The San Diego Water Plan – Solutions for a Drought Vulnerable Region

The Western Coalition of Arid States June 19, 2014

> Maureen A. Stapleton, General Manager San Diego County Water Authority



San Diego County Water Authority

- Wholesale water agency created by State Legislature in 1944

 - 24 member agencies
 35-member board of directors
 - Serves 3.1 million people and region's \$191 billion economy

Service area

- 950,000 acres
- 97% of county's population
- Imports ~80% of water used in San Diego County
- Builds, owns, operates and maintains regional water infrastructure
- Largest member agency of Metropolitan Water District of Southern California





Average Annual Precipitation in the Southwest

30-year normal precipitation Period: 1981-2010



Water Authority

10.77"-





Early Struggles for Water Supply Reliability: Pluviculture

- Dec. 1915: San Diego in multi-year drought
- City Council hires Rainmaker Charles Hatfield, aka "moisture accelerator"
 - \$10,000 "no rain, no pay" contract to "fill Morena Reservoir"
 - Devised potion and put in "rainmaking tower"
- Inspired 1956 film The Rainmaker



Charles Hatfield, 'Rainmaker'

Did it Work?

- Jan. 15–20, 1916, heavy rain throughout county
 - 17" fell in the mountains
 - San Diego River rose 6'
 - Mission Valley flood a mile wide
 - Roads and bridges wiped out
- Jan. 25-30: 14" fell
 - Sweetwater Dam damaged
 - Lower Otay Dam swept away
 - Bridges, railroads, highways, telephone lines destroyed
 - 14 people killed
- Wettest two weeks on record
- Hatfield was never paid

Charles Hatfield climbs his rainmaking tower at Morena Dam

 City Council assigned Hatfield responsibility for \$3.5 million in flood damages





Before the Water Authority

- 1926 City of San Diego stakes claim to water right on the Colorado River (112,000 acre-feet)
 - City Attorney placed claim in tin can in rock pile beside river
 - Studied building aqueduct from Imperial Valley to San Diego
 - Paid for capacity in All American Canal



World War II:

- Long-time home of Pacific Fleet (before Honolulu)
- 1st Marine Division at Camp Pendleton



- Major center for warplane manufacturing
- Between 1940 and 1944, San Diego's population doubled from 300,000 to 600,000
 - Water use also doubled
- Growth in population, wartime demands and drought threaten to outstrip water supply



- Water Authority formation
 - June 9, 1944: San Diego County Water Authority organizes after an election (May 16, 1944) within the nine original member public agencies
 - Options being studied for aqueduct include connecting to:
 - All American Canal to the east
 - Metropolitan Water District of Southern California's Colorado River Aqueduct to the north



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- Water Authority formation – Nov. 29, 1944: President Franklin D. Roosevelt issues directive:
 - U.S. Navy to build pipeline connecting MWD's Colorado River Aqueduct to City of San Diego's justcompleted San Vicente Reservoir in Lakeside
 - Annexation to MWD

THE WHITE HOUSE

WASHINGTON

November 29, 1944



Mr. Phil D, Swing, 604 San Diego Trust and Savings Bank, San Diego, California

Enclosure

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ANTILA VISTA, CRIIFURNIA, STEDAN, DRIVERINEN S. 1945

• Nov. 5, 1946, election:

VIL REAL

 Voters in Water Authority service approve annexation into Metropolitan MWD and related items

Colorado Water Approved With 18

Dec. 17, 1946: Water
 Authority annexes into
 Metropolitan Water District
 of Southern California

Returns of 12 to 1 Make Future Secure

five Crats

In a tremendous flood of votes, San Diego's water program was ratified at Tuesday's election by a majority of more than 12 to 1, returns showed last night.

The vote immediately set in motion machinery for completing the Colorado river enterprise started by the city in 1926, when it applied for allocation of such water and the Boulder dam project, which was conceived in 1922.

J. L. Burkholder, manager-engineer of the San Diego County Water authority, announced contracts would be signed with the Metropolitan Water district, of Los Angeles, for membership of the authority in the district long before Dec. 31, the deadline date set by M.W.D.

- Nov. 26, 1947: first Colorado River water flows into San Diego County at the San Vicente Reservoir
 - San Diego had less than three weeks of water supply left

San Diego County Water Authority

Needed River Water Arrives

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Water Authority Becomes MWD's Largest Customer – and Major Source of Revenue

- By 1949, the Water Authority is buying half of all MWD water supplies
 - MWD's Colorado River Aqueduct had become operational in 1941, but MWD had low water sales



MWD's Colorado River Aqueduct

San Diego County Water Supply 1991

<u>Local Supplies</u> 26,000 AF 5%

Metropolitan Water District 552,000 AF 95%

Total = 578,000 AF



History Repeats Itself: 1987–92 Drought





Shortage Allocations 1990-1992: 31% Shortage for 13 months

Stages of MWD's Interim Interruptible Conservation Program (Shortage Allocation Plan)



San Diego Civic Leaders Demand

"Never Again!"

State to Shut Off

Limits on

50% Water-Delivery Cut

"No More Water Shortages!"

State Water Project cuts on water to failing, un built of a

Water: Authority to Vote Today on Mandatory Restrictions



Reliability Through Diversification

- Employ resource strategies unique to local conditions
- No single resource strategy can manage all uncertainties
- Multi-faceted approach required
 - Conservation
 - New supplies
 - Supply diversification
 - Infrastructure improvements







2003 Quantification Settlement Agreement

- Water Authority secures new, more reliable Colorado River supplies
 - Imperial Irrigation District transfer
 - 200,000 AF/year for 45 to 75 years
 - Canal–lining projects
 - 80,000 AF/year for 110 years
- 8 Years in negotiations
- By 2021, 34% of region's supply
 - Provides 180,000 acre-feet in 2013



Lining the Coachella Canal



IID and Canal Lining Deliveries 2003-2021

Calendar Year

Investments in Local Supplies

- Carlsbad Seawater
 Desalination
 - 50 mgd seawater desalination project
 - Largest seawater desalination facility in North America
 - Expected on-line by early 2016



Local Supply Development – Advancements in Technology









Increasing Conservation and Local Water Supplies (Acre-Feet)



Next Increment of Water Supply

- City of San Diego Pure Water: 96,000 AF/year
- North County Recycled Water Program: up to 33,000 AF/year
- Padre Dam Advanced Purification Program: up to 3,000AF/year









City of San Diego's Advanced Water Purification Facility



Investing in Major Water Infrastructure: \$3.5 billion



Pipeline 2: *"The Last Pipe"* Investing in Water Infrastructure



Investments in Reliable Infrastructure: \$3.5 Billion Capital Improvement Program

- \$1.5 billion Emergency Storage Project
- New and expanded surface storage
- Water treatment
- Canal linings
- Pipelines
- Pump stations
- Power generation
- Aqueduct Protection Program
 - Pipeline relining program



Project: Olivenhain Dam & Reservoir Approved: 1998 Complete: 2003 Cost: \$198 million Benefit: 24,800 AF of storage



Project: All American & Coachella Canal Lining Projects Approved: 2003 Complete: 2010 (AAC) and 2006 (CC) Cost: \$448 million total, including \$190 million from Water Authority Benefits: 80,200 AF/Y for 110 Years

Project: Twin Oaks Water Treatment Plant Approved: 2005 Complete: 2008 Cost: \$179 million Benefit: 100 MGD advanced membrane treated supply for region

Project: Lake Hodges Projects Approved: 1998; Pumped Storage added 2002 Complete: 2013 Cost: \$196 million Benefits: 20,000 AF ESP storage; 40MW of power

Project: San Vicente Tunnel & Pipeline System Approved: 1998 Complete: 2011 Cost: \$393 million Benefit: Key link in Emergency Storage Project



Project: Pipeline Relining Program Approved: 1993 Complete: Ongoing Cost: \$780 million Benefit: Extend the life of 82 miles of large-diameter imported water pipeline by 75 years

Project: San Vicente Dam Raise Approved: 1998; CSP added 2003 Complete: 2014 Cost: \$450 million Benefit: 152,000 AF of new storage

Infrastructure Investments





Paying for Major Infrastructure Investments: Annual Debt Service Payments through 2050



*Includes debt service payments on existing senior and subordinate issuances

Historic Investments in Infrastructure

San Vicente Dam Raise & Related Projects \$843 million



Carlsbad Seawater Desalination Pipeline Projects \$239 million Plant Site

Olivenhain Dam & Reservoir \$198 million



Twin Oaks Valley Water Treatment Plant \$179 million



All-American & Coachella Canal Lining Projects \$447 million (\$190 million from the Water Authority)



Pipeline Relining \$786 million



Lake Hodges Projects \$204 million



Increasing San Diego County's Water Supply **Reliability through Supply Diversification**



Keys to Success

- Know your customer
 - Education
 - Outreach
- Lean into Discomfort
 - New era in water
 - Uncertain future
- Don't believe the Naysayers
 - Public agency risk aversion
- Perseverance
 - Not for the faint of heart





Bay Delta Conservation Plan Asking the tough questions. Waiting for answers.



Bay-Delta Conservation Plan (BDCP) Preferred Project: Twin Tunnels



BDCP Estimate: \$25 billion





Water Authority's BDCP Review Process

- Years-long Board and staff education process on BDCP proposal and related issues
 - 31 public meetings since July 2011
- Intensive, multi-disciplinary staff analysis of BDCP environmental and planning documents
- Water Authority comment letter submitted May 30, 2014



BDCP Plan and EIR/EIS



Water Authority's BDCP Analyses

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MWD's Largest Customer: San Diego County Water Authority Cutting MWD Purchases by 66%

- 1990: 672,800 acre-feet
- > 2013: 297,000 acre-feet
- > 2020: 231,000 acre-feet: 66% less than 1990



Southern California Plan to Reduce Their Reliance on Imported Water

Southern California's Local Water Supply Development Plans (2012 - 2035)



San Diego's Water Future: Imported or Local?

1. Continue to Rely on Imported Supplies?

BDCP Cost to S.D Ratepayers ¹	Potential Restored Imported Water Supplies
\$1.1 Billion to \$2.2 Billion	54,000 to 76,000 AF/Year ²

2. Invest in New Local Water Reuse Supplies?

City of San Diego	New, Drought–Proof,
Pure Water Project	Local Water Supplies
\$2 Billion to \$2.2 Billion ³	96,000 AF/Year

North County	New, Drought–Proof,
Recycled Water Program	Local Water Supplies
\$364 Million to \$665 Million	18,000 to 33,000 AF/Year

¹ Assumes BDCP cost estimates are accurate and costs are divided among water contractors in proportion to each contractor's water supply contract. ² Average annual restored Bay-Delta yield based upon BDCP estimates and the Water Authority's preferential right to MWD supplies. ³ Capital cost only.



What San Diegans say Invest in Local Supplies or Bay Delta?



Unanswered Questions

- 1. How big does the project need to be?
- 2. How much will it cost?
- 3. How much water will San Diego get?
- 4. What is the portion of the cost San Diego will be obligated to pay?



- 5. Who is going to commit to pay for it?
- 6. How will Water Authority ratepayers be protected from paying disproportionate share of BDCP costs?
- 7. Will the costs of BDCP to San Diego ratepayers negatively impact local supply development?

San Diego Count



2014 Water Supply Conditions

2014: Third Consecutive Dry Year



Water Authority

Lake Oroville – State Water Project Reservoir – July 2011 100% Capacity, 131% Average



Lake Oroville – Principal SWP Reservoir – January 2014 36% Capacity, 55% Average



2012-2014 Drought



San Diego Average Daily Maximum Temperature (Lindbergh Field) – Departure from Normal (°F)



2012-2014 Drought

May 1, 2014 Northern Sierra Snow Survey: 7% of Average



2012-2014 Drought

Average Water Year Statewide Runoff



San Diego County Water Authority

