Technical Memorandum

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Prepared for: Placer County Water Agency

Project Title: Analysis of 25-year Renewal and Replacement Program – Update 2020

Project No.: 155131

Technical Memorandum

Subject: Analysis of 25-year Renewal and Replacement Program – Update 2020

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Limitations:

This document was prepared solely for Placer County Water Agency in accordance with professional standards at the time the services were performed and in accordance with the contract between Placer County Water Agency and Brown and Caldwell dated July 1, 2020. This document is governed by the specific scope of work authorized by Placer County Water Agency; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by Placer County Water Agency and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Purpose

The purpose of this analysis is to provide a 25-year outlook for Placer County Water Agency's (Agency) water assets renewal and replacement (R&R) costs. This information is expected to be used in the Agency's financial planning modeling. This analysis is an update to the 2018 analysis. This analysis is referred to as the 2020 update.

General Approach

This is a high-level analysis to estimate the renewal and replacement needs within the water system. This is not a detailed analysis and the Agency's water assets are simply analyzed based on the Agency's nine capital improvement plan (CIP) budget categories. A MS Excel spreadsheet workbook was developed to calculate the projected R&R cost needs for each of the CIP categories. In the spreadsheet workbook specific facilities and asset quantities are listed for each of the CIP categories with the exception of the Planning and Miscellaneous categories. The entire spreadsheet workbook is attached. Based on the asset useful life assumptions, construction year, year of last R&R activities, and unit cost assumptions, discrete and average annual and cumulative costs are projected from 2021 to 2045 for each of the CIP categories. The CIP categories are listed below.

1. Treatment
2. Treated Water Transmission
3. Raw Water Transmission
4. Treated Water Storage
5. Untreated Storage
6. Groundwater
7. Planning
8. Miscellaneous (SCADA, Security, Site Improvements)
9. Pump Stations

This analysis does not include other raw water and treated water transmission and distribution facilities such as pressure regulating stations, metering stations, and flow control stations, for example. It is envisioned that this analysis will be refined and updated in the future to include these additional facilities as well as updates to assumptions as additional data becomes available.

Summary of Changes Since the 2018 Analysis

Below is a summary of the changes incorporated into the analysis for this 2020 update.

1. Time frame – the 2018 analysis analyzed the 25-year time period from 2018 to 2042. This 2020 update analyzes the time period from 2021 to 2045.
2. Next replacement year - Next replacement year formula places anything that needs to be replaced prior to the first year (2021), in 2021 to "catch up".
3. Replacement costs are escalated to 2020 dollars based on the Engineering News and Review Construction Cost Index for July 2020, San Francisco, for use of statement of value (SOV) data provided by the Agency in the treatment and pump stations analysis.
4. Treatment
    a. The approach to the total replacement cost and the cost breakdown by component was revised based on available SOV data for some facilities and based on cost curves and cost breakdown

data from the AWWA Cost Estimating Manual for Water Treatment Facilities when SOV data was not available. A varied approach by facility was necessary as detailed or total SOV data was not available for all facilities. Table 1 lists the approach used for each of the treatment facilities.

b. Last improvement dates for instrumentation and controls (I&C) at some of the water treatment plants (WTP) were updated.

Table 1. Approach to Treatment Total Replacement Cost and Cost Component Breakdown

Approach	WTP Facilities
A. Total and by component cost data available: a. Total R&R cost: Use SOV total cost, remove non-R&R costs (i.e. grading) b. Cost component breakdown: Use SOV cost breakdown	Foothill WTP #1, Colfax WTP
B. Total cost data available only: a. Total R&R cost: Use SOV total cost b. Cost component breakdown: Use cost breakdown in assumptions worksheet (based on AWWA Cost Estimating Manual for Water Treatment Facilities, Table 5.2.1 General Cost Equations for Water Treatment Processes with Parameters, Minimum and Maximum Limits) c. *Cost component breakdown (for membrane treatment plant (Applegate WTP)): Use cost breakdown assumptions worksheet (based on AWWA Cost Estimating Manual for Water Treatment Facilities, Figure 2.4.2a Predesign Cost Estimate for a Micro Membrane Treatment Plant, with Capacity of 10 mgd.)	Foothill WTP #2, Auburn WTP, Bowman(packaged) WTP, Applegate WTP*
C. No total or by component cost data available: a. Total R&R cost: Based on capacity cost curve from AWWA Cost Estimating Manual for Water Treatment Facilities Figure 5.7.3b Conventional Filtration b. Cost component breakdown: Use cost breakdown in assumptions worksheet (based on AWWA Cost Estimating Manual for Water Treatment Facilities, Table 5.2.1 General Cost Equations for Water Treatment Processes with Parameters, Minimum and Maximum Limits)	Sunset WTP, Bowman(conventional) WTP, Alta WTP, Monte Vista WTP

5. Treated Water Transmission and Distribution – Replacement linear footage by year was updated with data provided by the Agency on June 5, 2020.
6. Raw Water Transmission
   a. Replacement linear footage by year was updated with data provided by the Agency on June 5, 2020.
   b. Canal lining replacement cost in dollars per linear foot ($/LF) was updated with information on average gunite cost per linear foot. Replacement rate was reduced based on annual budget of $1.1 million.
   c. Riveted steel replacement rate reduced based on 2020 data (Long Ravine pipeline was replaced since the 2018 analysis).
7. Treated Water Storage
   a. Interior and exterior recoating dates were included and used to estimate timing of next recoating. This is updated from the 2018 analysis that based the recoating cost occurrences on the tank construction date.

8. Untreated Storage
    a. Date of last major improvement was added for some facilities.
9. Pump Stations
    a. Pump station R&R costs were added to this 2020 analysis as they were not included in the 2018 analysis results.
    b. Total replacement costs are either based on SOV data for a site or based on pump station cost curves from the Pumping Station Design Revised Third Edition manual (Jones et. al., 2003) escalated to 2020 dollars.
        i. SOV data was used for the following pump stations:
            1. American River Pump Station
            2. Auburn Tunnel Pump Station #1
            3. Barton Road Pump Station
            4. Midas Pump Station
            5. Ophir Pump Station
            6. Tinker Pump Station
            7. Whitney Pump Station
        ii. Cost curve data was used for the following pump stations:
            1. Boulder Road (Los Lagos) Pump Station
            2. Foothills Pump Station
            3. Laird Pump Station
            4. Northstar Pump Station
            5. Skyridge Pump Station
            6. Stoneridge Pump Station
            7. Turner Pump Station
    c. R&R cost breakdown by component as a percent of total replacement was either based on actual construction costs for a pump station with SOV data or an assumed breakdown based on pump station capacity category for pump stations with no SOV data. The pump station capacity categories are small (less than 2 mgd), medium (4 mgd to 30 mgd), and large (greater than 30 mgd).

Assumptions

Assumptions related to R&R costs, asset useful life, and replacement frequencies are documented and noted in the assumptions worksheet of the spreadsheet workbook. Where possible, R&R unit costs are based on recent Agency bid tabs, historical project costs, and SOVs. R&R frequencies are based on useful life assumptions for each asset category or each general component within some of the asset categories. Costs typically included in the Agency's operations and maintenance (O&M) budgets are not included in this analysis. The cost assumptions and results are present day values and do not include escalation over the 25-year duration.

Summary of Results

This high-level analysis of the Agency's estimated R&R cost needs over the next 25-years is based on the sum of the estimated discrete annual costs for each of the Agency's CIP categories, listed above. While the 25-year average annual R&R cost need is $17.1 million per year, projected discrete annual costs are much higher than that in some years such as 2021.

In 2021 (year 1 of this 2020 update analysis) the discrete R&R needs are estimated to be about triple the annual average costs as estimated in year 1 (2018) for the 2018 analysis due to the large amount of treated water transmission and distribution pipeline replacement as well as treatment needs.

- Treated water transmission and distribution pipeline replacement costs in 2021 include 72,000 linear feet of pipelines that are calculated to be beyond their useful life by 2021 (two-thirds of which are 4 to 6-in diameter pipelines).
- Treatment costs in 2021 include electrical R&R costs for many of the treatment facilities as well as mechanical R&R costs for Colfax WTP.

Other expected high discrete costs are shown in 2041 and 2043.

- Treatment costs in 2041 include the 20-year occurrence of mechanical R&R needs at Colfax WTP and electrical renewal needs for multiple WTPs.
- Treated water transmission and distribution pipeline replacement costs in 2043 for a large amount of 6-inch (in), 8-in, and 16-in diameter pipelines reaching the end of their useful life.

Table 1 summarizes the annual R&R costs for each category as well as average annual total costs and cumulative costs through 2045. Figures 1 illustrates the total discrete and average annual costs over the 25-year period. Figure 2 illustrates the annual discrete R&R costs by CIP category. Below are some key results of this analysis. Figure 3 provides a comparison of the average annual costs in the 2018 analysis and this 2020 update analysis.

- The total discrete annual R&R costs range from $5 million to $53 million with a 2021 to 2045 25-year average of $17.1 million/year.
- Average annual costs increased almost $4 million per year from the 2018 analysis due in part to the addition of the pump station R&R costs but also due to increased R&R costs associated with treatment and treated water transmission and distribution pipeline categories.
- The treatment and treated and raw pipeline categories make up 78 percent of the R&R costs while the other categories combined are only 22 percent of the total R&R costs over the 25-year period. The new pump stations category is 8 percent of the total R&R costs.
- R&R discrete annual costs for treatment facilities range from zero to almost $18 million in discrete years, with a 25-year average annual cost of $5.7 million/year ($2.3 million/year increase from the 2018 analysis due to changes in percent of total by component costs assumptions).
- R&R discrete annual costs for treated water transmission and distribution pipelines range from zero to $17 million in year 1 (2021) and $18.6 million (2043) in discrete years with a 25-year average annual cost of $4 million/year. The high cost in 2021 is due to 2021 catch-up replacement since 1999 for pipes that are now past their useful life. The high discrete cost in 2043 is due to a high amount of 6-in, 8-in, and 12-in diameter pipelines reaching the end of their useful life.
- R&R costs for raw water transmission and distribution canals, pipelines, and flumes have a 25-year average annual cost of $3.6 million/year (0.8 million/year less than the 2018 analysis predominantly due to reducing the annual expenditures on canal lining and riveted steel pipe replacement activities).

Table 1. Total Renewal and Replacement 25-year Program Cost Summary

Asset Category	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	25-year average annual cost
1. Treatment	$18.2	$0.0	$15.6	$0.0	$0.0	$2.6	$1.2	$11.6	$5.4	$0.0	$11.1	$0.0	$0.0	$9.8	$0.0	$2.9	$3.7	$7.1	$7.2	$6.1	$16.0	$0.0	$13.2	$10.0	$0.0	$5.7
2. Treated Water Transmission and Distribution	$17.0	$0.0	$0.0	$0.2	$1.8	$3.1	$1.6	$3.9	$0.4	$2.0	$1.0	$2.2	$2.5	$0.8	$0.6	$1.0	$10.0	$0.6	$3.4	$8.6	$8.7	$1.9	$18.6	$7.8	$5.1	$4.1
3. Raw Water Transmission and Distribution	$3.2	$4.9	$3.2	$4.2	$3.2	$4.5	$3.2	$3.3	$3.2	$3.6	$3.2	$3.4	$3.2	$4.6	$3.2	$4.2	$3.2	$3.8	$3.2	$5.0	$3.2	$4.2	$3.2	$3.2	$3.2	$3.6
4. Treated Water Storage	$7.5	$0.5	$0.2	$0.0	$0.2	$0.4	$0.4	$0.1	$0.0	$0.0	$0.0	$3.1	$2.7	$0.5	$0.0	$5.0	$0.3	$0.4	$0.3	$0.1	$4.1	$0.6	$0.1	$0.1	$0.0	$1.1
5. Untreated Storage	$3.5	$0.0	$0.0	$0.1	$0.3	$0.0	$0.1	$0.0	$0.1	$0.3	$0.0	$5.3	$0.0	$0.1	$0.3	$0.8	$0.0	$0.0	$0.1	$0.3	$0.0	$5.0	$0.3	$0.1	$0.3	$0.7
6. Groundwater	$0.0	$0.0	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.3	$0.0	$0.0
7. Planning	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
8. Miscellaneous																										
8a. Miscellaneous- SCADA	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
8b. Miscellaneous - Security	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
8c. Miscellaneous - Sitework	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3
9. Pump Stations	$3.5	$0.0	$1.0	$0.8	$0.1	$2.4	$5.0	$0.3	$0.0	$0.0	$1.4	$0.0	$0.0	$0.2	$0.5	$0.9	$10.6	$0.3	$0.0	$1.0	$3.5	$0.0	$1.0	$1.0	$0.1	$1.3
Total annual replacement cost, discrete	$53.5	$6.0	$20.8	$5.9	$6.1	$13.6	$12.0	$19.8	$9.7	$6.7	$17.2	$14.6	$9.0	$16.6	$5.1	$15.3	$28.6	$12.8	$14.8	$21.7	$36.0	$12.2	$37.0	$23.1	$9.2	$17.1
Total annual replacement cost, 5 year running average	$53.5	$29.8	$26.8	$21.6	$18.5	$10.5	$11.7	$11.5	$12.2	$12.4	$13.1	$13.6	$11.4	$12.8	$12.5	$12.1	$14.9	$15.7	$15.3	$18.6	$22.8	$19.5	$24.3	$26.0	$23.5	--
Total annual replacement cost, 2021-2030 average, 2031-2045 average	$15.4	$15.4	$15.4	$15.4	$15.4	$15.4	$15.4	$15.4	$15.4	$15.4	$18.2	$18.2	$18.2	$18.2	$18.2	$18.2	$18.2	$18.2	$18.2	$18.2	$18.2	$18.2	$18.2	$18.2	$18.2	--

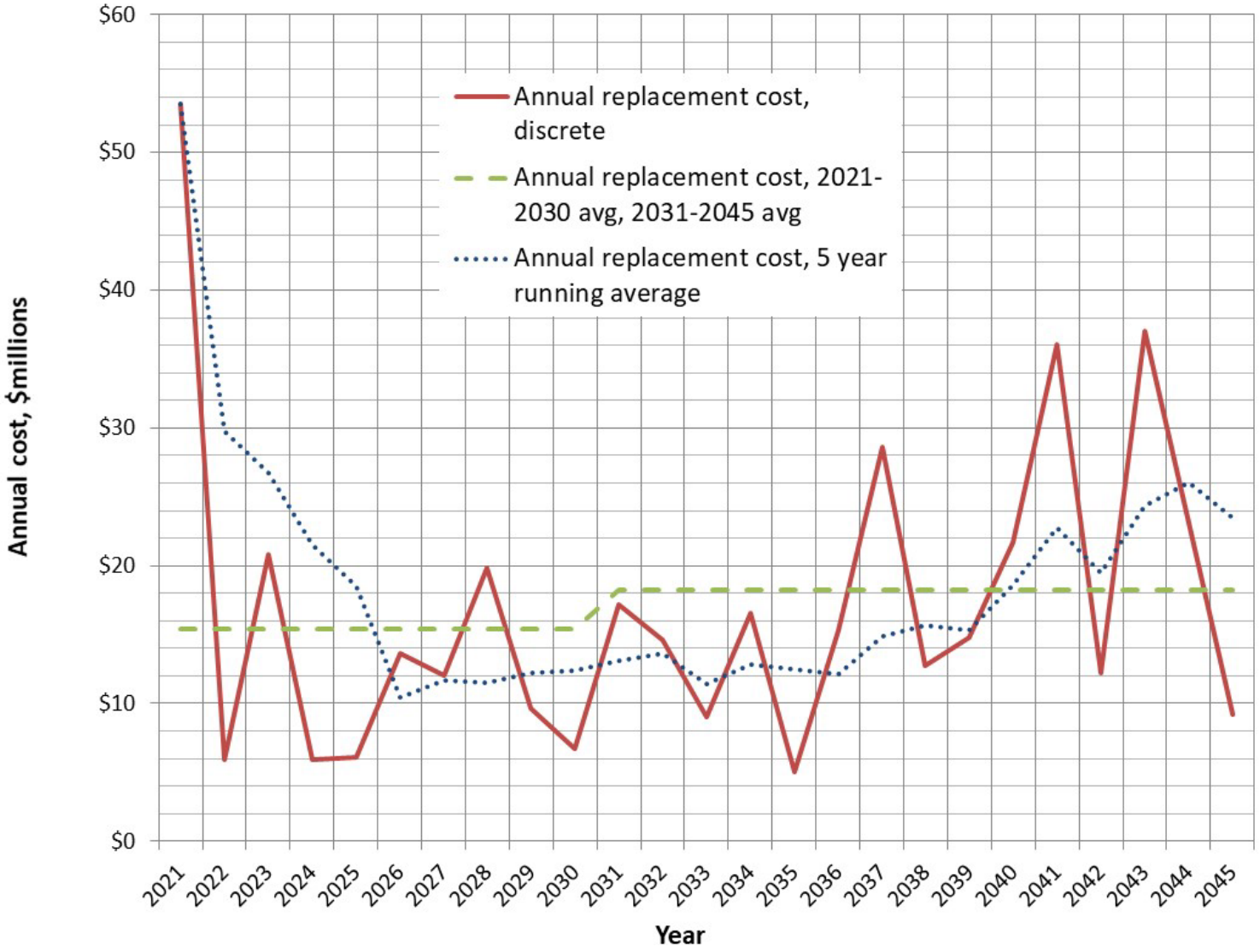


Figure 1. Total 25-Year Renewal and Replacement Annual Costs

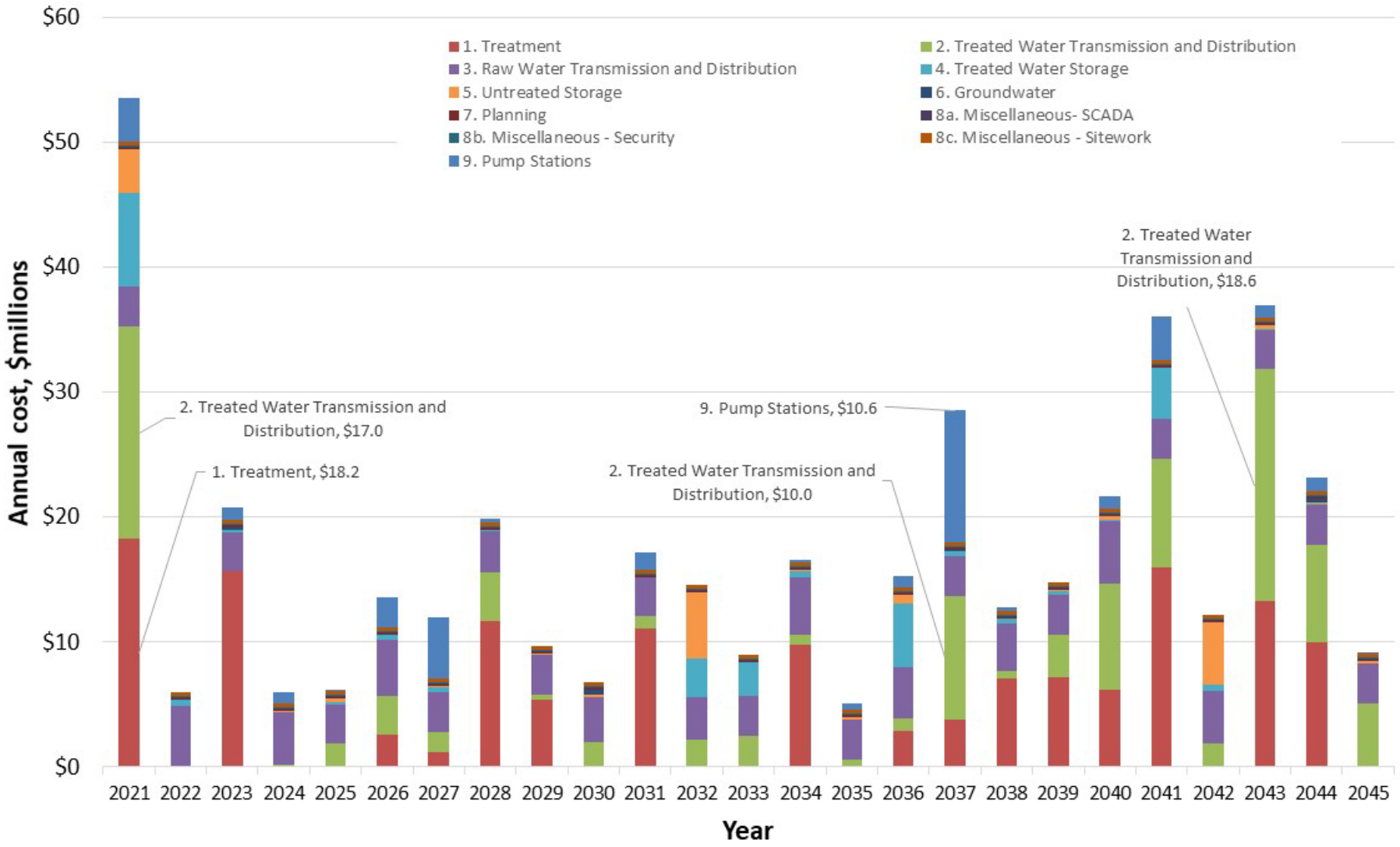


Figure 2. 25-Year Annual Discrete Renewal and Replacement Costs by CIP Category

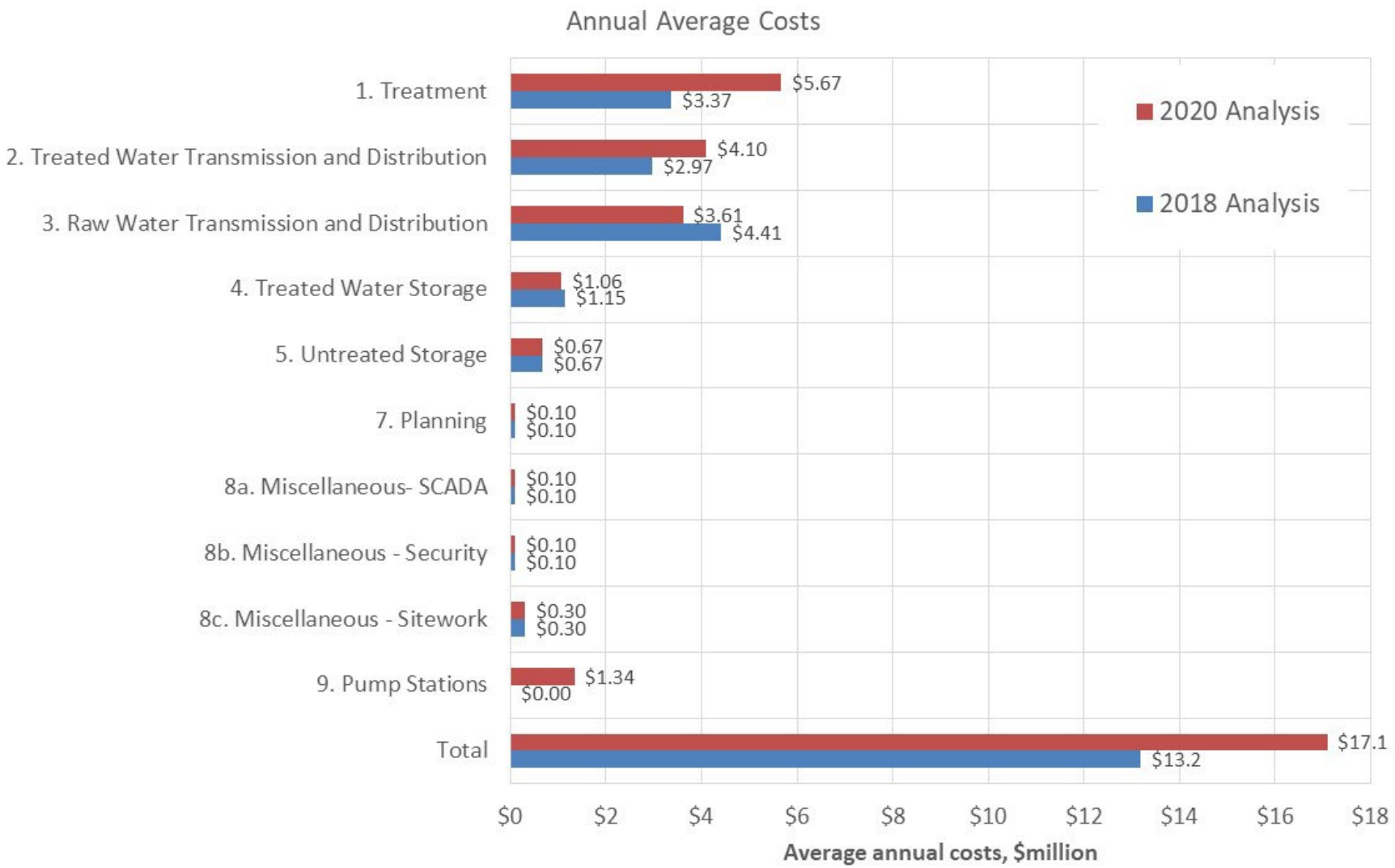


Figure 3. 25-Year Annual Average Renewal and Replacement Costs by CIP Category – 2018 Analysis vs 2020 Update Analysis

Attachment A: MS Excel Workbook for 25-Year Renewal and Replacement Analysis

Inputs and Assumptions

CIP Budget Categories	Hyperlinks	
1. Treatment	Assumptions table	Worksheet
2. Treated Water Transmission and Distribution	Assumptions table	Worksheet
3. Raw Water Transmission and Distribution	Assumptions table	Worksheet
4. Treated Water Storage	Assumptions table	Worksheet
5. Untreated Storage	Assumptions table	Worksheet
6. Groundwater	Assumptions table	Worksheet
7. Planning	Assumptions table	Worksheet
8. Miscellaneous	Assumptions table	Worksheet
a. SCADA		
b. Security		
c. Site Improvements		
9. Pump Stations		
Total Results Summary		Worksheet

1. Treatment - Assumptions

WTP Cost Components

	Assumed useful life		Replacement costs, % of total by component (Conventional WTP)		Replacement costs, % of total by component (Membrane WTP)	
Surface WTP component	This analysis	Reference	WTP R&R Cost Breakdown*	Notes	WTP R&R Cost Breakdown*	Notes
Structural	65	EPA The Clean Water and Drinking Water Infrastructure GAP Analysis 2002, WTP - Concrete Structures 60-70 years	30%	Structural includes buildings and process tanks. Distribution system treated water storage tanks are not included in the WTP R&R analysis.	15%	
Mechanical	20	EPA The Clean Water and Drinking Water Infrastructure GAP Analysis 2002, WTP - Mechanical and Electrical 15-25 years	25%		40%	
Piping	80	EPA The Clean Water and Drinking Water Infrastructure GAP Analysis 2002, 65-95 years	10%		10%	
I&C	10	EPA The Clean Water and Drinking Water Infrastructure GAP Analysis	10%		10%	
Electrical	20	EPA The Clean Water and Drinking Water Infrastructure GAP Analysis 2002, WTP - Mechanical and Electrical 15-25 years	10%		10%	
Site Improvements	50		5%		5%	
Portion of New WTP Costs Not Included in R&R Costs			10%	Assumed percentage of cost related to construction of new WTP that is not included in the cost of R&R activities of an existing WTP facility. These costs include site grading and related one-time activities.	10%	Assumed percentage of cost related to construction of new WTP that is not included in the cost of R&R activities of an existing WTP facility. These costs include site grading and related one-time activities.

* R&R WTP cost breakdown based on AWWA Cost Estimating Manual for Water Treatment Facilities, Table 5.2.1 General Cost Equations for Water Treatment Processes with Parameters, Minimum and Maximum Limits

** R&R WTP cost breakdown based on AWWA Cost Estimating Manual for Water Treatment Facilities, Figure 2.4.2a Predesign Cost Estimate for a Micro Membrane Treatment Plant, with Capacity of 10 mgd.

Total Cost by Capacity	Conventional WTP	
Capacity, mgd	Cost, $million*	Current Cost, $million**
40	$ 58.47	$ 84.91
18	$ 36.34	$ 52.77
8	$ 22.42	$ 32.56
5	$ 16.94	$ 24.60
2	$ 9.82	$ 14.26
1.25	$ 7.42	$ 10.77
0.52	$ 4.40	$ 6.39
0.10	$ 1.65	$ 2.33

* Total costs based on AWWA Cost Estimating Manual for Water Treatment Facilities, Figure 5.7.3b Conventional Filtration. ENR CCI 8889. Note that costs for WTPs with capacity less than 20 mgd are estimated extrapolated from this chart for the purposes of this analysis. Costs may not be accurate for WTPs with less than 20 mgd capacity.

**Costs are adjusted to current (2020) dollars using ENR CCI. ENR CCI for 2007 based on San Francisco December 2007 (9,131.81). ENR CCI for 2020 based on San Francisco July 2020 (12,907.92).

Approach to WTP Total Replacement Cost and Cost Component Breakdown		
Three approaches based on data availability (in all approaches use CCI to estimate costs in 2020 dollars):	**WTP Facilities:**	
A. Total and by component cost data available: a. Total R&R cost: Use SOV total cost, Remove non R&R costs (i.e. grading) b. Cost component breakdown: Use SOV cost breakdown	Foothill WTP #1, Colfax WTP	
B.Total cost data available only: a. Total R&R cost: Use SOV total cost b. Cost component breakdown: Use cost breakdown in assumptions worksheet (based on AWWA Cost Estimating Manual for Water Treatment Facilities, Table 5.2.1 General Cost Equations for Water Treatment Processes with Parameters, Minimum and Maximum Limits) *c. Cost component breakdown (for membrane treatment plant (Applegate WTP)): Use cost breakdown assumptions worksheet (based on AWWA Cost Estimating Manual for Water Treatment Facilities, Figure 2.4.2a Predesign Cost Estimate for a Micro Membrane Treatment Plant, with Capacity of 10 mgd.)	Foothill WTP #2, Auburn WTP, Bowman(packaged) WTP, Applegate WTP*	
C. No total or by component cost data available: a. Total R&R cost: Based on capacity cost curve from AWWA Cost Estimating Manual for Water Treatment Facilities Figure 5.7.3b Conventional Filtration b. Cost component breakdown: Use cost breakdown in assumptions worksheet (based on AWWA Cost Estimating Manual for Water Treatment Facilities, Table 5.2.1 General Cost Equations for Water Treatment Processes with Parameters, Minimum and Maximum Limits)	Sunset WTP, Bowman(conventional) WTP, Alta WTP, Monte Vista WTP	

To Treatment Worksheet

2. Treated Water Transmission and Distribution - Assumptions			
	Replacement costs		Reference
Diameter	$/in-dia/LF	$/LF	
1	$ 40	$ 40	
1.25	$ 40	$ 50	
1.5	$ 40	$ 60	
2	$ 40	$ 80	
3	$ 40	$ 120	
4	$ 40	$ 160	
6	$ 40	$ 240	
7	$ 40	$ 280	
8	$ 40	$ 320	
10	$ 36	$ 360	
12	$ 33	$ 400	See Treated Water Mains cost table.
14	$ 31	$ 440	
16	$ 30	$ 480	
18	$ 28	$ 500	
20	$ 26	$ 520	
22	$ 26	$ 572	
24	$ 23	$ 552	
30	$ 23	$ 690	
36	$ 23	$ 828	
42	$ 23	$ 966	
48	$ 23	$ 1,104	
Notes:			
1. Useful life assumed to be 80 year average.			
2. Pipes reaching end of useful life before 2018 (62,494 LF) assumed to be replaced in 2018.			
3. Pipes reaching end of useful life assumed to be replaced with same diameter pipe.			

$700/LF is based on 0.75 for soft costs

To Treated Water Transmission and Distribution Worksheet
To Treated Water Main_data Worksheet
To Treated Water Mains costs table

3. Raw Water Transmission and Distribution

	Replacement cost, $/LF	Replacement/maintenance, $/yr	Replacement rate, miles per year	Reference	Total LF
Canals (lining)	$ 83	--	2.5	`	
Riveted steel pipe	$ 700	--	0.080	Assume $700/LF replacement cost of 2.01 miles over 25 years. 2.01 miles based on 10,620 LF of RSP from 2020 data. Long Ravine pipeline was replaced since the 2018 analysis.	
Steel welded casing pipe	$ 700	--	0.46	Assume $700/LF replacement cost of 11.4 miles over 25 years. 11.5 miles based on 2020 data for length of Steel (25,760 LF) and WSC (34,596 LF) (CCML not included) = 60,356 LF (11.4 mil)	
Flumes	$ 4,100	--	Replace specific priority flumes with pipe, biannually, in order listed in worksheet. Assume piped section is twice as long as flume.	Unit costs based on recently completed - 174 lf of Hayford Flume #2 replaced with 369 lf 60 inch WSP. Project construction was $1.51M. Assume piped section is twice as long as flume and cost is $4,100 per LF.	
Flume rehab/maintenance		$100,000	Annually	Based on annual cost estimates	

To Raw Water Transmission and Distribution Worksheet

4. Treated Water Storage

	Assumed useful life		Replacement costs, % of total			
	This analysis	Reference	This analysis			Reference
Tank type/activities			Small (0.05 MG)	Mid (0.5 MG)	Large (2 MG)	
Redwood (replacement)	50	Engineering assumption.	1.75	1.35	1	$/MG
Bolted Steel (replacement)	30	AWWA M42	1.75	1.35	1	$/MG
Pre-stressed concrete tanks (replacement)	100	Engineering assumption. At least 100 years with appropriate maintenance.	1.75	1.35	1	$/MG
Welded Steel						
Interior recoating	15	Past coating history, 2 cycles	24	22	20	$/SQ
Exterior recoating	20	Past coating history, 2 cycles	16	14	12	$/SQ
Replacement	70		1.75	1.35	1	
Install mixer vents	No replacement needed	Assume for this 25 year analysis				need to be installed on all storage tanks that don't currently have one.

To Treated Water Storage Worksheet

5. Untreated Storage	Re-occurring frequency, years		Unit costs	
Typical activities	This analysis	Reference	This analysis	Reference
Update inundation maps and Emergency A	5	Starting in 2018	$ 125,000	Per occurrence, assume only for DSOD reservoirs
Sediment removal	50		$ 12,098	Per ac-ft reservoir capacity. Sediment removal equals 25% of capacity at $30 per cubic yard to remove.
Dam modification	50		See Untreated Storage worksheet	Varies by reservoir
Inlet/outlet improvements	25		See Untreated Storage worksheet	Varies by reservoir

Note: Assumes Ben Franklin and McCrary are small enough to be maintained under annual operating budget. Costs for rehabilitation and replacement of these reservoirs are not included in this worksheet.

To Untreated Storage Worksheet

6. Groundwater	Re-occurring frequency, years			Unit costs, $			
For each well:	Initial rehab activity, yrs following construction	Rehab frequency following initial rehab activity, yrs	Reference	Year 1	Year 2	Year 3	Reference
Downhole well rehabilitation activities - Phase 1 (light rehabilitation)	7	14	Downhole well rehabilitation and pump rehabilitation and repair are recommended to occur in two coordinated phases. For downhole well rehabilitation, Phase 1 is light rehabilitation and Phase 2 is heavy rehabilitation. Well rehabilitation phases are recommended to coincide with the timing of well pump rehabilitation and pump replacement phases. For well pump repair and replacement, Phase 1 is	$25,000			Typical
Downhole well rehabilitation activities - Phase 2 (heavy rehabilitation)	14	14		$75,000			Typical
Pump rehabilitation and replacement activities - Phase 1 (Light rehabilitation)	7	14		$50,000			Typical
Pump rehabilitation and replacement activities - Phase 2 (heavy rehabilitation)	14	14		$ 90,000			Typical
Well replacement	50		Commonly accepted industry standard assumed a 50-year life span for a municipal water well.	$500,000	$ 1,000,000	$ 2,000,000	Assumes no treatment. Includes Year 1 land acquisition, Year 2 design/drill well, Year 3 construct pump station/equip well. Based on SSWD Water System Master Plan (Brown and Caldwell, 2017)

To Groundwater Worksheet

7. Planning	Re-occurring frequency, years		Unit costs	
Typical activities	This analysis	Reference	This analysis	Reference
Planning activities	1	Annual assumption	$ 100,000	Engineering estimate. Typically activities are expansion related

To Planning Worksheet

8. Miscellaneous				
	Re-occurring frequency, years		Unit costs, $	
	This analysis	Reference	This analysis	Reference
SCADA				
Major upgrades	1		$ 100,000	Per conversation with Jeff Call: Average annual cost to replace major upgrades is $100,000. Operations budget includes $200,000 to cover routine replacements and is not included in this analysis. Instrumentation is typically handled through the operations budget and is not included in this analysis.
Security	1		$ 100,000	Based on internal discussions.
Site Improvements	1		$ 300,000	Based on what PCWA has done or plans to do. Includes paving, parking lots, access roads (buildings not included because paid through separate fund).

To Misc Worksheet

9. Pump Stations

	Assumed useful life		Replacement costs, Percent of total by component*			
Pump Station component	This analysis	Reference	$/mgd, Small (<=2mgd) (based on Barton Rd PS)	$/mgd, Medium (4 mgd to 30 mgd)	$/mgd, Large (>30 mgd)	Reference
New BPS (total)						$/mgd Planning level cost estimate
Structural	65	EPA The Clean Water and Drinking Water Infrastructure GAP Analysis 2002, WTP - Concrete Structures 60-70 years	0%	20%	20%	Small- typically no building, likely an enclosure such as a vault Medium - pump house Larger structures to house facility
Mechanical	20	EPA The Clean Water and Drinking Water Infrastructure GAP Analysis 2002, WTP - Mechanical and Electrical 15-25 years	40%	30%	30%	Percent of total cost
Piping	80	EPA The Clean Water and Drinking Water Infrastructure GAP Analysis 2002, 65-95 years	10%	15%	15%	Percent of total cost
I&C	10	EPA The Clean Water and Drinking Water Infrastructure GAP Analysis	10%	5%	5%	Percent of total cost
Electrical	20	EPA The Clean Water and Drinking Water Infrastructure GAP Analysis 2002, WTP - Mechanical and Electrical 15-25 years	15%	10%	10%	Percent of total cost
Site Improvements	50		25%	20%	20%	Percent of total cost

*Percent of total by component shown in this table is applied to facilities with site specific data not available. Percent of total replacement by component for Midas, Barton Road, Tinker, Auburn Tunnel, American River, Whitney, and Ophir pump stations are based on actual construction costs for those sites. Facilities with site specific percent per component are highlighted in yellow on the Pump Stations Worksheet.

To Pump Stations Worksheet

Treatment

Treatment

Facility name	Capacity, mgd	Assumed replacement cost (current dollars), $million	Year constructed/last major overhaul	Assumed useful life	Percent of total by component	Replacement costs, (based on % of total) $million
Foothill WTP #1	40	$ 26.71	2003			
Structural			2003	65	35%	$ 9.46
Mechanical			2003	20	42%	$ 11.32
Piping			2003	80	6%	$ 1.67
I&C			2017	10	4%	$ 1.17
Electrical			2003	20	7%	$ 1.93
Site Improvements			2003	50	4%	$ 1.18
Foothill WTP #2	18	$ 13.67	2018			
Structural			2018	65	30%	$ 4.10
Mechanical			2018	20	25%	$ 3.42
Piping			2018	80	10%	$ 1.37
I&C			2018	10	10%	$ 1.37
Electrical			2018	20	10%	$ 1.37
Site Improvements			2018		5%	$ 0.68
Auburn WTP	8	$ 29.37	2008			
Structural			2008	65	30%	$ 8.81
Mechanical			2008	20	25%	$ 7.34
Piping			2008	80	10%	$ 2.94
I&C			2008	10	10%	$ 2.94
Electrical			2008	20	10%	$ 2.94
Site Improvements			2008	50	5%	$ 1.47
Sunset WTP	8	$ 32.56	1969			
Structural			1969	65	30%	$ 9.77
Mechanical			2011	20	25%	$ 8.14
Piping			1969	80	10%	$ 3.26
I&C			2019	10	10%	$ 3.26
Electrical			1969	20	10%	$ 3.26
Site Improvements			1969	50	5%	$ 1.63
Bowman (packaged) WTP	2	$ 1.16	1992			
Structural			1992	65	30%	$ 0.35
Mechanical			2016	20	25%	$ 0.29
Piping			1992	80	10%	$ 0.12
I&C			2016	10	10%	$ 0.12
Electrical			2017	20	10%	$ 0.12
Site Improvements			2015	--	5%	$ 0.06
Bowman (conventional) WTP	5	$ 24.60	1979			
Structural			1979	65	30%	$ 7.38
Mechanical			2020	20	25%	$ 6.15
Piping			1979	80	10%	$ 2.46
I&C			2016	10	10%	$ 2.46
Electrical			2017	20	10%	$ 2.46
Site Improvements			2015	50	5%	$ 1.23
Colfax WTP	1.24	$ 13.03	1958			
Structural			1958	65	18%	$ 2.39
Mechanical			1958	20	50%	$ 6.52
Piping			1958	80	7%	$ 0.95
I&C			2019	10	5%	$ 0.71
Electrical			1958	20	14%	$ 1.81
Site Improvements			1958	50	5%	$ 0.64
Alta WTP	0.52	$ 6.39	1979			
Structural			1979	65	30%	$ 1.92
Mechanical			2019	20	25%	$ 1.60
Piping			1979	80	10%	$ 0.64
I&C			2019	10	10%	$ 0.64
Electrical			2019	20	10%	$ 0.64
Site Improvements			1979	50	5%	$ 0.32
Monte Vista WTP	0.10	$ 2.33	1979			
Structural			1979	65	30%	$ 0.70
Mechanical			1979	20	25%	$ 0.58
Piping			1979	80	10%	$ 0.23
I&C			2019	10	10%	$ 0.23
Electrical			1979	20	10%	$ 0.23
Site Improvements			1979	50	5%	$ 0.12
Applegate WTP	0.13	$ 1.25	1998			
Structural			1998	65	15%	$ 0.19
Mechanical			1998	20	40%	$ 0.50
Piping			1998	80	10%	$ 0.12
I&C			2019	10	10%	$ 0.12
Electrical			1998	20	10%	$ 0.12
Site Improvements			1998	50	5%	$ 0.06
Annual replacement cost (discrete)						
Annual replacement cost (average cost 2021-2030, 2031-2045)						

Cumulative replacement cost (discrete)						
Cumulative replacement cost, (average cost 2021-2030, 2031-2045)						

Treatment

Facility name	Next replacement year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Foothill WTP #1											
Structural	2068	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	2023	$ -	$ -	$ 11.32	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	2083	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	2027	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.17	$ -	$ -	$ -
Electrical	2023	$ -	$ -	$ 1.93	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements	2053	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Foothill WTP #2											
Structural	2083	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	2038	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	2098	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	2028	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.37	$ -	$ -
Electrical	2038	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Auburn WTP											
Structural	2073	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	2028	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.34	$ -	$ -
Piping	2088	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	2021	$ 2.94	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Electrical	2028	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.94	$ -	$ -
Site Improvements	2058	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sunset WTP											
Structural	2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	2031	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	2049	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	2029	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.26	$ -
Electrical	2021	$ 3.26	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements	2021	$ 1.63	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Bowman (packaged) WTP											
Structural	2057	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	2036	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	2072	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	2026	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ -	$ -	$ -	$ -
Electrical	2037	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements	--										
Bowman (conventional) WTP											
Structural	2044	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	2040	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	2059	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	2026	$ -	$ -	$ -	$ -	$ -	$ 2.46	$ -	$ -	$ -	$ -
Electrical	2037	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements	2065	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Colfax WTP											
Structural	2023	$ -	$ -	$ 2.39	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	2021	$ 6.52	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	2038	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	2029	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.71	$ -
Electrical	2021	$ 1.81	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements	2021	$ 0.64	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Alta WTP											
Structural	2044	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	2039	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	2059	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	2029	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.64	$ -
Electrical	2039	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements	2029	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.32	$ -
Monte Vista WTP											
Structural	2044	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	2021	$ 0.58	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	2059	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	2029	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.23	$ -
Electrical	2021	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements	2029	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ -
Applegate WTP											
Structural	2063	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	2021	$ 0.50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	2078	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	2029	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ -
Electrical	2021	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements	2048	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual replacement cost (discrete)		$ 18.24	$ -	$ 15.63	$ -	$ -	$ 2.58	$ 1.17	$ 11.65	$ 5.39	$ -
Annual replacement cost (average cost 2		$ 5.47	$ 5.47	$ 5.47	$ 5.47	$ 5.47	$ 5.47	$ 5.47	$ 5.47	$ 5.47	$ 5.47

Cumulative replacement cost (discrete)		$ 18.24	$ 18.24	$ 33.87	$ 33.87	$ 33.87	$ 36.45	$ 37.62	$ 49.26	$ 54.66	$ 54.66
Cumulative replacement cost, (average co		$ 5.47	$ 10.93	$ 16.40	$ 21.86	$ 27.33	$ 32.79	$ 38.26	$ 43.73	$ 49.19	$ 54.66

Treatment

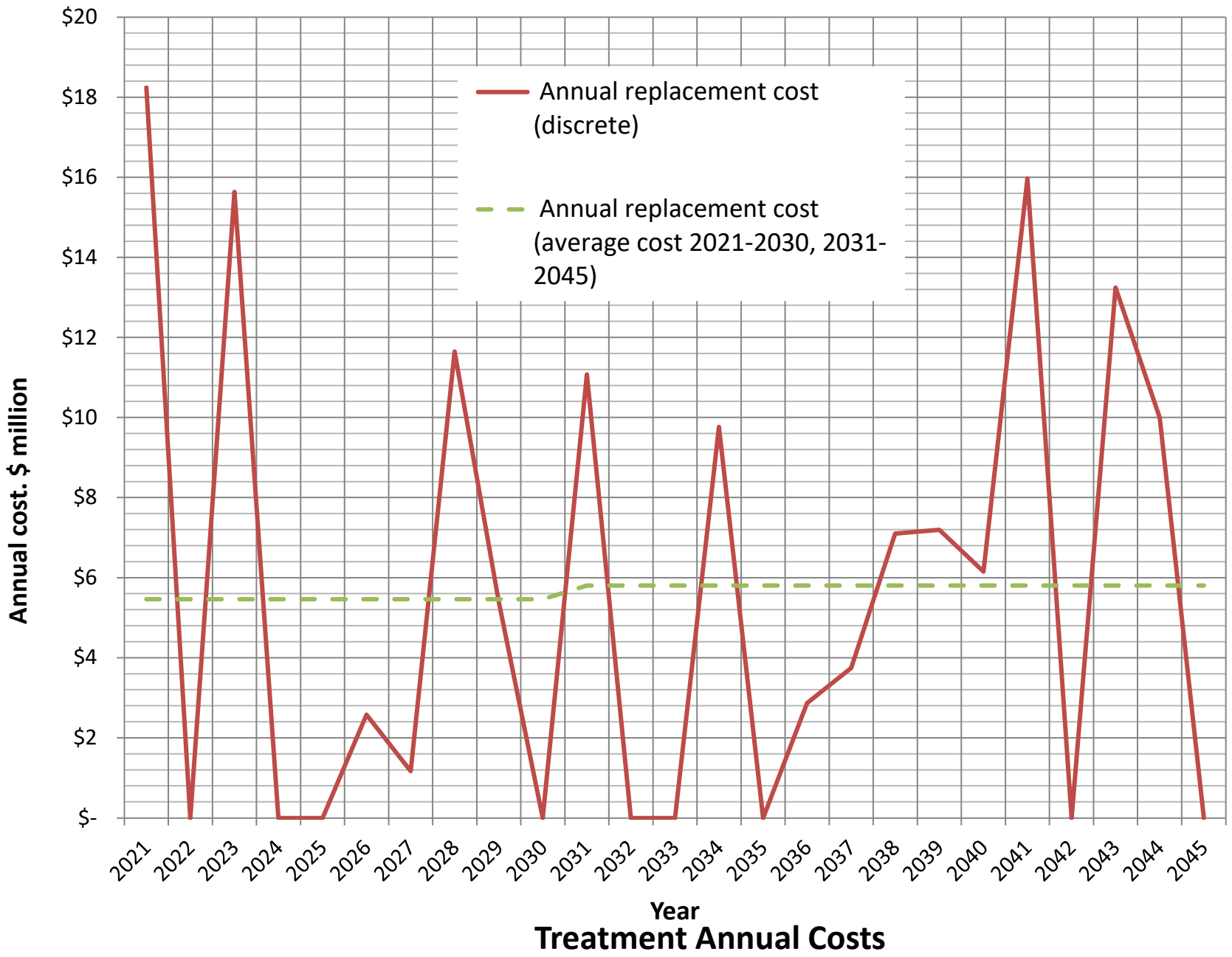
Facility name	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Foothill WTP #1											
Structural	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.17	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Foothill WTP #2											
Structural	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.42	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.37	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.37	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Auburn WTP											
Structural	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	$ 2.94	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.94
Electrical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sunset WTP											
Structural	$ -	$ -	$ -	$ 9.77	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	$ 8.14	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.26	$ -	$ -
Electrical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.26
Site Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Bowman (packaged) WTP											
Structural	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -	$ -	$ 0.29	$ -	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ -	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ -	$ -	$ -	$ -
Site Improvements											
Bowman (conventional) WTP											
Structural	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.15	$ -
Piping	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -	$ -	$ 2.46	$ -	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.46	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Colfax WTP											
Structural	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.52
Piping	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.95	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.71	$ -	$ -
Electrical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.81
Site Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Alta WTP											
Structural	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.60	$ -	$ -
Piping	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.64	$ -	$ -
Electrical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.64	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Monte Vista WTP											
Structural	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.58
Piping	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.23	$ -	$ -
Electrical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.23
Site Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Applegate WTP											
Structural	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.50
Piping	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ -	$ -
Electrical	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12
Site Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual replacement cost (discrete)	$ 11.08	$ -	$ -	$ 9.77	$ -	$ 2.87	$ 3.74	$ 7.10	$ 7.19	$ 6.15	$ 15.97
Annual replacement cost (average cost 2	$ 5.81	$ 5.81	$ 5.81	$ 5.81	$ 5.81	$ 5.81	$ 5.81	$ 5.81	$ 5.81	$ 5.81	$ 5.81

Cumulative replacement cost (discrete)	$ 65.73	$ 65.73	$ 65.73	$ 75.50	$ 75.50	$ 78.37	$ 82.11	$ 89.21	$ 96.40	$ 102.55	$ 118.52
Cumulative replacement cost, (average co	$ 60.46	$ 66.27	$ 72.08	$ 77.88	$ 83.69	$ 89.50	$ 95.30	$ 101.11	$ 106.92	$ 112.73	$ 118.53

Treatment

Facility name	2042	2043	2044	2045
Foothill WTP #1				
Structural	$ -	$ -	$ -	$ -
Mechanical	$ -	$ 11.32	$ -	$ -
Piping	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -
Electrical	$ -	$ 1.93	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -
Foothill WTP #2				
Structural	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -
Auburn WTP				
Structural	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -
Sunset WTP				
Structural	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -
Bowman (packaged) WTP				
Structural	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -
Site Improvements				
Bowman (conventional) WTP				
Structural	$ -	$ -	$ 7.38	$ -
Mechanical	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -
Colfax WTP				
Structural	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -
Alta WTP				
Structural	$ -	$ -	$ 1.92	$ -
Mechanical	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -
Monte Vista WTP				
Structural	$ -	$ -	$ 0.70	$ -
Mechanical	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -
Applegate WTP				
Structural	$ -	$ -	$ -	$ -
Mechanical	$ -	$ -	$ -	$ -
Piping	$ -	$ -	$ -	$ -
I&C	$ -	$ -	$ -	$ -
Electrical	$ -	$ -	$ -	$ -
Site Improvements	$ -	$ -	$ -	$ -
Annual replacement cost (discrete)	$ -	$ 13.24	$ 10.00	$ -
Annual replacement cost (average cost 2	$ 5.81	$ 5.81	$ 5.81	$ 5.81

Cumulative replacement cost (discrete)	$ 118.52	$ 131.76	$ 141.76	$ 141.76
Cumulative replacement cost, (average co	$ 124.34	$ 130.15	$ 135.95	$ 141.76



PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
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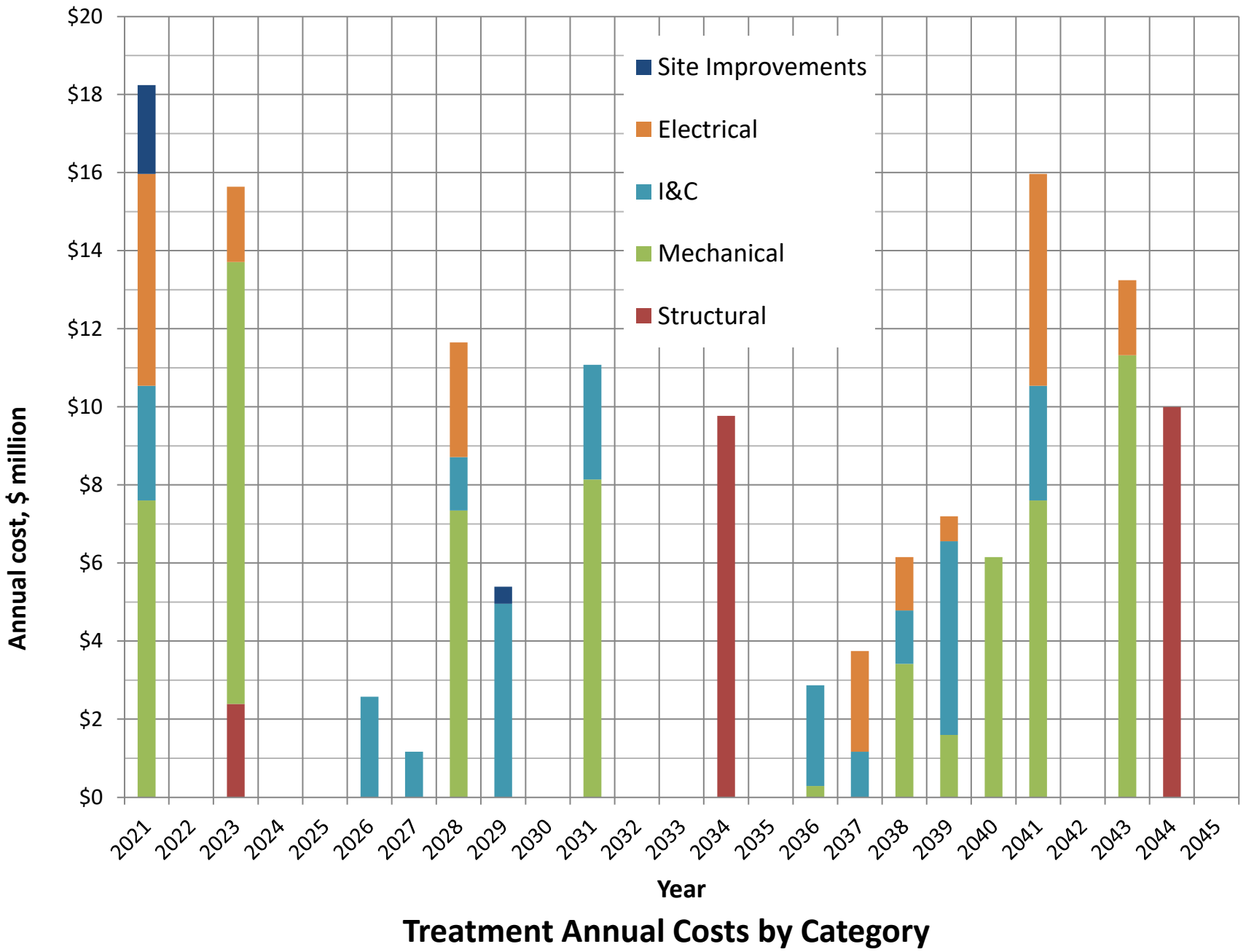
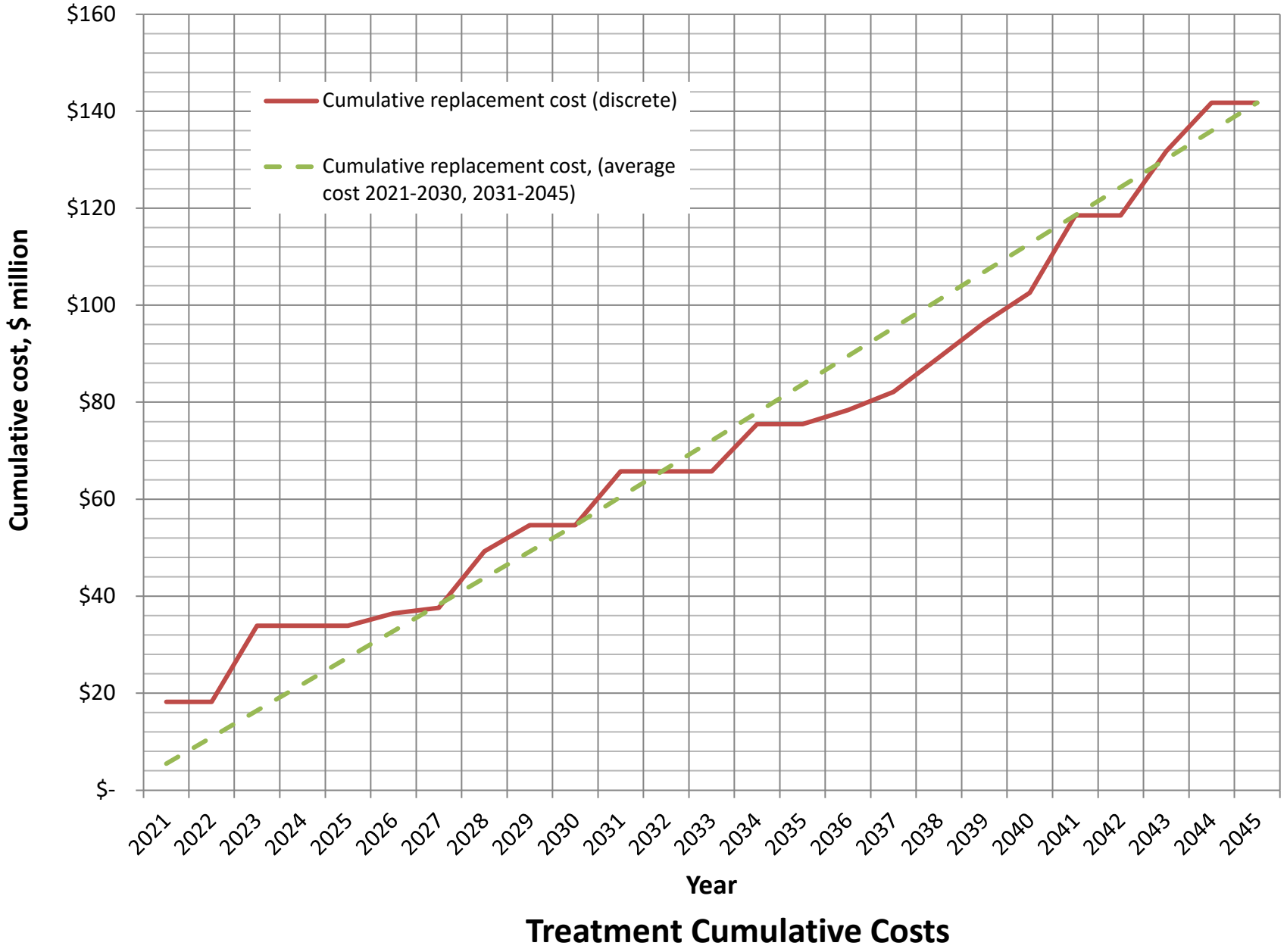


Treatment Annual Costs by Category

PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
2/10/2021



Treatment Cumulative Costs

PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
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Treated Water Transmission

Treated Water Transmission and Distribution - Assumptions

		$millions						
Transmission and distribution pipeline diameter,, inches	Replacement unit cost, $/LF	2021	2022	2023	2024	2025	2026	2027
1	$ 40	$ 0.001	$ -	$ -	$ 0.004	$ -	$ -	$ -
1.25	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1.5	$ 60	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	$ 80	$ 0.461	$ -	$ -	$ -	$ 0.085	$ 0.013	$ 0.050
3	$ 120	$ 0.028	$ -	$ -	$ -	$ -	$ -	$ -
4	$ 160	$ 3.421	$ -	$ -	$ 0.010	$ 0.191	$ 0.399	$ 0.105
6	$ 240	$ 5.961	$ -	$ -	$ -	$ 0.337	$ 0.271	$ 0.741
7	$ 280	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	$ 320	$ 2.868	$ -	$ -	$ 0.138	$ 0.442	$ 0.941	$ 0.407
10	$ 360	$ 2.452	$ -	$ -	$ -	$ 0.659	$ -	$ 0.186
12	$ 400	$ 0.906	$ -	$ -	$ -	$ 0.132	$ -	$ 0.016
14	$ 440	$ -	$ -	$ -	$ -	$ -	$ 1.450	$ 0.003
16	$ 480	$ 0.928	$ -	$ -	$ -	$ -	$ -	$ -
18	$ 500	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.089
20	$ 520	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	$ 572	$ -	$ -	$ -	$ -	$ -	$ -	$ -
24	$ 552	$ -	$ -	$ -	$ -	$ -	$ -	$ -
30	$ 690	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	$ 828	$ -	$ -	$ -	$ -	$ -	$ -	$ -
42	$ 966	$ -	$ -	$ -	$ -	$ -	$ -	$ -
48	$ 1,104	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual replacement cost (discrete)		$ 17.03	$ -	$ -	$ 0.15	$ 1.85	$ 3.07	$ 1.60
Annual replacement cost (average cost 2021 to 2030, 2031-2045)		$ 2.99	$ 2.99	$ 2.99	$ 2.99	$ 2.99	$ 2.99	$ 2.99
Annual replacement LF (2021-2030=0.42%/yr, 2031-2040=0.3%/yr, 2041-2045=1%/yr)		13,608	13,608	13,608	13,608	13,608	13,608	13,608
Annual replacement cost (2021-2030=0.42%/yr, 2031-2040=0.3%/yr, 2041-2045=1%/yr)		$ 3.75	$ 3.75	$ 3.75	$ 3.75	$ 3.75	$ 3.75	$ 3.75

Cumulative replacement cost (discrete)		$ 17.03	$ 17.03	$ 17.03	$ 17.18	$ 19.03	$ 22.10	$ 23.70
Cumulative replacement cost (Avg Years 2021-2030, 2031-2045)		$ 2.99	$ 5.98	$ 8.96	$ 11.95	$ 14.94	$ 17.93	$ 20.92
Cumulative replacement cost (2021-2030=0.42%/yr, 2031-2040=0.3%/yr, 2041-2045=1%/yr)		$ 3.75	$ 7.51	$ 11.26	$ 15.01	$ 18.77	$ 22.52	$ 26.27

Notes:
2021 costs include catch-up replacement since 1999

Treated Water Transmission and Distribution - Assumptions

Transmission and distribution pipeline diameter,, inches	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
1	$ 0.001	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1.25	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1.5	$ -	$ -	$ -	$ -	$ -	$ 0.009	$ -	$ -	$ -	$ -	$ -
2	$ 0.093	$ 0.022	$ -	$ 0.031	$ 0.016	$ -	$ -	$ 0.040	$ -	$ 0.292	$ -
3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
4	$ 0.533	$ 0.065	$ 0.167	$ 0.407	$ 0.319	$ 0.040	$ 0.142	$ 0.103	$ 0.086	$ 1.361	$ 0.097
6	$ 1.790	$ 0.264	$ 0.979	$ 0.337	$ 0.991	$ 0.468	$ 0.287	$ 0.365	$ 0.432	$ 5.691	$ 0.479
7	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	$ 0.912	$ -	$ 0.804	$ 0.060	$ 0.464	$ 0.958	$ 0.103	$ 0.065	$ 0.460	$ 1.415	$ -
10	$ 0.237	$ -	$ -	$ 0.122	$ -	$ 0.824	$ 0.293	$ -	$ -	$ 0.315	$ -
12	$ -	$ -	$ -	$ -	$ -	$ 0.228	$ -	$ -	$ -	$ 0.909	$ -
14	$ 0.320	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
16	$ -	$ -	$ -	$ -	$ 0.092	$ -	$ -	$ -	$ -	$ -	$ -
18	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
20	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	$ -	$ -	$ -	$ -	$ 0.334	$ -	$ -	$ -	$ -	$ -	$ -
24	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
30	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
42	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
48	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual replacement cost (discrete)	$ 3.89	$ 0.35	$ 1.95	$ 0.96	$ 2.22	$ 2.53	$ 0.82	$ 0.57	$ 0.98	$ 9.98	$ 0.58
Annual replacement cost (average cost 2021 to 2030,	$ 2.99	$ 2.99	$ 2.99	$ 4.84	$ 4.84	$ 4.84	$ 4.84	$ 4.84	$ 4.84	$ 4.84	$ 4.84
Annual replacement LF (2021-2030=0.42%/yr, 2031-2	13,608	13,608	13,608	9,720	9,720	9,720	9,720	9,720	9,720	9,720	9,720
Annual replacement cost (2021-2030=0.42%/yr, 2031	$ 3.75	$ 3.75	$ 3.75	$ 2.68	$ 2.68	$ 2.68	$ 2.68	$ 2.68	$ 2.68	$ 2.68	$ 2.68

Cumulative replacement cost (discrete)	$ 27.58	$ 27.93	$ 29.88	$ 30.84	$ 33.06	$ 35.58	$ 36.41	$ 36.98	$ 37.96	$ 47.94	$ 48.52
Cumulative replacement cost (Avg Years 2021-2030, 2	$ 23.91	$ 26.89	$ 29.88	$ 34.72	$ 39.56	$ 44.40	$ 49.24	$ 54.08	$ 58.92	$ 63.76	$ 68.60
Cumulative replacement cost (2021-2030=0.42%/yr, 2	$ 30.03	$ 33.78	$ 37.53	$ 40.21	$ 42.89	$ 45.58	$ 48.26	$ 50.94	$ 53.62	$ 56.30	$ 58.98

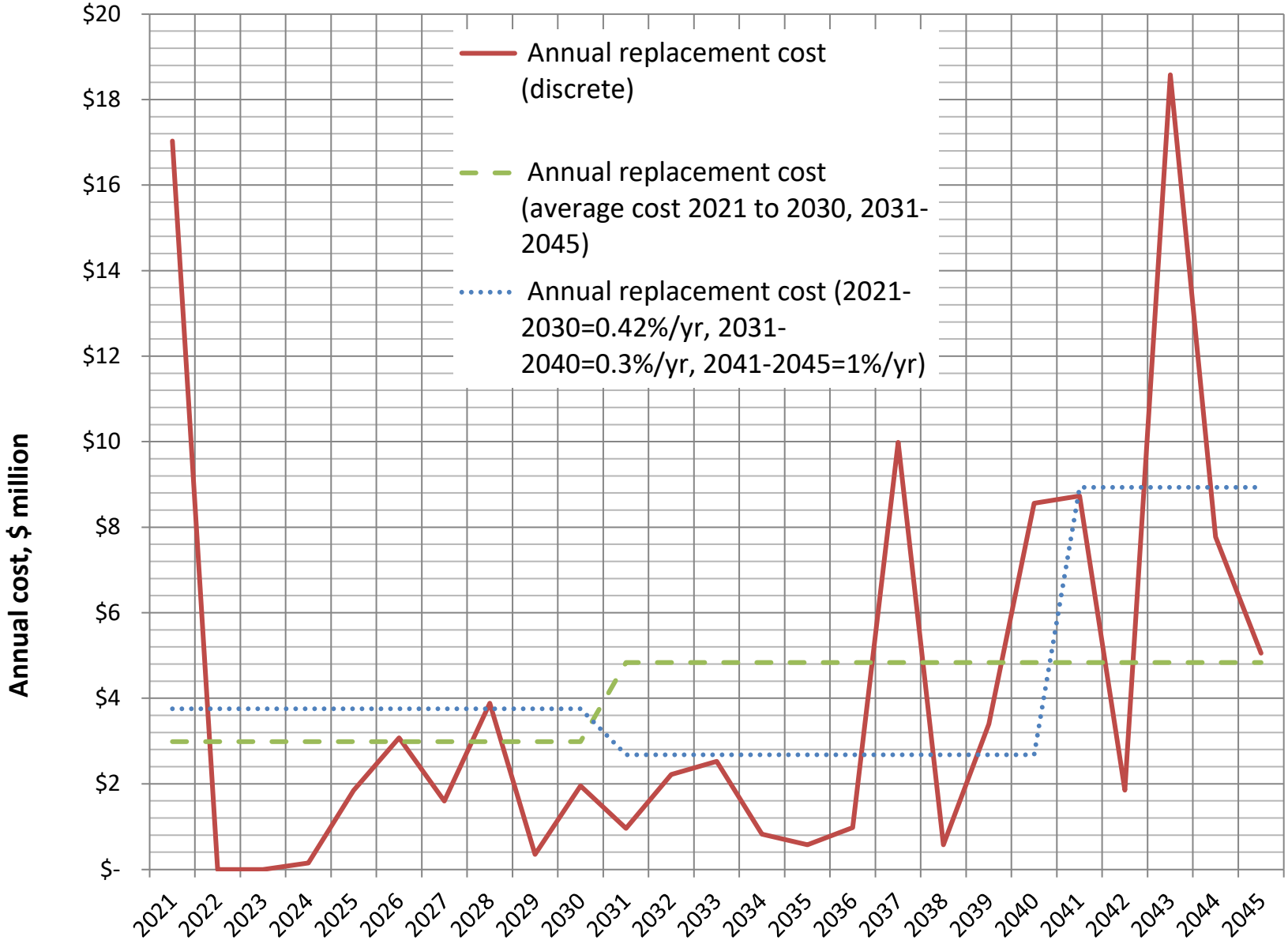
Notes:
2021 costs include catch-up replacement since 1999

Treated Water Transmission and Distribution - Assumptions

Transmission and distribution pipeline diameter,, inches	2039	2040	2041	2042	2043	2044	2045
1	$ -	$ 0.008	$ -	$ -	$ -	$ -	$ -
1.25	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1.5	$ -	$ 0.008	$ 0.015	$ -	$ -	$ -	$ -
2	$ -	$ 0.112	$ -	$ 0.003	$ 0.053	$ 0.007	$ 0.004
3	$ -	$ -	$ -	$ -	$ -	$ -	$ -
4	$ 0.000	$ 0.760	$ 0.373	$ 0.032	$ 0.334	$ 0.106	$ 0.078
6	$ 0.655	$ 3.130	$ 2.153	$ 0.870	$ 3.478	$ 2.294	$ 0.769
7	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	$ 1.949	$ 3.481	$ 4.716	$ 0.122	$ 4.388	$ 0.350	$ 3.289
10	$ 0.609	$ 1.062	$ -	$ 0.814	$ 0.755	$ 0.617	$ 0.022
12	$ 0.188	$ -	$ -	$ 0.010	$ 2.323	$ 0.018	$ 0.594
14	$ -	$ -	$ -	$ -	$ -	$ 0.010	$ -
16	$ -	$ -	$ -	$ -	$ 7.254	$ 0.088	$ 0.300
18	$ -	$ -	$ 1.473	$ -	$ -	$ -	$ -
20	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	$ -	$ -	$ -	$ -	$ -	$ -	$ -
24	$ -	$ -	$ -	$ -	$ -	$ 4.281	$ -
30	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	$ -	$ -	$ -	$ -	$ -	$ -	$ -
42	$ -	$ -	$ -	$ -	$ -	$ -	$ -
48	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual replacement cost (discrete)	$ 3.40	$ 8.56	$ 8.73	$ 1.85	$ 18.58	$ 7.77	$ 5.06
Annual replacement cost (average cost 2021 to 2030,	$ 4.84	$ 4.84	$ 4.84	$ 4.84	$ 4.84	$ 4.84	$ 4.84
Annual replacement LF (2021-2030=0.42%/yr, 2031-2	9,720	9,720	32,399	32,399	32,399	32,399	32,399
Annual replacement cost (2021-2030=0.42%/yr, 2031	$ 2.68	$ 2.68	$ 8.94	$ 8.94	$ 8.94	$ 8.94	$ 8.94

Cumulative replacement cost (discrete)	$ 51.92	$ 60.48	$ 69.21	$ 71.06	$ 89.64	$ 97.42	$ 102.47
Cumulative replacement cost (Avg Years 2021-2030, 2	$ 73.44	$ 78.28	$ 83.12	$ 87.96	$ 92.79	$ 97.63	$ 102.47
Cumulative replacement cost (2021-2030=0.42%/yr, 2	$ 61.66	$ 64.34	$ 73.28	$ 82.21	$ 91.15	$ 100.09	$ 109.02

Notes:
2021 costs include catch-up replacement since 1999



Treated Transmission Mains and Distribution Annual Costs

PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
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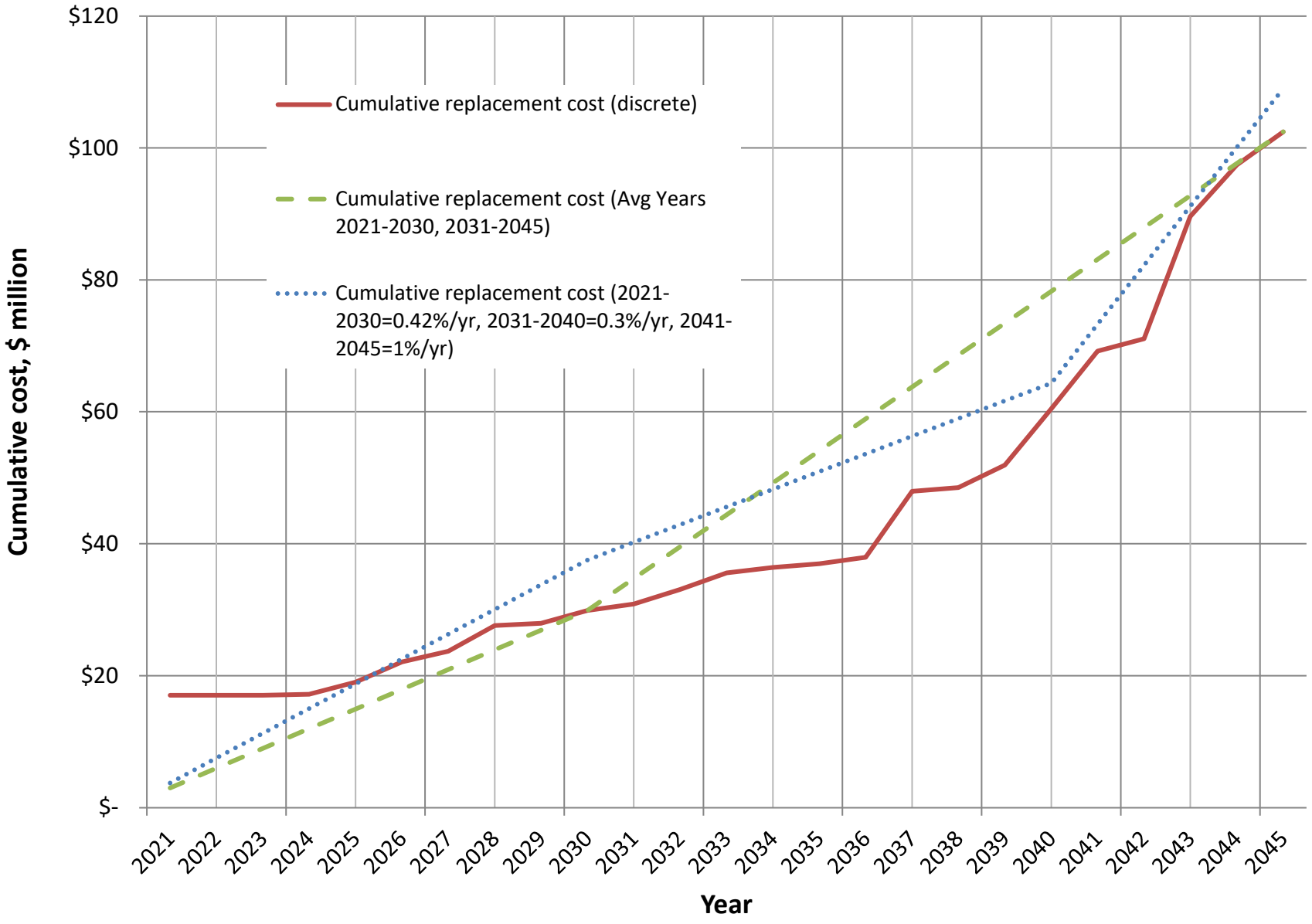

Treated Transmission Mains and Distribution Cumulative Costs

PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
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Raw Water Transmission

Raw Water Transmission and Distribution System

						$millions			
Raw pipe material	Flume length, LF (to be piped)	Replacement length, LF/yr	Replacement unit cost, $/LF	Annual re-occurring costs, $/yr	Flume piping replacement year	2021	2022	2023	2024
Canal lining		13,253	$ 83			$ 1.10	$ 1.10	$ 1.10	$ 1.10
Riveted steel pipe		425	$ 700			$ 0.30	$ 0.30	$ 0.30	$ 0.30
Steel welded casing pipe		2,414	$ 700			$ 1.69	$ 1.69	$ 1.69	$ 1.69
Flume rehab/maintenance				$ 100,000		$ 0.10	$ 0.10	$ 0.10	$ 0.10
Flume - Elizabeth Taylor No. 1	408		$ 4,100		2022	$ -	$ 1.67	$ -	$ -
Flume - Cherry Tree	258		$ 4,100		2024	$ -	$ -	$ -	$ 1.06
Flume - Secret Town	326		$ 4,100		2026	$ -	$ -	$ -	$ -
Flume - Spring Valley	37		$ 4,100		2028	$ -	$ -	$ -	$ -
Flume - Alpine Meadows	102		$ 4,100		2030	$ -	$ -	$ -	$ -
Flume - Hayford #1	55		$ 4,100		2032	$ -	$ -	$ -	$ -
Flume - Spaulding	338		$ 4,100		2034	$ -	$ -	$ -	$ -
Flume - Weimar	238		$ 4,100		2036	$ -	$ -	$ -	$ -
Flume - Lazzarini	145		$ 4,100		2038	$ -	$ -	$ -	$ -
Flume - Miller	443		$ 4,100		2040	$ -	$ -	$ -	$ -
Flume - Bishop	245		$ 4,100		2042	$ -	$ -	$ -	$ -
Annual replacement cost (discrete)						$ 3.19	$ 4.86	$ 3.19	$ 4.25
Annual replacement cost (average 2021-2030, 2031-2045)						$ 3.65	$ 3.65	$ 3.65	$ 3.65

Cumulative replacement cost (discrete)						$ 3.19	$ 8.05	$ 11.23	$ 15.48
Cumulative replacement cost (average 2021-2030, 2031-2045)						$ 3.65	$ 7.30	$ 10.95	$ 14.60

Notes:
Costs in this table only include steel mains, canals, and flumes. Based on leak history, steel mains are determined to be a priority to be replaced prior to address other material pipes that were

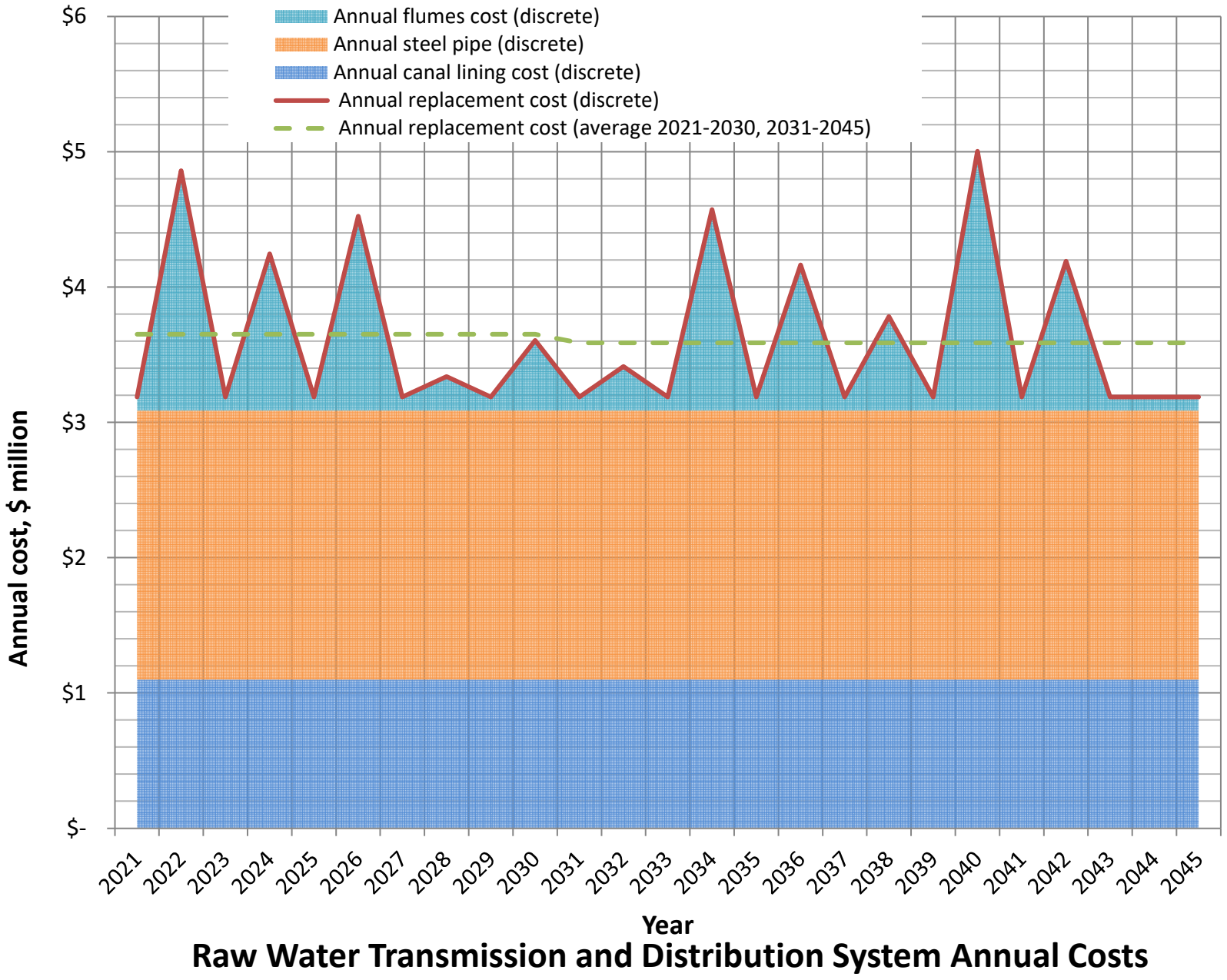
2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10
$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30
$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69
$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ 1.34	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ 0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ 0.42	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.23	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.39	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 3.19	$ 4.52	$ 3.19	$ 3.34	$ 3.19	$ 3.61	$ 3.19	$ 3.41	$ 3.19	$ 4.57	$ 3.19
$ 3.65	$ 3.65	$ 3.65	$ 3.65	$ 3.65	$ 3.65	$ 3.59	$ 3.59	$ 3.59	$ 3.59	$ 3.59

$ 18.67	$ 23.19	$ 26.38	$ 29.72	$ 32.90	$ 36.51	$ 39.70	$ 43.11	$ 46.30	$ 50.87	$ 54.06
$ 18.26	$ 21.91	$ 25.56	$ 29.21	$ 32.86	$ 36.51	$ 40.10	$ 43.69	$ 47.27	$ 50.86	$ 54.45

: installed later.

2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10	$ 1.10
$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30
$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69	$ 1.69
$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 0.98	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ 0.59	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ 1.82	$ -	$ -	$ -	$ -	$ -
$ -	$ -	$ -	$ -	$ -	$ -	$ 1.00	$ -	$ -	$ -
$ 4.16	$ 3.19	$ 3.78	$ 3.19	$ 5.00	$ 3.19	$ 4.19	$ 3.19	$ 3.19	$ 3.19
$ 3.59	$ 3.59	$ 3.59	$ 3.59	$ 3.59	$ 3.59	$ 3.59	$ 3.59	$ 3.59	$ 3.59

$ 58.22	$ 61.41	$ 65.19	$ 68.38	$ 73.38	$ 76.57	$ 80.76	$ 83.95	$ 87.14	$ 90.32
$ 58.04	$ 61.62	$ 65.21	$ 68.80	$ 72.39	$ 75.97	$ 79.56	$ 83.15	$ 86.74	$ 90.32



Raw Water Transmission and Distribution System Annual Costs

PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
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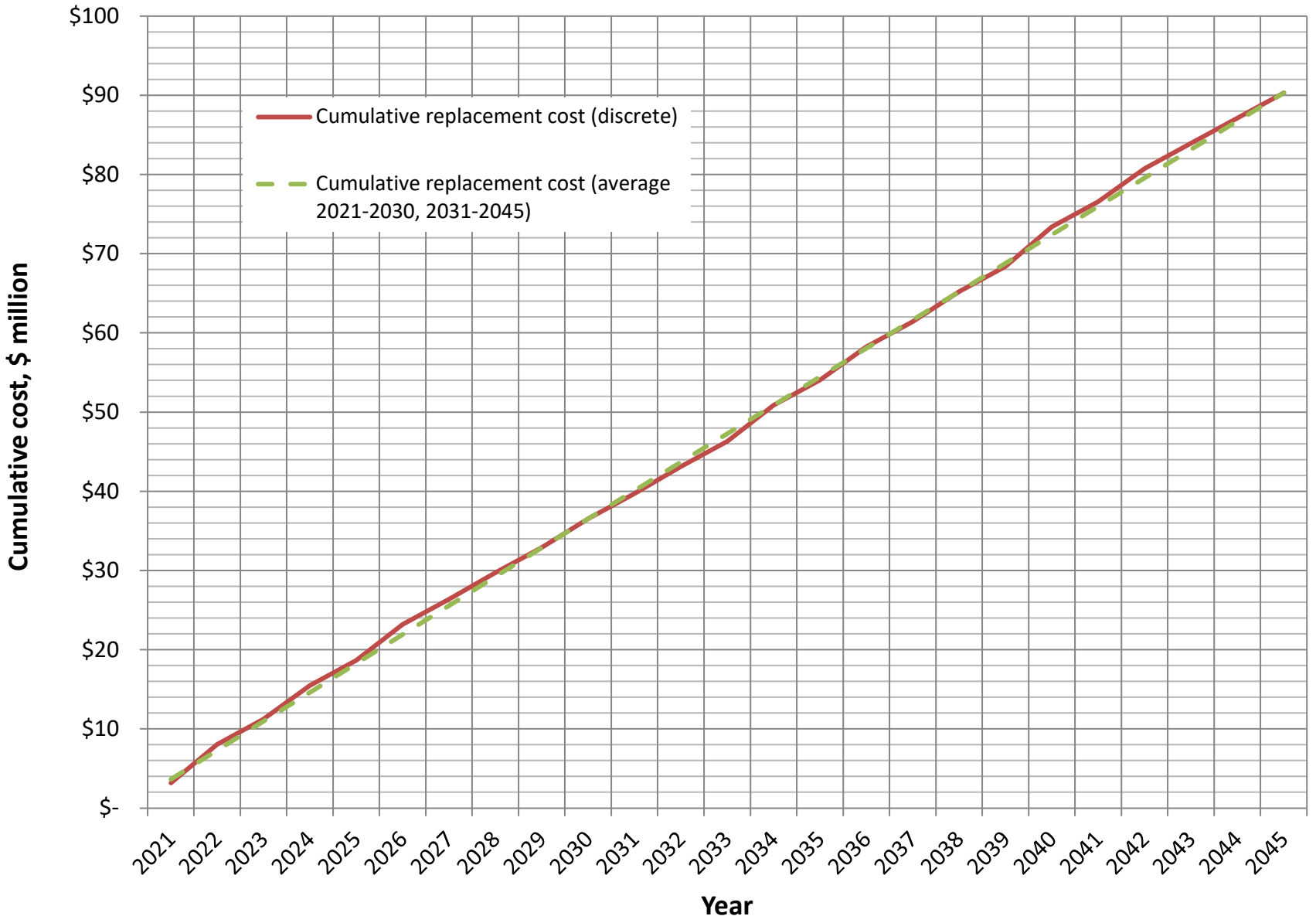

Raw Water Transmission and Distribution System Cumulative Costs

PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
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Treated Water Storage

Treated Water Storage

						Useful life/rehab frequency			*From 2018 analysis*		
Facility name	Capacity, MG	Surface area	Type	Year constructed/ last coating rehab	Tank Mixer/Vent installation, $	Assumed replacement useful life	Interior recoating frequency	Exterior recoating frequency	Next replacement year	Next replacement year	Assumed replacement cost, $million
APPLEGATE WTP TANK	0.100	2,969	BOLTED STEEL	1996		30			2026	2026	$ 0.14
ELECTRIC STREET -Tank	5.000	39,788	CONCRETE	2013		100			2113	2113	$ 5.00
FOOTHILL WTP 10 MG TANK	10.000	62,895	CONCRETE	1978		100			2078	2078	$ 10.00
SUNSET 10 MG TANK	10.000	78,219	CONCRETE	2002		100			2102	2102	$ 10.00
TINKER TANK	10.000	66,115	CONCRETE	2007		100			2107	2107	$ 10.00
ALTA WTP TANK #1	0.100	2,631	REDWOOD	1950		50			2018	2021	$ 0.14
MONTE VISTA TANK	0.060	1,885	REDWOOD	1975		50			2018	2025	$ 0.08
ALTA WTP BACKWASH TANK #1	0.024	1,257	WELDED STEEL	1995		70			2065	2065	$ 0.04
Interior coating				1995			15			2021	
Exterior coating				1995				20		2021	
ALTA WTP BACKWASH TANK #2	0.045	2,238	WELDED STEEL	2012		70			**2082**	2082	$ 0.08
Interior coating				2012			15			2027	
Exterior coating				2012				20		2032	
ALTA WTP TANK #2	0.100	2,631	WELDED STEEL	2006	$ 50,000	70			2076	2076	$ 0.14
Interior coating				2006			15			2021	
Exterior coating				2006				20		2026	
BELL ROAD TANK	1.000	11,740	WELDED STEEL	1981		70			2051	2051	$ 1.35
Interior coating				1981			15			2021	
Exterior coating				1981				20		2021	
BELLA TUSCANY TANK	0.500	5,667	WELDED STEEL	2008	$ 75,000	70			2078	2078	$ 0.68
Interior coating				2008			15			2023	
Exterior coating				2008				20		2028	
BOWMAN 10MG TANK	10.000	59,046	WELDED STEEL	1991	$ 200,000	70			2061	2061	$ 10.00
Interior coating				1991			15			2021	
Exterior coating				1991				20		2021	
BOWMAN 1MG TANK	1.000	13,584	WELDED STEEL	1963		70			2033	2033	$ 1.35
Interior coating				1963			15			2021	
Exterior coating				1994				20		2021	
BOWMAN BACKWASH TANK #1	0.108	2,815	WELDED STEEL	1978		70			2048	2048	$ 0.15
Interior coating				1978			15			2021	
Exterior coating				1978				20		2021	
BOWMAN BACKWASH TANK #2	0.100	2,631	WELDED STEEL	2006		70			2076	2076	$ 0.14
Interior coating				2006			15			2021	
Exterior coating				2006				20		2026	
CHANNEL HILL TANK	1.000	11,740	WELDED STEEL	1963		70			**2033**	2033	$ 1.35
Interior coating				1963			15			2021	
Exterior coating				1981				20		2021	
COLFAX BACKWASH	0.055	2,376	WELDED STEEL	2012		70			**2082**	2082	$ 0.07
Interior coating				2012			15			2027	
Exterior coating				2012				20		2032	
COLFAX BALL PARK TANK	0.600	8,482	WELDED STEEL	1988		70			2058	2058	$ 0.81
Interior coating				1988			15			2021	
Exterior coating				1988				20		2021	
COLFAX WTP 0.3 MG TANK	0.300	6,048	WELDED STEEL	1971		70			2041	2041	$ 0.41
Interior coating				2007			15			2022	
Exterior coating				1994				20		2021	

Treated Water Storage

						Useful life/rehab frequency			*From 2018 analysis*		
Facility name	Capacity, MG	Surface area	Type	Year constructed/ last coating rehab	Tank Mixer/Vent installation, $	Assumed replacement useful life	Interior recoating frequency	Exterior recoating frequency	Next replacement year	Next replacement year	Assumed replacement cost, $million
COLFAX WTP 1MG TANK	1.000	11,486	WELDED STEEL	1971		70			2041	2041	$ 1.35
Interior coating				1994			15			2021	
Exterior coating				1994				20		2021	
FOOTHILL WTP 1.0 MG TANK	1.000	13,584	WELDED STEEL	1978		70			2048	2048	$ 1.35
Interior coating				2002			15			2021	
Exterior coating				2002				20		2022	
FOOTHILL WTP BACKWASH TANK	0.108	2,815	WELDED STEEL	1978		70			2048	2048	$ 0.15
Interior coating				1978			15			2021	
Exterior coating				1978				20		2021	
MIDAS TANK (SUNSET/WHITNEY)	3.000	24,533	WELDED STEEL	1962	$ 200,000	70			**2032**	2032	$ 3.00
Interior coating				1962			15			2021	
Exterior coating				2007				20		2027	
MONTE VISTA BACKWASH TANK	0.007	584	WELDED STEEL	1995		70			2065	2065	$ 0.01
Interior coating				1995			15			2021	
Exterior coating				1995				20		2021	
NEWCASTLE TANK	1.000	13,512	WELDED STEEL	2001	$ 100,000	70			2071	2071	$ 1.35
Interior coating				2001			15			2021	
Exterior coating				2001				20		2021	
PENRYN TANK	1.000	12,177	WELDED STEEL	1978	$ 100,000	70			2048	2048	$ 1.35
Interior coating				2002			15			2021	
Exterior coating				2002				20		2022	
ROCKLIN TANK	1.000	11,740	WELDED STEEL	1981		70			2051	2051	$ 1.35
Interior coating				1981			15			2021	
Exterior coating				2019				20		2039	
SKYRIDGE TANK	1.000	12,177	WELDED STEEL	1978	$ 100,000	70			**2048**	2048	$ 1.35
Interior coating				1978			15			2021	
Exterior coating				1992				20		2021	
STANFORD RANCH TANK	2.500	21,828	WELDED STEEL	1989	$ 100,000	70			2059	2059	$ 2.50
Interior coating				1989			15			2021	
Exterior coating				1989				20		2021	
SUNSET 2.5 MG TANK	2.500	24,781	WELDED STEEL	1981	$ 100,000	70			2051	2051	$ 2.50
Interior coating				2019			15			2034	
Exterior coating				2018				20		2038	
VINTAGE OAKS TANK (NOT IN USE)											
Annual replacement cost (discrete)											
Annual replacement cost (average 2021-2030, 2031-2045)											

Cumulative replacement cost (discrete)											
Cumulative replacement cost, (average 2021-2030, 2031-2045)											

Treated Water Storage

	Costs		$millions														
Facility name	Assumed interior recoating cost, $million	Assumed exterior recoating cost, $million	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
APPLEGATE WTP TANK			$ -	$ -	$ -	$ -	$ -	**$0.14**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ELECTRIC STREET -Tank			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
FOOTHILL WTP 10 MG TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SUNSET 10 MG TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TINKER TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ALTA WTP TANK #1			**$ 0.14**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MONTE VISTA TANK			$ -	$ -	$ -	$ -	**$0.08**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ALTA WTP BACKWASH TANK #1			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.030		**$ 0.03**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.020	**$ 0.02**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ALTA WTP BACKWASH TANK #2			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.054		$ -	$ -	$ -	$ -	$ -	$ -	**$0.05**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.036	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 0.04**	$ -	$ -	$ -
ALTA WTP TANK #2			$ -	$ -	**$0.05**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.058		**$ 0.06**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.037	$ -	$ -	$ -	$ -	$ -	**$0.04**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BELL ROAD TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.258		**$ 0.26**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.164	**$ 0.16**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BELLA TUSCANY TANK			$ -	$ -	$ -	$ -	**$0.08**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.125		$ -	$ -	**$0.12**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.079	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0.08**	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BOWMAN 10MG TANK			$ -	$ -	$ -	$ -	$ -	**$0.20**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 1.181		**$ 1.18**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.709	**$ 0.71**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BOWMAN 1MG TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 1.35**	$ -	$ -
Interior coating	$ 0.299		**$ 0.30**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.190	**$ 0.19**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BOWMAN BACKWASH TANK #1			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.062		**$ 0.06**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.039	**$ 0.04**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BOWMAN BACKWASH TANK #2			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.058		**$ 0.06**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.037	$ -	$ -	$ -	$ -	$ -	**$0.04**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CHANNEL HILL TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 1.35**	$ -	$ -
Interior coating	$ 0.258		**$ 0.26**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.164	**$ 0.16**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
COLFAX BACKWASH			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.052		$ -	$ -	$ -	$ -	$ -	$ -	**$0.05**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.033	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 0.03**	$ -	$ -	$ -
COLFAX BALL PARK TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.187		**$ 0.19**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.119	**$ 0.12**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
COLFAX WTP 0.3 MG TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.133		$ -	**$0.13**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.085	**$ 0.08**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Treated Water Storage

	Costs		$millions														
Facility name	Assumed interior recoating cost, $million	Assumed exterior recoating cost, $million	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
COLFAX WTP 1MG TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.253		**$ 0.25**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.161	**$ 0.16**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
FOOTHILL WTP 1.0 MG TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.299		**$ 0.30**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.190	$ -	**$0.19**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
FOOTHILL WTP BACKWASH TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.062		**$ 0.06**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.039	**$ 0.04**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MIDAS TANK (SUNSET/WHITNEY)			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 3.00**	$ -	$ -	$ -
Interior coating	$ 0.491		**$ 0.49**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.294	$ -	$ -	$ -	$ -	$ -	$ -	**$0.29**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MONTE VISTA BACKWASH TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.014		**$ 0.01**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.009	**$ 0.01**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
NEWCASTLE TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.297		**$ 0.30**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.189	**$ 0.19**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
PENRYN TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.268		**$ 0.27**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.170	$ -	**$0.17**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ROCKLIN TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.258		**$ 0.26**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.164	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SKYRIDGE TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.268		**$ 0.27**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.170	**$ 0.17**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
STANFORD RANCH TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.437		**$ 0.44**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating		$ 0.262	**$ 0.26**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SUNSET 2.5 MG TANK			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.496		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 0.50**	$ -
Exterior coating		$ 0.297	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
VINTAGE OAKS TANK (NOT IN USE)																	
Annual replacement cost (discrete)			$ 7.49	$0.49	$0.17	$ -	$0.16	$0.41	$0.40	$0.08	$ -	$ -	$ -	$ 3.07	$ 2.70	$ 0.50	$ -
Annual replacement cost (average 2021-2030, 2031-2045)			$ 0.92	$0.92	$0.92	$0.92	$0.92	$0.92	$0.92	$0.92	$0.92	$0.92	$ 1.15	$ 1.15	$ 1.15	$ 1.15	$ 1.15

Cumulative replacement cost (discrete)			$ 7.49	$7.99	$8.16	$8.16	$8.32	$8.73	$9.13	$9.21	$9.21	$9.21	$ 9.21	$12.28	$14.98	$15.47	$15.47
Cumulative replacement cost, (average 2021-2030, 2031-2045)			$ 0.92	$1.84	$2.76	$3.68	$4.60	$5.52	$6.44	$7.36	$8.29	$9.21	$10.36	$11.51	$12.66	$13.81	$14.96

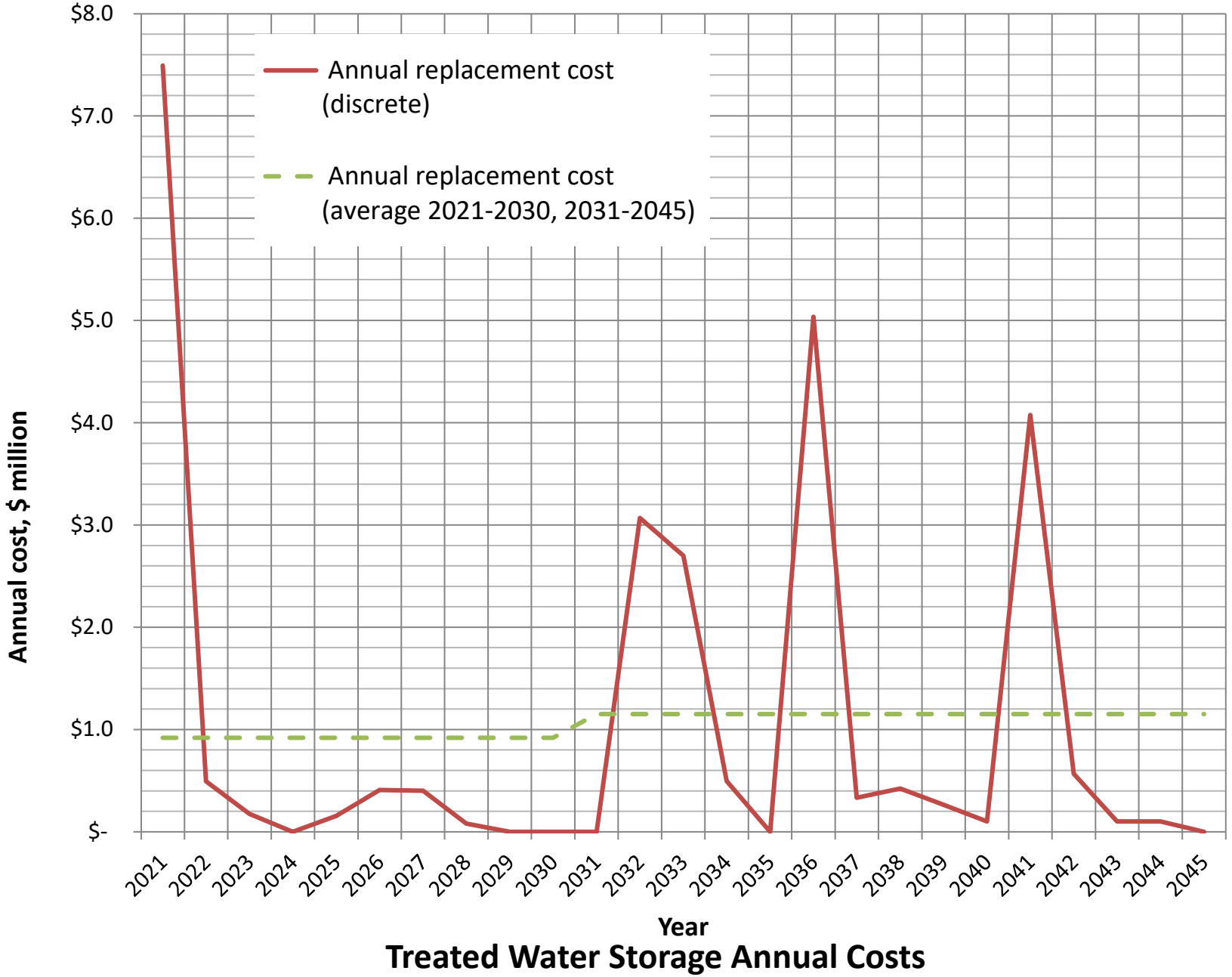
Treated Water Storage

Facility name	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
APPLEGATE WTP TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ELECTRIC STREET -Tank	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
FOOTHILL WTP 10 MG TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SUNSET 10 MG TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TINKER TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ALTA WTP TANK #1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MONTE VISTA TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ALTA WTP BACKWASH TANK #1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ **0.03**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ **0.02**	$ -	$ -	$ -	$ -
ALTA WTP BACKWASH TANK #2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ **0.05**	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ALTA WTP TANK #2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ **0.06**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BELL ROAD TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ **0.26**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ **0.16**	$ -	$ -	$ -	$ -
BELLA TUSCANY TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ -	$ -	$ **0.12**	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BOWMAN 10MG TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ **1.18**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ **0.71**	$ -	$ -	$ -	$ -
BOWMAN 1MG TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ **0.30**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ **0.19**	$ -	$ -	$ -	$ -
BOWMAN BACKWASH TANK #1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ **0.06**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ **0.04**	$ -	$ -	$ -	$ -
BOWMAN BACKWASH TANK #2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ **0.06**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CHANNEL HILL TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ **0.26**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ **0.16**	$ -	$ -	$ -	$ -
COLFAX BACKWASH	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ **0.05**	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
COLFAX BALL PARK TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ **0.19**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ **0.12**	$ -	$ -	$ -	$ -
COLFAX WTP 0.3 MG TANK	$ -	$ -	$ -	$ -	$ -	$ **0.41**	$ -	$ -	$ -	$ -
Interior coating	$ -	$ **0.13**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ **0.08**	$ -	$ -	$ -	$ -

Treated Water Storage

Facility name	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
COLFAX WTP 1MG TANK	$ -	$ -	$ -	$ -	$ -	$ 1.35	$ -	$ -	$ -	$ -
Interior coating	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ 0.16	$ -	$ -	$ -	$ -
FOOTHILL WTP 1.0 MG TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.30	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.19	$ -	$ -	$ -
FOOTHILL WTP BACKWASH TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ -	$ -	$ -	$ -
MIDAS TANK (SUNSET/WHITNEY)	$ -	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.49	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MONTE VISTA BACKWASH TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ -	$ -	$ -	$ -
NEWCASTLE TANK	$ -	$ -	$ -	$ 0.10	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.30	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ 0.19	$ -	$ -	$ -	$ -
PENRYN TANK	$ -	$ -	$ -	$ -	$ 0.10	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.17	$ -	$ -	$ -
ROCKLIN TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interior coating	$ 0.26	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ 0.16	$ -	$ -	$ -	$ -	$ -	$ -
SKYRIDGE TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ -	$ -	$ -
Interior coating	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ 0.17	$ -	$ -	$ -	$ -
STANFORD RANCH TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ -	$ -
Interior coating	$ 0.44	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ -	$ -	$ -	$ 0.26	$ -	$ -	$ -	$ -
SUNSET 2.5 MG TANK	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ -
Interior coating	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Exterior coating	$ -	$ -	$ 0.30	$ -	$ -	$ -	$ -	$ -	$ -	$ -
VINTAGE OAKS TANK (NOT IN USE)										
Annual replacement cost (discrete)	$ 5.04	$ 0.33	$ 0.42	$ 0.26	$ 0.10	$ 4.08	$ 0.57	$ 0.10	$ 0.10	$ -
Annual replacement cost (average 2021-2030, 2031-2045)	$ 1.15	$ 1.15	$ 1.15	$ 1.15	$ 1.15	$ 1.15	$ 1.15	$ 1.15	$ 1.15	$ 1.15

Cumulative replacement cost (discrete)	$20.51	$20.84	$21.26	$21.53	$21.63	$25.70	$26.27	$26.37	$26.47	$26.47
Cumulative replacement cost, (average 2021-2030, 2031-2045)	$16.11	$17.26	$18.41	$19.56	$20.72	$21.87	$23.02	$24.17	$25.32	$26.47



Treated Water Storage Annual Costs

PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
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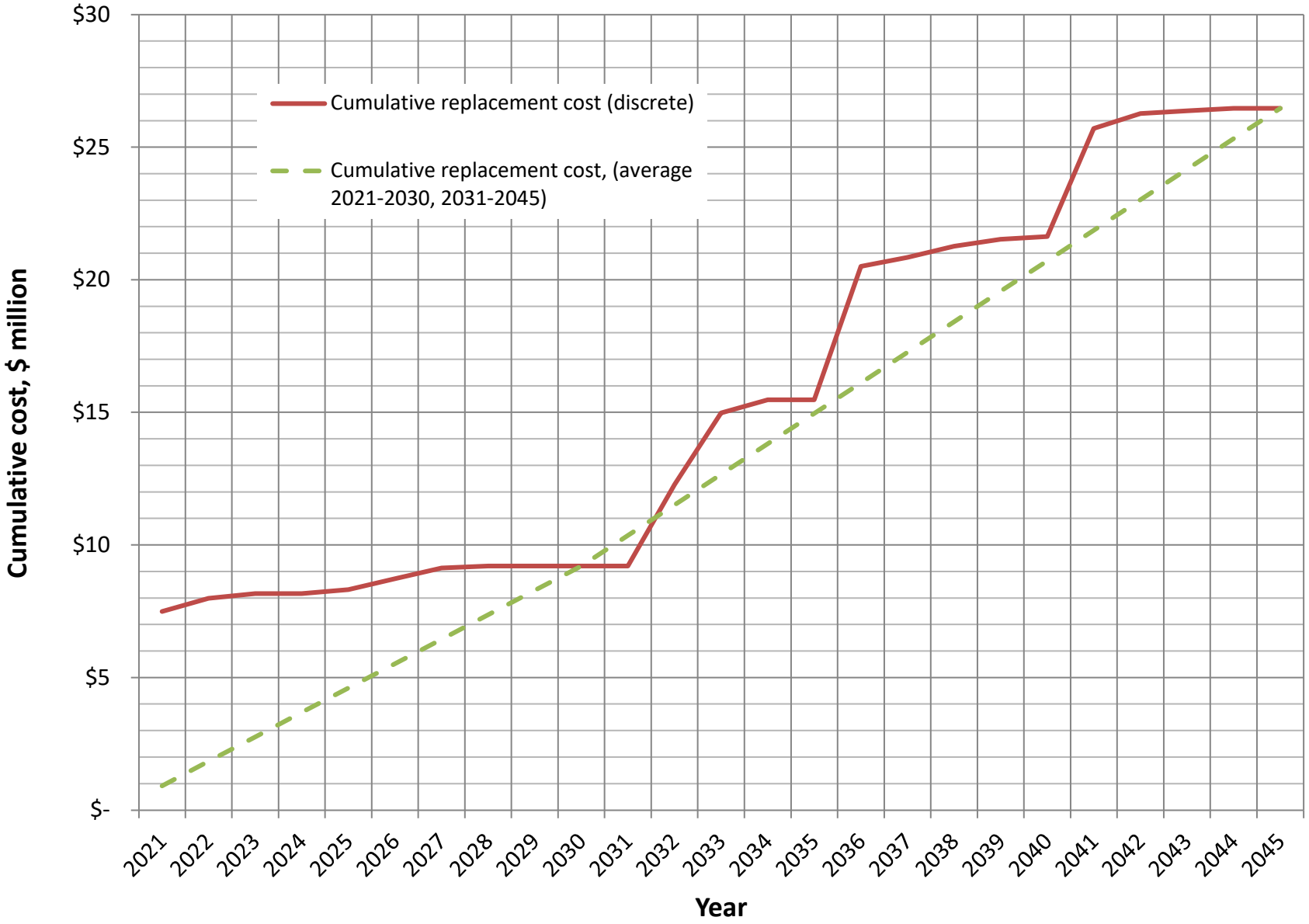

Treated Water Storage Cumulative Costs

PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
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Untreated Storage

Untreated Storage

Facility name	Capacity, ac-ft	Construction date	Date of last major improvement	DSOD requires maps/plans	Unit costs	Frequency of occurrence, Yrs	Date of next action (a), yr	$millions 2021
Mammoth	115	1851	1931	Yes				
Update inundation maps and Emergency Action Plans			2019		$ 125,000	5	2024	$ -
Sediment removal			1967		$ 1,388,793	50	2021	$ **1.39**
Dam modification			1998		$ 800,000	50	2048	$ -
Inlet/outlet improvements					$ 100,000	25	2021	$ **0.10**
Arthur	94	1909		Yes		-		
Update inundation maps and Emergency Action Plans			2020		$ 125,000	5	2025	$ -
Sediment removal					$ 1,137,165	50	2021	$ **1.14**
Dam modification					$ 100,000	50	2021	$ **0.10**
Inlet/outlet improvements					$ 100,000	25	2021	$ **0.10**
Theodore	344	1896		Yes				
Update inundation maps and Emergency Action Plans			2020		$ 125,000	5	2025	$ -
Sediment removal			1992		$ 4,165,169	50	2042	$ -
Dam modification			1992		$ 800,000	50	2042	$ -
Inlet/outlet improvements			1992		$ 250,000	25	2021	$ **0.25**
Alta	270	1862		No				
Update inundation maps and Emergency Action Plans			2020		$ -	5	2025	$ -
Sediment removal			1982		$ 3,266,325	50	2032	$ -
Dam modification			1982		$ 2,000,000	50	2032	$ -
Inlet/outlet improvements			2011		$ 750,000	25	2036	$ -
Whitney	49	1965		No				
Update inundation maps and Emergency Action Plans					$ -	5		$ -
Sediment removal			2002		$ 592,778	50	2052	$ -
Dam modification			2002		$ 500,000	50	2052	$ -
Inlet/outlet improvements			2002		$ 100,000	25	2027	$ -
Clover Valley	29	1909		No				
Update inundation maps and Emergency Action Plans					$ -	5		$ -
Sediment removal					$ 345,989	50	2021	$ **0.35**
Dam modification			1993		$ 250,000	50	2043	$ -
Inlet/outlet improvements			1993		$ 100,000	25	2021	$ **0.10**
Caperton (reservoir is bypassed, no R&R costs included in this analysis)	11	1909		No				
Update inundation maps and Emergency Action Plans					$ -	5		$ -
Sediment removal					$ 130,653	50		$ -
Dam modification					$ 100,000	50		$ -
Inlet/outlet improvements					$ 100,000	25		$ -
Ben Franklin	1	Unknown		No				
Update inundation maps and Emergency Action Plans					$ -	5	*Assume in O&M*	
Sediment removal					$ 12,098	50	*Assume in O&M*	
Dam modification					$ 100,000	50	*Assume in O&M*	
Inlet/outlet improvements					$ 100,000	25	*Assume in O&M*	
McCrary	7	1909		No				
Update inundation maps and Emergency Action Plans					$ -	5	*Assume in O&M*	
Sediment removal					$ 83,473	50	*Assume in O&M*	
Dam modification					$ 100,000	50	*Assume in O&M*	
Inlet/outlet improvements					$ 100,000	25	*Assume in O&M*	
Annual replacement cost (discrete)								$ 3.52
Annual replacement cost (average 2021-2030, 2031-2045)								$ 0.44

Cumulative replacement cost (discrete)								$ 3.52
Cumulative replacement cost, (average 2021-2030, 2031-2045)								$ 0.44

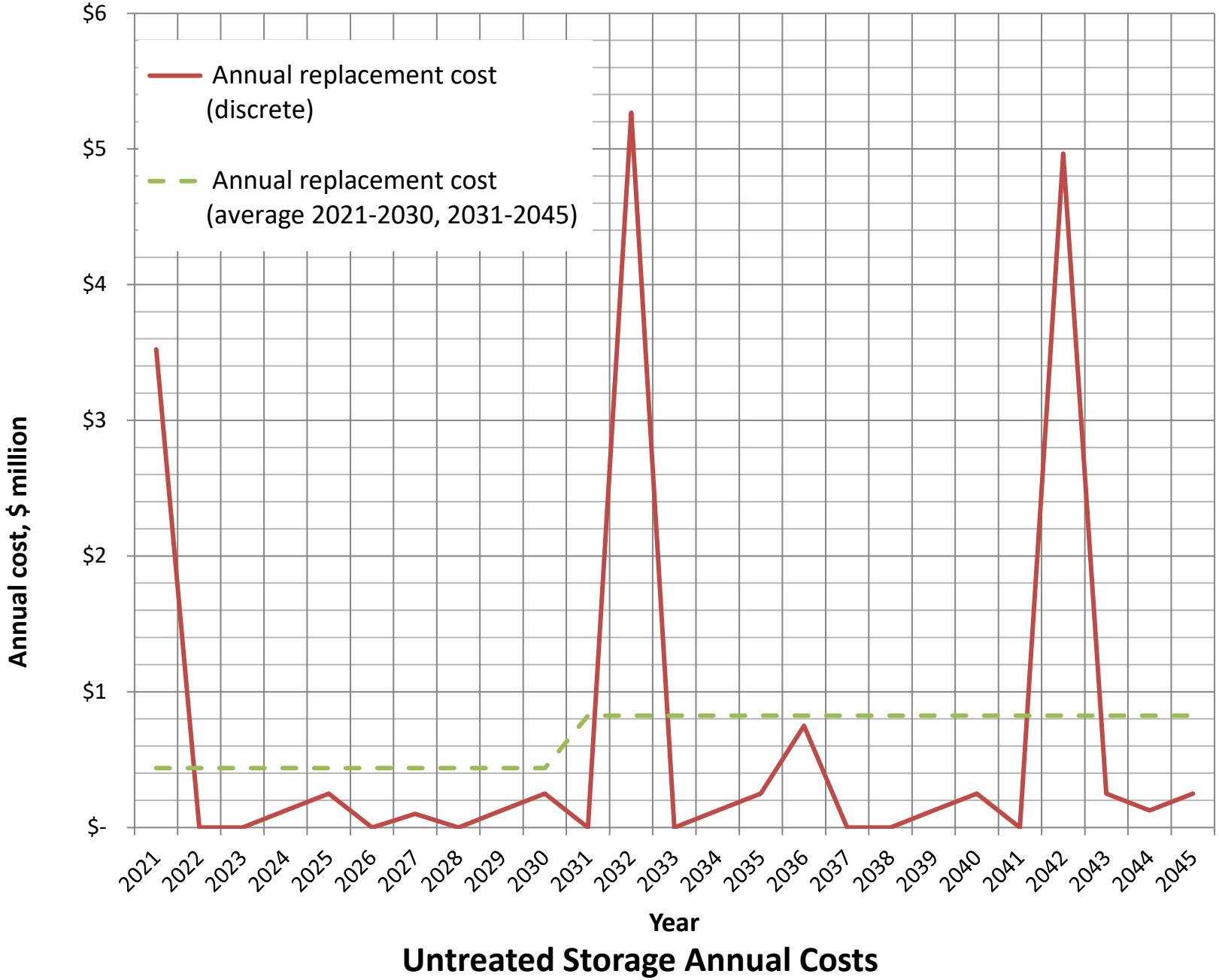
Untreated Storage

Facility name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Mammoth															
Update inundation maps and Emergency Action Plans	$ -	$ -	$ **0.13**	$ -	$ -	$ -	$ -	$ **0.13**	$ -	$ -	$ -	$ -	$ **0.13**	$ -	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Arthur															
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ **0.13**	$ -	$ -	$ -	$ -	$ **0.13**	$ -	$ -	$ -	$ -	$ **0.13**	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Theodore															
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ **0.13**	$ -	$ -	$ -	$ -	$ **0.13**	$ -	$ -	$ -	$ -	$ **0.13**	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Alta															
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ **3.27**	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ **2.00**	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ **0.75**
Whitney															
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ **0.10**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Clover Valley															
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Caperton (reservoir is bypassed, no R&R costs included in this analysis)															
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ben Franklin															
Update inundation maps and Emergency Action Plans															
Sediment removal															
Dam modification															
Inlet/outlet improvements															
McCrary															
Update inundation maps and Emergency Action Plans															
Sediment removal															
Dam modification															
Inlet/outlet improvements															
Annual replacement cost (discrete)	$ -	$ -	$ 0.13	$ 0.25	$ -	$ 0.10	$ -	$ 0.13	$ 0.25	$ -	$ 5.27	$ -	$ 0.13	$ 0.25	$ 0.75
Annual replacement cost (average 2021-2030, 2031-2045)	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.82	$ 0.82	$ 0.82	$ 0.82	$ 0.82	$ 0.82

Cumulative replacement cost (discrete)	$ 3.52	$ 3.52	$ 3.65	$ 3.90	$ 3.90	$ 4.00	$ 4.00	$ 4.12	$ 4.37	$ 4.37	$ 9.64	$ 9.64	$ 9.76	$ 10.01	$ 10.76
Cumulative replacement cost, (average 2021-2030, 2031-2045	$ 0.87	$ 1.31	$ 1.75	$ 2.19	$ 2.62	$ 3.06	$ 3.50	$ 3.93	$ 4.37	$ 5.20	$ 6.02	$ 6.84	$ 7.67	$ 8.49	$ 9.31

Untreated Storage

Facility name	2037	2038	2039	2040	2041	2042	2043	2044	2045
Mammoth									
Update inundation maps and Emergency Action Plans	$ -	$ -	$ **0.13**	$ -	$ -	$ -	$ -	$ **0.13**	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Arthur									
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ **0.13**	$ -	$ -	$ -	$ -	$ **0.13**
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Theodore									
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ **0.13**	$ -	$ -	$ -	$ -	$ **0.13**
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ **4.17**	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ **0.80**	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Alta									
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Whitney									
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Clover Valley									
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ **0.25**	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Caperton (reservoir is bypassed, no R&R costs included in this analysis)									
Update inundation maps and Emergency Action Plans	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sediment removal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dam modification	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Inlet/outlet improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ben Franklin									
Update inundation maps and Emergency Action Plans									
Sediment removal									
Dam modification									
Inlet/outlet improvements									
McCrary									
Update inundation maps and Emergency Action Plans									
Sediment removal									
Dam modification									
Inlet/outlet improvements									
Annual replacement cost (discrete)	$ -	$ -	$ 0.13	$ 0.25	$ -	$ 4.97	$ 0.25	$ 0.13	$ 0.25
Annual replacement cost (average 2021-2030, 2031-2045)	$ 0.82	$ 0.82	$ 0.82	$ 0.82	$ 0.82	$ 0.82	$ 0.82	$ 0.82	$ 0.82
Cumulative replacement cost (discrete)	$ 10.76	$ 10.76	$ 10.89	$ 11.14	$ 11.14	$ 16.10	$ 16.35	$ 16.48	$ 16.73
Cumulative replacement cost, (average 2021-2030, 2031-2045	$ 10.14	$ 10.96	$ 11.79	$ 12.61	$ 13.43	$ 14.26	$ 15.08	$ 15.90	$ 16.73



Untreated Storage Annual Costs

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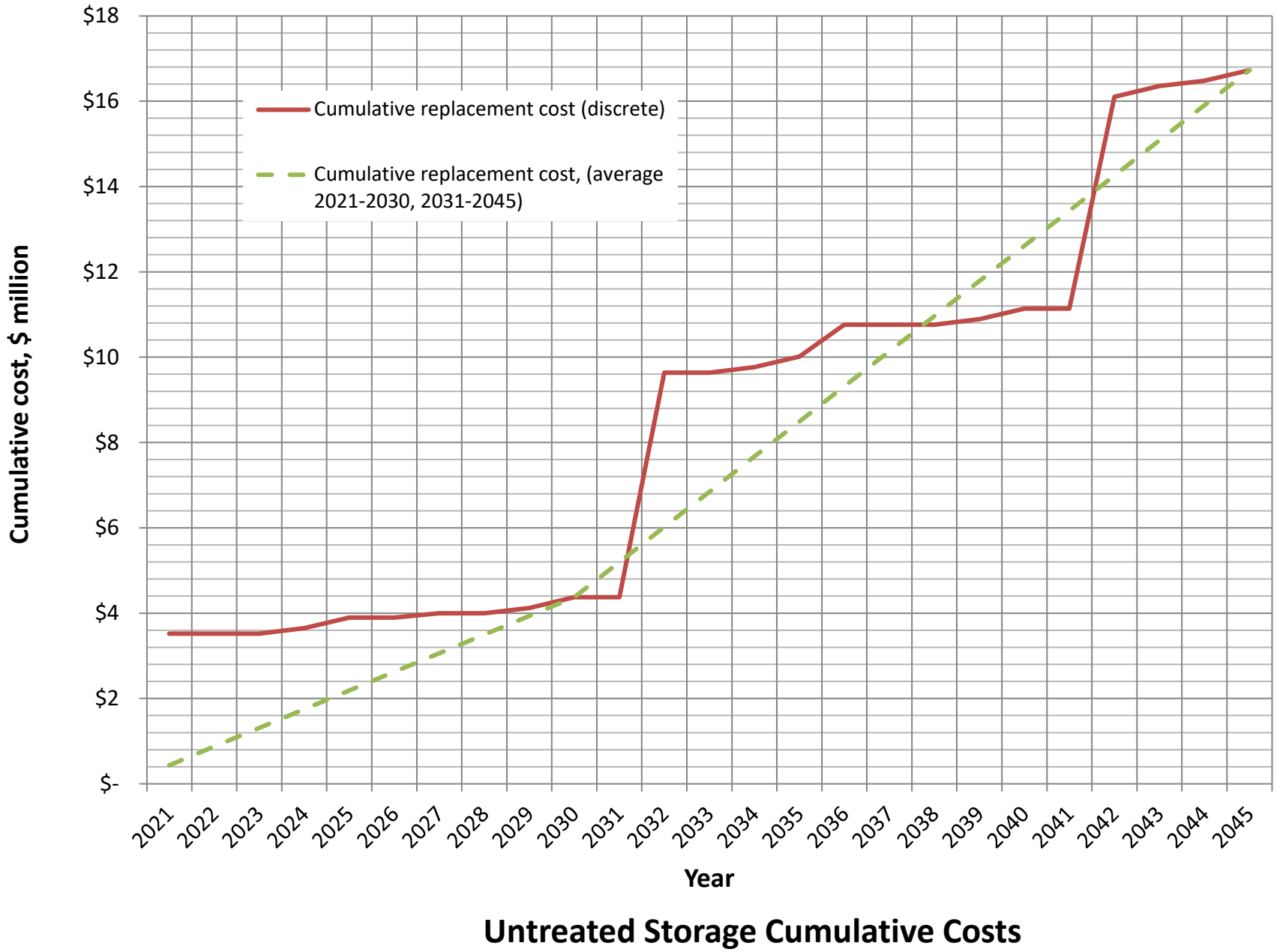

Untreated Storage Cumulative Costs

PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
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Groundwater

Groundwater

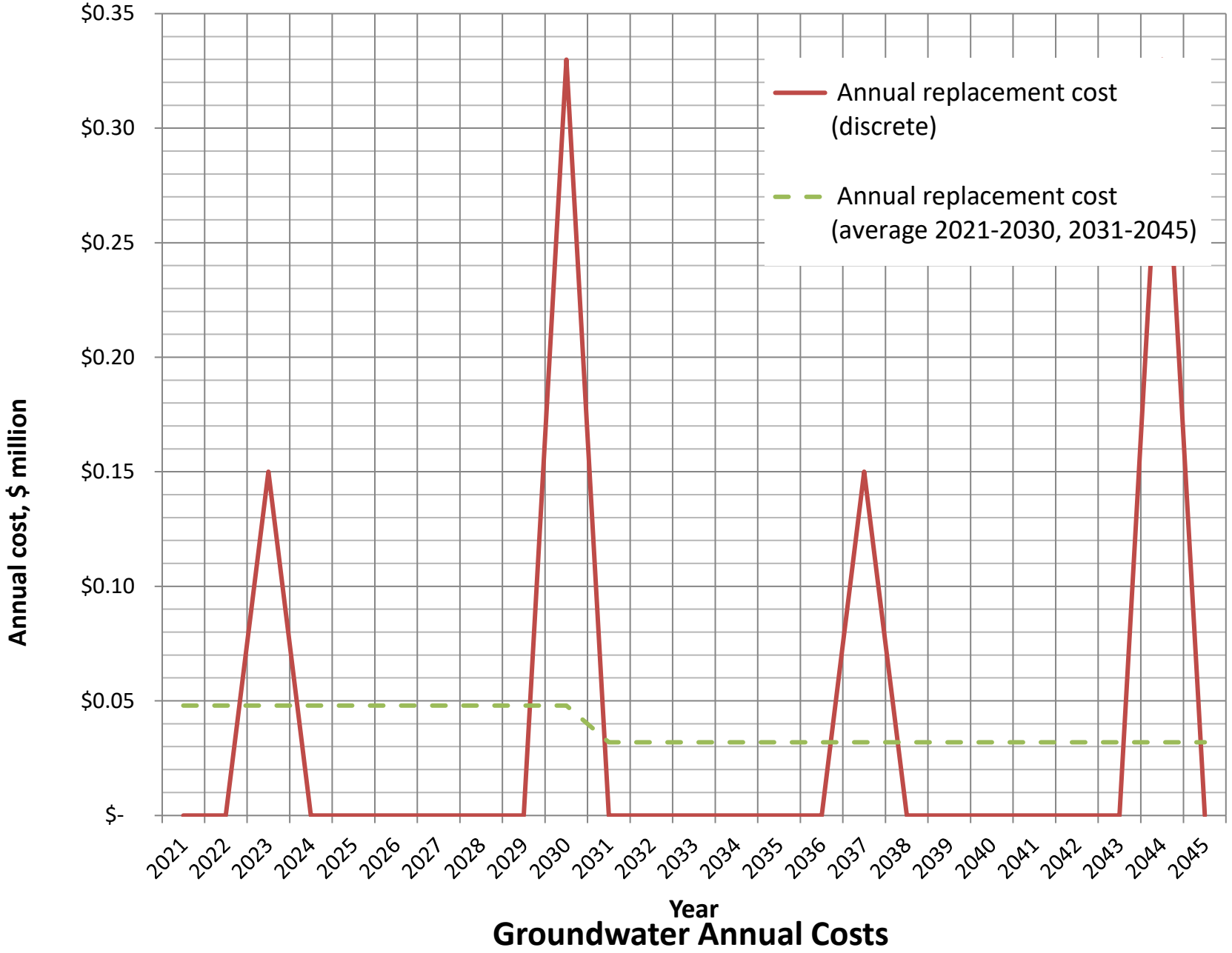
			From 2018 analysis				
	Initial rehab activity following construction, yrs	Rehab frequency following initial rehab activity, yrs	Year installed or last rehabilitated	Year installed or last rehabilitated	Year of next rehab activity	Rehab/Year 1 replacement cost, $	Year 2 replacement cost, $
Sunset Industrial Well							
Downhole well rehabilitation activities - Phase 1 (light rehabilitation)	7	14	2016	2016	2023	$ 25,000	
Downhole well rehabilitation activities - Phase 2 (heavy rehabilitation)	14	14	2016	2016	2030	$ 75,000	
Pump rehabilitation and replacement activities - Phase 1 (Light rehabilitation)	7	14	2016	2016	2023	$ 50,000	
Pump rehabilitation and replacement activities - Phase 2 (heavy rehabilitation)	14	14	2016	2016	2030	$ 90,000	
Well replacement	50		2016	2016	2066	$ 500,000	$ 1,000,000
Tinker Well							
Downhole well rehabilitation activities - Phase 1 (light rehabilitation)	7	14	2016	2016	2023	$ 25,000	
Downhole well rehabilitation activities - Phase 2 (heavy rehabilitation)	14	14	2016	2016	2030	$ 75,000	
Pump rehabilitation and replacement activities - Phase 1 (Light rehabilitation)	7	14	2016	2016	2023	$ 50,000	
Pump rehabilitation and replacement activities - Phase 2 (heavy rehabilitation)	14	14	2016	2016	2030	$ 90,000	
Well replacement	50		2016	2016	2066	$ 500,000	$ 1,000,000
Annual replacement cost (discrete)							
Annual replacement cost (average 2021-2030, 2031-2045)							
Cumulative replacement cost (discrete)							
Cumulative replacement cost (average 2021-2030, 2031-2045)							

Groundwater

		$millions													
	Year 3 replacement cost, $	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Sunset Industrial Well															
Downhole well rehabilitation activities - Phase 1 (light rehabilitation)		$ -	$ -	$ 0.03	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Downhole well rehabilitation activities - Phase 2 (heavy rehabilitation)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ -	$ -	$ -	$ -
Pump rehabilitation and replacement activities - Phase 1 (Light rehabilitation)		$ -	$ -	$ 0.05	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pump rehabilitation and replacement activities - Phase 2 (heavy rehabilitation)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.09	$ -	$ -	$ -	$ -
Well replacement	$ 2,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tinker Well															
Downhole well rehabilitation activities - Phase 1 (light rehabilitation)		$ -	$ -	$ 0.03	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Downhole well rehabilitation activities - Phase 2 (heavy rehabilitation)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ -	$ -	$ -	$ -
Pump rehabilitation and replacement activities - Phase 1 (Light rehabilitation)		$ -	$ -	$ 0.05	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pump rehabilitation and replacement activities - Phase 2 (heavy rehabilitation)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.09	$ -	$ -	$ -	$ -
Well replacement	$ 2,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual replacement cost (discrete)		$ -	$ -	$ 0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.33	$ -	$ -	$ -	$ -
Annual replacement cost (average 2021-2030, 2031-2		$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.03	$ 0.03	$ 0.03	$ 0.03
Cumulative replacement cost (discrete)		$ -	$ -	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.5	$ 0.5	$ 0.5	$ 0.5	$ 0.5
Cumulative replacement cost (average 2021-2030, 203		$ 0.0	$ 0.1	$ 0.1	$ 0.2	$ 0.2	$ 0.3	$ 0.3	$ 0.4	$ 0.4	$ 0.5	$ 0.5	$ 0.5	$ 0.6	$ 0.6

Groundwater

	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Sunset Industrial Well											
Downhole well rehabilitation activities - Phase 1 (light rehabilitation)	$ -	$ -	$ 0.03	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Downhole well rehabilitation activities - Phase 2 (heavy rehabilitation)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ -
Pump rehabilitation and replacement activities - Phase 1 (Light rehabilitation)	$ -	$ -	$ 0.05	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pump rehabilitation and replacement activities - Phase 2 (heavy rehabilitation)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.09	$ -
Well replacement	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tinker Well											
Downhole well rehabilitation activities - Phase 1 (light rehabilitation)	$ -	$ -	$ 0.03	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Downhole well rehabilitation activities - Phase 2 (heavy rehabilitation)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ -
Pump rehabilitation and replacement activities - Phase 1 (Light rehabilitation)	$ -	$ -	$ 0.05	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pump rehabilitation and replacement activities - Phase 2 (heavy rehabilitation)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.09	$ -
Well replacement	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual replacement cost (discrete)	$ -	$ -	$ 0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.33	$ -
Annual replacement cost (average 2021-2030, 2031-2	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03
Cumulative replacement cost (discrete)	$ 0.5	$ 0.5	$ 0.6	$ 0.6	$ 0.6	$ 0.6	$ 0.6	$ 0.6	$ 0.6	$ 1.0	$ 1.0
Cumulative replacement cost (average 2021-2030, 203	$ 0.6	$ 0.7	$ 0.7	$ 0.7	$ 0.8	$ 0.8	$ 0.8	$ 0.9	$ 0.9	$ 0.9	$ 1.0



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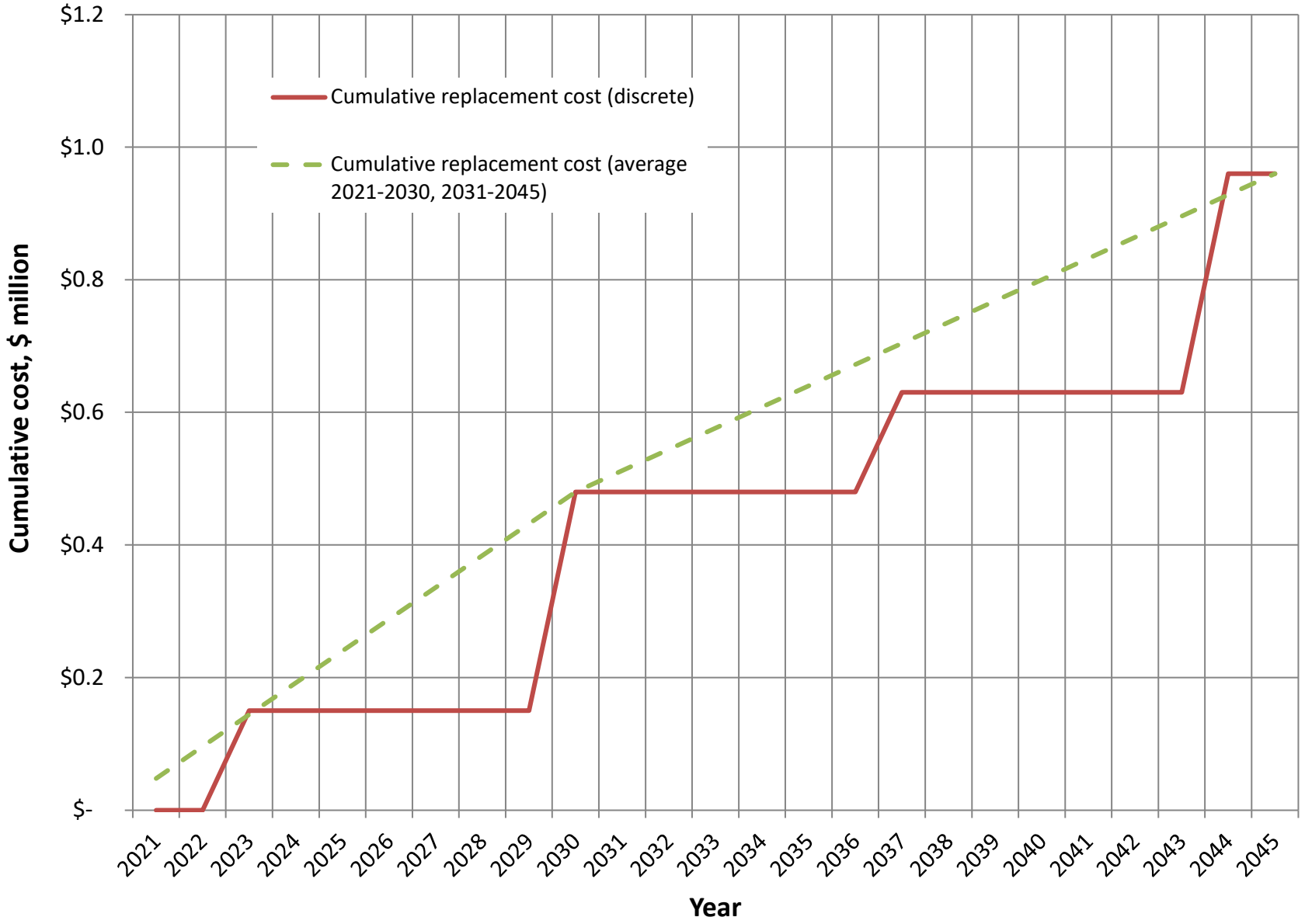

Groundwater Cumulative Costs

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Planning

Planning

			$millions						
	Frequency, years	Cost, $	2021	2022	2023	2024	2025	2026	2027
Planning activities	1	$ 100,000	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**
Annual replacement cost (discrete)			$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10
Annual replacement cost (average 2021-2030, 2031-2045)			$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10

Cumulative replacement cost (discrete)			$ 0.1	$ 0.2	$ 0.3	$ 0.4	$ 0.5	$ 0.6	$ 0.7
Cumulative replacement cost (average 2021-2030, 2031-2045)			$ 0.1	$ 0.2	$ 0.3	$ 0.4	$ 0.5	$ 0.6	$ 0.7

Planning

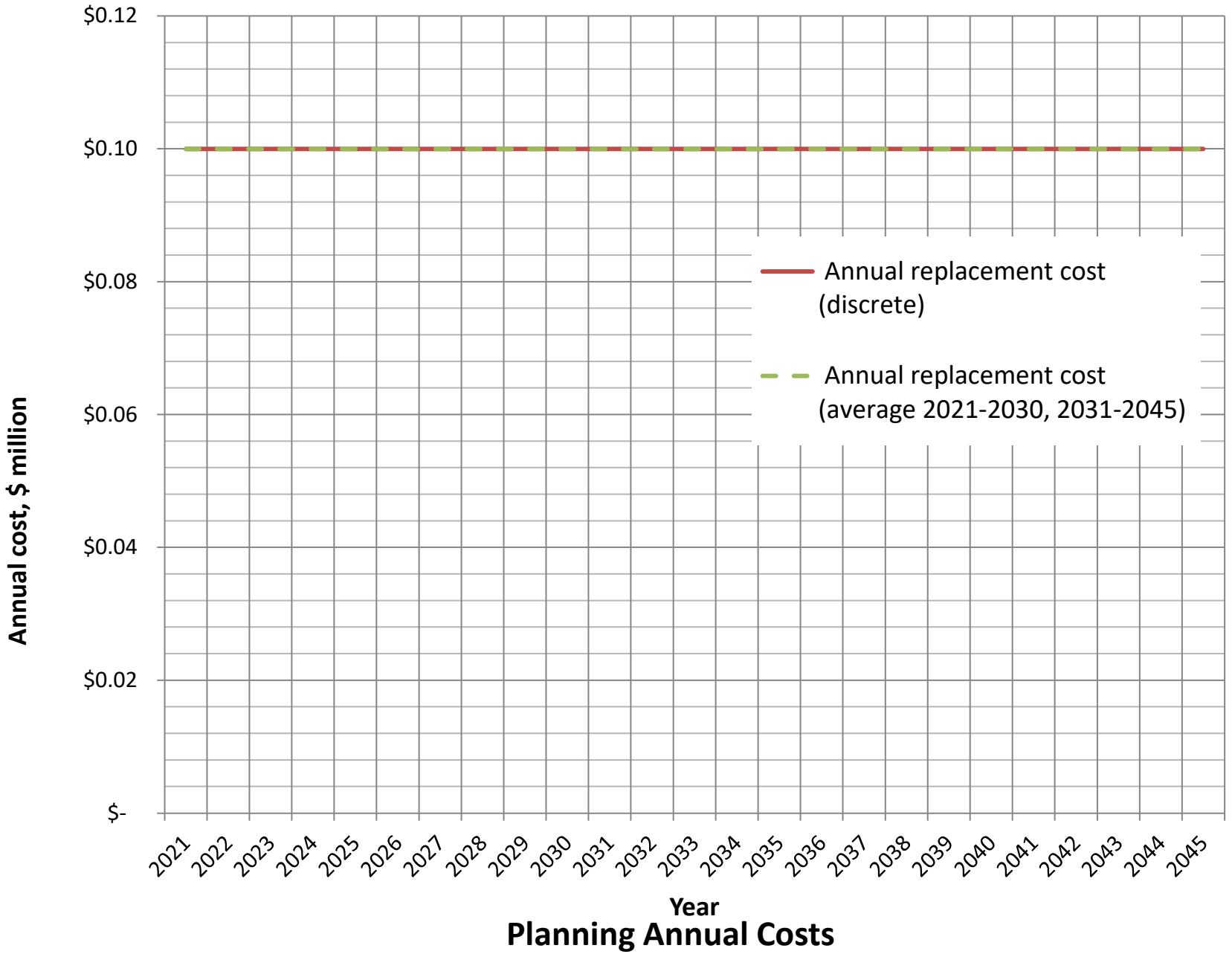
	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Planning activities	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**
Annual replacement cost (discrete)	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10
Annual replacement cost (average 2021-2030, 2031-	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10

Cumulative replacement cost (discrete)	$ 0.8	$ 0.9	$ 1.0	$ 1.1	$ 1.2	$ 1.30	$ 1.40	$ 1.50	$ 1.60	$ 1.70	$ 1.80	$ 1.90
Cumulative replacement cost (average 2021-2030, 20	$ 0.8	$ 0.9	$ 1.0	$ 1.1	$ 1.2	$ 1.30	$ 1.40	$ 1.50	$ 1.60	$ 1.70	$ 1.80	$ 1.90

Planning

	2040	2041	2042	2043	2044	2045
Planning activities	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**
Annual replacement cost (discrete)	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10
Annual replacement cost (average 2021-2030, 2031-	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10

Cumulative replacement cost (discrete)	$ 2.00	$ 2.10	$ 2.20	$ 2.30	$ 2.40	$ 2.50
Cumulative replacement cost (average 2021-2030, 20	$ 2.00	$ 2.10	$ 2.20	$ 2.30	$ 2.40	$ 2.50



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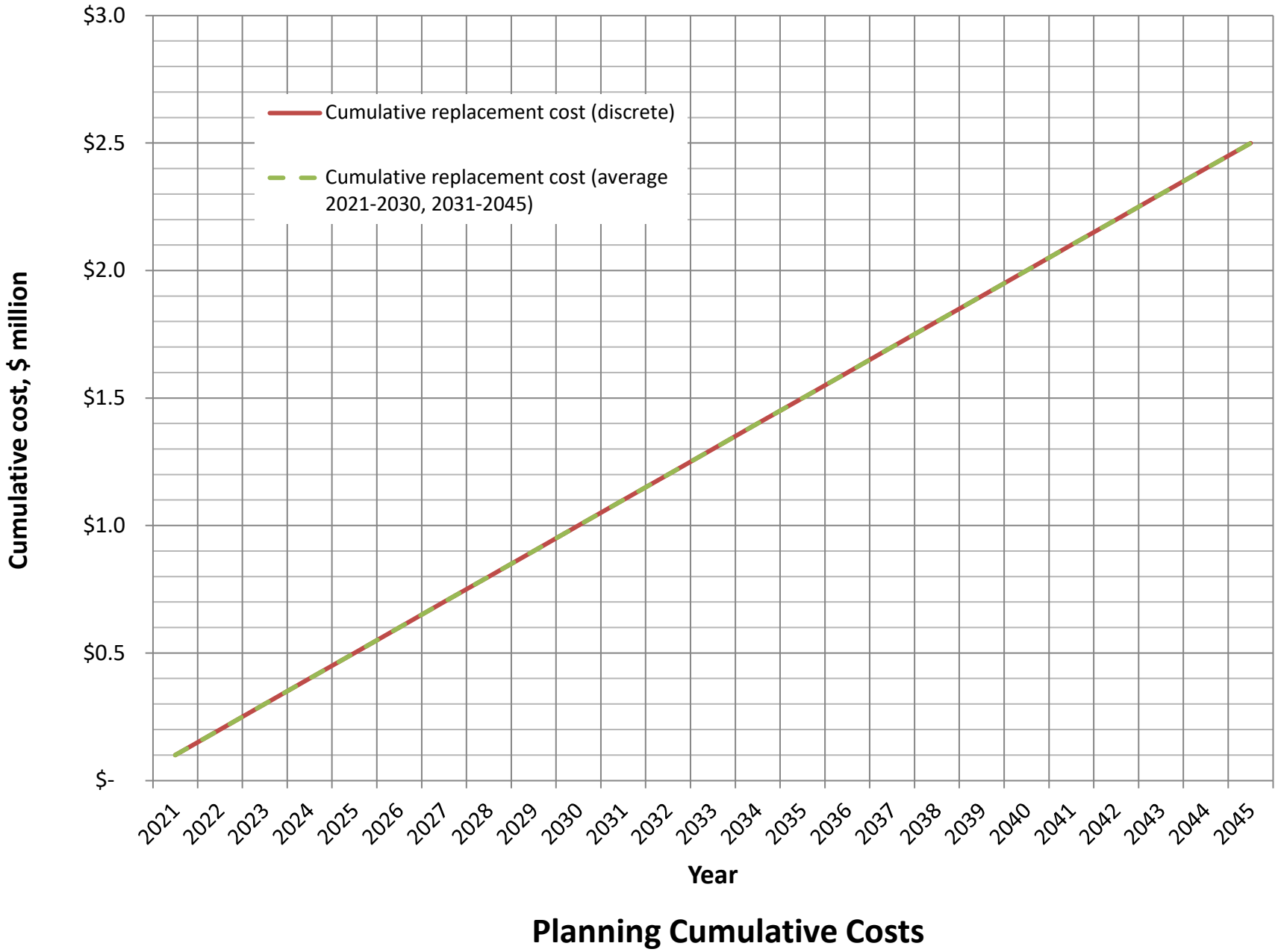

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Miscellaneous (SCADA, Security, Site Improvements)

Miscellaneous

SCADA				$millions				
Facility name	Assumed replacement useful life	Next replacement year	Assumed replacement cost, $million	2021	2022	2023	2024	2025
SCADA								
Major upgrades	1	2021	**0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**
Security								
Annual security expenditures	1		**0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**
Site Improvements								
Annual site improvements	1		**0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**
Annual replacement cost (discrete)				$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50
Annual replacement cost (average 2021-2030, 2031-2045)				$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50

Cumulative replacement cost (discrete)				$ 0.50	$ 1.00	$ 1.50	$ 2.00	$ 2.50
Cumulative replacement $, (average 2021-2030, 2031-2045)				$ 0.50	$ 1.00	$ 1.50	$ 2.00	$ 2.50

Miscellaneous

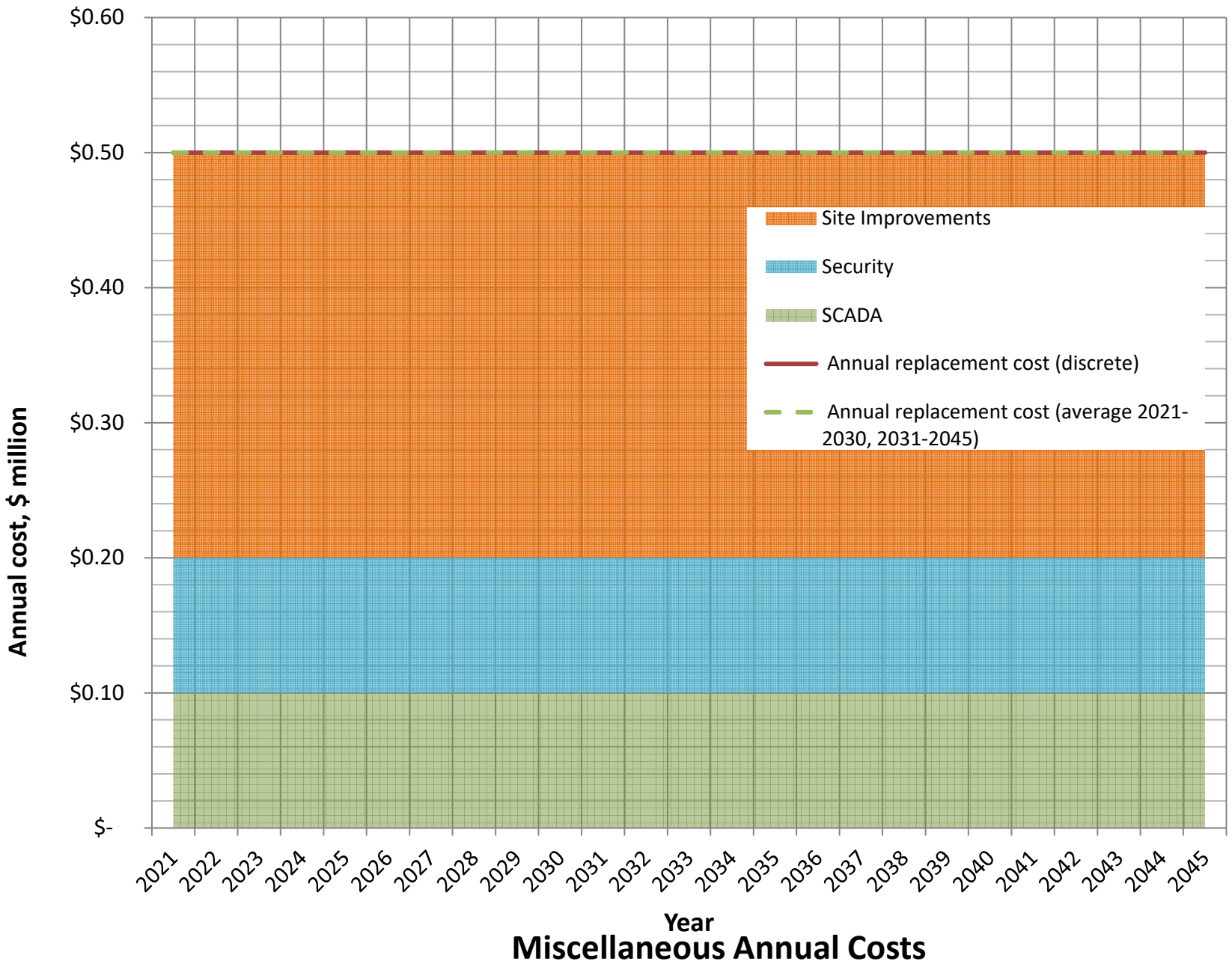
SCADA													
Facility name	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
SCADA													
Major upgrades	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**
Security													
Annual security expenditures	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**
Site Improvements													
Annual site improvements	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**
Annual replacement cost (discrete)	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50
Annual replacement cost (average 2021-2030, 2031-	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50

Cumulative replacement cost (discrete)	$ 3.00	$ 3.50	$ 4.00	$ 4.50	$ 5.00	$ 5.50	$ 6.00	$ 6.50	$ 7.00	$ 7.50	$ 8.00	$ 8.50
Cumulative replacement $, (average 2021-2030, 203	$ 3.00	$ 3.50	$ 4.00	$ 4.50	$ 5.00	$ 5.50	$ 6.00	$ 6.50	$ 7.00	$ 7.50	$ 8.00	$ 8.50

Miscellaneous

SCADA								
Facility name	2038	2039	2040	2041	2042	2043	2044	2045
SCADA								
Major upgrades	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**
Security								
Annual security expenditures	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**	**$ 0.10**
Site Improvements								
Annual site improvements	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**	**$ 0.30**
Annual replacement cost (discrete)	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50
Annual replacement cost (average 2021-2030, 2031-	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50

Cumulative replacement cost (discrete)	$ 9.00	$ 9.50	$ 10.00	$ 10.50	$ 11.00	$ 11.50	$ 12.00	$ 12.50
Cumulative replacement $, (average 2021-2030, 203	$ 9.00	$ 9.50	$ 10.00	$ 10.50	$ 11.00	$ 11.50	$ 12.00	$ 12.50



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Pump Stations

Pump Stations

Facility name	Capacity, cfs	Capacity, gpm	Capacity, mgd	Assumed replacement cost, $million	Year constructed/last major overhaul	Assumed useful life	Percent of total by component (based on replacement needs, not original construction)	Replacement costs, (based on % of total) $million	Next replacement year	$millions 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
American River PS (RW)	189	84,835	122	$ 16.3	2007																		
Structural					2007	65	36%	$ 5.88	2072	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					2007	20	19%	$ 3.14	2027	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$3.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					2007	80	19%	$ 3.02	2087	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					2017	10	3%	$ 0.41	2027	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical					2007	20	5%	$ 0.85	2027	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					2007	50	18%	$ 2.98	2057	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Auburn Tunnel PS #1 (RW)	48	21,545	31	$ 2.0	1991																		
Structural					1991	65	13%	$ 0.26	2056	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					1991	20	58%	$ 1.14	2021	$1.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					1991	80	9%	$ 0.17	2071	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					1991	10	5%	$ 0.10	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0
Electrical					1991	20	11%	$ 0.21	2021	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					1991	50	5%	$ 0.10	2041	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Barton Road Intertie (TW)		1,389	2	$ 0.7	2015																		
Structural					2015	65	0%	$ -	2080	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					2015	20	40%	$ 0.28	2035	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					2015	80	10%	$ 0.07	2095	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					2015	10	10%	$ 0.07	2025	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical					2015	20	15%	$ 0.11	2035	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					2015	50	25%	$ 0.18	2065	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Boulder Road (Los Lagos) PS (TW)		900	1.3	$ 0.6	2000																		
Structural					2000	65	0%	$ -	2065	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					2000	20	40%	$ 0.23	2021	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					2000	80	10%	$ 0.06	2080	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					2000	10	10%	$ 0.06	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0
Electrical					2000	20	15%	$ 0.09	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					2000	50	25%	$ 0.14	2050	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Foothill PS (TW)		1,500	2.2	$ 0.8	1994																		
Structural					1994	65	0%	$ -	2059	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					1994	20	40%	$ 0.31	2021	$0.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					1994	80	10%	$ 0.08	2074	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					1994	10	10%	$ 0.08	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0
Electrical					1994	20	15%	$ 0.12	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					1994	50	25%	$ 0.19	2044	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Laird PS (RW)	1	449	0.6	$ 0.9	2006																		
Structural					2006	65	0%	$ -	2071	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					2011	20	40%	$ 0.37	2031	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.4	$0.0	$0.0	$0.0
Piping					2006	80	10%	$ 0.09	2086	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					2018	10	10%	$ 0.09	2028	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical					2006	20	15%	$ 0.14	2026	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					2006	50	25%	$ 0.23	2056	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Midas PS (TW)		1,100	2	$ 3.0	2020																		
Structural					2020	65	19%	$ 0.57	2085	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					2011	20	15%	$ 0.44	2031	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.4	$0.0	$0.0	$0.0
Piping					2020	80	14%	$ 0.41	2100	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					2018	10	7%	$ 0.21	2028	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical					2020	20	34%	$ 1.02	2040	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					2020	50	12%	$ 0.36	2070	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Northstar PS (TW)		700	1.0	$ 0.5	1967																		
Structural					1967	65	0%	$ -	2032	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					1967	20	40%	$ 0.19	2021	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					1967	80	10%	$ 0.05	2047	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					1967	10	10%	$ 0.05	2021	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical					1967	20	15%	$ 0.07	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Pump Stations

Facility name	Capacity, cfs	Capacity, gpm	Capacity, mgd	Assumed replacement cost, $million	Year constructed/last major overhaul	Assumed useful life	Percent of total by component (based on replacement needs, not original construction)	Replacement costs, (based on % of total) $million	Next replacement year	$millions 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Site Improvements					1967	50	25%	$ 0.12	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Ophir PS (RW)	100	44,886	65	$ 23.1	2007																		
Structural					2007	65	16%	$ 3.69	2072	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					2007	20	2%	$ 0.58	2027	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					2007	80	12%	$ 2.88	2087	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					2016	10	4%	$ 0.93	2026	$0.0	$0.0	$0.0	$0.0	$0.0	$0.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical					2017	20	44%	$ 10.16	2037	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					2015	50	21%	$ 4.82	2065	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Skyridge PS (TW)		1,300	1.9	$ 0.6	2003																		
Structural					2003	65	0%	$ -	2068	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					2003	20	40%	$ 0.25	2023	$0.0	$0.0	$0.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					2003	80	10%	$ 0.06	2083	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					2003	10	10%	$ 0.06	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0
Electrical					2003	20	15%	$ 0.09	2023	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					2003	50	25%	$ 0.16	2053	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Stoneridge PS (TW)		3,000	4	$ 1.7	2003																		
Structural					2003	65	20%	$ 0.34	2068	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					2003	20	30%	$ 0.52	2023	$0.0	$0.0	$0.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					2003	80	15%	$ 0.26	2083	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					2003	10	5%	$ 0.09	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0
Electrical					2003	20	10%	$ 0.17	2023	$0.0	$0.0	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					2003	50	20%	$ 0.34	2053	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Tinker PS (TW)		3,000	4	$ 9.7	2006																		
Structural					2006	65	11%	$ 1.03	2071	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					2006	20	5%	$ 0.47	2026	$0.0	$0.0	$0.0	$0.0	$0.0	$0.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					2006	80	12%	$ 1.13	2086	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					2006	10	0%	$ 0.02	2021	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical					2006	20	9%	$ 0.89	2026	$0.0	$0.0	$0.0	$0.0	$0.0	$0.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					2006	50	63%	$ 6.14	2056	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Turner PS (RW)	0.80	359	1	$ 0.8	1984																		
Structural					1984	65	0%	$ -	2049	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					1984	20	40%	$ 0.32	2021	$0.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					1984	80	10%	$ 0.08	2064	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					1984	10	10%	$ 0.08	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0
Electrical					1984	20	15%	$ 0.12	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					1984	50	25%	$ 0.20	2034	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2
Whitney PS (RW)	33	14,812	21	$ 1.6	2004																		
Structural					2004	65	15%	$ 0.23	2069	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical					2004	20	16%	$ 0.25	2024	$0.0	$0.0	$0.0	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping					2004	80	10%	$ 0.15	2084	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C					2004	10	4%	$ 0.06	2021	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0
Electrical					2004	20	36%	$ 0.57	2024	$0.0	$0.0	$0.0	$0.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements					2004	50	20%	$ 0.31	2054	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Annual replacement cost (discrete)										$ 3.5	$ -	$ 1.0	$ 0.8	$ 0.1	$ 2.4	$ 5.0	$ 0.3	$ -	$ -	$ 1.4	$ -	$ -	$ 0.2
Annual replacement cost (average cost 2021-2030, 2031-2045)										$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.4	$ 1.4	$ 1.4	$ 1.4

Cumulative replacement cost (discrete)										$ 3.5	$ 3.5	$ 4.5	$ 5.3	$ 5.4	$ 7.8	$ 12.8	$ 13.1	$ 13.1	$ 13.1	$ 14.5	$ 14.5	$ 14.5	$ 14.7
Cumulative replacement cost, (average cost 2021-2030, 2031-2045)										$ 1.3	$ 2.6	$ 3.9	$ 5.2	$ 6.5	$ 7.9	$ 9.2	$ 10.5	$ 11.8	$ 13.1	$ 14.5	$ 15.8	$ 17.2	$ 18.6

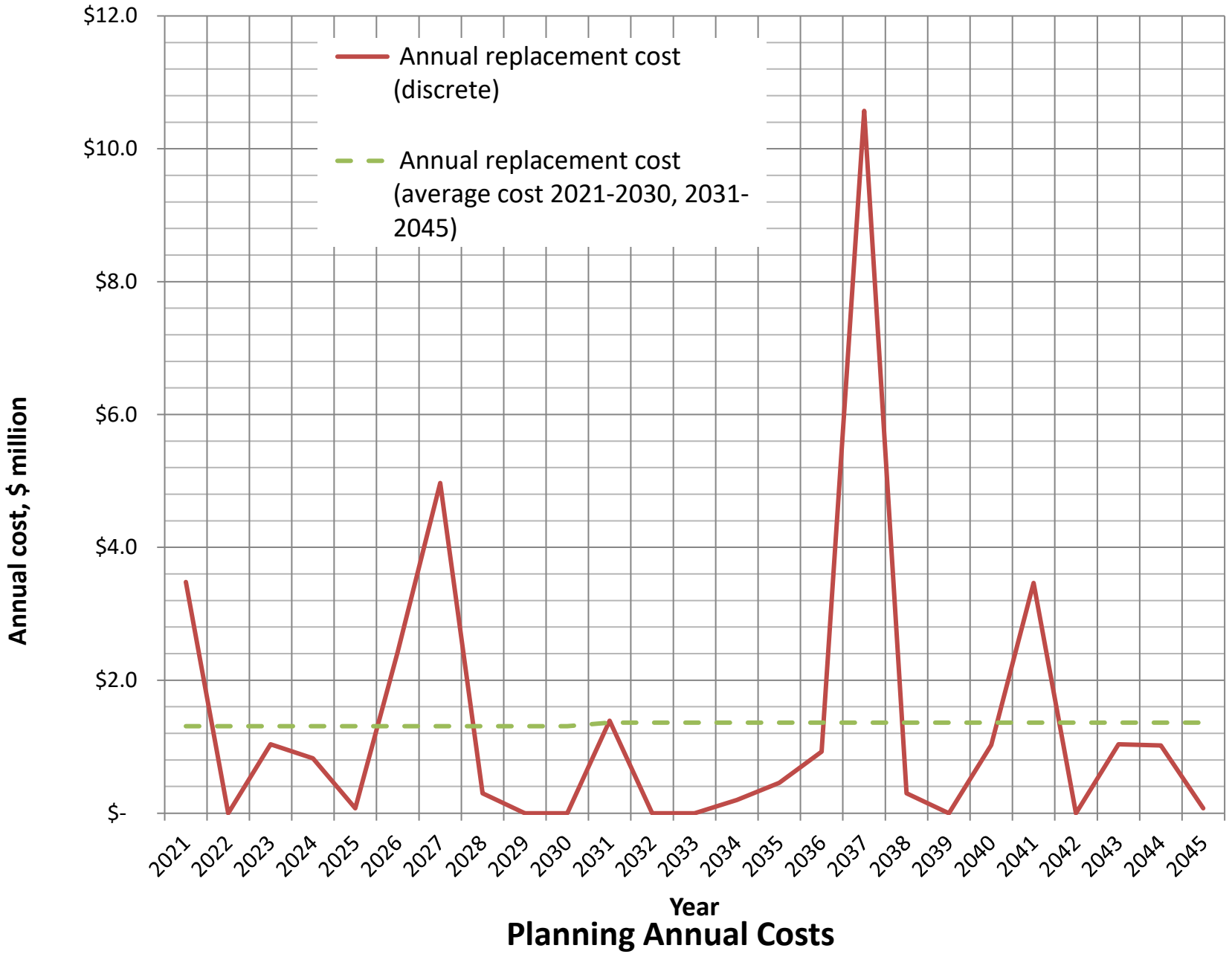
Pump Stations

Facility name	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
American River PS (RW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Auburn Tunnel PS #1 (RW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$1.1	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2	$0.0	$0.0	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Barton Road Intertie (TW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1
Electrical	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Boulder Road (Los Lagos) P											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Foothill PS (TW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.3	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2	$0.0
Laird PS (RW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Midas PS (TW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$1.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Northstar PS (TW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0

Pump Stations

Facility name	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Ophir PS (RW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$10.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Skyridge PS (TW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.3	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Stoneridge PS (TW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.5	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Tinker PS (TW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Turner PS (RW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.3	$0.0	$0.0	$0.0	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Whitney PS (RW)											
Structural	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mechanical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2	$0.0
Piping	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
I&C	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0
Electrical	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.6	$0.0
Site Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Annual replacement cost (	$ 0.5	$ 0.9	$ 10.6	$ 0.3	$ -	$ 1.0	$ 3.5	$ -	$ 1.0	$ 1.0	$ 0.1
Annual replacement cost (	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4

Cumulative replacement co	$ 15.1	$ 16.1	$ 26.6	$ 26.9	$ 26.9	$ 28.0	$ 31.4	$ 31.4	$ 32.5	$ 33.5	$ 33.5
Cumulative replacement co	$ 19.9	$ 21.3	$ 22.6	$ 24.0	$ 25.4	$ 26.7	$ 28.1	$ 29.5	$ 30.8	$ 32.2	$ 33.5



PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
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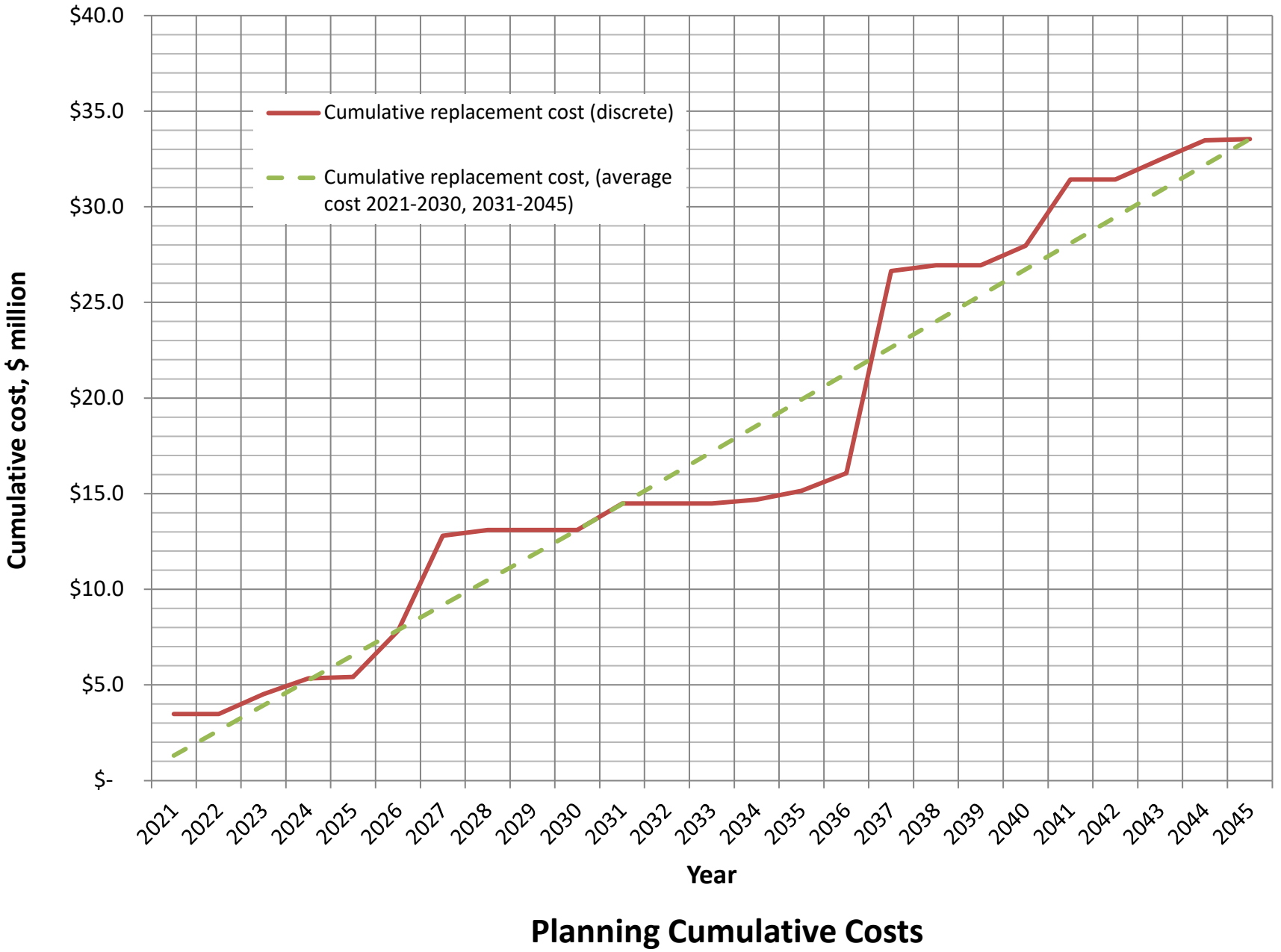

PCWA_calcs_long term RR costs_Update_v2020-21.xlsx
2/10/2021