

APPENDIX A. INDOOR/OUTDOOR ANALYSIS

This appendix provides a brief summary of the analysis used to estimate ratio of indoor to outdoor water demand used in this Water Supply Evaluation (WSE).

Zone 7 staff reviewed monthly water production for Municipal and Industrial use from 2005 to 2009 to estimate the percentage of indoor and outdoor use within Zone 7's service area. For planning-level purposes, indoor use was defined as the monthly average water production from December through March. Table A-1 presents the results of this analysis, while Figure A-1 provides a graphical summary of the results.

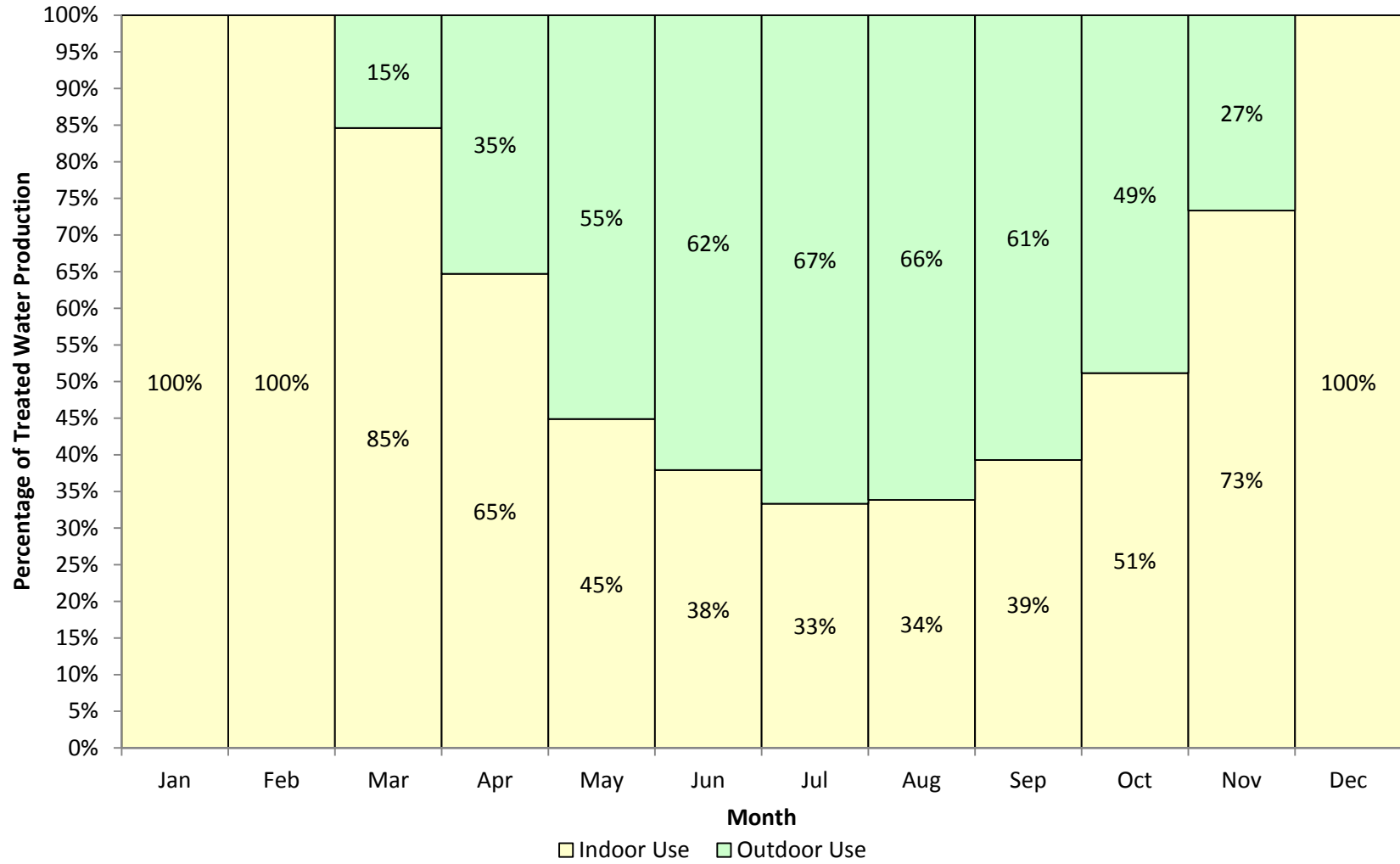
Table A-1. Average Indoor/Outdoor Water Use: 2005 to 2009^(a)

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 2005 | 2,087 | 1,856 | 2,365 | 2,729 | 3,832 | 5,454 | 6,858 | 6,727 | 5,542 | 4,711 | 3,181 | 2,163 | 47,505 |
| 2006 | 2,010 | 1,868 | 1,925 | 2,080 | 4,909 | 6,054 | 7,155 | 6,811 | 5,947 | 4,600 | 2,721 | 2,297 | 48,376 |
| 2007 | 2,372 | 2,101 | 3,152 | 4,196 | 5,359 | 6,184 | 6,634 | 6,493 | 5,654 | 3,903 | 3,261 | 2,510 | 51,819 |
| 2008 | 2,080 | 2,028 | 3,187 | 4,440 | 5,468 | 5,967 | 6,319 | 6,244 | 5,598 | 4,626 | 2,714 | 2,302 | 50,973 |
| 2009 | 2,299 | 1,371 | 2,423 | 3,751 | 4,850 | 5,519 | 6,241 | 6,140 | 5,447 | 3,721 | 2,977 | 2,239 | 46,978 |
| Average | 2,200 | 1,800 | 2,600 | 3,400 | 4,900 | 5,800 | 6,600 | 6,500 | 5,600 | 4,300 | 3,000 | 2,300 | 49,000 |
| Indoor Use ^(b) | 2,200 | 2,200 | 2,200 | 2,200 | 2,200 | 2,200 | 2,200 | 2,200 | 2,200 | 2,200 | 2,200 | 2,200 | 26,400 |
| % Indoor Use | 100% | 100% | 85% | 65% | 45% | 38% | 33% | 34% | 39% | 51% | 73% | 100% | 54% |
| Outdoor Use | 0 | 0 | 400 | 1,200 | 2,700 | 3,600 | 4,400 | 4,300 | 3,400 | 2,100 | 800 | 0 | 22,600 |
| % Outdoor Use | 0 | 0% | 15% | 35% | 55% | 62% | 67% | 66% | 61% | 49% | 27% | 0% | 46% |

^(a) Data obtained from Zone 7 records in Monthly.dbf, and include TW_Z7_TOTAL, GWP_CWS, GWP_PLEAS, which account for all treated water use in the Livermore-Amador Valley.

^(b) Indoor water use based on average use from December to March.

Figure A-1. Monthly Ratio of Indoor and Outdoor Use: 2005 to 2009



APPENDIX B. KEY POLICIES

EXISTING RELIABILITY POLICY

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO 04-2662

INTRODUCED BY DIRECTOR MARCHAND
SECONDED BY DIRECTOR CONCANNON

Reliability Policy for Municipal & Industrial Water Supplies

WHEREAS, the Zone 7 Board of Directors desires to maintain a highly reliable Municipal and Industrial (M&I) water supply system so that existing and future M&I water demands can be met during varying hydrologic conditions; and

WHEREAS, the Board has an obligation to communicate to its M&I customers and municipalities within its service area the ability of the Zone's water supply system to meet projected water demands.

WHEREAS, the Board on May 15, 2002 adopted Resolution No. 02-2382 setting forth its Reliability Policy for Municipal & Industrial Water Supplies; and

WHEREAS, the Zone's current water supply policy includes a provision for a valley-wide groundwater production capability to meet 75% of valley-wide M&I demand in the event of an outage of the South Bay Aqueduct; and

WHEREAS, the Board desires to revise the Reliability Policy to include all Zone 7 water supply facilities and to clarify demand levels for planning purposes;

NOW, THEREFORE, BE IT RESOLVED that the Board hereby rescinds Resolution No. 02-2382 adopting the May 15, 2002 Reliability Policy for Municipal & Industrial Water Supplies; and

BE IT FURTHER RESOLVED that the Board hereby adopts the following policy goals regarding reliability¹ to guide the management of the Zone's M&I water supplies as well as its Capital Improvement Program (CIP)²:

- GOAL 1. Meet 100% of its treated water customers water supply needs in accordance with Zone 7's most current Contracts for M&I Water Supply, including existing and projected demands for the next 20 years as specified in Zone 7's Urban Water Management Plan, (UWMP), which will be coordinated with Zone 7's M&I water Contractors. Zone 7 will endeavor to meet this goal during an average water year³, a single dry water year⁴, and multiple dry water years⁵, and

GOAL 2: Provide sufficient treated water production capacity and infrastructure to meet at least 75% of the maximum daily M&I contractual demands should any one of Zone 7's major supply, production or transmission facilities experience an extended unplanned outage.

BE IT FURTHER RESOLVED that to ensure that this Board policy is carried out effectively, the Zone 7 General Manager will provide a water supply status report to the Board every five years with the Zone 7 Urban Water Management Plan that specifies how these goals can be, or are being, achieved.

If the General Manager finds that the goals might not be met, then the Board will hold a public hearing within two months of the General Manager's finding to consider remedial actions that will bring the Zone into substantial compliance with the stated reliability goals. Remedial actions may include, but are not limited to, voluntary conservation or mandatory rationing to reduce water demands, acquisition of additional water supplies, and/or a moratorium on new water connections. After reviewing staff analyses and information gathered at the public hearing, the Board shall, as expeditiously as is feasible, take any additional actions that are necessary to meet the reliability goals during the following five-year period; and

BE IT FURTHER RESOLVED that the Zone 7 General Manager shall prepare an Annual Review of the Sustainable Water Supply Report which includes the following information:

- (1) An estimate of the current annual average water demand for M&I water as well as a five-year projection based on the same information used to prepare the UWMP and CIP;
- (2) A summary of available water supplies⁶ to Zone 7 at the beginning of the calendar year;
- (3) A comparison of current water demands with the available water supplies; and
- (4) A discussion of water conservation requirements and other long-term water supply programs needed to meet Zone 7 M&I water demands for a single dry water year and multiple dry years, as specified in the Zone's UWMP.

A summary of this review will be provided to M & I customers.

Definitions

¹**Reliability**—the ability of a water supply system to provide water during varying hydrologic conditions without the need for reductions in water use.

²**Capital Improvement Program (CIP)**—the CIP is the Zone's formal program for developing surface and ground water supplies, along with associated infrastructure, including import water conveyance facilities, surface water treatment plants, groundwater wells, and M&I water transmission system to meet projected water demands.

³Average water year—the statistical average quantity of water from all of the water supplies available to Zone 7 on a contractual or legal basis (e.g., surface water runoff to Del Valle reservoir), based on the historical hydrologic records available to Zone 7.

⁴Single dry water year—for the purposes of meeting the requirements of the UWMP, the Zone 7 staff will identify and justify the selection of a calendar year from the historic record that represents the lowest yield from all normally contracted or legally available supplies.

⁵Multiple dry water years—for the purposes of meeting the requirements of the UWMP, the Zone 7 staff will identify and justify the selection of three or more consecutive dry years from the historic record that represent the lowest yields from all normally contracted or legally available supplies.

⁶Available water supplies consist solely of (1) water supplies that the Zone 7 has contracted for (e.g., listed under Schedule A of the State Water Contract, dry-year water options, special contracts with other water districts, etc.) and (2) water actually stored in surface and subsurface reservoirs.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS CONCANNON, GRECI, KOHNEN, MARCHAND, QUIGLEY

NOES: NONE

ABSENT: DIRECTORS KALTHOFF, STEVENS

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a resolution
Adopted by the Board of Directors of Zone 7 of Alameda
County Flood Control and Water Conservation District on

August 18, 2004

By 
President, Board of Directors

Vice

WATER QUALITY POLICY

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO 03-2494

INTRODUCED BY DIRECTOR MARCHAND
SECONDED BY DIRECTOR KALTHOFF

Water Quality Policy for Potable and Non-potable Water

WHEREAS, the Zone 7 Board of Directors is committed to delivering high quality water supplies, to its potable (treated drinking water) and non-potable water Contractors, that meet or exceed the California Department of Health Services and the United States Environmental Protection Agency's public health requirements in accordance with existing water supply agreements, in a manner that is fiscally responsible, proactive, and environmentally sensitive; and

WHEREAS, the Board desires to deliver potable water of an approximately equal quality to each Municipal and Industrial (M&I) Contractor without diminishing their existing water quality; and

WHEREAS, the Board desires to deliver non-potable water of an appropriate quality for irrigation users from current surface and ground water supplies, and as a blended source of untreated and recycled water, when available.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby adopts the following policy goals regarding water quality to guide the Zone 7 potable and non-potable water operations and its Capital Improvement Program:

GOAL 1 – Zone 7 shall continue to meet all state and federal primary Maximum Contaminant Levels¹ (MCLs) for potable water delivered to the M&I Contractors' turnouts, in accordance with existing water supply agreements. In addition, Zone 7 shall deliver potable water of a quality that is as close as technically feasible and fiscally responsible to the Public Health Goals² (PHGs) and/or Maximum Contaminant Level Goals³ (MCLGs). To ensure a margin of safety, the delivered water shall generally be of a quality that contains no greater than 80 percent of the applicable state or federal primary MCLs.

GOAL 2 – Zone 7 shall meet all state and federal secondary MCLs¹ in the potable water delivered to its M&I Contractors' turnouts. In addition, Zone 7 shall, within technical and fiscal constraints, proactively mitigate earthy-musty taste and odor events from surface water supplies and reduce hardness levels to "moderately hard", defined as 75 to 150 mg/L. Also, Zone 7 shall optimize its treatment processes to minimize chlorinous odors by maintaining consistent disinfectant dosage and residual.

GOAL 3 – Zone 7 shall endeavor to deliver to its non-potable Contractor turnouts, from a variety of sources, water of a quality that meets the irrigation needs of its Contractors and does not negatively impact vegetation, crops, or soils.

GOAL 4 – In order to achieve Goals 1 through 3, Zone 7 shall continue to work to improve the quality of its source waters. This may be achieved through Zone 7's Salt Management Plan, which will maintain or improve the water quality in the groundwater basin, and through advocacy of improvements in the State Water Project, its facilities and their operations, which may improve the source water of Zone 7's surface water supplies. In addition, Zone 7 will encourage the retailers to take similar steps as those outlined in this policy to improve the quality of the retail customers' water.

BE IT FURTHER RESOLVED that this Board policy be reviewed and updated as needed. Also, to ensure that this Board policy is carried out effectively, the Zone 7 General Manager shall implement the following actions:

- An Implementation Plan shall be prepared as a part of the Water Quality Management Program to implement treatment or other processes necessary to meet the water quality policy goals. Optimization of system operations will be recommended, wherever possible, prior to the identification of the need for capital improvements;
- The Implementation Plan shall be reviewed and updated every two years, or sooner if required, to reflect any emerging water quality issues and other relevant regulatory and/or technology development; and
- The Implementation Plan, and any subsequent updates, shall be incorporated into the annual updates of Zone 7's Five-year Capital Improvement Plan, as feasible.

¹ Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

¹ Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

¹ Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the United States Environmental Protection Agency.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS CONCANNON, GRECI, JOHNSTON, KALTHOFF, LAYTON, MARCHAND

NOES: NONE

ABSENT: DIRECTOR STEVENS

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a resolution
Adopted by the Board of Directors of Zone 7 of Alameda
County Flood Control and Water Conservation District on

April 16, 2003

By 
President, Board of Directors

JOINT WATER QUALITY RESOLUTION

**City of Pleasanton
Resolution No. 05-065**

**DSRSD
Resolution No. 35-05**

**Zone 7 Water Agency
Resolution No. 06-2783**

**JOINT RESOLUTION
CITY OF PLEASANTON
DUBLIN SAN RAMON SERVICES DISTRICT
ZONE 7 WATER AGENCY**

A JOINT RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PLEASANTON, THE BOARD OF DIRECTORS OF THE DUBLIN SAN RAMON SERVICES DISTRICT AND THE BOARD OF DIRECTORS OF THE ZONE 7 WATER AGENCY REGARDING WATER QUALITY

WHEREAS, the existing Zone 7 Water Quality Policy and Implementation Plan was adopted on April 16, 2003 after extensive discussions with stakeholders, and with the support of the Retail Water Contractors California Water Service Company, the Dublin San Ramon Services District, the City of Livermore, and the City of Pleasanton; and

WHEREAS, the adopted Water Quality Policy and Implementation Plan identified specific water quality targets, and proposed specific projects and implementation schedules; and

WHEREAS, the proposed projects are currently on schedule: and

WHEREAS, the Water Quality Policy calls Zone 7 to review and update that document at a minimum of every two years; and

WHEREAS, opinion surveys conducted by Zone 7, the City of Pleasanton, and the Dublin San Ramon Services show that a substantial number of customers desire feasible improvements to the quality of their delivered water; and

WHEREAS the Dublin San Ramon Services District and the City of Pleasanton desire revisions to the existing Water Quality Policy, Goals, and Implementation Plan, and desire that the Water Quality Goals, and Implementation Plan schedules and that various

City of Pleasanton Resolution No. 05-065
DSRSD Resolution No. 35-05
Zone 7 Water Agency Resolution No. 06-2783

other options to further improve water quality be evaluated in the ongoing biannual review of the Water Quality Policy; and

WHEREAS, the Dublin San Ramon Services District and the City of Pleasanton understand that the acceleration of project schedules, and the implementation of additional improvements to water quality may result in added costs to their customers; and;

WHEREAS, on May 13, 2005 a special meeting involving members of the City Council of the City of Pleasanton, the Board of Directors of the Dublin San Ramon Services District and the Board of Directors of the Zone 7 Water Agency was held for the purpose of discussing mutual concerns about the taste, odor and hardness of the water received by the customers of all three agencies; and

WHEREAS, the participants at that meeting expressed a shared desire to take prudent and practical steps to improve the taste and reduce the odor and hardness of the delivered water; and

WHEREAS, the road to improve the taste and to reduce the odor and hardness of the delivered water will include new facilities, operational considerations and financial decisions in which all three agencies have an interest; and

WHEREAS, another meeting involving members of the City Council of the City of Pleasanton, the Board of Directors of the Dublin San Ramon Services District and the Board of Directors of the Zone 7 Water Agency was held on August 1, 2005; and

WHEREAS, the City Council of the City of Pleasanton, the Board of Directors of the Dublin San Ramon Services District and the Board of Directors of the Zone 7 Water Agency wish to express their mutual commitment to work together for the benefit of the common customers they all serve.

NOW, THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PLEASANTON, THE BOARD OF DIRECTORS OF THE DUBLIN SAN RAMON SERVICES DISTRICT AND THE BOARD OF DIRECTORS OF THE ZONE 7 WATER AGENCY AS FOLLOWS:

1. That the City of Pleasanton and the Dublin San Ramon Service District do hereby express their formal support for the water quality improvement projects listed in the Zone 7 brochure entitled “Water Quality Projects 2005-2015; December 2004”; and

2. That the Zone 7 Water Agency does hereby formally acknowledge the importance of the water quality concerns of the City of Pleasanton and the Dublin San Ramon Services District and commits to implementing the water quality improvements projects shown in the December 2004 brochure referenced in paragraph 1 in a prudent but expeditious manner; and

3. That the City of Pleasanton, the Dublin San Ramon Services District and the Zone 7 Water Agency pledge to work together to explore and identify ways to make further progress to improve the taste and reduce the odor and hardness of the water that is served to all customers; and

4. That City of Pleasanton, the Dublin San Ramon Services District and the Zone 7 Water Agency commit to do this in a way that will not degrade the quality of the water served to other parts of the Zone 7 service area.

5. That the attached “Policy Principles” will guide the City of Pleasanton, the Dublin San Ramon Services District and the Zone 7 Water Agency in developing and implementing projects, programs and operational guidelines related to improving delivered water quality.

City of Pleasanton Resolution No. 05-065
DSRSD Resolution No. 35-05
Zone 7 Water Agency Resolution No. 06-2783


Adopted and passed by the Board of Directors of the Dublin San Ramon Services
District at its regular meeting held on August 2, 2005 by the following vote:

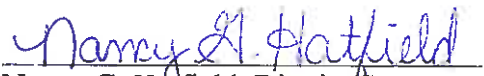
AYES: 5 - Directors Daniel J. Scannell, Richard M. Halket, Jeffrey G.
Hansen, Dwight L. Howard, Thomas W. Ford

NOES: 0

ABSENT: 0

ABSTAIN: 0

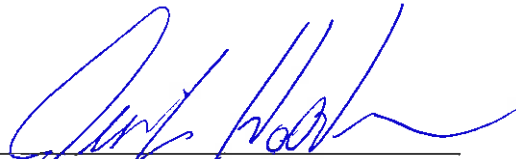

Thomas W. Ford, President

ATTEST: 
Nancy G. Hatfield, District Secretary

City of Pleasanton Resolution No. 05-065
DSRSD Resolution No. 35-05
Zone 7 Water Agency Resolution No. 06-2783

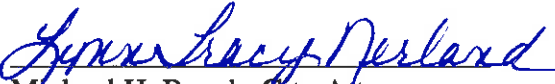
Adopted and passed by the City Council of the City of Pleasanton at its regular meeting held on August 16, 2005 by the following vote:

AYES: Councilmembers – Brozosky, McGovern, Sullivan, Thorne and Mayor Hosterman
NOES: None
ABSENT: None
ABSTAIN: None

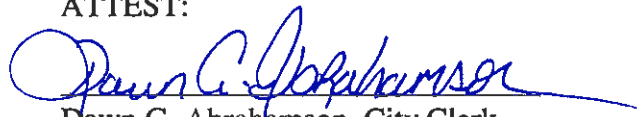


Jennifer Hosterman, Mayor

APPROVED AS TO FORM:


for Michael H. Roush, City Attorney

ATTEST:


Dawn G. Abrahamson, City Clerk

City of Pleasanton Resolution No. 05-065
DSRSD Resolution No. 35-05
Zone 7 Water Agency Resolution No. 06-2783

Adopted and passed by the Board of Directors of the Zone 7 Water Agency at its regular meeting held on August 17, 2005 by the following vote:

AYES: DIRECTORS CONCANNON, GRECI, KALTHOFF, KOHNEN, MARCHAND, QUIGLEY

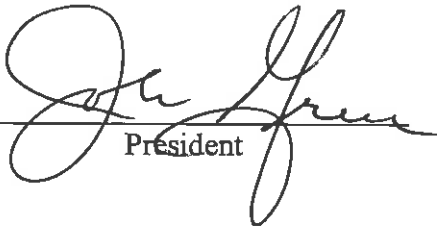
NOES: NONE

ABSENT: DIRECTOR STEVENS

ABSTAIN: NONE

ATTEST:


District Secretary


President

POLICY PRINCIPLES
For
ZONE 7 WATER QUALITY PROGRAM
Related to
IMPLEMENTATION PLAN UPDATE
In the areas of
GENERAL POLICIES
OPERATIONS
FACILITIES
EDUCATION
FUNDING

INTENT

The intent of these Policy Principles is to document the mutual expectations of the policy makers in the Tri-Valley related to the updating and implementation of Zone 7 Water Quality Program and the role of the Retailers in the updating of that program.

ZONE 7 WATER QUALITY PROGRAM

Zone 7 Water Quality Policy, Goals, and Targets, adopted by the Zone 7 Board of Directors in 2003, were developed after extensive discussions with, and in cooperation with, local retail water Contractors, including the California Water Service Company, the Cities of Livermore and Pleasanton, and the Dublin San Ramon Services District, and other interested stakeholders. The adopted Water Quality Policy expressly required that the Water Quality Program Implementation Plan be reviewed and updated at a minimum of every two years to reflect any emerging water quality issues and/or other relevant regulatory and/or technology development, and that, as feasible, any plan updates be incorporated into the annual updates of the Zone 7 Capital Improvement Plan. Zone 7 staff began work on the initial update to the adopted 2003 Implementation Plan in March 2005.

Opinion surveys conducted by Zone 7, the City of Pleasanton, and the Dublin San Ramon Services District show that a substantial number of customers desire feasible improvements to the quality of their water supply.

The following is a brief description of the preliminary Work Plan for the Water Quality Policy and Implementation Plan Update and the anticipated schedule.

Phase I:

Zone 7 staff will prepare an informational item to be presented to the Zone 7 Board of Directors in September, 2005 which will consist of a technical water quality report card. This Phase I Report Card will include graphical presentations of the status of each constituent of concern in relation to the Water Quality Targets, which were specified in the 2003 Zone 7 Water Quality Policy and Implementation Plan, at Retail Contractors'

turnouts. If desired, a similar presentation will be made at the Committee of Valley Water Retailers, which includes the California Water Service Company, the Dublin San Ramon Services District, the City of Livermore, and the City of Pleasanton. (CoVWR) at their annual October meeting.

Phase II:

Beginning in July/August, 2005 and concurrent with the development of the Water Quality Report Card, Zone 7 staff will develop a technical tool box, considering the Policy Principles herein, to assist in identifying and evaluating alternative projects or activities that would enhance Zone 7's ability to meet the Board's adopted Water Quality Policy Goals. For example, based on any data gaps identified in the Phase I Report Card, what could be done to better assess the water quality impacts of ongoing & future planned projects e.g. additional water quality monitoring, data collection, or modeling/forecasting needs for each retailer turnout? Phase II work is expected to be completed in September, 2005.

Phase III:

Initiate discussions in October/November, 2005 with Retail Water Contractors and other stakeholders, as appropriate, to further develop the technical tool box, and to further discuss Policy Principles in an effort to identify mutually acceptable Policies and feasible activities to incorporate into the Water Quality Program Implementation Plan and/or the Zone 7 Water Quality Policy. Phase III is expected to be accomplished within six months of its actual implementation date.

ROLE OF THE RETAILERS

Zone 7 will maintain a regular dialog with the retail agencies at all levels as appropriate throughout the development of the Water Quality Program. The schedule for any discussions will be such that there will be an opportunity for meaningful input from the retailers ahead of any decisions made by Zone 7 staff or Board. DSRSD and Pleasanton will provide input in a timely manner and will encourage the other retailers to do likewise. Zone 7 shall give serious consideration to the comments and suggestions of the Retailers.

POLICY PRINCIPLES

Identified in the following sections are mutually agreeable Policy Principles related to water quality. These Policy Principles will be evaluated in detail during Phase III discussions with Retail Water Contractors, and other interested stakeholders. The staff's of the parties will report back at a combined meeting of the Agencies' policy makers as the proposed method and schedule for adoption of the appropriate Policy Guidelines.

General Policy Principles

1. Reaffirm contractual commitment to provide aesthetically acceptable water and to blend Zone 7's different water sources within its operational capabilities to provide approximately equal quality water to each of the retailers.
2. Support the water quality projects in Zone 7's four-page brochure entitled "Water Quality Projects 2005-2015, December 2004".
3. Support and cooperate with development and implementation of the Salt Management Program.
4. Program and Project recommendations must not result in any degradation of the existing delivered water quality for east side retailers.
5. Each liaison committee (Pleasanton-Zone 7; Pleasanton-DSRSD and DSRSD-Zone 7) will receive a common staff report from the managers of each agency every six months on the status of the various efforts called for within these Policy Principles; those liaison committees may call for separate or combined liaison meetings to discuss the status reports.

Operational Principles

1. Examine Zone 7 and retailer operating practices over time (summer to winter, day to day and at individual turnouts to the retailers), at both present and future facilities, that could be feasibly optimized to improve, and to better equalize delivered water quality.
2. Establish operations guidelines for Zone 7 wells, that without compromising overall system reliability, would be consistent with the goals of delivering aesthetically acceptable water to retailers' turnouts, and improving and, to the extent possible, equalizing delivered water quality.
3. Study operational capacities of water treatment plants and transmission facilities to maximize deliveries of treated surface water to retailer turnouts.
4. Examine the practical extent to which wells with demineralization capabilities can be preferentially operated before wells without demineralization capabilities, without compromising overall water system reliability.

Facilities Principles

1. Implement all projects in the 4 page Water Quality brochure on the schedule shown to the maximum extent possible among which are projects that will improve the hardness, taste and odor of water delivered to the west side retailers.
2. Identify and evaluate the potential effectiveness and feasibility of constructing new facilities (pipelines, pumping facilities etc.) to minimize variations in

delivered water quality, to improve overall delivered water quality, and to better equalize delivered water quality.

3. Examine the feasibility of installing treatment facilities at individual turnouts to improve and to better equalize the water quality delivered to individual retailers
4. Examine the feasibility of “point of use” treatment devices or facilities in localized areas.
5. Examine alternative means to deliver treated surface water from any of the treatment plants to points closer to retailer turnouts so as to better balance surface water deliveries to each retailer.
6. Support those taste and odor improvement projects that will benefit east side retailers.

Educational Principles

1. Develop joint educational material for the public regarding local water supplies, emphasizing all the actions taken and to be taken to improve water quality, including how those actions affect each retailer.
2. Develop joint educational material describing the benefits of the Salt Management Program.

Funding Principles

1. Identify and evaluate the most appropriate alternatives to equitably fund the capital and operating costs needed to improve water quality.
2. Provide bi-annual reports to the community describing the condition of Zone 7 water system assets, actual and proposed uses of Asset Management Program (AMP) Funds, AMP fund balances, and the ability of the Asset Management Fund to meet the needs for which it has been established.

APPENDIX C. KEY SUPPORTING INFORMATION FOR WATER QUALITY

Appendix C1. Total Dissolved Solids in the South Bay Aqueduct

Appendix C1 provides a brief summary of the analysis used to estimate the total dissolved solids (TDS) concentration of source water from the Delta before a Delta Fix. These results were used to help evaluate potential salt implications associated with an approximately 20 percent reduction in TDS of State Water Project (SWP) water delivered to the South Bay Aqueduct (SBA) after a Delta Fix. Zone 7 staff reviewed monthly SBA inflow into Patterson Pass between 1990 and 2010 using data collected by Zone 7's Water Quality Group. Figure C1-1 presents average monthly TDS concentrations between 1990 and 2010, while Figure C1-2 presents the average TDS concentration during the highest groundwater recharge months of the year.

Figure C1-1. Average Monthly TDS Concentrations in the SBA

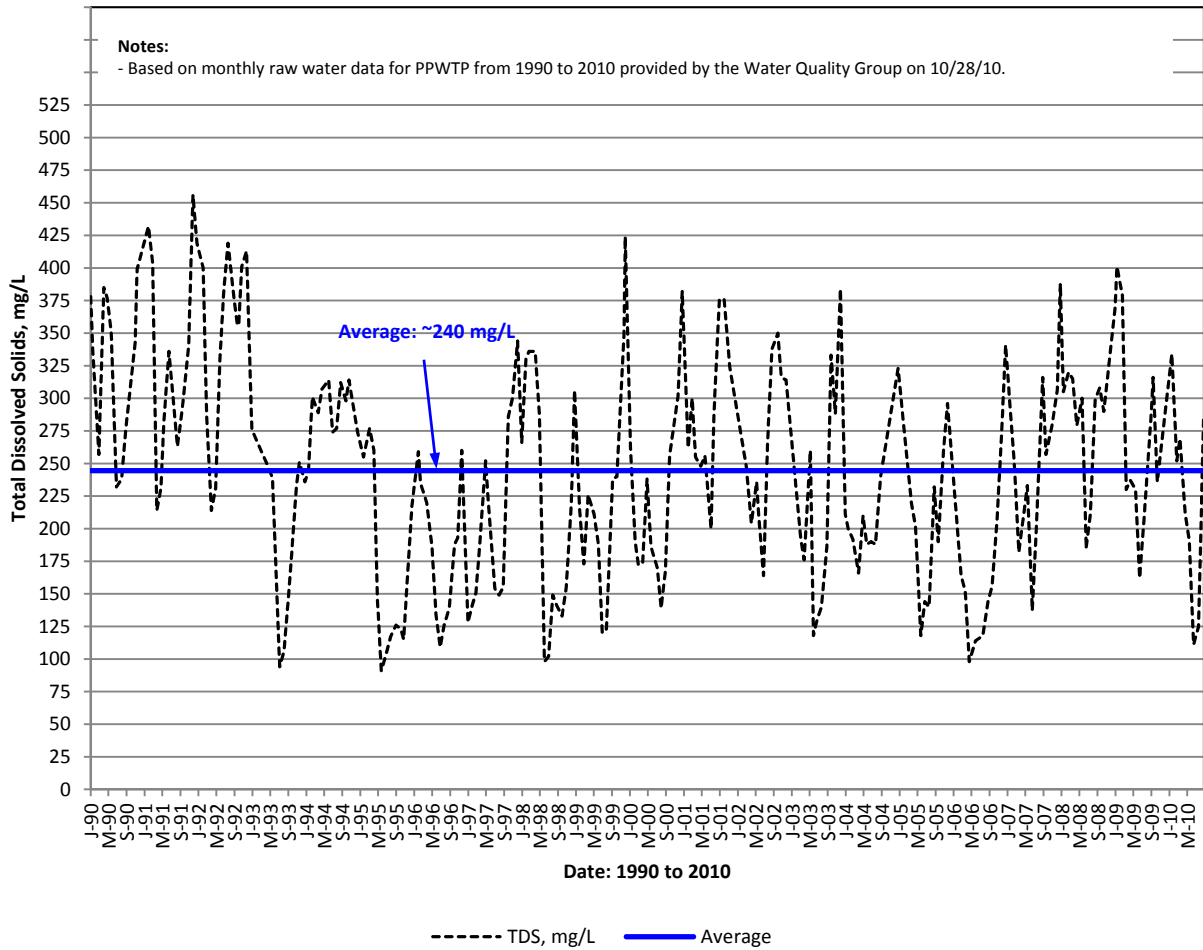
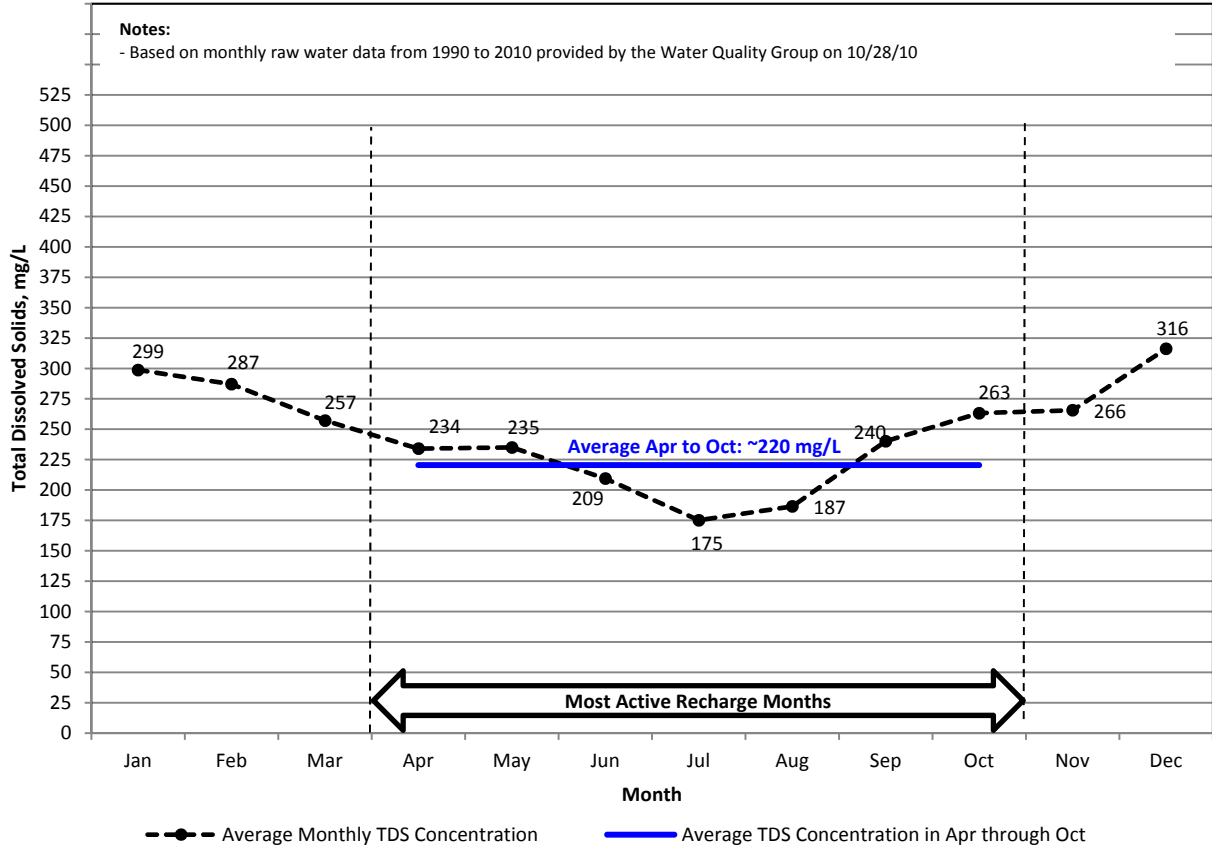


Figure C1-2. Average Monthly TDS Concentrations in the SBA During Recharge Months



Appendix C2. Summary of Quantitative Salt Loading Results^(a)

| Portfolio | Reliability | Salt Loading, tons per year | | | Recycled Water, acre-feet | | |
|--------------|-------------|-----------------------------------|-------------------------------------|-------------------------------------|---------------------------|-----------------|-------------------|
| | | Existing Demin Facility | | 2nd Phase of Demin | Total | Over Main Basin | % Over Main Basin |
| | | No Recycled Water Over Main Basin | With Recycled Water Over Main Basin | With Recycled Water Over Main Basin | | | |
| Current Path | 85% | (1,000) | (200) | (1,400) | 2,000 | 2,000 | 100% |
| | 90% | (300) | 600 | (1,400) | 2,000 | 2,000 | 100% |
| | 95% | (400) | 500 | (1,400) | 2,000 | 2,000 | 100% |
| | 99% | (400) | 500 | (1,400) | 2,000 | 2,000 | 100% |
| In Valley | 75% | 300 | 1,500 | 100 | 3,000 | 2,000 | 67% |
| | 80% | 300 | 1,400 | 0 | 3,800 | 2,000 | 53% |
| | 85% | 300 | 1,400 | (60) | 4,200 | 2,000 | 48% |
| | 90% | 200 | 1,300 | (6) | 5,200 | 2,200 | 42% |
| | 95% | 100 | 1,400 | (31) | 6,300 | 2,600 | 41% |
| | 99% | 10 | 1,500 | (30) | 7,600 | 3,100 | 41% |
| Westside | 75% | 300 | 1,100 | (10) | 2,000 | 2,000 | 100% |
| | 80% | 300 | 1,100 | (20) | 2,000 | 2,000 | 100% |
| | 85% | 200 | 1,000 | (100) | 2,000 | 2,000 | 100% |
| | 90% | 200 | 1,000 | (200) | 2,000 | 2,000 | 100% |
| | 95% | 100 | 1,000 | (200) | 2,000 | 2,000 | 100% |
| | 99% | 60 | 900 | (300) | 2,000 | 2,000 | 100% |

^(a) Salt modeling results assume equilibrium conditions (i.e., all required facilities are online).

APPENDIX D. COST ESTIMATES

This appendix provides the detailed tables and figures used to develop costs for comparative purposes in this Water Supply Evaluation (WSE). The costs were developed based on previously planning-level reports, actual bid documents, or construction costs previously estimated by Zone 7 Water Agency (Zone 7).

All of the construction costs are presented in 2010 dollars using the Engineering News Record San Francisco Construction Cost Index (CCI). The following present the cost estimate information:

- Contingencies and Other Project Costs
- Preliminary Detailed Schedules Used to Develop Present Worth and Amortized Costs
- Key Tables and Figures Used to Estimates Costs for Individual Supply Options

Contingencies and Other Project Costs

The following planning-level cost contingencies were also applied as necessary:

- Construction Contingency: 25 percent
- Planning and Environmental: 10 percent
- Design and Implementation: 10 percent
- Construction Management: 10 percent

Construction contingency represents an increase in the cost estimate to account for construction uncertainties that are unavoidable under normal construction conditions. Planning and environmental represents an increase to the cost estimate to account for initial studies required before design and implementation. Design and implementation represents an increase to the cost estimate to account for the cost of project design and program implementation (e.g., legal fees, financing, and administrative costs). Construction management represents an increase to the cost estimate to account for items such as contract management and inspection during construction.

**PRELIMINARY DETAILED SCHEDULES USED TO DEVELOP PRESENT WORTH AND
AMORTIZED COSTS**

Figure CP-1. Potential Schedule Evaluated for Current Plan: 85%

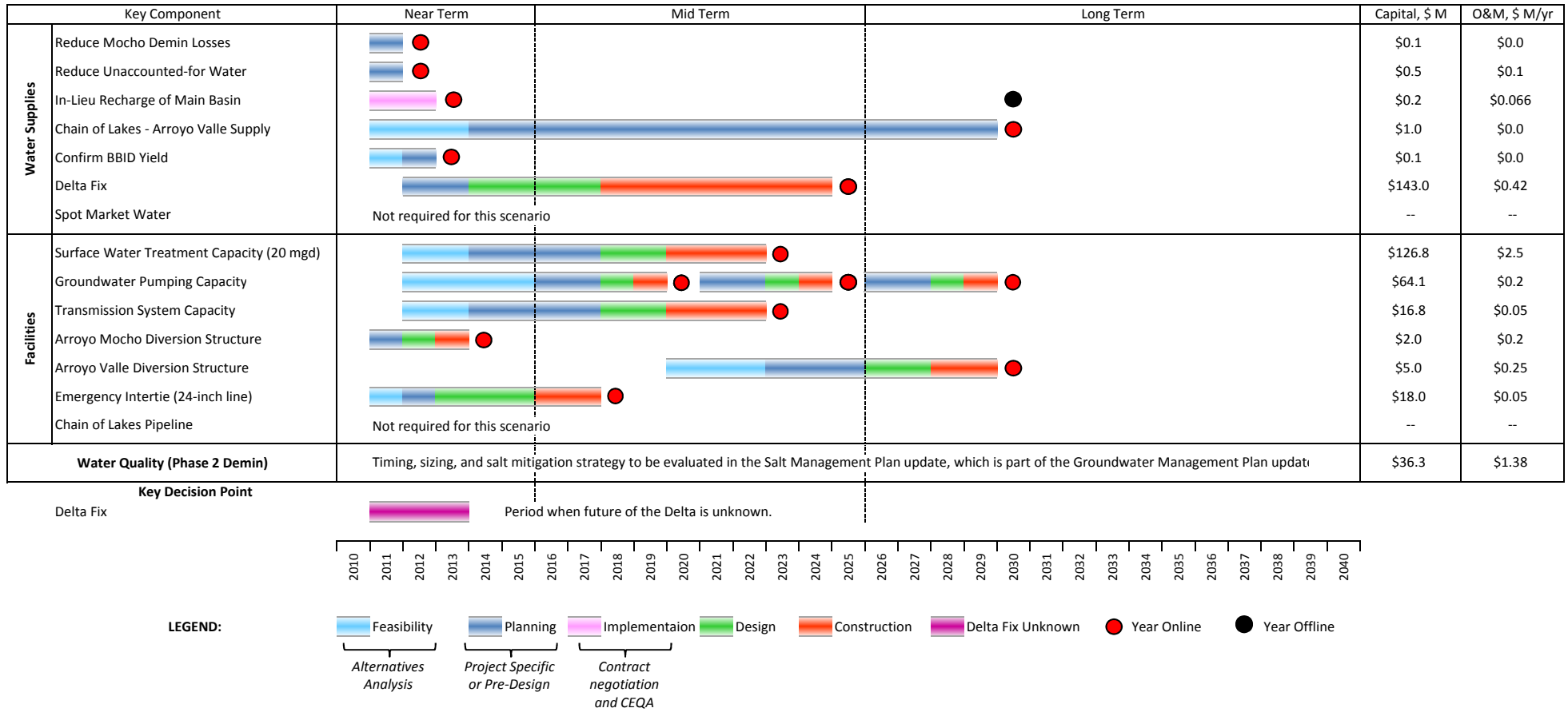


Figure CP-2. Potential Schedule Evaluated for Current Plan: 90%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|---|--|-----------|-----------|---------------|--------------|
| Key Component | Reduce Mocho Demin Losses | 2011-2012 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2011-2012 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2011-2013 | | | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2011-2030 | | | \$1.0 | \$0.0 |
| | Confirm BBID Yield | 2011-2013 | | | \$0.1 | \$0.0 |
| | Delta Fix | 2012-2025 | | | \$143.0 | \$0.42 |
| | Spot Market Water (up to 3,500 af dry year) | | 2019-2027 | | \$2.10 | \$0.16 |
| Facilities | Surface Water Treatment Capacity (20 mgd) | 2011-2023 | | | \$126.8 | \$2.5 |
| | Groundwater Pumping Capacity | 2011-2025 | 2020-2025 | 2026-2030 | \$64.1 | \$0.2 |
| | Transmission System Capacity | 2011-2023 | | | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2011-2014 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | | 2020-2030 | | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2011-2018 | | | \$18.0 | \$0.05 |
| | Chain of Lakes Pipeline | | 2020-2030 | | \$20.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix

Period when future of the Delta is unknown.



LEGEND:

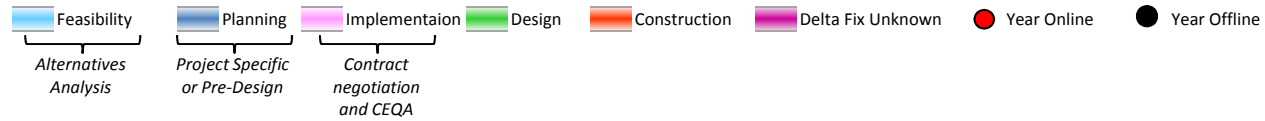


Figure CP-3. Potential Schedule Evaluated for Current Plan: 95%

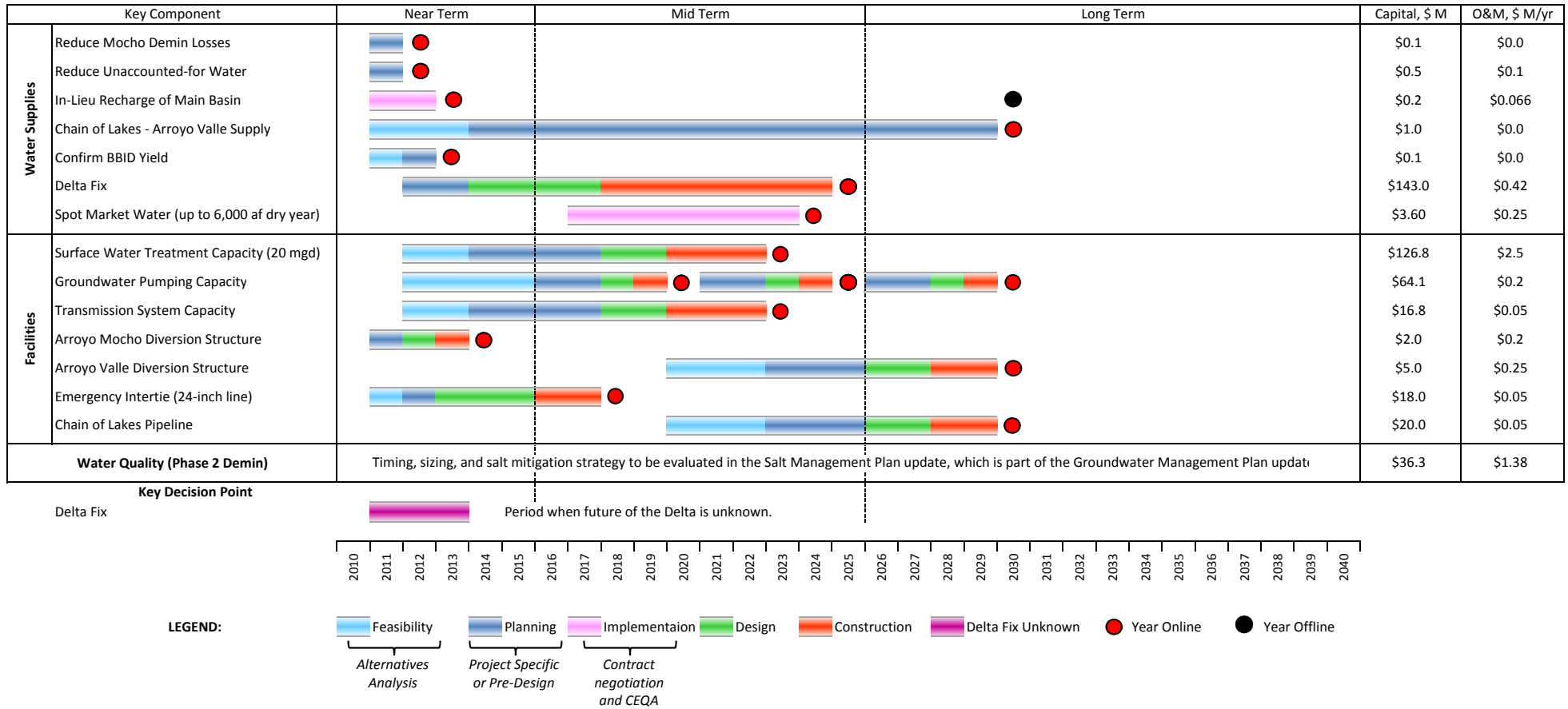


Figure CP-4. Potential Schedule Evaluated for Current Plan: 99%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|--|-----------|-----------|-----------|---------------|--------------|
| Water Supplies | Reduce Mocho Demin Losses | 2011-2012 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2011-2012 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2012-2013 | | | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2011-2030 | | | \$1.0 | \$0.0 |
| | Confirm BBID Yield | 2011-2012 | | | \$0.1 | \$0.0 |
| | Delta Fix | 2012-2025 | | | \$143.0 | \$0.42 |
| | Spot Market Water (up to 10,000 af dry year) | | 2017-2024 | | \$6.00 | \$0.45 |
| Facilities | Surface Water Treatment Capacity (20 mgd) | 2011-2023 | | | \$126.8 | \$2.5 |
| | Groundwater Pumping Capacity | 2011-2025 | 2020-2025 | 2026-2030 | \$64.1 | \$0.2 |
| | Transmission System Capacity | 2011-2023 | | | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2011-2014 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | | 2020-2030 | | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2011-2018 | | | \$18.0 | \$0.05 |
| | Chain of Lakes Pipeline | | 2020-2030 | | \$20.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 | |

Key Decision Point

Delta Fix

Period when future of the Delta is unknown.



LEGEND:

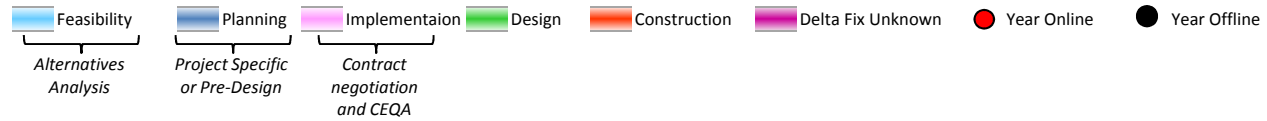


Figure IV-1. Potential Schedule Evaluated for In-Valley Portfolio: 75%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|---|--|-----------|-----------|---------------|--------------|
| Water Supplies | Reduce Mocho Demin Losses | 2010-2011 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2010-2011 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2010-2013 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2010-2030 | | | \$1.0 | \$0.0 |
| | Confirm BBID Yield | 2010-2013 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2010-2020 | 2020-2024 | | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2010-2020 | 2020-2024 | | \$1.6 | \$0.012 |
| | Additional Recycled Water (Direct): 1,000 afa | 2010-2018 | 2018-2024 | | \$15.1 | \$0.8 |
| | Additional Recycled Water (Storage) | Not required for this scenario | | | -- | -- |
| Facilities | Surface Water Treatment Capacity (15 mgd) | 2010-2014 | 2014-2024 | 2024-2030 | \$106.6 | \$2.1 |
| | Groundwater Pumping Capacity | 2010-2020 | 2020-2025 | 2025-2030 | \$64.1 | \$0.2 |
| | Transmission System Capacity | 2010-2014 | 2014-2024 | 2024-2030 | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2010-2014 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | 2010-2018 | 2018-2020 | 2020-2030 | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2010-2018 | | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix

Period when future of the Delta is unknown.



LEGEND:

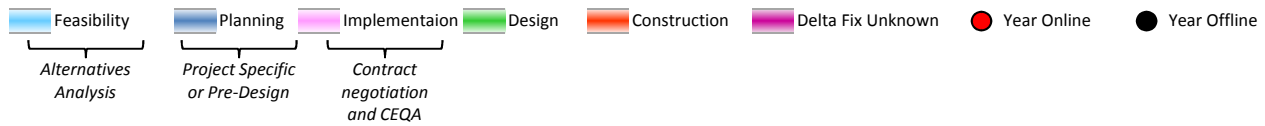


Figure IV-2. Potential Schedule Evaluated for In-Valley Portfolio: 80%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|---|--|-----------|-----------|---------------|--------------|
| Water Supplies | Reduce Mocho Demin Losses | 2010-2012 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2010-2012 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2010-2013 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2010-2029 | | 2030 | \$1.0 | \$0.0 |
| | Confirm BBID Yield | 2010-2013 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2010-2024 | 2025 | | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2010-2024 | 2025 | | \$1.6 | \$0.012 |
| | Additional Recycled Water (Direct): 1,800 afa | 2010-2024 | | | \$27.2 | \$1.4 |
| | Additional Recycled Water (Storage) | Not required for this scenario | | | -- | -- |
| Facilities | Surface Water Treatment Capacity (13 mgd) | 2010-2024 | 2025 | | \$97.8 | \$1.9 |
| | Groundwater Pumping Capacity | 2010-2020 | 2021-2024 | 2025 | \$64.1 | \$0.2 |
| | Transmission System Capacity | 2010-2024 | 2025 | | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2010-2013 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | 2010-2020 | 2021-2024 | 2025 | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2010-2018 | | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix

Period when future of the Delta is unknown.



LEGEND:

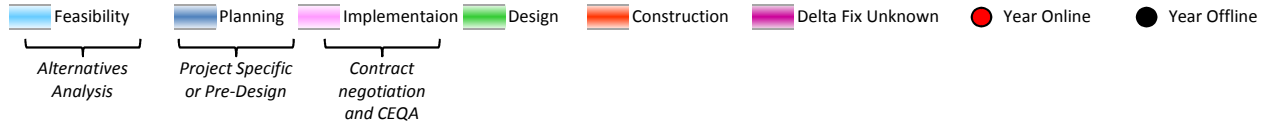


Figure IV-3. Potential Schedule Evaluated for In-Valley Portfolio: 85%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|---|--|-----------|-----------|---------------|--------------|
| Key Components | Reduce Mocho Demin Losses | 2010-2012 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2010-2012 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2010-2013 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2010-2030 | | | \$1.0 | \$0.0 |
| | Confirm BBID Yield | 2010-2013 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2010-2025 | 2025-2030 | | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2010-2025 | 2025-2030 | | \$1.6 | \$0.012 |
| | Additional Recycled Water (Direct): 2,200 afa | 2010-2024 | 2024-2030 | | \$33.2 | \$1.7 |
| | Additional Recycled Water (Storage) | Not required for this scenario | | | -- | -- |
| Facilities | Surface Water Treatment Capacity (12 mgd) | 2010-2025 | 2025-2030 | | \$93.3 | \$1.8 |
| | Groundwater Pumping Capacity | 2010-2020 | 2020-2025 | 2025-2030 | \$64.1 | \$0.2 |
| | Transmission System Capacity | 2010-2025 | 2025-2030 | | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2010-2014 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | 2010-2020 | 2020-2030 | | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2010-2018 | | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix

Period when future of the Delta is unknown.



LEGEND:

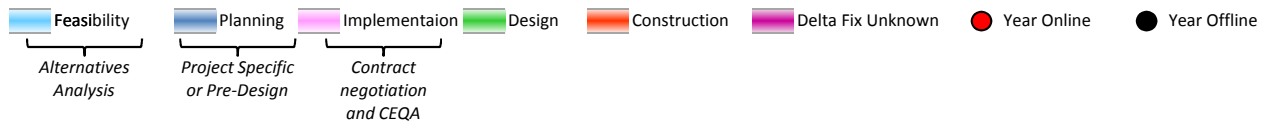


Figure IV-4. Potential Schedule Evaluated for In-Valley Portfolio: 90%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|---|--|-----------|-----------|---------------|--------------|
| Key Components | Reduce Mocho Demin Losses | 2010-2011 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2010-2011 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2010-2013 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2010-2030 | | | \$1.0 | \$0.0 |
| | Confirm BBID Yield | 2010-2013 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2010-2025 | 2025-2027 | | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2010-2025 | 2025-2027 | | \$1.6 | \$0.012 |
| | Additional Recycled Water (Direct): 3,200 afa | 2010-2024 | 2024-2025 | | \$48.3 | \$2.4 |
| | Additional Recycled Water (Storage) | Not required for this scenario | | | -- | -- |
| Facilities | Surface Water Treatment Capacity (11 mgd) | | 2016-2027 | | \$88.6 | \$1.8 |
| | Groundwater Pumping Capacity | 2011-2020 | 2020-2025 | 2025-2030 | \$64.1 | \$0.2 |
| | Transmission System Capacity | | 2016-2027 | | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2010-2014 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | | 2020-2030 | | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2010-2018 | | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix

Period when future of the Delta is unknown.



LEGEND:



Figure IV-5. Potential Schedule Evaluated for In-Valley Portfolio: 95%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|--|--|-----------|-----------|---------------|--------------|
| Water Supplies | Reduce Mocho Demin Losses | 2010-2011 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2010-2011 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2010-2013 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2010-2013 | 2013-2029 | 2029-2030 | \$1.0 | \$0.0 |
| | Confirm BBID Yield | 2010-2011 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2010-2013 | 2013-2024 | 2024-2025 | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2010-2013 | 2013-2024 | 2024-2025 | \$1.6 | \$0.012 |
| | Additional Recycled Water (Direct): 3,200 afa | 2010-2013 | 2013-2024 | 2024-2025 | \$48.3 | \$2.4 |
| | Additional Recycled Water (Storage): 1,100 afa | 2010-2013 | 2013-2024 | 2024-2025 | \$25.6 | \$0.9 |
| Facilities | Surface Water Treatment Capacity (9 mgd) | | 2017-2024 | 2024-2029 | \$78.5 | \$1.6 |
| | Groundwater Pumping Capacity | 2010-2013 | 2013-2020 | 2020-2025 | \$64.1 | \$0.2 |
| | Transmission System Capacity | | 2017-2024 | 2024-2029 | \$16.0 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2010-2013 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | | 2017-2024 | 2024-2029 | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2010-2013 | 2013-2018 | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix

Period when future of the Delta is unknown.



LEGEND:

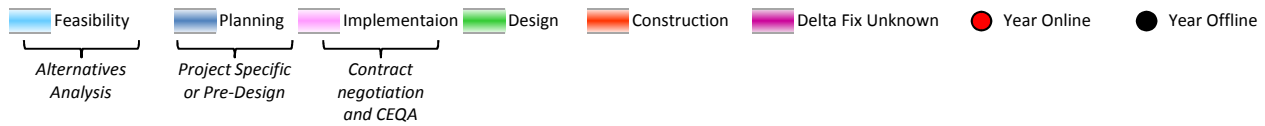


Figure IV-6. Potential Schedule Evaluated for In-Valley Portfolio: 99%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|--|--|-----------|-----------|---------------|--------------|
| Water Supplies | Reduce Mocho Demin Losses | 2010-2011 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2010-2011 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2010-2013 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2010-2029 | | 2030 | \$1.0 | \$0.0 |
| | Confirm BBID Yield | 2010-2013 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2010-2024 | 2025 | | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2010-2024 | 2025 | | \$1.6 | \$0.012 |
| | Additional Recycled Water (Direct): 3,200 afa | 2010-2024 | 2025 | | \$48.3 | \$2.4 |
| | Additional Recycled Water (Storage): 2,400 afa | 2010-2024 | 2025 | | \$45.2 | \$2.0 |
| Facilities | Surface Water Treatment Capacity (7 mgd) | | 2018-2029 | 2030 | \$67.4 | \$1.3 |
| | Groundwater Pumping Capacity | 2010-2020 | 2021-2025 | 2030 | \$64.1 | \$0.2 |
| | Transmission System Capacity | | 2018-2029 | 2030 | \$15.1 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2010-2014 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | | 2018-2029 | 2030 | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2010-2018 | | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix

Period when future of the Delta is unknown.



LEGEND:

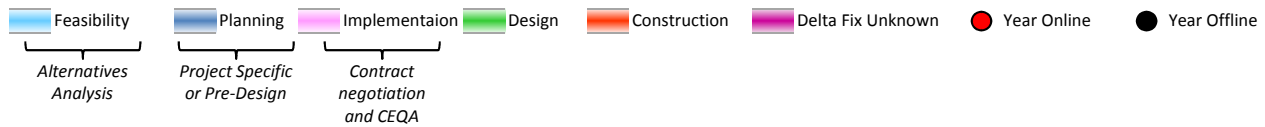


Figure INT-1. Potential Schedule Evaluated for Intertie Portfolio: 75%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|---|--|-----------|-----------|---------------|--------------|
| Water Supplies | Reduce Mocho Demin Losses | 2012-2013 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2012-2013 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2013-2014 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2012-2030 | | | \$0.99 | \$0.0 |
| | Confirm BBID Yield | 2012-2013 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2013-2023 | 2023-2025 | | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2013-2023 | 2023-2025 | | \$1.6 | \$0.012 |
| | Intertie Supply A | 2012-2025 | 2025-2030 | 2037 | \$2.00 | \$4.2 |
| | Intertie Supply B | Not required for this scenario | | | | |
| Facilities | Surface Water Treatment Capacity (20 mgd) | 2012-2023 | 2023-2025 | 2025-2030 | \$126.8 | \$2.5 |
| | Groundwater Pumping Capacity | 2012-2020 | 2020-2025 | 2025-2030 | \$64.1 | \$0.2 |
| | Transmission System Capacity | 2012-2023 | 2023-2025 | | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2012-2014 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | | 2020-2030 | | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2012-2018 | | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix

Assumed period when the prospects of Delta Conveyance is unknown.



LEGEND:

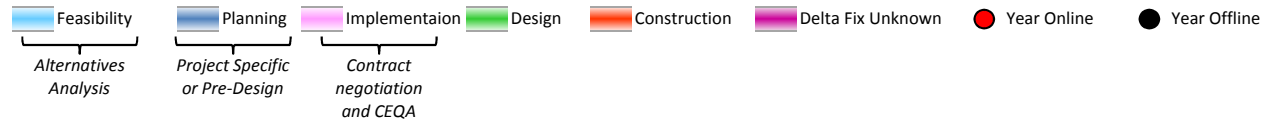


Figure INT-2. Potential Schedule Evaluated for Intertie Portfolio: 80%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|--|--------------------------------|-----------|-----------|---------------|--------------|
| Water Supplies | Reduce Mocho Demin Losses | 2010-2012 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2010-2012 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2010-2013 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2010-2030 | | | \$0.99 | \$0.0 |
| | Confirm BBID Yield | 2010-2013 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2013-2023 | 2023-2025 | | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2013-2023 | 2023-2025 | | \$1.6 | \$0.012 |
| | Intertie Supply A | 2013-2025 | 2025-2030 | 2038 | \$2.00 | \$4.8 |
| | Intertie Supply B | Not required for this scenario | | | | |
| Facilities | Surface Water Treatment Capacity (20 mgd) | 2010-2014 | 2014-2023 | 2023-2030 | \$126.8 | \$2.5 |
| | Groundwater Pumping Capacity | 2010-2020 | 2020-2025 | 2025-2030 | \$64.1 | \$0.2 |
| | Transmission System Capacity | 2010-2014 | 2014-2023 | 2023-2030 | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2010-2014 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | | 2019-2025 | 2025-2030 | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2010-2018 | | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 | |

Key Decision Point

Delta Fix

Assumed period when the prospects of Delta Conveyance is unknown.



LEGEND:

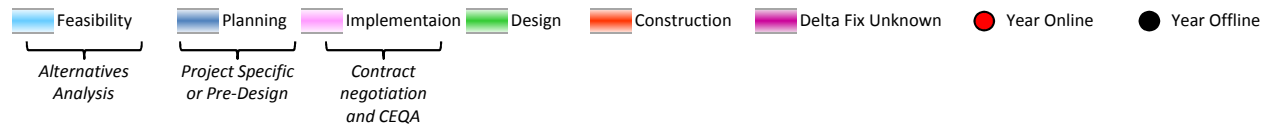
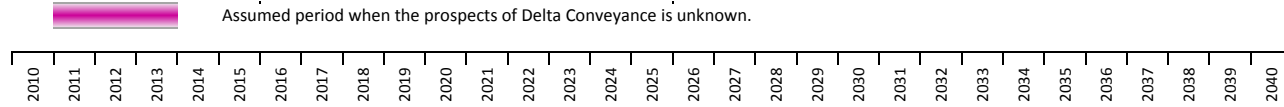


Figure INT-3. Potential Schedule Evaluated for Intertie Portfolio: 85%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|---|--|-----------|-----------|---------------|--------------|
| Water Supplies | Reduce Mocho Demin Losses | 2011-2012 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2011-2012 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2012-2013 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2011-2012 | 2012-2029 | 2030 | \$0.99 | \$0.0 |
| | Confirm BBID Yield | 2011-2012 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2013-2014 | 2014-2023 | 2023-2025 | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2013-2014 | 2014-2023 | 2023-2025 | \$1.6 | \$0.012 |
| | Intertie Supply A | 2012-2013 | 2013-2023 | 2023-2025 | \$2.00 | \$5.2 |
| | Intertie Supply B (1,600 af D) | 2012-2013 | 2013-2023 | 2023-2039 | Incl. Above | Incl. Above |
| Facilities | Surface Water Treatment Capacity (20 mgd) | 2011-2012 | 2012-2023 | 2023-2025 | \$126.8 | \$2.5 |
| | Groundwater Pumping Capacity | 2011-2012 | 2012-2020 | 2020-2025 | \$64.1 | \$0.2 |
| | Transmission System Capacity | 2011-2012 | 2012-2023 | 2023-2025 | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2011-2012 | 2012-2014 | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | | 2019-2020 | 2020-2030 | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2011-2012 | 2012-2018 | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix



LEGEND:

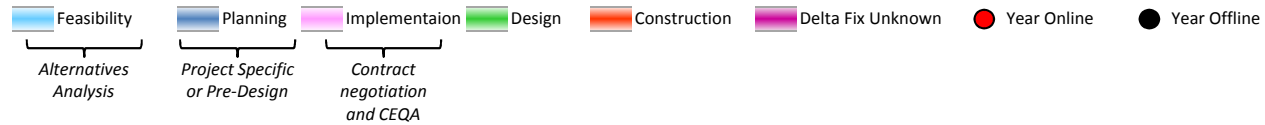
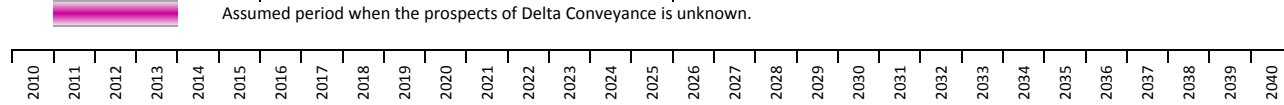


Figure INT-4. Potential Schedule Evaluated for Intertie Portfolio: 90%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|---|--|-----------|-----------|---------------|--------------|
| Water Supplies | Reduce Mocho Demin Losses | 2012-2013 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2012-2013 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2012-2013 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2012-2013 | 2013-2029 | 2030 | \$0.99 | \$0.0 |
| | Confirm BBID Yield | 2012-2013 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2013-2014 | 2014-2022 | 2022-2025 | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2013-2014 | 2014-2022 | 2022-2025 | \$1.6 | \$0.012 |
| | Intertie Supply A | 2012-2013 | 2013-2022 | 2022-2025 | \$2.00 | \$6.2 |
| | Intertie Supply B | 2013-2014 | 2014-2025 | 2025-2036 | Incl. Above | Incl. Above |
| Facilities | Surface Water Treatment Capacity (20 mgd) | 2012-2013 | 2013-2022 | 2022-2023 | \$126.8 | \$2.5 |
| | Groundwater Pumping Capacity | 2012-2013 | 2013-2020 | 2020-2025 | \$64.1 | \$0.2 |
| | Transmission System Capacity | 2012-2013 | 2013-2022 | 2022-2023 | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2012-2013 | 2013-2014 | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | | 2020-2022 | 2022-2030 | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2012-2013 | 2013-2018 | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix



LEGEND:

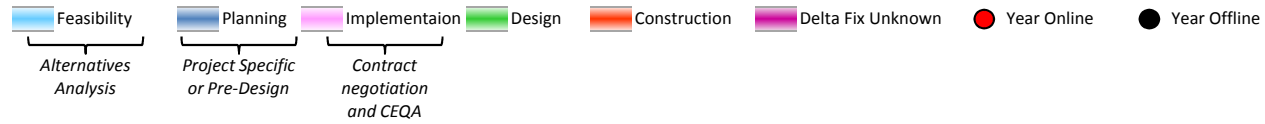
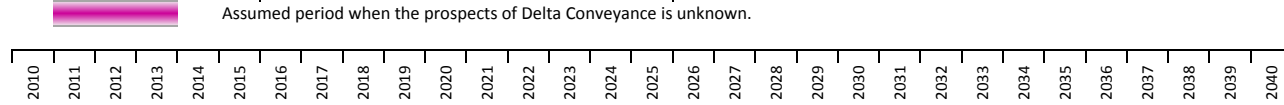


Figure INT-5. Potential Schedule Evaluated for Intertie Portfolio: 95%

| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|---|--|----------|-----------|---------------|--------------|
| Water Supplies | Reduce Mocho Demin Losses | 2012-2013 | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | 2012-2013 | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | 2012-2013 | | 2030 | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | 2012-2030 | | | \$0.99 | \$0.0 |
| | Confirm BBID Yield | 2012-2013 | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | 2013-2025 | | | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | 2013-2025 | | | \$1.6 | \$0.012 |
| | Intertie Supply A | 2012-2025 | | | \$2.00 | \$6.9 |
| | Intertie Supply B | 2020-2035 | | | Incl. Above | Incl. Above |
| Facilities | Surface Water Treatment Capacity (20 mgd) | 2012-2023 | | | \$126.8 | \$2.5 |
| | Groundwater Pumping Capacity | 2012-2025 | | | \$64.1 | \$0.2 |
| | Transmission System Capacity | 2012-2023 | | | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | 2012-2014 | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | 2020-2030 | | | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | 2012-2018 | | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix



LEGEND:

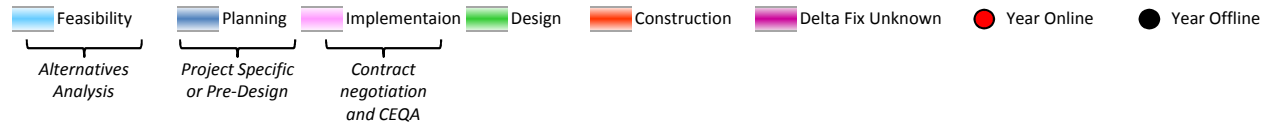
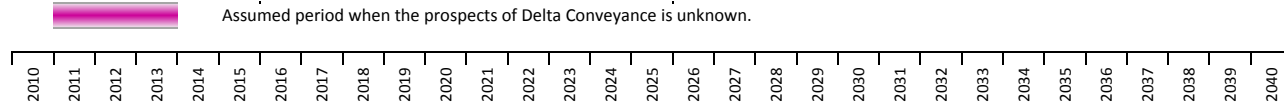


Figure INT-6. Potential Schedule Evaluated for Intertie Portfolio: 99%

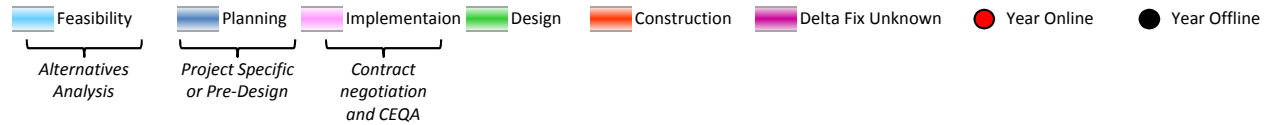
| Key Component | | Near Term | Mid Term | Long Term | Capital, \$ M | O&M, \$ M/yr |
|--------------------------------------|--|--------------------------------|----------|-----------|---------------|--------------|
| | Reduce Mocho Demin Losses | | | | \$0.1 | \$0.0 |
| | Reduce Unaccounted-for Water | | | | \$0.5 | \$0.1 |
| | In-Lieu Recharge of Main Basin | | | | \$0.2 | \$0.066 |
| | Chain of Lakes - Arroyo Valle Supply | | | | \$0.99 | \$0.0 |
| | Confirm BBID Yield | | | | \$0.1 | \$0.0 |
| | Arroyo Mocho Water Rights | | | | \$1.8 | \$0.012 |
| | Arroyo Las Positas Water Rights | | | | \$1.6 | \$0.012 |
| | Intertie Supply A | | | | \$2.00 | \$7.5 |
| | Intertie Supply B | Not required for this scenario | | | | |
| Facilities | Surface Water Treatment Capacity (20 mgd) | | | | \$126.8 | \$2.5 |
| | Groundwater Pumping Capacity | | | | \$64.1 | \$0.2 |
| | Transmission System Capacity | | | | \$16.8 | \$0.05 |
| | Arroyo Mocho Diversion Structure | | | | \$2.0 | \$0.2 |
| | Arroyo Valle Diversion Structure | | | | \$5.0 | \$0.25 |
| | Emergency Intertie (24-inch line) | | | | \$18.0 | \$0.05 |
| Water Quality (Phase 2 Demin) | Timing, sizing, and salt mitigation strategy to be evaluated in the Salt Management Plan update, which is part of the Groundwater Management Plan update | | | | \$36.3 | \$1.38 |

Key Decision Point

Delta Fix



LEGEND:



KEY TABLES AND FIGURES USED TO ESTIMATE COSTS FOR INDIVIDUAL SUPPLY OPTIONS

Provided in Alphabetical Order:

- Acquisition of Arroyo Las Positas Water Rights
- Acquisition of Arroyo Mocho Water Rights
- ACWD Entitlement Exchange
- Additional Water from the State Water Project
- Aquifer Storage and Recovery in the Main Basin
- Arroyo Del Valle: Perfection of Existing Water Right Permit
- Bay Area Regional Desalination Project
- Chain of Lakes Pipeline
- Confirm BBID Yield
- Delta Fix
- End-User Graywater Reuse for Residential Irrigation
- End-User Local Rain Capture for Irrigation
- Enhance Existing In-lieu Recharge Program
- Groundwater Injection with Highly Treated Recycled Water
- In-Stream Infiltration via Swales
- Long-Term Non-State Water Project Lease or Transfer
- Los Vaqueros Expansion
- Modified Operation of Lake Del Valle
- New Intertie
- Recycled Water – Direct and Storage
- Reduce Demineralization Losses
- Reduce Unaccounted-for Water
- Reduction of Well Start-Up Waste

Acquisition of Arroyo Las Positas Water Rights: Amortized Costs

| | Low | High | Interest 6% | Inflation 0% | Year 30 |
|--------------------------|-------------|-------------|----------------|-----------------|--|
| Capital Cost | \$1,600,000 | \$1,600,000 | | | |
| O&M Cost | \$12,000 | \$12,000 | | | |
| Capital Costs | \$1,600,000 | \$1,600,000 | | | |
| Amortized Costs | \$116,200 | \$116,200 | | | |
| Annual O&M Costs | \$12,000 | \$12,000 | | | |
| Total | \$128,200 | \$128,200 | | | |
| Additional Avg Yield, af | 1,500 | 750 | | | |
| Additional Yield, mgd | 1.3 | 0.7 | | | |
| | | | | | Incl. only 25% of calculated yield; 50% range assumed for uncertainty |
| \$/af | \$100 | \$200 | | | |
| \$/mgd | \$95,741 | \$191,483 | | | |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

Acquisition of Arroyo Las Positas Water Rights: Capital Costs

| Item | Capital Costs | O&M Costs |
|---------------------|--------------------|---|
| Diversion Structure | \$0 | \$0 Potentially constructed as part of SMMP |
| Application Fee | \$351,100 | Based on discussions with Water Right consultants |
| EIR/Hydrology | \$500,000 | Based on discussions with Water Right consultants |
| Protest Resolution | \$250,000 | Based on discussions with Water Right consultants |
| Hearing | \$250,000 | Based on discussions with Water Right consultants |
| Legal Fees | \$250,000 | Based on discussions with Water Right consultants |
| Maintenance | \$0 | \$11,800 Based on staff time only |
| Total | \$1,600,000 | \$12,000 |

Acquisition of Arroyo Mocho Water Rights: Amortized Costs

| | Low | High | Interest | Inflation | Year |
|--------------------------|-------------|-------------|--|-----------|------|
| Capital Cost | \$1,800,000 | \$1,800,000 | 6% | 0% | 30 |
| O&M Cost | \$12,000 | \$12,000 | | | |
| Capital Costs | \$1,800,000 | \$1,800,000 | | | |
| Amortized Costs | \$130,800 | \$130,800 | | | |
| Annual O&M Costs | \$12,000 | \$12,000 | | | |
| Total | \$142,800 | \$142,800 | | | |
| Additional Avg Yield, af | 1,800 | 900 | | | |
| Additional Yield, mgd | 1.6 | 0.8 | | | |
| | | | Incl. only 25% of calculated yield; 50% range assumed based on uncertainty | | |
| \$/af | \$100.0 | \$200.0 | | | |
| \$/mgd | \$88,871 | \$177,742 | | | |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

Acquisition of Arroyo Mocho Water Rights: Capital Costs

| Item | Capital Costs | O&M Costs | Comments |
|---------------------|--------------------|-----------------|---|
| Diversion Structure | \$0 | \$0 | Already in Zone 7's current CIP |
| Application Fee | \$540,850 | | Based on discussions with Water Right consultants |
| EIR/Hydrology | \$500,000 | | Based on discussions with Water Right consultants |
| Protest Resolution | \$250,000 | | Based on discussions with Water Right consultants |
| Hearing | \$250,000 | | Based on discussions with Water Right consultants |
| Legal Fees | \$250,000 | | Based on discussions with Water Right consultants |
| Maintenance | \$0 | \$11,800 | Based on staff time only |
| Total | \$1,800,000 | \$12,000 | |

Acquisition of Yara Yara Well: Amortized Costs

| | Low | Interest 6% | Inflation 0% | Year 30 |
|--------------------------|-------------|----------------|-----------------|------------|
| Capital Cost | \$4,000,000 | | | |
| O&M Cost | \$28,000 | | | |
| Capital Costs | \$4,000,000 | | | |
| Amortized Costs | \$290,600 | | | |
| Annual O&M Costs | \$28,000 | | | |
| Total | \$318,600 | | | |
| Additional Avg Yield, af | 280 | | | |
| Additional Yield, mgd | 0.2 | | | |
| | \$/af | \$1,140.0 | | |
| | \$/mgd | \$1,274,651 | | |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

Acquisition of Yara Yara Well: Capital Costs

| Item | Capital Costs | O&M Costs | Comments |
|----------------|---------------|-----------|---------------------------|
| Infrastructure | \$4,000,000 | \$28,000 | Per discussion with DSRSD |
| Total | \$4,000,000 | \$28,000 | |

ACWD Entitlement Exchange via Demineralization: Amortized Costs

| | | |
|--------------|--------------|---|
| | Cost | |
| Capital Cost | \$80,000,000 | Per ACWD meeting on 5/25/10 - costs should be at least double or about \$80 M |
| O&M Cost | \$6,000,000 | Per ACWD meeting on 5/25/10 - costs should be at least double |

| | |
|------------------|--------------|
| Capital Costs | \$80,000,000 |
| Amortized Costs | \$5,811,913 |
| Annual O&M Costs | \$6,000,000 |
| Total | \$11,811,913 |

| | | |
|----------|-----------|------|
| Interest | Inflation | Year |
| 6% | 0% | 30 |

| | | |
|-----------------------|-------|-----------------------|
| Additional Yield, af | 4,100 | Exchange 80% of Yield |
| Additional Yield, mgd | 3.7 | |

| | |
|--------------|----------------|
| \$/af | \$2,900 |
| \$/mgd | \$3,227,300 |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

Costs based on information available for ACWD's Desal Facility

Additional Water from the State Water Project

| Selling Party | Year Effective | Table A Amount, af | Transfer Cost ^(a) | | | | SWP Fixed Cost ^(b) | | Total Fixed Cost | | Power & Chemicals ^(g) | | Total Cost | |
|---|----------------|--------------------|------------------------------|-----------------|-----------------|---------------|-------------------------------|--------------|------------------|---------------|----------------------------------|---------------|------------------|---------------|
| | | | Cost, \$ | \$/af | \$/af (2010) | \$/af/yr | \$/af (2010) | \$/af/yr | \$/af (2010) | \$/af/yr | \$/af | \$/af/yr | \$/af | \$/af/yr |
| Berrenda Mesa WD | 2000 | 7,000 | \$ 7,000,000 | \$ 1,000 | \$ 1,310 | \$ 95 | \$ 1,405 | \$ 73 | \$ 2,715 | \$ 170 | | | | |
| Lost Hills WD | 2000 | 15,000 | \$ 15,000,000 | \$ 1,000 | \$ 1,310 | \$ 95 | \$ 1,039 | \$ 54 | \$ 2,349 | \$ 150 | | | | |
| Belridge WSD | 2001 | 10,000 | \$ 10,808,100 | \$ 1,081 | \$ 1,420 | \$ 103 | \$ 1,039 | \$ 54 | \$ 2,459 | \$ 160 | | | | |
| Tulare Lake Basin WSD | 2003 | 400 | \$ 712,800 | \$ 1,782 | \$ 2,220 | \$ 161 | \$ 1,078 | \$ 56 | \$ 3,298 | \$ 220 | | | | |
| Belridge WSD | 2004 | 2,219 | \$ 3,893,707 | \$ 1,755 | \$ 2,070 | \$ 150 | \$ 1,039 | \$ 54 | \$ 3,109 | \$ 200 | | | | |
| Future Transfers^{(e),(f)} | 2009 | 10,000 | \$ 52,500,000 | \$ 5,250 | \$ 8,750 | \$ 636 | \$ 1,347 | \$ 70 | \$ 10,097 | \$ 710 | \$ 2,502 | \$ 130 | \$ 12,600 | \$ 840 |

^(a) Transfer Cost is the one time payment to the former

Range based on 25% Increase \$15,750 \$1,050

^(b) SWP fixed cost is the sum of annual payments to cover Bond surcharge, Delta charge and Transportation charge

^(c) Costs inflated using ENR San Francisco CCI (9722.17)

^(d) Amortized over 30 year period and 6% interest rate.

^(e) Used 2009 Dudley Ridge Water District transfer to Mojave Water Agency price as an example for future transfer. Actual future price will depend on the market for Table A water

^(f) Amonut available for future transfers will depend on how much we are willing to pay

^(g) O&M cost increased 3% annually for inflation

Aquifer Storage and Recovery in the Main Basin: Amortized Costs

| | | |
|-----------------------|--------------|-----------------------------|
| | Cost | |
| Capital Cost | \$2,400,000 | |
| O&M Cost | \$600,000 | 25% of Capital |
| | | |
| Capital Costs | \$2,400,000 | |
| Amortized Costs | \$174,357 | |
| Annual O&M Costs | \$600,000 | |
| Total | \$774,000 | |
| | | |
| Additional Yield, af | 3,000 | Additional water in storage |
| Additional Yield, mgd | 2.7 | |
| | | |
| \$/af | \$260 | |
| \$/mgd | \$300,000 | |

| | | |
|----------|-----------|------|
| Interest | Inflation | Year |
| 6% | 0% | 30 |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

Aquifer Storage and Recovery in the Main Basin: Capital Costs

| Item | Cost | |
|--------------------------------|----------------|--|
| Piping & Retrofit | \$1,000,000 | \$500,000 per well - based on Vasco/Airport Piping and Valving + Electrical + 50% markup |
| Study/Benchtest/Demonstration | \$500,000 | Based on discussions with Matt on 6/24/10 |
| Subtotal | \$1,500,000 | |
| Construction Contingency (25%) | \$375,000.00 | |
| Subtotal | \$1,875,000.00 | |
| Planning/Environmental | \$187,500.00 | |
| Design/Permitting | \$187,500.00 | |
| Construction Management | \$187,500.00 | |
| Total | \$2,400,000.00 | |

Arroyo Del Valle - Perfection of Existing Water Right: Amortized Costs

| | |
|--------------|-----------|
| Capital Cost | \$990,000 |
| O&M Cost | \$0 |

| | |
|------------------|-----------|
| Capital Costs | \$990,000 |
| Amortized Costs | \$71,922 |
| Annual O&M Costs | \$0 |
| Total | \$70,000 |

| | |
|-----------------------|-------|
| Additional Yield, af | 3,800 |
| Additional Yield, mgd | 3.4 |

| | |
|--------------|-------------|
| \$/af | \$20 |
| \$/mgd | \$0 |

| | | |
|----------|-----------|------|
| Interest | Inflation | Year |
| 6% | 0% | 30 |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

Bay Area Regional Desalination Project: Amortized Costs

| | Low | High | |
|-----------------------|--------------|--------------|--|
| Capital Cost | \$42,400,000 | \$42,400,000 | From Pilot Test report completed by BARD members Range depends on Zone 7's share of O&M Costs |
| O&M Cost | \$4,400,000 | \$2,600,000 | |
| Capital Costs | \$42,400,000 | \$42,400,000 | Interest |
| Amortized Costs | \$3,100,000 | \$3,100,000 | 6% |
| Annual O&M Costs | \$4,400,000 | \$2,600,000 | Inflation |
| Total | \$7,500,000 | \$5,700,000 | 0% |
| | | | Year |
| | | | 30 |
| | | | $A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$ |
| % Dry | 33% | 100% | |
| Additional Yield, af | 9,300 | 5,600 | |
| Additional Yield, mgd | 8.3 | 5.0 | |
| | | | |
| \$/af | \$806 | \$1,018 | |
| \$/mgd | \$903,403 | \$1,140,224 | |
| | | | |
| Wheeling, \$/af | \$622 | \$1,016 | Preliminary, to be verified with modeling |
| | | | |
| Total | \$1,400 | \$2,000 | |

Bay Area Regional Desalination Project: Capital Costs

| Item | Cost, \$M |
|---|-------------|
| Desalination Capital Costs (20 mgd facility) ^(a,b) | 98.4 |
| Proportionate Share (.25) | 24.6 |
| <i>Construction Contingency (25%)</i> | 6.2 |
| Total Capital Costs | 30.8 |
| <i>Planning and Environmental (10%)</i> | 3.1 |
| <i>Design & Implementation (10%)</i> | 3.1 |
| <i>Construction Management (10%)</i> | 3.1 |
| <i>Land Acquisition^(c)</i> | 0.9 |
| <i>Concentrate Discharge Permit & Connection Fee</i> | 0.3 |
| <i>Intake Permit & Fees</i> | 1.0 |
| <i>Water Right^(d)</i> | 0.3 |
| Total | 42.4 |

^(a) MWH, 2010. Pilot Testing at Mallard Slough - Pilot Plant Engineering Report. June.

^(b) Table 6-6, Scenario 1.

Bay Area Regional Desalination Project: O&M Costs

| Item | \$/year |
|--|-------------------|
| Power Requirements ^(a) | 5,400,000 |
| Chemical Costs ^(a) | 1,400,000 |
| Equipment Replacement Cost ^(a) | 1,400,000 |
| Staffing Costs ^(a) | 900,000 |
| Outside Services ^(a) | 1,350,000 |
| Total | 10,450,000 |
| Zone 7 share in Dry Years - 25% ^(b) | 2,612,500 |
| Zone 7 Share in Other Years - 50% ^(b) | 5,225,000 |
| % Dry Years ^(a) | 33% |
| % Other Years ^(a) | 67% |
| Weighted Average | 4,400,000 |

^(a) Obtained from BARDP Partners - see Plant Capacity Analysis.xls

^(b) Based on 5 mgd in Dry Years and 10 mgd in Normal/Wet Years

Chain of Lakes Pipeline

| | Item | Quantity | Source |
|--------------|---|---------------------|--|
| Pump Station | Maximum annual pumping, acre-feet | 10,000 | Based on risk-modeling results |
| | Maximum puming rate, MGD | 12 | Based on 9-month estimate |
| | Maximum puming rate, GPM | 8,448 | |
| | Hydraulic grade line at DVWTP, feet | 666 | Zone 7 staff |
| | Minimum elevation at Lake C | 320 | Zone 7 staff |
| | Lift required, feet | 346 | |
| | Water horsepower | 739 | |
| | Electrical horsepower | 1,000 | Assumes 85% wire to water efficiency and 90% pump efficiency |
| | Unit Cost (w/ mark-ups) | \$4,180 | 2009 Altamont Peer Review Study |
| | Cost of the Pumping Station | \$4,180,000 | |
| Pipeline | Length of pipeline, feet | 17,952 | GIS/CAD |
| | Diameter, inches | 36 | |
| | Unit cost, \$/LF/in diameter | \$19 | Altamont pipeline costs + 25% construction contingency |
| | Construction cost of Pipeline | \$12,279,168 | |
| | Cost of Pipeline (w/ all contingencies) | \$15,962,918 | Add 30% for other contingencies |
| | Total Cost | \$20,142,918 | |

Confirm BBID Yield (2,000 to 5,000 af): Amortized

| | | | |
|-----------------------|-----------|-----------|--|
| | Low | High | |
| Capital Cost | \$50,000 | \$100,000 | 50% range assumed for planning purposes Based on treating additional water |
| O&M Cost | \$850,000 | \$850,000 | |
| | | | |
| Capital Costs | \$50,000 | \$100,000 | |
| Amortized Costs | \$3,600 | \$7,300 | Interest Inflation Year |
| Annual O&M Costs | \$850,000 | \$850,000 | 6% 0% 30 |
| Total | \$853,600 | \$857,300 | |
| | | | |
| Additional Yield, af | 3,000 | 3,000 | $A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$ |
| Additional Yield, mgd | 2.7 | 2.7 | |
| | | | |
| \$/af | \$284.5 | \$285.8 | |
| \$/mgd | \$318,740 | \$320,122 | |

Delta Fix - Amortized

| | Low | High | Comments |
|-----------------|-----------------|------------------|--|
| Capital Cost | \$9,000,000,000 | \$12,000,000,000 | Based on preliminary information provided by DWR |
| O&M Cost | \$35,000,000 | \$35,000,000 | Based on preliminary information provided by DWR |
| % SWP | 55% | 61% | Based on preliminary information provided by DWR |
| % Zone 7 of SWP | 1.95% | 1.95% | Based on Table A Amount |

| | Low | High | Interest | Inflation | Year |
|------------------|--------------|---------------|----------|-----------|------|
| Capital Costs | \$97,000,000 | \$143,000,000 | 6% | 0% | 30 |
| Amortized Costs | \$7,046,944 | \$10,388,794 | | | |
| Annual O&M Costs | \$380,000 | \$420,000 | | | |
| Total | \$7,400,000 | \$10,800,000 | | | |

| | | |
|-----------------------|--------|--------|
| Additional Yield, % | 15% | 15% |
| Additional Yield, af | 12,100 | 12,100 |
| Additional Yield, mgd | 10.8 | 10.8 |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

| | | |
|--------------|--------------|--------------|
| \$/af | \$600 | \$900 |
| \$/mgd | \$700,000 | \$1,000,000 |

Delta Fix - Present Worth

| | | | |
|-----------------|-----------------|------------------|--|
| | Low | High | |
| Capital Cost | \$9,000,000,000 | \$12,000,000,000 | Based on preliminary information provided by DWR |
| O&M Cost | \$35,000,000 | \$35,000,000 | Based on preliminary information provided by DWR |
| | | | |
| % SWP | 55% | 61% | Based on preliminary information provided by DWR |
| % Zone 7 of SWP | 1.95% | 1.95% | Based on Table A Amount |

| | | | | | |
|----------------------|---------------|---------------|-----------------------------|-----------|------|
| Annual Costs | \$375,495 | \$416,458 | Interest | Inflation | Year |
| Present Worth of O&M | \$7,226,890 | \$8,015,278 | 6% | 3% | 30 |
| Capital Costs | \$96,555,868 | \$142,785,647 | Present Worth O&M Equation: | | |
| Total | \$100,000,000 | \$150,000,000 | | | |

| | | |
|-----------------------|--------|--------|
| Additional Yield, % | 15% | 15% |
| Additional Yield, af | 12,100 | 12,100 |
| Additional Yield, mgd | 10.8 | 10.8 |

$$PW = A \left[\frac{1 - \left(\frac{1+g}{1+i} \right)^n}{i-g} \right]$$

| | | |
|--------------|----------------|-----------------|
| \$/af | \$8,300 | \$12,400 |
| \$/mgd | \$9,300,000 | \$13,900,000 |

PW = Present Worth
 A = Annual Cost, \$/year
 i = interest rate (6%)
 g = inflation rate (3%)
 n = period, years

End-User Graywater Reuse for Residential Irrigation: Amortized Costs

| | Low | High | Interest 6% | Inflation 0% | Year 30 |
|--------------------------|--------------|---------------|----------------|-----------------|------------|
| Capital Cost | \$20,000,000 | \$163,000,000 | | | |
| O&M Cost | \$3,000,000 | \$24,000,000 | | | |
| Capital Costs | \$20,000,000 | \$163,000,000 | | | |
| Amortized Costs | \$1,453,000 | \$11,841,800 | | | |
| Annual O&M Costs | \$3,000,000 | \$24,000,000 | | | |
| Total | \$4,453,000 | \$35,841,800 | | | |
| Additional Avg Yield, af | 1,200 | 5,400 | | | |
| Additional Yield, mgd | 1.1 | 4.8 | | | |
| \$/af | \$3,700 | \$6,600 | | | |
| \$/mgd | \$4,156,950 | \$7,435,316 | | | |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

End-User Graywater Reuse for Residential Irrigation: Capital Costs

| Component | Capital | O&M |
|-----------------------|----------------|----------------|
| Filtration Unit/Pump | \$1,000 | -- |
| Piping | \$1,000 | -- |
| Misc. | \$500 | -- |
| Filter Cleaning | -- | \$250 |
| Equipment Maintenance | -- | \$125 |
| Total per System | \$2,500 | \$375 |
| Existing | \$143,000,000 | \$21,000,000 |
| Future | \$20,000,000 | \$3,000,000 |
| Existing Accounts | 57,260 | UWMP Data |
| Future Accounts | 8030 | UWMP Data |

End-User Local Rain Capture for Irrigation: Amortized Costs

| | Low | High | | Interest | Inflation | Year |
|-----------------------|--------------|---------------|---------------------------|----------|-----------|------|
| Capital Cost | \$94,000,000 | \$395,000,000 | New vs. New plus Existing | 6% | 0% | 30 |
| O&M Cost | \$9,400,000 | \$39,500,000 | | | | |
| Capital Costs | \$94,000,000 | \$395,000,000 | | | | |
| Amortized Costs | \$6,800,000 | \$28,700,000 | | | | |
| Annual O&M Costs | \$9,400,000 | \$39,500,000 | | | | |
| Total | \$16,200,000 | \$68,200,000 | | | | |
| Additional Yield, af | 220 | 860 | | | | |
| Additional Yield, mgd | 0.2 | 0.8 | | | | |
| \$/af | \$73,600.0 | \$79,300.0 | | | | |
| \$/mgd | \$82,488,941 | \$88,836,066 | | | | |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

End-User Local Rain Capture for Irrigation: Potential Yield and Costs - Total Costs

| Sector | Average Roof Size, ft ² | Theoretical Average Supply, gallons/year | 2-Month Supply, gallons | Potential Number of Customers | Total Supply, af | Approximate Capital Cost per System | Total Cost, \$M | O&M (@ 10% of System), \$M |
|---------------|------------------------------------|--|-------------------------|-------------------------------|------------------|-------------------------------------|-----------------|----------------------------|
| Residential | 2,100 | 15,000 | 2,500 | 8,400 to 65,400 | 60 to 500 | \$4,000 | \$33.6 to \$260 | 3.4 to 26.2 |
| Commercial | 14,700 | 107,000 | 17,800 | 3,000 to 6,500 | 160 to 350 | \$20,000 | \$60 to \$130 | 6 to 13 |
| Institutional | 8,200 | 60,000 | 10,000 | 40 to 310 | 1 to 9 | \$12,000 | \$0.48 to \$3.7 | .048 to .37 |

Average roof size based on Alameda County Assessors data

End-User Local Rain Capture for Irrigation: Potential Yield and Costs - \$/system

| Statistical Measure | Building Size, ft ² | Theoretical Supply per Home, gallons/year | Average Monthly Supply, gallons | 2 Month Supply, gallons | Tanks Size, Tank Cost, Pump Cost, Piping, Total Cost | | | | |
|----------------------|--------------------------------|---|---------------------------------|-------------------------|--|----------|-----------|---------|------------|
| | | | | | gallons | \$/gal | Pump Cost | Piping | Total Cost |
| Residential Average | 2,079 | 15,166 | 1,264 | 2,528 | 3000 | \$3,000 | \$600 | \$500 | \$4,100 |
| Commercial Average | 14,652 | 106,884 | 8,907 | 17,814 | 18000 | \$18,000 | \$1,200 | \$1,000 | \$20,200 |
| Insitutional Average | 8,187 | 59,725 | 4,977 | 9,954 | 10000 | \$10,000 | \$1,200 | \$1,000 | \$12,200 |

| | | | |
|---------|----------------------|----------------------|-----------------------------|
| Average | 14.59 inches of rain | \$600/pmp | 0.28/lf |
| Min | 5.21 inches of rain | 2 pumps for com inst | 2100 lf for Double com inst |
| | 5,416 | 2,528 | |
| | 38,168 | 17,814 | |
| | 21,327 | 9,954 | |

Costs based on Texas Manual on Rainwater Harvesting

Enhance Existing In-Lieu Recharge Program: Amortized Costs

| | | | |
|-----------------------|-----------|-----------|-----------------------------|
| | Low | High | |
| Capital Cost | \$200,000 | \$200,000 | Assumed program setup costs |
| O&M Cost | \$66,400 | \$40,000 | Power and Chemical of WTPs |
| | | | |
| Capital Costs | \$200,000 | \$200,000 | |
| Amortized Costs | \$14,530 | \$14,530 | |
| Annual O&M Costs | \$66,400 | \$40,000 | |
| Total | \$80,930 | \$54,530 | |
| | | | |
| Additional Yield, af | 830 | 500 | Cumulative / # years |
| Additional Yield, mgd | 0.7 | 0.4 | |

| | | | |
|--|--------------|--------------|--------------|
| | \$/af | \$100 | \$110 |
| | \$/mgd | \$109,200 | \$122,200 |

| | | |
|----------|-----------|------|
| Interest | Inflation | Year |
| 6% | 0% | 30 |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

Groundwater Injection with Highly Treated Recycled Water: Amortized Costs

| | Low | High |
|--------------------------|--------------|--------------|
| Capital Cost | \$34,100,000 | \$39,970,853 |
| O&M Cost | \$1,400,000 | \$1,400,000 |
| Capital Costs | \$34,100,000 | \$39,970,853 |
| Amortized Costs | \$2,477,300 | \$2,903,800 |
| Annual O&M Costs | \$1,400,000 | \$1,400,000 |
| Total | \$3,877,300 | \$4,303,800 |
| Additional Avg Yield, af | 2,801 | 2,801 |
| Additional Yield, mgd | 2.5 | 2.5 |
| \$/af | \$1,400.0 | \$1,500.0 |
| \$/mgd | \$1,550,920 | \$1,721,520 |
| Supply Cost, \$/af | \$100.0 | \$100.0 |
| | \$1,500.0 | \$1,600.0 |

Low is a new system for only Livermore, while the high includes an additional 32% more than original cost for rehab of DSRSD's RO Units.

| | | |
|----------|-----------|------|
| Interest | Inflation | Year |
| 6% | 0% | 30 |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

Groundwater Injection with Highly Treated Recycled Water: Capital Costs

| Item | Capital Costs | O&M Costs | Comment |
|-------------------------------|---------------------|--------------------|--|
| Rehabilitate Treatment System | \$18,100,000 | | Redesign and build of RO Units |
| Pipeline to new well site | \$4,400,000 | | Additional 18-inch lines to new well (9,800 feet) - from figure |
| Pipeline for Demin Facility | \$7,500,000 | | Based on 16,900 feet of 18-inch pipe using WSMP unit costs - from figure |
| Injection Well | \$2,100,000 | | Per original costs |
| Maintenance | \$0 | \$1,400,000 | Provided by DSRSD |
| Public Outreach | \$2,000,000 | | Assumed based on pervious experience |
| Total | \$34,100,000 | \$1,400,000 | |

ENR (11/98) 6845.59
 ENR (4/10) 9730.17 downloaded on 4/9/10
 Ratio 1.42137785

| | Eng/Consult | Equip | Constru | Total | Total Cost | % | |
|---|-------------|-----------|-------------|-------------|--------------|-----|---------------------|
| Additional Expense for DSRSD RO Replacement | \$1,169,406 | \$275,150 | \$2,689,651 | \$4,134,207 | \$12,745,872 | 32% | Per DSRSD Estimates |

Groundwater Injection with Highly Treated Recycled Water: Map Used for Analysis

Demineralization Replacement Line: 16,900 feet

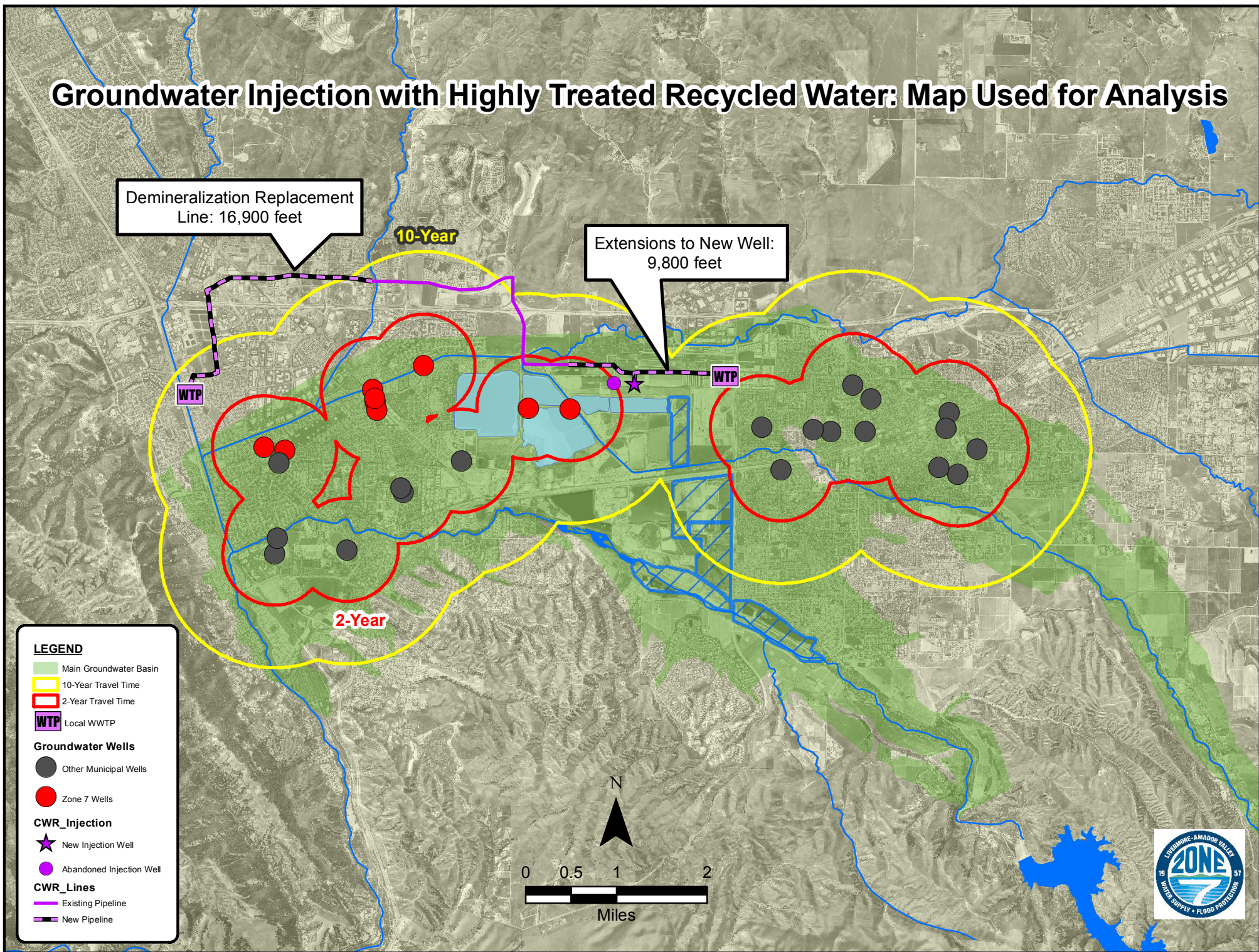
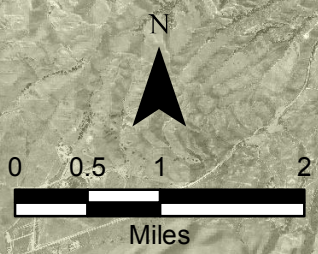
Extensions to New Well: 9,800 feet

10-Year

2-Year

LEGEND

- Main Groundwater Basin
- 10-Year Travel Time
- 2-Year Travel Time
- Local WWTP
- Groundwater Wells**
 - Other Municipal Wells
 - Zone 7 Wells
- CWR_Injection**
 - New Injection Well
 - Abandoned Injection Well
- CWR_Lines**
 - Existing Pipeline
 - New Pipeline



In-Stream Infiltration via Swales: Amortized Costs

| | | |
|-----------------------|---------------|--------------------------------|
| | Low | |
| Capital Cost | \$7,800,000.0 | New vs. New plus Existing |
| O&M Cost | \$1,560,000.0 | |
| | | |
| Capital Costs | \$8,000,000 | |
| Amortized Costs | \$600,000 | |
| Annual O&M Costs | \$1,560,000 | |
| Total | \$2,160,000 | |
| | | |
| Additional Yield, af | 830 | Based on areas along the Mocho |
| Additional Yield, mgd | 0.7 | |
| | | |
| \$/af | \$2,600.0 | |
| \$/mgd | \$2,915,272 | |

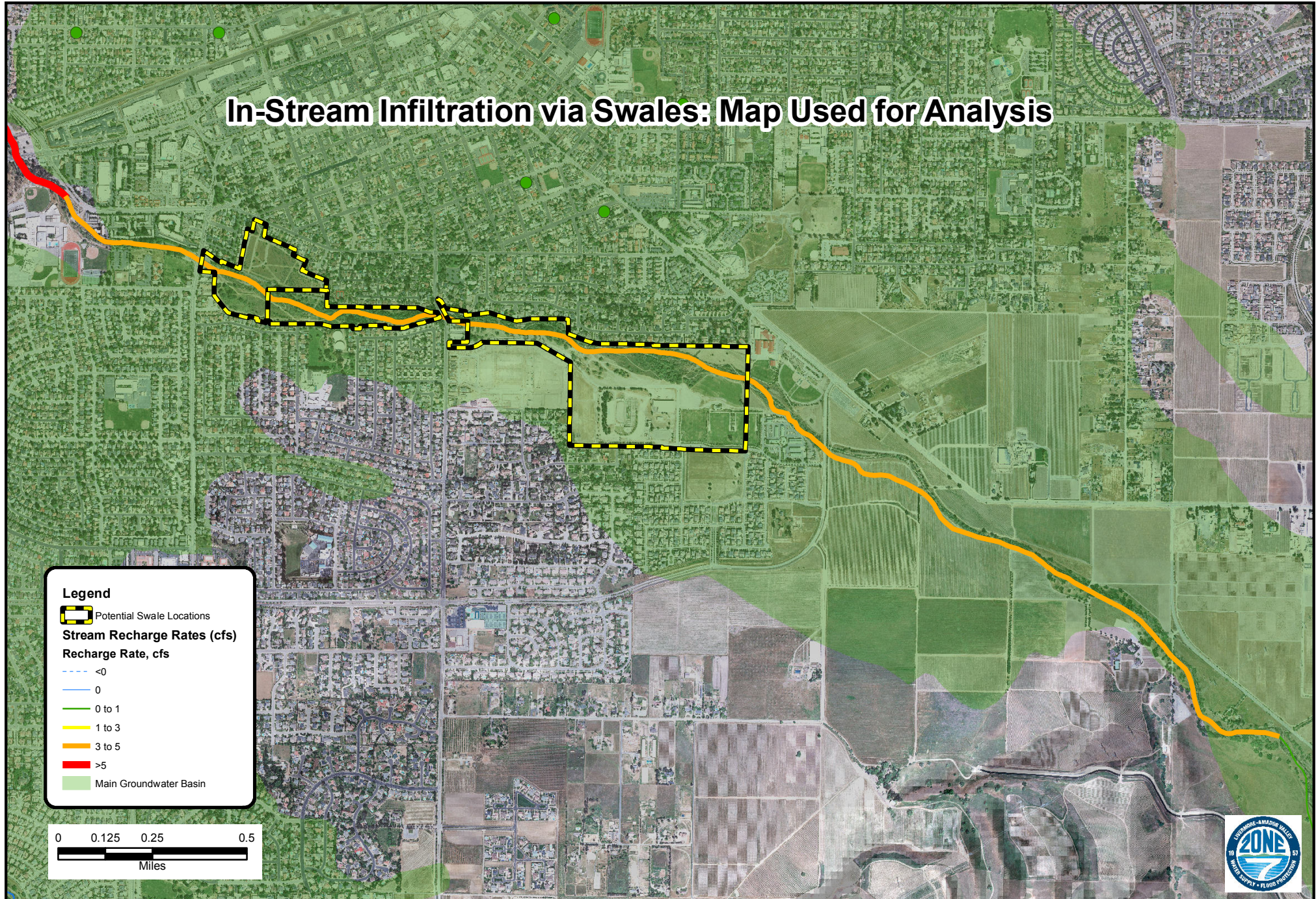
| | | |
|----------|-----------|------|
| Interest | Inflation | Year |
| 6% | 0% | 30 |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

In-Stream Infiltration via Swales: Capital Costs

| Component | Cost |
|--------------------------|-------------|
| RP Project | \$2,400,000 |
| MP Project | \$2,400,000 |
| Total | \$4,800,000 |
| Construction Contingency | \$1,200,000 |
| Subtotal | \$6,000,000 |
| Planning/Environmental | \$600,000 |
| Design | \$600,000 |
| Construction Management | \$600,000 |
| Total | \$7,800,000 |

In-Stream Infiltration via Swales: Map Used for Analysis



Long-Term Non-SWP Lease or Transfer

| | Low | High | | | |
|------------------------|-------------|-------------|---|-----------|------|
| Capital Cost | \$0 | \$0 | | | |
| Capital Costs | \$2,000,000 | \$2,000,000 | Interest | Inflation | Year |
| Amortized Costs | \$100,000 | \$100,000 | 6% | 0% | 30 |
| Annual O&M Costs | \$0 | \$0 | | | |
| Total | \$100,000 | \$100,000 | | | |
| | | | $A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$ | | |
| Additional Yield, af | 10,900 | 10,900 | | | |
| Additional Yield, mgd | 9.7 | 9.7 | | | |
| \$/af | \$0 | \$0 | | | |
| \$/mgd | \$10,277 | \$10,277 | | | |
| Long-term Lease, \$/af | \$200 | \$300 | Based on discussions with other agencies Preliminary - based on discussion with other agencies | | |
| Other Wheeling, \$/af | \$622 | \$1,016 | | | |
| Total, \$/af | \$800 | \$1,300 | | | |

Los Vaqueros Expansion: Amortized for Zone 7

| | Low | High |
|-----------------------|--------------|---------------|
| Capital Cost | \$32,400,000 | \$212,000,000 |
| O&M Cost | \$420,000 | \$2,800,000 |
| | | |
| Capital Costs | \$32,400,000 | \$212,000,000 |
| Amortized Costs | \$2,353,800 | \$15,401,600 |
| Annual O&M Costs | \$420,000 | \$2,800,000 |
| Total | \$2,773,800 | \$18,201,600 |
| | | |
| Additional Yield, af | 8,300 | 8,300 |
| Additional Yield, mgd | 7.4 | 7.4 |
| | | |
| \$/af | \$330.0 | \$2,200.0 |
| \$/mgd | \$374,369 | \$2,456,602 |

| | | |
|----------|-----------|------|
| Interest | Inflation | Year |
| 6% | 0% | 30 |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

Los Vaqueros Expansion: Amortized based on CCWD and CDM Reports

| | Low (Fed & State) | High (SBA Contr) | |
|--|-------------------|------------------|--------------------------|
| Capital (w/Buy-In) | \$ 893,000,000 | \$ 893,000,000 | Interest |
| ENR SF (08 to 10) | 1.046 | 1.046 | 6% |
| Capital (2010) | \$ 934,248,633 | \$ 934,248,633 | Inflation |
| Amortized Capital | \$ 67,900,000 | \$ 67,900,000 | 0% |
| Energy | \$ 3,800,000 | \$ 3,800,000 | Year |
| O&M | \$ 7,900,000 | \$ 7,900,000 | 30 |
| Total Annual Cost | \$ 79,600,000 | \$ 79,600,000 | |
| $A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$ | | | |
| Additional Yield for all participants, af | 229000 | 35,000 | Average Yield |
| Additional Yield for all participants, mgd | 204.4 | 31.2 | |
| \$/af | \$300 | \$2,300 | |
| \$/mgd | \$400,000 | \$2,500,000 | |
| Zone 7 Yield, af | \$3,900 | \$25,514 | |
| 8300 | \$32,400,000 | \$212,000,000 | Used for Zone 7 estimate |
| O&M Costs | \$51 | \$334 | |
| | \$420,000 | \$2,800,000 | |

Modified Operation of Lake Del Valle: Amortized

| | | | |
|-----------------------|--------------|--------------|--|
| | Low | High | |
| Capital Cost | \$500,000 | \$1,000,000 | Based on 50% SBA Contractor participation |
| O&M Cost | \$80 | \$80 | |
| | | | |
| Capital Costs | \$500,000 | \$1,000,000 | |
| Amortized Costs | \$36,000 | \$73,000 | Interest |
| Annual O&M Costs | \$48,000 | \$48,000 | Inflation |
| Total | \$84,000 | \$121,000 | Year |
| | | | 6% 0% 30 |
| | | | |
| Additional Yield, af | 600 | 600 | $A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$ |
| Additional Yield, mgd | 0.5 | 0.5 | |
| | | | |
| \$/af | \$140 | \$200 | |
| \$/mgd | \$156,800 | \$225,900 | |

Modified Operation of Lake Del Valle: Present Worth

| | Low | High | |
|-----------------------|------------------|--------------------|---|
| Capital Cost | \$500,000 | \$1,000,000 | Based on 50% SBA Contractor participation |
| O&M Cost | \$0 | \$0 | |
| Annual Costs | \$0 | \$0 | |
| Present Worth of O&M | \$0 | \$0 | |
| Capital Costs | \$500,000 | \$1,000,000 | Interest Inflation Year |
| Total | \$500,000 | \$1,000,000 | 6% 3% 20 |
| Additional Yield, af | 600 | 600 | |
| Additional Yield, mgd | 0.5 | 0.5 | |
| | | | |
| \$/af | \$800 | \$1,700 | |
| \$/mgd | \$930,000 | \$1,870,000 | |

Present Worth O&M Equation:

$$PW = A \left[\frac{1 - \left(\frac{1+g}{1+i} \right)^n}{i-g} \right]$$

PW = Present Worth
A = Annual Cost, \$/year
i = interest rate (6%)
g = inflation rate (3%)
n = period, years

New Intertie: Amortized Costs

| | Low: Dougherty | High: Mocho |
|-----------------------|----------------|--------------|
| Capital Cost | \$18,000,000 | \$35,000,000 |
| O&M Cost | \$50,000 | \$50,000 |
| Capital Costs | \$18,000,000 | \$35,000,000 |
| Amortized Costs | \$1,307,680 | \$2,542,712 |
| Annual O&M Costs | \$50,000 | \$50,000 |
| Total | \$1,360,000 | \$2,590,000 |
| Additional Yield, af | 8,600 | 8,600 |
| Additional Yield, mgd | 7.7 | 7.7 |
| \$/af | \$160 | \$300 |
| \$/mgd | \$200,000 | \$300,000 |

Interest Inflation Year
6% 0% 30

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

New Intertie to Dougherty: Capital Costs

| Item | Quantity | Units | Unit Cost | Units | Total Cost ^(a,b) |
|--|----------|-------|-----------|----------|-----------------------------|
| 24-inch Diameter Pipeline ^(c,d) | 29,800 | feet | \$15.4 | \$/lf/in | 11,000,000 |
| Pump Station ^(e) | 0 | hp | \$1,500 | \$/hp | 0 |
| Capital Costs | | | | | 11,000,000 |
| <i>Construction Contingency (25%)</i> | | | | | <i>2,800,000</i> |
| Subtotal | | | | | 13,800,000 |
| <i>Planning & Environmental (10%)</i> | | | | | <i>1,400,000</i> |
| <i>Design & Implementation (10%)</i> | | | | | <i>1,400,000</i> |
| <i>Construction Management (10%)</i> | | | | | <i>1,400,000</i> |
| Grand Total^(f) | | | | | 18,000,000 |

^(a) All costs, except the grand total, were rounded to the nearest \$100,000.

^(b) All costs were adjusted to reflect the ENR San Francisco Construction Cost Index for May 2010, or 9885.92.

^(c) Pipeline size based on Table 7 in the Draft 2003 Zone 7/EBMUD Conjunctive Use Project-Preliminary Evaluation. A smaller, 24-inch line, was assumed since a max flow of 10 mgd would be required. Length obtained from GIS.

^(d) Unit cost of pipeline is based on Zone 7's costs to construct 29,570 feet of 42-inch line through urban developed areas. The line was completed in 2009. The unit cost does not include any contingencies; however, it does account for 2 rate control stations, a tunnel under I-580, and jack and bore across two arterial roads.

^(e) No pump station is required because supply to EBMUD would come from the desalination plant.

^(f) Grand total rounded to the nearest \$1,000,000.

New Intertie to Mocho Well Field

| Item | Quantity | Units | Unit Cost | Units | Total Cost ^(a,b) |
|--|----------|-------|-----------|----------|-----------------------------|
| 24-inch Diameter Pipeline ^(c,d) | 57,600 | feet | \$15.4 | \$/lf/in | 21,300,000 |
| Pump Station ^(e) | 0 | hp | \$1,500 | \$/hp | 0 |
| Capital Costs | | | | | 21,300,000 |
| <i>Construction Contingency (25%)</i> | | | | | <i>5,300,000</i> |
| Subtotal | | | | | 26,600,000 |
| <i>Planning & Environmental (10%)</i> | | | | | <i>2,700,000</i> |
| <i>Design & Implementation (10%)</i> | | | | | <i>2,700,000</i> |
| <i>Construction Management (10%)</i> | | | | | <i>2,700,000</i> |
| Grand Total ^(f) | | | | | 35,000,000 |

^(a) All costs, except the grand total, were rounded to the nearest \$100,000.

^(b) All costs were adjusted to reflect the ENR San Francisco Construction Cost Index for May 2010, or 9885.92.

^(c) Pipeline size and quantity based on Table 7 in the Draft 2003 Zone 7/EBMUD Conjunctive Use Project-Preliminary Evaluation. A smaller, 24-inch line, was assumed since a max flow of 10 mgd would be required.

^(d) Unit cost of pipeline is based on Zone 7's costs to construct 29,570 feet of 42-inch line through urban developed areas. The line was completed in 2009. The unit cost does not include any contingencies; however, it does account for 2 rate control stations, a tunnel under I-580, and jack and bore across two arterial roads.

^(e) No pump station is required because supply to EBMUD would come from the desalination plant.

^(f) Grand total rounded to the nearest \$1,000,000.

Recycled Water - Direct and Indirect: Livermore

| Cost Item | Direct | | Indirect (Seasonal Storage) | |
|-----------------------------------|----------------------|----------------------|-----------------------------|-----------------------|
| | Low | High | Low | High |
| Tertiary Capacity | \$ 10,640,000 | \$ 10,640,000 | \$ - | \$ 460,000 |
| Advanced Treatment (MF/UV/RO) | \$ - | \$ - | \$ - | \$ - |
| Storage | \$ - | \$ - | \$ 37,588,546 | \$ 38,640,000 |
| Pipelines and Pump Stations | \$ 12,260,000 | \$ 23,730,000 | \$ 18,890,000 | \$ 37,590,000 |
| <i>subtotal</i> | <i>\$ 22,900,000</i> | <i>\$ 34,370,000</i> | <i>\$ 56,478,546</i> | <i>\$ 76,690,000</i> |
| Project Construction (25%) | \$ 5,725,000 | \$ 8,592,500 | \$ 14,119,636 | \$ 19,172,500 |
| <i>subtotal</i> | <i>\$ 28,625,000</i> | <i>\$ 42,962,500</i> | <i>\$ 70,598,182</i> | <i>\$ 95,862,500</i> |
| Engineering Planning/Design (10%) | \$ 2,862,500 | \$ 4,296,250 | \$ 7,059,818 | \$ 9,586,250 |
| Construction Management (10%) | \$ 2,862,500 | \$ 4,296,250 | \$ 7,059,818 | \$ 9,586,250 |
| Program Implementation (10%) | \$ 2,862,500 | \$ 4,296,250 | \$ 7,059,818 | \$ 9,586,250 |
| Total Capital Cost | \$ 37,212,500 | \$ 55,900,000 | \$ 91,800,000 | \$ 124,600,000 |
| O&M | \$ 2,800,000 | \$ 2,800,000 | \$ 4,300,000 | \$ 4,500,000 |
| Yield, af | 3,700 | 3,700 | 5,700 | 5,860 |
| Amortized, \$/af | \$ 1,500 | \$ 1,900 | \$ 1,900 | \$ 2,300 |

Interest Inflation Term
6% 3% 30

PW Factor 19.2463
AM Factor 0.072649

Recycled Water - Direct and Indirect: Pleasanton

Interest 6% Inflation 3% Term 30

PW Factor 19.2463

AM Factor 0.072649

| Cost Item | Direct | | Indirect (Seasonal Storage) | |
|-----------------------------------|----------------------|----------------------|-----------------------------|----------------------|
| | Low | High | Low | High |
| Tertiary Capacity | \$ 7,470,000 | \$ 7,470,000 | \$ - | \$ - |
| Advanced Treatment (MF/UV/RO) | \$ - | \$ - | \$ - | \$ - |
| Storage | \$ - | \$ - | \$ 23,740,000 | \$ 23,740,000 |
| Pipelines and Pump Stations | \$ 8,620,000 | \$ 16,680,000 | \$ 11,930,000 | \$ 23,090,000 |
| <i>subtotal</i> | <i>\$ 16,090,000</i> | <i>\$ 24,150,000</i> | <i>\$ 35,670,000</i> | <i>\$ 46,830,000</i> |
| Project Construction (25%) | \$ 4,022,500 | \$ 6,037,500 | \$ 8,917,500 | \$ 11,707,500 |
| <i>subtotal</i> | <i>\$ 20,112,500</i> | <i>\$ 30,187,500</i> | <i>\$ 44,587,500</i> | <i>\$ 58,537,500</i> |
| Engineering Planning/Design (10%) | \$ 2,011,250 | \$ 3,018,750 | \$ 4,458,750 | \$ 5,853,750 |
| Construction Management (10%) | \$ 2,011,250 | \$ 3,018,750 | \$ 4,458,750 | \$ 5,853,750 |
| Program Implementation (10%) | \$ 2,011,250 | \$ 3,018,750 | \$ 4,458,750 | \$ 5,853,750 |
| Total Capital Cost | \$ 26,100,000 | \$ 39,200,000 | \$ 58,000,000 | \$ 76,100,000 |
| O&M | \$ 1,980,000 | \$ 1,980,000 | \$ 2,740,000 | \$ 2,740,000 |
| Yield, af | 2,600 | 2,600 | 3,600 | 3,600 |
| Amortized, \$/af | \$ 1,500 | \$ 1,900 | \$ 1,900 | \$ 2,300 |

Recycled Water - Direct and Indirect: DSRSD

Interest Inflation Term
 6% 3% 30

PW Factor 19.2463
 AM Factor 0.072649

| Cost Item | Indirect (Seasonal Storage) | |
|-----------------------------------|-----------------------------|-----------------------|
| | Low | High |
| Tertiary Capacity | \$ - | \$ - |
| Advanced Treatment (MF/UV/RO) | \$ - | \$ - |
| Storage | \$ 43,520,000 | \$ 43,520,000 |
| Pipelines and Pump Stations | \$ 21,870,000 | \$ 42,330,000 |
| <i>subtotal</i> | <i>\$ 65,390,000</i> | <i>\$ 85,850,000</i> |
| Project Construction (25%) | \$ 16,347,500 | \$ 21,462,500 |
| <i>subtotal</i> | <i>\$ 81,737,500</i> | <i>\$ 107,312,500</i> |
| Engineering Planning/Design (10%) | \$ 8,173,750 | \$ 10,731,250 |
| Construction Management (10%) | \$ 8,173,750 | \$ 10,731,250 |
| Program Implementation (10%) | \$ 8,173,750 | \$ 10,731,250 |
| Total Capital Cost | \$ 106,300,000 | \$ 139,500,000 |
| O&M | \$ 5,000,000 | \$ 5,000,000 |
| Yield, af | 6,200 | 6,200 |
| Amortized, \$/af | \$ 2,100 | \$ 2,400 |

Recycled Water - Direct and Indirect: Unit Costs

| Item | B&C, 2003. Recycled Water Use for Ag. November | | | | GA, 2002. Cope Lake Eng. Services. March. | | | | Zone 7 Demineralization Facility | | | | HSE, 1999. Plsnt RW Feasibility Study. November. | | | | Zone 7 Non-Potable Study | | | |
|--|--|---------|---|---------|---|-------|--------------|-------|----------------------------------|---------|--------------|---------|--|---------|--------------|---------|--------------------------|---------|--------------|--------------------|
| | 2003 Dollars | | 2010 Dollars | | 2002 Dollars | | 2010 Dollars | | 2009 Dollars | | 2010 Dollars | | 2009 Dollars | | 2010 Dollars | | 2005 Dollars | | 2010 Dollars | |
| | Unit Cost | Units | Unit Cost | Units | Unit Cost | Units | Unit Cost | Units | Unit Cost | Units | Unit Cost | Units | Unit Cost | Units | Unit Cost | Units | Unit Cost | Units | Unit Cost | Units |
| Secondary Supply | | | | | | | | | | | | | | | | | | | | |
| Tertiary Treatment | | | | | | | | | | | | | | | | | | | | |
| MF/UV/RO | 0.9 | \$M/mgd | 1.1 | \$M/mgd | | | | | | | | | | | | | | | | |
| Storage | 3.1 | \$M/mgd | 3.8 | \$M/mgd | | | | | 4.2 | \$M/mgd | 4.2 | \$M/mgd | | | | | | | | |
| Pipes, PS, Tanks (Scenario 1) | 12,800 | \$/af | 15,800 | \$/af | | | \$/af | 6,594 | \$/af | | | | | | | | | | | |
| Pipes, PS, Tanks (Scenario 2) | 1.4 | \$M/mgd | 1.7 | \$M/mgd | | | | | | | | | 0.88 | \$M/mgd | 1.2 | \$M/mgd | 2.16 | \$M/mgd | 2.477641 | \$M/mgd Scenario 2 |
| Pipes, PS, Tanks (Scenario 3) | 0.74 | \$M/mgd | 0.9 | \$M/mgd | 14000000 | | 17,805,101 | | | | | | 0.84 | \$M/mgd | 1.2 | \$M/mgd | | | | |
| O&M (Scenario 1) | 0.89 | \$M/mgd | 1.1 | \$M/mgd | | | | | | | | | 0.90 | \$M/mgd | 1.3 | \$M/mgd | | | | |
| O&M (Scenario 2) | 1,290 | \$/af | 1,592 | \$/af | | | | | | | | | | | | | | | | |
| O&M (Scenario 3) | 616 | \$/af | 760 | \$/af | | | | | | | | | | | | | | | | |
| Alternative 2 (Sunol + Pleasanton): Pipe/Pumps | 506 | \$/af | 625 | \$/af | | | | | | | | | | | | | | | | |
| Alternative 2 (O&M) | | | | | | | | | | | | | | | | | | | | |
| | | Ratio | | | | | | | | | | | | | | | | | | |
| ENR (1999) | 6816.7 | 1.43 | | | | | | | | | | | | | | | | | | |
| ENR (2002) | 7644.46 | 1.27 | | | | | | | | | | | | | | | | | | |
| ENR (2003) | 7880 | 1.23 | | | | | | | | | | | | | | | | | | |
| ENR (2005) | 8462 | 1.15 | | | | | | | | | | | | | | | | | | |
| ENR (2006) | 9108.66 | 1.07 | | | | | | | | | | | | | | | | | | |
| ENR (6/2009) | 9735.67 | 0.9986 | | | | | | | | | | | | | | | | | | |
| ENR (2/2010) | 9722.17 | | | | | | | | | | | | | | | | | | | |
| Tertiary to RO Ratio | 3 to 1 | | Per B&C, 2003. Recycled Water Use for Ag. November. | | | | | | | | | | | | | | | | | |

Reduce Demineralization Losses: Amortized Costs

| | | | | | |
|-----------------------|-----------------|--|--|-----------|------|
| | Cost | | | | |
| Capital Cost | \$100,000 | Assumed planning and permit change costs | | | |
| O&M Cost | \$0 | | | | |
| | | | Interest | Inflation | Year |
| Capital Costs | \$100,000 | | 6% | 0% | 30 |
| Amortized Costs | \$7,265 | | | | |
| Annual O&M Costs | \$0 | | | | |
| Total | \$7,265 | | | | |
| Additional Yield, af | 260 | | | | |
| Additional Yield, mgd | 0.2 | | | | |
| | | | $A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$ | | |
| \$/af | \$28 | | | | |
| \$/mgd | \$31,300 | | | | |

Reduce Unaccounted-for Water: Amortized Costs

| | | |
|--------------|-----------|-------------------------------|
| | Cost | |
| Capital Cost | \$500,000 | Assumed cost of study and fix |
| O&M Cost | \$100,000 | \$80 per af pwr chem |

| | | | | |
|------------------|-----------|----------|-----------|------|
| Capital Costs | \$500,000 | Interest | Inflation | Year |
| Amortized Costs | \$36,324 | 6% | 0% | 30 |
| Annual O&M Costs | \$100,000 | | | |
| Total | \$136,324 | | | |

| | |
|-----------------------|-------|
| Additional Yield, af | 1,300 |
| Additional Yield, mgd | 1.2 |

| | |
|--------------|--------------|
| \$/af | \$100 |
| \$/mgd | \$117,500 |

$$A = PW \left[\frac{i - g}{1 - \left(\frac{1 + g}{1 + i} \right)^n} \right]$$

Reduction of Well Startup Waste: Yield Estimate

| Well ^(b) | Total Annual Discharge | | | Average |
|---------------------|------------------------|-------------|-------------|-------------|
| | 2006 | 2007 | 2008 | |
| Mocho 1 | 4.4 | 4.6 | 3.8 | 4.3 |
| Mocho 3 | 11.4 | 10.7 | 7.6 | 9.9 |
| Mocho 4 | 7.2 | 5.7 | 7.9 | 6.9 |
| Hopyard 6 | 4.0 | 2.5 | 3.0 | 3.2 |
| Hopyard 9 | 0.3 | 0.8 | 0.7 | 0.6 |
| Stoneridge | 14.6 | 3.0 | 10.1 | 9.2 |
| Total | 41.9 | 27.3 | 33.1 | 34.1 |

^(a) Data obtained from Annual Surface Water Monitoring Report prepared by WRE.

^(b) Waste from Chain of Lakes 1 and 2 is already captured in Cope Lake.