



May 20, 2024

Delta Conveyance Design and Construction Authority
Board of Directors

Subject: ***Materials for the May 16, 2024 Special Board Meeting***

Members of the Board:

The Delta Conveyance Design and Construction Authority (DCA) Board of Directors had a Special Board Meeting, on **Thursday, May 16, 2024 at 2:00 p.m.**

Enclosed are the final meeting materials presented at the Special Board meeting in a PDF file, which have been bookmarked for your convenience.

Regards,

A handwritten signature in blue ink that reads "Graham C. Bradner". The signature is fluid and cursive, written in a professional style.

Graham Bradner
DCA Executive Director



DELTA CONVEYANCE DESIGN AND CONSTRUCTION AUTHORITY
BOARD OF DIRECTORS MEETING

SPECIAL MEETING

Thursday, May 16th, 2024

2:00 p.m.

Hybrid (Teleconference) Meeting

DCDCA Boardroom
980 9th Street, Suite 100
Sacramento, CA 95814

TELECONFERENCE LOCATIONS:

- 1) Valley Water, 5700 Almaden Expressway, Headquarters Boardroom, San Jose, CA 95123
- 2) Metropolitan Water District, 700 N. Alameda Street, Conference Room 12-310, Los Angeles, CA 90012

CONFERENCE ACCESS INFORMATION:

Phone Number: (669) 444-9171 Access Code: 89139961292#

Virtual Meeting Link: <https://dcdca-org.zoom.us/j/89139961292?from=addon>

Please join the meeting from your computer, tablet, or smartphone

Additional information about participating by telephone or via the remote meeting solution is available here: <https://www.dcdca.org>

AGENDA

Except as permitted by Government Code section 54953(f), Directors will attend the meeting from the DCDCA Boardroom or any of the teleconference locations. Members of the public may attend in person at these locations or remotely through the virtual meeting link above. Assistance to those wishing to participate in the meeting in person or remotely will be provided to those requiring accommodations for disabilities in compliance with the Americans with Disabilities Act of 1990. Interested person must request the accommodation as soon as possible in advance of the meeting by contacting the DCA support staff at (888) 853-8486 or info@dcdca.org. Members of the public may speak regarding items on the agenda during those items and when recognized by the Chair. Speakers are limited to three minutes each; however, the Chair may limit this time when reasonable based on the circumstances. Persons wishing to provide public comment remotely on Agenda Items are encouraged to complete a public comment request form at: <https://tinyurl.com/dcapubliccomment> by 2:15 pm or through the QR code below. In addition, members of the public may use the "raise hand" function (*9 if participating by telephone only) during the meeting to request the opportunity to speak. Additional information will be provided at the commencement of the meeting.



1. CALL TO ORDER

2. DISCUSSION ITEMS

(a) Presentation on the Cost Estimate/Benefit Cost Analysis

Recommended Action: Information Only.

3. ADJOURNMENT

* * * * *

Next scheduled meetings of the Delta Conveyance Design and Construction Authority Board of Directors:

June 20, 2024, Regular Board Meeting at 2:00 p.m. (1:30 p.m. if there is a closed session).

August 15, 2024, Regular Board Meeting at 2:00 p.m. (1:30 p.m. if there is a closed session).

Board Memo

Contacts: Graham Bradner, Executive Director

Date: May 16, 2024 Special Board Meeting

Item No. 2a

Subject: Presentation on the Updated Cost Estimate and Benefit-Cost Analysis

Summary:

This is a placeholder memorandum for this item. The DCA Executive Director, Graham Bradner, will present an updated estimate of total program costs for the Delta Conveyance Project (DCP). Dr. David Sunding, Emeritus Professor, UC Berkeley, will present the findings from a new benefit-cost analysis for the DCP. Materials will be presented at the Board meeting.

Recommended Action:

Information, only.



DCA

May 16, 2024

Agenda Item 2a

DELTA CONVEYANCE PROJECT COST ESTIMATE UPDATE

Graham Bradner

Executive Director

Delta Conveyance Design & Construction Authority

Agenda

- 1. Estimating Scope and Methodology**
- 2. Cost Estimate Update - 2023**
- 3. Secondary (Innovations) Cost Estimate**
- 4. Next Steps and Questions**



Estimating Scope and Methodology



Cost Estimate Background



- **Last “cost assessment” prepared in 2020 for a Central Alignment concept, 6,000 cfs = \$15.9B (2020’s, undiscounted)**
- **Why issue an updated cost estimate?**
 - At the conclusion of CEQA in Dec. 2023, DWR selected Bethany Reservoir Alignment – re-evaluate costs using improved information in updated 2023 \$\$’s
 - Provides key information for economic feasibility analyses
 - Helps identify areas for potential cost management going forward
- **Will this estimate be updated again in the future?**
 - Yes! This estimate is prepared in 2023 “real prices” to support economic feasibility evaluations
 - Future evaluations of project cost will be needed to establish budget for implementation

What did we estimate?



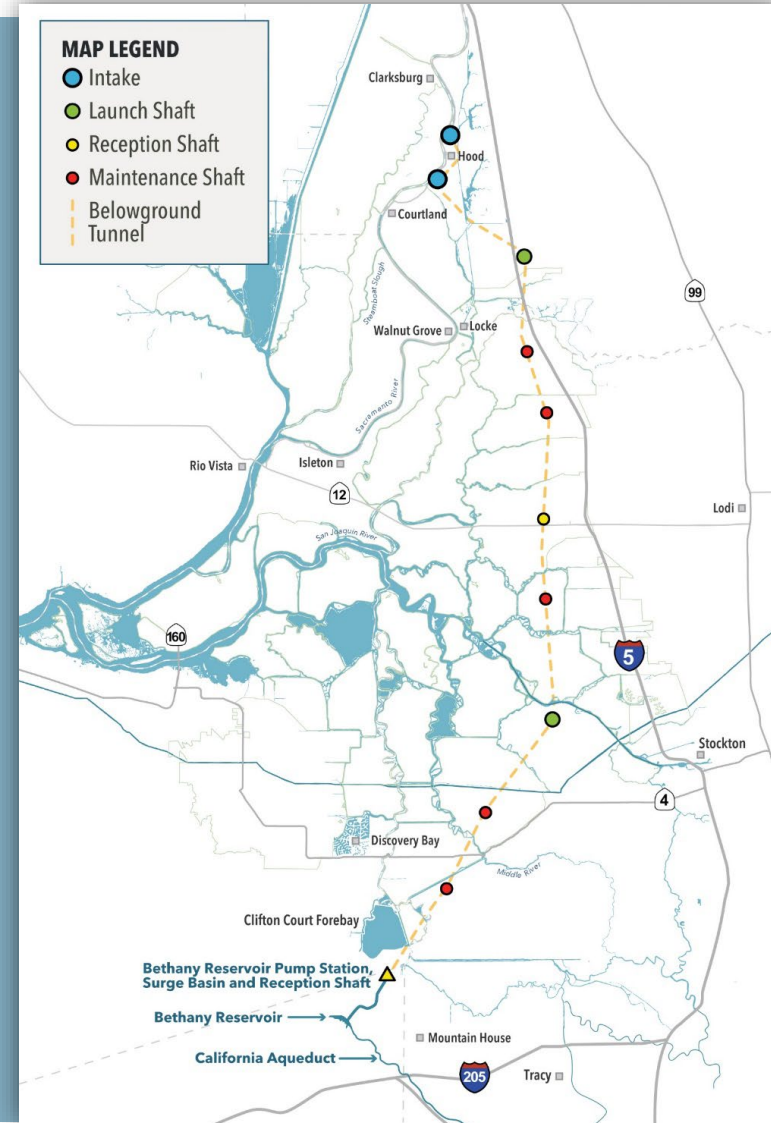
***Bethany Reservoir Alignment – 6,000 cfs, approx.
10% (conceptual) design level**

Construction Costs

- **Bethany Reservoir Project (6,000 cfs)**
- **Intakes – Two 3000 cfs each intakes (Intake 3 & 5)**
- **Main Tunnel & Shafts**
 - 36-ft ID tunnels by 45-mile Long
 - 11 Shafts w/ two double launch shafts
- **Bethany Reservoir Pumping Plant**
- **Aqueduct**
 - Four 15-ft diameter pipelines
 - Tunnel Crossing of Jones Penstocks
 - Bethany Conservation Easement Tunnel & Shafts
- **Bethany Reservoir Discharge Structure**
- **Access and Logistics**
 - Road & Rail Access
 - Levee Improvements
- **Communications**
- **Site Restoration**
- **Contingency**

Other Program Costs

- **Planning/Design/CM (Soft Costs)**
 - DWR Permitting & Oversight
 - DCA Permits & Agency Coordination
 - DCA Program Management
 - DCA Engineering Mgt, Design & CM
- **Land**
- **DWR Mitigation**
 - Mitigation Plans
 - Habitat Restoration
 - Tribal Monitoring
 - Other Mitigation
- **Power**
 - Design/Procurement
 - Construction
 - Consumption
- **CCWD Settlement**
- **Community Benefits**
- **Contingency**



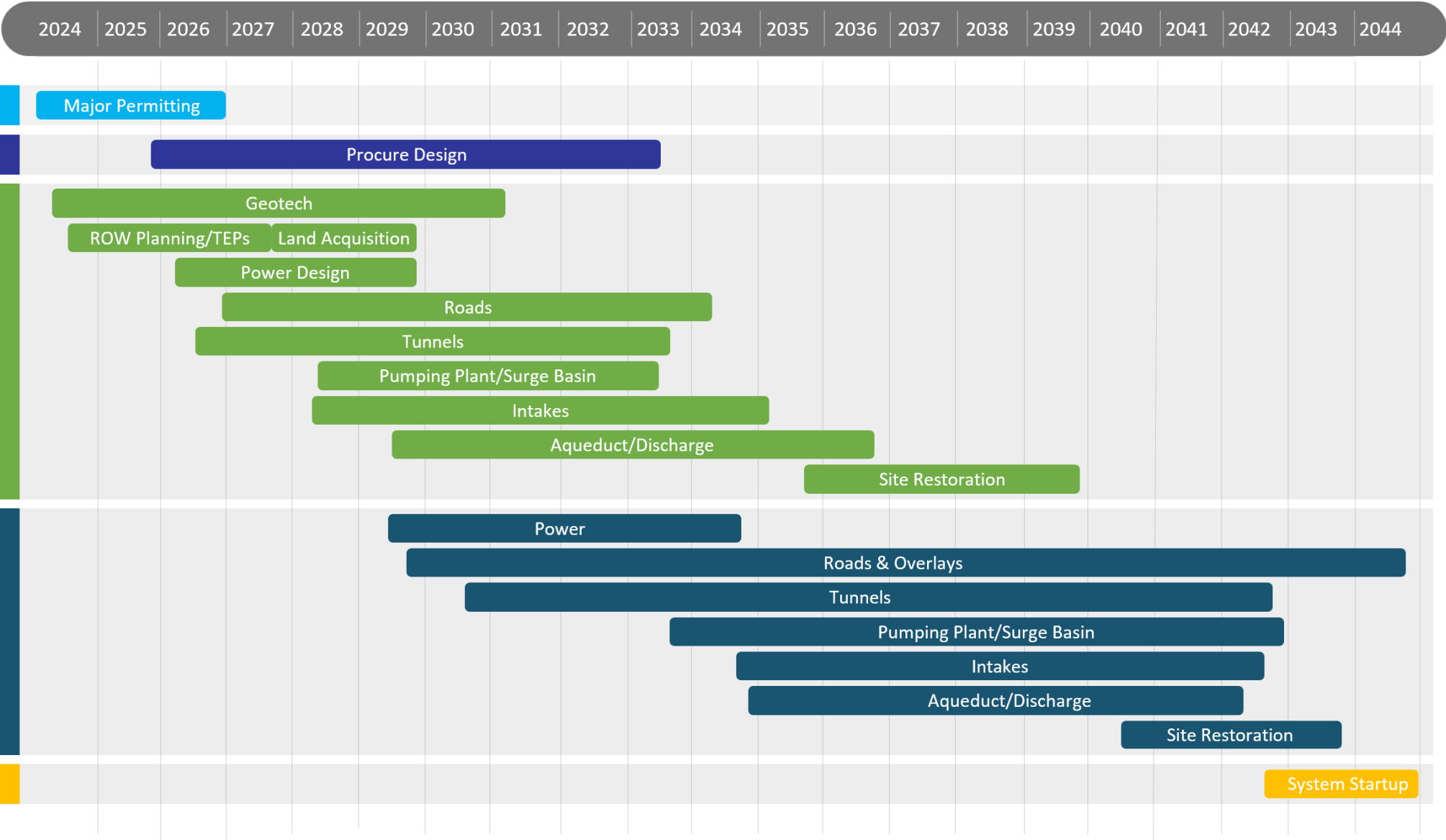


Estimate Methodology

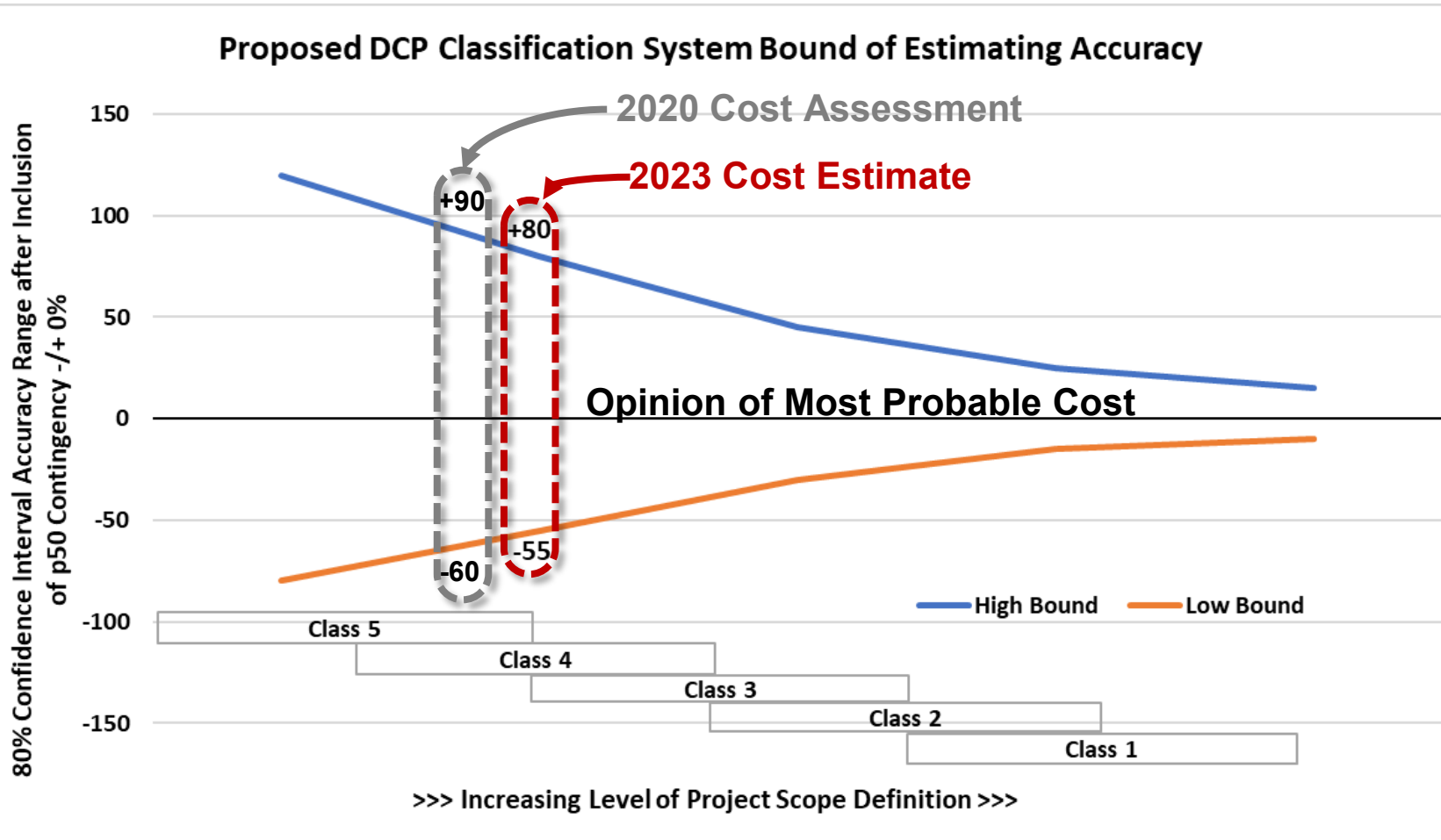


- “Bottoms up” cost estimating approach based on labor, equipment, materials, and schedule to accomplish the work
- Estimate uses 2023 “real” undiscounted dollars per typical economic standards
- Reconciliation process with independent cost estimating and resolution of cost differences
- Includes contingency and risk treatment costs to account for uncertain items
- Assumes Design-Bid-Build procurement

DCP Schedule Summary



Estimate Classification

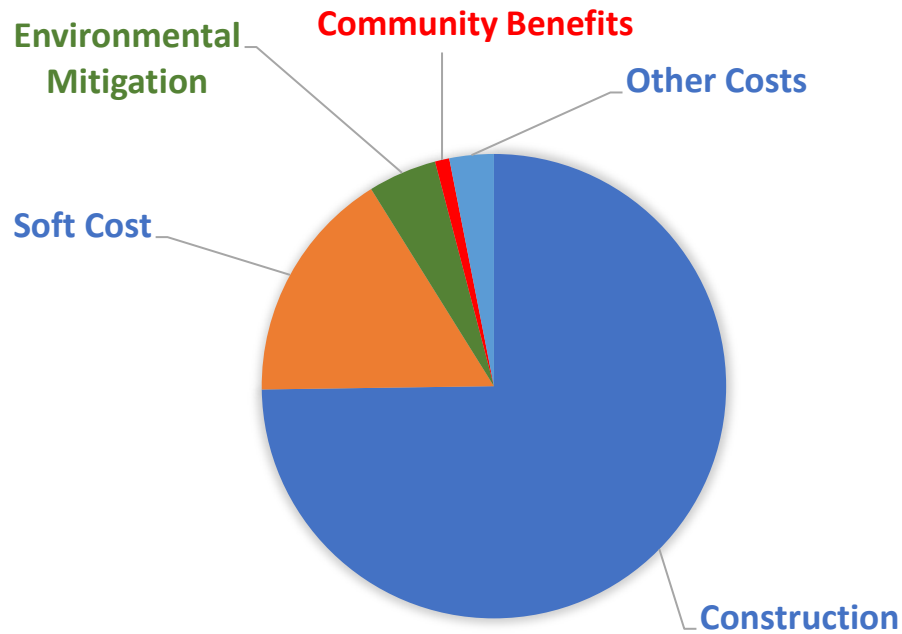


- **Mostly AACE Class 4 Estimate, but with some Class 5 aspects (i.e. ground conditions along tunnel alignment)**
- **Estimate approach supports DCA's opinion of most probable cost:**
 - Engineering documentation in drawings and TMs
 - Used deterministic approach for item cost development
 - Replaced most cost allowances with actual estimates and quotes
 - Better understanding of ground conditions at Intakes and Pumping Plant
 - Better Understanding of Schedule and Risks

2023 Cost Estimate



2023 Cost Estimate Update



	BETHANY (2023)	% Construction Cost
TOTAL CONSTRUCTION COSTS	\$15,012,000,000	
Two Intakes	\$1,714,000,000	--
Tunnel and Shafts	\$6,353,000,000	--
Pumping Plant /Surge Basin/Aqueduct & Discharge	\$3,198,000,000	--
Utilities, Power and Logistics (Power for Bethany Below)	\$283,000,000	--
Construction Sub-Total	\$11,548,000,000	--
Contingency (30%)	\$3,464,000,000	--
OTHER PROGRAM COSTS	\$5,108,000,000	
Planning/Design/CM (Soft Costs)	\$3,328,000,000	22.2%
DWR Oversight	\$426,000,000	2.8%
DCA Program Management Office	\$668,000,000	4.4%
DCA Engineering (Design and CM Services)	\$2,167,000,000	14.4%
DCA Permits and Agency Coordination	\$67,000,000	0.4%
Other Costs	\$1,780,000,000	--
Land Acquisition	\$158,000,000	--
Mitigation Program	\$960,000,000	--
Power	\$415,000,000	--
CCWD Settlement	\$47,000,000	--
Community Benefits Program	\$200,000,000	--

TOTAL \$20,120,000,000

Construction Cost by Major Features



Feature	Item Cost	Risk Treatment	Total Construction
Intakes	\$1,660,000,000	\$54,000,000	\$1,714,000,000
Main Tunnels	\$6,018,000,000	\$335,000,000	\$6,353,000,000
Pumping Plant & Surge Basin	\$2,496,000,000	\$40,000,000	\$2,536,000,000
Aqueduct Pipe & Tunnels	\$541,000,000	\$22,000,000	\$563,000,000
Discharge Structure	\$95,000,000	\$4,000,000	\$99,000,000
Access Logistics & Early Works	\$241,000,000	\$12,000,000	\$253,000,000
Communication	\$13,000,000	\$-	\$13,000,000
Restoration	\$17,000,000	\$-	\$17,000,000
TOTALS	\$11,081,000,000	\$467,000,000	\$11,548,000,000
Construction Contingency (30%)			\$3,464,000,000
TOTAL CONSTRUCTION			\$15,012,000,000

- **Costs prepared using Heavy Bid (HCSS)**
 - Crew-based approach (Labor, Equipment, Materials) based on construction method and schedule activities
 - Work Breakdown Structure (WBS) that supports Master Program Schedule
- **Includes prevailing wage labor rates, equipment & material quotes, sales tax, markup & profit, insurance, bonds, etc.**
- **Risk treatment costs included for containment of identified risks**
- **Construction contingency included to account for uncertain items or conditions not currently identified in the estimate**

Reconciliation of Construction Costs



- Independent Estimates Prepared by DCA Design and Program Management teams – Initial Cost $\Delta = 13\%$
- Cost Reconciliation identified key factors:
 - Cost differences due to Material Equipment Estimates vs. Quotes from Manufactures/Suppliers
 - Intake Structure – Tee Screens vs. Flat Panel Screens
 - Pumping Plant – Updated Equipment Costs from Manufactures, Understanding of Below Ground Construction Sequence and Requirements
- Final Reconciled Cost $\sim \Delta 2\%$

Legend
 EDM Team Estimate
 PMO Independent Estimate
 Difference Between Estimates

Project/Feature	Total Construction Cost
Intakes 3 & 5	\$ 1,714,053,672
	\$ 1,748,095,147
	\$ 34,041,475
	2%
Tunnels	\$ 6,352,835,984
	\$ 6,704,409,367
	\$ (351,573,383)
	6%
Pumping Plant Bethany Complex	\$ 2,535,740,250
	\$ 2,305,990,580
	\$ (229,749,670)
	-9%
Aqueduct Pipeline	\$ 562,600,049
	\$ 591,858,494
	\$ 29,258,446
	5%
Discharge Structure	\$ 98,987,731
	\$ 95,724,357
	\$ (3,263,374)
	-3%
Construction Logistics and Access	\$ 269,900,015
	\$ 305,587,358
	\$ 35,687,343
	13%
Communication (Fibre)	\$ 13,448,276
	\$ 16,258,558
	\$ 2,810,282
	21%
Total EDM	\$ 11,547,565,979
	\$ 11,767,923,861
	\$ 220,357,883
	1.91%

Development of Construction Contingency



- **Contingency is an amount incorporated into the estimate to account for uncertain items, conditions, or events likely to result in additional costs**
- **Established in partnership between the estimating and engineering teams and reflects our assessment of:**
 - Design development maturity (~10% design)
 - Semi-quantitative risk analysis (assessment of cost and schedule impacts)
 - Professional judgment
- **Settled on 30% construction contingency**
- **Contingency levels will decrease as the engineering work advances and the unknown elements of the work are revealed or resolved.**

FEATURE	% of CONTINGENCY AGAINST CONSTRUCTION COST	
	2020 ESTIMATE	2023 BETHANY ESTIMATE
INTAKES	35%	NOT APPLICABLE
TUNNELS AND SHAFTS	40%	
FOREBAY AND LEVEE	35%	
SOUTH DELTA CONNECTIONS	35%	
PUMPING PLANT	30%	
EARLY WORKS/LOGISTICS	50%	
PROJECT AVERAGE CONTINGENCY	38%	30%

Other Program Cost Summary



- **Bottoms-up (unit rates, level of effort, durations) estimates of all labor-based costs (Soft Costs)**
- **Estimates of other costs:**
 - Updated land cost to reflect estimated land requirements and cost associated with various land uses
 - Mitigation costs
 - Power utility estimates for design, procurement, construction of power to work sites
 - Power consumption during construction
 - CCWD Settlement Agreement and Community Benefits Program allowance
- **Developed independent Soft Cost estimates, reconciled differences and aligned to Master Program Schedule**
- **Added contingency of 0%, 15%, or 30% depending on item**

Item Description	Estimated Cost (w/o contingency)	Applied Contingency		Estimated Cost (w/ contingency)
		Percent	Amount	
Planning/Design/CM Labor:	\$ 2,894,100,000			\$ 3,328,200,000
DCO Permitting & Oversight	\$ 370,100,000	15%	\$ 55,500,000	\$ 425,600,000
DCA Permitting Support	\$ 58,600,000	15%	\$ 8,800,000	\$ 67,400,000
DCA PMO	\$ 581,100,000	15%	\$ 87,200,000	\$ 668,300,000
DCA Engineering	\$ 728,900,000	15%	\$ 109,300,000	\$ 838,200,000
DCA FDCs	\$ 437,500,000	15%	\$ 65,600,000	\$ 503,100,000
DCA CM	\$ 717,900,000	15%	\$ 107,700,000	\$ 825,600,000
Other Costs:	\$ 1,521,300,000			\$ 1,780,200,000
DWR Mitigation	\$ 797,200,000	see below	see below	\$ 960,400,000
Tribal Monitoring	\$ 24,800,000	15%	\$ 3,700,000	\$ 28,500,000
Mitigation Plans	\$ 6,000,000	15%	\$ 900,000	\$ 6,900,000
Habitat Restoration Projects	\$ 290,500,000	30%	\$ 87,200,000	\$ 377,700,000
Other Significant Mitigation	\$ 475,900,000	15%	\$ 71,400,000	\$ 547,300,000
Land	\$ 121,800,000	30%	\$ 36,500,000	\$ 158,300,000
Power	\$ 355,300,000	see below	see below	\$ 414,500,000
Utility Design/Construction	\$ 197,400,000	30%	\$ 59,200,000	\$ 256,600,000
Consumption During Construction	\$ 157,900,000	0%	\$ -	\$ 157,900,000
CCWD Settlement Agreement	\$ 47,000,000	0%	\$ -	\$ 47,000,000
Community Benefits Program	\$ 200,000,000	0%	\$ -	\$ 200,000,000
TOTAL	\$ 4,415,400,000			\$ 5,108,400,000

Comparison to 2020 Cost Assessment



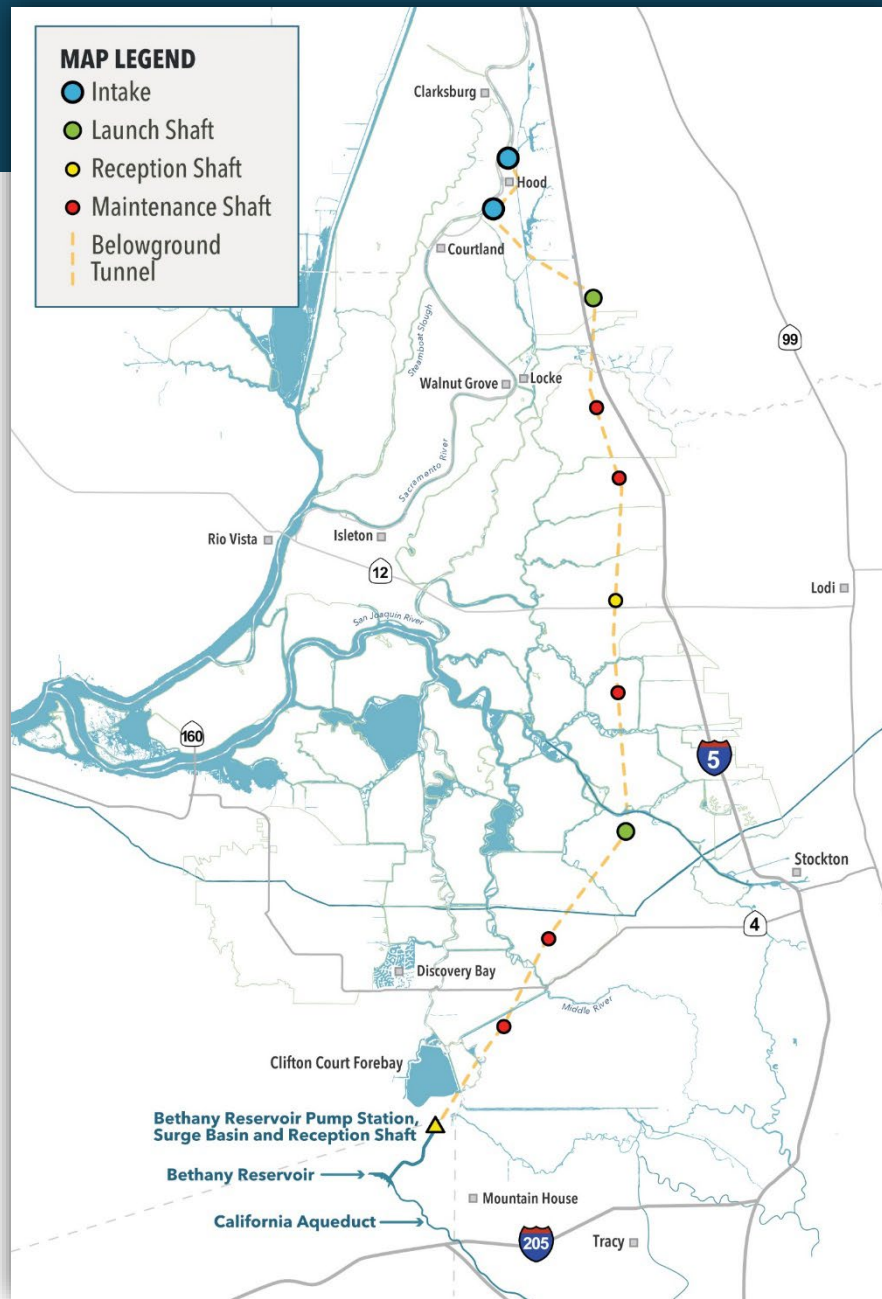
	BETHANY (2023)	% Const Cost	2020 Assessment	% Const Cost	*2020 in \$2023
TOTAL CONSTRUCTION COSTS	\$15,012,000,000		\$ 12,101,000,000		\$15,346,000,000
Two Intakes	\$1,714,000,000	--	\$ 1,448,000,000	--	\$1,836,000,000
Tunnel and Shafts	\$6,353,000,000	--	\$ 4,473,000,000	--	\$5,672,000,000
Bethany Complex / Southern Complex Facilities (Forebay)	\$3,198,000,000	--	\$ 2,326,000,000	--	\$2,950,000,000
Utilities, Power and Logistics (Power for Bethany Below)	\$283,000,000	--	\$ 522,000,000	--	\$662,000,000
Construction Sub-Total	\$11,548,000,000	--	\$ 8,769,000,000	--	\$11,120,000,000
Contingency (30% / 38%)	\$3,464,000,000	--	\$ 3,332,000,000	--	\$4,226,000,000
Other Program Costs	\$5,108,000,000		\$3,800,000,000		\$4,827,000,000
Planning/Design/CM (Soft Costs)	\$3,328,000,000	22.2%	\$3,080,000,000	25.5%	\$3,906,000,000
DWR Oversight	\$426,000,000	2.8%	\$ 180,000,000	1.5%	\$228,000,000
DCA Program Management Office	\$668,000,000	4.4%	\$ 420,000,000	3.5%	\$533,000,000
DCA Engineering (Design and CM Services)	\$2,167,000,000	14.4%	\$ 2,420,000,000	20.0%	\$3,069,000,000
DCA Permits and Agency Coordination	\$67,000,000	0.4%	\$ 60,000,000	0.5%	\$76,000,000
Other Costs	\$1,780,000,000	--	\$720,000,000	--	\$921,000,000
Land Acquisition	\$158,000,000	--	\$ 320,000,000	--	\$416,000,000
Mitigation Program	\$960,000,000	--	\$ 400,000,000	--	\$ 505,000,000
Power	\$415,000,000	--	included above	--	included above
CCWD Settlement	\$47,000,000	--	\$0	--	\$0
Community Benefits Program	\$200,000,000	--	\$0	--	\$0
TOTAL	\$20,120,000,000		\$15,901,000,000		\$20,173,000,000

* 2020 Dollars Escalated to 2023 Dollars based on USBR CCI = 26.8%

Secondary Estimate – Cost Reducing Innovations



What are Innovations?

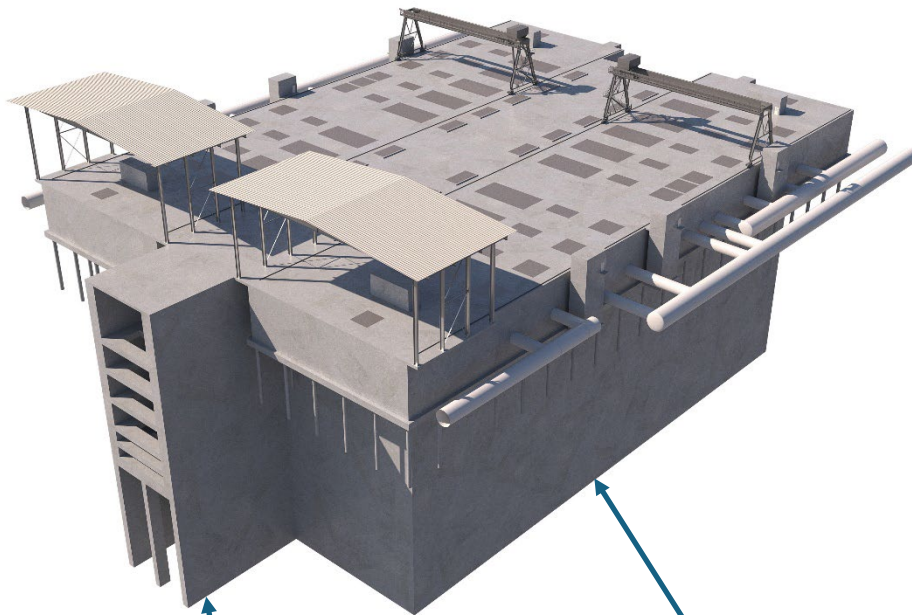


- EIR/EPR project represents a conservative configuration for analysis of impacts
- Innovations represent opportunities to reduce impacts, cost, schedule, and/or risk
- Initial innovations indicate how the project could evolve through future value engineering and design phase
- Developed 19 innovations for inclusion in secondary cost estimate - do not currently represent changes to the project description

Innovation Example – Bethany Reservoir Pumping Plant



Current EPR Design



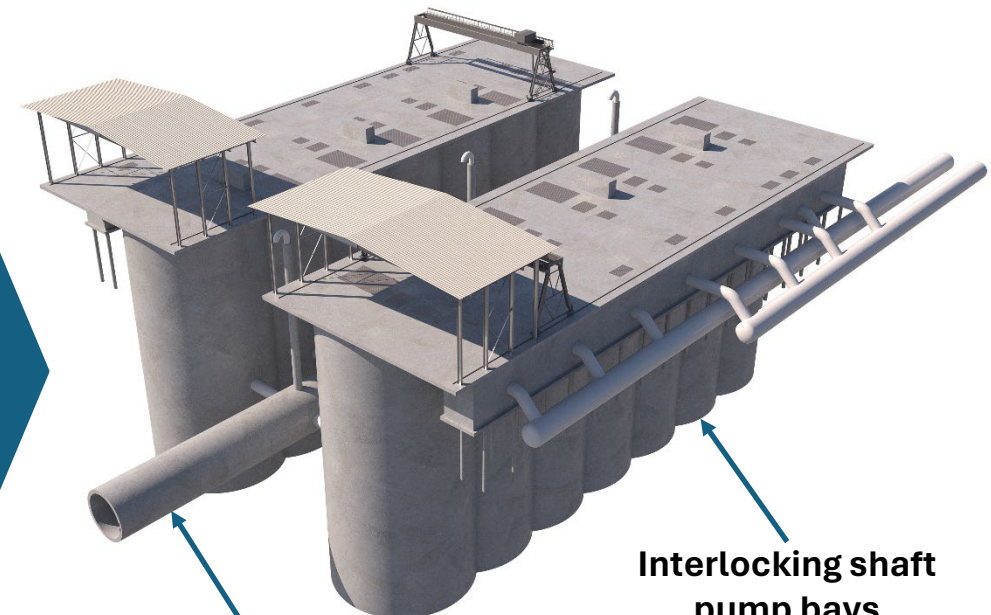
Rectangular concrete wet well and inlet conduit from tunnel

Rectangular concrete pump bays

INNOVATION ADVANTAGES

- Reduced construction quantities, saves:
 - 274,000 yd³ soil excavation
 - 84,000 yd³ concrete
 - 10,400 tons rebar
- Shortens construction schedule by **981 days**
- Reduces direct construction cost by **\$138,720,000**
- No changes to above ground site configuration or surface features

Innovation Design



Tunnel connection to pump bays

Interlocking shaft pump bays

Innovations Construction Cost Savings by Feature



- **Cost savings compares direct construction \$\$'s of innovation to EPR design**
- **Risk treatment costs for innovations included as scaled proportion of construction cost savings**

Feature	Potential Construction Cost Savings	Potential Risk Treatment Cost Savings	Total Potential Cost Savings
Intakes	\$35,000,000	\$1,000,000	\$36,000,000
Tunnels & Shafts	\$211,000,000	\$12,000,000	\$223,000,000
Pumping Plant & Surge Basin	\$370,000,000	\$6,000,000	\$376,000,000
Aqueducts	\$75,000,000	\$3,000,000	\$78,000,000
Discharge Structure	\$40,000,000	\$1,000,000	\$41,000,000
Logistics	\$18,000,000	\$1,000,000	\$19,000,000
Total	\$749,000,000	\$24,000,000	\$773,000,000

Comparison of Costs w/ Innovations



- **Estimate Total Project Cost w/ Innovations using contingency %, labor %'s, and direct application of "other costs"**
- **Innovations reduce total project cost by \$1.23B , or 6% of total cost**
- **Does not account for:**
 - Potential risk or contingency benefits
 - Potential value of schedule reductions
 - Potential reduced land requirements
 - Potential reduced mitigation requirements
 - Potential benefits of Collaborative Delivery contracting approaches

	Total Project Cost Estimate (\$2023)	% Const Cost	Total Project Cost w/ Innovations (\$2023)
TOTAL CONSTRUCTION COSTS	\$15,012,000,000		\$ 14,008,000,000
Two Intakes	\$1,714,000,000	--	\$ 1,678,000,000
Tunnel and Shafts	\$6,353,000,000	--	\$ 6,130,000,000
Pumping Plant /Surge Basin/Aqueduct & Discharge	\$3,198,000,000	--	\$ 2,703,000,000
Utilities and Logistics	\$283,000,000	--	\$ 264,000,000
Construction Sub-Total	\$11,548,000,000	--	\$ 10,775,000,000
Contingency (30%)	\$3,464,000,000	--	\$ 3,223,000,000
Other Program Costs	\$5,108,000,000		\$4,838,900,000
Planning/Design/CM	\$3,328,000,00	22.2%	\$3,106,000,000
DWR Oversight	\$426,000,000	2.8%	\$ 398,000,000
DCA Program Management Office	\$668,000,000	4.4%	\$ 623,000,000
DCA Engineering (Design and CM Services)	\$2,167,000,000	14.4%	\$ 2,022,000,000
DCA Permits and Agency Coordination	\$67,000,000	0.4%	\$ 63,000,000
Other Costs	\$1,780,000,000	--	\$1,780,000,000
Land Acquisition	\$158,000,000	--	\$158,000,000
Mitigation Program	\$960,000,000	--	\$960,000,000
Power	\$415,000,000	--	\$415,00,000
CCWD Settlement	\$47,000,000	--	\$47,000,000
Community Benefits Program	\$200,000,000	--	\$200,000,000
TOTAL	\$20,120,000,000		\$18,894,000,000

Next Steps on Costs



➤ Analyze economic feasibility of DCP through benefit-cost analysis and agency-specific local economic studies

➤ Continue development of design, construction, contracting innovations to improve/refine project definition and constructability

➤ Support DWR's evaluation, including CEQA, of select innovations for possible changes to the approved project



Delta Conveyance Project

Benefit-Cost Analysis

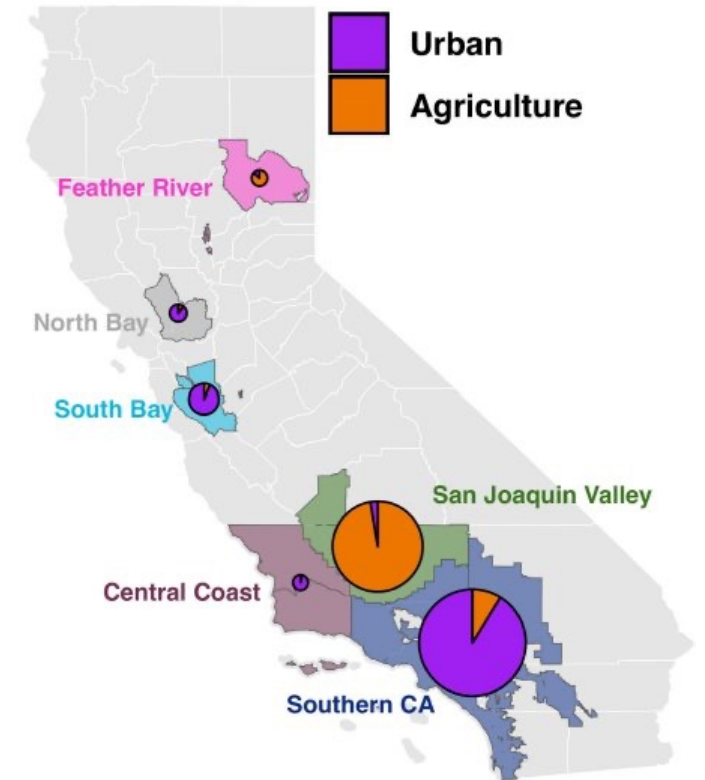
5/16/2024

David Sunding, Ph.D.
Berkeley Research Group

Oliver Browne, Ph.D.
Berkeley Research Group

The State Water Project

- **Service Area:**
 - 27 million people
 - GDP \$2.8 trillion, equivalent to the world's 8th largest economy
- **Current Water Supply:**
 - ~2.56 million acre-feet per year (MAF/yr) of deliveries to urban and agricultural customers
- **Future Challenges:**
 - Climate change and sea level rise expected to reduce deliveries by ~22% by 2070
 - Risk of extended disruption during seismic event





Costs Are Flat, Adjusting for Inflation

- **Updated cost estimate: \$20.1B** (undiscounted 2023 dollars)
 - Refined estimate is rigorous, with significantly more detail than typical for design stage
 - Costs are flat after adjusting for inflation relative to preliminary assessment (**\$15.9B** 2020), despite added detail
- **Supplemental design innovations: \$18.9B**
 - Potential savings: **\$1.2B** (pending approval)

DCP Readily Passes the Benefit- Cost Test

- **Project Benefits:**

- **Water Supply Reliability and Quality:** Offset negative impacts of climate change on water deliveries
- **Seismic Reliability:** Maintain deliveries even after major seismic events

- **Project Costs:**

- DCA Cost estimate (discounted)
- + additional O&M costs and environmental impacts

- **Benefit Cost Ratio: 2.20**

- Passes the Benefit-Cost Test
- **Every \$1 spent = \$2.20 gained**



Key Assumptions

- **Yield:** Protects ~403,000 acre-feet annually on average
- **Cost:** \$20.1B in undiscounted 2023 dollars
- **Real discount rates:** between 2% and 1.4%
 - Changes over time based on guidance from the federal Office of Management and Budget
- **Construction period:** 15 years
- **Life of the project:** 100 years



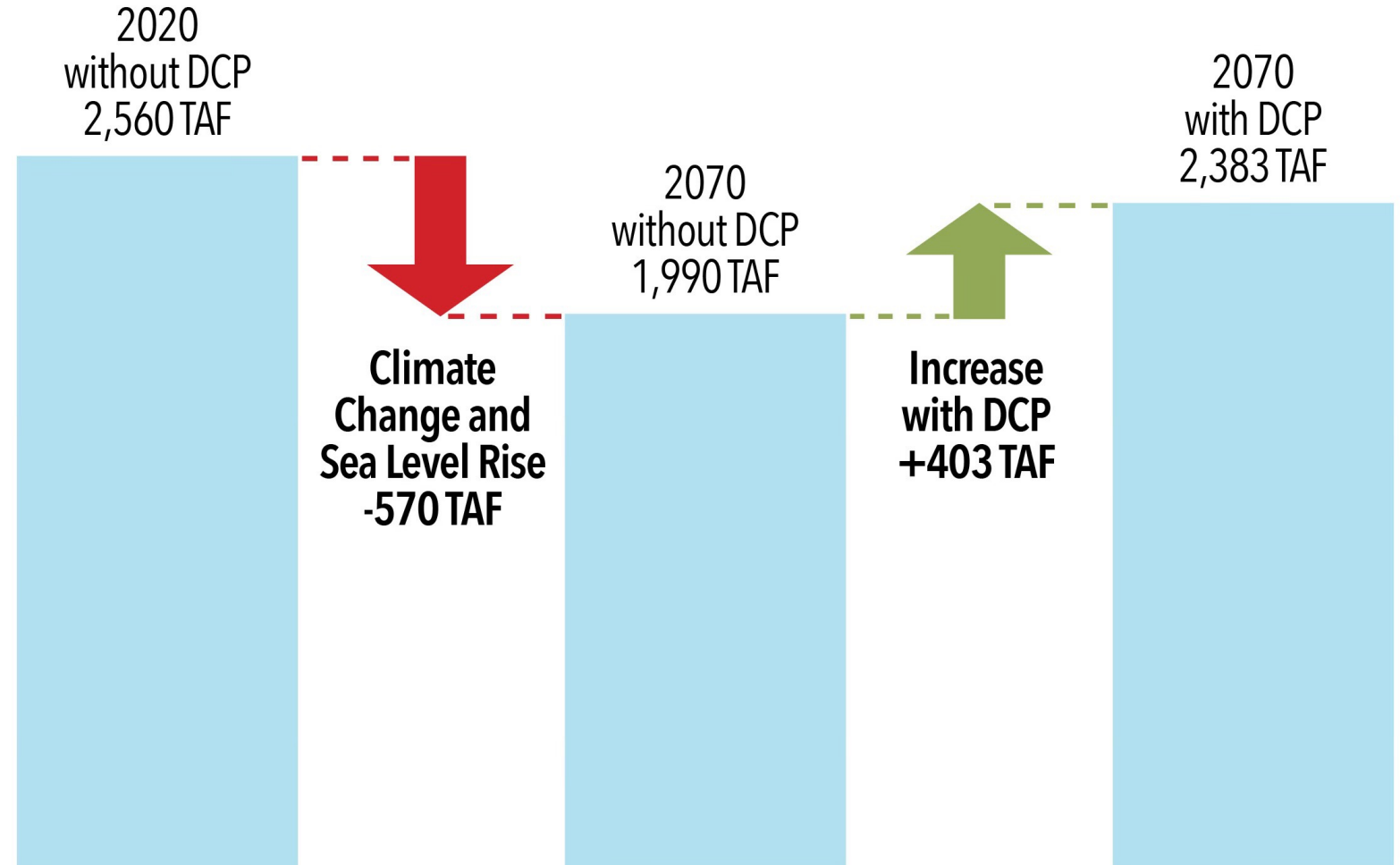
Water Supply Benefits

- **More SWP deliveries allow** agencies to:
 - Fill storage more frequently
 - Enter drought periods with higher reserves
 - Impose fewer periods of mandatory rationing
 - Reduce severity and frequency of shortages
- **Urban:** measured as consumers' willingness to pay to avoid shortages-based on economic research
- **Ag:** based on widely-used SWAP model and water market transaction data



Water Supply Benefits

State Water Project Deliveries:





Water Quality Benefits

- **Benefits** of reduced salinity for SWP contractors **outweigh costs** of 'less than significant' increase in Delta salinity
- **Salinity Impacts:**
 - **Urban:** Reduces treatment cost, improves taste, useful life of appliances, cost of water softening
 - **Ag:** More efficient water use; reduces use of irrigation water needed to flush salts from root zones



Seismic Benefits

- **Avoiding disruption** to statewide water supply during potentially significant earthquakes **saves money and protects water quality**
- **Scenario Analyzed: Delta Flood Emergency Management Plan (2018) Scenario 1**
 - 500-year event, 50 levee breaches & 20 islands flooded
 - Economic impacts assessed with water supply reliability and water quality models for urban and agriculture

Seismic Benefits

No Project

- Delta export disruption
- 203 days
- Reduced water quality
- 340 days (1552 TDS)

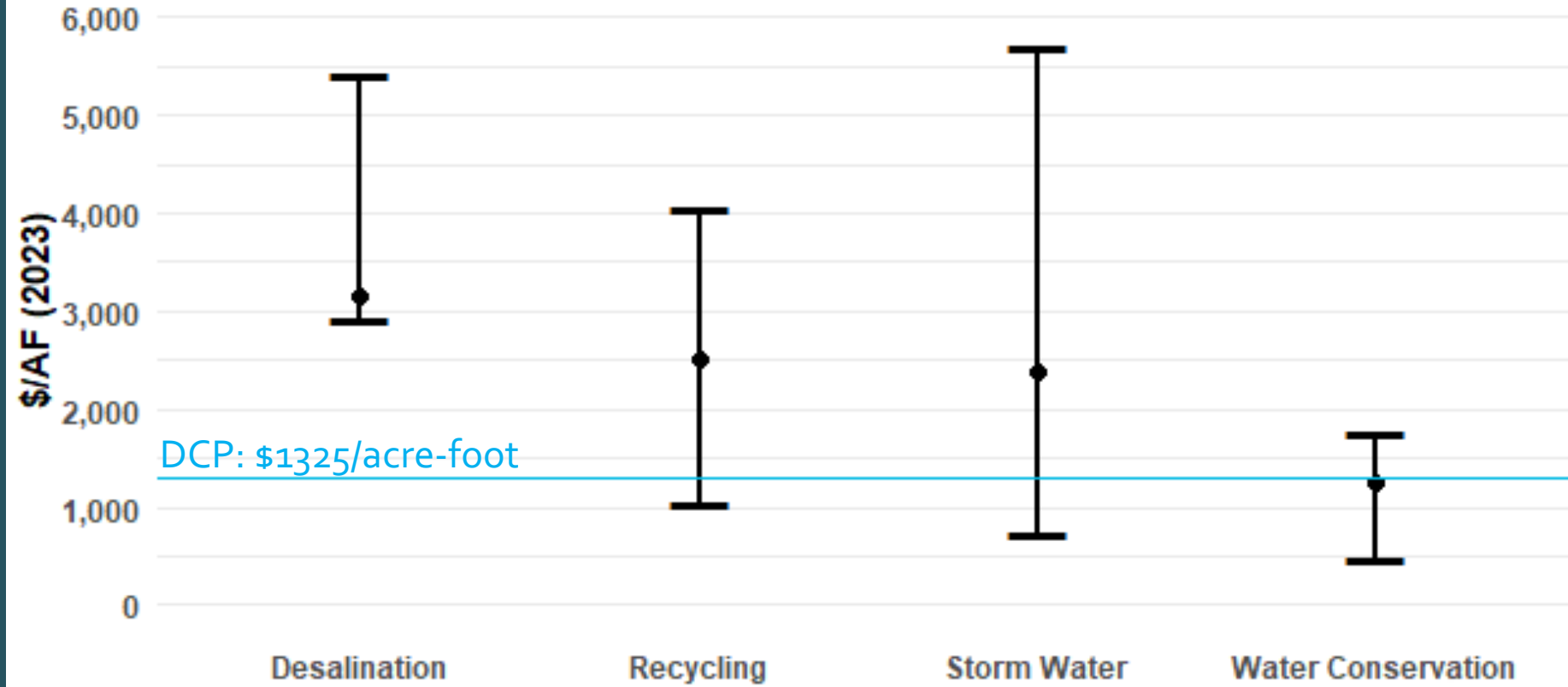
With Project

- DCP operates for full duration
- Business-as-usual deliveries, or
- Minimum deliveries to meet Public Health and Safety
- No reduction in water quality





Comparison to Alternative Supplies



Source: Sunding, Browne, Zhu (2023) The Economy of the State Water Project
Constructed using data from previous studies by the Pacific Institute, PPIC and CPUC and updated for inflation
DCP cost does not include South-of-Delta conveyance



Positive Benefit-Cost Ratio Across All Climate Scenarios

Sensitivity Analysis

	Main Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
	2070 Median 1.8' SLR	2070 Median 1.8' SLR & mitigation	2070 Median 3.5' SLR	2070 Median 3.5' SLR & mitigation	2040 Median 1.8' SLR	2040 Central Tendency 1.8' SLR
Benefit-Cost Ratio	2.20	2.20	2.63	2.45	1.78	1.54



Important Considerations

- **PWAs can transfer excess DCP supplies** and associated costs
 - Flexibility preserves water supplies and aids cost management
- Costs of environmental impacts after mitigation: **\$167M**
 - **During construction:** Lost agricultural land, local air quality, noise, transportation
 - **During operations:** water quality in Delta
- Many **benefits outside of CBA scope**, are still valuable and compelling:
 - **Operational flexibility:** missed opportunity this year to add 909 TAF (equivalent to Folsom Lake)
 - **Community Benefits Program effects**
 - **Job creation:** 5,000 high paying jobs
 - **Groundwater:** relieves pressure on dwindling/constrained groundwater sources



Cost of Doing Nothing

- **Cost of Inaction on Climate and Seismic Risk**
 - 22% reduction in deliveries by 2070 (570,000 AF/yr)
- **Direct impacts** of climate change and seismic risk:
 - **Reduced reliability** and flexibility for SWP operations
 - **Water shortages** and mandatory restrictions
 - Ongoing risk of **major seismic disruption**
 - Expensive **alternative supplies**
- **Indirect Impacts** (not evaluated):
 - **Higher rates** for local agencies
 - Impacts on **Employment and economic activity** for agricultural economies in Central Valley and urban development in SoCal
 - Higher **Food prices**
 - Depletion of **Groundwater resources**
- **The cost of inaction** on climate and seismic risk **exceeds the \$38B in project benefits**

Bethany Cost Estimate



Benefit Cost Analysis



Stay Informed



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Multilingual Project Hotline

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Questions?