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Working Toward a Sustainable Water Supply Solution 2019 AEP Conference

PRESENTED BY: Rosemary Menard, Ron Duncan and Brian Lockwood Ann Sansevero (Moderator)

March 25, 2019

Overview

01 Rosemary Menard, Water Director, Santa Cruz Water Department

02 Ron Duncan, General Manager, Soquel Creek Water District

03 Brian Lockwood, General Manager Pajaro Valley Water Management Agency

City of Santa Cruz Water Supply Augmentation Strategy

Association of Environmental Professionals March 25, 2019

Our Water, Our Future



Santa Cruz is located about 75 miles south of San Francisco, with the city water utility serving about 100,000 customers inside and outside the city limits.





According to the 2008 book, "The Leftmost City"

- From the late 1960s until recently, Santa Cruz, California was the most politically progressive medium-sized or large city in the United States.
- A coalition of liberal and progressive interests stopped every major development project they didn't like after 1969 and controlled the City Council from 1981 through the beginning of the 21st century.
- By 2010, the progressive coalition was in decline due to a lack of burning issues and new ideas to energize it.



... And then, the Santa Cruz Water Department proposed building a small desalination plant to address a 40 year old water supply reliability problem.

 Things started to come unglued during the 2011 public review and City Council adoption of the 2010 update to the City's Urban Water Management Plan;

• And rapidly went down hill from there....

For those of us who have been around awhile, we know that

- Getting a big project done, especially a water supply project, is fraught with pitfalls;
- Some kind of meltdown near the end of the project (and sometimes even earlier) isn't the exception, it's the rule.







Santa Cruz anti-desal activists achieved a major strategic victory by successfully amending the City Charter in November 2012 to require a public vote on desal

• "ONLY MEASURE P WILL GUARANTEE THE RIGHT TO VOTE ON DESALINATION because it will place a provision in the City Charter that cannot be changed solely by elected officials."

Election Result	Votes	Percentages
Yes	19,124	72.13%
No	7,389	27.87%

• And, they followed up this victory by actively attacking the Draft Environmental Impact Report issued for public review and comment in the spring of 2013.

Ultimately, the focus of the desal meltdown was about:

Alternatives and transparency

And the real and/or perceived issues surrounding both



PAVING THE WAY FOR DESALINATION

In mid-2013, the Santa Cruz City Council decided to step back and reconsider...

Ultimately deciding to appoint a citizens committee to provide recommendations on how to solve the City's longstanding water supply reliability problem.

Water Supply Advisory Committee April 2014 – October 2015

- 14 citizens appointed by the City Council
- Interests represented included: inside and outside city water customers, the Chamber, **Coastal Watershed** Council, Desal Alts, Sierra Club, Surfrider, Sustainable Water Coalition, the Water Commission and 3 community-at-large members.



WSAC Members not pictured: Peter Beckman and Charlie Keutmann

The 20-year water demand forecast, including projected growth and consistency with the City's General Plan, is FLAT



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The projected worst year gap is BIG – peak season shortage with agreed fish flows is 1.2 billion gallons



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WSAC's Problem Statement July 2015

- Limited Storage
- Need to meet fish flow requirements and prepare for potential climate change impacts
- Resulting peak-season gap: ≈1.2 billion gallons worst-year shortage
- Water conservation alone is not enough

Our Water, Our Future: the October 2014 "Santa Cruz Water Supply Convention," showcased more than 40 water supply solutions and attracted 350 people

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Sustainable

Water Coalitio

Nearly 100 Alternative Water Supply Solutions Identified and Screened

- Expanded conservation, e.g.,
 - Peak season demand reduction
 - Water neutral development
- Decentralized systems, e.g.,
 - Graywater
 - Rainwater catchments
 - Water from humidity in the air
- Winter flow harvest, e.g.,
 - Passive and active recharge
 - Water transfers and exchanges
- Water reuse
 - Various approaches to non-potable and potable reuse
- Desalination
 - Various locations and technological approaches to seawater desalination

WSAC Supply Augmentation Recommendations

- Implement additional water conservation efforts
- Explore the feasibility of winter water harvest to create drought supply of 3 billion gallons to provide for 2 years of back to back drought
 - In-lieu water transfers/exchange with Soquel Creek
 Scotts Valley and/or San Lorenzo Valley water districts
 - Aquifer storage and recovery (ASR) in the Santa Margarita and/or Santa Cruz Mid-County Basins
- Explore the feasibility of alternative water supplies to supplement existing sources during droughts
 - Recycled water
 - Desalination

IMPLEMENTING THE WSAC RECOMMENDATIONS

Passive Recharge: In Lieu: Transfers & Exchanges

- **Concept:** Wet season water transfers and/or exchanges with Soquel Creek, Scotts Valley and/or San Lorenzo Valley water districts;
- Groundwater is "passively stored" based on districts not pumping their wells;
- Storage volumes limited by demands of 3 districts, with assumed wet season average demands of:

SqCWD	SVWD	SLVWD	Total
2.3 mgd	1.3 mgd	o.9 mgd	4.5 mgd

Current Status of In-Lieu

- Pilot transfers initiated with the Soquel Creek Water District on December 3, 2018 and continuing at this time.
- Continuing discussions with other agencies about their ongoing interest in water transfers.
- Continuing to refine groundwater modeling work to determine benefits to the basin(s) and ability to return water to Santa Cruz when needed for drought supply.

Active Recharge: Aquifer Storage and Recovery

• Concept: store wet season available flows in regional aquifers for future use during drought.

Current Status of Aquifer Storage & Recovery

- Completed Phase I technical analyses – No Fatal Flaws;
- Used modeling to confirm water availability to meet drought supply needs and establish preliminary infrastructure sizing;
- Pilot testing of ASR in the western Purisima ongoing at this time.

June 2018 Recycled Water Study

September 2017

Looked at about ~40 alternatives for using recycled water.

Two small projects for non-potable reuse recommended and multiple potable reuse options continue to be evaluated.

Kennedy/Jenks Consultants

Recycled Water Alternatives Analyzed

Seawater Desalination Update

- Following WSAC's recommendations, the City conducted a feasibility update for desalination with a focus on costs, timeliness and changed conditions since 2013.
- Changed regulatory conditions include a new requirement to evaluate and implement sub-surface intakes for desalination plants, if feasible.
- Completed work in August 2018.
- In November 2018 the City Council approved the Department's recommendation to de-prioritize desal due to changed regulatory conditions.

Our Water, Our Future SANTA CRUZ Water Departmen

Working Toward a Sustainable Water Supply Solution AEP March 25, 2019

Long and Winding Road

WHY: Seawater Intrusion

Connect - Humanizing the Situation

Process Matters – 30%

Soquel Creek Water District's Exploratory Discussions on Water Reduction and Back-Up Water Supply Options

Soquel Creek Water District relies entirely on groundwater for its water supply which is overpumped and experiencing seawater intrusion, a condition that allows seawater to enter and contaminate the groundwater supply.

The District has been evaluating a joint seawater desalination project with the City of Santa Cruz since 2007 but is also exploring back-up options.

For more information visit www.soquelcreekwater.org/exploratory-discussions or call 831-475-8500 or email melanies@soquelcreekwater.org

Created With Our Community, For Our Community

Our Path to a Reliable Water Supply Conservation - Groundwater Management - New Water Supplies

2017 Progress Report

PUREWater Soquel

Replenishing Mid-County Groundwater

Pure Water Soquel Cost

- Project Cost Estimate: \$90M
- Grants awarded:
 - \$75K SWRCB Feasibility Study (FS)
 - \$150K US Bureau of Reclamation FS
 - \$2M SWRCB Planning Grant -Prop. 1
- Potential grants:
 - Up to \$50M SWRCB Construction Grant
 - Up to \$20M US Bureau of Reclamation
- Costs with Grants = \$20M (\$90 \$70M = \$20M)

Pure Water Soquel Proposed Timeline

Evaluate:
2015-2018CEQA
Completed
Dec. 2018Permit, Design,
& Construct:
2019-2023Center
Construct:
2019-2023

Goal to Replenish the Basin: 2040



Plan vs. Strategy





Outward Looking

scanning the landscape

<u>SEPTEL</u>

• Social, Economic, Political, Technological, Environmental, Legal



Inward Focus strategy design and strategy delivery

- Both equally important
- Design is headed and delivery is humanistic
- About the right people and team evolution



Identify and Address Critical Success Factors Example: Water Quality



SOQUEL CREEK WATER DISTRICT

Disruption – be ready







Ron Duncan, GM

Soquel Creek Water District rond@soquelcreekwater.org



Stakeholder Driven Water Resources Management, Pajaro Valley Groundwater Basin

Association of Environmental Professionals State Conference

March 25, 2019

Presented by: Brian Lockwood, PG, CHg General Manager



Pajaro Valley Water Management Agency

Presentation Overview

- Acknowledgements
- Background
- SGMA
- Basin Management Planning
- Summary





Pajaro Valley Water Management Agency

- Formed by the CA State Legislature in 1984
- Our Job: Achieve Sustainable Groundwater Resources
- Multi-jurisdictional: City of Watsonville, parts of Santa Cruz, Monterey and San Benito Counties
- Basin Management Planning, Well Metering, Hydrologic Modeling, Supplemental Water, Conservation







Sustainable Groundwater Management Act

Sustainable Groundwater Management Act

- The Sustainable Groundwater Management Act or SGMA (September 2014) requires that high priority, critically overdrafted groundwater basins such as the Pajaro Valley be brought into balance by 2040.
- If not, the State Water Resources Control Board may intervene and may impose pumping restrictions.



Pajaro Valley Water & SGMA

- PV Water Est. 1984
- Basin Management Plans (aka Groundwater Sustainability Plan???) in 1999, 2002, 2014
- SGMA Adopted, Fall 2014
- Groundwater Sustainability Agency, Fall 2015
- Basin Boundary Modification, Spring 2016
- Groundwater Sustainability Plan - Alternative Submittal, Winter 2016
- Prop. 1 Sustainable
 Groundwater Planning Grant \$1.5 million, Spring 2018,
 pending Alternative



State of the Basin





Pajaro Valley Aquifer System

- Six Model Layers:
- Alluvium
- •Alluvial Confining Unit
- •Upper Aromas
- Aromas Confining Unit
- Lower Aromas
- Purisima



Water Use and Precipitation Trends Pajaro Valley 2000 - 2018







Prepared by PV Water on March 24, 2017. This Document is a graphic representation developed using the best currently available data sources & professional judgement.





Prepared by PVWMA on March 24, 2017. This Document is a graphic representation developed using the best currently available data sources & professional judgement.













Existing Water Supply Facilities



Grants to Fund Water Supply Projects



- Approximately half of constructed project costs were funded through grants
- PV Water projects, which focus on water conservation and optimize use of local resources, are competitive for federal and state funding

Existing Water Supply Facilities to Reduce Overdraft & Seawater Intrusion

Harkins Slough Facility

- Managed Aquifer Recharge & Recovery
- Stream flow diversion
- 8,000 AF recharged since 2002

Recycled Water Facility

- 4,000 AFY irrigation season capacity
- Drought tolerant supply
- Reduces discharge of secondary effluent to marine sanctuary
- Coastal Distribution System
 - Over 21 miles of water conveyance pipeline
 - **Blend Supplies**



Harkins Slough Managed Aquifer Recharge & Recovery

Recycled Water Facility









Increasing groundwater elevations to prevent seawater intrusion

Springfield Terrace Well Water Level, 2005 - 2018



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Water Supply Facilities

Pajaro Valley Hydrologic Model

- A hydrologic flow model to guide water management decisions
- Designed to reproduce all natural & human components of the hydrologic system, and related climatic factors
- Management & planning tool
- Offset in water budget: 12,100 AFY





Prepared in cooperation with the Pajaro Valley Water Management Agency

Integrated Hydrologic Model of Pajaro Valley, Santa Cruz and Monterey Counties, California



Scientific Investigations Report 2014–5111

U.S. Department of the Interior U.S. Geological Survey
Basin Management Planning Update

In 2010 the PV Water Board established an Ad Hoc Basin Management Plan Committee to...

"investigate all practical projects and programs that contribute to the efficient and economical management of existing and supplemental water supplies" and "serve as an advisory committee to the PV Water Board so that Board decisions are fully informed and affected and guided by the community's interests".





Pajaro Valley Water Management Agency

Basin Management Plan Update

Final • February 2014



Ad Hoc BMP Committee Members

Committee Member	Member Type	Representative Entity
Dave Cavanaugh (Chair)	Appointed	Pajaro Valley Water Management Agency
Kirk Schmidt (Vice Chair)	Appointed	Agricultural
Rosemarie Imazio	Appointed	Pajaro Valley Water Management Agency
Rich Persoff	Appointed	Pajaro Valley Water Management Agency
John Ricker	Appointed	County of Santa Cruz
Ryan Kelly	Appointed	County of Monterey
Steve Palmisano	Appointed	City of Watsonville
Harry Wiggins	Appointed	Pajaro Sunny Mesa Community Services District
John E. Eiskamp	Appointed	Santa Cruz County Farm Bureau
Dave Kegebein	Appointed	Monterey County Farm Bureau
John Martinelli	Appointed	Landowner Group
Chuck Allen	Appointed	Community Dialogue Effort
Vicki Morris	Appointed	Aromas Water District
Ron Duncan	Appointed	At Large
Thomas Karn	Applicant	Rural Residential
Bob Culbertson	Applicant	Environmental
Amy Newell	Applicant	At Large
Skip Fehr	Applicant	Mutual Water Agency
Stuart Kitayama	Appointed	Agricultural
Frank Capurro	Appointed	Agricultural
Tom Rider	Appointed	Agricultural

Basin Management Plan Update contains three primary components to achieve 12,100 ac-ft/yr

Develop new water supplies *4,100 AFY*

Conservation 5,000 AFY

Optimize the use of existing water supplies *3,000 AFY*



Proposed College Lake Integrated Resources Management Project

- Projected Yield: 1,800 to 2,400 AFY
- Water Storage Area (285 acres, 1764 AF)
- Weir Structure, Screened Intake, and Pump Station
- Water Treatment Plant (~5 acres)
- Pipeline (5.5 miles)





Source Treatment Conveyance End Users



Proposed Pipeline Alignment



 Connects College Lake to CDS and recycled water facilities at Watsonville WWTP.

 Serve agricultural uses along route.

College Lake Project Updated Schedule





Figure 13: Average Water Level Change Due to Implementing Selected Alternative – Upper Aromas Aquifer



Figure 10: Extent of Simulated Seawater Intrusion – Upper Aromas Aquifer

Summary & Future Work

- Existing water supply projects and conservation programs are working to reduce groundwater overdraft and seawater intrusion, but more are needed to eliminate these problems.
- Stakeholder involvement, through ad hoc committees in particular, has been critical to recent successes.
- Projected climate change impacts will present new challenges.
- Work just getting started includes land subsidence analysis, new streamflow monitoring sites to help answer questions pertaining to groundwater—surface water interactions, hydrologic model improvements, and developing funding for proposed projects.

Thank You...

By phone: 831-722-9292 By email: lockwood@pvwater.org Or visit our website: pvwater.org

