

# Update on the Consolidated Alternatives



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# Overarching Issues

- **Where is my favorite Alt?**
  - Good faith effort made to reflect every idea submitted
  - Many are variations on a similar theme
  - Continuing to refine, revise, strengthen
  - See Bill at the break



# Overarching Issues (cont.)

- Where and when can we get additional technical information about the Alts?
  - Costs, yields, and other key information development is in progress
  - A challenging and on-going process
  - Each iteration helps identify the most critical questions and information needs



# Using the CAs in the Portfolio Exercise

## Considerations related to Yields

- Yields not always additive
  - Some Alts may embody elements of another
  - Some Alts are substitutes for another
- Yields for added supply may be constrained by infrastructure or other factors
  - Need to run CAs through *Confluence* to better assess realistic yields



# Overview of Discussion

- Goals
- Updated state of the work
- Review of CAs

# Goals

- Capture range of high-level ideas that people from the community
- Balance need to have a manageable number of CAs
  - in terms of time, clarity, and resources

# Process and State of the Work

- Compile full list of WCAs (update continuing)
- Group similar WCAs to reduce redundancy
- Capture full breadth of project types
- Clearly demonstrate what happened to each WCA
- Summary of Pueblo work to date

## Key Preliminary Pueblo Findings (Santa Margarita/Lompico/Purisma/Aromas)

- Potential Aquifer Storage (6,900 MG)
- Potential additional annual diversion (average and wet years)
  - 565 MG
- Potential Beltz well field storage; TBD
- Potential Beltz well field additional drought production
  - TBD (possibly 1 MGD plus, based on historical production or 365 MG/year for several years)



# Discussion of CAs: Water Efficiency and Enhanced Supply

- See Consolidated Alternatives Table
- Mapping of WCAs—see spreadsheet
- Summary Sheets – see examples
- FAQs for Immature Alternatives

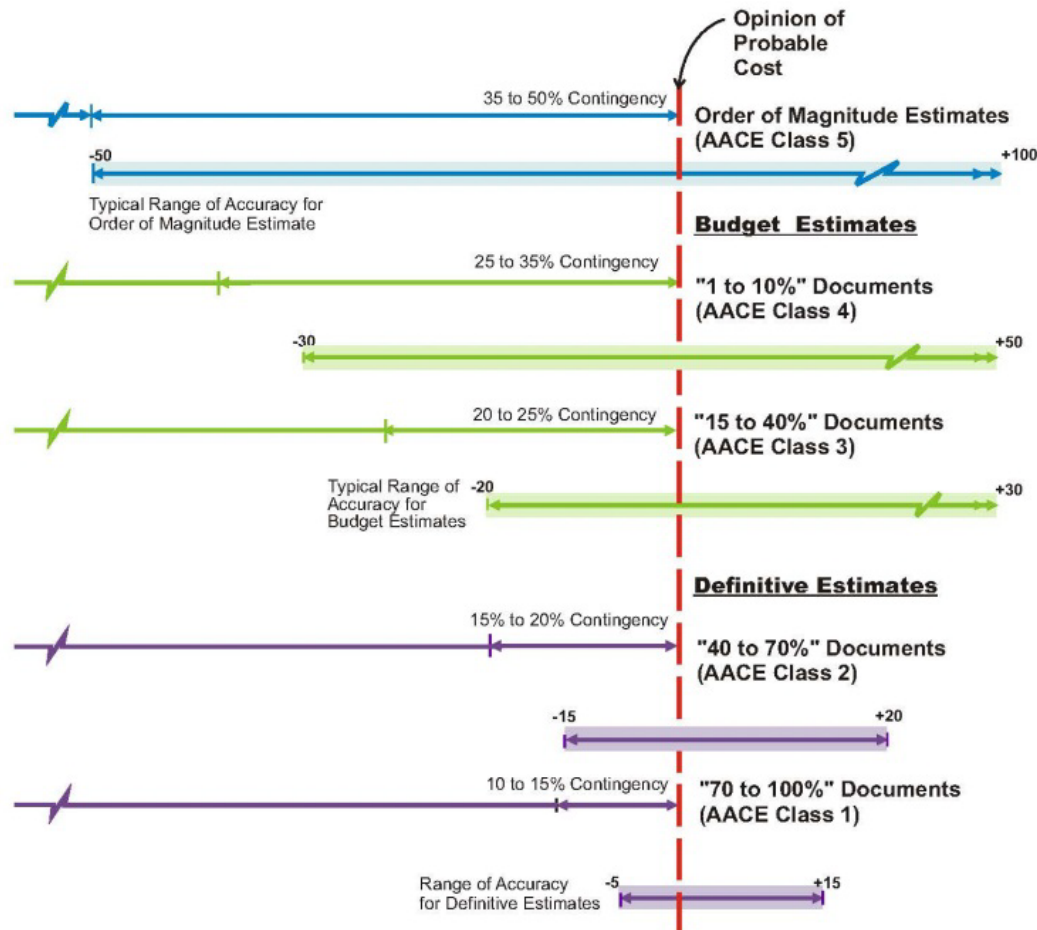


# 10-Step Process to Commercial Maturity

- Discovery
- Mathematical modeling
- Lab (Bench Scale) Testing
- Proof of concept
- Pilot testing
- Demonstration testing
- Deployment
- Infancy
- Established track record
- Commercial maturity

# Opinions of Probable Cost

## Typical Contingencies and Ranges of Accuracy



**Note:**

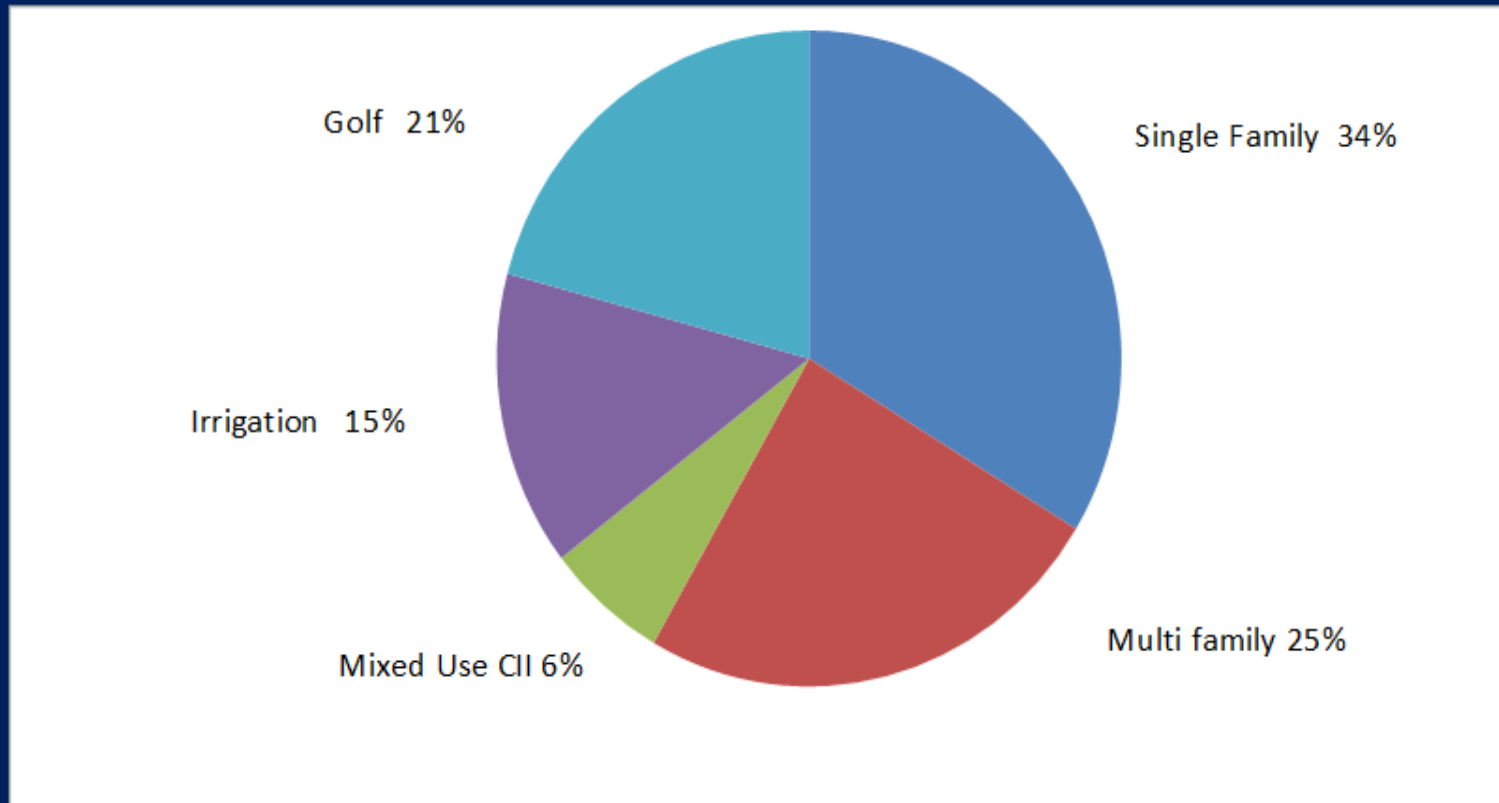
1. Contingencies shown are typical
2. Ranges of Accuracy indicated are typical values from AACE document 18R-97 (REV 02/06)

# CA1: Shaving Peak Season Demands

- Focus on cutting water uses that create the peak season demand “bulge”
- Implies a focus on irrigation
  - Turf replacement or removal as a key facet
- Drawing a lot of interest and questions
- 25% savings = 170 MG
- \$35,000/MG (based on turf replacement)



# Who has Turf in Santa Cruz



# How Much Turf Removal or Replacement Would be Needed?

Goal	Amount of city wide turf removed and replaced with <u>zero water use</u> material <sup>1</sup>	Amount of city wide turf removed and replaced with <u>low water use</u> material
Cut Peak 10%	15%	34%
Cut Peak 25%	39%	84%
Cut Peak 50%	77%	169%

<sup>1</sup> Artificial turf, bark, hard scape, etc.

## CA3: “Program C Recommended”

- Drawn from the Water Conservation Master Plan
- Updated to reflect changes, including interim demand forecast
- Large number of program elements
- Collectively saves 489 MG (in 2030), after 10-yr implementation timeline
- PV cost/MG: \$2,400/MG
- Could be accelerated (and could be part of CA1)



## CA2: Water Neutral Development

- Up to 440 MG potential savings (by 2030)
- May largely consist of accelerated savings
  - Could hit a wall in terms of savings
- Development fee mechanism
  - Essentially changes who pays for the water saving investments
  - Builders and home buyers, renters





## CA4: WaterSmart Home Water Reports

- Informs and motivates households about relative water use and opportunities to improve their water use efficiencies
- Based on results from EBMUD and elsewhere:
  - Water savings of 37 MG
  - Costs of \$896/MG saved



## CA5: Home Water Recycling

- Graywater collection, treatment, and reuse system for single family residences
- Applied to toilet flushing and irrigation
- Effectively limited to new construction of single family residences
- Estimated savings: 15.5 MG
- Cost: \$22,700/MG



# CA6: Another Graywater Idea (TBD)

## Possible Versions

- Low tech aimed at existing homes
  - E.g., laundry to landscape (L2L)
  - Available pilot study data raises questions
- Higher tech for commercial sites
  - Could be focused on specific sectors (e.g., laundries)
  - Could be more advanced (gray and blackwater systems in new buildings)



# Summary of CAs 07-19 with Preliminary Yields and Costs

CA-# and Title	Additional Water in Wet/Average Year	Drought Recovery		Preliminary Capital Cost Estimate		Preliminary NPV Estimate	Preliminary O&M Cost Estimate	Preliminary Energy Estimate
	MG/yr	MG/yr	Duration (years)	Million dollars	Million dollars/MGD	Million dollars	Million dollars/MG	kWh/MG
CA-07 Deepwater Desalination	500	1,000	4 to 5	117	85	210	0.1	13,000
CA-08 Water from Atmosphere	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CA-09 Winter Flows Capture	560	500	4 to 5	TBD	TBD	TBD	TBD	1,500
CA-10 Water Reuse for Aquifer Recharge	1,330	500	4 to 5	83	23	147	2	6,000
CA-11 Water Reuse for Direct Potable	1,330	1,830	No limit	83	23	147	2	6,000
CA-12 Water Reuse for Indirect Potable	1,330	1,330+	No limit	83	23	147	2	6,000
CA-13 Water Reuse for Non- Potable	770	770	No limit	39	13	99	1	3,500
CA-14 Desal Using Forward Osmosis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CA-15 Desalination Using Reverse Osmosis	500	1000 (500 MG/yr after 5 years)	4 to 5	115	84	207	0.1	13,000
CA-16 Aquifer Restoration/Storage	640	TBD	4 to 5	30	17	54	TBD	TBD
CA-17 Expand Treatment Capacity	560	Availability of water may decrease substantially in drier years	4 to 5	52	3.7	94	TBD	1,500
CA-18 Off-Stream Water Storage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CA-19 Ranney Collectors	560	Availability of water may decrease substantially in drier years	4 to 5	16	1.3	29	0.03	1,500

# CAs to Portfolios—Time to Hatch the Eggs

