



Strategic Water Supply Assessment

BOARD UPDATE

January 24, 2023



Workshop Agenda: Strategic Water Supply Assessment

- Project Update
- Review of Water Management Portfolios
- Summary of Performance of Portfolios
- Developing Roadmaps
- Next Steps

Strategic Water Supply Assessment: Schedule

- December 13 – Draft Strategies and Portfolios
- **January 24 – Analysis of Portfolios**
- February TBD – Roadmap

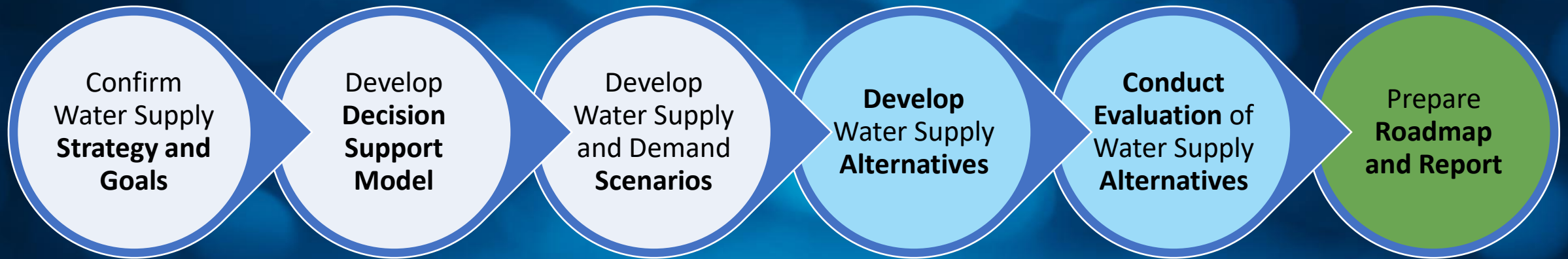
Process for Assessment

Key Project Scope Elements

Understanding Current Risks & Establishing Goals

Identifying & Evaluating Alternatives

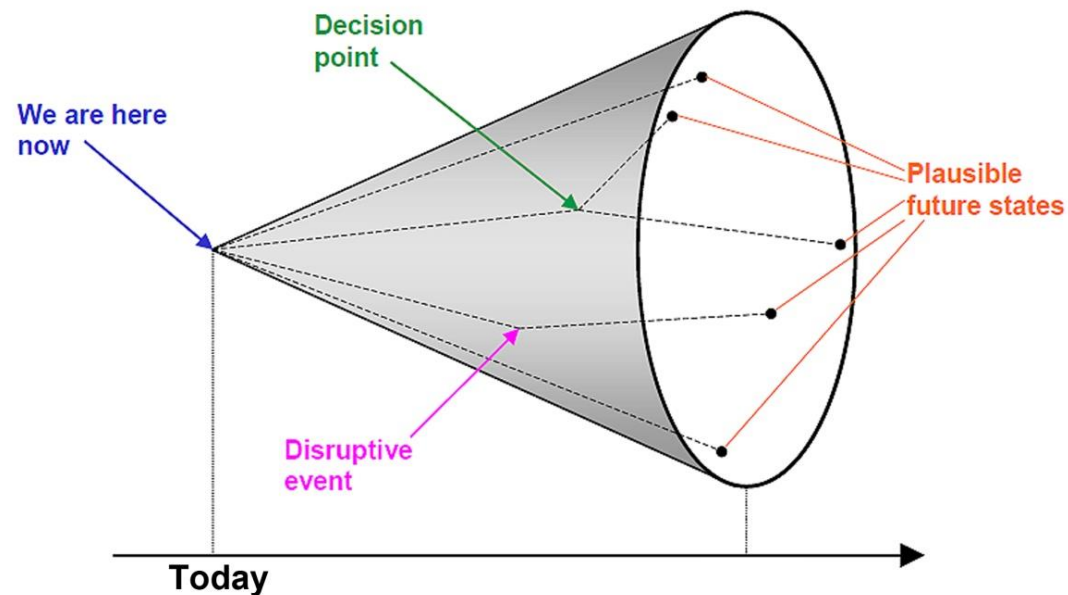
Recommendations
& Path Forward



We are here

Strategic Water Supply Assessment: Scenarios

■ Draft Scenarios – *Explore Uncertainties We Don't Control*



Scenario 1 – Current Trends

Scenario 2 – Short and Severe Drought

Scenario 3 – Beyond Drought of Record

Scenario 4 – Abrupt Disruptions

Conservation scenario is now a Water Management Alternative

Draft Scenario Assumptions

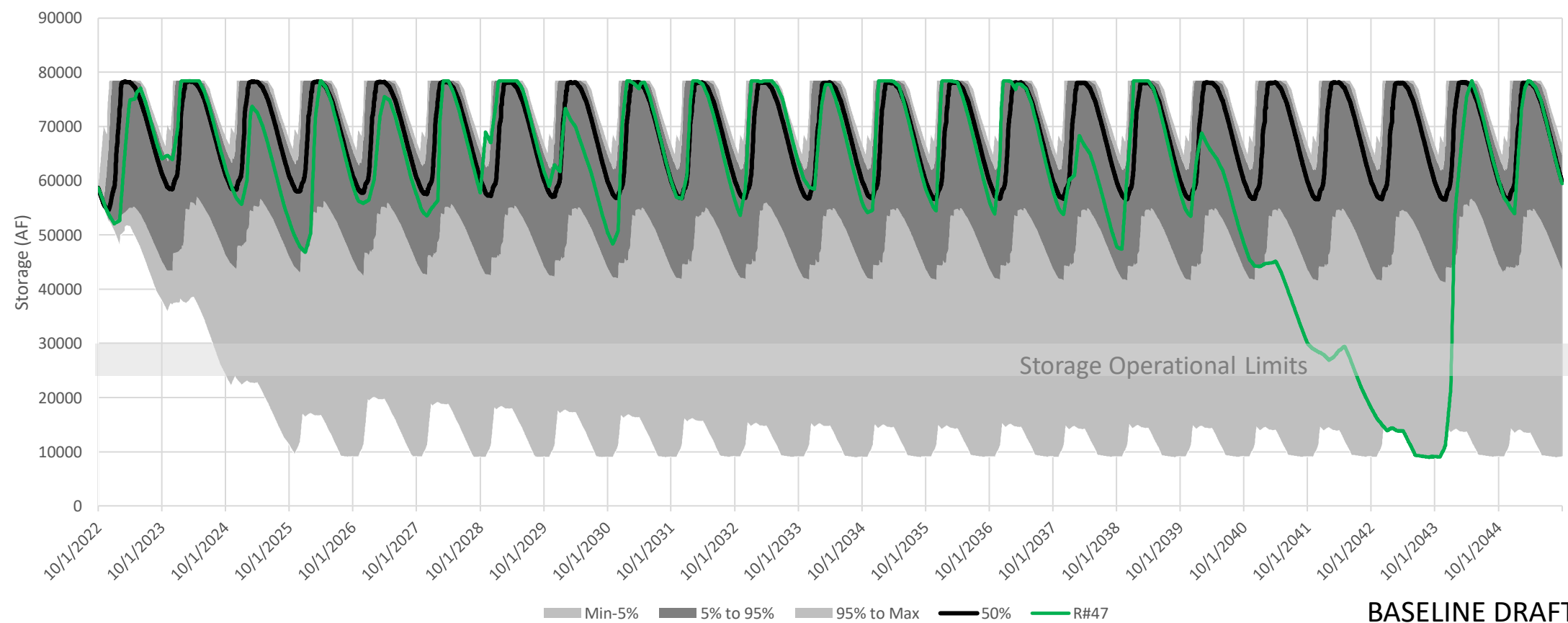
Scenario	Hydroclimate Assumptions	Demand Assumptions	Operational Assumptions
Scenario 1 – Current Trends	Historical observed	Passive-level savings; drought conservation per WSCP	Current operations; local supply preference; supplemental water with Kastania Pump Station rehabilitation
Scenario 2 – Short and Severe Drought	Severe 4-Yr drought (2020, 2021, 1976, 1977)	Passive-level savings; drought conservation per WSCP	Current operations; local supply preference; supplemental water with Kastania Pump Station rehabilitation
Scenario 3 – Beyond Drought of Record	Long-range, extended 6- or 7-Yr drought (based on climate change projections)	Passive-level savings; drought conservation per WSCP	Current operations; local supply preference; supplemental water with Kastania Pump Station rehabilitation
Scenario 4 – Abrupt Disruptions	Severe 2-Yr (2020, 2021) or 4-Yr drought (2020, 2021, 1976, 1977); high wildfire likelihood	Passive-level savings; drought conservation per WSCP	Operational disruptions due to post-wildfire sediment loads; Treatments plants at reduced capacity (Bon Tempe offline & San Geronimo @ 50% operating capacity for 6 months)

Conservation scenario is now a Water Management Alternative

Scenarios Provide Planning Level Estimates of Deficit

Scenario	Max. Deficit Duration	Annual Deficit (AFY)
Scenario 2 – Short and Severe Drought	4 years	7,500 – 8,500 AFY (4 yrs)

Simulated MMWD Total Reservoir Storage, WY 2023-2045, Scenario 2



Review of Water Management Portfolios

Moving Toward Strategies and Portfolios

- **Strategies** – a particular plan of action or policy designed to achieve the overall water management goals
- **Portfolios** – a combination of actions designed to implement a particular strategy
- Recognizing no singular alternative is likely to achieve all goals
 - How to balance long-term and shorter-term actions?
 - Are some alternatives synergistic? Can one set of alternatives amplify the benefit of other alternatives or preclude others?
 - Develop select strategies and associated portfolios for testing performance
- Draft portfolios are designed to INFORM roadmap; but are NOT themselves the roadmap
 - Roadmap will follow analysis and evaluation of the portfolios

Draft Portfolios for Analysis

■ Portfolio A: Maximize Existing Infrastructure

- Emphasizes alternatives that maximize existing local and regional water supplies
- Sonoma-Marín partnerships, local storage optimization, interconnections

■ Portfolio B: New Local Supply

- Emphasizes alternatives which add new local drought-resilient supplies
- Desalination, Reuse

■ Portfolio C: Diversify Imports

- Emphasizes alternatives that diversify imported water from different source watersheds
- Water purchases with Bay interties (EBMUD or CCWD)

■ Portfolio D: Low Cost

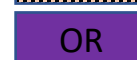
- Emphasizes lowest cost actions (less than ~ \$2,500/AF)
- Greater conservation, maximizing Sonoma Water purchase, regional groundwater bank, local storage augmentation, Petaluma brackish desalination

Portfolio A – Maximize Existing Infrastructure

Project	Portfolio A: Maximize Existing Infrastructure		
	Near Term (0-3yrs)	Mid Term (4-7yrs)	Long-Term (8-12 yrs)
Temporary Urgency Change Permits (TUCPs)			
Water Shortage Contingency Plan (WSCP) - Stage 1-3			
Water Conservation Program			
Regulatory Driven Program			
Maximize Use of Sonoma Water - Existing Facilities			
Maximize Use of Sonoma Water - Resolve Bottlenecks			
Maximize Use of Sonoma Water - Resolve Bottlenecks+South Transmission System			
Maximize Use of Sonoma Water - Dedicated Conveyance Stafford to Nicasio			
Maximize Use of Sonoma Water - Dedicated Conveyance Kastania to Nicasio			OR
Maximize Use of Sonoma Water - Dedicated Conveyance Cotati to SoulaJule			OR
Regional Groundwater Bank			
SoulaJule Enlargement			OR
Nicasio Enlargement			OR
Kent Enlargement			OR
Halleck Reservoir			
Devil's Gulch Reservoir			
Movable Spillway Gates - SoulaJule			
Movable Spillway Gates - Nicasio			
Movable Spillway Gates - Kent			
Movable Spillway Gates - Alpine			
Phoenix Lake - Bon Tempe Lake Connection			
SoulaJule Electrification			



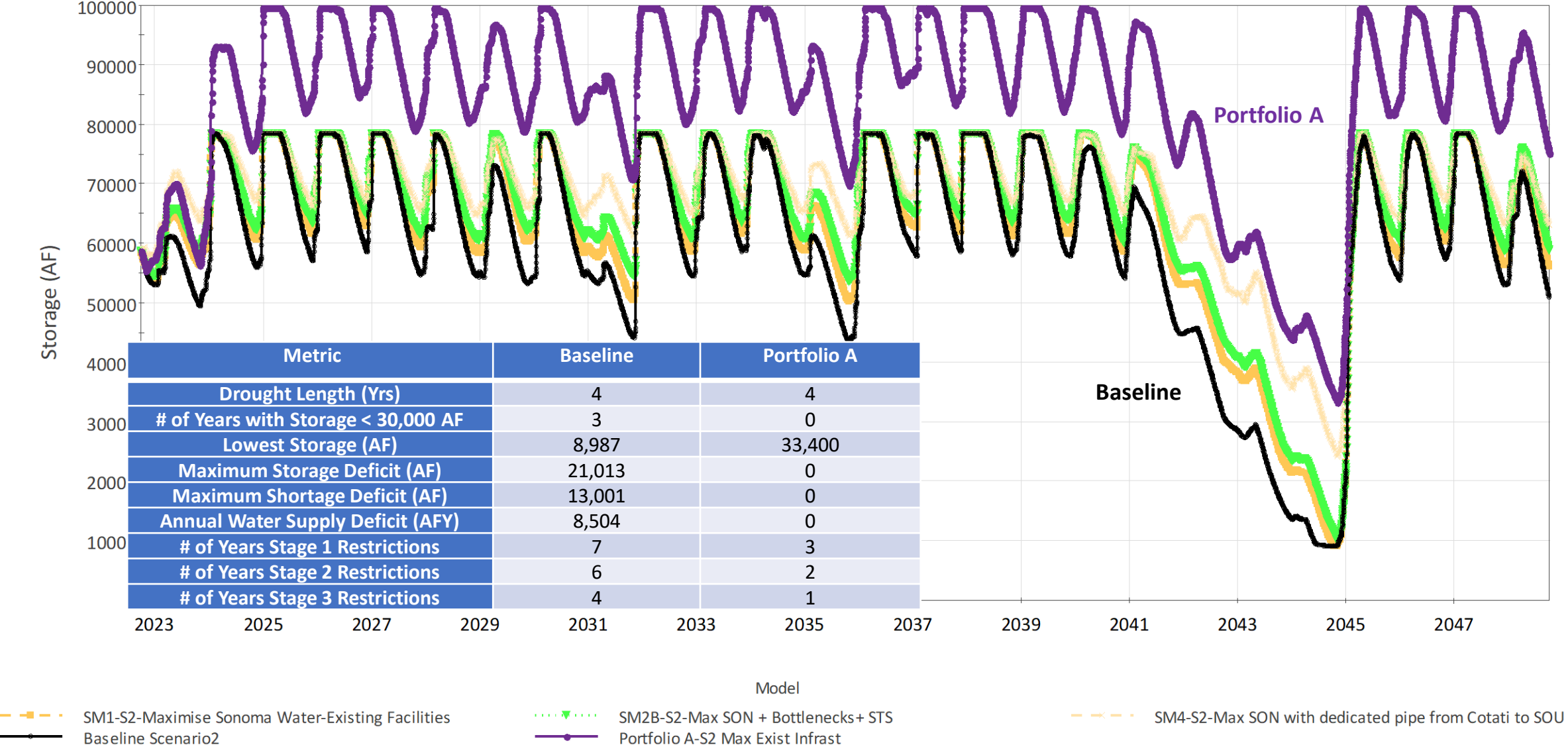
Part of portfolio, but uncertain implementation. Planning required. Not simulated.



Decision between projects. Only one would be selected.

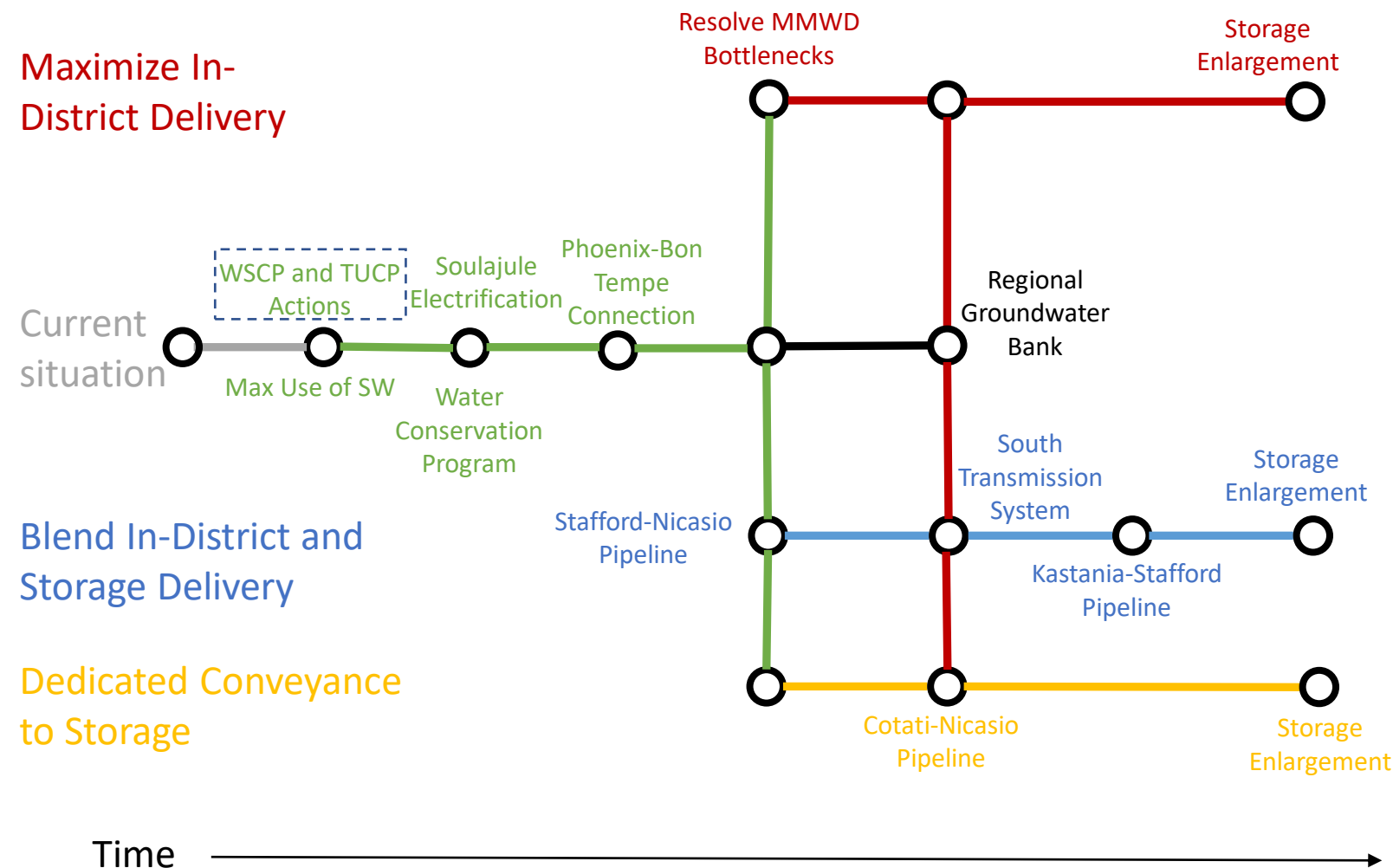
Portfolio A - Maximize Existing Infrastructure

Total MMWD Reservoir Storage (Scenario 2)



Draft Roadmap for Portfolio A

Adaptation Pathway Roadmap



Scorecard for Pathways

Pathway	Yield (AFY)	Cost (\$/AFY)	Reliability Rating ¹	Environ. Rating ²	Social Rating ³
	5,100	1,600	H	H	H
	10,800	2,200	M/H	M/H	M/H
	6,300	1,700	H	H	H
	9,100	2,200	M/H	M/H	M
	13,500	2,300	M/H	M/H	M
	14,800	2,400	M/H	M/H	M/H
	16,300	2,500	M/H	M/H	M/H

1. Includes "Reliability", "Flexibility", and "Feasibility" ratings.
2. Includes "Environmental", "Energy", and "Permitting" ratings.
3. Includes "Social" and "Public Acceptance" ratings.

Portfolio B – New Local Supply

Project	Portfolio B: New Local Supply		
	Near Term (0-3yrs)	Mid Term (4-7yrs)	Long-Term (8-12 yrs)
Temporary Urgency Change Permits (TUCPs)			
Water Shortage Contingency Plan (WSCP) - Stage 1-3			
Water Conservation Program			
Regulatory Driven Program			
Marin Regional Desalination Facility- 5 MGD Stand Alone			
Marin Regional Desalination Facility - 5 MGD Expandable			
Marin Regional Desalination Facility - 10 MGD Expandable			
Marin Regional Desalination Facility - 15 MGD			
Containerized Desalination Facility			
Bay Area Regional Desalination Facility			
Petaluma Brackish Groundwater Desalination Facility			
Recycled Water Expansion - Peacock Gap			
Recycled Water Expansion - San Quentin			
Regional Indirect Potable Reuse (IPR)			
CMSA Direct Potable Reuse (DPR) - Raw Water Augmentation			
CMSA Direct Potable Reuse (DPR) - Treated Water Augmentation			
Regional Direct Potable Reuse (DPR)			



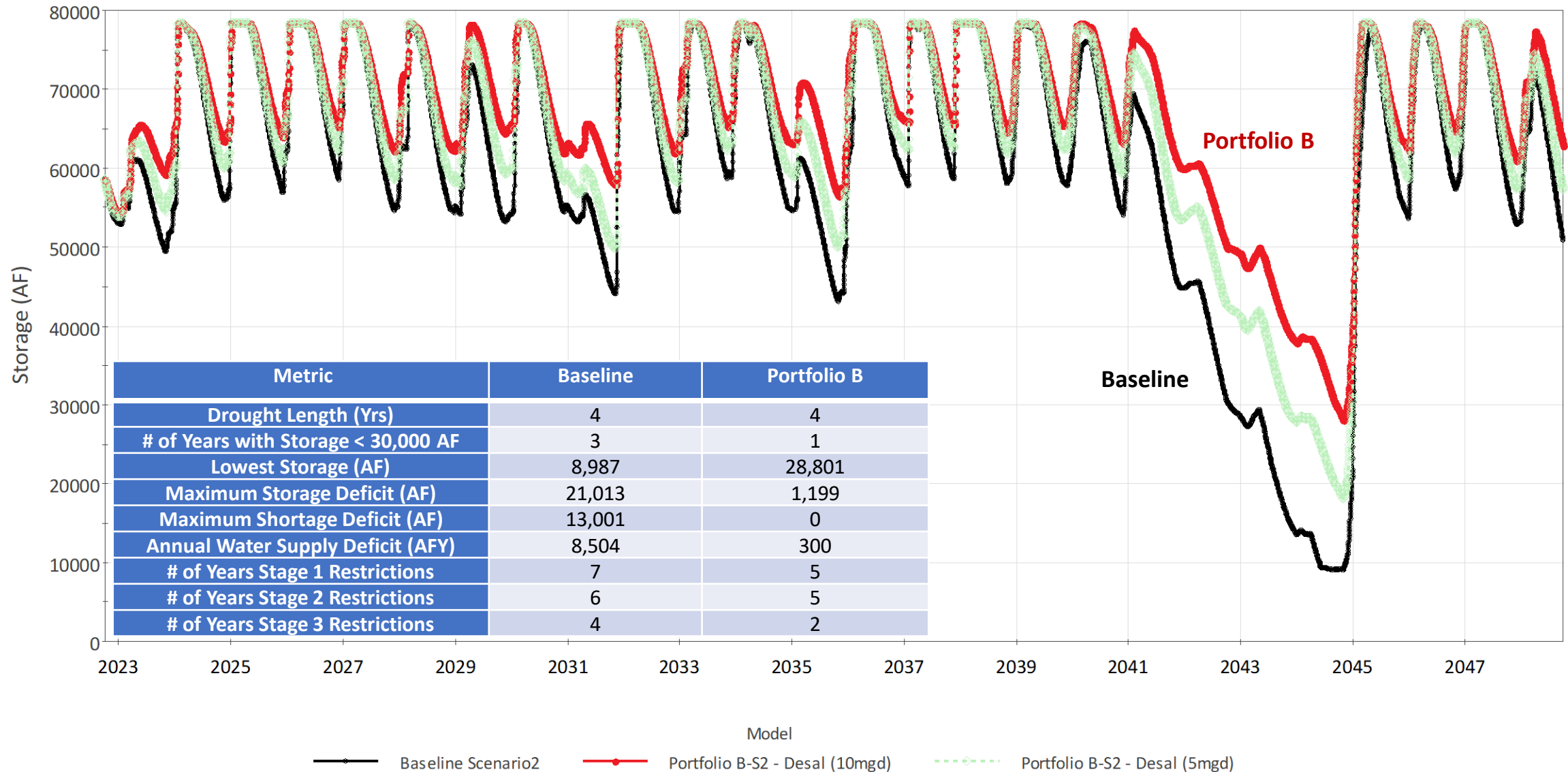
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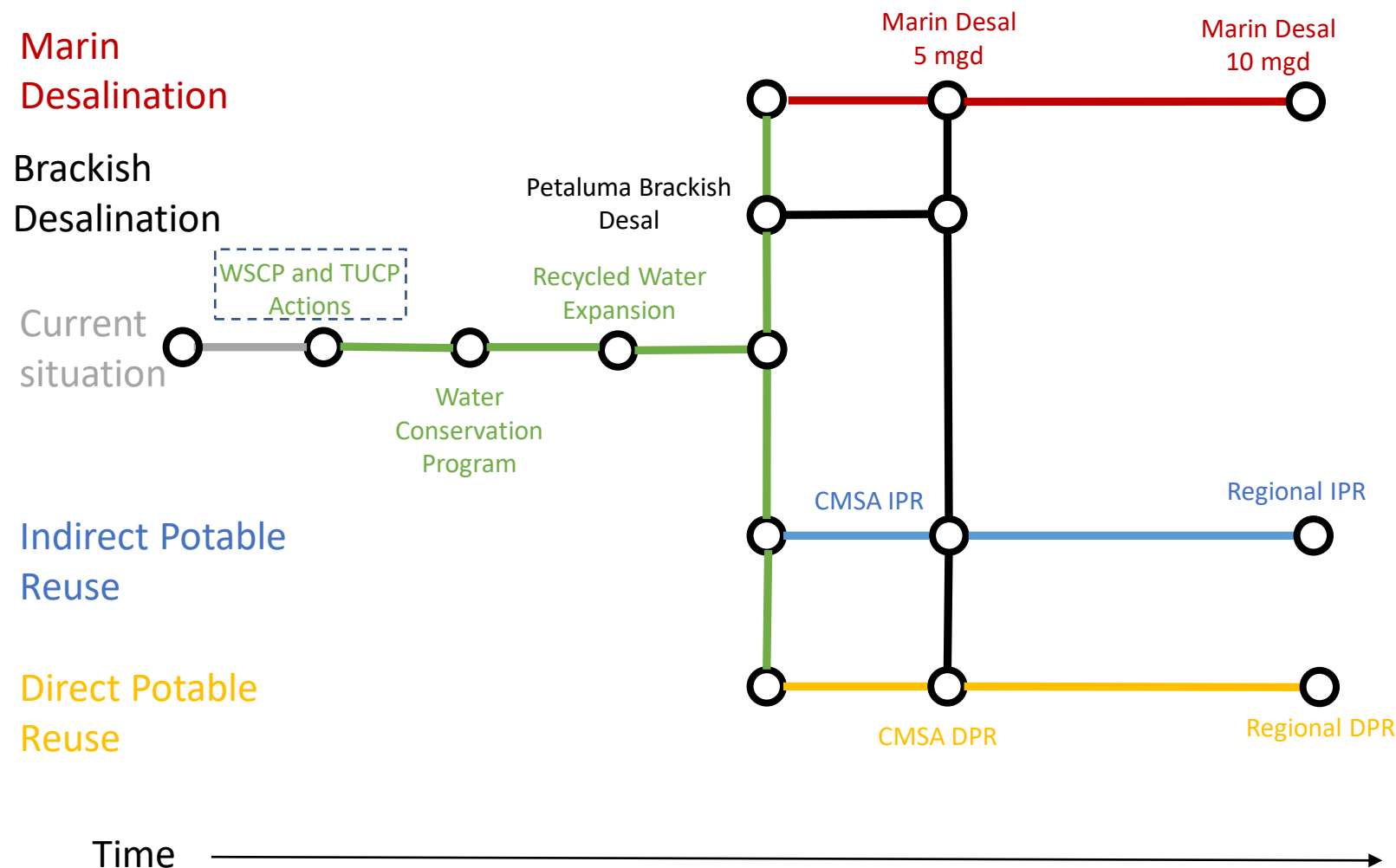
Portfolio B – New Local Supply

Total MMWD Reservoir Storage (Scenario 2)



Draft Roadmap for Portfolio B

Adaptation Pathway Roadmap



Scorecard for Pathways

Pathway	Yield (AFY)	Cost (\$/AFY)	Reliability Rating	Environ. Rating	Social Rating
	2,800	2,300	H	H	H
	12,900	3,400	M/H	L/M	M/H
	8,200	2,400	M/H	M/H	H
	9,900	3,600	M/H	M	M/H
	9,900	4,600	M	L/M	L/M
	15,200	3,200	M/H	M	M/H
	15,200	3,800	M	L/M	M

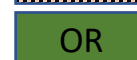
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3. Includes "Social" and "Public Acceptance" ratings.

Portfolio C – Diversify Imports

	Portfolio C: Diversify Imports		
	Near Term (0-3yrs)	Mid Term (4-7yrs)	Long-Term (8-12 yrs)
Temporary Urgency Change Permits (TUCPs)			
Water Shortage Contingency Plan (WSCP) - Stage 1-3			
Water Conservation Program			
Regulatory Driven Program			
EBMUD Intertie		OR	
CCWD Intertie		OR	
NBA Intertie - MMWD			
NBA Intertie - Sonoma Aqueduct			
SFPUC Intertie			



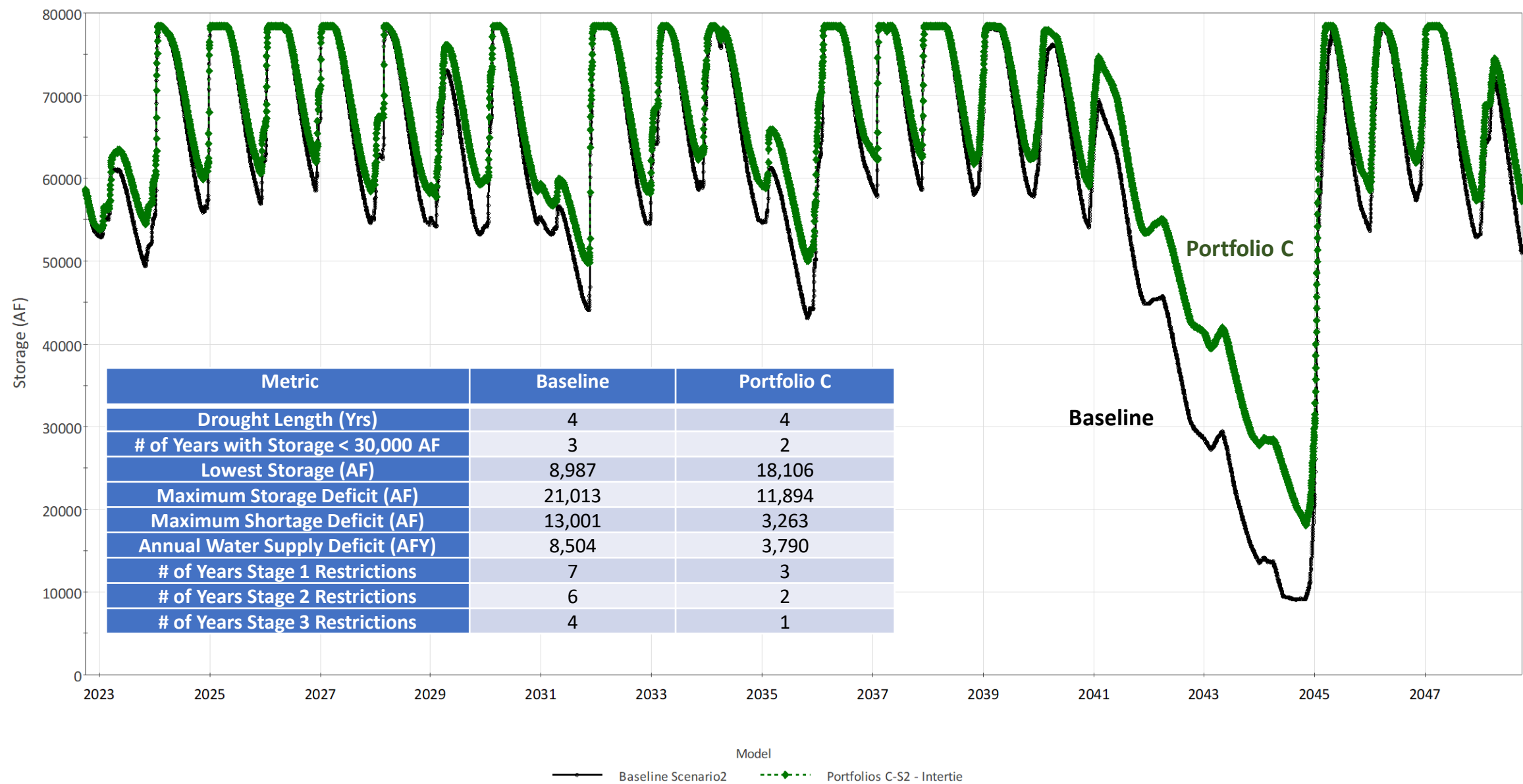
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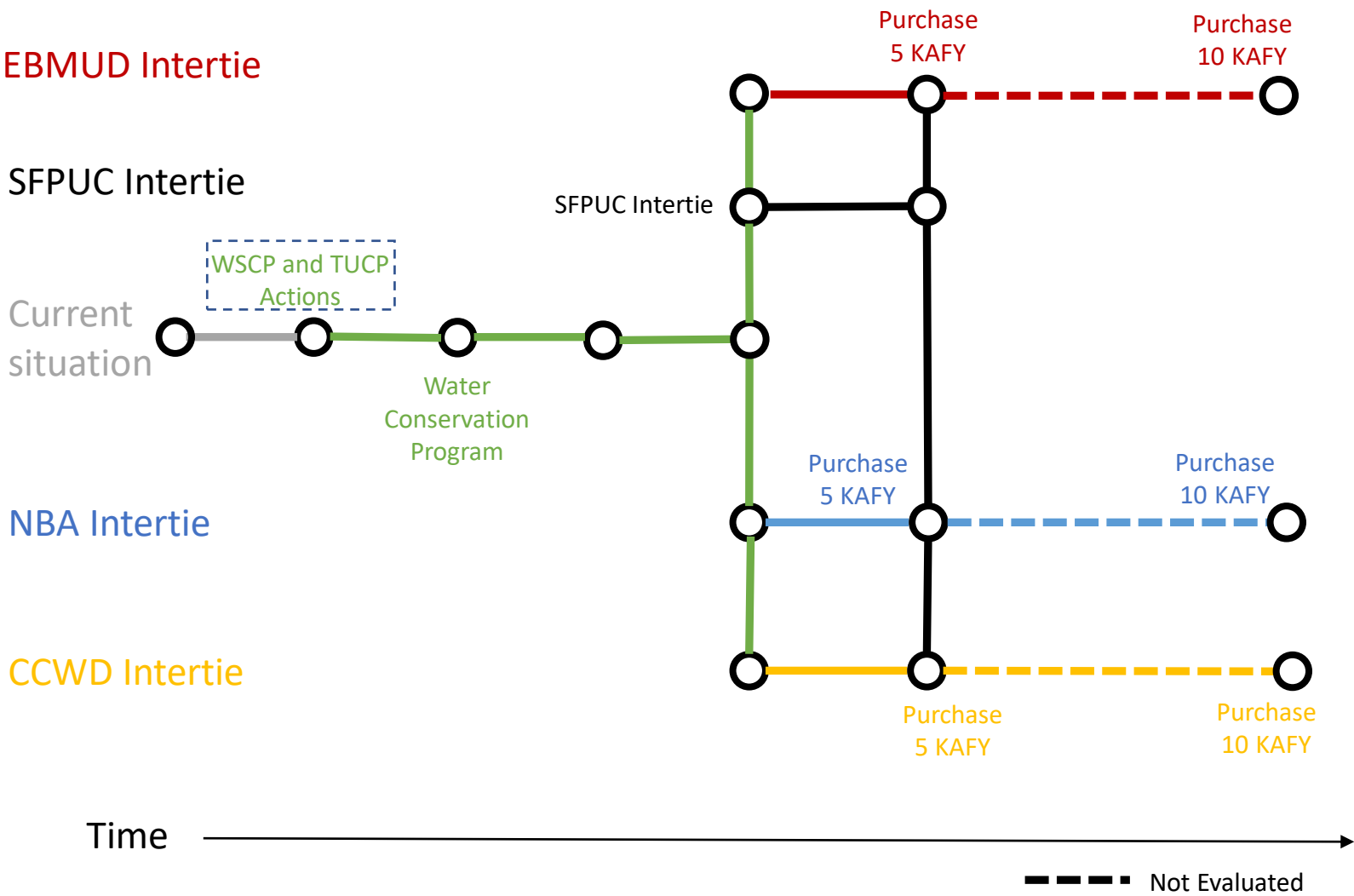
Portfolio C – Diversify Imports

Total MMWD Reservoir Storage (Scenario 2)



Draft Roadmap for Portfolio C

Adaptation Pathway Roadmap



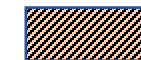
Scorecard for Pathways

Pathway	Yield (AFY)	Cost (\$/AFY)	Reliability Rating	Environ. Rating	Social Rating
	2,400	1,800	H	H	H
	7,400	2,500	M/H	M/H	M/H
	3,400	2,200	M/H	M/H	M/H
	7,400	4,200	M/H	M/H	M/H
	7,400	3,600	M/H	M/H	M/H
	8,400	2,500	M/H	M/H	M/H
	8,400	3,500	M/H	M/H	M/H

1. Includes "Reliability", "Flexibility", and "Feasibility" ratings.
2. Includes "Environmental", "Energy", and "Permitting" ratings.
3. Includes "Social" and "Public Acceptance" ratings.

Portfolio D – Low Cost

Project	Portfolio D: Low Cost (less than \$2500/AF)		
	Near Term (0-3yrs)	Mid Term (4-7yrs)	Long-Term (8-12 yrs)
Temporary Urgency Change Permits (TUCPs)			
Water Shortage Contingency Plan (WSCP) - Stage 1-3			
Water Conservation Program			
Regulatory Driven Program			
Maximize Use of Sonoma Water - Existing Facilities			
Maximize Use of Sonoma Water - Resolve Bottlenecks			
Maximize Use of Sonoma Water - Resolve Bottlenecks+South Transmission System			
Maximize Use of Sonoma Water - Dedicated Conveyance Stafford to Nicasio			
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Regional Groundwater Bank			
Soulajule Enlargement			
Nicasio Enlargement			
Kent Enlargement			
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Devil's Gulch Reservoir			
Movable Spillway Gates - Soulajule			
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EBMUD Intertie			
CCWD Intertie			
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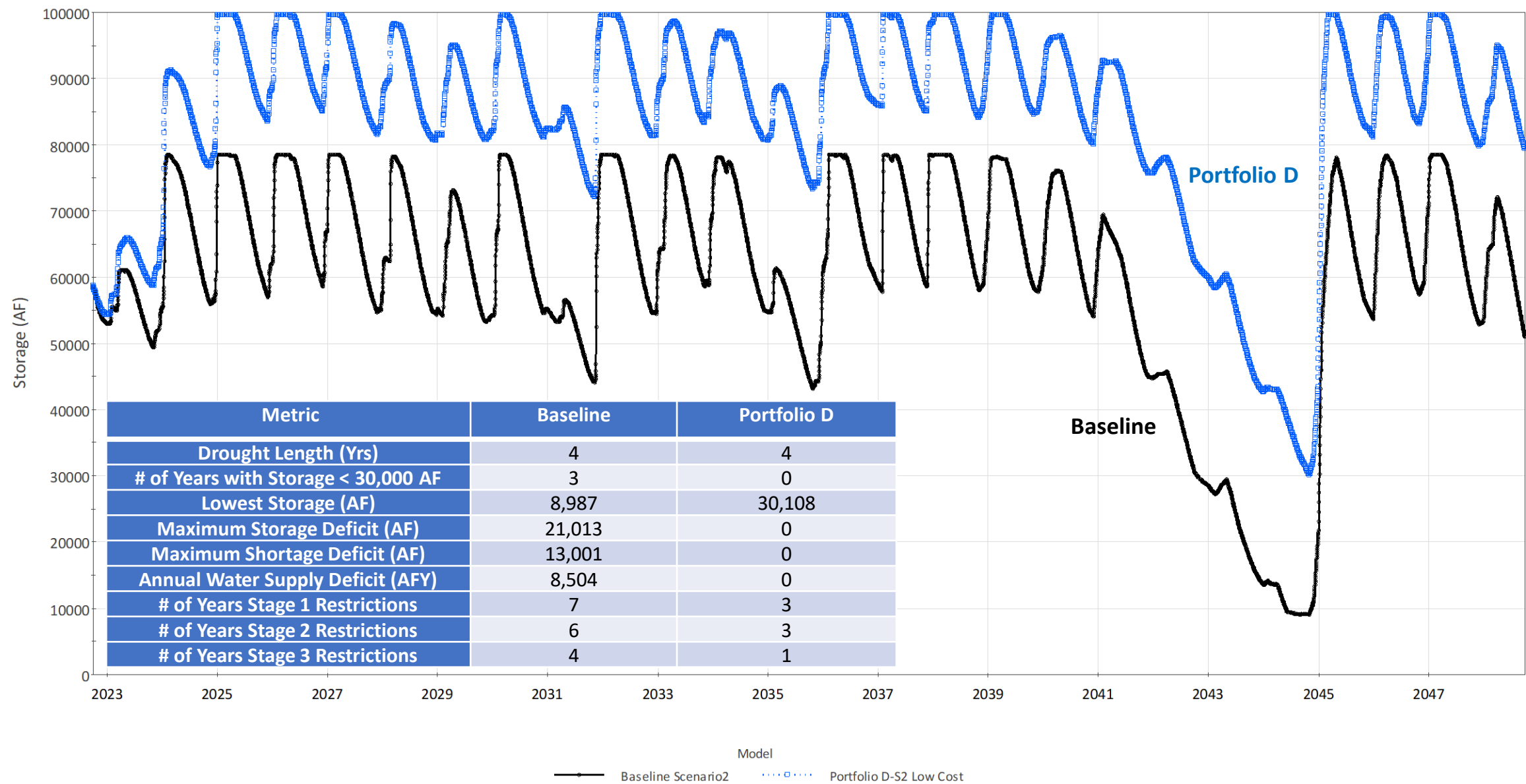
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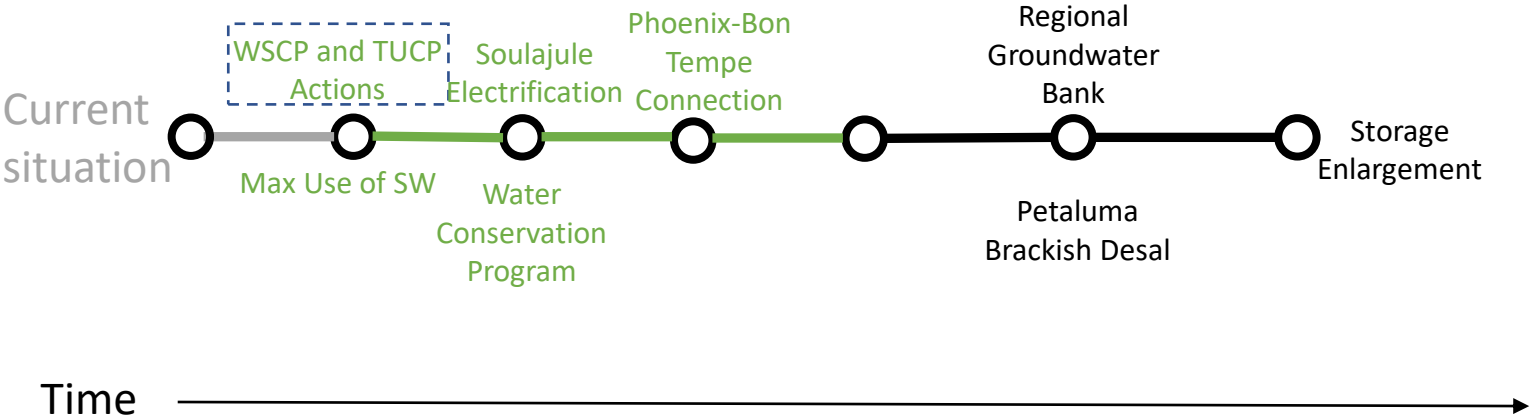
Portfolio D – Low Cost

Total MMWD Reservoir Storage (Scenario 2)



Draft Roadmap for Portfolio D

Adaptation Pathway Roadmap



Scorecard for Pathways

Pathway	Yield (AFY)	Cost (\$/AFY)	Reliability Rating	Environ. Rating	Social Rating
○	5,100	1,600	H	H	H
○●	11,700	2,000	M/H	M/H	H

- 1. Includes “Reliability”, “Flexibility”, and “Feasibility” ratings.
- 2. Includes “Environmental”, “Energy”, and “Permitting” ratings.
- 3. Includes “Social” and “Public Acceptance” ratings.

Comparison of Portfolios

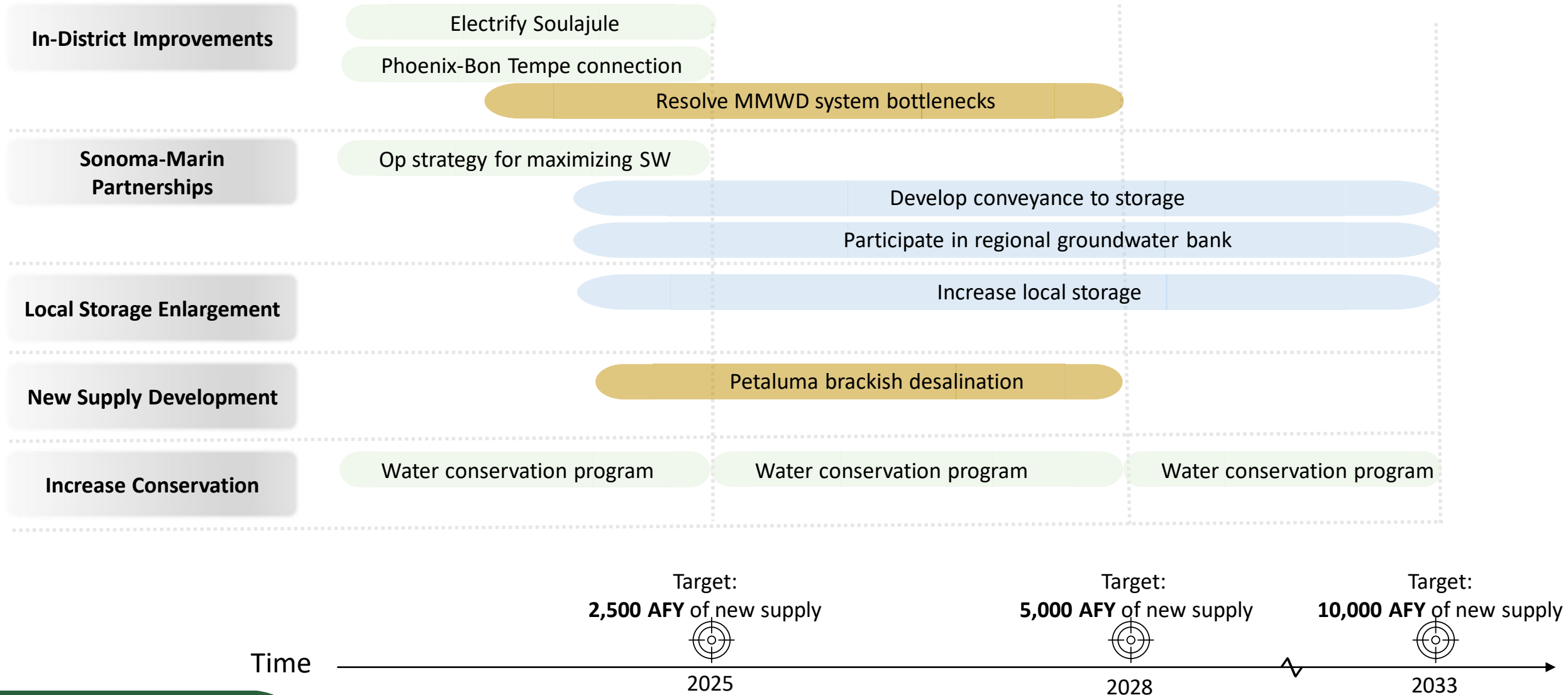
	Portfolio A – Max. Exist Infrastructure	Portfolio B – New Local Supply	Portfolio C – Diversify Imports	Portfolio D – Low Cost
Performance in Achieving Goals	✓✓✓	✓✓✓	✓	✓✓✓
Dry Year Yield (AFY)	9,100 - 16,300	9,900 - 15,200	7,400 – 8,400	11,700
Cost per AFY (\$)	\$2,200 – 2,500	\$3,200 – 4,600	\$2,500 – 4,200	\$2,000
Reliability Rating	M/H	M/H	M/H	M/H
Environmental Rating	M/H	L/M to M/H	M/H	M/H
Social Rating	M	L/M to M/H	M/H	H
Components Driving Performance	Conservation; maximizing delivery of SW supply; increase storage; resolving conveyance limitations	Conservation; new desal supply; new reuse supply	Conservation; new imports from Sac Valley	Conservation; maximizing delivery of SW supply; brackish desal supply; increase storage

Observations/Findings

- Multiple viable pathways exist for drought resiliency
- Portfolio observations
 - Conservation and drought restrictions are key elements
 - Operational strategies to maximize Sonoma Water supply can yield benefits with existing infrastructure
 - Enlarging storage provides substantial benefits taking advantage of runoff in both local and Russian River watersheds
 - New desalination, reuse, and Sac Valley import supplies likely to need be generated at scale for drought resiliency, or combined with other actions
 - “Low Cost” portfolio is a useful reference and suggests that drought resiliency can be achieved with new supply costs less than \$2,500/AF
- Integration of promising elements of the portfolios can demonstrate more realistic roadmaps showing performance over time; linking early “low regret” actions with longer-term infrastructure investments

Example Integrated Roadmap and Supply Targets

Combining actions from various portfolios



Next Steps

- Further evaluation of portfolios and draft roadmaps
- Development and presentation of recommended roadmap
- Final assessment report