

# Common Assumptions Surface Storage Project Analysis

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*Progress Report Modeling Results*

Presented to:

**BDPAC**

**Water Supply Subcommittee**

January 12, 2005

# Why are we here today?

- CALFED surface storage investigations on same modeling platform (Fall '03)
  - Information request from WSS
  - Directed to begin effort to assist potential project partners in determining project participation
  - Assist DWR in funding prioritization decisions
- Required *common model package* concept be developed

# Why are we here today?

- Review evolution of Common Assumptions effort
- Highlight results and discuss findings using first *common model package*
  - Define investigation scenarios
  - Results from
    - *Progress Report Common Model Package*
    - Project-specific models
- Discuss near-term and longer-term next steps

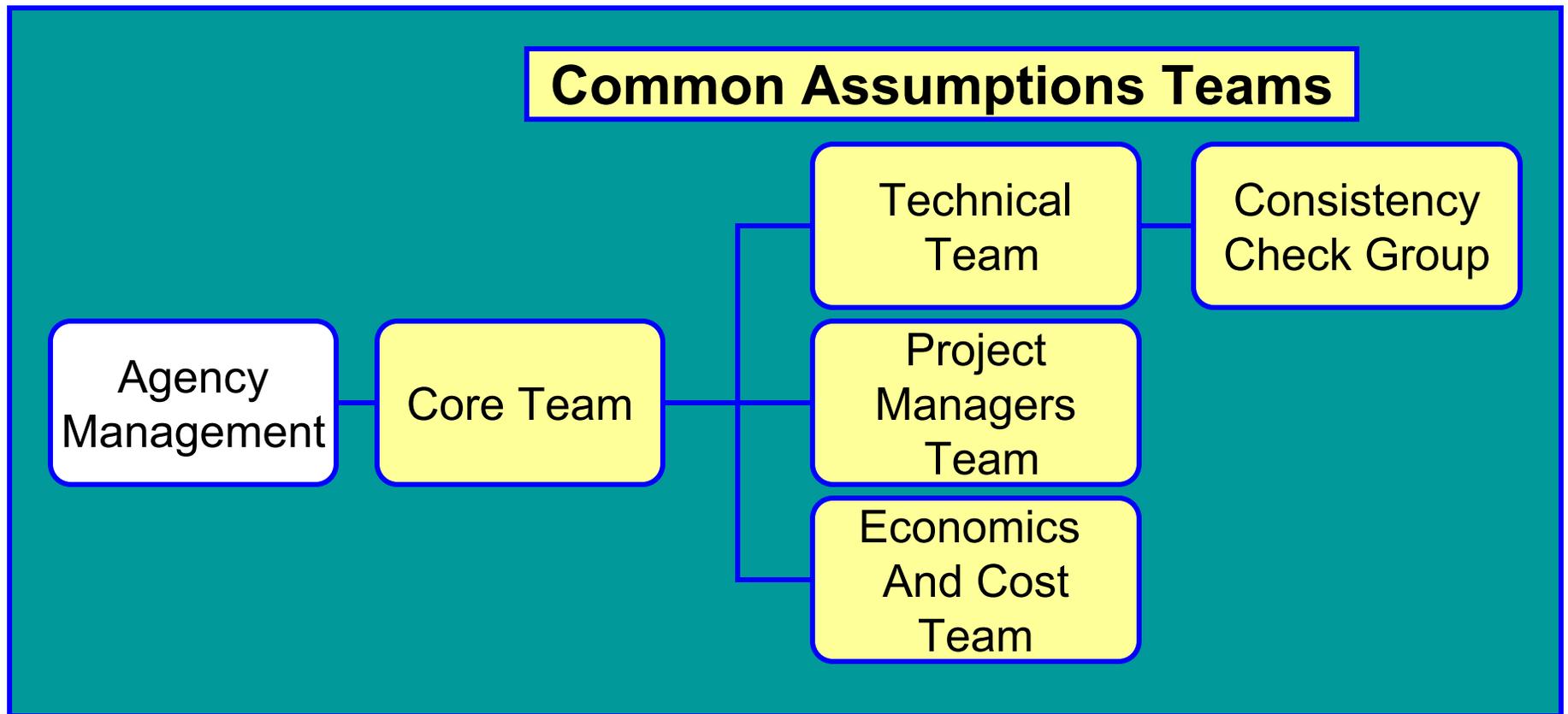
# Review Objectives of the Common Assumptions Effort

- Resolve technical and policy issues associated with modeling
  - Develop set of *common* tools. Review project-specific tools.
  - Develop steps to use *common* tools. Check for consistency of usage.
  - Develop set of *common* inputs. Review project or agency-specific inputs.
  - Develop set of *common* reporting metrics. Publish results from project-specific modeling

# Review Objectives of the Common Assumptions Effort

- Facilitate use of both *common* model tools and *project-specific* tools.
  - Keep assumptions and usage the same for all storage projects for *common* tools
  - Examples of *project-specific* tools
    - Shasta – salmon mortality model
    - LV – reservoir operations model
- Develop setting where all CALFED storage project study team members may identify problems, check results and present solutions

# Common Assumptions Team Structure



# Responsibilities

## Agency Management

Determine Demarcation  
Between  
Existing Conditions  
& Future Conditions

Develop Criteria  
For inclusion in  
Future Conditions

Provide Guidance on  
Environmental Documents  
& Permitting Strategies

Provide  
Implementation  
Decisions

## Project Study Teams

Develop Scenarios  
and  
Analyze Performance

Develop Alternatives  
and  
Analyze Performance

Complete Feasibility Studies,  
Environmental Docs &  
Permitting

Implement  
Projects

## Common Assumptions Teams

Distribute Interim  
CALSIM II  
& Refined Baselines

Develop Consistent  
Reporting Metrics  
and  
Quantify other Water  
Management Options

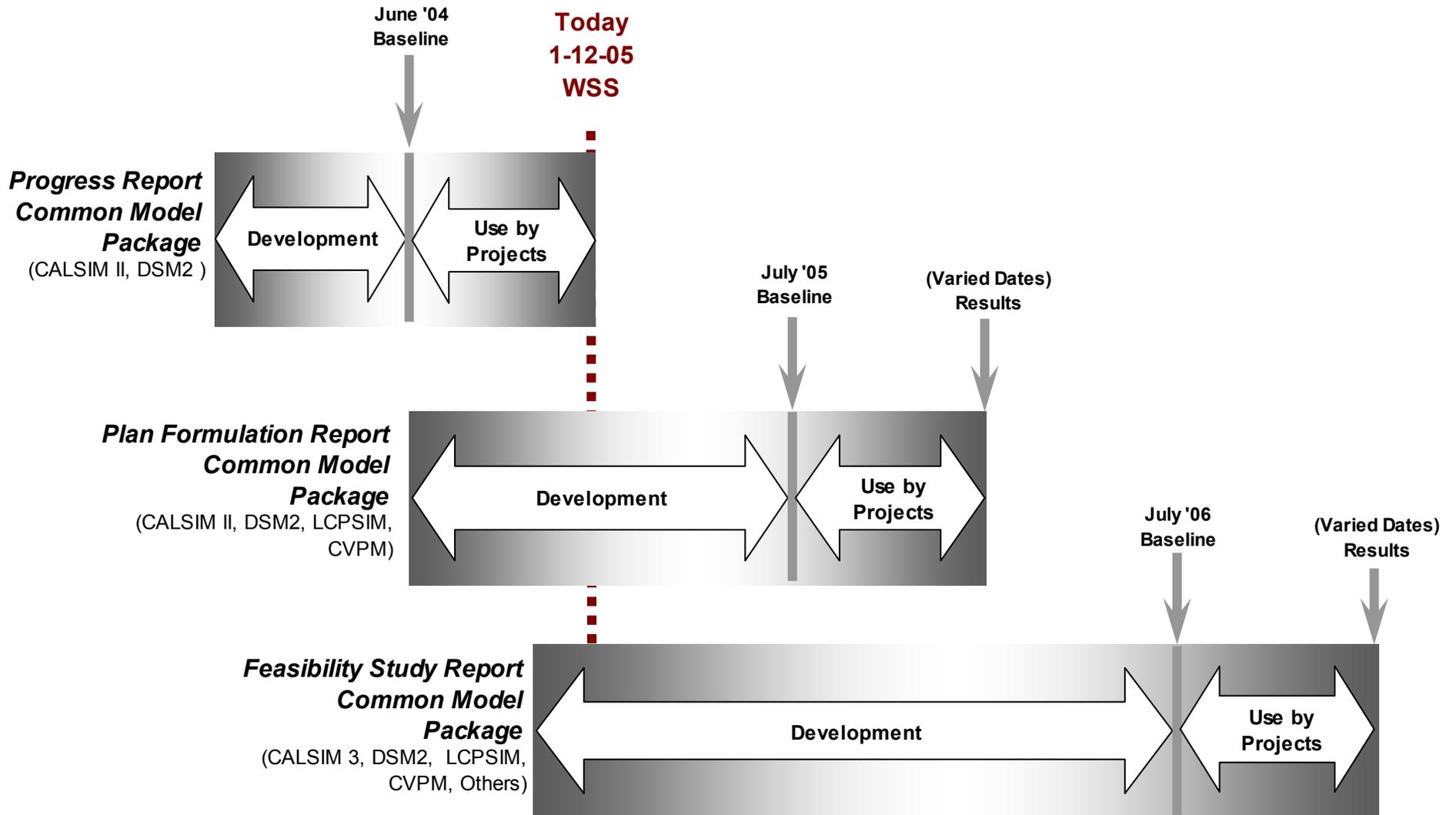
Refine Baselines for all  
Models, Existing Conditions  
Future No-Action,  
Alternative Future &  
Cumulative Impacts

Coordinate Economic & Cost  
Analyses

# Develop Common Tools

- Develop *common model packages* for use by all surface storage study teams to include:
  1. *Progress Report* (baseline completed in June '04)
  2. *Plan Formulation Report* (baseline expected in July '05)
  3. *Feasibility Study Report* (baseline expected in July '06)
- Development activities include:
  - Expand model capabilities
  - Define input assumptions and data sets
  - Establish modeling protocols
  - Clarify policy and regulatory decisions
  - Test models and model interactions

# Common Model Packages



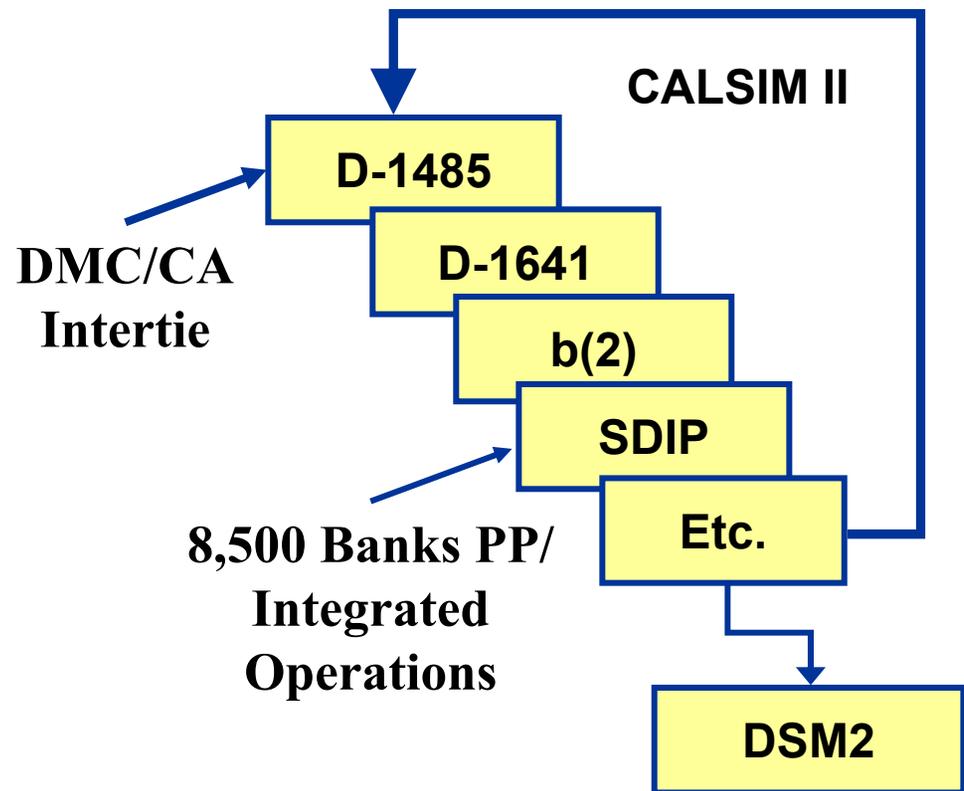
# Development of Progress Report Common Model Package

- Most work performed by Technical Team and Consistency Check Group
  - Objective was development and refinement of common system operations models
  - 20 participants from DWR, Reclamation, Authority, project study teams and consultants
  - Intensive effort. 14 meetings since release of June '04 baseline
  - Identified and resolved numerous technical issues
  - With Core Team and Agency Management, dealt with first set of policy issues
  - Full documentation and transparency

# Progress Report

## Common Model Package

- Major Assumptions
  - DMC/CA Intertie
  - 8,500 cfs @ Banks
  - Integrated Operations
- Thousands of modeling input and operational assumptions
- Issue identification and resolution
- Protocol consistency



# What Was Modeled?

Using *Progress Report Common Model Package*, project study teams completed modeling for:

- |                                    |             |
|------------------------------------|-------------|
| – Shasta Enlargement               | 3 scenarios |
| – North of Delta Offstream Storage | 4 scenarios |
| – In-Delta Storage                 | 4 scenarios |
| – Los Vaqueros Expansion           | 3 scenarios |
| – Upper San Joaquin Basin Storage  | Not updated |

# Presentation of Results

- For each storage project, results are shown using both the *common model package* and *project-specific modeling*
- Detailed common reporting metrics have been developed and will be discussed in detail beginning at **tomorrow's** WSS *Ad-Hoc Technical Stakeholder Work Group*

# Shasta Lake Water Resources Investigation Scenarios

<b>Scenario 1</b> Water Supply 6.5 ft Raise	<ul style="list-style-type: none"><li>▪ Increase water supply reliability of CVP contractors by raising Shasta Dam 6.5 ft</li></ul>
<b>Scenario 2</b> Water Supply 18.5 ft Raise	<ul style="list-style-type: none"><li>▪ Increase water supply reliability of CVP contractors by raising Shasta Dam 18.5 ft</li></ul>
<b>Scenario 3</b> Water Supply & Anadromous Fish 18.5 ft Raise	<ul style="list-style-type: none"><li>▪ Increase water supply reliability of CVP contractors by raising Shasta Dam 18.5 ft</li><li>▪ Includes a conjunctive use component for drought period reliability</li><li>▪ Improve habitat for anadromous fish populations</li></ul>

# Shasta Lake Water Resources Investigation

## Results

Reporting Metric	Scenario		
	1	2	3
	(difference from base condition)		
<b>Total water supply - long-term (TAF/year)</b>	<b>39</b>	<b>69</b>	<b>89</b>
<b>- driest periods (TAF/year)</b>	<b>63</b>	<b>127</b>	<b>160</b>
<b>Percent of time the river temperature at Bend Bridge exceeds 56° (Apr-Sep) - long term</b>	<b>-3.0%</b>	<b>-6.7%</b>	<b>-6.9%</b>
<b>Early life stage salmon mortality in Sacramento River (winter run) - dry &amp; critical</b>	<b>-0.3%</b>	<b>-1.4%</b>	<b>-0.4%</b>
<b>Early life stage salmon mortality in Sacramento River (spring run) - dry &amp; critical</b>	<b>-0.8%</b>	<b>-9.0%</b>	<b>-6.2%</b>
<b>Net increase in CVP energy production (GWh/year) - long term</b>	<b>11</b>	<b>36</b>	<b>30</b>

Common Model Package

Project-specific modeling

Common Model Package

Project-specific modeling

# North-of-the-Delta Offstream Storage Scenarios

<b>Scenario 1</b> Water Supply	<ul style="list-style-type: none"><li>▪ Increase water supply reliability of local water users &amp; CVP/SWP contractors</li></ul>
<b>Scenario 2</b> Water Quality	<ul style="list-style-type: none"><li>▪ Improve Delta water quality during July, August, and September with an augmented 1,500 cfs Delta outflow</li></ul>
<b>Scenario 3</b> Environmental	<ul style="list-style-type: none"><li>▪ Provide supplemental flows for environmental objectives</li><li>▪ Reduce diversion from Sacramento River during critical fish migration periods</li></ul>
<b>Scenario 4</b> EWA	<ul style="list-style-type: none"><li>▪ Provide water supply for the EWA</li><li>▪ Reduce diversion from Sacramento River during critical fish migration periods</li></ul>

# North-of-the-Delta Offstream Storage

## Results

Reporting Metric	Scenario			
	1	2	3	4
Total water supply - long-term (TAF/year)	259	177	220	87
- driest periods (TAF/year)	392	294	314	203
Long-term average EWA water supply delivered to Delta inflow (TAF/year)	n/a	n/a	n/a	124
Change in average Chloride loading to California Aqueduct for Jul-Oct (1976-91)	3%	-27%	4%	1%
Increase in long-term average flow below Keswick for Oct-Dec (TAF/year)	n/a	n/a	107	104
Reduction in long-term average Sacramento River diversions for Apr-Aug (TAF/year)	175	234	173	189
Long-term average water supply available for rice decomposition/refuges (TAF/year)	80	81	69	75

Common Model Package

Project-specific modeling

# In-Delta Storage

## Scenarios

<b>Scenario 1</b> Water Supply	<ul style="list-style-type: none"><li>▪ Increase water supply reliability of CVP/SWP contractors</li></ul>
<b>Scenario 2</b> Water Supply and EWA	<ul style="list-style-type: none"><li>▪ Increase water supply reliability of CVP/SWP contractors</li><li>▪ Provide water supply for the EWA</li></ul>
<b>Scenario 3</b> Water Supply, EWA and ERP	<ul style="list-style-type: none"><li>▪ Increase water supply reliability of CVP/SWP contractors</li><li>▪ Provide water supply for the EWA</li><li>▪ Provide water for the Ecosystem Restoration Program goals</li></ul>
<b>Scenario 4</b> Water Supply, EWA and Water Quality	<ul style="list-style-type: none"><li>▪ Increase water supply reliability of CVP/SWP contractors</li><li>▪ Provide water supply for the EWA</li><li>▪ Improve Delta water quality during July, August and September with an augmented 1,500 cfs Delta outflow.</li></ul>

# In-Delta Storage

## Results

Reporting Metric	Scenario			
	1	2	3	4
Total water supply - long-term (TAF/year)	77	73	52	63
- driest periods (TAF/year)	64	61	51	49
Long-term average EWA water supply delivered to San Luis Reservoir (TAF/year)	n/a	26	28	14
Long-term average water supply for ERP actions (TAF/year)	n/a	n/a	19	n/a
Long-term average releases for improving Delta water quality (TAF/year)	n/a	n/a	n/a	35

Common Model Package

# Los Vaqueros Reservoir Expansion Scenarios

<p><b>Scenario 2</b> Environmental Water and Water Quality</p>	<ul style="list-style-type: none"><li>▪ Provide water supply for the EWA</li><li>▪ Improve water quality for the South Bay Aqueduct (SBA) contractors</li></ul>
<p><b>Scenario 3</b> Water Supply Reliability, Environmental Water and Water Quality</p>	<ul style="list-style-type: none"><li>▪ Ensure 100% reliability for SBA contractors in all years</li><li>▪ Otherwise, same as Scenario 2</li></ul>
<p><b>Scenario 4</b> Water Supply Reliability, Environmental Water and Water Quality</p>	<ul style="list-style-type: none"><li>▪ Provide 10 TAF to the Contra Costa Water District for reliability in dry years</li><li>▪ Otherwise, same as Scenario 3</li></ul>

# Los Vaqueros Reservoir Expansion

## Results

Reporting Metric	Scenario		
	2	3	4
	(difference from base condition)		
<b>Total water supply (CVP/SWP) - long-term (TAF/year)<sup>1</sup></b>	<b>- 5</b>	<b>3</b>	<b>9</b>
<b>- driest periods (TAF/year)<sup>1</sup></b>	<b>- 3</b>	<b>14</b>	<b>23</b>
<b>Total EWA long-term water supply (TAF/year)</b>	<b>143</b>	<b>123</b>	<b>117</b>
<b>Improvement to Water Quality (Chloride) Delivered to the SBA SWP Contractors During the Sep. thru Nov. Period Long-term</b>	<b>-58%</b>	<b>-52%</b>	<b>-50%</b>
<b>Payback Operation – long-term (TAF/year)</b>	<b>5</b>	<b>5</b>	<b>4</b>
<b>– driest periods (TAF/year)</b>	<b>2</b>	<b>3</b>	<b>2</b>

Common Model Package

Project-specific modeling

<sup>1</sup> Impacts to CVP/SWP water supply deliveries will not occur because they are compensated by use of Los Vaqueros storage through the “payback” operation

# Upper San Joaquin River Basin Storage Investigation Results (Not based on Common Model Package)

As reported in *California Bay-Delta Surface Storage Program Progress Report*. (April 2004)

- Water supply benefit: 100-235 (TAF/Year)<sup>1</sup>

<sup>1</sup> From *Phase 1 Investigation Report*, October 2003.

# Progress Report

- WSS Ad-Hoc Technical Stakeholder Work Group meeting to discuss detailed modeling results
  - Jan. 13 (tomorrow) 1 pm to 3:30 at CBDA
- *Progress Report* available in March 2005
  - Updates of project-specific investigations
  - Common Model Package results
  - Project-specific modeling results

# Economics and Cost Team Activities

- LCPSIM Improvements completed
  - Benefit quantification method
  - Shortage loss functions
  - Demand variance
  - Interim water transfer assumptions
- Modifications to LCPSIM Bay Region geographic scope expected by end of January

# Economics and Cost Team Activities

- Work continues on other LCPSIM improvements for Plan Formulation Report common model package
  - Updates to regional demands, local supply options, conservation options
  - Development and testing of rules for interaction with CALSIM
  - Comparison of data and assumptions with other local agency water planning models

# Economics and Cost Team Activities

- Cost Estimation Work Group
  - Purpose to provide guidelines to project teams
  - Includes cost estimators from DWR and Reclamation
- CVPM/CALAG Data Update Work Group
- Reporting metrics for economics developed

# Characterization Activities

- Refining method to represent water transfers in CALSIM and LCPSIM
- Finalizing Water Transfers Tool to help set available transfer quantities
- Finalizing recycling, desalination and conservation quantities
- Integrating draft conservation and recycling quantities into LCPSIM
- Characterizing groundwater and local supply

# Technical Coordination Team Activities

For next *common model package*, major efforts will focus on:

- New San Joaquin River Model
- Integrated existing Los Vaqueros Reservoir
- Integrated EWA Operations
- Water Transfers Tool (WTT)
- Model integration (WTT/CALSIM/LCPSIM)
- DSM2 extension to 73-year period
- Characterization of groundwater, WUE, local supply, etc.
- Additional Models (Temperature?, Power? ...)

Questions?