MARIN WATER

Smith Saddle Tanks Rehabilitation Project

Board Meeting

July 20, 2021

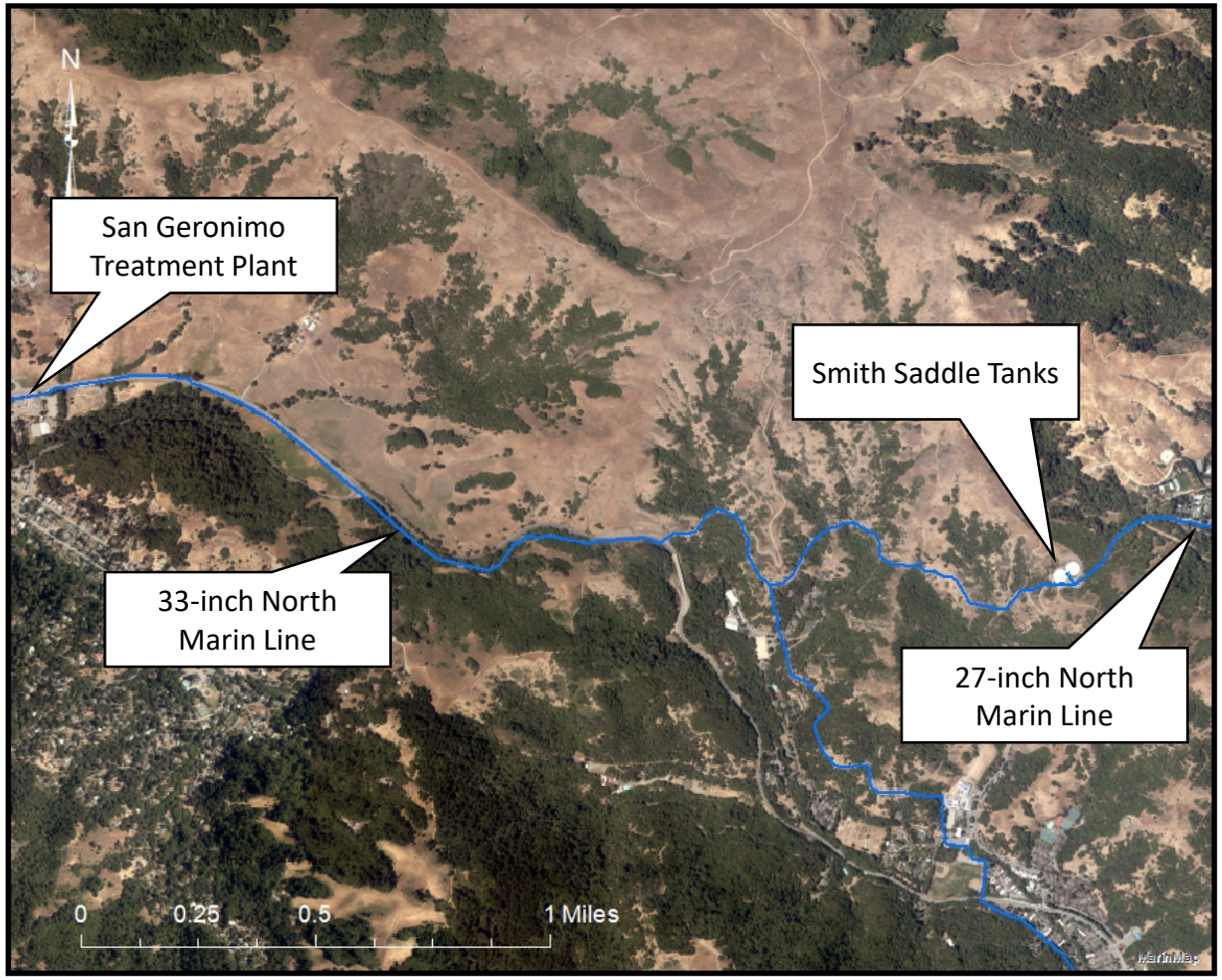
Overview

- Background
- How the Tanks Function
- Consultant’s Assessment
- Rehabilitation Alternatives
- Cost Analysis
- Design Recommendation
- Project Funding

Smith Saddle Tanks Background

- Constructed in 1960 of Welded Steel
- Tanks function together as a system for a total capacity of 10,000,000 gallons of potable water
- Interior coating is 61 years old
- Exterior Coating is 38 years old
- Typical industry standard is for coatings life expectancy is 20 years.

Smith Saddle Tanks Function



- Smith Saddle Tanks are some of the largest tanks in the system
- San Geronimo Treatment Plant directly supplies water to Smith Saddle Tanks via the North Marin Line
- More potable water goes through the Smith Saddle Tanks than any other tanks in the District

Assessment

- Kennedy Jenks Contracted
- Assessment evaluated tank structure, floor, shell roof and framing
- Corrosion was typical of metal components above water surface level

Assessment

- Assessment of the 61 years old interior coating showed coating blisters on floor and shell and failure in the roof vapor area
- Assessment of the 38 years old exterior coating failed ASTM D3359 adhesion test and had signs of corrosion failure

Rehabilitation Alternatives

Three different design alternatives were identified and presented to the District

Alternative 1 - Repair, Strengthen and Recoat the two existing tanks

Alternative 2 – Construct two new 5 million gallon tanks to replace the existing tanks

Alternative 3 – Construct two new 5 million gallon pre-stressed concrete tanks to replace the existing tanks

Cost Analysis

Description	Alternative No. 1 Repair/Recoat Two Existing Tanks	Alternative No. 2 Two New 5.0-MG Welded Steel Tanks	Alternative No. 3 Two New 5.0-MG Prestressed Concrete Tanks
Total Estimated Construction Cost	**$18,600,000**	**$23,600,000**	**$21,600,000**
100-Year Cumulative Maintenance Cost	$24,400,000	$24,400,000	$1,200,000
Estimated 100-Year Total Life-Cycle Cost	**$43,000,000**	**$48,000,000**	**$22,800,000**

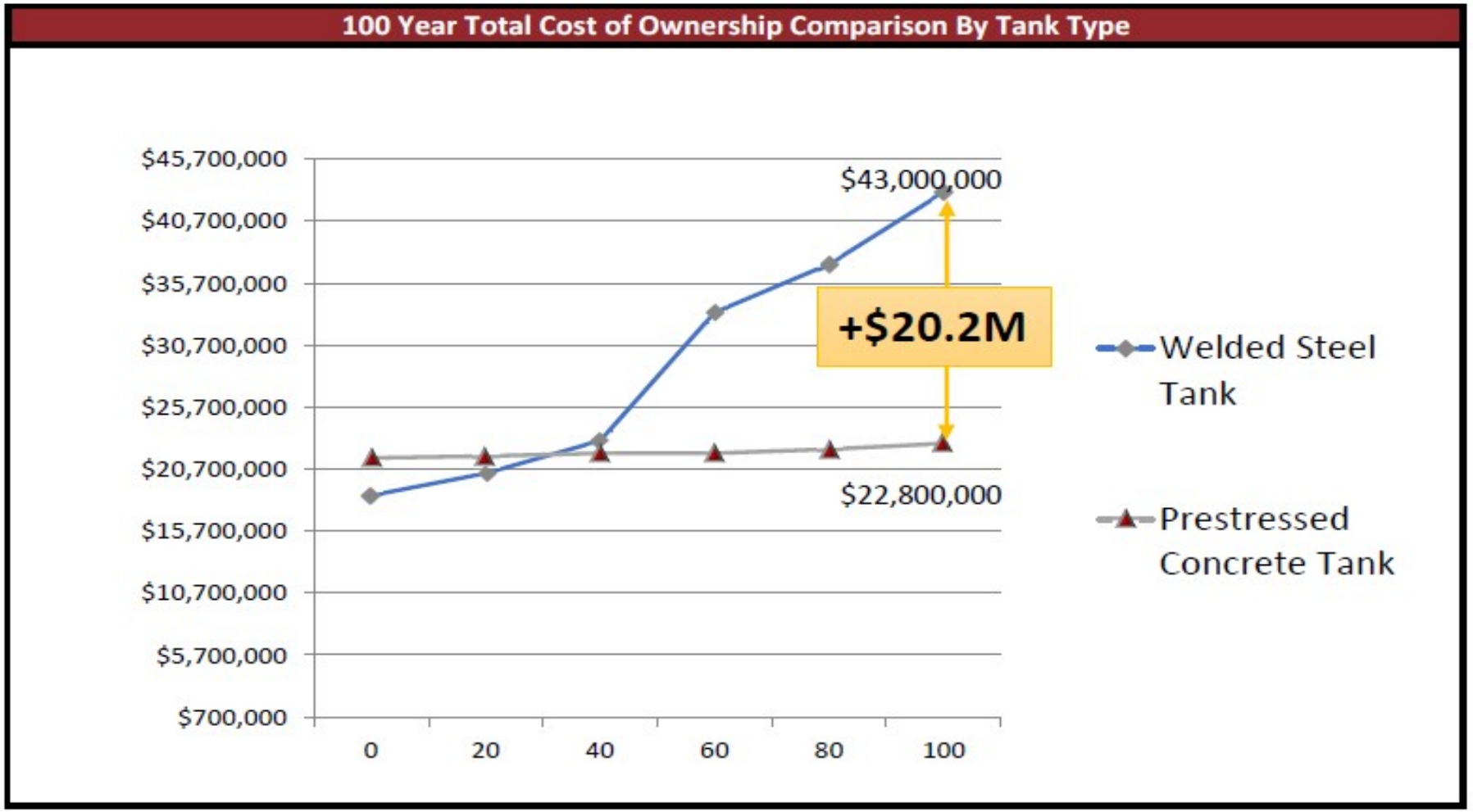
100 Year Maintenance Cost

Welded Steel Tank Maintenance Costs				
Return Period	Maintenance Scheduled	Sq Ft	Unit Price	Total Price
20	Blast exterior and re-application of coatings	40,000	$12.00	$480,000
20	Cathodic Protection Anode Strings			$16,000
20	Engineering Design Cost (Estimate 10%)			$49,600
20	Construction Management / Inspection Cost (Estimate 10%)			$49,600
TOTAL MAINTENANCE COST PER 20 YEAR RETURN PERIOD				**$1,190,400**
50	Blast interior and re-application of coatings	80,000	$20.00	$1,600,000
50	Engineering Design Cost (Estimate 10%)			$160,000
50	Construction Management / Inspection Cost (Estimate 10%)			$160,000
TOTAL MAINTENANCE COST PER 50 YEAR RETURN PERIOD				**$3,840,000**

Prestressed Concrete Tank Maintenance Costs				
Return Period	Maintenance Scheduled	LS	Unit Price	Total Price
20	Powerwashing, Routine Maintenance, and Inspection	LS	$50,000.00	$50,000
TOTAL MAINTENANCE COST PER 20 YEAR RETURN PERIOD				**$100,000**

100 Year Total Cost of Ownership Comparison				
	Capital and Maintenance Cost Schedule		Cumulative Total Cost of Ownership	
Year	Prestressed Concrete	Welded Steel	Prestressed Concrete	Welded Steel
0	$21,600,000	$18,600,000	$21,600,000	$18,600,000
20	$148,595	$1,768,872	$21,748,595	$20,368,872
40	$220,804	$2,628,450	$21,969,399	$22,997,322
50		$10,335,698	$21,969,399	$33,333,020
60	$328,103	$3,905,739	$22,297,502	$37,238,759
80	$487,544	$5,803,723	$22,785,046	$43,042,482
100			**$22,785,046**	**$43,042,482**

Cost Analysis Breakdown



Design Recommendation

- Design recommendation:
  - Circular strand-wound prestressed concrete tanks.
- Based on review of:
  - Design alternatives
  - Construction materials
  - Total construction cost
  - Estimated life-cycle cost
  - Improved water quality

Project Funding

- Design is Budgeted within FY 22 CIP

- Construction Funding Yet to be identified
    a. State Revolving Fund Loan
    b. California Infrastructure and Economic Development Loan
    c. Grants and other funding sources

QUESTIONS?