



SWP Infrastructure Overview

January 26, 2023
CCWA Board of Directors Meeting
Agenda Item VII - C

SWC SWP Infrastructure Objectives



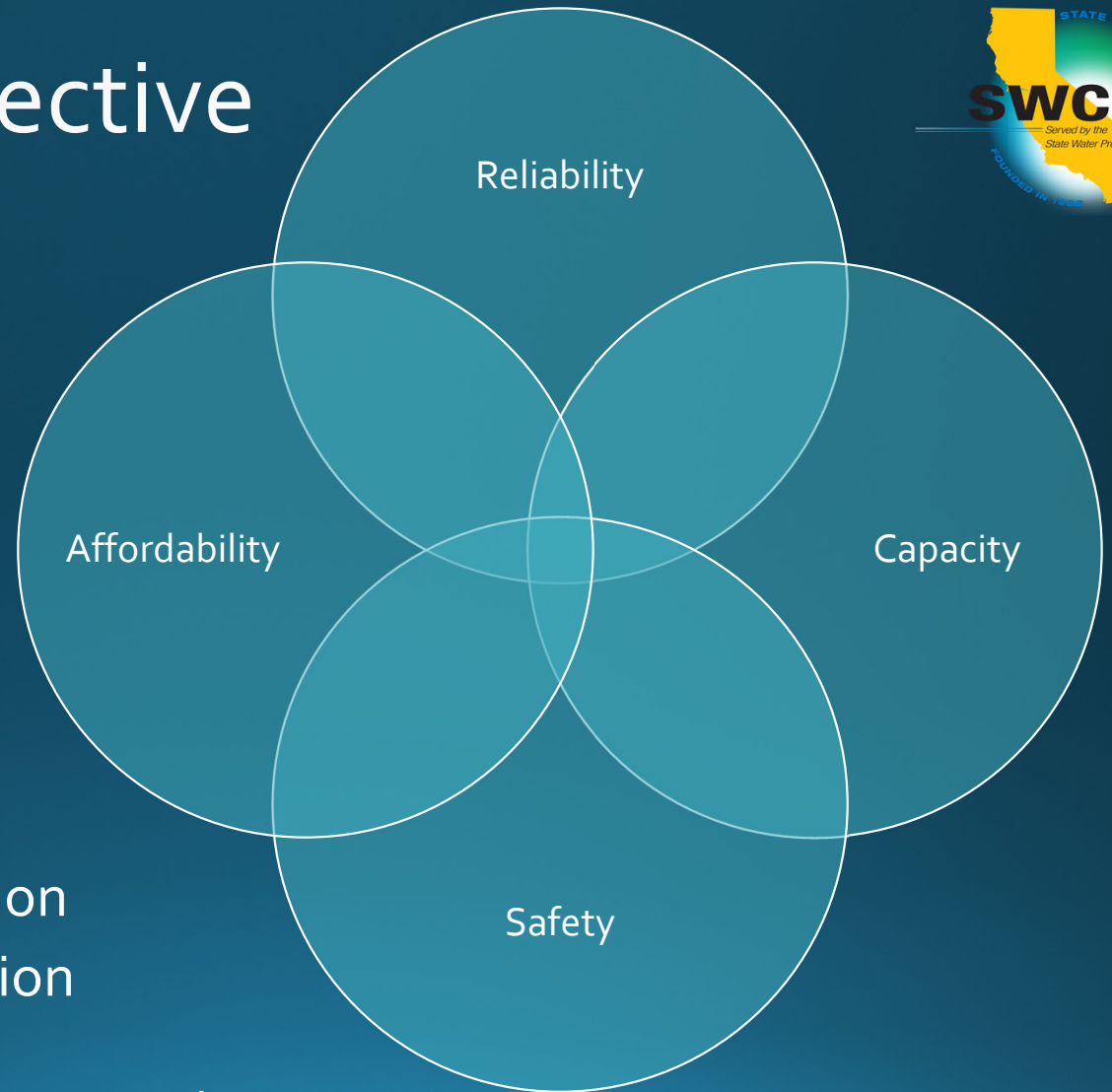
- Infrastructure Reliability
- Capacity Retention
- Infrastructure Safety
- Infrastructure Affordability

Infrastructure Objective Challenges

- Aging Infrastructure
- Subsidence
- New Regulations
- Emergency Responses

Compounding Factors

- Climate Change
- Federal Funding Appropriation
- Succession Planning/Retention



SWP Overview

- 20 Pumping Plants
- 5 Hydroelectric Power Plants
- 4 Pumping Generating Plants
- Over 700 mile of canals, tunnels, and pipelines
- 34 storage facilities
- 5 field divisions



State Water Project





Major SWP Programs/Projects	Reliability	Capacity	Safety	Affordability
Unit Refurb/Replacements (motor/turbine/valve)	X	X	X	X
Dam Safety Program	X	X	X	X
Fire and Life System Modernization	X	X	X	X
Bridge Repairs/ Replacement	X		X	
Security (Cyber/ Physical/Energy)			X	X
CA Aqueduct Subsidence Program	X	X	X	X
Sisk Dam Safety of Dams Modification Project	X	X	X	X
Asset Management Program	X	X		X

Major SWP Infrastructure Programs/Projects

- List not inclusive of all programs/projects related to SWP infrastructure
- Focus on highlighted topics

SWP Fire and Life System Modernization



Triggers

- Nov. 2012 Thermalito Fire (\$157M)
- New Regulation Requirements
- Aging infrastructure

SWC Objectives

- Safety
- Reliability
- Capacity
- Affordability



SWP Fire and Life System Modernization



- **Mission**

To improve the safety of personnel and facilities by assessing the fire risks at all SWP plants and selected support facilities and mitigating those risks by constructing the identified necessary improvements.

- **Key Components:**

- Modernization of the fire detection and suppression systems to meet current design and fire code standards
- Improving occupied spaces and emergency egress through fire rated construction
- Improving fire safety through consistent and regular inspection, testing, and maintenance programs.



SWP Fire and Life System Modernization



Field Divisions Statuses:

- Oroville (\$53.7M) - Project closeout underway
- San Luis (\$40.4M) – Planned to be completed in June 2026
- San Joaquin – (\$110M) 30% designs review
- Southern FD Phase I (\$76M) – Kickoff initiation in 2025
- Southern FD Phase II (\$40M) – Kickoff initiation in 2027
- Delta FD (\$40M) – Kickoff initiation in 2029



Other New Regulation Requirements

- **Bridge Seismic Retrofit Projects (\$127.3M)**
 - 6 total projects
 - Coordination with Caltrans and local counties regarding future ownership
- **Physical Security at Field Divisions (\$13.6M)**
- **Dam Safety Program**
 - 2018 Budget Change Proposal for Dam Safety Program & Emergency Preparedness
 - Tasks: Data collection, potential failure mode analyses, Independent Review Boards, stakeholder outreach....

CA Aqueduct Subsidence Program

Trigger

- Subsidence

SWC Objectives

- Capacity
- Reliability
- Safety
- Affordability



CA Aqueduct Subsidence Program

Background

- Subsidence in the San Joaquin Valley has been recorded, analyzed, and studied since the 1920s.
- Before the construction of the Aqueduct in the mid to late 1960s, subsidence of 20 feet to 30 feet had been recorded in portions of the San Joaquin Valley.
- DWR reports that the historic subsidence within the San Joaquin Valley is primarily attributed to groundwater aquifer overdraft



San Joaquin Valley southwest of Mendota (Ireland and others, 1984).

CA Aqueduct Subsidence Program

Preventive

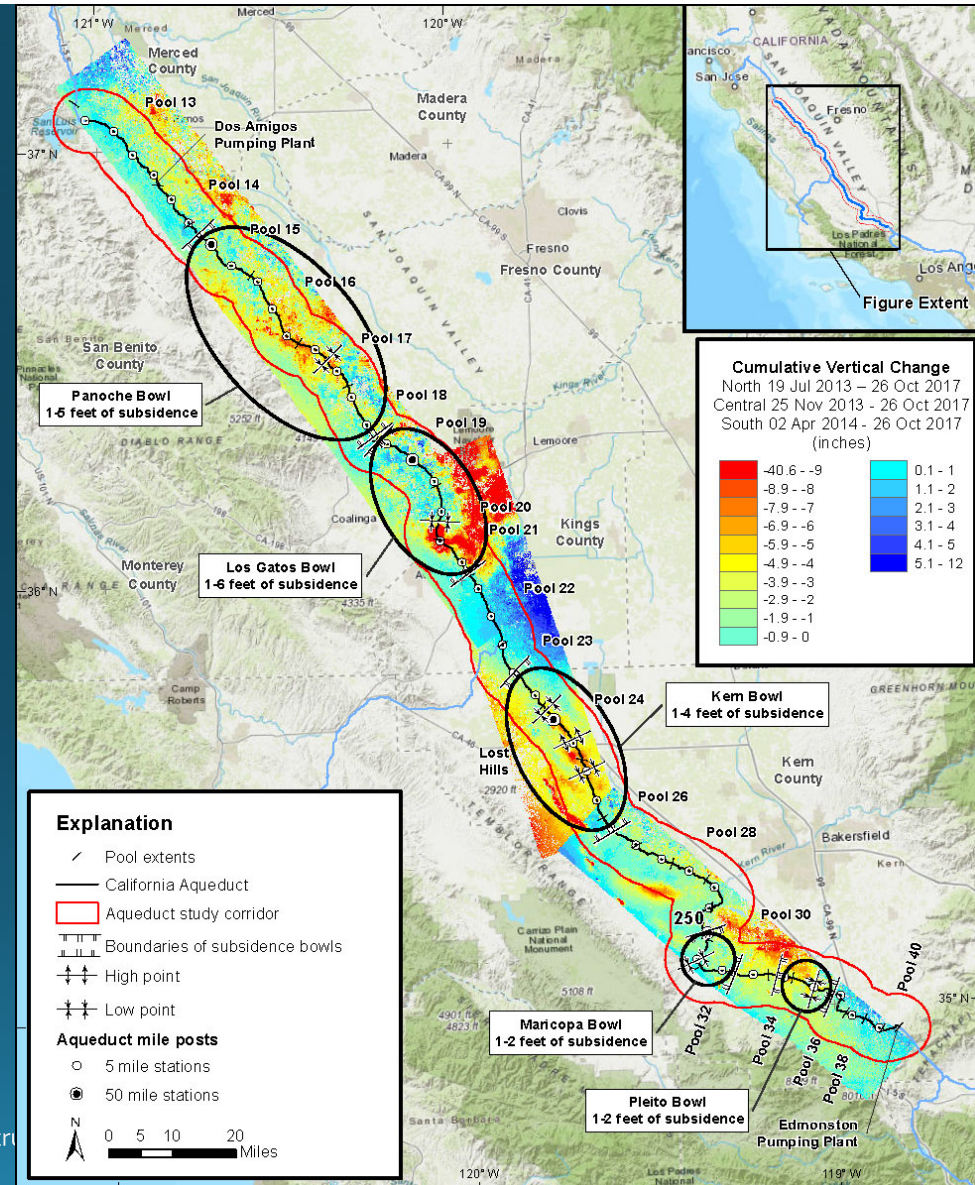
- Improve ability to determine and affect specific causes of subsidence
- Identify, evaluate, and take additional non-structural actions to reduce or eliminate subsidence as soon as possible

Corrective

- Identify and evaluate actions based on return on investment
- Formulate credible cost allocation and funding sources

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CA Aqueduct Subsidence Program

Pools 17 & 18 Embankment Rehabilitation – SWP/CVP Joint Use (\$380M)

- 7 bridges to be replaced as part of Pools 17-18 Embankment construction
- 65% Design is scheduled to be completed by Sept. 2023.

Pools 20 & 21 Embankment Rehabilitation – SWP/CVP Joint Use (\$134M)

- 65% design is scheduled to be completed by Aug. 2023.

Check 17 Subsidence Rehabilitation – SWP/CVP Joint Use (\$55M)

- Five cofferdam alternatives have developed and will be presented for determining ranking.
- The draft design schedule is currently under review.



CA Aqueduct Subsidence Program



Preventative Actions

- Conduct modeling & planning studies
 - Initial subsidence forecast model complete
 - Hydraulic model complete, and results integrated into CalSim
- Continuing outreach and coordination with GSAs in preparation for GSP revisions and affected communities.
- Developing objectives and requirements for enhanced groundwater and subsidence monitoring.
- Evaluating potential changes in flood risk related to subsidence and the CAAQ.

CA Aqueduct Subsidence Program



Funding

- 55% / 45% cost share (or better)
- DWR is coordinating with Reclamation to complete XMJ reports
- DWR is also seeking additional state/federal funding

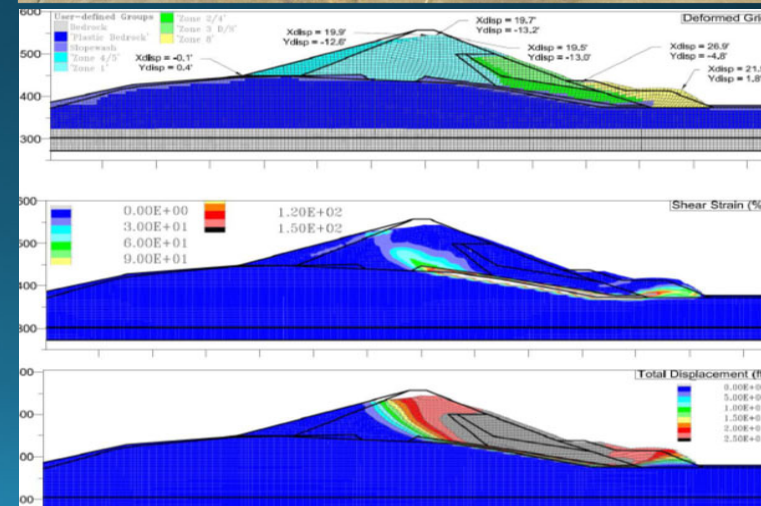
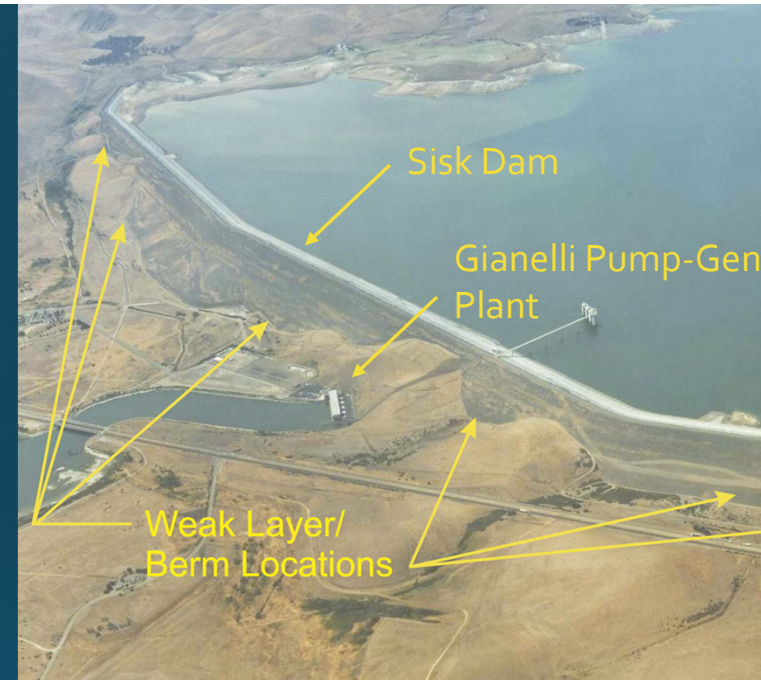
Sisk Dam Safety of Dams Modification Project

Triggers

- Safety
- New Regulation Requirements

SWC Objectives

- Safety
- Reliability
- Capacity



Sisk Dam Safety of Dams Modification Project

Construction Phasing (8 to 10 Years)

First Contract (2022-2025)

- Develop site access roads and quarry
- Construct slopewash sections (SW36, SW145, SW180)
- Construct spillway filter and berm

Second Contract

- Construct NVS shear key and berm
- Construct SVS berm
- Construct SW165

Third Contract

- Raise dam crest and place filter on downstream face of dam
- Restore site and access roads
- Final Instrumentation

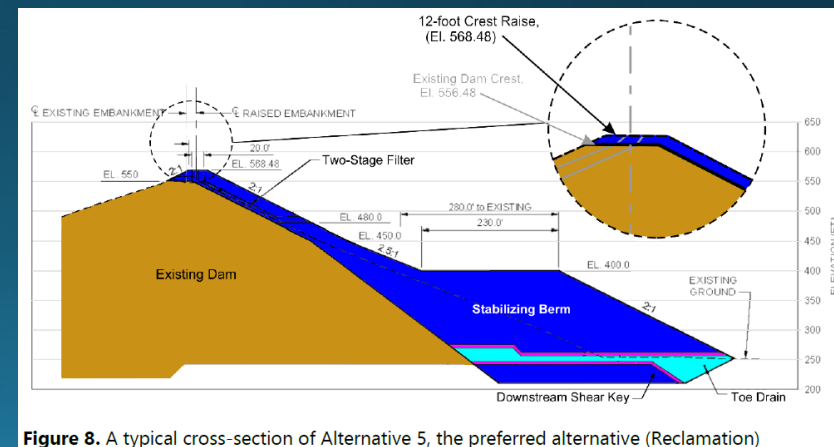
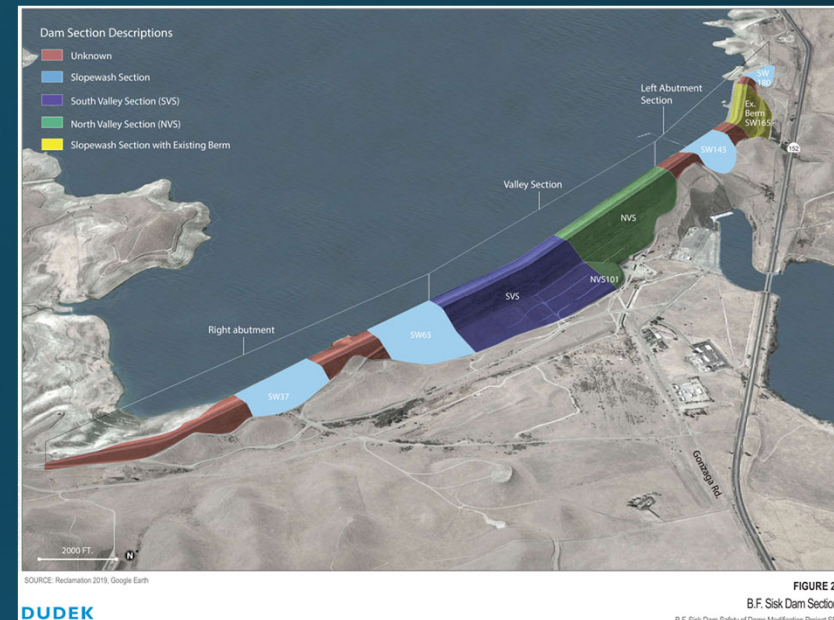


Figure 8. A typical cross-section of Alternative 5, the preferred alternative (Reclamation)

Sisk Dam Safety of Dams Modification Project

Project Funding

First Contract (2022-2025)

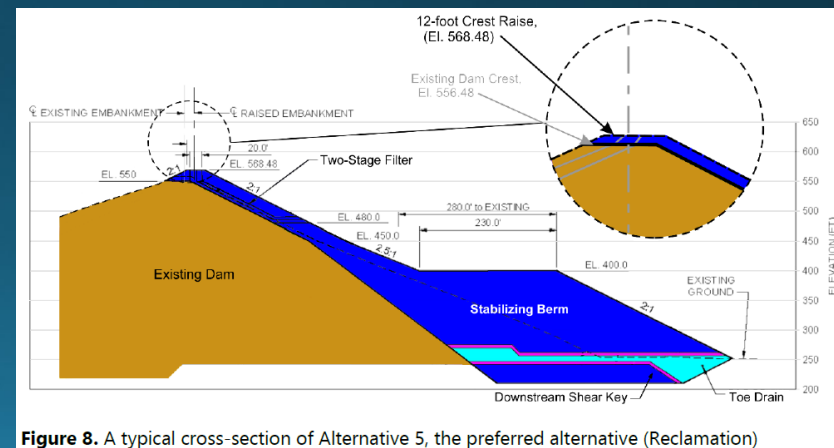
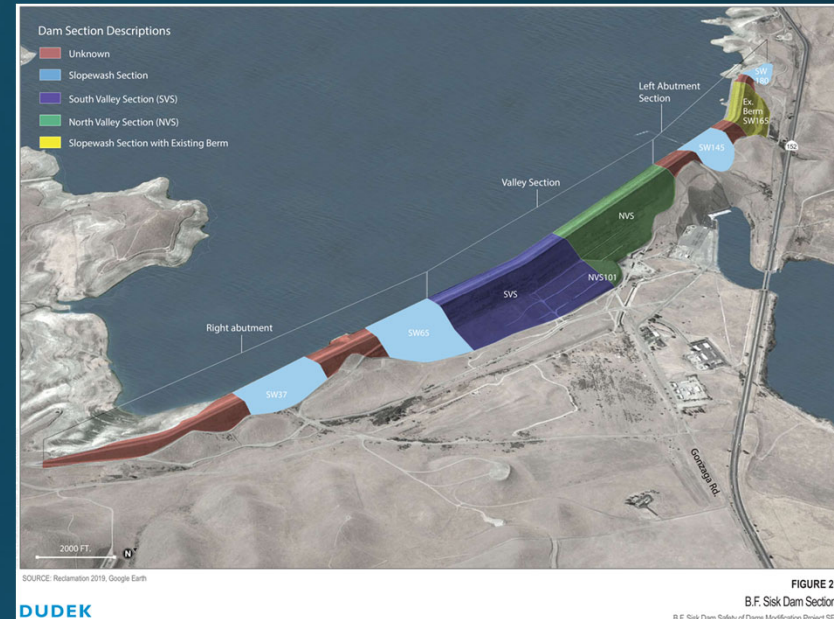
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Asset Management Program

Triggers

- Aging Infrastructure
- 200 new projects/year

SWC Objectives:

- Reliability
- Affordability

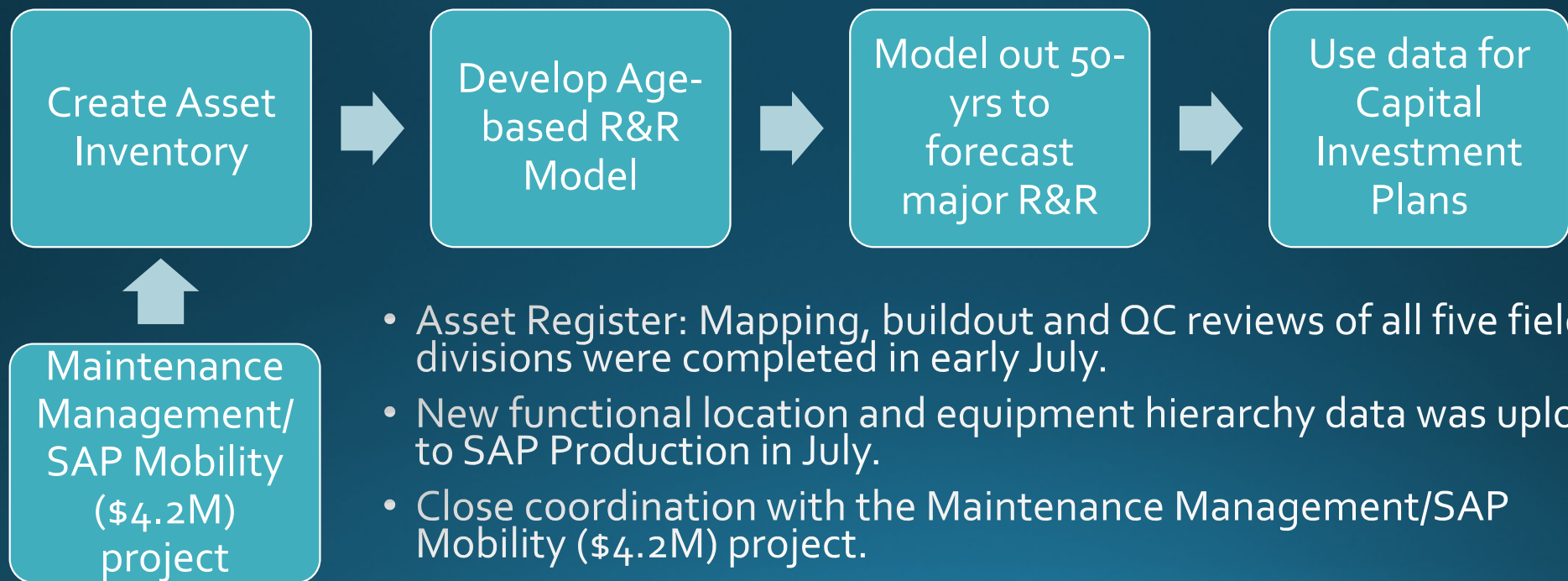
Program Objectives:

- Develop initial 20-year forecast of age-based refurbishment and replacement (R&R) costs
- Establish a baseline for condition-based asset R&R modeling
- First step towards a Capital Investment Plan



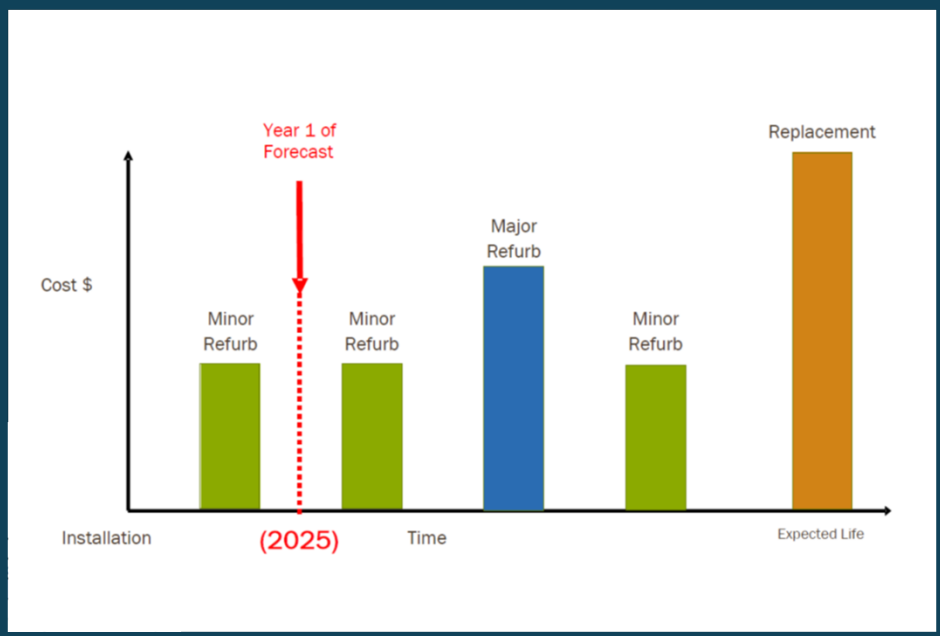
Asset Management Program

Asset Management Program Development (\$4.4M)



Asset Management Program

Example of Asset Lifecycle



Asset Class R&R Cycles and Costs

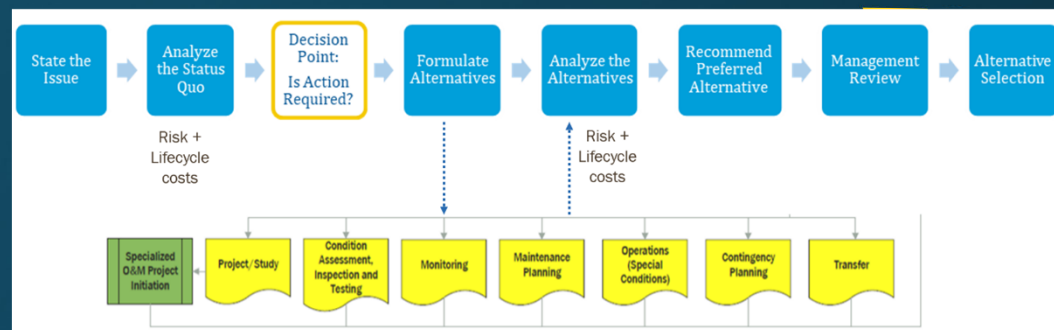
Size Band - Small			
	Min. Value	Unit	Max. Value
Size Band - Small	2	Feet (diameter)	To
Replacement Cost	\$500,000	\$	
Rehabilitation / Refurbishment Cycles and Costs			
Years of Service	Cost \$	Type of R&R	Description of R&R Work
5	\$40,000	Minor Refurbishment 1	
10	\$100,000	Major Refurbishment 1	
20	\$500,000	Replacement	

Size Band - Medium			
	Min. Value	Unit	Max. Value
Size Band - Medium	4	Feet (diameter)	To 8 Feet (diameter)
Replacement Cost	\$1,500,000	\$	
Rehabilitation / Refurbishment Cycles and Costs			
Years of Service	Cost \$	Type of R&R	Description of R&R Work
5	\$150,000	Minor Refurbishment 1	
10	\$500,000	Major Refurbishment 1	
15	\$150,000	Minor Refurbishment 2	
20	\$500,000	Major Refurbishment 2	
30	\$1,500,000	Replacement	

Asset Management Program

Business Case Evaluation (BCE) Tool

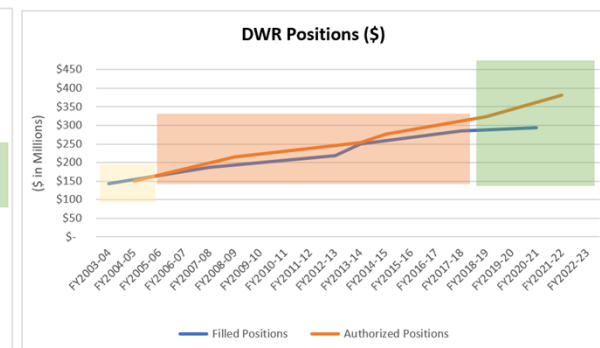
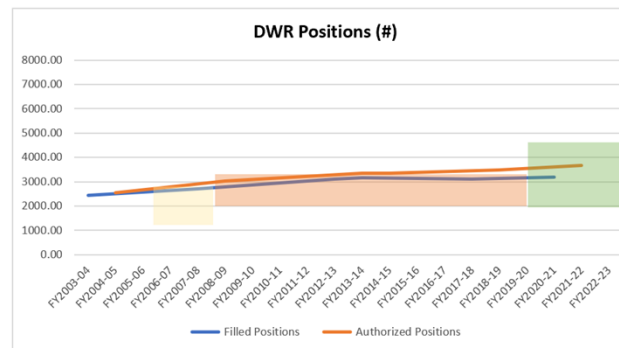
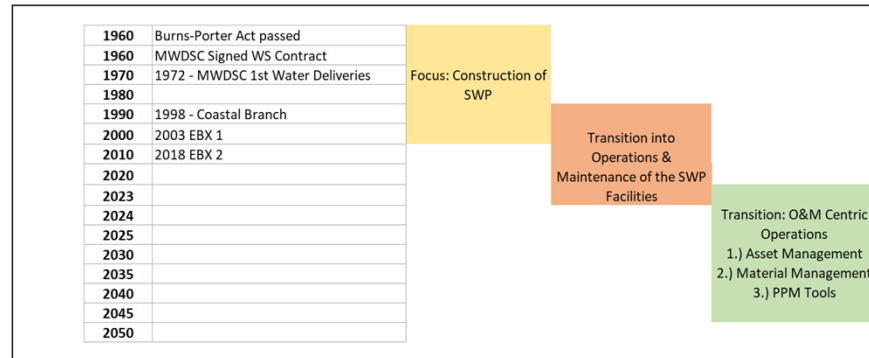
- Planning tool to determine best path forward for projects
- BCE tool guides project team and SMEs through a process standardized process considering asset specific data
- Goal is to have BCE application take 2 to 3 weeks
- Larger & complicated projects may require Value Engineering Studies



Asset Management Program

Looking Forward

- Continue coordination with Asset Management Program
 - Track BCEs
 - Track Maintenance Management
 - Integration with project management
- Coordinate with SWC Finance Team
 - Capital Investment Plan
 - BCP tracking



Questions?

