the
18 associated cost of water to ratepayers.

19
20 Q33. So in summary, MCWRA and MCWD have a combination of at least three
21 alternatives to provide the funding necessary to construct the Project Facilities.
22 The Agencies will pursue the lowest cost alternative that provides adequate funds
23 for construction with an approach that provides the Agencies with the best
24 flexibility.

25 A33. Yes, the funds for the project are available in today's market and the Agencies are
26 being flexible with a goal to obtain the maximum amount of grant funding and
27 lowest cost borrowing available considering market conditions.
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Q34. Are you aware of the comments regarding the estimated costs that were prepared by Mr. David Stoldt of the MPWMD?

A34. Yes. In particular, his comments are related to financial aspects of the project, and how the financing of the project affects the annual revenue requirements and the overall cost of water to the CAW ratepayers.

Q35. Are you aware of the comments contained in the April 30, 2010 DRA Testimony of Dr. Nihar Shah, Joyce Steingass, Richard Rauschmeier, and Lindsey Fransen on the Settlement Agreement, specifically Chapter 4?

A35. Yes. The referenced comments are related to calculating the total revenue requirement needed for the first full year of operation.

Q36. Are you aware of what has been termed the Unified Financing Model (UFM)?

A36. Yes, I am. During the May 2010 Cost Workshops in San Francisco, the Settling Parties, led by MCWD, MCWRA and CAW, and DRA agreed that a common financing model was needed so that financing options could be compared on a similar basis. During the May 2010 workshops Richard Rauschmeier of DRA presented the financing model DRA was currently working from. All parties agreed that modifications to the model were needed to add more flexibility on inputs and financing options. At the workshop Commissioner Bohn and ALJ Minkin asked the parties to work together to develop a financing model with which everyone could agree. Based on discussions with the Settling Parties and DRA, Richard Rauschmeier modified the original model to incorporate everyone's comments. The final model, called the Unified Financing Model or UFM, has been reviewed by the parties, and it has been agreed that it could be used as a basis for comparing different financing scenarios. A more detailed and in-depth analysis will need to be completed in the future to determine how additional refinements to

1 the financing options could change the cost of water. For example, the UFM
2 currently assigns the revenue from sales of the MCWD Agreed Allocation to the
3 CAW Facilities when we feel it may be more properly assigned to the Project
4 Facilities since this Allocation is associated with the operation of the Brackish
5 Source Water Wells and Desalination Plant, not the CAW distribution facilities.
6 However, we are satisfied with using the Unified Financing Model at this time as a
7 basis to evaluate how different project financing scenarios affect the cost of water
8 from the Project Facilities.

9
10 Q37. How was the UFM used to determine the financing cost of water for the Project
11 Facilities and CAW Facilities?

12 A37. The UFM was used to determine a range of potential costs for the Project
13 Facilities. We've created six scenarios that are illustrative examples of how the
14 costs vary depending on the financing option. The results from the financing
15 scenarios should be viewed as a range of costs and financing options. The interest
16 rates used in the scenarios range from a conservative estimate of 6% (this is also
17 the rate DRA used in their April 30, 2010 testimony) to 4.79% based on current
18 bond financing that could be made available to the MCWD and MCWRA, to 2.5%
19 SRF, 20-year term loans. Table 4 below summarizes the assumptions used for the
20 six scenarios. The complete lists of inputs for the scenarios are found in exhibit
21 LWM-15.

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Table 4: Unified Financing Model Inputs

Scenario	Project Cost (\$ millions)	PAB Interest Rate	Construction Duration (Years)	SRF Funding (\$ millions)	Grants (\$ millions)
#1	\$297.5 ¹	6% ²	4.5 ³	-	-
#2	\$249.4 ⁴	6% ⁵	3.5	\$182 ⁶	-
#3	\$249.4 ⁴	6% ⁵	3.5	\$225 ⁷	-
#4	\$249.4 ⁴	4.79% ⁸	3.5	\$225 ⁷	-
#5	\$227.3 ⁹	6%	3.5	\$203 ⁷	-
#6	\$227.3 ⁹	6% ⁸	3.5	\$170 ¹⁰	\$80 ¹⁰

1. A total project cost of \$297 million as defined in Exhibit C of the WPA (\$297 million).
2. Project is financed through one Private Activity Bond sale at an interest rate of 6%.
3. Assumption is construction will be delayed and take 4.5 years.
4. A project cost of \$249 million from the Estimate Project Facilities Costs in Exhibit C. An additional \$9 million was added for a reserve fund payment account and costs of obtaining the indebtedness.
5. The project is financed with one initial Private Activity Bond sale at 6% to fund the project through initiation and design followed by SRF Funding.

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- 6. This is based on the assumption that only \$50 million per agency per year can be funded through SRF, and that the proposed construction schedule limits the total SRF funding. If the \$50 million cap is increased additional SRF funds would be available, further reducing the cost of water
- 7. This is based on the assumption that construction scheduling and/or a modification to the SRF loan guidelines would result in SRF funding being available for all construction costs.
- 8. Project is financed with one initial Private Activity Bond sale at 4.798% to fund the project through initiation and design followed by SRF funding
- 9. Total project cost of \$227 million defined as the Regional Project in the April 15, 2010 cost comparison figures (excluding the \$22 million contribution from the MCWD) (see exhibit LWM-14). An additional \$9 million was added for a reserve fund payment account and costs of obtaining the indebtedness
- 10. Project is financed with \$80 million in grant funding, one initial Private Activity Bond sale at 4.79% to fund the project through initiation and design followed by \$170 million of SRF funding and. The grants reduced the amount of SRF financing needed.

The results from these six scenarios can be seen in Table 5 below.

Table 5: Unified Financing Model Results

REGIONAL DESALINATION PROJECT	UNIT COSTS OF WATER TO DELIVERY POINT (\$/AF)	
	1ST YEAR PLANT COST (AT 8,800 AFY TO CAW)	AT FULL PRODUCTION¹ (8,800 AFY TO CAW PLUS 1,700 AFY TO MCWD)
SCENARIO 1	\$5,550	\$ 4,660
SCENARIO 2	\$3,880	\$3,260
SCENARIO 3	\$3,880	\$ 3,260
SCENARIO 4	\$3,780	\$ 3,180
SCENARIO 5	\$3,660	\$ 3,080
SCENARIO 6	\$3,220	\$ 2,710

Q38. Do these costs consider the MCWE Buy-in from Fees contribution?

A38. No, they do not. The MCWD Buy-in from Fees contribution will serve to reduce the annual debt payment and the associated cost of water to ratepayers for each of the alternative financing scenarios shown in Table 5.

Q39. Was the UFM used to calculate the cost of water from the North Marina and Moss Landing Projects?

A39. The UFM was built to calculate the cost of water for the Regional Desalination Project only. It was not designed to calculate the cost for a CAW North Marina or Moss Landing Project. The financing costs of water for those projects will be determined by CAW using their financing models, as discussed in the Rebuttal Testimony of David Stephenson.

¹ Costs if plant was in full production (8,800 AFY to CAW and 1,700 AFY to MCWD) in First Year.

1 Q40. How do the financing costs of water for the Project Facilities compare to the
2 financing costs for the North Marina and Moss Landing Projects?

3 A40. Table 6 below summaries the range of potential financing costs from the UFM for
4 the Project Facilities listed as the Regional Project in the table below, and the
5 CAW calculations for the North Marina and Moss Landing Projects. The costs
6 below are to the Delivery Point only and exclude the CAW Facilities. As discussed
7 in Question 35, the UFM is being used to evaluate potential project financing costs
8 at this point in the project development. A more detailed and in-depth analysis
9 would need to be done in the future to determine how additional refinement to the
10 financing options could reduce the cost of water.
11

12 The following assumptions have been made for these comparisons:

- 13 • The Regional Desalination Project shows the range of First Year of Plant
14 Costs from Scenario 1 thru Scenario 6.
- 15 • The North Marina and Moss Landing financing costs were developed by
16 CAW using the capital cost for the most probable cost as seen in Table 3
17 and the high end accuracy range, which assumed an additional 25% to the
18 total capital costs.
19

20 **Table 6: First Year Financing Cost Comparison- Cost to Delivery Point**

	REGIONAL PROJECT (\$/AF)	NORTH MARINA \$/AF)	MOSS LANDING \$/AF)
COST RANGE	\$ 3,220 (SCENARIO 6): TO \$5,550 (SCENARIO 1):	\$6,992 (MOST PROBABLY COST) TO \$8,208 (HIGH END COST)	\$7,580 (MOST PROBABLY COST) TO \$8,930 (HIGH END COST)

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28 As shown on Table 6, even the most conservative estimate of the first year costs of water for the Regional Desalination Project is lower than any of the North Marina

1 or Moss Landing estimates. Regardless of the financing scenario used, the
2 Regional Desalination Project is the lowest cost alternative.

3
4 Q41. Besides having the lowest cost of water, are there other issues that make the
5 Regional Desalination Project more feasible and less risky than the North Marina
6 or Moss Landing Project?

7 A41. Yes, there are. The Moss Landing project relies on an open ocean intake and is co-
8 located with a power plant with once-through cooling. Both of these features are
9 opposed by local environmental groups and the California Coastal Commission.
10 Further, on May 10, 2010 the State Water Resources Control Board² approved a
11 new Statewide policy on the use of coastal waters for power plant cooling which
12 will require existing power plants to reduce their intake flow rate by 93 percent
13 compared to the design intake flow rate. While this Policy is not yet in effect, it is
14 indication that reliance on the long-term continuation of once-through cooling as a
15 water source for the Moss Landing Project increases the risk of unknown future
16 costs and litigation, and increases the difficulty of obtaining a permit to construct
17 the Moss Landing project.

18 The North Marina project would require condemnation of MCWD lands for
19 construction of the desalination treatment plant, would require access by CAW to
20 the Salinas Basin which is controlled and managed by MCWRA, and would
21 require some entity to agree to take the Salinas Basin offset water - either MCWD
22 or MCWRA for CSIP as described in my Answer to Question 8. These issues
23 could take years to resolve, would add substantial costs to the project due to
24 litigation and escalation, and would jeopardize the ability to complete the project
25 before the Cease and Desist Order takes effect in 2016, if at all.

26
27

2 State Water Resources Control Board, Statewide Water Quality Control Policy On The Use Of Coastal And
28 Estuarine Waters For Power Plant Cooling, May 4, 2010.

1 In addition, as discussed in the Rebuttal Testimony of James Heitzman, both the
2 Moss Landing and North Marina alternatives would be in violation of Monterey
3 County's ordinance prohibiting private ownership of desalination plants in the
4 county, raising the additional likelihood of additional extensive litigation and
5 escalation costs for those two alternatives.

6
7 **IV. Bureau of Reclamation and DRA Comments on Desalination Plant**

8 Q42. Have the Bureau of Reclamation (Bureau) and the DRA commented on the cost
9 assumptions?

10 A42. The Bureau of Reclamation had a number of comments on the Regional
11 Desalination Project which they presented in the report entitled the Bureau of
12 Reclamation Review Comments on Coastal Water Project and Alternatives,
13 Monterey, CA, prepared for the Division of Ratepayers Advocates, California
14 Public Utilities Commission, March 11, 2010 (Bureau Comments). The Bureau
15 Comments were incorporated into Chapter 3 of the Division of Ratepayer
16 Advocates Testimony on the Settlement Agreement, April 30, 2010 (DRA April
17 30, 2010 Testimony). The following questions pertain to the Bureau Comments
18 and the incorporation of the Bureau Comments into the DRA April 30, 2010
19 Testimony.

20 Q43. The Bureau Comments (page 16, Figure 2) include a cost curve, entitled
21 Comparison of Water Production Costs, which is incorporated in the DRA April
22 30, 2010 Testimony (page 1-1 Paragraph C) as the basis for proposing a cost cap of
23 \$2,200/AF. Is the cost curve information applicable to estimating the costs for the
24 Project Facilities?

25 A43. No. The cost curve information presented in the Bureau Comments and the DRA
26 April 30, 2010 Testimony is not applicable to estimating costs for the Project
27 Facilities. The cost curve in the Bureau Comments was based on anecdotal cost
28

1 information in the September 15, 2008 Water Desalination Report (WDR), which
2 is a weekly on-line trade journal about desalination and advanced water treatment.
3 However, the Bureau Comments did not include the WDR introductory text which
4 contained cautions about using the data to compare costs of projects. The
5 September 15, 2008 WDR article presenting the cost information included the
6 following text: *“If softer costs – such as those related to permitting, energy,
7 membrane replacement, chemicals, interest and local labor rates, and the period of
8 amortization – were included, the number of possibilities (technical system factors
9 that influence total water cost) grows significantly. When the impact of inflation
10 and currency (or mix of currencies) fluctuations based is added to the mix, **the
11 inherent risk of comparing two water costs becomes obvious.** All of this is based
12 on the often (usually) incorrect assumption that the scope of the projects being
13 considered is the same (Water Desalination Report, September 15, 2008).* (Bold
14 font added) In the September 22, 2008 edition of the WDR, the WDR authors
15 included the following statement about the preceding weeks (September 15, 2008)
16 cost information: *“...it is important to consider that the numbers are what they
17 are, and admittedly, many of them carry a lot of baggage. **They come from a
18 variety of sources including conference proceedings, utility websites, and other
19 press reports.**”* (Bold font added)
20

21 The projects included in the cost information come from projects being undertaken
22 around the world and, as stated by the authors of the WDR, were not intended to be
23 a basis for comparing the costs of two different water projects. No attempt was
24 made by the Bureau to normalize the cost information contained in the WDR to a
25 common basis that would be relevant to the costs of a project in Monterey,
26 California. For example, it is not known whether the costs include intake wells,
27 intake pipelines, distribution pipeline, storage tanks, or distribution pump stations;
28 whether the costs have been adjusted to account for currency fluctuations in

1 addition to country-specific inflation rates; whether the costs have been normalized
2 to Monterey costs of construction; whether the costs include the extensive pre-
3 Effective Date costs incurred for development of the project; what the financing
4 conditions were, including interest rate, amortization, cost of financing; whether
5 the costs included the costs of project permitting requirements, including obtaining
6 a California Coastal Commission permit or a CPCN from a regulatory agency such
7 as the Commission. Without a detailed analysis to ensure an “apples to apples”
8 comparison of costs, the cost information included in the WDR report and
9 incorporated into the Bureau’s comments has little relevance to the costs for the
10 Project Facilities.

11 The following table shows a comparison of the costs of the Project Facilities to
12 desalination plants built in the last 5 years in the United States and Australia.
13 Australian plants are included because (a) there are more reverse osmosis plants in
14 Australia than in the United States, (b) the implementation process (such as need
15 for environmental documentation) is similar to that in the United States, and (c) the
16 drinking water regulations in the two countries are similar. As shown in the table
17 below, the cost per gallon for the Project Facilities is less than the median cost for
18 other reported desalination plants in the U.S. and Australia. The costs shown in
19 Table 7 have the same limitations as those described above for the cost information
20 from the WDR, i.e., they have not been thoroughly vetted to ensure an apples to
21 apples comparison with the Project Facilities’ cost. The information in Table 7
22 suggests that the Bureau’s methodology of using cost curve-type data for cost
23 comparisons could be used to justify higher, not lower, costs for the Project
24 Facilities depending on which plants are used in the comparison.
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Table 7: Desalination Costs in the U.S. and Australia

Utility	Start-up Date	Capacity, mgd	Capital Cost, US \$M	\$/gallon
Tampa Bay Water	2007	25	\$158	\$6
Water Corporation (Perth1)*	2006	37	\$350	\$9
Sydney Water	2010	66	\$1,714	\$26
Regional Desalination Plant	2014	10	\$282	\$28
Melbourne water	2001 to 2012	108	\$3,616	\$33
Gold Coast Australia	2009	33	\$1,180	\$36
South Australia water	2012	35	\$1,654	\$47
Water Corporation (Perth2)*	2011	13	\$863	\$66

Source: Response to Comments from Bureau of Reclamation on Coastal Water Project and Alternatives, Monterey, CA dated March 11, 2010, Trussell Technologies, May 19, 2010 (included as Exhibit LWM-16.)

Q44. Are there other reasons why recommendation of a cost cap is ill advised?

A44. Yes. My response number 36 illustrates that the cost of water is highly dependent on the type of financing used for the project. It is ill advised to calculate cost caps based on the cost of water, as opposed to the capital cost of facilities, until the Financing Plan has been finalized and financing has been secured.

Q45. The Bureau Comments recommend conducting a year-long pilot test (Section 2.1.3, page 9) and this suggestion was included in the DRA April 30, 2010 Testimony (page 3-22). Why does the Regional Desalination Project not include a year-long pilot test?

A45. A pilot plant is not necessary because the concerns raised by the Bureau's comments are already being addressed by the conceptual design of the Desalination Plant. The pretreatment process includes pressure filtration and chlorination to

1 protect the reverse osmosis membranes. The design concepts will be further
2 developed in final design of the project to incorporate water quality data from the
3 proposed test wells. A pilot plant would add a minimum of \$1.5 million in capital
4 costs (Bureau's estimate) plus an additional \$8 million of escalation (at an
5 escalation rate of 4%) due to the year delay in project implementation and would
6 increase the costs of the Regional Desalination Project, not decrease them. Further,
7 MCWD has already obtained approval of the process for the Desalination Plant
8 from the California Department of Public Health.

9
10 Q46. The Bureau Comments recommend eliminating the partial second pass (Section
11 2.1.4, page 10) and this suggestion was included in the DRA April 30, 2010
12 Testimony (page 3-22). Why does the Desalination Plant include a partial second
13 pass?

14 A46. The need for the partial second pass is addressed more completely by the
15 Testimony of Dr. Rhodes Trussell. In summary, the partial second pass provides
16 additional reliability for reducing boron to levels lower than the State notification
17 level of 1 mg/L, prevents horticultural toxicity when the desalinated water is used
18 to irrigate the home landscaping of the CAW ratepayers, and helps protect the
19 approximate \$4 billion per year agricultural industry of Monterey County when the
20 water is returned and used in the form of recycled water for agricultural irrigation.
21 A partial second pass is common in the desalination industry, and both the Tampa
22 Bay plant and the Carlsbad plant (under construction) include a partial second pass.
23 The cost of the second pass is a small percentage of the overall cost of the project,
24 representing approximately 3% of the total project cost. Eliminating the partial
25 second pass would significantly increase the risk associated with desalinated water
26 production.

1 Q47. The Bureau Comments (Section 2.6.1, page 17) recommend reducing the capacity
2 of the Moss Landing project from 6 RO membrane arrays of 2 mgd each to 5 arrays
3 of 2 mgd each. This comment was included in the DRA April 30, 2010 Testimony
4 (page 3-23). Why is the Desalination Plant sizing based on 6 arrays of 2 mgd each?

5 A47. CAW requires a firm, reliable flow rate of 10 mgd during the summer to meet the
6 water demands of its ratepayers. In a drought year, the Desalination Plant will be
7 the only source of water other than the Seaside Basin wells available to CAW
8 during the summer months. It is critical that the Desalination Plant be able to
9 reliably produce a flow rate of 10 mgd, even if one of the reverse osmosis arrays is
10 out of service for maintenance or clean-in-place. The design criteria used in all of
11 the desalination projects included in the FEIR is that there would be six arrays of
12 membranes, each sized at 2 mgd (for Regional Project, Exhibit C and Moss
13 Landing) or 2.2 mgd (for North Marina). This enables the Desalination Plant to
14 reliably meet the water demands of the CAW ratepayer. It should be noted that it
15 is standard practice in the water industry to have redundant equipment available to
16 provide reliable capacity in the event of maintenance or equipment outages. The
17 cost of the redundant array is a small percentage of the overall cost of the project,
18 representing only approximately 5% of the total project cost. Eliminating the
19 equipment redundancy would significantly increase the risk associated with
20 desalinated water production and the ability of CAW to meet customer demands
21 during summer months.

22
23 Q48. The Bureau Comments (Section 2.1.1 and 2.1.2, pages 6 through 9) raise technical
24 issues associated with slant and vertical wells and recommended installing test
25 wells. This comment was included in the DRA April 30, 2010 Testimony (pages
26 3-22). Do you have a response to this?
27
28

1 A48. Yes. Per Section 8.2 of the WPA the Parties intend to construct and manage the
2 Brackish Source Water Wells in a manner to maximize the intake of seawater on a
3 cost-effective basis, considering both potential operational and capital costs over
4 the Term of the Agreement. Thus, this Bureau of Reclamation recommendation
5 has been met in the WPA. I would note that, to be conservative, the Exhibit C
6 project costs are based on the assumption that the Regional Desalination Project
7 will utilize all slant wells, but that is for estimating purposes.
8

9 Q49. In its Comments on the Settlement (at p. 9), DRA takes the position that slant wells
10 would assure adequate proportions of seawater to groundwater to satisfy the supply
11 needs of CAW ratepayers while minimizing the amount of water that must stay in
12 the Salinas Basin to satisfy the MCWRA Agency Act. The DRA argument appears
13 to revolve around the risk associated with not committing to slant wells from the
14 outset, the alleged risk being that increasing costs associated with the requirement
15 to keep Salinas Basin water in the basin would be borne by CAW ratepayers. Do
16 you have any comments regarding slant wells versus vertical wells?
17

18 A49. Yes. I am aware of this line of thought presented by DRA. The WPA calls for the
19 implementation of test wells, both slant and vertical, and commits the parties to
20 maximizing seawater in the source water if it can be done cost-effectively. Thus,
21 the WPA both agrees to least-cost, most-feasible intake strategies, as well as
22 assuring that adequate seawater will be treated to supply CAW with the anticipated
23 quantity of water supply from the Desalination Plant. Essentially, the test wells are
24 intended to supplement existing analyses to provide additional information to allow
25 a sound basis for selection of the intake well configuration.
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1 Q50. Are there other issues beyond the performance and cost of the slant well versus
2 vertical well configuration that should be considered in selecting the recommended
3 intake well configuration?

4 A50. The location of the slant wells as described in the FEIR are near or adjacent to the
5 MCWD Administration Building on Marina State Beach. One of the greatest
6 uncertainties and risks is associated with the operation and maintenance of the
7 facilities. Cleaning and backwashing slant well intakes has not been deeply
8 examined due to the limited experiences are available internationally.
9 Accordingly, sand and sediment build up within the slant well intake may pose
10 operational challenges, potential increased operational costs for unclogging and
11 clearing, and decreased performance due to constriction and clogging. Thus, an
12 examination of coastal erosion is important when projecting risks and uncertainties
13 associated with slant wells.
14

15 Q51. Has there been an analysis of coastal erosion in the vicinity of the proposed slant
16 wells?

17 A51. Yes, there has. According to analytical investigations on the tidal regime in the
18 Monterey Bay, performed for the Association of Monterey Bay Area Governments,
19 the slant well location experiences relatively large wave heights from Fort Ord to
20 Marina.³ One of the key issues with wave climate in this location of the southern
21 Monterey Bay derives from differential wave energy alongshore which causes
22 variations in the magnitude of erosion due to wave impacts at the dune toe.⁴ The
23 rate of erosion increases as waves become stronger. This is observed during El
24 Nino events and is of increasing concern for climate change and associated sea
25 level rise.⁵
26

27 ³ Phil Williams and Associates, LTD et al., "Coastal Regional Sediment Management Plan for Southern Monterey
28 Bay," Prepared for the Association of Monterey Bay Area Governments, November, 3, 2008, p. 16

⁴ Ibid.

⁵ Ibid. p. 18 and pp. 19-20

1 According to expert analysis, the near-normal incidence of waves approaching the
2 southern Monterey Bay shoreline is conducive to rip current generation. The most
3 important perspective here for slant well operation is that rip currents impact
4 sediment transport. Studies show that there is active sediment transport on a
5 seasonal basis in the Fort Ord to Marina locations.⁶ While slant well operations
6 may be aided by adequate engineering, without better understanding of the
7 performance of slant wells in this location, sediment transport and dune erosion of
8 the magnitude exhibited in the project location pose potential uncertainty for the
9 viability of slant wells.

10 Slant well operations are not necessarily strongly impacted by tidal action.
11 Evidence exists that some sediment transport around the intake actually may have a
12 beneficial impact of cleaning the sand adjacent to the intake.⁷ The uncertainty and
13 risk issue is focused on the extent of erosion and sediment transport and the
14 geologic setting. Intake evaluations in the northern portion of Monterey Bay have
15 concluded that slant well subsurface intakes are not feasible and would become
16 clogged during operation.⁸

17 The uncertainties associated with slant well operations can become increasingly
18 better understood and defined. The means for better understanding uncertainties,
19 defining known and quantifiable risks, and preparing robust evaluations is to devise
20 and execute pilot testing. Without the empirical understanding of the engineering
21 challenges associated with constructing and operating slant wells in north Marina,
22 California, slant well technology offers no greater dependability of minimization of
23 risk than does vertical well technology.

24
25 ⁶ Ibid. pp. 24-27

26 ⁷ Roscoe Moss Company, "Designing Buried Seawater Intake Structures for Enhanced Corrosion Resistance and
27 Prolonged Durability," Technical Memorandum #008-2, 2008, [online] [http://roscoemoss.com/pdfs/TechMemo_008-
2_Buried_Seawater_Intake_Structures.pdf](http://roscoemoss.com/pdfs/TechMemo_008-2_Buried_Seawater_Intake_Structures.pdf)

28 ⁸ Todd Reynolds, PE, Kennedy Jenks Engineers and Scientists, "SCWD² Desalination Program Intake Evaluation Update, Navigating the Technical, Regulatory, and Economic Aspects of a Seawater Intake, 2009 Alden Desalination Intake/Discharge Workshop," 2009.

1 Q52. The Bureau Comments recommend changing the values used for Contractor's
2 overhead and profit, contingencies, and accuracy of estimate range. How would
3 incorporating these changes affect the project cost?
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5 A52. There are three related Bureau Comments that affect the overall project cost.

- 6 1) Section 3.8, page 28 of the Bureau Comments states that the Bureaus'
7 typical allowance for Contractor's overhead and profit ranges from 32 to
8 40% and that the Cost Exhibit's allowance of 18% is too low.
- 9 2) Section 3.10, page 30 of the Bureau's comments state that the Bureau's
10 typical range of contingencies is from 37.5% to 44% versus the 25%
11 shown in the estimates. Note that the DRA April 30, 2010 Testimony
12 (page 3-24) appears to have misinterpreted this Bureau Comment by
13 confusing contingency with cost estimating accuracy range (see below).
- 14 3) Section 3.12, page 30 of the Bureau Comments states that the accuracy
15 range of the estimates should be in the higher value end of the Expected
16 Accuracy Range as opposed to the lower value end as utilized, i.e. - 30%
17 to +50%.

18 As an illustrative example to evaluate the net effect of the Bureaus' comments, we
19 have estimated the net change in the Project Facilities cost if all of the Bureaus'
20 key recommendations were implemented, i.e. all slant wells, deleting partial second
21 pass, deleting redundant array, adding year long pilot test, changing the
22 contractor's overhead and profit to 36% (mid-point of the Bureaus' range),
23 changing the contingency to 40.75% (mid-point of the Bureaus' range), and
24 changing the high end of accuracy estimate to +50%. The net result of
25 incorporating all of the Bureau's comments is shown in the following table:
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1 **Table 8: Impact of Bureau Comments on Costs**

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	Exhibit C Project	Exhibit C Project with Bureau's Comments Incorporated
5 Base Construction	\$140 million	\$147 million ⁽¹⁾
6 All "Soft" Costs	\$ 53 million	\$ 58 million ⁽²⁾
7 Contingency	\$ 47 million	\$ 81 million ⁽³⁾
8 Most Probable Cost	\$240 million	\$286 million
9 High Range of Accuracy Estimate	\$282 million	\$422 million ⁽⁴⁾

10 Notes:

- 11 1: Deleted partial second pass, deleted redundant array, changed contractor's overhead and
12 profit to 36%
- 13 2. Added pilot test and added additional year of escalation to project
- 14 3. Changed contingency to 40.75%
- 15 4. Changed high end of accuracy estimate to +50%

16 In summary, incorporating all of the Bureau's comments would result in a cost
17 estimate that is 47% higher than the Exhibit C estimate and would result in a
18 project with lower levels of reliability and redundancy for the CAW ratepayer due
19 to deletion of the partial second pass and redundant membrane array. This topic is
20 also addressed in Section B and C of the Rebuttal Testimony of F. Mark Schubert
21 of CAW.

22 Q53. Were there other issues addressed in the Bureau Comments and incorporated into
23 the DRA April 10, 2010 testimony?

24 A53. Yes, there were other items, which are summarized on page 4 of the Bureau
25 Comments, but none of them have a significant impact on project costs. The other
26 items included developing membrane replacement criterion and labor policies,
27 which will be done during final design of the Project; carrying out water quality
28 tests on water stability and disinfection byproducts, which will be done during
start-up and testing to adjust the quantity and type of post-treatment chemicals;
conducting the Brine Waste Disposal Study, which is already underway as part of

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the Outfall Agreement between MRWPCA and MCWD; and developing more detailed cost estimates and equipment bids, which will be done during final design.

Q54. Does that conclude your Direct Testimony?

A54. Yes, it does.