Engineering, Operations & Technology Committee

Prestressed Concrete Cylinder Pipe Rehabilitation Program Update

Item 6c

August 19, 2024

Item 6c
Prestressed Concrete Cylinder Pipe Rehabilitation Program Update

Subject

Update on PCCP Rehabilitation Program

Purpose

Provide briefing on background & status of the PCCP Rehabilitation Program

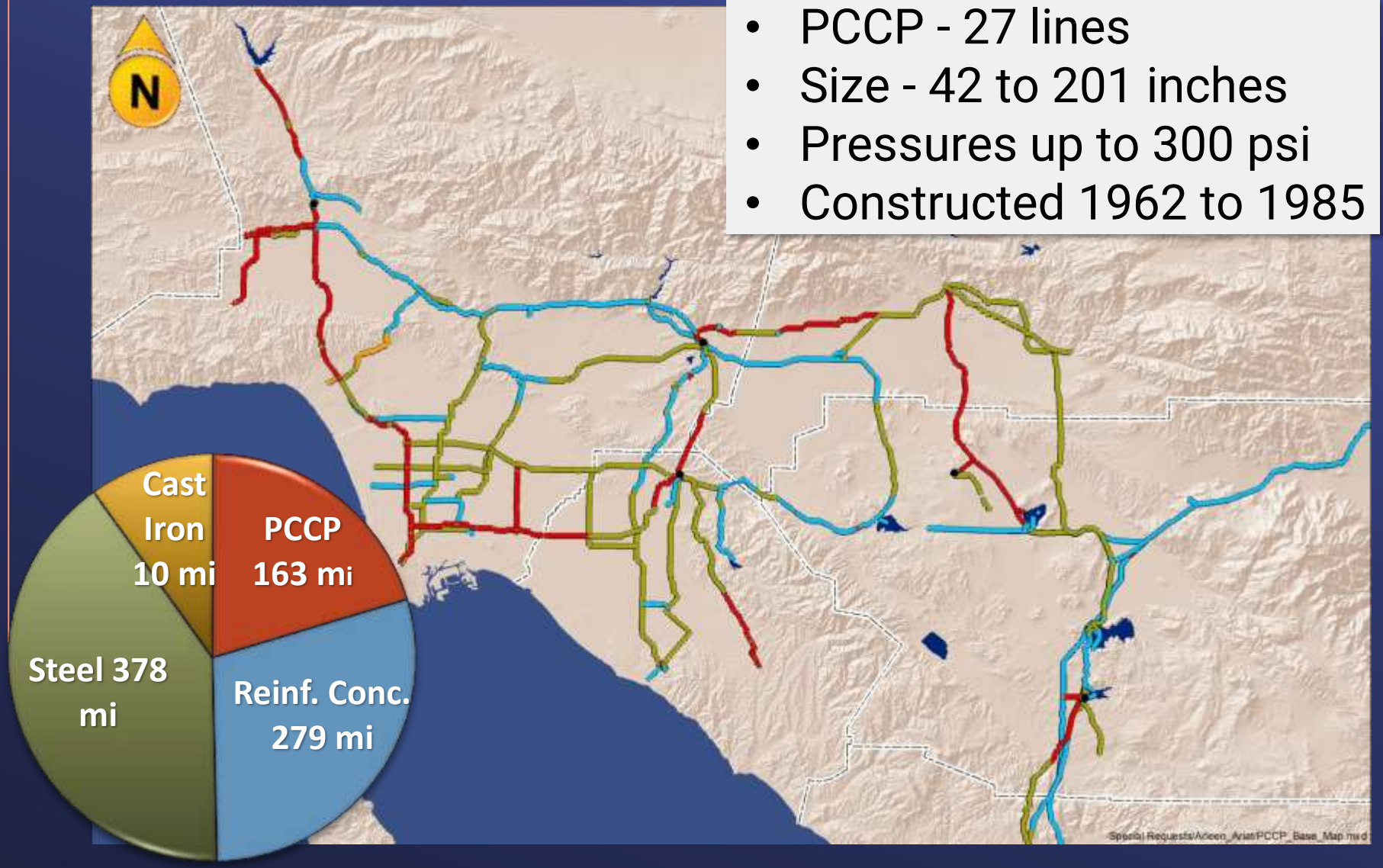
Next Steps

Continue implementation of the PCCP Rehabilitation Program

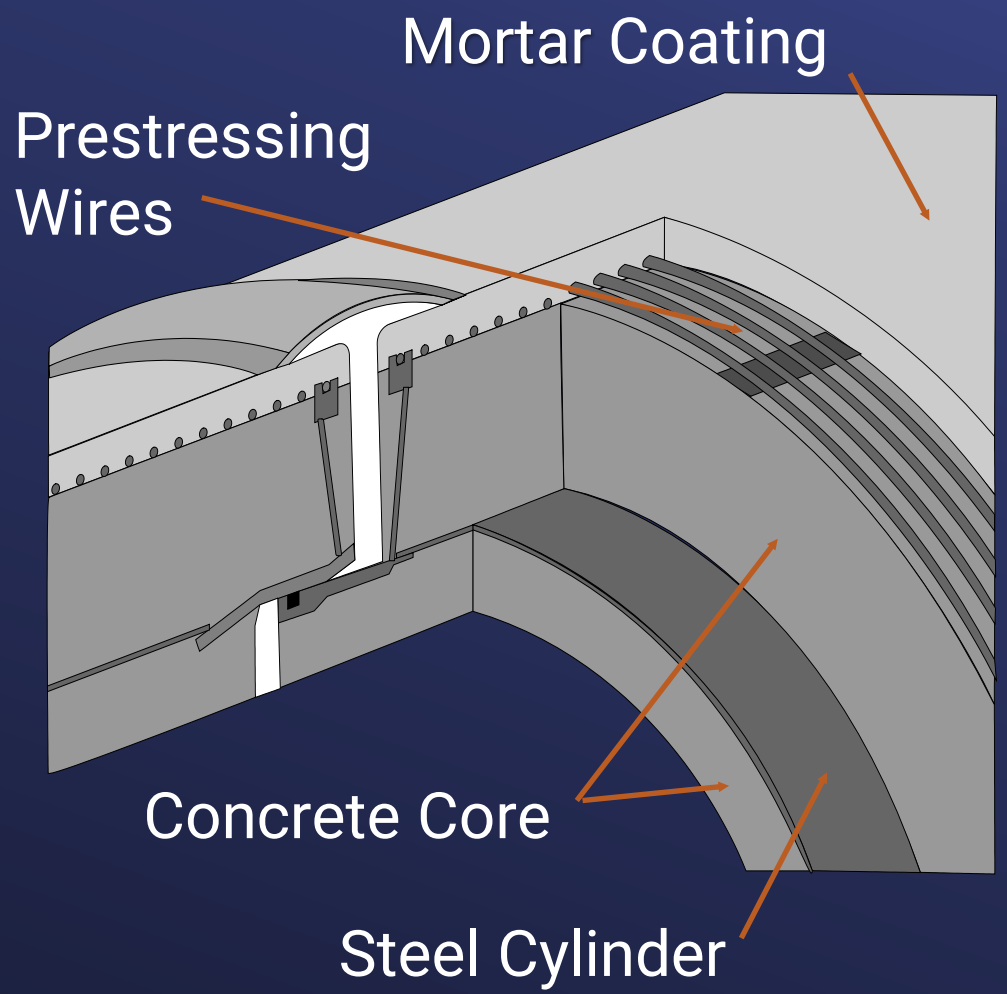
PCCP Rehab Program Update

Distribution System

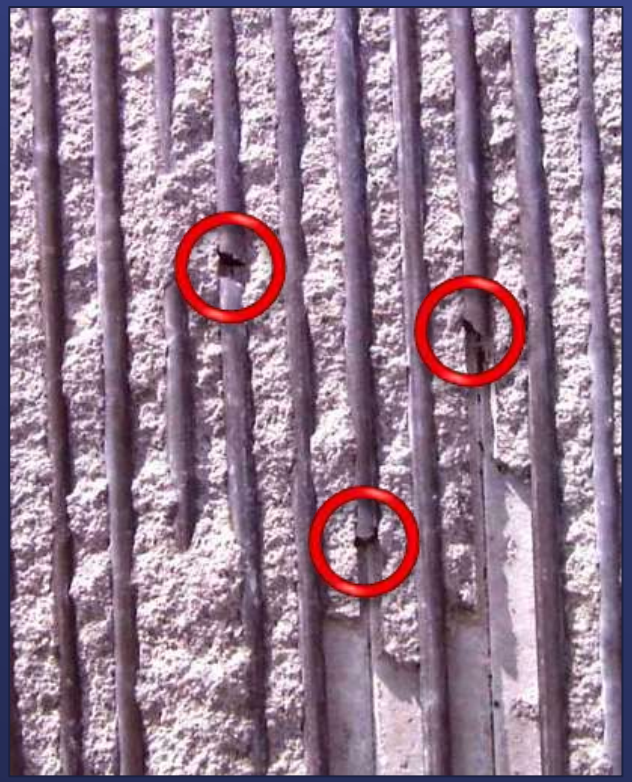
- PCCP - 27 lines
- Size - 42 to 201 inches
- Pressures up to 300 psi
- Constructed 1962 to 1985



Prestressed Concrete Cylinder Pipe (PCCP)



Broken Prestressing Wires



PCCP Rehabilitation Program Background

- Dec. 1999 – AMP Break
- Sep. 2011 – Authorized development of PCCP Rehabilitation program
  - Initiate a comprehensive long-term program for monitoring & rehabilitation of PCCP
  - Increase overall system reliability
  - Reduce risk of potential PCCP failure
  - Reduce unplanned outages
- Sep. 2013 – Started implementation
- Jan. 2015 – First rehabilitation project
- Jan. 2017 – Adopted Programmatic EIR

1999 Allen-McColloch Pipeline Break

PCCP Management Strategy

- Continue regular inspection & monitoring
  - Visual & electromagnetic inspections
  - Investigate new technologies
  - Monitor stray currents & install drain stations where necessary
- Perform repair of distressed segments as needed
- Plan & execute long-term rehabilitation
  - Identify & prioritize reaches
  - Reline or replace pipelines based on priority of individual reaches
  - Adjust priorities as needed

Second Lower Feeder Relining

Electromagnetic Inspections

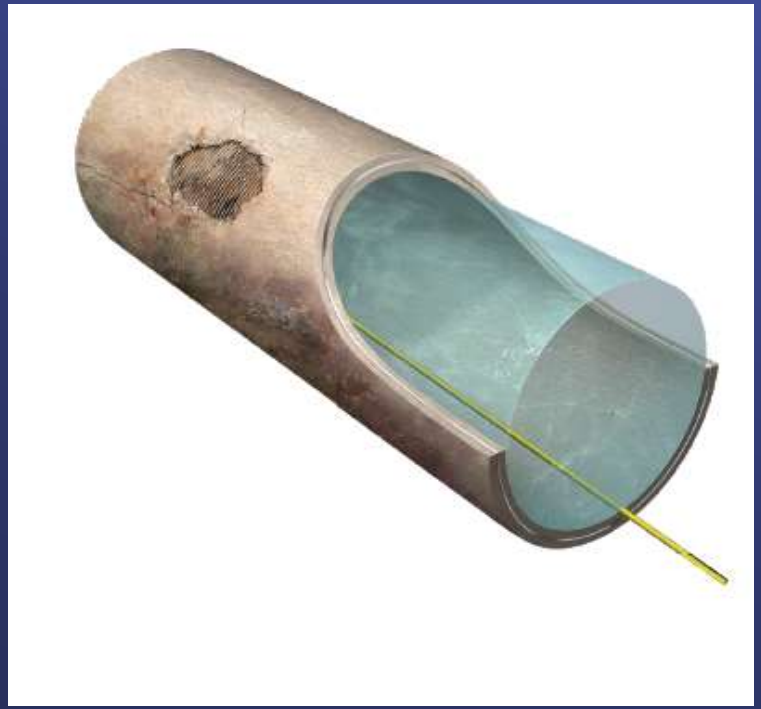
2023/2024 PCCP Inspections

Pipeline	Miles
Allen-McColloch Pipeline	8.70
West Valley Feeder No. 2	2.85
Calabasas Feeder	9.31
Orange County Feeder Relocation	0.87
San Jacinto Pipeline	0.56
Total	**22.29**

Electromagnetic Inspection

Acoustic Fiber Optic (AFO) Monitoring

- Uses fiber optic cable to detect wire breaks in real-time
- Pilot completed in Mar. 2015
  - Second Lower Feeder at Long Beach airport
  - Removed after relining (two years)
  - Effective in detecting wire breaks
  - Monitoring is costly
  - Best utilized when regular electromagnetic inspection not feasible
- Planned installation for Foothill Feeder
  - February 2026



AFO Monitoring Visualization

Investigating New Technologies

- PipeDiver inspection of Sepulveda Feeder
- Competitive comparison of electromagnetic inspection
  - Pure Technologies
  - INSIGHT Water Technologies
  - APPIA Pipeline Solutions

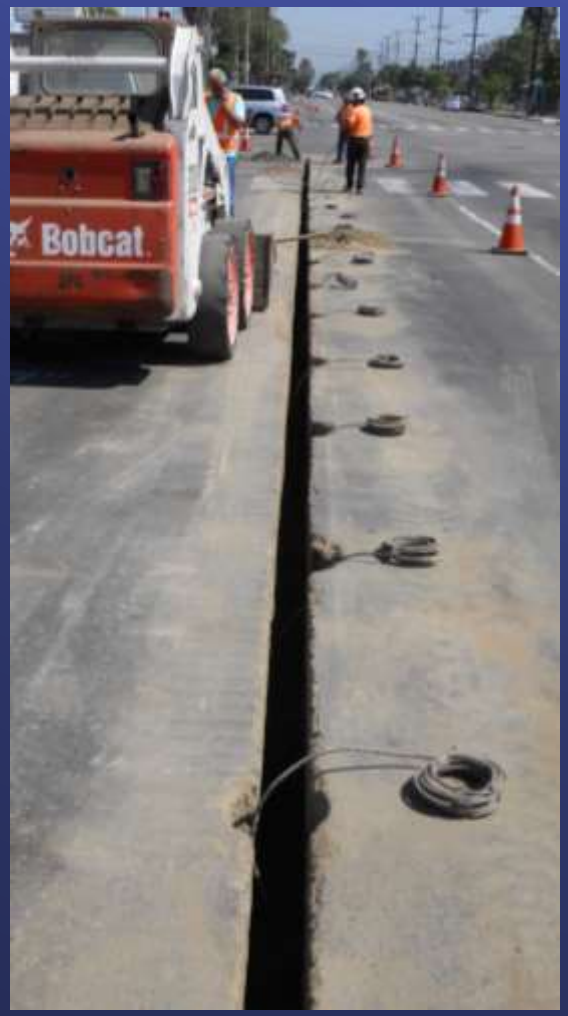
PipeDiver Inspection Tool

Stray Current Monitoring & Drain Stations

Stray Current Monitoring

Drilling for Anodes

Anode Installation



Anode Wiring

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Second Lower Feeder Relining

Individual Segment Repairs

Sepulveda Feeder Urgent Carbon Fiber Lining

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Second Lower Feeder Relining

PCCP Rehabilitation Prioritization

- Condition Criteria
  - Wire breaks, repair history, broken backs, other industry-recognized factors
- Consequence Criteria
  - Pressure, criticality, location
- Developed Risk Score/Ranking
  - Separate score for each pipe schedule
  - Based on highest score for each feeder
- Selected 5 priority lines for rehabilitation
  - Continue to reevaluate priorities after every inspection cycle
- Maintain flexibility to make adjustments

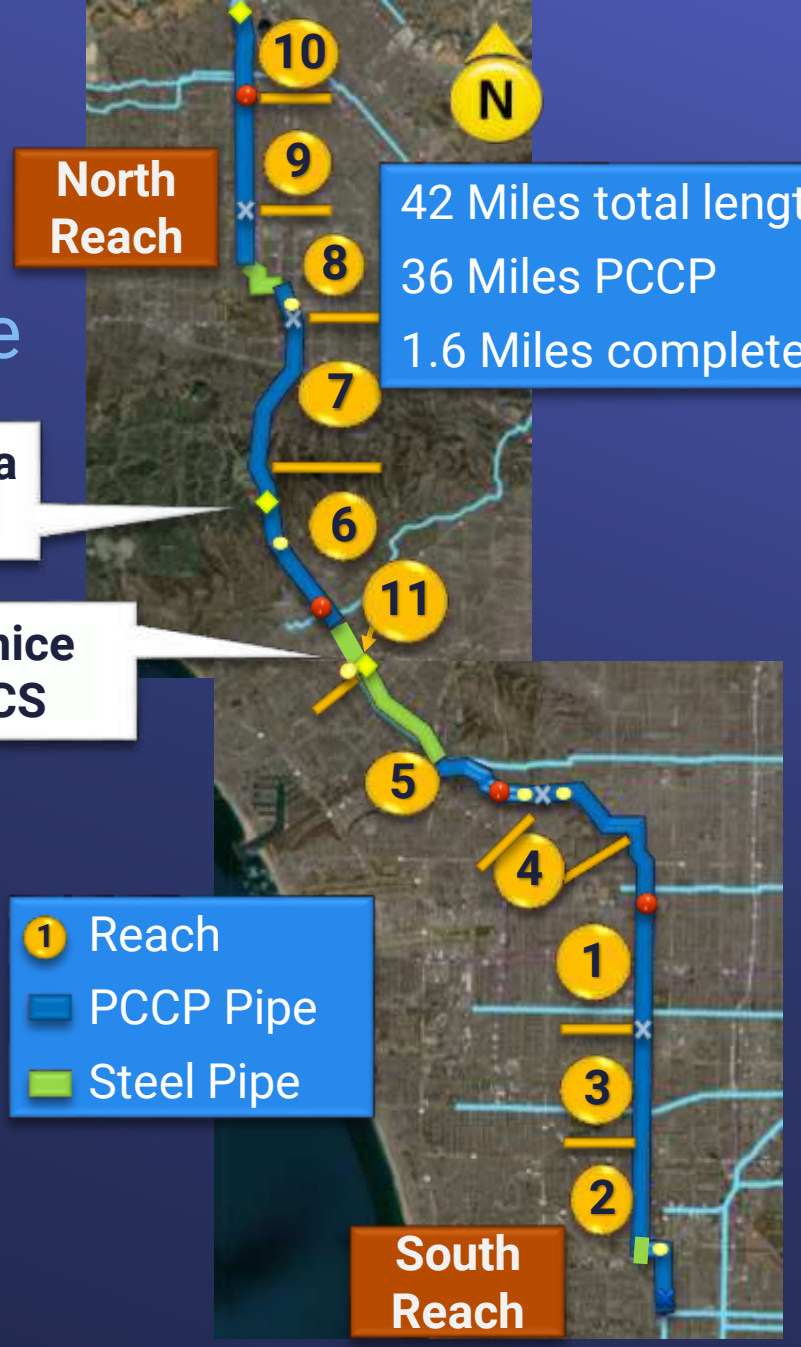
Allen-McColloch Pipeline Relining

PCCP Rehabilitation Program

- **5 PCCP priority lines**
- **100 miles to be rehabilitated**

Sepulveda Feeder

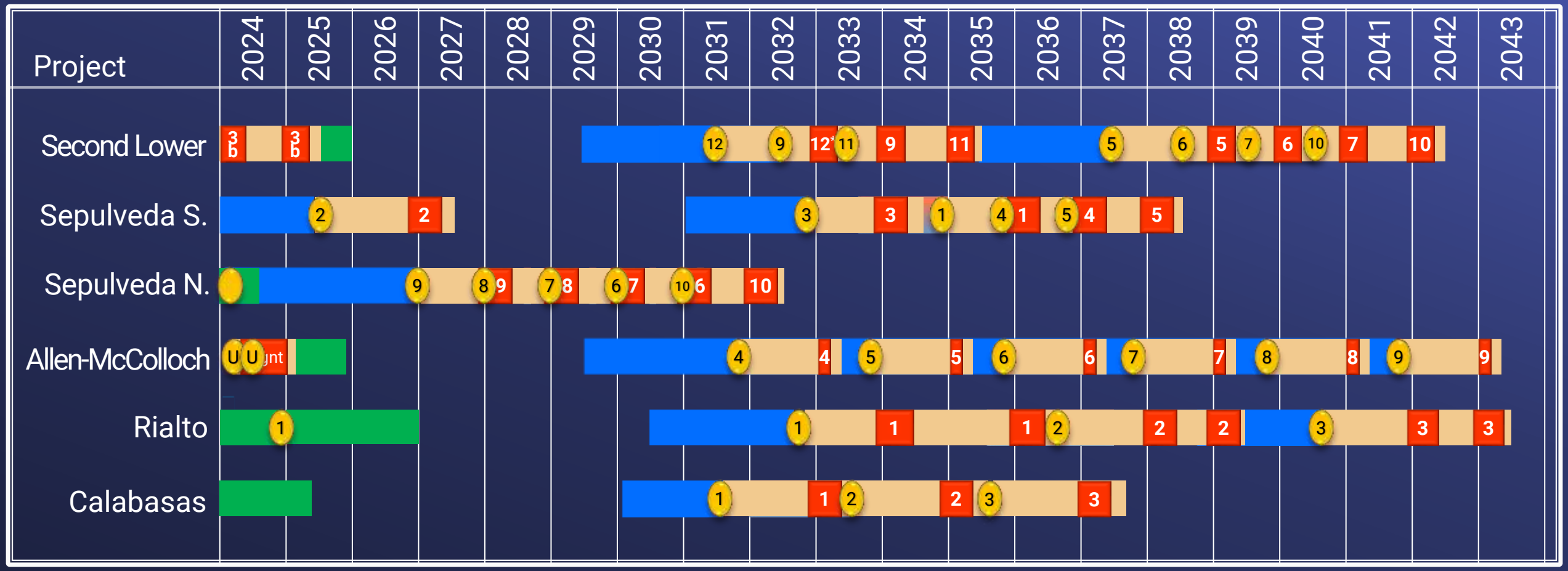
- Resequencing
  - Accelerating North Reach to accommodate potential Stage 2 pumping
  - Proceeding from North to South
- Challenges
  - Large diameter
    - 120-inch, 96-inch, & 84-inch diameter
    - Anticipate higher costs
  - Extensive traffic control, permitting
- Current Status
  - Preliminary Design completed
  - Final Design underway (Reaches 1, 2, & 9)



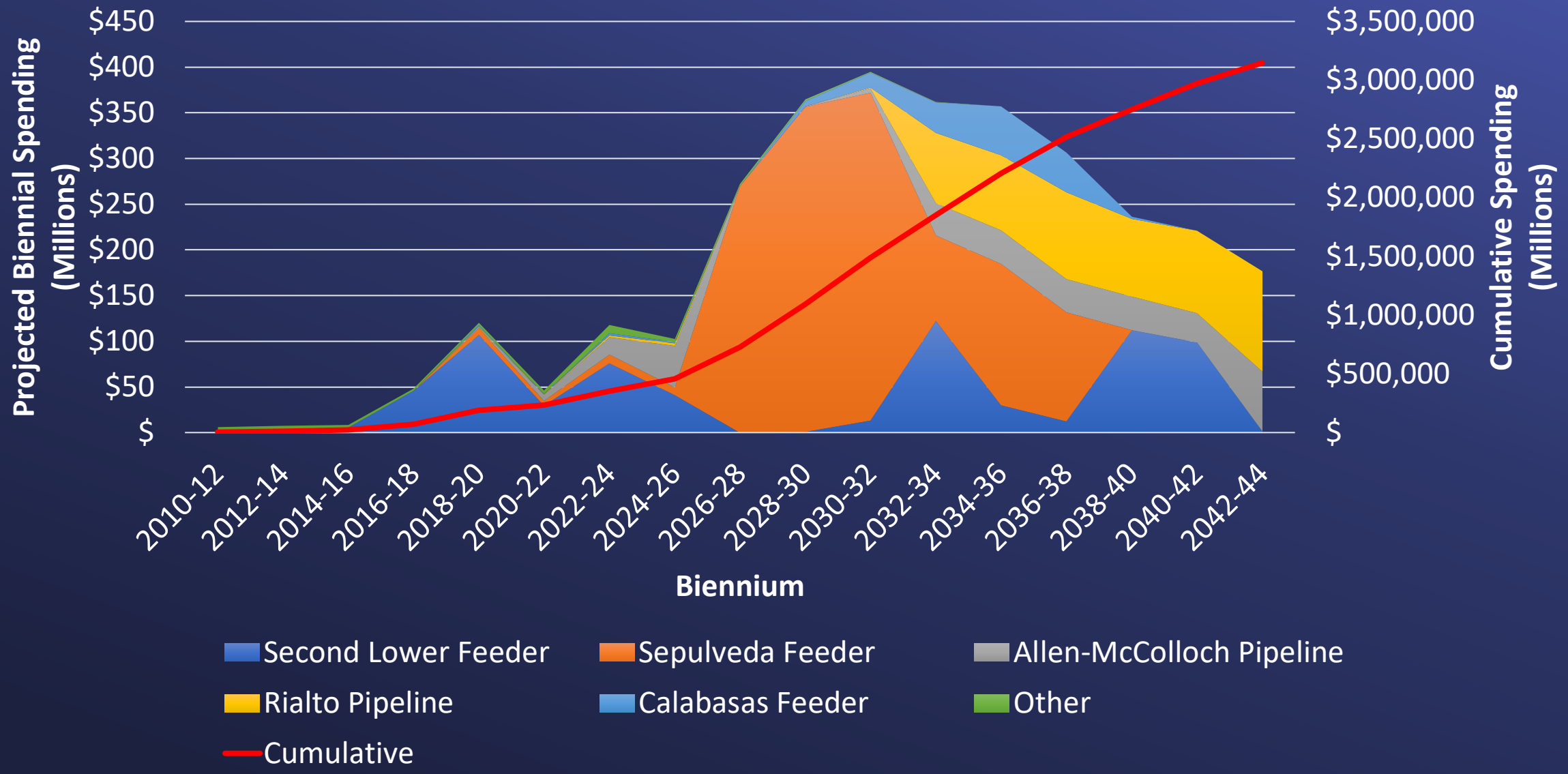
PCCP Rehabilitation Program Constraints

- System Limitations
  - System ability to accommodate shutdowns
  - Outage duration & impacts to member agencies
- Resource Limitations
  - Staff ability to perform corrective & preventative maintenance
  - Contractor availability & resources
- Permitting
  - Traffic control
  - Work hours & noise variances
- Budget Limitations
  - CIP biennial budget

PCCP Rehabilitation Program Schedule



PCCP Rehabilitation Program Cash Flow



PCCP Rehabilitation Program Budget

Feeder	Budget	Work Completed
Second Lower	$696,232,000	• 16.5 miles relined (55%)
Sepulveda	$1,383,900,000	• 1.6 miles relined (4%)
Rialto	$546,632,000	• Completing prelim. design
Calabasas	$160,423,000	• Prelim. design underway
Allen-McColloch	$320,152,000	• 3.2 miles completed or underway (35%)
Other	$40,182,000	
Total	**$3,147,521,000**	• **21.3 miles total relined (21%)**

Next Steps

- Continue PCCP Rehabilitation Program Strategy
  - Comprehensive rehabilitation based on risk priority
  - Complete preliminary designs
- Planned Inspections
  - Rialto Pipeline, Second Lower Feeder, San Diego Pipeline No. 5
  - 37.7 miles total
- Upcoming Board Actions
  - Late 2024 – Agreement for Rialto Pipeline PCCP Rehabilitation Final Design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SOUTHERN CALIFORNIA
1928