

# Wheeling of Non-Project Water Supplies



June 5, 2012

## Introduction

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### *Topic: Use of the CAP system to move Non-Project Water*

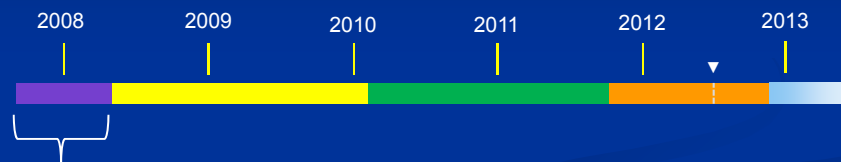
- “**Project Water**” – Colorado River water available to CAP, along with certain Agua Fria inflows captured in Lake Pleasant
- “**Non-Project Water**” – Any water other than Project Water, including Colorado River water, imported groundwater or other supplies
  
- **Agenda**
  - Introduction
  - Update on Activities and Approach
  - Issues Related to CAP Delivery Capacity
  - Next Steps
  - Discussion

## Background

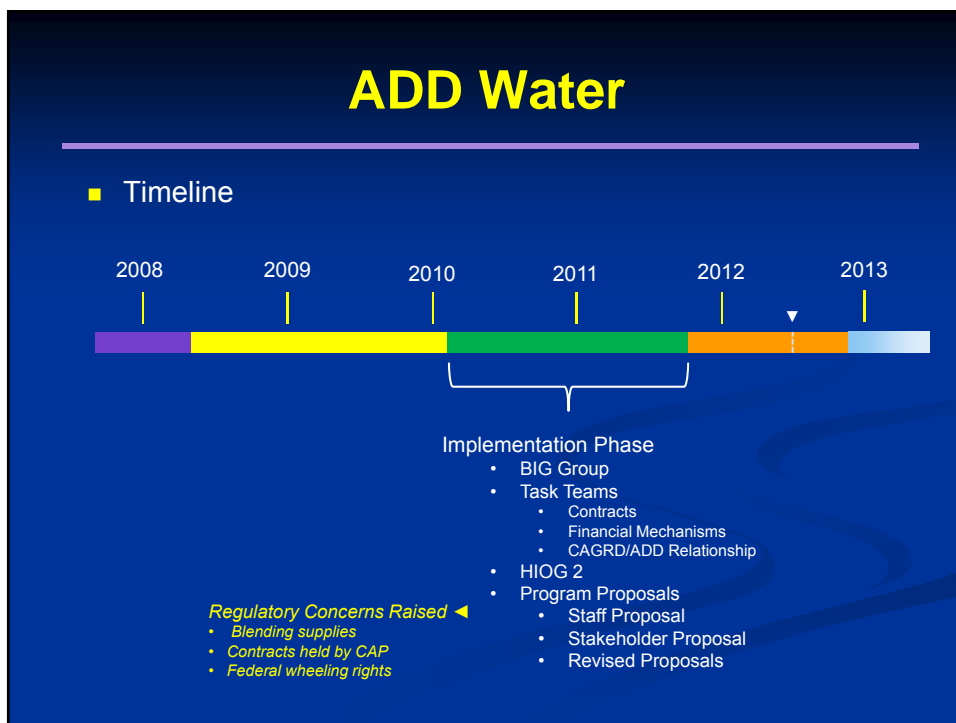
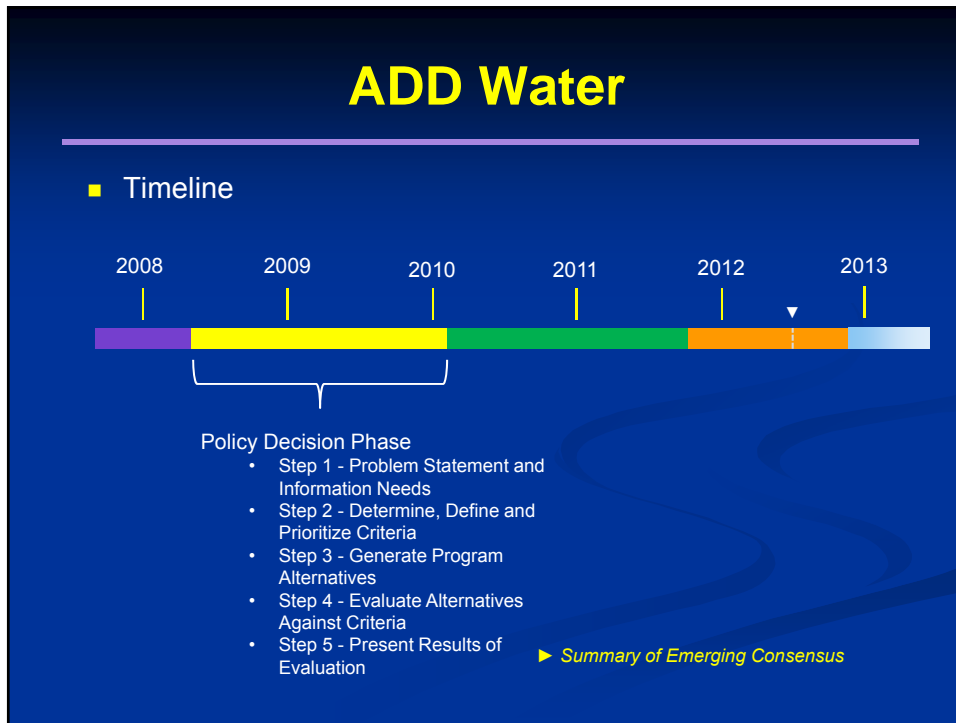
- Previous activities
  - 1983—Board Position Statement endorsing the concept of wheeling
  - 1988—Wheeling Discussion Document identifies major issues and approaches
  - 1998—Wheeling discussion related to Scottsdale water supplies
  - 2002—Project Wheel process established interim set asides
  - 2005—Water providers initiate informal discussions on new water supplies and wheeling
  - 2008—ADD Water

## ADD Water

- Timeline

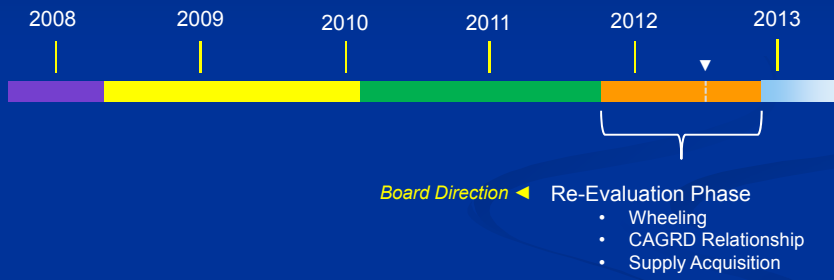


- Planning/Preparation Phase
- Internal Meetings
  - Public Participation Plan
  - Future Water Supply Evaluation
  - Project Team Meetings



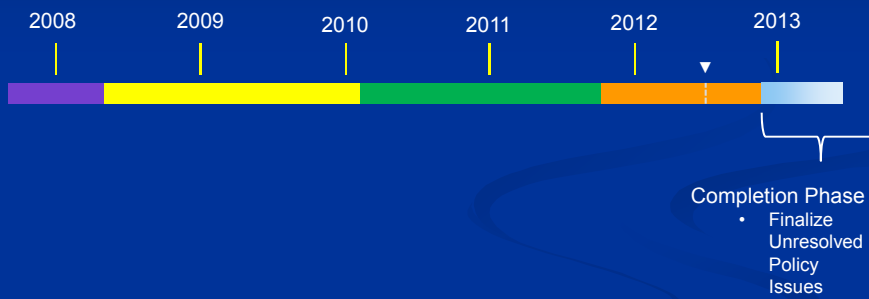
# ADD Water

## ■ Timeline

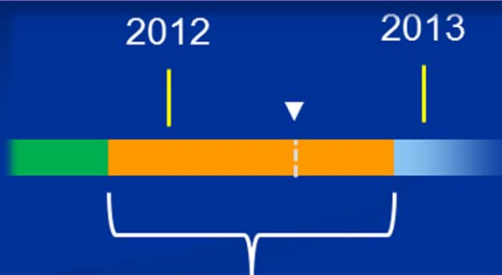


# ADD Water

## ■ Timeline



## Re-Evaluation Phase



- *Wheeling*
  - Seek solutions that are legally, operationally and institutionally appropriate
  - Begin with foundational agreements between CAP and Reclamation

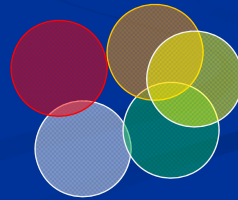
## Update on Activities and Approach

## Analytical Constraints

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### The preferred wheeling solution should...

- Ensure that long-term, reliable delivery of non-Project Water is possible under a range of future conditions
- Not interfere with Project Water deliveries
- Respect the existing framework and agreements
- Account for physical and operational constraints
- Acknowledge previous work



## General Approach

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- Review previous work and source documents
  - Boulder Canyon Project Act
  - Master Repayment Contract
  - Revised Stipulation
  - Operating Agreement
  - Adopted Board Policies
  - Project Wheel Discussion Documents
  - ADD Water Summary of Emerging Consensus
  - *Et cetera*
- Challenge assumptions
- Identify critical-path elements
- Seek workable solutions

## Master Repayment Contract

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- Contract between Reclamation and CAP
  - Executed in 1988 (superseded the 1972 Contract)
- Eleven articles covering wide range of issues, including construction, operation, delivery and payment
  - Some of those issues (notably cost) were litigated and resolved in the Revised Stipulation (2003)
- The MRC also includes specific provisions related to wheeling of non-Project Water

## Master Repayment Contract

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- **8.18 – “Wheeling Non-Project Water”**
  - After consideration of Project Water deliveries
  - Subject to availability of Project capacity
  - Pursuant to agreements between entity proposing to wheel and CAP
    - Each agreement subject to USBR approval
  - Reclamation and CAP jointly develop a “standard form of wheeling agreement”
  - Wheeling charges can cover administration and OM&R; excess charges to Development Fund

## Master Repayment Contract

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- **8.19 – “Use of Project Power to Wheel Non-Project Water”**

- Project Power may be used
- After requirements for pumping Project Water are met
- Subject to Navajo Marketing Plan

> *Project Power available, but only at market rates*

## Master Repayment Contract

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- **8.17 – “Rights Reserved to the United States to Have Water Carried by Project Facilities”**

- CAP “agrees that all project facilities will be available for the diversion, transportation, and carriage of water for Indian and non-Indian uses”
- “[P]ursuant to arrangements or contracts” with the Secretary
- CAP “shall divert, transport and carry such water...”
- Payment of capital and OM&R



## Master Repayment Contract

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- **9.3 – “Contractor’s Construction Cost Repayment Obligation”**
  - (g) “In the event that the Secretary contracts for delivery of non-project water under the provisions of Article 10.1, capital charges [shall apply].”
  
- **10.1 – “Other Contracts”**
  - “The Secretary reserves the right contract directly with other water using entities concerning water supply through project facilities.”
  - “In the event this occurs, the provisions of Article 8.17 hereof shall be applicable.”

## Initial Technical Questions

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- Definition of “availability of Project capacity” under 8.18
  - How can it be quantified?
  - What affects its magnitude?
  
- Federal rights to have water transported under 8.17
  - What is the relationship between federal rights under 8.17 and the rights of those with wheeling contracts with CAP?
  - If Reclamation approves agreements under 8.18, how are their rights under 8.17 affected?
  
- Additional capacity associated with system improvements
  - How can it be identified and quantified?
  - How does it relate to provisions of 8.17 and 8.18?

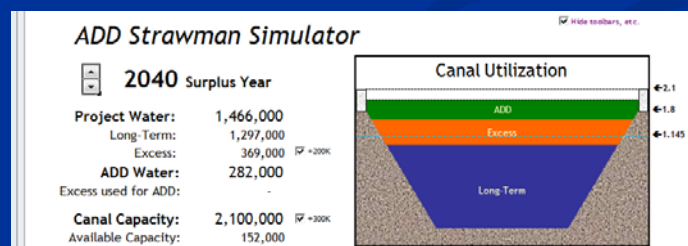
# Issues Related to CAP Delivery Capacity

## a.) Current System Capacity

## Delivery Capacity

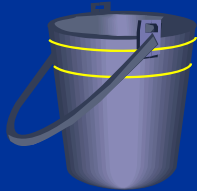
- “On an on-going basis, CAWCD will annually divert approximately 1.5 million acre-feet during normal water supply years. CAWCD staff estimates that approximately 1.8 million acre-feet of water can be safely conveyed through the CAP system on an annual basis. This yields an available system resource of roughly 300,000 acre-feet per year.”

—Discussion Document: On Issues Related to Excess Canal Capacity and Wheeling Non-Project Water, 2002



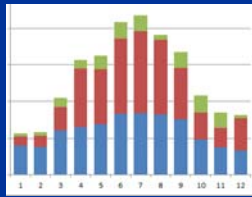
# Delivery Capacity

“Bucket”



Annual

“Schedule”



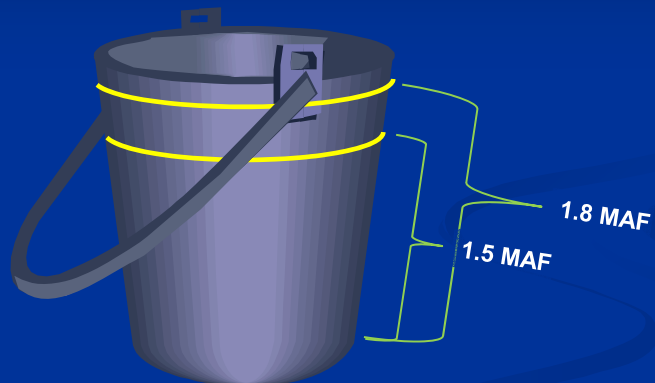
Monthly

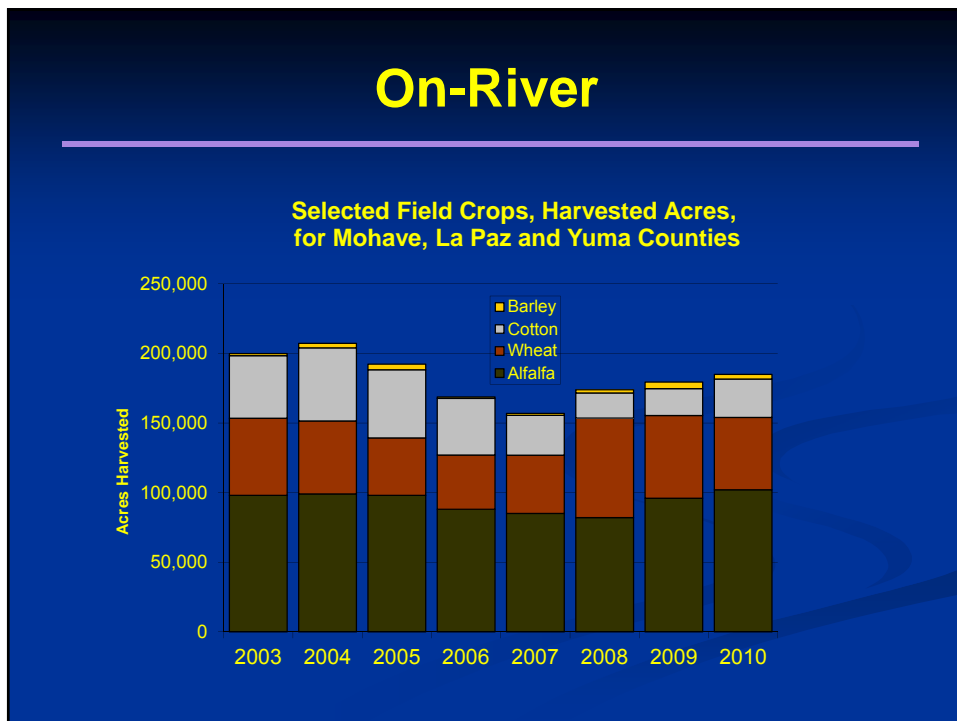
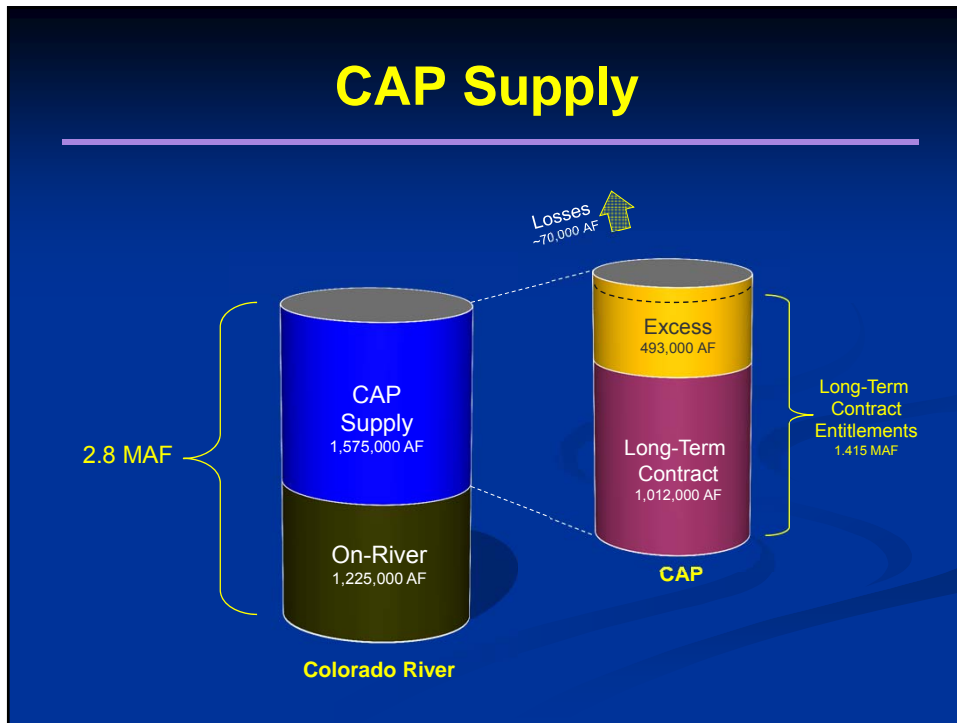
“System”



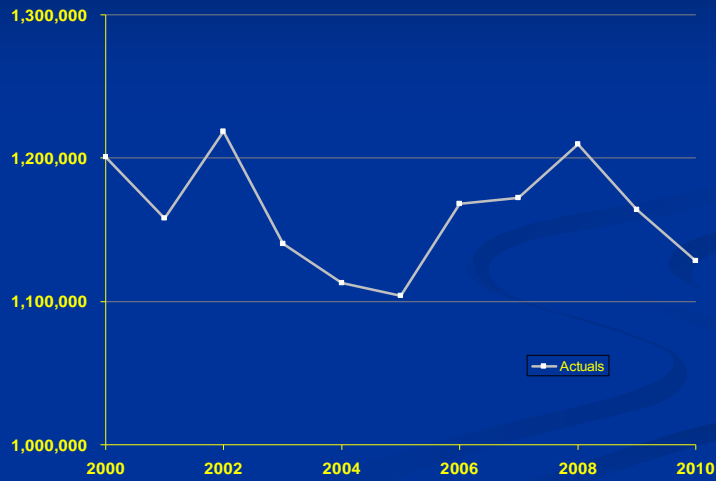
Daily

# “Bucket” View





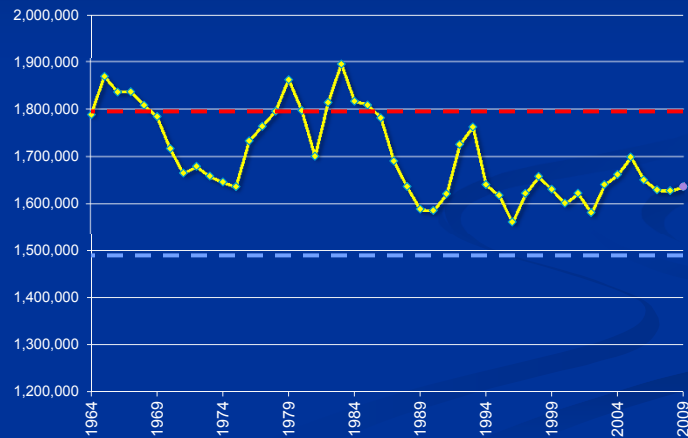
## On-River

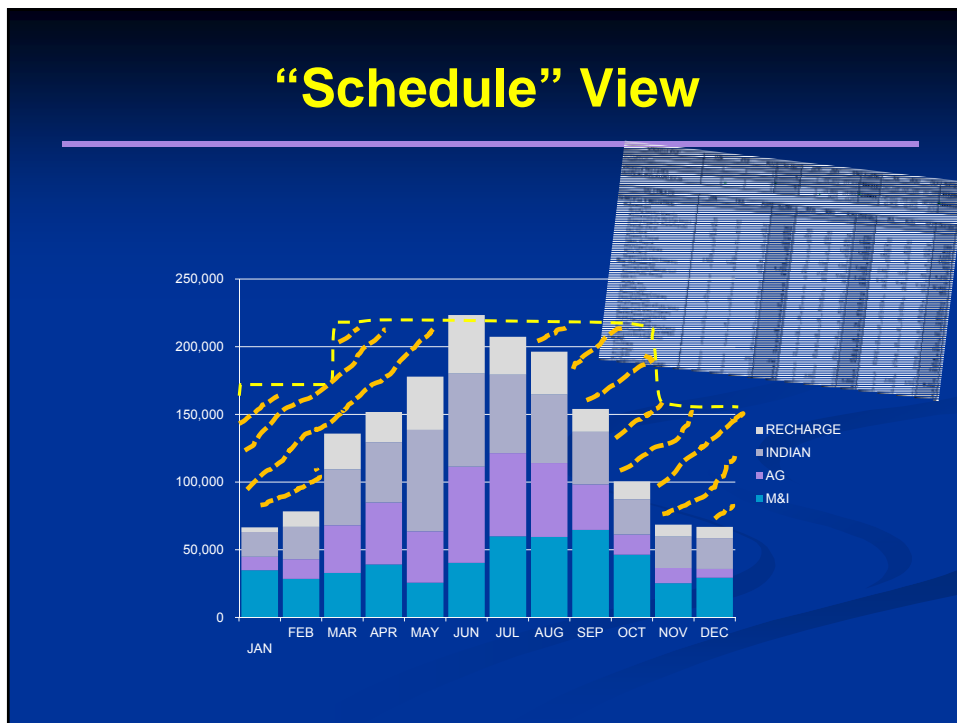
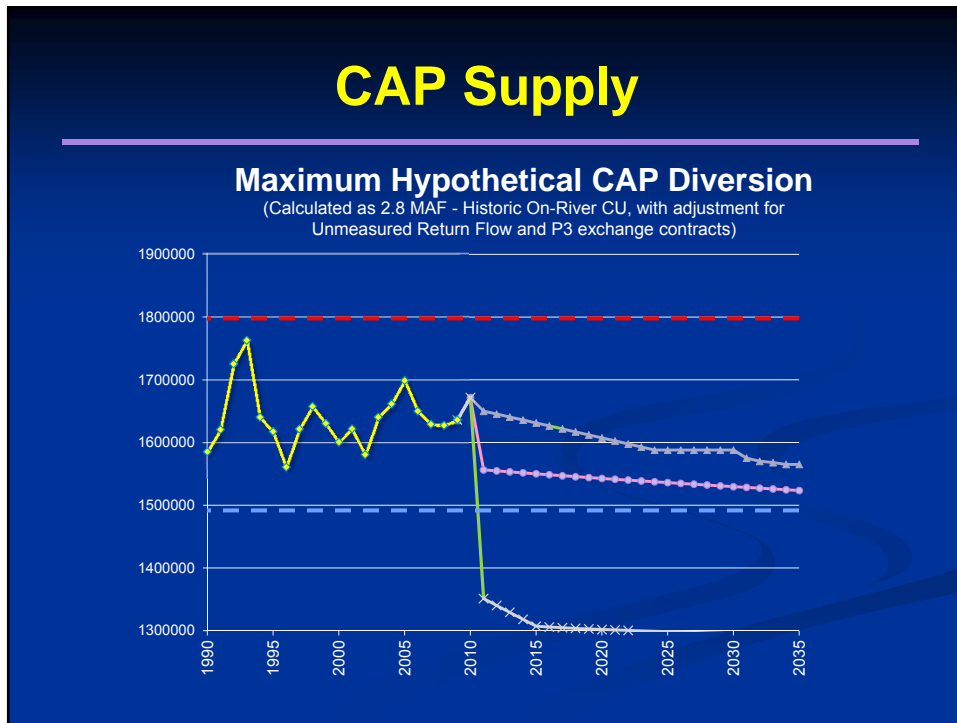


## CAP Supply

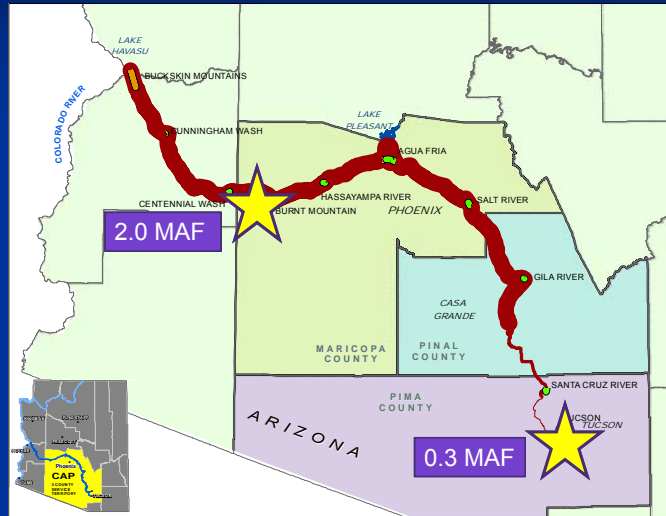
### Maximum Hypothetical CAP Diversion

(Calculated as 2.8 MAF - Historic On-River CU, with adjustment for Unmeasured Return Flow and P3 exchange contracts)

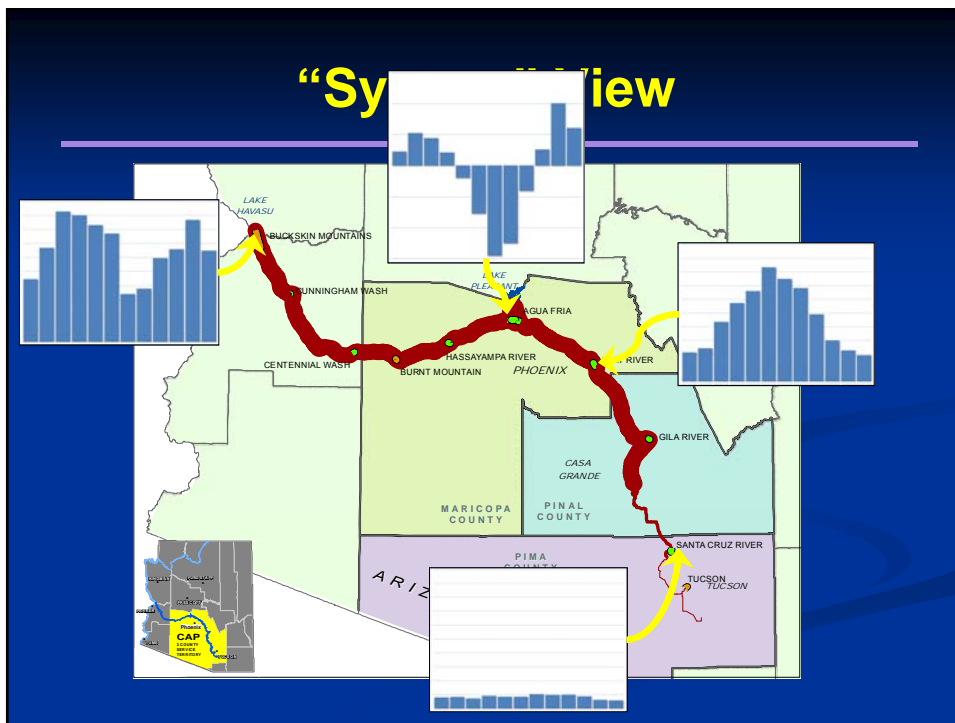




# "System" View



# "System" View



## Conclusions

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- “Capacity” is a multifactoral concept that has spatial, temporal and policy dimensions
- There is existing available capacity, but the magnitude of that capacity, both year-to-year and over longer periods of time, is uncertain
  - Project Supply
  - Maintenance
  - 8.17 Claims
- Expanding system capacity provides the clearest path for satisfying all of the analytical constraints

## Issues Related to CAP Delivery Capacity

b.) Additional System Capacity



## Additional Capacity

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- Hayden-Rhodes Aqueduct Capacity Study (2009)
  - Scope
  - Summary
- Additional Analysis
  - Update to 2009 Study
  - Alternative approaches
- Quantification Example

## Hayden-Rhodes Capacity Study

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- Task
  - Complete a feasibility study to expand the Hayden-Rhodes Aqueduct to 3600 cubic feet per second (cfs)
- Objective
  - Create a guidance document for CAP for long-term water resource planning
  - Take advantage of regular maintenance activities and capital replacements to increase system capacity
  - Create a Master Plan sequencing CAP improvement projects

## Study Scope

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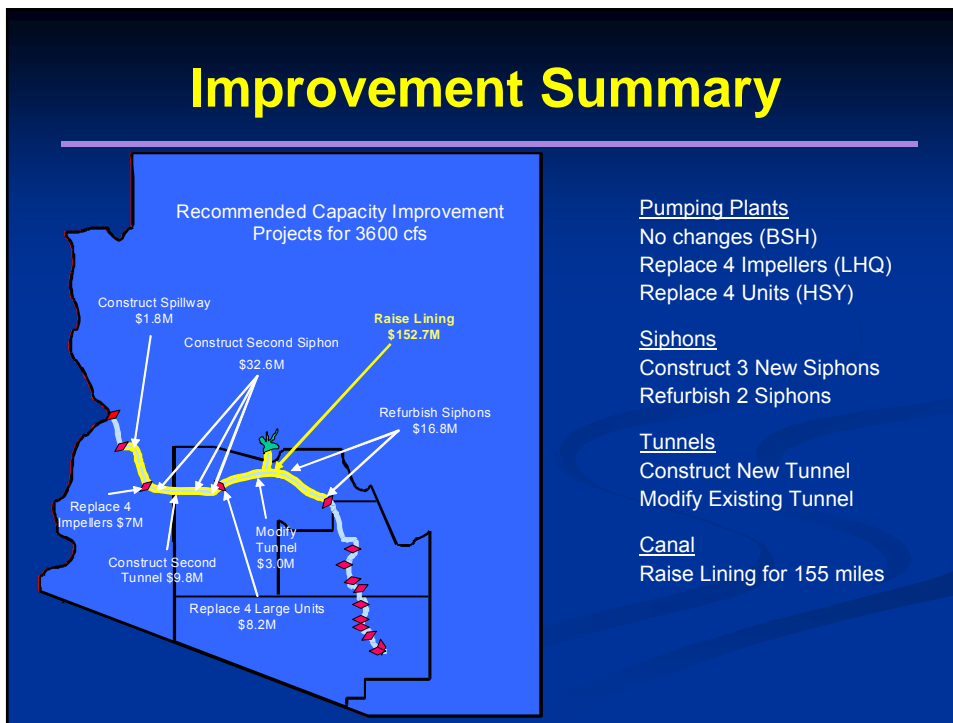
- Identify and review alternatives for expansion of major components to 3600 cfs
  - Canal Lining/Check Structures
  - Siphons
  - Tunnels
  - Pumping Plants
  - Drainage and Transportation Crossings
- Provide preliminary cost estimates for capacity improvements
  - Design and construction only, 2008 dollars
- Provide recommendations/priority for capacity projects

## Study Summary

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- 3600 cfs is feasible for Hayden-Rhodes Aqueduct
- Capacity improvements can be made by completing smaller individual projects
- Not all projects need to be completed to begin realizing system capacity benefits
- Projects that increase seasonal peak capacity or maintenance capacity will add to the total annual capacity

## Improvement Summary



**Pumping Plants**  
 No changes (BSH)  
 Replace 4 Impellers (LHQ)  
 Replace 4 Units (HSY)

**Siphons**  
 Construct 3 New Siphons  
 Refurbish 2 Siphons

**Tunnels**  
 Construct New Tunnel  
 Modify Existing Tunnel

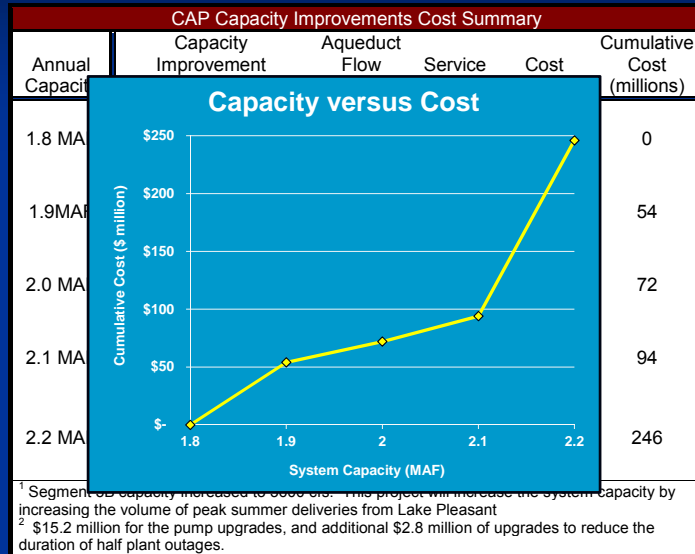
**Canal**  
 Raise Lining for 155 miles

## Cost Summary

CAP Capacity Improvements Cost Summary					
Annual Capacity	Capacity Improvement Project(s)	Aqueduct Flow Capacity	Service Factor	Cost (millions)	Cumulative Cost (millions)
1.8 MAF	None (Existing Capacity)	3000 cfs	83%	0	0
1.9MAF	Siphons and Lining for Segment 3B	3000 <sup>1</sup> cfs	88%	54	54
2.0 MAF	Plant Upgrades at Little Harquahala and Hassayampa PP <sup>2</sup>	3000 cfs	92.5%	18	72
2.1 MAF	Construct Spillways for each Segment, Centennial Siphon	3300 cfs	88%	22	94
2.2 MAF	Canal Lining Segments 1 through 3A, Construct, Modify Tunnels and Siphons	3600 cfs	85%	153	246

<sup>1</sup> Segment 3B capacity increased to 3600 cfs. This project will increase the system capacity by increasing the volume of peak summer deliveries from Lake Pleasant  
<sup>2</sup> \$15.2 million for the pump upgrades, and additional \$2.8 million of upgrades to reduce the duration of half plant outages.

## Cost Summary



## Additional Analysis

- System Demand
- Maintenance Practices
- Energy
- Updated Costs
- Alternative Approaches
- Procedures for quantification

## Quantification Example

- The relationship between specific system improvements and overall capacity is complex, and related to the timing and location of deliveries
- Simple Hypothetical Example
  - Expand Segment 3b capacity by 300 cfs
    - Current
      - At maximum capacity for 2 months
      - $300 \text{ cfs} \times 723.97 \text{ AFY/cfs} \times 2/12^{\text{th}} \text{ yr} = \underline{36,200} \text{ AFY}$  of new capacity
    - At "full use" (i.e., 1.8 MAF),
      - At maximum capacity for 8 months
      - $300 \text{ cfs} \times 723.97 \text{ AFY/cfs} \times 8/12^{\text{th}} \text{ yr} = \underline{144,800} \text{ AFY}$  of new capacity

## Issues Related to CAP Delivery Capacity

c.) Potential Agreements

## Areas Requiring Agreement

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- Initially-identified areas where agreement with Reclamation is needed
  - Annual Availability Quantification
  - System Improvement Fee
  - System Improvement Quantification
  - Standard Form of Wheeling Agreement

## Availability Quantification

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- Purpose
  - Formalize a procedure for CAP to annually determine the expected “availability of project capacity” for the upcoming year, taking into consideration Project Water supplies, customer orders and maintenance schedules.
- Related Provisions
  - “[S]ubject to availability of project capacity, non-project water may be wheeled through project facilities...” *MRC, 8.18*
  - “Deliveries of CAP Project Water, including CAP Excess Water, shall have priority to use of CAP system capacity over deliveries of ADD Water, which is non-Project Water.” *SEC, NQ1*

## System Improvement Fee

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- Purpose
  - Ensure that CAP can collect a fee for projects that add to system delivery capacity; ensure that the fee is used exclusively for those projects; prevent fee revenue from being swept into Development Fund
  
- Related Provisions
  - "All revenues from wheeling charges in excess of the OM&R costs and administrative charges shall be remitted by [CAP] to [Reclamation] and deposited into the Development Fund..." *MRC, 8.18*
  - "CAWCD will begin improvements to expand canal capacity at the start of the ADD Water Program." *SEC, NQ1*

## System Improvement Quantification

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- Purpose
  - Develop a procedure for calculating the additional annual system delivery capacity that can be attributed to a specific infrastructure improvement project; ensure that non-Project Water deliveries, up to that additional volume, are not displaced by Project Water or claims under 8.17
  
- Related Provisions
  - "After taking into consideration the water delivery requirements of contracts for project water service...non-project water supplies may be wheeled..." *MRC, 8.18*
  - "[A]ll project facilities will be available for the diversion, transportation and carriage of water...[on behalf of] the Secretary." *MRC, 8.17*
  - "Deliveries of ADD Water will have priority to use the increased canal capacity paid for by ADD Water contractors." *SEC, NQ1*

## System Improvement Quantification

- Related Provisions
  - “‘Substantial Change’ means modifications which would significantly alter the operational capabilities or performance of the Transferred Works.” *Operating Agreement (2000), 4.2.6*
  - “The District shall notify Reclamation of its intent to make any material physical change to the Transferred Works...[and Reclamation] shall determine whether the propose change is a Substantial Change.” *Operating Agreement (2000), 12.1*
  - “If [Reclamation] determines that the proposed change is a Substantial Change, the District may make the change only after receiving [Reclamation’s] written consent...” *Operating Agreement (2000), 12.1*

## Standard Form of Wheeling Agreement

- Purpose:
  - Develop standardized contract language that specifies the terms of delivery for non-Project Water; individual contracts based on that language would be tied to a specific user and supply, and would not carry any reservation of capacity
- Related Provisions:
  - “[CAP] and [Reclamation] shall jointly develop a standard form of wheeling agreement...” *MRC, 8.18*
  - “[A] wheeling agreement will be negotiated with the United States to use the CAP system to delivery water.” *SEC, Q15*



## **Standard Form of Wheeling Agreement**

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- Likely elements in standard form of wheeling agreement
  - Environmental Clearances
  - Points of Delivery and Measurement
  - Interruptions and Reductions
  - Water Quality
  - Losses
  - Scheduling
  - Administrative charges
  - OM&R charges
  - Infrastructure improvement charge

## **Next Steps**

## CAP Process

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- Technical discussions with Reclamation
- Concept drafting
- Stakeholder feedback
- Board involvement
- Initial scoping for “Completion Phase”

## Reclamation Process

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- Technical discussions with CAP
- Preparation of documents for delegation of authority
- Conformance with public participation requirements

# Discussion