Overview of the Water Authority’s Draft 2010 Urban Water Management Plan

Water Planning Committee Workshop
February 10, 2011
Workshop Agenda

1. Introduction/Background
2. Overview of Plan Content and Coordination
3. 2035 Draft Water Demand Forecast
4. Water Use Efficiency Target (Compliance with SBX7-7)
5. Preliminary Projected Water Resources Mix
6. Scenario Planning Process to Manage Uncertainties
“And it never failed that during the dry years the people forgot about the rich years, and during the wet years they lost all memory of the dry years. It was always that way.”

“East of Eden,” John Steinbeck
San Diego region weathered past booms and busts

Source: California Employment Development Department; National Bureau of Economic Research
Events Cause Fluctuations in Water Use
Five Large Urban Agencies from FYs 1980 - 2010

- Drought
- Restrictions
- Recession
- Growth
- Conservation programs
- Drought
- Deeper recession
- Price signals
- Messaging
- Restrictions
- Weather
2010 UWMP Update: Planning in a Changing Environment

Water Demand

- Significant reductions in demand since FY 2007
  - 20% Municipal and industrial
  - 56% certified agriculture

- Concerted effort by water agencies to reduce demand
  - Concurrent with other external factors (eg: economic recession, cooler weather)

- 20% reduction urban water use by 2020
  - Will act to suppress resurgence of water demand
  - Will it be successful? – What effect on economic growth?
  - Demand hardening will intensify effect of future shortages
Planning In a Changing Environment

Water Rates

• Between 1993 – 2007 retail water rates increased at or below the rate of inflation
• Between 2007-2010 most residential customers experienced >60% increase
• Future retail rate increases will affect demand
  • 2035 demand forecast assumes continued retail rate increases above inflation
  • How will consumer rate fatigue factor into sustained increases?
Planning In a Changing Environment

Water Supply

• Bay-Delta
  • Will there be a fix?, How much water?

• Colorado River
  • QSA Litigation

• Economics of local supply
  • Cost of imported water - MWD rate litigation

• Climate change
  • Does it make a difficult situation worse?
What’s New for the 2010 UWMP

- Scenario planning to deal with uncertainties
  - Climate change
  - Regulatory/Legislative actions
  - Water supply development & conservation costs
- SBX 7-7 compliance: wholesale supplier compliance and water use efficiency target
- IRWM section
Important Definitions

- Local supply categories
  - verifiable
  - planned
  - conceptual
- Water Use Efficiency = Conservation and Recycling
  - Passive or code based conservation = savings are permanent
  - Active or program conservation = savings decay over time
- Water Use Efficiency Target: 20% by 2020 GPCD
Important Definitions

- **Near Term Annexations**
  - Probable annexations identified by member agencies

- **Accelerated Forecasted Growth**
  - Future residential development identified in SANDAG forecast but not included in current Land Use general Plans

- **SB 221 and SB 610**
  - Legislation linking land use approvals to planning for available water supply
2010 UWMP
Overview of Plan Requirements and Coordination

Kelley Gage
Preparation of the Water Authority’s 2010 UWMP

- Update required by law every 5 years
- Purpose and importance has grown since first required 25 years ago
- Includes detailed information (actions, steps, schedule) on future supply development
- Includes elements of drought management planning
- Coordination with member agencies critical element
Benefits of Preparing an UWMP

- Document existing and future supplies available to reliably meet demands
- Utilize as supporting document in preparation of water supply assessments/verifications under SB 610 & 221
- Required to be eligible to receive funding or drought assistance from state
Contents of the Water Authority’s 2010 UWMP

Sec 1: Regulatory Overview & Water Authority Background

Sec 2: Water Demands including Water Use Efficiency Targets

Sec 3: Demand Management including Wholesaler Compliance with SBX7-7
Contents of the Water Authority’s 2010 UWMP (cont.)

Sec 4-6 Supplies:
- Water Authority
- Member Agency
- MWD

Sec 7 Water Quality

Sec 8 IRWM Discussion - Linkage to Regional Plans
Contents of the Water Authority’s 2010 UWMP (cont.)

Sec 9 Water Supply Reliability

Sec 10 Scenario Planning: Climate Change & Other Uncertainties

Sec 11 Shortage Contingency Planning
UWMP Coordination

**Member Agencies**
- Staff workgroup and MAM meetings
- Data collection to date: local supplies, annexations, billing information
- Coordination on draft UWMP & demands

**Internal**
- Staff coordination meetings
- Scenario Planning process

**DWR**
- Webinars: Draft Guidebook & SBX7-7
- Workshop scheduled March 7, 2011
2010 UWMP
Draft 2035 Water Demand Forecast

Tim Bombardier
SANDAG 2050 Regional Growth Forecast

- 1992 Memorandum of Agreement between SANDAG and Water Authority
- Series 12 Forecast approved by SANDAG Board in Feb-2010
- New forecast includes:
  - Updated economic outlook based on current recession
  - General/Specific plan updates approved since last forecast
  - Compliant with SB-375 requirement for sufficient housing to meet projected housing demand
## SANDAG Series 12 Projected Demographic & Economic Growth between 2015 and 2035

<table>
<thead>
<tr>
<th>Forecast Variable</th>
<th>Growth - Water Authority Service Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>+634,945</td>
</tr>
<tr>
<td>Single-Family Housing Units</td>
<td>+34,960</td>
</tr>
<tr>
<td>Multi-Family Housing Units</td>
<td>+175,315</td>
</tr>
<tr>
<td>Employment Counts</td>
<td>+277,648</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>+$14,417</td>
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</table>
Comparison of SANDAG Series 10 and Series 12 Forecasts for the Year 2030

<table>
<thead>
<tr>
<th>Forecast Variable</th>
<th>Series 10</th>
<th>Series 12</th>
<th>Variance</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>3,703,243</td>
<td>3,758,933</td>
<td>-55,690</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>-1.5%</td>
</tr>
<tr>
<td>Population</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>737,059</td>
<td>713,416</td>
<td>-23,643</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-3.2%</td>
</tr>
<tr>
<td>Single-Family Housing Units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>513,444</td>
<td>570,863</td>
<td>57,419</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>+11.2%</td>
</tr>
<tr>
<td>Multi-Family Housing Units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,812,779</td>
<td>1,682,102</td>
<td>-130,677</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-7.2%</td>
</tr>
<tr>
<td>Employment Counts</td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Water Authority Service Area
Baseline Forecast Structure

- Econometric model CWA-MAIN
- SDCWA forecast = sum of member agency level projections
- Forecast generated by major sector
  - Single-family
  - Multi-family
  - Non-residential
  - Agriculture
CWA-MAIN Modeling Approach

- Models use a “rate of use x driver variable” approach

- Rate of use factors
  - Income
  - Price
  - Weather

- Predictive drivers of demand
  - Housing units
  - Employment counts
  - Agricultural acres

\[
Q_{SDCWA} = \sum_j Q_{MA} \\
Q_{MA} = \sum_i N_i \cdot q_i \\
q_i = f(x)
\]
Draft Normal Year Baseline Total Demand Forecast (TAF)

<table>
<thead>
<tr>
<th>Year</th>
<th>Baseline Demand without Price Effect</th>
<th>Baseline Demand with Price Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>722</td>
<td>775</td>
</tr>
<tr>
<td>2025</td>
<td>789</td>
<td>846</td>
</tr>
<tr>
<td>2030</td>
<td>849</td>
<td>909</td>
</tr>
<tr>
<td>2035</td>
<td>901</td>
<td>965</td>
</tr>
</tbody>
</table>
### Draft Projected Normal Year Baseline Demand Excluding Future Conservation (AF)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline M&amp;I Forecast</strong></td>
<td>582,000</td>
<td>662,000</td>
<td>728,000</td>
<td>787,000</td>
<td>838,000</td>
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<tr>
<td><strong>Agricultural Forecast</strong></td>
<td>55,000</td>
<td>50,000</td>
<td>48,000</td>
<td>47,000</td>
<td>46,000</td>
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<tr>
<td><strong>SAWR Program Agricultural</strong></td>
<td>30,000</td>
<td>27,000</td>
<td>26,000</td>
<td>26,000</td>
<td>25,000</td>
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<tr>
<td><strong>Full Service (M&amp;I) and Local Agricultural</strong></td>
<td>25,000</td>
<td>23,000</td>
<td>22,000</td>
<td>21,000</td>
<td>21,000</td>
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<tr>
<td><strong>Known Future Annexations</strong></td>
<td>6,000</td>
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<td>6,000</td>
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<tr>
<td><strong>Accelerated Forecasted Growth</strong></td>
<td>2,000</td>
<td>4,000</td>
<td>7,000</td>
<td>9,000</td>
<td>11,000</td>
</tr>
<tr>
<td><strong>Total Baseline Demand</strong></td>
<td>645,000</td>
<td>722,000</td>
<td>789,000</td>
<td>849,000</td>
<td>901,000</td>
</tr>
</tbody>
</table>
2010 UWMP
SBX7-7 Retail Compliance

Toby Roy
Conservation Goals: Past and Current

- **Past:**
  - Implement BMPs, estimate widget/activity based savings

- **Current:**
  - Urban retail water supplier sets targets using one of four methods
Target: Approach No. 1

- 10-15 year baseline
- 80% of baseline
- Excludes all recycled water
- May exclude Ag or process water
- Minimum 5% from 5 year baseline
Target: Approach No. 2

- Water Budget Approach
  - Indoor: 55 gpcd
  - Outdoor: Per Landscape ordinance
  - CIH: 10% reduction from baseline
- Minimum 5% reduction from 5 year baseline
- Consider if no room for savings
Target: Approach No. 3

- 95% of 2020 Hydrologic Region Target:
  (Region 4: 0.95 X 149 = 142)
- Minimum 5% reduction from 5 year baseline
Target: Approach No. 4

- DWR Provisional Proposal
  - Indoor: Reduce to 85% saturation of devices
  - CII: 10% reduction
  - Landscape and water loss: 21.6% reduction

- May be revised in 2014
Member Agency Targets

- Initial assumption:
  - Member agency target calculated based on Method 1
  - Equated to an estimated 167 GPCD in 2020
  - GPCD target fixed after 2020

- Will update based on member agency calculations
### Meeting Retail Compliance SBX7-7

**Preliminary Target for Planning Purposes (AF)**

<table>
<thead>
<tr>
<th>Selected Target</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water-Use Efficiency Target (Includes Existing Recycled)</td>
<td>---</td>
<td>47,000</td>
<td>77,000</td>
<td>100,000</td>
<td>119,000</td>
</tr>
</tbody>
</table>

**Meeting the WUE Target:**

| Additional Verifiable Recycled<sup>1</sup> | 15,000 | 19,000 | 25,000 | 28,000 | 32,000 |
| Additional Conservation Requirement          | ---    | 28,000 | 52,000 | 72,000 | 87,000 |
| Additional Planned Recycled<sup>2</sup>       | 800    | 18,000 | 22,000 | 22,000 | 22,000 |
| Potential Additional Conservation Requirement | ---    | 10,000 | 30,000 | 50,000 | 64,000 |

1. Verifiable projects are those that at a minimum have completed CEQA compliance, obtained permits, and funding is identified in agency’s CIP for construction.

2. Additional Planned Project are those projects which the agency is expended funds to develop.
2010 UWMP
Projected Resources Mix and Scenario Planning Process

Dana Friehauf
2010 UWMP - Preliminary Projected Resource Mix

- Developed in coordination with member agencies
- Generated based on following factors:
  - SBx7-7 conservation targets
  - “Verifiable” member agency information on projected local supplies
  - Water Authority QSA supplies
  - Completion of proposed regional seawater desalination facility in Carlsbad
  - MWD supplies
    - Supplemental in normal weather years
    - Allocation based on preferential right in dry years
Local Supplies - Recycled Water
Existing, Verifiable and Planned (AF)

Data provided by member agencies.
Local Supplies - Brackish Groundwater
Existing, Verifiable and Planned (AF)

Data provided by member agencies.
Local Supplies – Seawater Desalination
Existing, Verifiable and Planned (AF)

Data provided by member agencies.
## Projected Mix of Resources (AF, Normal Year)

### Verifiable Local Supplies

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
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<td>---</td>
<td>28,000</td>
<td>52,000</td>
<td>72,000</td>
<td>87,000</td>
</tr>
<tr>
<td><strong>Total Demands w/ Conservation</strong></td>
<td>645,000</td>
<td>694,000</td>
<td>737,000</td>
<td>777,000</td>
<td>814,000</td>
</tr>
</tbody>
</table>

### Supplies to Meet Demands

#### Member Agency Supplies

- **Surface Water**: 59,000
- **Groundwater**: 12,000
- **Brackish Groundwater**: 16,000
- **Recycled (WUE Target)**: 41,000

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Member Agency Supplies</strong></td>
<td>128,000</td>
<td>132,000</td>
<td>137,000</td>
<td>141,000</td>
<td>145,000</td>
</tr>
</tbody>
</table>

#### Water Authority Supplies

- **QSA Transfer Supplies**: 180,000
- **Proposed Regional Seawater Desalination**: 56,000
- **MWD**: 281,000

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Authority Supplies</strong></td>
<td>517,000</td>
<td>562,000</td>
<td>600,000</td>
<td>636,000</td>
<td>670,000</td>
</tr>
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</table>

#### Total Supplies:

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
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<td>694,000</td>
<td>737,000</td>
<td>777,000</td>
<td>814,000</td>
</tr>
</tbody>
</table>
## Alternative Projected Resources Mix (AF, Normal Year)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
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<td>722,000</td>
<td>789,000</td>
<td>849,000</td>
<td>901,000</td>
</tr>
<tr>
<td><strong>SBX7-7 Additional Conservation</strong></td>
<td>---</td>
<td>&gt;10,000</td>
<td>&gt;30,000</td>
<td>&gt;50,000</td>
<td>&gt;64,000</td>
</tr>
<tr>
<td><strong>Total Demands w/ Conservation</strong></td>
<td>645,000</td>
<td>712,000</td>
<td>759,000</td>
<td>799,000</td>
<td>837,000</td>
</tr>
</tbody>
</table>

### Supplies to Meet Demands

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Member Agency Supplies</strong></td>
<td>129,000</td>
<td>180,000</td>
<td>189,000</td>
<td>193,000</td>
<td>197,000</td>
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<tr>
<td><strong>Verifiable Projects</strong></td>
<td>128,000</td>
<td>132,000</td>
<td>137,000</td>
<td>141,000</td>
<td>145,000</td>
</tr>
<tr>
<td><strong>Additional Planned Projects</strong></td>
<td>800</td>
<td>48,000</td>
<td>52,000</td>
<td>52,000</td>
<td>52,000</td>
</tr>
<tr>
<td><strong>Additional Groundwater</strong></td>
<td>0</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td><strong>Additional Recycled (Including IPR)</strong></td>
<td>800</td>
<td>18,000</td>
<td>22,000</td>
<td>22,000</td>
<td>22,000</td>
</tr>
<tr>
<td><strong>Otay WD Seawater Desalination</strong></td>
<td>0</td>
<td>25,000</td>
<td>25,000</td>
<td>25,000</td>
<td>25,000</td>
</tr>
<tr>
<td><strong>Water Authority Supplies</strong></td>
<td>516,000</td>
<td>532,000</td>
<td>570,000</td>
<td>606,000</td>
<td>640,000</td>
</tr>
<tr>
<td><strong>QSA Transfer Supplies</strong></td>
<td>180,000</td>
<td>270,000</td>
<td>280,000</td>
<td>280,000</td>
<td>280,000</td>
</tr>
<tr>
<td><strong>Proposed Regional Seawater Desalination</strong></td>
<td>56,000</td>
<td>56,000</td>
<td>56,000</td>
<td>56,000</td>
<td>56,000</td>
</tr>
<tr>
<td><strong>MWD</strong></td>
<td>280,000</td>
<td>206,000</td>
<td>234,000</td>
<td>270,000</td>
<td>304,000</td>
</tr>
<tr>
<td><strong>Total Supplies:</strong></td>
<td>645,000</td>
<td>712,000</td>
<td>759,000</td>
<td>799,000</td>
<td>837,000</td>
</tr>
</tbody>
</table>
Preliminary Dry-Year Projected Resources Mix
MWD Allocation at Preferential Right

(1.8 MAF Total MWD Supplies)

<table>
<thead>
<tr>
<th>Year</th>
<th>Demand</th>
<th>MWD Allocation at Preferential Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>685 TAF</td>
<td>Gap</td>
</tr>
<tr>
<td>2020</td>
<td>765 TAF</td>
<td>Carry-over storage</td>
</tr>
<tr>
<td>2025</td>
<td>836 TAF</td>
<td>Local Dry Supply (verifiable)</td>
</tr>
<tr>
<td>2030</td>
<td>900 TAF</td>
<td>QSA Transfer Supplies</td>
</tr>
<tr>
<td>2035</td>
<td>955 TAF</td>
<td>Regional Seawater Desalination</td>
</tr>
</tbody>
</table>
Why Scenario Planning?

- Standard planning method to deal with uncertainty
  - Develops small but wide range of scenarios to test and make planning decisions more comprehensive
  - Highly transparent, easily implemented
  - Avoids “black box” issue

- Selected from 2010 Water Utility Climate Alliance White Paper on decision support planning methods

- Utilized by other state and local water agencies

- Assist in compliance with UWMP Act Reliability Assessment
2010 Urban Water Management Plan

Major Steps in Scenario Planning Process

**Projected Resources Mix**
- Develop in coordination with member agencies

**Uncertainty Scenarios**
- Based on critical uncertainties
- Risk assessment of resources mix
- Identify “supply gap”

**Potential Strategies**
- Qualitative and quantitative
- Manage uncertainties
- Fill potential “supply gap”

**Key Tracking Metrics**
- Metrics to track implementation of resource mix and potential need for strategies
- Avoid over investment
## Critical Uncertainties that influence Key Issue (Supply Reliability)

<table>
<thead>
<tr>
<th>Sources of Gradual Change and Uncertainty</th>
<th>Sources of Sudden or Short-term Change and Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Shift</strong></td>
<td><strong>Droughts</strong></td>
</tr>
<tr>
<td>Growth deviates from SANDAG Forecast</td>
<td>Severity, timing, and frequency</td>
</tr>
<tr>
<td><strong>Climate Change</strong></td>
<td><strong>SWP Regulatory Restrictions</strong></td>
</tr>
<tr>
<td>Impacts from long-term changes in temperature and rainfall</td>
<td>Regulatory restrictions are put in place that further limit supply availability</td>
</tr>
<tr>
<td><strong>State Water Project Reliability</strong></td>
<td></td>
</tr>
<tr>
<td>Willingness to pay for Delta fix</td>
<td></td>
</tr>
<tr>
<td><strong>Local supplies not developed as planned</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table format adapted from DWR California Water Plan Update 2009, Chapter 5

Table provides summary of critical uncertainties to be used for scenario planning. Doesn’t include all the uncertainties water planners face, but focuses on issues that are associated with supply planning reliability.
Selected Scenarios Based on Uncertainties (Dry-Year)

1. Limited MWD Supplies
2. Limited MWD and Member Agency Local Supplies
3. Limited MWD, Member Agency Local Supplies and Water Authority Local Supplies
4. Climate Change (Qualitative Analysis)
5. Demographic Shift (Qualitative Analysis)

NOT PROJECTIONS: Serve as “what-if” situations for planning purposes
Scenario 1: MWD Supplies Limited
2030 Projected Water Resources Mix
(Single Dry Year)

Projected Dry-Year Demands:
900,000 AF

- MWD (P.R. 1.5 MAF) 281,000 AF
- Carryover storage 30,000 AF
- SBx7-7 Conservation 72,000 AF
- Local Supply (dry & verifiable) 102,000 AF
- Regional Seawater Desalination 56,000 AF
- QSA 280,000 AF

Supply Gap 78,000 AF
Scenario 2: Limited MWD and Local Supplies

2030 Projected Water Resources Mix
(Single Dry Year)

Projected Dry-Year Demands:
900,000 AF

Supply Gap 86,000 AF

- MWD (P.R. 1.5 MAF) 281,000 AF
- Carryover Storage 30,000 AF
- SBx7-7 Conservation 102,000 AF
- Local Supply (dry-year & existing) 65,000 AF
- Regional Seawater Desalination 56,000 AF
- QSA 280,000 AF

Continued SBx7-7 compliance requires additional conservation of 30,000 AF to replace recycling assumed not to occur.
Scenario 3: Limited MWD, Member Agency and Water Authority Local Supplies

2030 Projected Water Resources Mix
(Single Dry Year)

Projected Dry-Year Demands:
900,000 AF

Supply Gap 142,000 AF

- MWD (P.R. 1.5 MAF) 281,000 AF
- Carryover storage 30,000 AF
- SBx7-7 Conservation 102,000 AF
- Local Supply (dry-year & existing) 65,000 AF
- QSA 280,000 AF

Continued SBx7-7 compliance requires additional conservation of 30,000 AF to replace recycling assumed not to occur.
# Potential Common Strategies

Strengthen Projected Resource Mix Implementation and Manage Uncertainty Scenario

<table>
<thead>
<tr>
<th>Potential Water Authority Policy/ Program Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State Water Project</strong></td>
</tr>
<tr>
<td>Advocate for near-term actions and permanent Delta Fix</td>
</tr>
<tr>
<td><strong>Colorado River - Quantification Settlement Agreement</strong></td>
</tr>
<tr>
<td>Defend QSA against existing and potential litigation</td>
</tr>
<tr>
<td><strong>Member Agency Local Projects</strong></td>
</tr>
<tr>
<td>Technical Assistance</td>
</tr>
<tr>
<td>Local Projects Development funding</td>
</tr>
<tr>
<td>Advocate federal/state agencies for funding and minimizing regulatory constraints</td>
</tr>
<tr>
<td><strong>Water Conservation</strong></td>
</tr>
<tr>
<td>Offer programs that encourage long-term behavior changes</td>
</tr>
<tr>
<td><strong>Climate Change</strong></td>
</tr>
<tr>
<td>Encourage focused scientific research to identify impacts on supplies</td>
</tr>
</tbody>
</table>
## Proposed Adaptive Strategies to Manage Uncertainty Scenarios

<table>
<thead>
<tr>
<th>Potential Adaptive Supply Projects (Alternative Sources to fill gap)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Member agency Additional Planned Projects</strong></td>
</tr>
<tr>
<td>Recycled (includes IPR projects)</td>
</tr>
<tr>
<td>Brackish groundwater</td>
</tr>
<tr>
<td>Seawater desalination (Otay WD Binational Project)</td>
</tr>
<tr>
<td><strong>Water Authority Additional Planned Projects</strong></td>
</tr>
<tr>
<td>Camp Pendleton Seawater Desalination Project</td>
</tr>
<tr>
<td><strong>Additional Water Authority Dry-Year Supplies</strong></td>
</tr>
<tr>
<td>Transfers, Additional Carry-over Storage</td>
</tr>
</tbody>
</table>
Final Step: Key Tracking Metrics

- Track progress on implementation of projected resource mix and need for adaptive management strategies
- Key metrics identified in 2010 UWMP and monitored through annual water supply reports
- Example of tracking metric for 2012 annual supply report:
  - Is recycled water development on track to assist in achieving 2020 SBX7-7 UWMP targets?
- Complete update of resource mix would occur every 5 years through UWMP update
Tracking Metric: SBX7-7 GPCD Target
(Potable Demand: Excludes Recycling)
<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special CWA Water Planning Committee workshop</td>
<td>Feb. 10, 2011</td>
</tr>
<tr>
<td>Member agency manager’s meeting</td>
<td>Feb. 15, 2011</td>
</tr>
<tr>
<td>Member agency technical review of Water Authority draft 2010 UWMP</td>
<td>Late Feb. /Early Mar. 2011</td>
</tr>
<tr>
<td>DWR 2010 UWMP workshop at CWA office</td>
<td>Mar. 7, 2011</td>
</tr>
<tr>
<td>Draft 2010 UWMP distributed to Board &amp; public for review and comment</td>
<td>Apr. 26, 2011</td>
</tr>
<tr>
<td>Public hearing on draft 2010 UWMP</td>
<td>May 26, 2011</td>
</tr>
<tr>
<td>CWA Board adoption of 2010 UWMP</td>
<td>Jun. 23, 2011</td>
</tr>
<tr>
<td>Submit adopted 2010 UWMP to DWR</td>
<td>Jul. 23, 2011</td>
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</tbody>
</table>