Ventura County Waterworks District No. 8
City of Simi Valley

FINAL REPORT

Waterworks Facilities Assessment and Cost of Service Evaluation

APRIL 2015

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VENTURA COUNTY WATERWORKS DISTRICT NO. 8
CITY OF SIMI VALLEY

WATERWORKS FACILITIES ASSESSMENT AND COST OF SERVICE STUDY

April 2015

FINAL REPORT

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VENTURA COUNTY WATERWORKS DISTRICT NO. 8

WATERWORKS FACILITIES ASSESSMENT AND COST OF SERVICE STUDY

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ACRONYMS

AACE	Association for the Advancement of Cost Engineering
ACP	Asbestos Cement Pipe
ASCE	American Society of Civil Engineers
AWWA	American Water Works Association
CCP	Concrete Cylinder Pipe
CI	Cast Iron Pipe
CIP	Capital Improvement Program
City	City of Simi Valley
CMLC	Cement Mortar Lined & Coated Steel Pipe
CMU	concrete masonry unit
CMWD	Calleguas Municipal Water District
CPI	Consumer Price Index
CUWCC	California Urban Water Conservation Council
DIP	Ductile Iron Pipe
District	Ventura County Waterworks District No. 8
ENR CCI	Engineering News Record Construction Cost Index
EvRUL	Evaluated Remaining Useful Life
FY	Fiscal Year
GALV	Galvanized Steel Pipe
HCF	Hundred Cubic Feet
MCC	Motor Control Center
MET	Metropolitan Water District of Southern California
OUL	Original Useful Life
O&M	Operations and Maintenance
PVC	Polyvinyl Chloride Plastic
R&R	Rehabilitation and Replacement
SCP	Steel Cylinder Pipe
SRF	State Revolving Fund
UNK	Unknown Material
WEF	Water Environmental Federation

ES.1 INTRODUCTION

Water service for the City of Simi Valley (City) area is provided by the Ventura County Waterworks District No. 8 (District), which is managed by the City's Public Works Department and City Council. The District currently delivers over 900 million cubic feet of potable water per year, or approximately 23,000-acre feet, to residential, commercial, and industrial customers in the region.

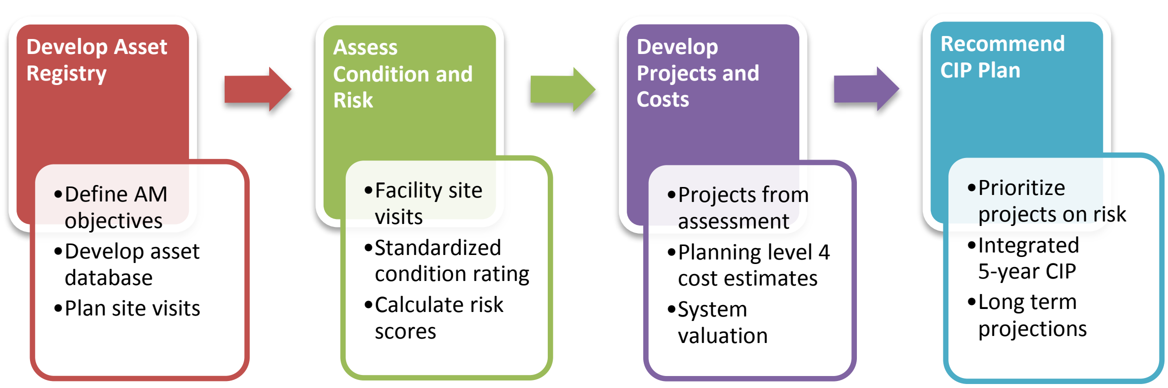
The primary objectives of the Waterworks Facilities Assessment and Cost of Service Study were to: 1) assess the District's waterworks assets to identify the rehabilitation and replacement (R&R) needs of the facilities, and 2) based on the needs identified by the facilities assessment, conduct a water revenue and rate study for Fiscal Years (FY) 2014/15 through 2024/25.

The facilities assessment included an asset management-based approach to condition and risk assessment of above-ground water facilities, a statistical model to determine the risk and remaining useful life of below-ground water pipelines, and development of projects and cost estimates for asset rehabilitation and replacement. The facilities assessment provided the basis for a water revenue and rate study that included a comprehensive cost of service and rate design analysis, culminating in the development of a ten-year financial plan and a proposed cost-based revision of water user charges for the next five years.

ES.2 FACILITIES ASSESSMENT

ES.2.1 Approach

The approach for the facilities assessment followed standard asset management methodologies for risk assessment and R&R project prioritization. The following diagram illustrates the major steps that were used in the development of the facilities assessment:



ES.2.2 Asset Condition and Risk Assessment

ES.2.2.1 Above-Ground Assessment

Using a multi-discipline team of mechanical, structural, and electrical engineers, visual condition assessments were conducted of 43 water storage tanks, 21 pump stations, one water treatment plant, and two well sites. The findings of the condition assessment showed that, in general, the District's facilities are well maintained and in good condition. However, primarily due to age and previous seismic events, there were structural issues noted at multiple reservoir sites that are recommended for further evaluation and rehabilitation, and a few assets at a small number of pump stations are reaching the end of their useful life and require replacement. District operations and engineering staff were aware of these issues and have already begun planning to address many of the deficiencies.

As shown in Figure ES.1, a majority of the assets were assigned a condition score of 2, which indicates that there were very few defects found throughout the above-ground water facilities. There was one asset assigned a condition score of 5, a motor at the Tapo Street Pump Station, which is currently in the District's CIP for complete pump station replacement. Many of the assets with a condition score of 4 are also planned for replacement in the near-term CIP.

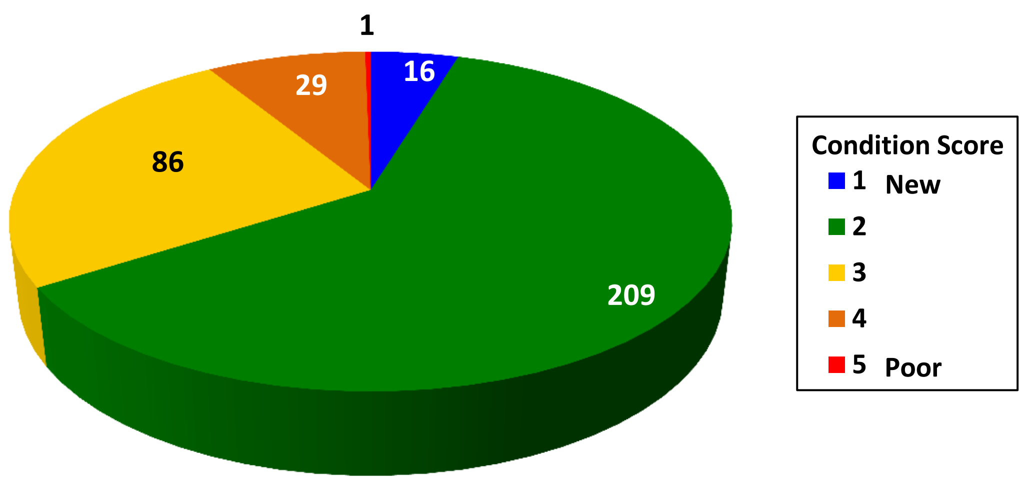


Figure ES.1 Number of Above-Ground Assets by Condition Score

Asset risks, which were used to determine the priorities for asset rehabilitation and replacement, were calculated as the product of vulnerability, indicating the likelihood of asset failure, and criticality, indicating the consequence of asset failure. Vulnerability was calculated as the inverse of evaluated remaining useful life, which was determined based on the original useful life of the asset and the condition score from the facility assessment. Criticality was calculated as the weighted sum of three separate criticality rankings determined with the assistance of District staff. The highest risk above-ground assets are shown in Table ES.1.

Table ES.1 Highest Risk Above-Ground Assets

Site/Asset	Criticality	Vulnerability	Risk
Tapo Street Motor #2	4.75	5.00	23.75
Water Treatment RO Membrane P1	5.5	2.38	13.1
Water Treatment RO Membrane P2	5.5	2.38	13.1
Flanagan Tank	10	0.67	6.67
Madera 1 Tank	10	0.67	6.67
Station 3 Tank	10	0.67	6.67
Stow Tank #2	10	0.67	6.67
Stow Tank #3	10	0.67	6.67
Stow Tank #4	10	0.67	6.67
Station 2 Tank	9.25	0.67	6.17
Well 31 Tank	9.25	0.67	6.17
Water Treatment Cartridge Filter (2)	3.25	1.59	5.16
Hilltop Tank	10	0.50	5
Mellow Lane Tank	10	0.50	5
Rocketdyne Tank	10	0.50	5
Stearns Tank South	10	0.50	5

ES.2.2.2 Below-Ground Assessment

A desktop analysis of the below-ground assets was conducted using GIS data because visual condition assessment was not possible. The vulnerability, criticality, and risk of the water distribution pipelines were evaluated using a similar methodology as for above-ground assets, with adjustments to the criticality rankings and original useful lives that were used in calculating the vulnerability and risk scores. An analysis of the District's water system shows that a majority of the water pipelines are eight-inches in diameter, are most commonly ACP (asbestos cement pipe - 65%) or PVC/C900 (polyvinyl chloride – 25%) material type, and were primarily installed from 1960 to 1969 (45%).

Using a statistical model to determine remaining useful life, which was then used to calculate vulnerability, and the assessment of criticality based on pipeline size and proximity to critical facilities, a map of the pipeline risks was developed. The results of this statistical model and the water pipeline risk assessment are shown in Figure ES.2.

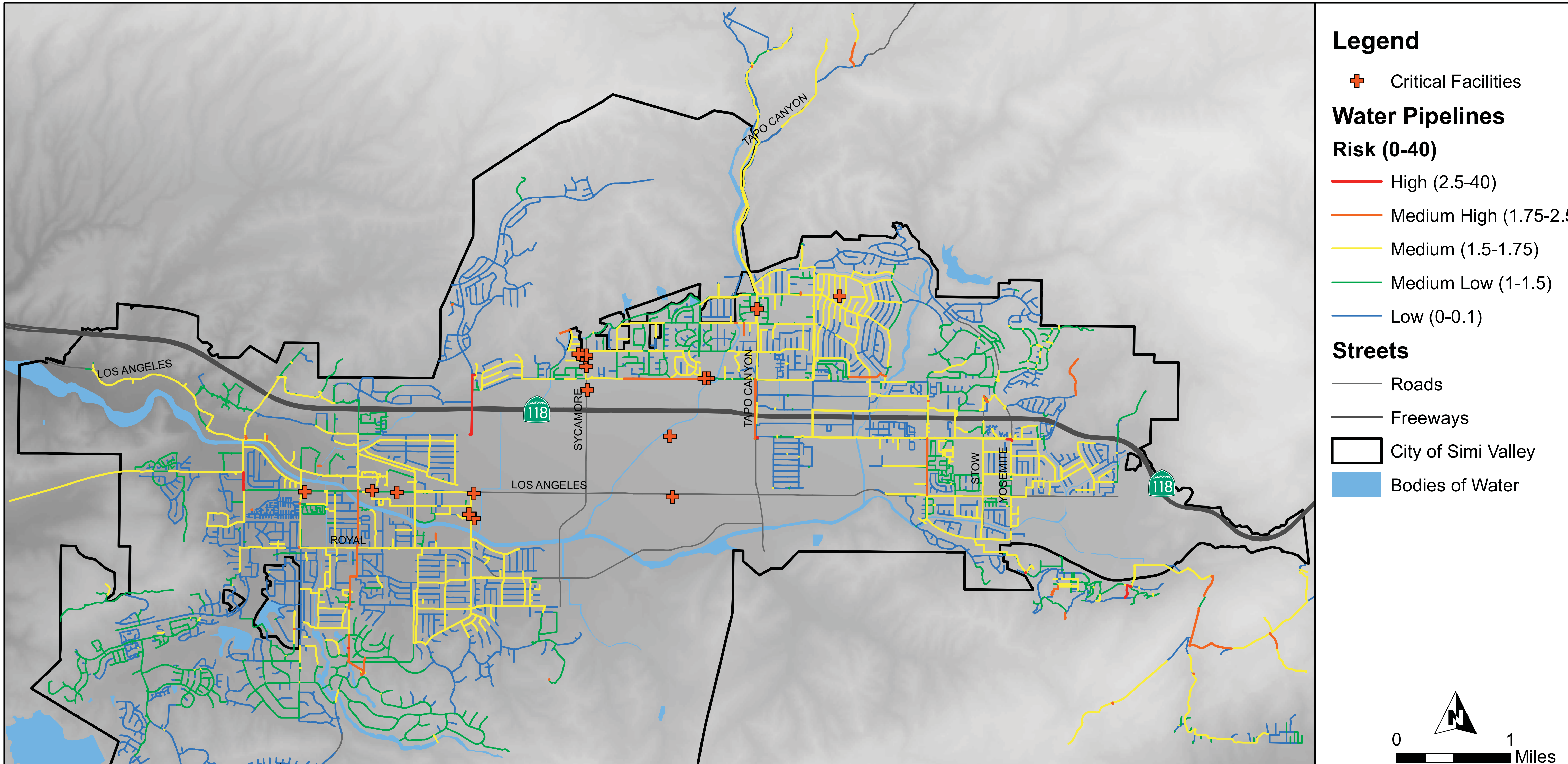


Figure ES.2
Map of Water Pipeline Risk
Waterworks Facilities Assessment and Cost of Service Evaluation
Ventura County Waterworks District No.8

ES.2.3 Replacement Cost Estimates

Cost estimates were developed for specific rehabilitation projects recommended based on the condition assessment findings, and for individual assets as replacement cost estimates. The rehabilitation and replacement projects were used in developing the 5-year CIP recommendations as discussed in Section 2.6. A valuation summary was developed for full replacement of the water system using direct and indirect cost factors applied to the replacement costs for above-ground assets, and unit costs per lineal foot of water pipelines that include estimates for appurtenances. A summary of the full replacement cost of the District's water system assets is shown in Table ES.2.

Table ES.2 Valuation Summary

Discipline	Cost	Percentage
Tank Sites	$111,600,000	25.0%
Pump Stations	$14,300,000	3.2%
Wells	$1,300,000	0.3%
Treatment	$5,200,000	1.2%
Pipelines	$314,000,000	70.3%
Water System Total	$446,400,000	100.0%

ES.2.4 Rehabilitation and Replacement Projects

ES.2.4.1 Above-Ground Projects

Recommended projects were developed for rehabilitation and replacement of both above-ground and below-ground assets. The above-ground asset project recommendations were based on the facility condition assessment and consist of tank site projects, pump station projects, water treatment plant projects, ongoing replacement programs, and other system wide projects.

The tank site projects primarily consist of structural projects that are recommended based on compliance with the latest ASCE 7-10 (2014) building code and American Water Works Association D100 (2001) steel tank requirements. While many of the tanks have been retrofitted since the 1994 Northridge earthquake, some of the tanks require additional projects to comply with the most recent updates in the ASCE building code. In addition, many of the recommended projects require additional seismic analysis to determine the specific needs of the site. Details of the specific tank site projects are included in Tables 2.10 and 2.11.

The pump station projects were recommended to address concerns for assets such as pumps and motors that are nearing the end of their useful service life. A few structural rehabilitation projects were also recommended at a few of the stations to address wall, concrete pad, and paving deficiencies. Details of the specific pump station projects are included in Table 2.12.

System wide projects consist of: dive inspection program, interior tank coatings, hydrant and valve replacement programs, water system analysis, seismic evaluation, SCADA project, and a well assessment programs. These projects are recommended based on observations during the visual site assessment and discussions with District staff. Details of these projects are contained in Sections 2.6.1.2 and 2.6.1.4, and Table 2.13.

Including minor projects at the water treatment plant to replace the RO membranes and address structural issues with the concentrate tank, the total for recommended above-ground asset rehabilitation and replacement projects is $6,822,600 over 5 years.

ES.2.4.2 Below-Ground Projects

Below-ground projects were recommended for the highest risk pipelines identified using a GIS-based analysis of the water system. The specific high risk pipeline replacement projects total $585,000 over the next 5 years. Details of the pipelines recommended for replacement are included in Table 2.15.

In addition, a statistical model was developed of the District's water pipeline replacement needs over a full replacement lifecycle as shown in Figure ES.3. This model projects that the District's pipeline replacement needs over the next 20 years will vary in the general range of $200,000 to $1,000,000 per year. However, beyond the year 2035, there is a projected drastic increase in pipeline replacement costs, ranging annually from $2,000,000 to nearly $6,000,000 over a 50-year period, during which the majority of the District's ACP pipelines will have reached the end of their useful service lives and will need to be rehabilitated or replaced. Accordingly, it is recommended that the District target an annual water main improvement and replacement program of $1,000,000 in years 5 through 20 of the financial plan, to address these needs.

Including both the specific high risk pipeline replacement projects, and the long term water main replacement program, the total recommended for below-ground asset rehabilitation and replacement projects is $2,785,000 over the next 5 years.

ES.2.5 Capital Improvement Program Recommendations

In order to provide the complete revenue requirements for the following Waterworks Cost-of-Service Study, City staff assisted in integrating the recommended facilities assessment projects with previously scheduled Waterworks CIP projects for the next 5 fiscal years of 2015-16 through 2019-20. The resulting 5-year CIP for Waterworks facilities totals $16,558,600 and is shown in Table ES.3. In addition, a twenty-year CIP was developed to support long term financial planning for asset rehabilitation and replacement needs, as shown in Figure ES.4. Furthermore, in order to examine the full replacement cycle for Waterworks assets, the above- and below-ground models were extended to a 100-year timeframe as shown in Figure ES.5. Based on these analyses, the recommended average annual investment for renewal of the District's water infrastructure is $3.9 million for the 20-year timeframe, and $9.2 million for the 100-year timeframe, in current dollars. These averages demonstrate that the District's water system is relatively young, and the near-term rehabilitation and replacement investment is much lower than in the long term.

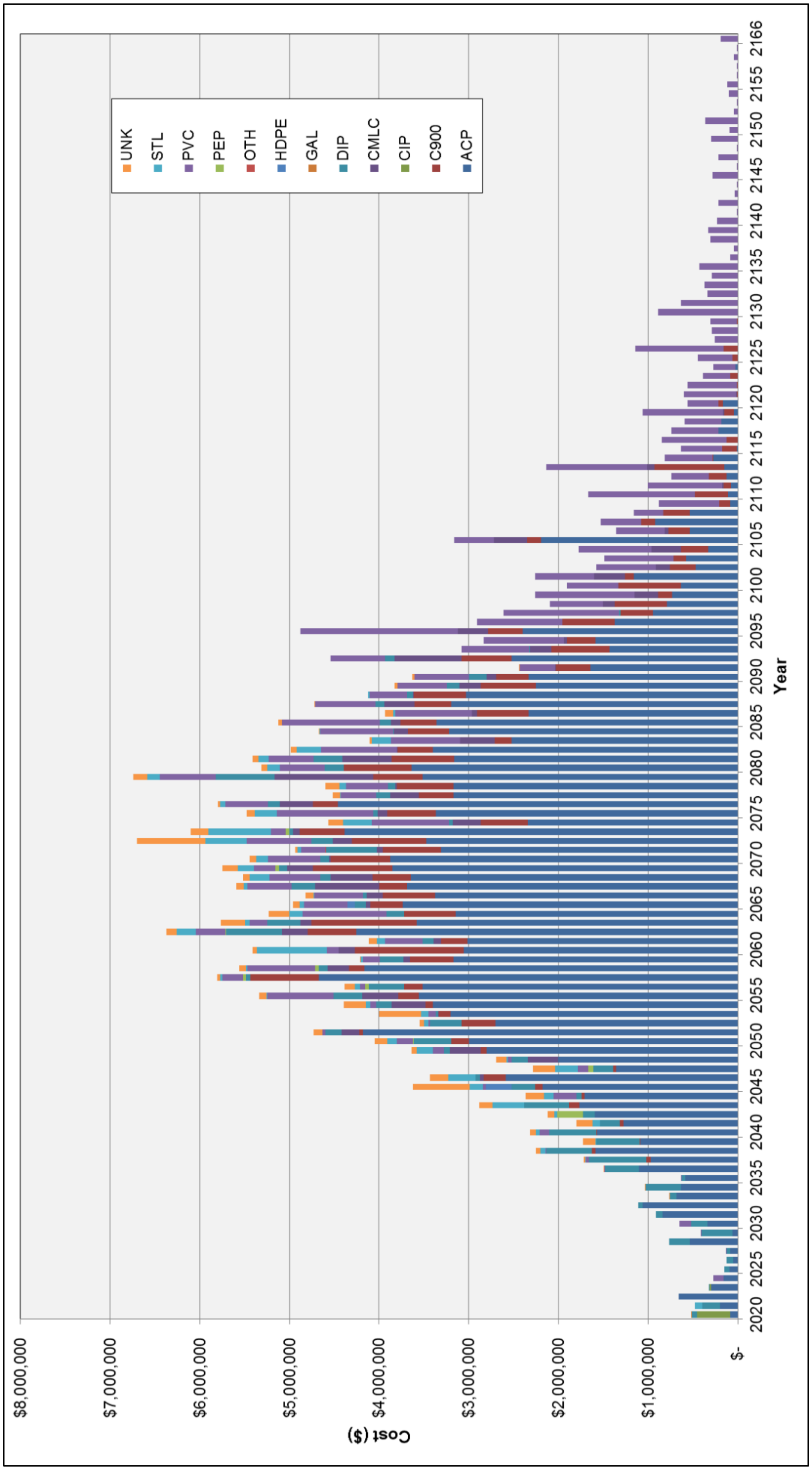


Figure ES.3 Estimated Pipeline Annual Replacement Costs by Material Type

Table ES.3 Five-Year CIP Recommendations

PROJECT	2015-16	2016-17	2017-18	2018-19	2019-20	TOTAL
FACILITIES ASSESSMENT PROJECTS (FA)						
PIPELINES						
High-risk 4" galv. steel on Hilltop (1965)	0	0	10,000	0	0	10,000
High-risk 6"-16" cast iron Madera & Lookout Rock (1965)	0	0	369,000	0	0	369,000
High-risk 8"-16" DI on Loma, Ash, Katey, & Leisure (1955-63)	0	0	0	119,000	0	119,000
High-risk 4"-8" steel on Township, Felix, & Sheri (1957)	0	0	0	87,000	0	87,000
SYSTEM-WIDE						
Tank Dive Inspections	65,000	65,000	65,000	65,000	65,000	325,000
Hydrant Replacement	27,000	27,000	27,000	27,000	27,000	135,000
Valve Replacement	131,000	131,000	131,000	131,000	131,000	655,000
Seismic Evaluation	250,000	0	0	0	0	250,000
Capacity Study	0	150,000	0	0	0	150,000
TREATMENT PLANT						
Concentrate Tank	0	0	0	0	5,000	5,000
RO Membranes	75,000	0	0	0	0	75,000
TANKS						
Station No. 3 Tank	202,500	0	0	0	0	202,500
Flanagan Tank	55,000	0	0	0	0	55,000
Station No. 2 Tank	232,500	0	0	0	0	232,500
Stearns Tank	300,000	0	0	0	0	300,000
Thompson Tank	75,000	0	0	0	0	75,000
Mellow Lane Tank	120,000	0	0	0	0	120,000
Stow Street Tank	0	640,000	0	0	0	640,000
Rocketdyne Tank	0	45,000	0	0	0	45,000
Lilac Tank	0	225,000	0	0	0	225,000
Madera Tank	0	370,000	0	0	0	370,000
Mine Road Tank	0	320,000	0	0	0	320,000
First Street Tank	0	0	385,000	0	0	385,000
Casual Court Tank	0	0	70,000	0	0	70,000
Aerator Tank	0	0	277,500	0	0	277,500
Alta Vista Tank	0	0	210,000	0	0	210,000
Wood Ranch Tank No. 1	0	0	0	150,000	0	150,000
McCoy Tank	0	0	0	50,000	0	50,000
Big Sky Tank	0	0	0	5,000	0	5,000
Crosby Tank	0	0	0	50,000	0	50,000
Mt. Sinai Tank	0	0	0	0	55,000	55,000
Greystone Tank	0	0	0	0	55,000	55,000
Marr Ranch Tank	0	0	0	0	155,000	155,000
Walnut Tank	0	0	0	0	115,000	115,000
Madera Tank	0	0	0	0	50,000	50,000

Table ES.3 Five-Year CIP Recommendations

PROJECT	2015-16	2016-17	2017-18	2018-19	2019-20	TOTAL
PUMP STATIONS						
Station No. 2 Pump Sta.	245,600	0	0	0	0	245,600
Station No. 1 Pump Sta.	212,200	0	0	0	0	212,200
Mine Road Pump Sta.	0	176,700	0	0	0	176,700
Stearns Pump Sta.	0	0	15,000	0	0	15,000
Madera Pump Sta.	0	0	5,000	0	0	5,000
Library Pump Station	0	0	0	10,000	0	10,000
Bridal Path 2 Pump Sta.	0	0	0	214,600	0	214,600
Flanagan Pump Sta.	0	0	0	126,000	0	126,000
Crosby Pump Sta.	0	0	0	0	10,000	10,000
Total Facilities Assessment Projects	**1,990,800**	**2,149,700**	**1,564,500**	**1,034,600**	**668,000**	**7,407,600**
REPLACEMENT RESERVE FUND (CIP)						
Interior Tank Recoating	240,000	285,000	275,000	345,000	285,000	1,430,000
Small Tank Replacements	160,000	0	0	0	0	160,000
Water Line Relocation - Box Canyon	40,000	0	0	0	0	40,000
Water Line Replacement - Rollins	105,000	0	0	0	0	105,000
Water Main Impr / Repl	0	200,000	500,000	500,000	1,000,000	2,200,000
Well Rehab Program	80,000	80,000	80,000	45,000		285,000
SCADA Upgrade (New)	0	250,000	250,000	0	0	500,000
Total Replacement Reserve Fund	**625,000**	**815,000**	**1,105,000**	**890,000**	**1,285,000**	**4,720,000**
CAPITAL IMPROVEMENT FUND (CIP)						
Emergency Generators	70,000	0	0	0	0	70,000
Crown Hill Pump-Tank System	500,000	1,500,000	550,000	0	0	2,550,000
Stearns Yard Storage Building	40,000	0	0	0	0	40,000
Walnut Street Pump Station	342,000	214,000	0	0	0	556,000
Water Storage Mixing Systems	90,000	50,000	0	0	0	140,000
Well 32A Development	0	0	500,000	500,000	0	1,000,000
Recycled Water Cost of Service Study	75,000	0	0	0	0	75,000
Total Capital Improvement Fund	**1,117,000**	**1,764,000**	**1,050,000**	**500,000**	**0**	**4,431,000**
TOTAL 5-YR WW CIP	**1,742,000**	**2,579,000**	**2,155,000**	**1,390,000**	**1,285,000**	**9,151,000**
TOTAL CIP AND FA PROJECTS	**3,732,800**	**4,728,700**	**3,719,500**	**2,424,600**	**1,953,000**	**16,558,600**

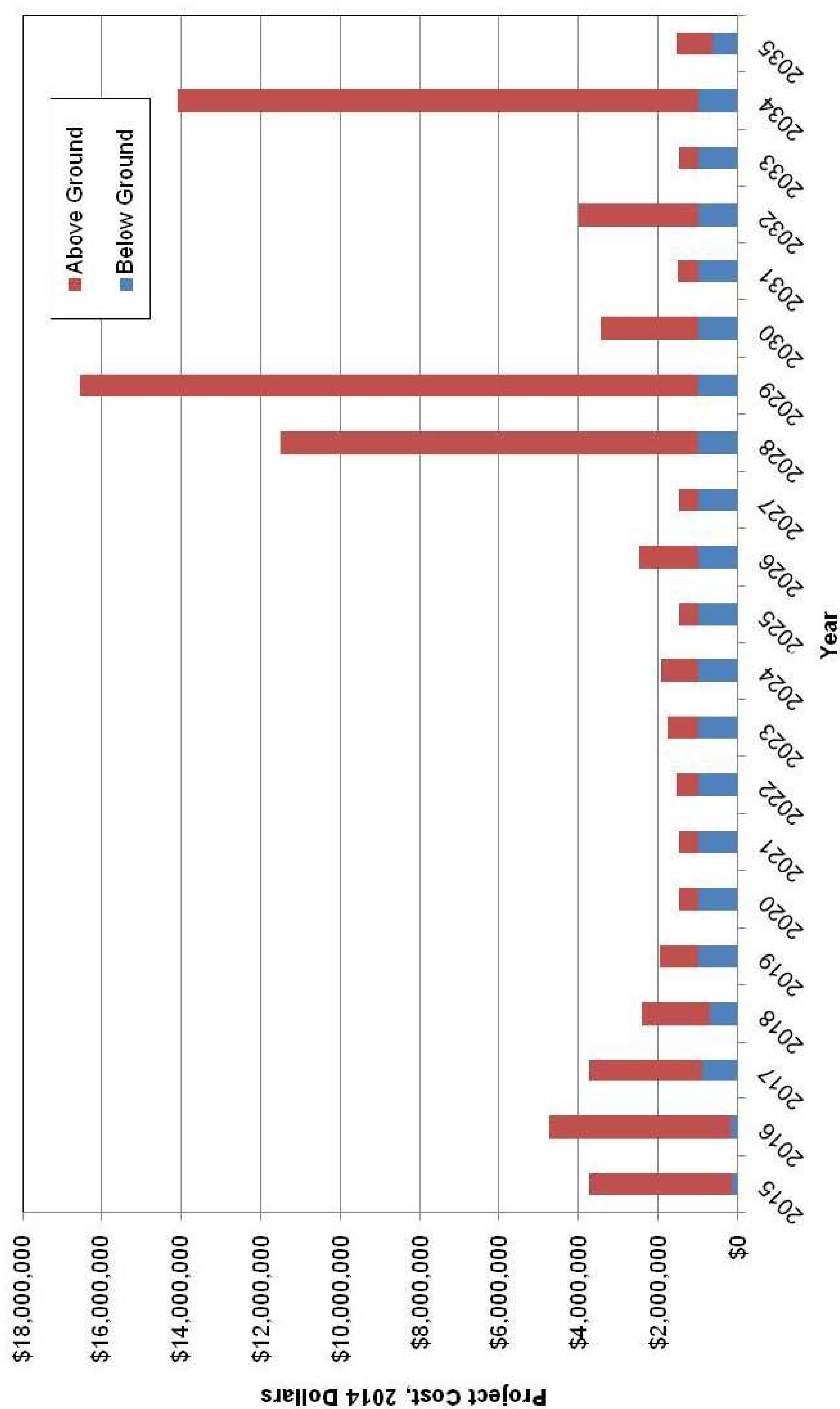


Figure ES.4 Twenty (20) Year Combined CIP

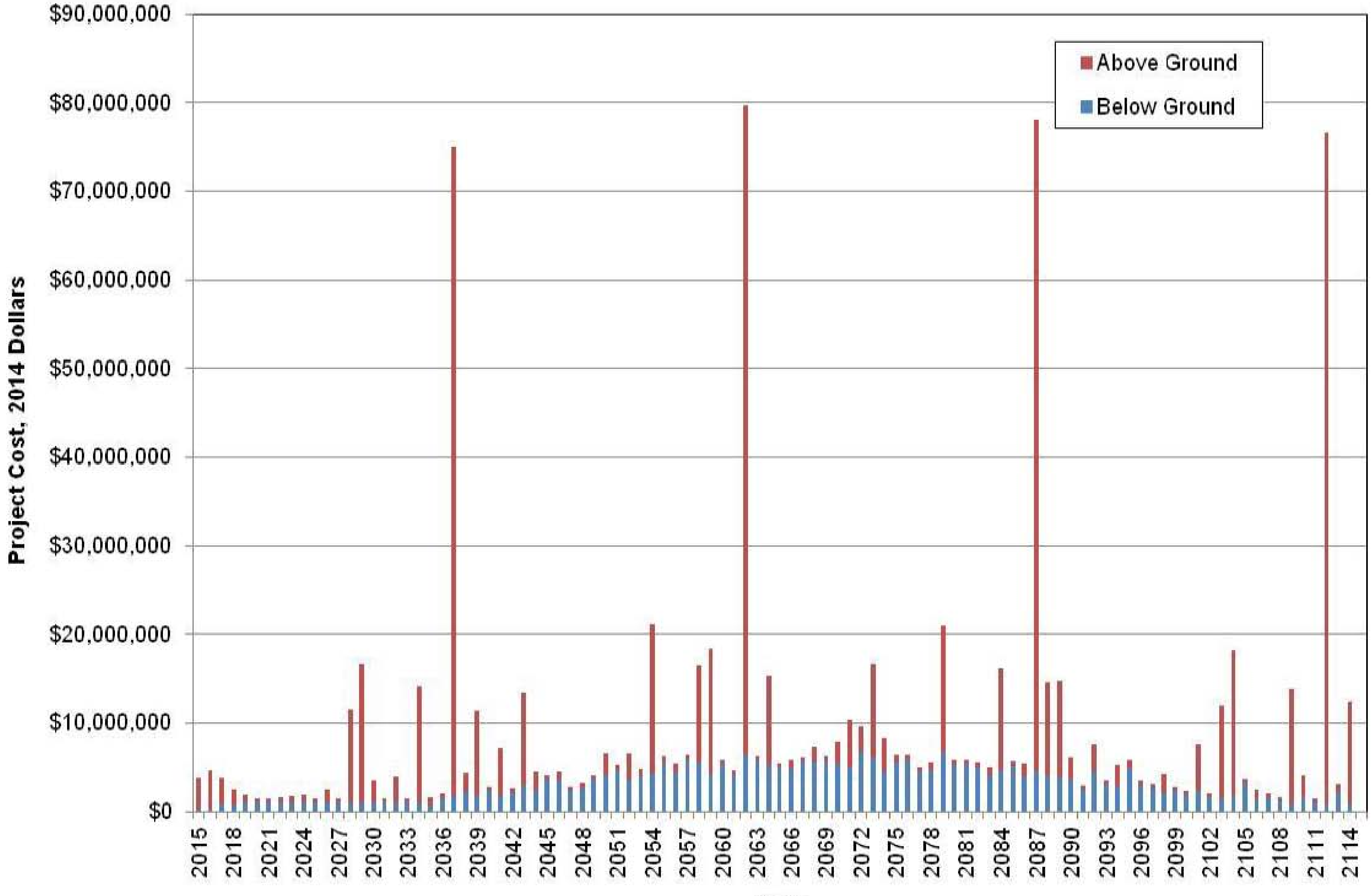


Figure ES.5 Combined 100 Year CIP

ES.3 COST-OF-SERVICE STUDY

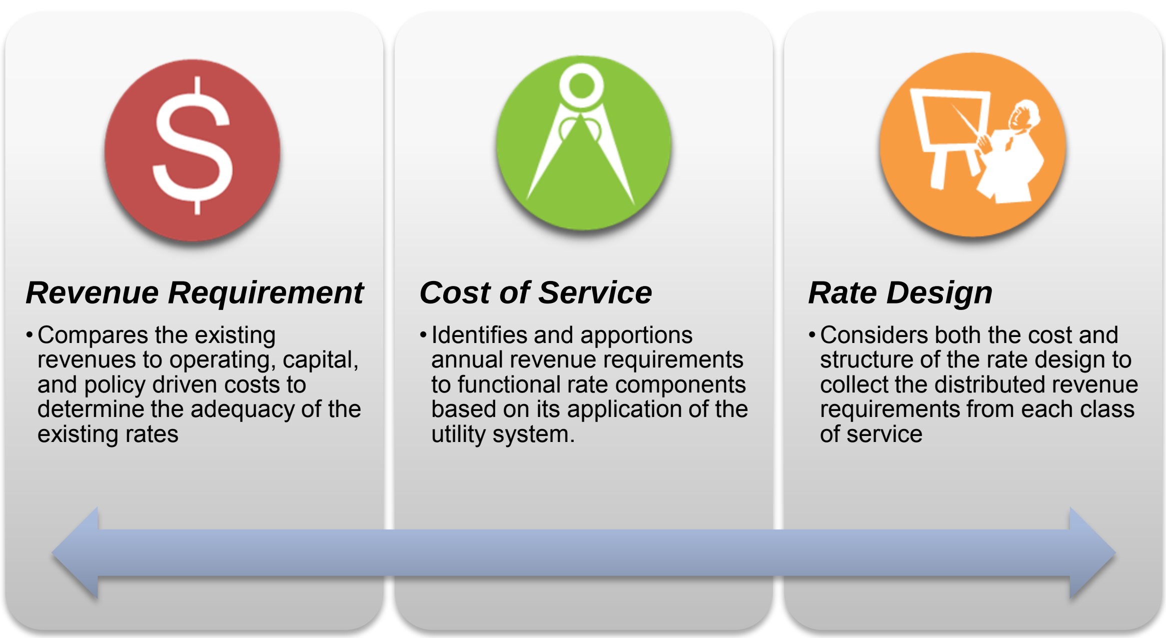
In spring 2014, the Ventura County Waterworks District No. 8 (District) initiated a Water Revenue and Rate Study by Carollo Engineers in order to assess its current water rates and confirm that collected revenues covered all anticipated expenses, planned capital reinvestment, and other obligations.

ES.3.1 Overview of Rate Setting Process

Rate analyses are typically performed every few years so that revenues from rates are adequately funding utility operations, maintenance, and future capital needs. Additionally, in California, water rates must adhere to the cost of service requirements imposed by Proposition 218 and the State Constitution. Proposition 218 requires that property related fees and charges, including water rates, do not exceed the reasonable and proportional cost of providing the service.

In addition, rates – through price signaling - can promote water conservation and the efficient use of natural resources by the District's water customers. The recommended rates are also designed to account for the specific characteristics of the District's water system, including the unique demands and usage patterns of various customer classes.

To achieve these requirements, a comprehensive rate study typically consists of the following progression of three interconnected processes.



ES.3.2 Findings & Recommendations

The findings and recommendations related to the revenue requirements analysis reflect analysis of actuals, estimates, and projections from FY 2014/15 through FY 2024/25. However, rate recommendations are only being proposed for a 5 year period starting in FY 2015/16.

ES.3.2.1 Revenue Requirements Analysis

This first step in the Water Revenue and Rate Study compares the current revenues achieved by the District with its operating, capital, and policy-driven expenditures. This comparison tests the adequacy and appropriateness of the existing rate structure, and defines the necessary adjustments to recover any existing shortfall.

The revenue requirements analysis underscored several challenges that the District is currently facing:

- **Significant Expense Increases**: Water purchases from Calleguas Municipal Water District (Calleguas) account for 72% of total operating expenditures. These expenditures have increased well in excess of inflation (20% over the past four years). Costs are forecasted to continue to climb in excess of general inflation.
- **Chronic Revenue Shortfalls:** Revenues are not keeping pace with expenditures and reserves are declining. Total working capital for Operations, Replacement, and Capital sub-funds has dropped from $21.7 million at the end of FY 2010-11 to a projected $10.3 million at end of FY 2013-14. Recent passage of modest water rate increases will improve the situation, but without additional correction(s), the District's total working capital will likely be in deficit by June 2016.
- **Pass through of Purchased Water Costs:** As the District has no control over the amounts set by Calleguas (or Metropolitan Water District), it is appropriate for the District to directly pass through those costs to customers.
- **Recommended Revenue Increases:** Revenue increases are necessary to (1) fund ongoing operations, (2) rebuild recently depleted reserves, and (3) fund identified capital investments.
- **Revenue Smoothing:** Rate increases are proposed to be effective starting July 1, 2015 and are smoothed, as much as possible, over the next five years to mitigate any potential rate shock. This is done by gradually building up operating reserves to targeted levels over the five years. However, this action may limit the District's ability to manage short-term funding needs and overall operational flexibility.

Table ES.4 Proposed Revenue Adjustment Schedule

Fiscal Year	Proposed Revenue Adjustments* (%)	Effective Revenue Adjustments ($)	Proposed Implementation Date
FY 2015/16	8.00%	$2,811,996	July 1st, 2015
FY 2016/17	8.00%	3,006,586	July 1st, 2016
FY 2017/18	1.00%	401,830	July 1st, 2017
FY 2018/19	1.00%	401,790	July 1st, 2018
FY 2019/20	1.00%	401,750	July 1st, 2019

*Revenue adjustments do not include any forecasted increases to Calleguas purchased water rates. Any increases to the cost of purchased water would be automatically passed-through to rate payers

ES.3.2.2 Cost of Service Analysis

The Cost of Service Analysis determines the distribution of revenue derived from the various customer classes. Each expense is first allocated to a specific cost category, with the primary categories being base demand, peak demand, customer service, and capacity reservation. Each customer class - groupings such as residential, commercial, and similar categories - receives an allotment based on the use of the system.

The Cost of Service Analysis highlighted areas where the District's current rate structure could be modified:

- **Fixed and Variable Revenues:** The District currently generates about 80 percent of revenues from variable charges. Conversely, only 20 percent of revenues are from a fixed and predictable source. As the District continues to seek conservation of upwards of 20 percent, this ratio creates significant revenue volatility. The recommended rates target nearly 30 percent of revenues to be collected from fixed charges.

ES.3.2.3 Rate Design Analysis

With all revenue requirements placed into a functional cost category, the rate design calculates the cost of service based rates for each customer class. Both fixed (service) charges collected during each billing period, and variable charges based on commodity rates levied on a volumetric usage, are determined.

Carollo has developed the following recommendations based on the rate design analysis:

- **Greater Fixed Cost Recovery:** Fixed and commodity revenues are realigned (increase to fixed revenues) to provide additional revenue stability and better align revenues with how costs are incurred.
- **Bi-Monthly Service Charges:** Resulting from the increased allocation to fixed charges, the proposed service charges will increase as detailed in Table ES.5.
- **Revised Commodity Rates:** The proposed variable (commodity) charges are summarized in Table ES.6. This recommendation does not include future adjustments related to increases from Calleguas purchased water rates.
- **Customer Impacts:** In general, all customers will see their bills increase. Figure ES.6 illustrates the impact for two typical users. Additional bill comparisons are provided in Appendix C.

ES.3.3 Results

Tables ES.5 and ES.6 below outline the proposed rate alternatives developed by Carollo. While rate adjustments are necessary, there are no changes to the existing rate structure.

Note that any future adjustments made to the cost of purchased water from Calleguas will be automatically passed through to rate payers. No projected increases to water costs are built-in to the proposed rates. At least 30 days before the effective date of the adjustment, the District will provide its customers with the expected adjustment(s), which will generally be calculated as the total projected cost increase divided by the projected annual water consumption.

Table ES.5 Proposed Service Charges (Bimonthly)

Meter Size	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20
Single Family	$54.75	$58.55	$58.50	$58.50	$58.50
Multi-Family	38.75	41.40	41.40	41.40	41.40
3/4"	74.75	79.90	79.90	79.90	79.90
1"	114.75	122.70	122.65	122.65	122.65
1-1/2"	214.75	229.60	229.60	229.55	229.55
2"	334.75	357.90	357.90	357.85	357.80
3"	714.75	764.20	764.15	764.05	764.00
4"	1,274.80	1,363.00	1,362.85	1,362.70	1,362.60
6"	2,814.80	3,009.60	3,009.30	3,009.00	3,008.70

Table ES.6 Proposed Commodity Rates (Bimonthly)

	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20
Single Family			**Rate (per HCF)**		
0 - 36 (HCF)	$2.44	$2.64	$2.67	$2.69	$2.72
36 – 60	3.44	3.71	3.75	3.79	3.83
61 +	4.10	4.43	4.47	4.52	4.56
Uniform Rates			**Rate (per HCF)**		
Commercial/Multi-Family	$2.89	$3.12	$3.15	$3.18	$3.21
Landscape/Schools/Industry	3.07	3.31	3.34	3.37	3.41
Pumping Charge (per lift)	0.13	0.14	0.14	0.14	0.15
Well Water	1.58	1.71	1.73	1.75	1.76

Note
(1) FY 2015/16 proposed rates effective July 1, 2015. Future rate adjustments to be effective July 1st.

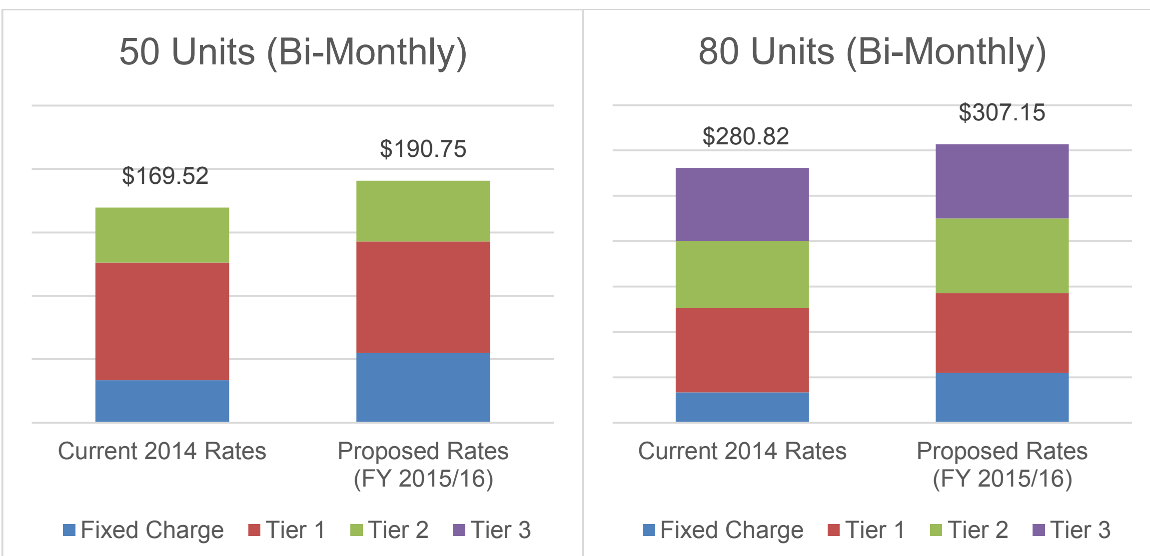


Figure ES.6 Rate Impacts for Single-Family Users

Chapter 1

INTRODUCTION

1.1 BACKGROUND

Water service for the City of Simi Valley (City) area is provided by the Ventura County Waterworks District No. 8 (District), which is managed by the City's Public Works Department and City Council that serves as the Board of Directors for the District. The District currently delivers over 900 million cubic feet of potable water per year, or approximately 23,000 acre feet, to residential, commercial, and industrial customers in the region.

The District retained Carollo Engineers for a Waterworks Facilities Assessment and Cost of Service Study for two primary efforts:

1. Assess the District's waterworks assets to identify the rehabilitation and replacement (R&R) needs of the facilities, and
2. Based on the needs identified by the facilities assessment, conduct a water revenue and rate study for Fiscal Years (FY) 2014/15 through 2024/25.

The facilities assessment included an asset management-based approach to condition and risk assessment of above-ground water facilities, a statistical model for the risk and remaining useful life of below-ground water pipelines, and development of projects and cost estimates for asset rehabilitation and replacement. The water revenue and rate study included a comprehensive cost of service and rate design analysis culminating in the development of a ten-year financial plan and a proposed cost-based revision of water user charges for the next five years.

1.2 REPORT OVERVIEW

Chapter 2 presents the findings and recommendations of the Facilities Assessment task. This task included determining the inventory, condition, value, and future R&R needs of the District's existing Waterworks Facilities assets. These assets varied from above-ground assets, such as water storage tanks and pumping equipment, to below-ground assets, primarily distribution system piping. An approach based in industry-standard asset management methodologies was used to assess these varied assets, with expertise applied according to the physical nature of the asset. Capital Improvement Program (CIP) projects were recommended for the five-year and twenty-year timeframes. The five-year timeframe includes explicit recommendations, whereas the twenty-year timeframe features estimated R&R costs per year based on projected needs developed using the asset management models. Finally, a hundred-year forecast was developed to examine the full replacement cycle of the District's assets, many of which are buried pipes with a life expectancy exceeding 100 years.

Building on the foundation of the Facilities Assessment, Chapter 3 presents the findings and recommendations of the Cost of Service Study. The primary purpose of a cost-of-service analysis is to provide a rational basis for distributing the service costs to each customer class in proportion to the demands they place on the system, and consistent with the cost of service and proportionality requirements of Article XIII D, Section 6 of the California Constitution (referred to in this Report as "Proposition 218"). In addition, the Report provides the supporting documentation required by Proposition 218 and related legal provisions.

This task included an in-depth evaluation of the District's existing water revenues and rates, expenditures, customer usage characteristics, capital funding alternatives, and additional future drivers of service costs and revenue. Chapter 3 documents the methodology and assumptions used to develop the financial plan, the fiscal policy decisions that were made, the proposed water rates, and the customer bill impacts.

Chapter 2

FACILITIES ASSESSMENT

2.1 INTRODUCTION

In the spring of 2014, the Ventura County Waterworks District No.8 (District) initiated a Facilities Assessment and Costs of Service Study in order to develop a defensible basis for prioritizing capital projects and for analyzing the current water rates and fees. This chapter presents and summarizes the findings of the Facilities Assessment task, which involved definition of the existing waterworks assets, assessment of their R&R needs using industry-standard asset management methodologies, and development of recommended projects for the five- and twenty-year timeframes.

The District's objectives for the Facilities Assessment included the following:

Evaluate

- Evaluate and update the District's existing asset inventory with accurate information.
- Assess the current condition of the District's above-ground assets and evaluate the estimated remaining useful life of **below ground assets.**

Prioritize

- Develop a list of recommended rehabilitation and replacement (R&R) projects with cost estimates for above- and below-ground assets.
- Prioritize the R&R efforts through a risk based approach using vulnerability (likelihood of failure) and criticality (consequence of failure) scores.

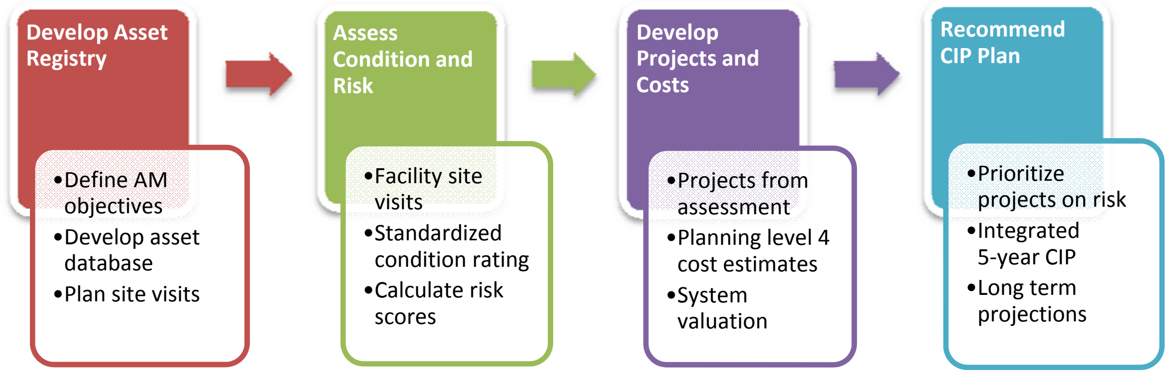
Plan

- Incorporate the results of the facilities assessment and previous planning efforts into an encompassing CIP plan for all above-ground and below-ground assets.
- Develop projections of long term asset R&R needs to support financial planning and policy decisions.

2.2 APPROACH

2.2.1 Overview

The approach for the facilities assessment followed standard asset management methodologies for risk assessment and R&R project prioritization. The following diagram illustrates the steps were used in the development of the facilities assessment, and are described in detail in this chapter:



2.2.2 Asset Registry

Using multiple references provided by the District, Carollo Engineers (Carollo) compiled an inventory of above-ground assets with the appropriate level of detail for visual condition assessment and development of system-wide capital planning projects. An "asset" was defined as a complete physical component of a facility that enables service to be provided, is critical to water system operations, and/or has a value greater than $10,000. Assets were classified by site type, site location, and type of assets within each facility. Carollo reviewed the history of replacements and major rehabilitations with District staff and identified data gaps or areas of uncertainty for focus during the field assessment. Where possible, existing references were used to identify design and sizing criteria, age, capacity, and other information prior to the assessment.

2.2.3 Asset Risk

Risk of an asset is a measure of the impact of asset failure on the overall system. By quantifying and assessing the risk of failure or inability of an asset to meet its intended function, rehabilitation and replacement (R&R) projects can be selected and implemented to mitigate the risk. The following sections describe the calculations used to estimate risk for both above and below-ground assets.

2.2.3.1 <u>Vulnerability</u>

The vulnerability metric reflects the "likelihood of asset failure." Failure can occur from physical failure, performance failure, or technological obsolescence. The vulnerability of an asset is inversely proportional to the Evaluated Remaining Useful Life (EvRUL), which is determined as part of the condition assessment. The vulnerability expresses the likelihood of failure of an asset in the next year. Details on how vulnerability was estimated for above- and below-ground assets can be found in Sections 2.3.2 and 2.4.2, respectively.

2.2.3.2 Criticality

The criticality scoring system divides probable "consequences of failure" into three categories:

- Public Health and Safety
- Financial Impact
- Service Delivery and Effect on Customers / Public Confidence

The criticality scoring scale used in the assessment of each facility is shown in Table 2.1. This scale is adopted from the *International Infrastructure Management Manual, New Zealand National Asset Management Steering Group, and the Institute of Public Works Engineering of Australia* (2011). Typically, criticality matrices include a fourth category, Effect on the Environment. District staff determined that this category was not sufficiently applicable to the Waterworks assets to include in this analysis.

The criticality of an asset is the sum of the score from each of the three categories multiplied by the category weighting factor. Because the approach for below-ground assets included pipe size and geospatial factors, additional details on the criticality methodology for below-ground assets can be found in Section 2.4.3.

Table 2.1 Criticality Matrix

Level of Service / Criticality Category	Weight	Negligible = 1	Low = 4	Moderate = 7	Severe = 10
Health and Safety for Public and Employees	25%	No injuries or adverse health effects	No lost-time injuries or medical attention	Lost-time injury or medical attention	Loss of life
Financial Impact	25%	Absorbed within budget line item < $5,000	Absorbed within current budget and under GM signature $5,000 to $125,000	Requires Board approval $125,000 to $500,000	May require new borrowing, or impact rates > $500,000
Service Delivery and Effect on Customers / Public Confidence	50%	No impacts on service delivery or customers	Minor disruption	Short-term impact &/or substantial disruption	Long-term impact &/or area-wide disruption

2.2.3.3 Risk

Just as risk is expressed in economics as the product of chance and cost, risk is calculated in this analysis as the product of the likelihood of failure and the consequence of the failure, or:

Risk = Vulnerability x Criticality

At a minimum, assets with higher risk ratings should be closely monitored and targeted for corrective or preventative action, including maintenance, rehabilitation, or replacement.

2.3 ABOVE-GROUND ASSET ASSESSMENT

2.3.1 Above-Ground Overview

The term “above-ground asset” refers to any structure, equipment, or site work owned and operated by the District and meeting the definition of an asset given in Section 2.2.1. The Waterworks facilities are comprised of 43 water storage reservoirs, 22 pump stations, two well sites, two storage buildings, and one water treatment plant. Above-ground assets were divided into six site types for organizational purposes: water storage tanks, pump stations, wells, turnouts, treatment facilities, and storage buildings. Each of the unique assets within the sites was evaluated for current condition and estimated remaining useful service life.

2.3.2 Above-Ground Vulnerability

The field effort consisted of visual condition assessments conducted by a multi-disciplinary engineering team. The team included an assessment coordinator who directed the process, a project engineer who took photographs and supported the discipline engineers, and senior discipline engineers with structural, mechanical, and electrical expertise. The assessment team visited each of the facilities and inspected all of the major assets at each location. The team also interviewed operations and maintenance (O&M) personnel while at the sites for information regarding asset history and performance.

The team verified design and sizing criteria for each asset and noted typical condition parameters. These condition parameters can be used to standardize the procedure for future assessments. The discipline engineers evaluated the condition of each asset on a one-through-five score, based on the International Infrastructure Management Manual (IIMM). In the IIMM, condition is expressed in terms of the amount of rehabilitation needed to bring an asset to like-new (perfect) condition. The definitions for the one-through-five condition scoring system from the IIMM are shown in Table 2.2.

Table 2.2 Condition Scoring Definitions

Condition Score	Descriptive Definition	Amount of Repair Needed
1	Very good	0
2	Minor defects	0 - 10%
3	Requires Significant Maintenance	11 - 20%
4	Requires Rehabilitation	21 - 40%
5	Unserviceable	>= 50%

2.3.2.1 Condition Assessment Findings

Visual condition assessments were conducted on May 6 and 7, and June 4 and 9, 2014. In general, facilities were found to be well maintained and in better than expected condition, given the overall age of the system. Figure 2.1 shows the number of above-ground assets assigned each of the condition scores. A majority of the assets were assigned a condition score of 2, which indicates that there were very few defects found throughout the water system. There was one asset assigned a condition score of 5, a motor at the Tapo Street Pump Station, which is currently in the District's CIP for complete pump station replacement. Many of the assets with a condition score of 4 are also planned for replacement in the near-term CIP. Details can be found in Appendix A. Significant findings are summarized in the sections below for each of the facility site types.

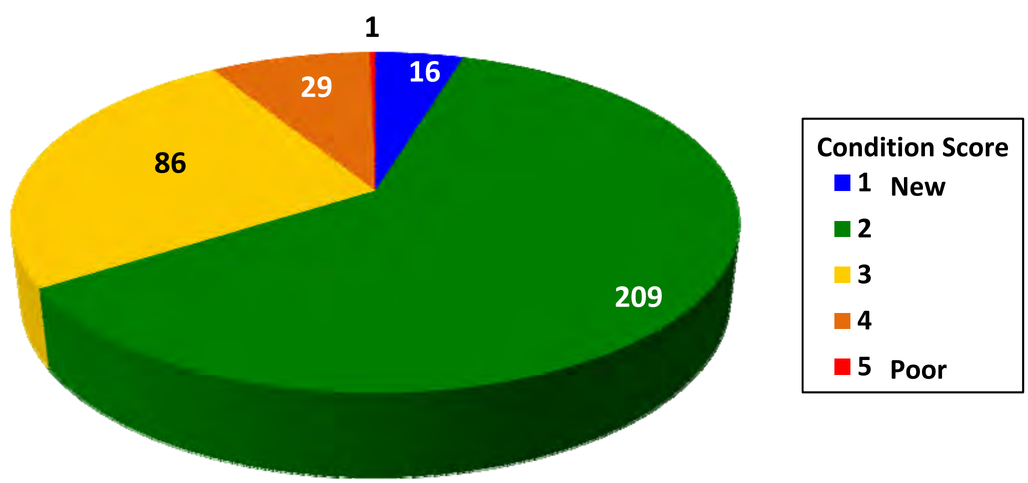


Figure 2.1 Number of Above-Ground Assets by Condition Score

Water Storage Tanks

The majority of condition issues noted for tanks relate to seismic concerns. Details for each of the tank sites can be found in Appendix A, and tabulated recommendations can be found in Section 2.5.1. Major findings are summarized as follows:

- Approximately 30 tanks were observed to be unanchored with additional seismic analysis being required to determine any additional retrofit needs. For each of these, a tank evaluation is recommended to determine if anchorage should be present, if the tank shell is adequate, and if the roof structure is adequate given the current tank freeboard. Many of the tanks have rigid tank piping connections between the tank shell and the sub-grade that should be replaced with flexible pipe couplings, and voids below the tank perimeter that should be filled with flowable fill material.
- Site stability was also an issue at various tanks, requiring replacement or investigation of the sub-base confining ring. Areas surrounding the tanks were found to require bollards around the tank inlet/outlet piping.
- Other tanks require rehabilitation for corrosion, coating, or sealant issues: this may includes localized blasting and recoating of the wall base around the tank, sealing ring cracks around the perimeter, blasting and replacing corroded bolts and flanges, and/or coating the exterior concrete masonry unit (CMU) retaining wall.
- Many of the tanks require that the level gauge staff be replaced or remarked. Safety issues associated with ladders were discovered on a few tanks, with minor security retrofits being required.
- Approximately seven tank locations were given an overall condition score of 4, meaning that the sites require rehabilitation for significant reasons. These issues are described as follows:
  - Flanagan Tank was noted to be an essential tank with no backup. Significant cracking of the ring wall footing was observed, as well as damage to the anchors, panel distortion to the northwest sidewall, and black tar build up on the inside of the tank. The northeast corner of the site is subsiding and has pavement damage, possibly due to destabilization caused by neighboring property owner.
  - Madera 1 Tank was lifted up off the ring beam so that 30 to 40 percent of the perimeter wall was found to be non-load bearing. Evidence of bottom plate corrosion at the walls was also noted. This tank was likely damaged in the 1994 earthquake.
  - Station 2 Tank was found to have a relatively low diameter to height ratio, which presents a concern for overturning. The overflow pipe and inlet pipe both require retrofit mentioned above as part of the seismic evaluation. Evidence of corrosion repair was noted.

– Station 3 Tank was found to have heavy corrosion at access hatch, the staff indicated that the bottom failed and was repaired previously. There is evidence of repair to the sidewall and a previous leak separate from the bottom failure. The tank was found to have a lack of security at the ladder, and a low diameter/height ratio. The tank was observed to have rigid pipe connection and anchoring issues mentioned above.
– Stow Tanks 2, 3, and 4 were given condition scores of four due to tank walls on all three tanks that have lifted off their base and semi-constrained pipe connections.

Pump Stations

The most significant pump station concerns were related to reported capacity and fire flow constraints at the Cottonwood, Library, Oak Knolls, and Stations 1, 2, and 3 tank sites. Because a hydraulic model was not developed as part of this effort, and the condition assessment could not confirm the concerns, the capacity issues were not factored into the condition ratings for pump station assets. Additional hydraulic analyses of the water system are needed to determine the actions required for these pump stations. Details of the condition assessment can be found in Appendix A. Notable findings not related to the capacity concerns are as follows:

- Bridal Path 1 and 2 have components that were observed to be in poor condition. Bridal Path 1 Pump #1 was out of service and noted to be in poor condition during the site visit, but has since been replaced by the District. The pumps and motors at Bridal Path 2 Pump Station were observed to be in poor condition and the assets are nearing the end of their useful life.
- Flanagan, Mine Road, and Tapo Pump Station motor control centers (MCCs) were noted to be in poor condition, per client feedback. Replacement is recommended at these sites.
- Station 1 Pump Station has a natural gas engine-driven pump in addition to the electric pumps. The District is considering decommissioning the natural gas pumps and replacing them with electric pumps.
- The paving at Station 2 Pump Station was observed to have significant cracking and should be rehabilitated.
- Tapo Street Pump Station Motor #2 was rated as poor condition, and was not running at the time of the site visit. Significant site erosion, as well as a deteriorating gate, should be addressed concurrently with mechanical and electrical issues at the site.
- Wood Ranch Pump Stations 1 and 2 were not operating during the site visits. According to District staff, the sites act as backup pump stations and are rarely used. It is recommended that the need for these sites be addressed in the Water System Analysis (presented in Section 2.6.1.5). If the pump stations are found to be

necessary, then actions should be considered to rehabilitate or replace the pumps that have angle drives at some point in the future.

Wells

Three wells were included in the assessment: Well 31 C, Well 31 D, and Well 32. All three wells were in good condition with no issues except for water quality concerns, which were beyond the scope of this study.

Water Treatment Plant

The water treatment plant, built in 2008, was found to be in good to excellent condition. This treatment plant contains RO membranes that were assigned an OUL of 7 years based on the experience of District staff. This OUL is reasonable as RO membranes typically have a service life between 5 and 10 years depending on various factors including source water quality, pretreatment processes, and maintenance levels. Because the RO membranes are now at or beyond their recommended useful life, replacement is recommended within the near term CIP.

Storage Buildings

The Stearns Storage Site was found to be in fair condition. The Walnut Storage Site was not assessed by the Carollo team, but staff reported no condition issues of concern.

2.3.2.2 Remaining Useful Life Calculations

The following sections detail the approach for using current condition to calculate remaining useful life for above-ground assets, which in turn is used to calculate vulnerability. The values calculated for each asset can be found in Appendix A.

Original Useful Life

Original Useful Life is the number of years an asset is expected to be in service as a function of asset type (i.e., mechanical, structural, electrical, instrumentation and control). The Original Useful Life estimates for different types of assets are presented in Table 2.3. These estimates were based on industry standard guidelines (e.g., American Water Work Association (AWWA), Water Environment Federation (WEF), American Society of Civil Engineers (ASCE), and the International Infrastructure Management Manual (IIMM)).

Table 2.3 Estimated Useful Life Based on Asset Category

Asset Category	Original Useful Life[1]
Civil/Sitework	**50**
Paving/Fencing	15
Structural	
General/Other	50
Concrete	50
Fiberglass	25
Steel	25
Plastic	10
Mechanical	
General/Other	20
Valves	35
Pumps	20
Chemical Equipment	15
Coolers/ACs/Fans	15
Reverse Osmosis Units	7
Electrical	**30**
Motors	20
MCCs	30
Cathodic Protection	20
Instrumentation	**15**

Note:
(1) These defaults are based on values from the International Infrastructure Management Manual (IIMM), Edition 2006, USEPA guides, other industry references, and Carollo project experience.

Evaluated Remaining Useful Life

The EvRUL is based on the current condition of the asset and is the estimated remaining number of years until the physical failure of the asset. EvRUL does not take into account the actual age of the asset; rather it reflects an estimate of remaining useful life based on the observed condition alone. EvRUL was calculated as:

$$(1 - \text{Condition Fraction}) \times \text{Original Useful Life}$$

Condition fractions are shown in Table 2.4. The relationship between condition ranking and condition fraction reflects the logic that once an asset deteriorates to a below-average condition, its probability of failure increases and its remaining years in service decline more rapidly than for assets that are maintained in good condition.

Table 2.4 Asset Condition Fraction

Condition as Defined in Table 3.1	Condition Fraction
1	0
2	0.10
3	0.20
4	0.40
5	0.90

Vulnerability Summary

The highest vulnerability assets were those that have a poor condition and short original useful life. Table 2.5 shows the highest risk above-ground assets, which also have the corresponding highest vulnerability scores, ranging from 0.67 to 5.0 on an adjusted 10 point scale (used to match the criticality 10 point scale). Complete vulnerability scores can be found in Appendix A.

Table 2.5 Highest Risk Above-Ground Assets

Site/Asset	Criticality	Vulnerability	Risk
Tapo Street Motor #2	4.75	5.00	23.75
Water Treatment RO Membrane P1	5.5	2.38	13.1
Water Treatment RO Membrane P2	5.5	2.38	13.1
Flanagan Tank	10	0.67	6.67
Madera 1 Tank	10	0.67	6.67
Station 3 Tank	10	0.67	6.67
Stow Tank #2	10	0.67	6.67
Stow Tank #3	10	0.67	6.67
Stow Tank #4	10	0.67	6.67
Station 2 Tank	9.25	0.67	6.17
Well 31 Tank	9.25	0.67	6.17
Water Treatment Cartridge Filter (2)	3.25	1.59	5.16
Hilltop Tank	10	0.50	5
Mellow Lane Tank	10	0.50	5
Rocketdyne Tank	10	0.50	5
Stearns Tank South	10	0.50	5

2.3.3 Above-Ground Criticality

In general, assets with the highest criticality scores were either tanks, due to their high cost and substantial consequence of failure on health and safety, or electrical assets such as motors and MCCs, which have a high health and safety factor due to hazards associated with troubleshooting these assets. A subset of criticality scores for the highest risk assets is included in Table 2.5. Complete criticality scores can be found in Appendix A.

2.3.4 Above-Ground Risk

As described above, the vulnerability and criticality scores were multiplied to obtain a measure of risk. Risk scores for all above-ground assets can be found in Appendix A. A summary of the highest risk above-ground assets within the water system is presented in Table 2.5.

2.4 BELOW-GROUND ASSET ASSESSMENT

A desktop analysis of the below-ground assets was conducted using GIS data provided by the District. As with above-ground assets, this analysis was conducted using estimates of vulnerability and criticality to produce a metric of risk. The following subsections detail the approach and findings.

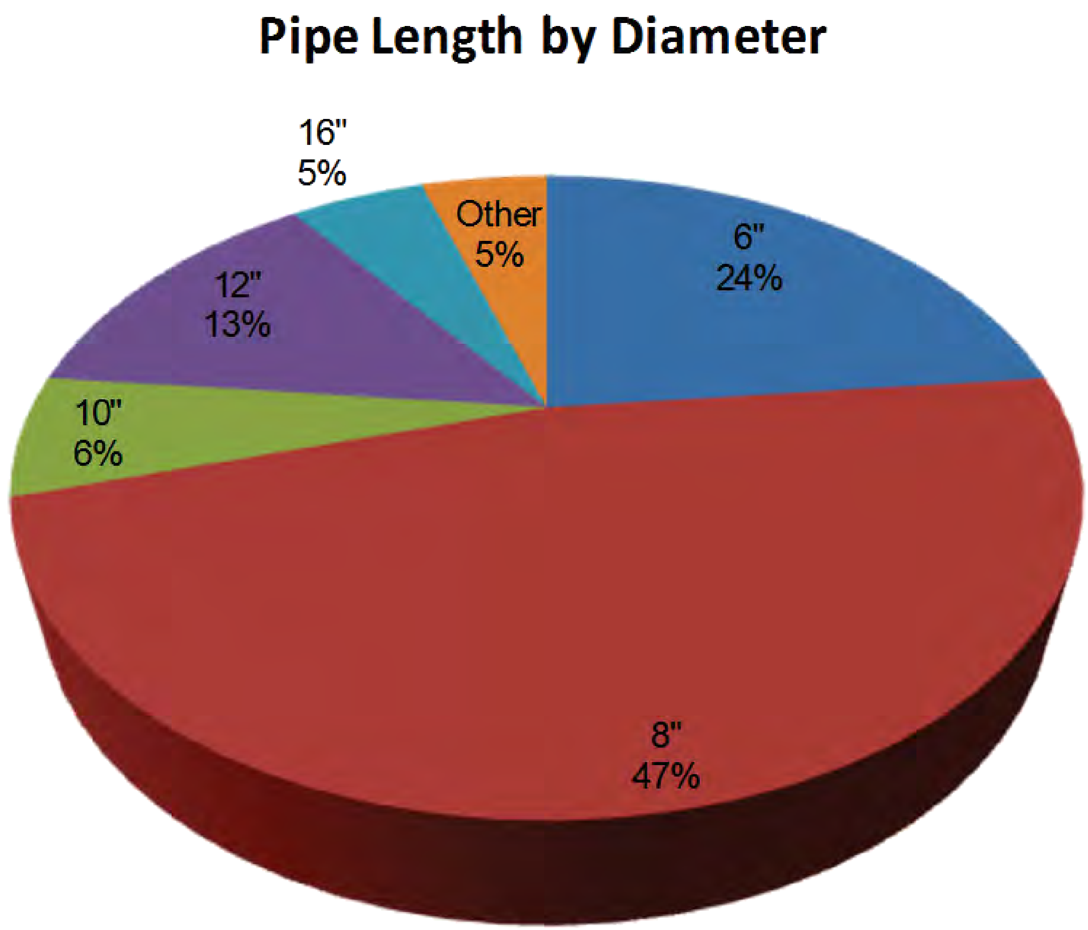
2.4.1 Below-Ground Overview

Figures 2.2, 2.3, and 2.4 show the distribution system by diameter, material, and decade of installation, respectively. These figures show that a majority of the system is eight-inches in diameter, made mostly of asbestos cement pipe (ACP), and has an average installation year of roughly 1960 to 1969.

2.4.2 Below-Ground Vulnerability

The useful life of pipes varies based on several factors other than pipe age and material, but these other factors are often difficult to quantify. Factors affecting pipe failures include:

- Pipe bedding that is substandard.
- Loading from traffic above pipes in the street.
- High groundwater levels.
- Freeze and thaw action of surrounding soils.
- Soil conditions and corrosivity.
- Construction methods, primarily poor quality work.
- Pipe lining issues.
- Level of and need for cathodic protection.
- Operating beyond recommended limitations of material.



DISTRIBUTION SYSTEM BY DIAMETER

FIGURE 2.2

CITY OF SIMI VALLEY
WATERWORKS FACILITIES ASSESSMENT AND COST OF SERVICE STUDY

carollo

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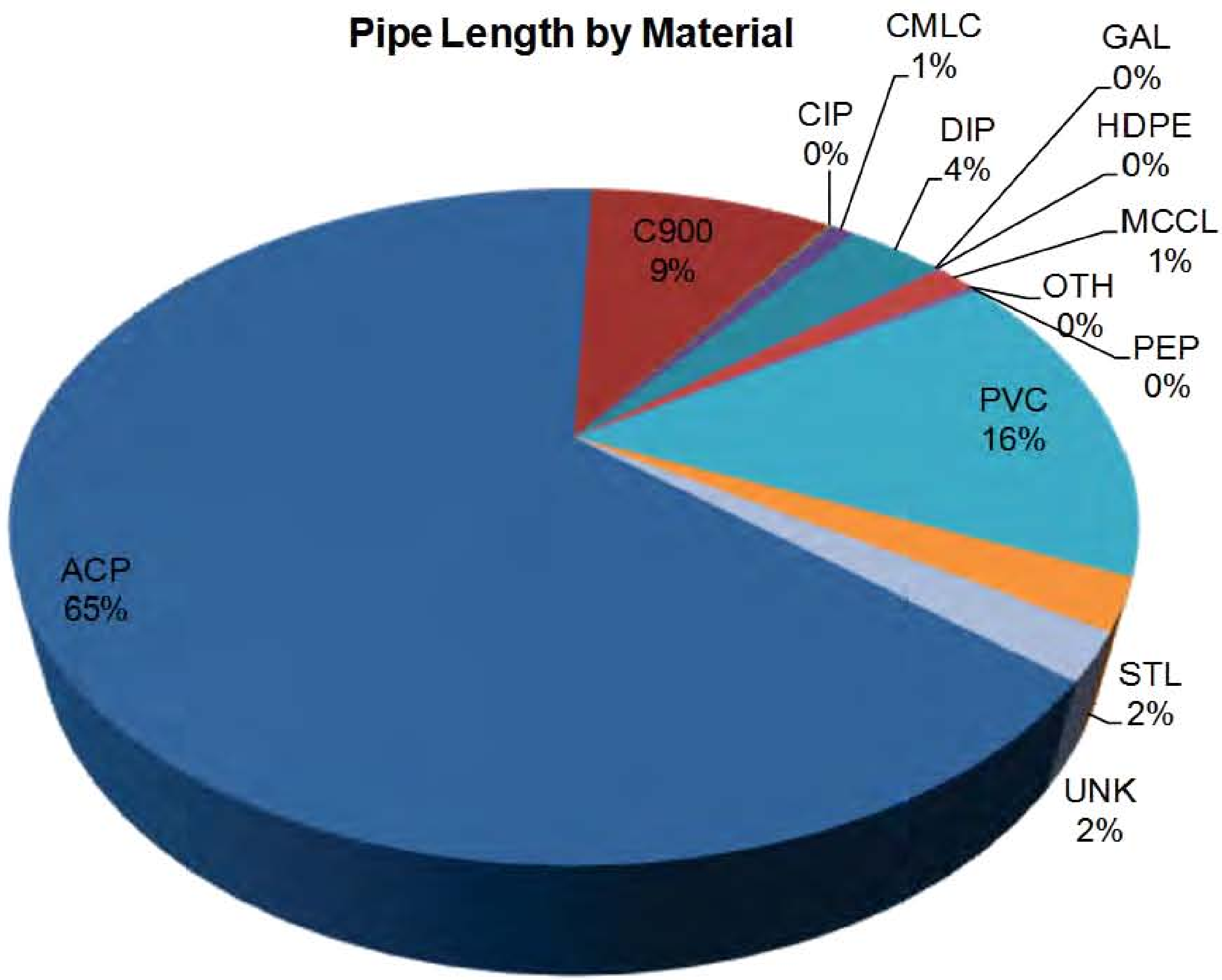

DISTRIBUTION SYSTEM MATERIAL

FIGURE 2.3

CITY OF SIMI VALLEY
WATERWORKS FACILITIES ASSESSMENT AND COST OF SERVICE STUDY

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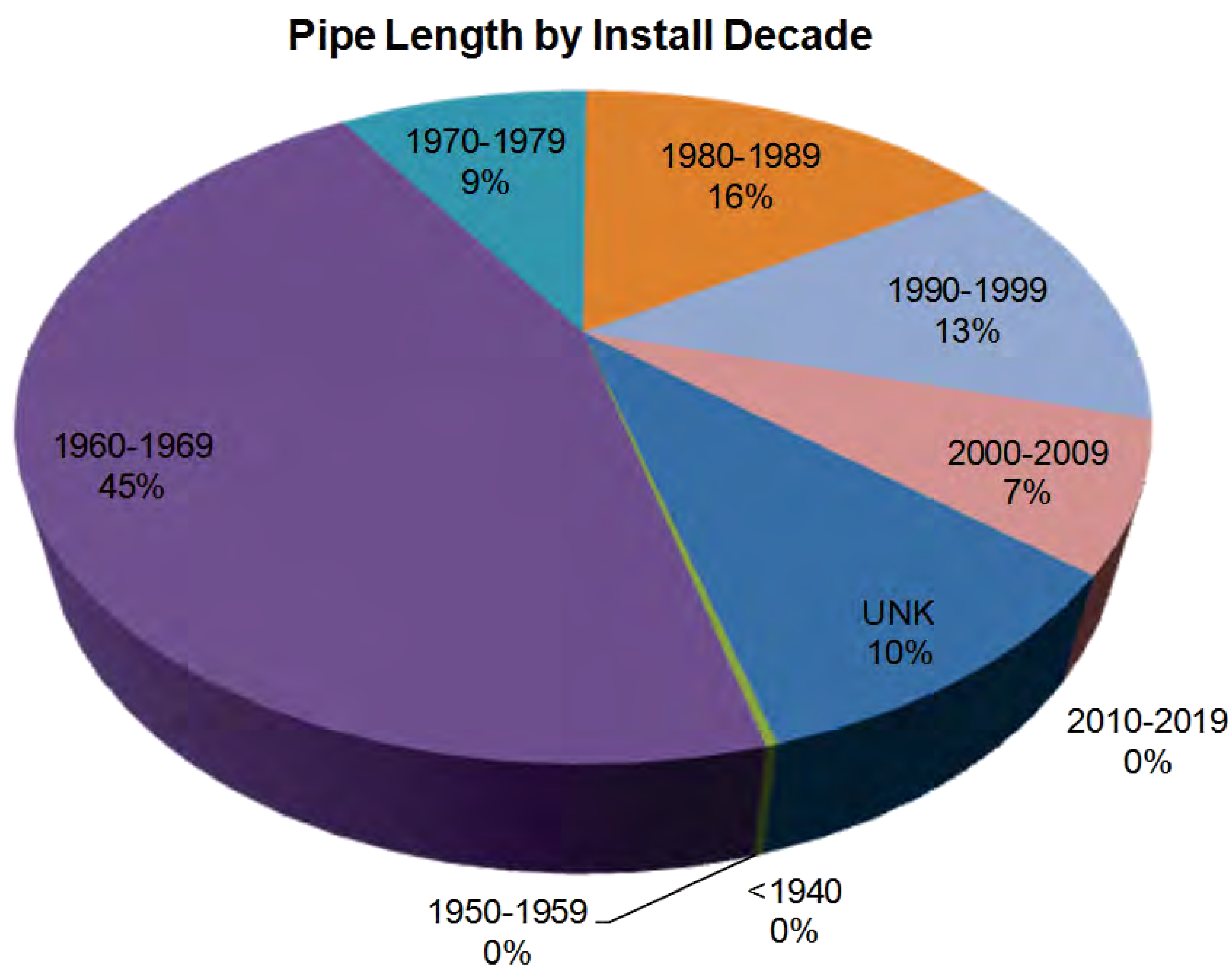


DISTRIBUTION SYSTEM AGE

FIGURE 2.4

CITY OF SIMI VALLEY
WATERWORKS FACILITIES ASSESSMENT AND COST OF SERVICE STUDY

Because the useful life of a pipeline asset depends upon a large variety of factors that are often not well defined (or understood), pipeline age is often used as an indicator of condition and therefore remaining life. Remaining useful life was calculated based on year of installation, as reported in the GIS dataset, and the OUL values shown in Table 2.6. A map of vulnerability is shown in Figure 2.5.

Table 2.6 Original Useful Life for Water Mains

Water Pipe Material	Time to First Failure (years)(1)	Replacement Curve (years)(2)	Useful Life Input to Model
Asbestos Cement Pipe (ACP)	60	60	90
Cast Iron Pipe (CIP)	40	30	55
Cement Mortar Lined & Coated Steel Pipe (CMLC)	70	60	100
Concrete Cylinder Pipe (CCP)	70	20	80
Ductile Iron Pipe (DIP)	50	50	75
Galvanized Steel Pipe (GALV)	40	20	50
Polyvinyl Chloride Plastic (PVC)	70	90	115
Reinforced Concrete Pipe (RCP)	60	30	75
Steel Cylinder Pipe (SCP)	70	20	80
Unknown Material (UNK)	70	30	85
Steel Pipe (STL)	70	20	80
Polyethylene Pipe (PEP)	70	50	95
High Density Polyethylene Pipe (HDPE)	70	90	115
AWWA C900 Polyvinyl Chloride Pipe (C900)	70	90	115
Other (OTH)	70	30	85

Notes:

(1) "Time to first failure" refers to the number of years after installation at which replacements are expected to begin.

(2) "Replacement curve" is the duration of the replacement era, beginning at time to first failure. Failures are normally distributed within the replacement curve duration.

2.4.3 Below-Ground Criticality

Criticality rankings were assigned to the District's linear assets based on the methodology described below. While the criticality scoring system was structured similar to that used for above-ground assets, specific criteria were developed for each of the below-ground asset systems. Adjustments to the rankings were established in collaboration with District staff during a Facilities Assessment Workshop. The criticality matrix applied to below-ground assets is presented in Table 2.7. A map of the water pipeline criticality is shown in Figure 2.6.

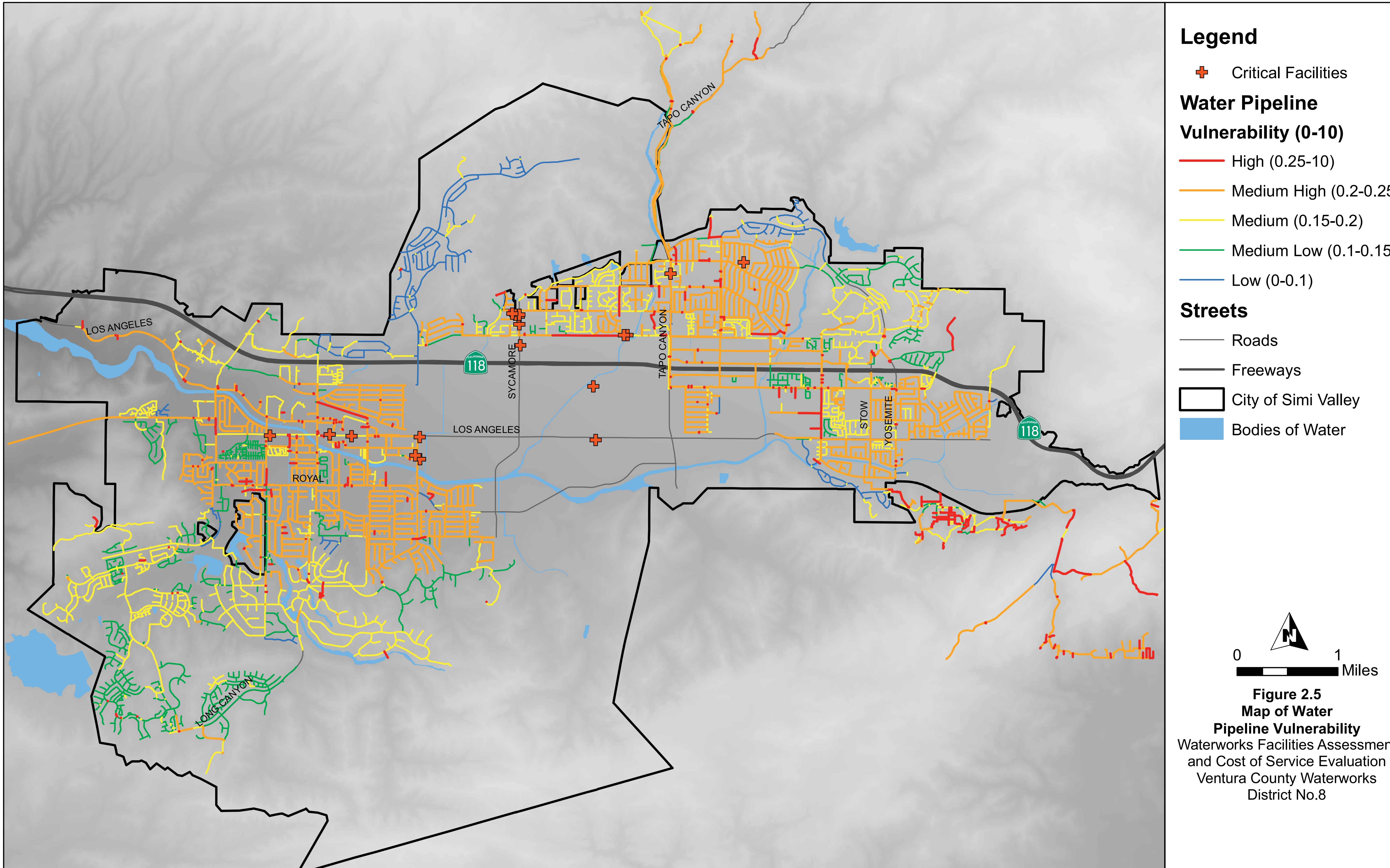


Figure 2.5
Map of Water
Pipeline Vulnerability
Waterworks Facilities Assessment
and Cost of Service Evaluation
Ventura County Waterworks
District No.8

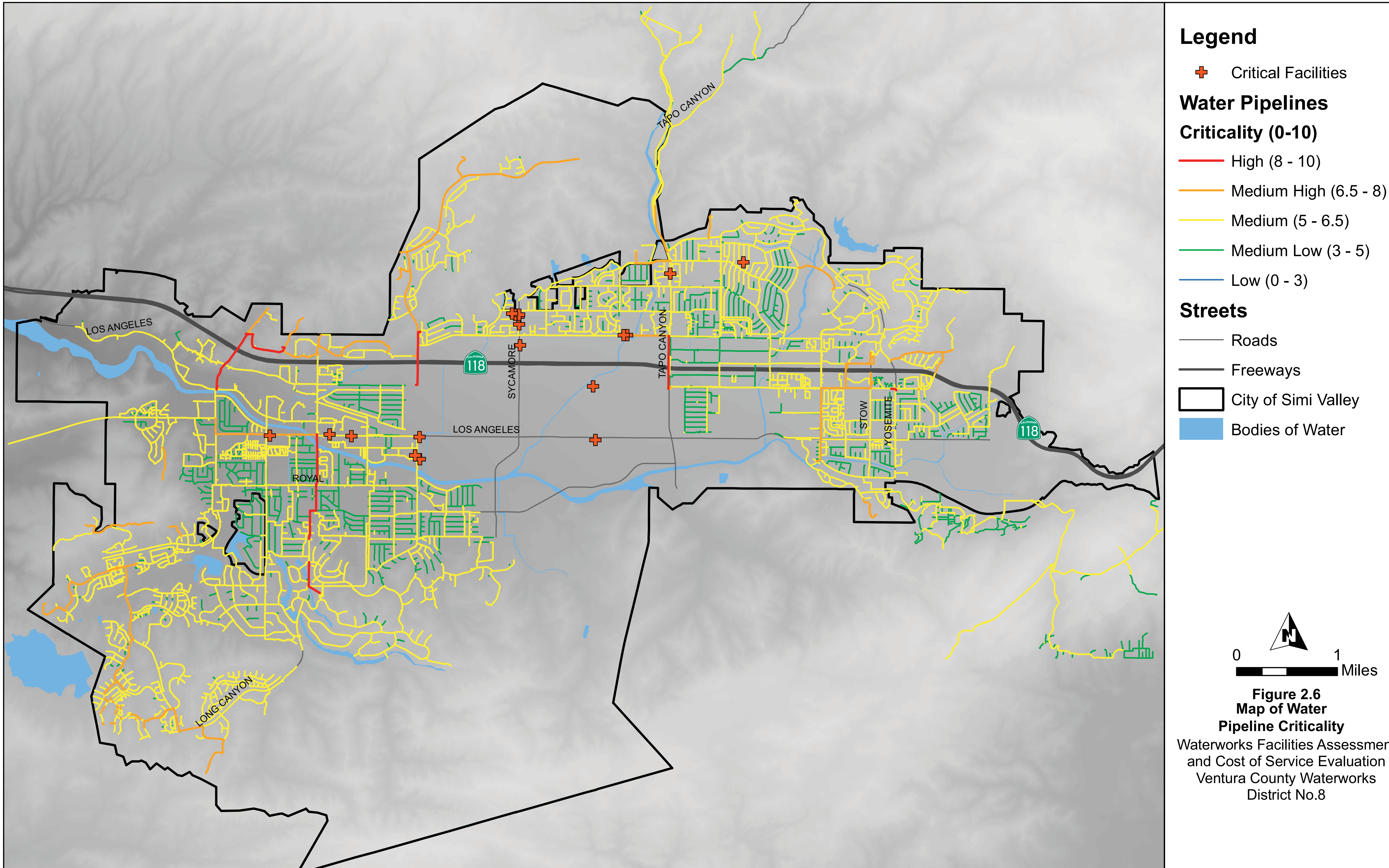


Figure 2.6
Map of Water Pipeline Criticality
Waterworks Facilities Assessment and Cost of Service Evaluation
Ventura County Waterworks District No.8

Table 2.7 Criticality Ranking Scale

Water Infrastructure Failures				
Criticality Category	**Weight**	**Description**	**Ranking**	**Water Pipe Event**
Health and Safety of Public and Employees	25%	No injuries or adverse health effects.	1	No pipes.
		No lost-time injuries or medical attention.	4	Pipes 6" and smaller.
		Potential for lost-time injury or medical attention.	7	Pipes larger than 6" and up to 16". Pipes within 1000-foot buffer around critical facilities.
		Potential loss of life.	10	Pipes larger than 16".
Financial Impact	25%	< $5,000	1	No pipes.
		$5,000 to $125,000	4	Pipes 12" and smaller.
		$125,000 to $500,000	7	Pipes larger than 12" and up to 18".
		> $500,000	10	Pipes larger than 18".
Service Delivery and Effect on Customers / Public Confidence	50%	No impacts on service delivery or customers.	1	No pipes.
		Minor disruption.	4	Pipes 6" and smaller
		Short-term impact and/or substantial disruption.	7	Pipes larger than 6" and up to 16". Pipes within 1000 feet. Buffer around critical facilities.
		Long-term impact and/or area-wide disruption.	10	Pipes larger than 16".

2.4.4 Below-Ground Risk

Risk is the product of the vulnerability and criticality rankings. The vulnerability and criticality values were calculated for buried assets utilize the same methodology that was used for above-ground assets. By using the same methodology, the District can better evaluate the risk of pipeline-related assets as compared to treatment or other above-ground assets.

Figure 2.7 is a map of the District with the pipelines color-coded to show the relative risk scores of the water system. The breakpoints between levels of risk were modified to better illustrate the water pipelines with different risk scores, with the highest risk score representing pipes between 2.5 and 40, on a 100-point scale, and the lowest score for pipes between 0 and 0.1. As shown, the few segments with the highest risk score are typically the older pipes that serve as the backbone of the system and provide water supply from the turnouts. The high risk assets risk should be targeted for further inspection and condition assessment, in order to determine a plan for ongoing maintenance and future rehabilitation or replacement.

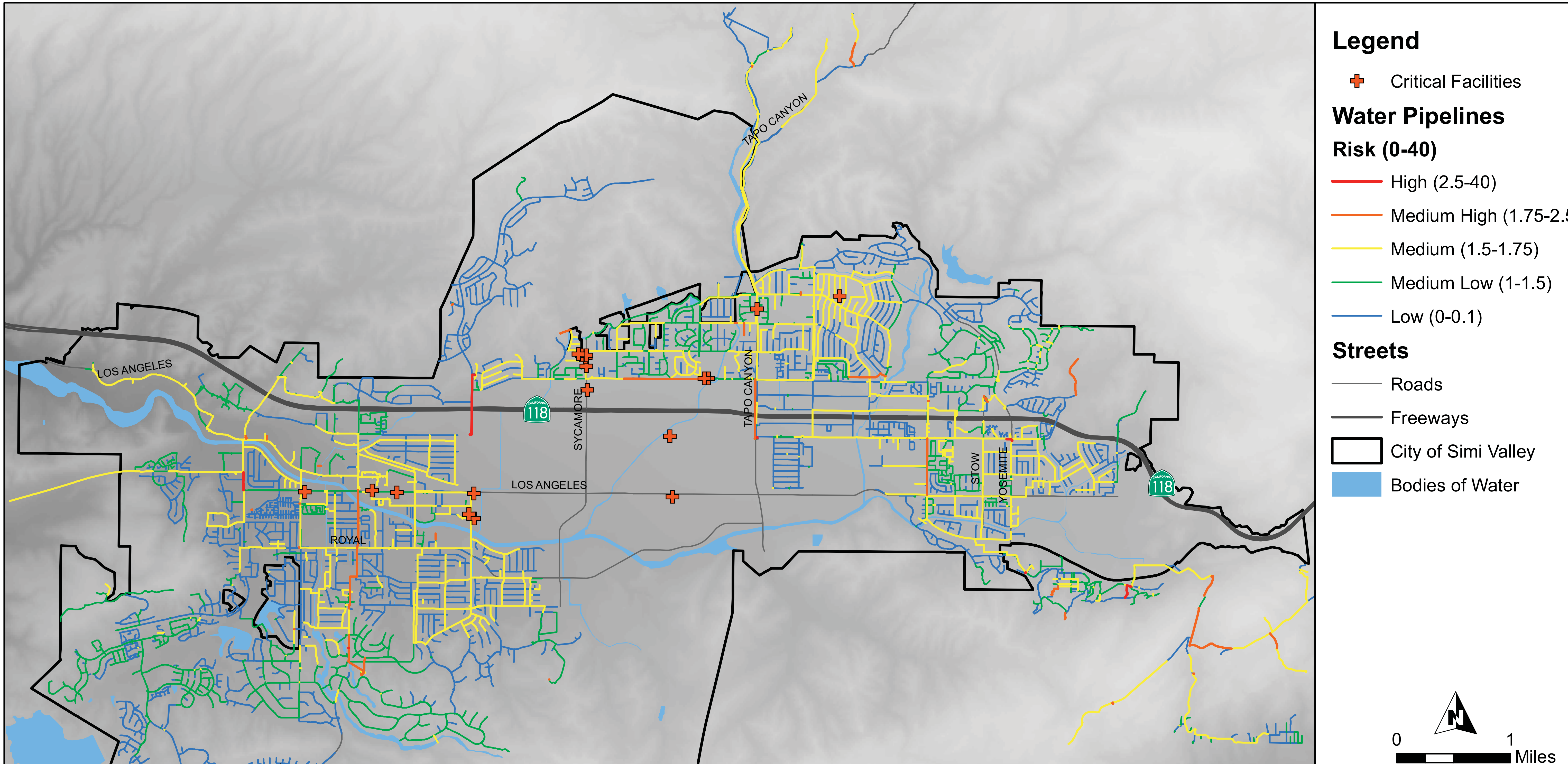


Figure 2.7
Map of Water Pipeline Risk
Waterworks Facilities Assessment and Cost of Service Evaluation
Ventura County Waterworks District No.8

2.5 REPLACEMENT COST ESTIMATES

2.5.1 Methodology

Two types of costs are presented in this report. The first type is estimates for specific rehabilitation projects recommended based on the condition assessment findings. The second type of costs is the replacement cost estimates for individual assets, which are shown in Appendix A.

The following are the assumptions for the replacement cost estimates:

1. Both types of costs are presented as current value based on an Engineering News Record Construction Cost Index (ENR CCI) number of and are categorized as "Class 5" estimates by the Association for the Advancement of Cost Engineering (AACE) International. Costs are not escalated in future years.

2. The opinion of probable cost was prepared in accordance with the guidelines of the AACE International (the Association for the Advancement of Cost Engineering) for a Class 5 estimate. According to the definitions of AACE International, the "Class 5 Estimate" is defined as:

Class 5 estimates are considered to be planning level estimates with an order of magnitude level of accuracy. Typical accuracy ranges for Class 5 estimates are -20 percent to -50 percent on the low side, and +30 percent to +100 percent on the high side, depending on the technological complexity of the project, and appropriate contingency determination.

Actual project costs will depend on labor and material costs, site conditions, productivity, competitive market conditions, renewal schedules, and other variable factors. Consequently, the final R&R project costs may vary significantly from the estimates presented within this report. It is recommended that the District confirm estimated project costs during preliminary and final engineering for all projects.

2.5.2 Above-Ground Asset Replacement Costs

The replacement cost estimates for individual above-ground assets are estimates of the total project cost to purchase and install similar assets in today's dollars. Replacement values are comprised of both direct and indirect costs.

Unless otherwise noted, direct costs were estimated for in-kind replacement of each asset based on a variety of sources and are the costs directly attributed to the physical make-up of the assets (e.g., site development, materials, site dewatering, facilities, equipment, piping, electrical/ instrumentation/controls, installation and labor, etc.).

Because the asset inventory is comprised only of the important and/or high cost assets, remaining components are accounted for in a factor termed "ancillary support." This factor encompasses items such as sump pumps, seal water pumps, small valves, equipment piping, hoses, etc. The lumped value of these assets is adjusted according to best professional judgment and usually amounts to approximately 20 percent of the sum of the itemized asset costs; therefore, a 20 percent ancillary cost factor is applied to each asset. Indirect costs of 75 percent were then applied, including demolition, general conditions, contractor overhead and profit, sales tax, engineering/legal/administration, and construction management. Therefore, the total cost factor that was applied to the direct, in-kind, asset replacement costs to account for ancillary support and indirect costs was 2.1.

2.5.3 Below-Ground Asset Replacement Costs

The replacement cost estimates for below-ground assets were developed based on unit costs for the water pipelines, which includes a combined cost estimate per lineal foot (LF) for the pipe and any appurtenances such as valves, hydrants, and blow-offs. The unit costs used for development of the below-ground asset replacement costs were verified with District staff based on recent project costs and are shown in Table 2.8.

Table 2.8 Water Pipeline Replacement Unit Costs

Diameter	Replacement Cost/LF
4”	$120
5”	$120
6”	$120
8”	$160
10”	$200
12”	$240
14”	$280
16”	$320
18”	$360
20”	$400
24”	$480
30”	$600

2.5.4 Valuation Summary

Table 2.9 shows the valuation breakdown by facility type for in-kind replacement of water system assets. As is typical of water utilities, the large majority of the asset value is in the water distribution pipelines. Taken as a whole, the District has a large investment of nearly a half billion dollars in its water system, which is significant when considering the ongoing costs to maintain, rehabilitate, and eventually replace the system.

Table 2.9 Valuation Summary

Discipline	Cost	Percentage
Tank Sites	$111,600,000	25.0%
Pump Stations	$14,300,000	3.2%
Wells	$1,300,000	0.3%
Treatment	$5,200,000	1.2%
Pipelines	$314,000,000	70.3%
Water System Total	$446,400,000	100.0%

2.6 REHABILITATION AND REPLACEMENT PROJECTS

The project recommendations for asset rehabilitation and replacement are described below according to the following categories:

- Above-Ground Projects
  - Recommended Tank Site Projects
  - Ongoing Structural Projects for Tank Sites
  - Recommended Pump Station Projects
  - Ongoing Replacement Programs
  - Other Above-Ground Recommendations
  - Previously Scheduled Above-Ground CIP Projects
- Below-Ground Projects
  - Recommended High-Risk Pipeline Projects
  - Ongoing Pipeline Replacement Program
  - Previously Scheduled Below-Ground CIP Projects

2.6.1 Above-Ground Projects

2.6.1.1 Recommended Tank Site Projects

Table 2.10 describes the types of structural and civil/sitework projects that were recommended for the various tank sites. Table 2.11 shows the recommended structural and civil/sitework projects for each tank site and the estimated project costs.

Table 2.10 Recommended Project Types for Tank Sites

Project Type Number	Description
T1	Provide a seismic evaluation of the tank to determine whether anchorage should be provided or not, the adequacy of the tank shell, and adequacy of the roof structure given the current tank freeboard. Based on the results of such an evaluation, tank anchorage and strengthening may be required. Tank anchorage may require installation of a concrete footing and/or soil anchors.
T2	Replace existing rigid tank piping connections between the tank shell and the sub-grade with pipe fittings that have flexible pipe connections that are capable of accommodating ASCE 7, Table 15.7-1 displacements for self-anchored tanks.
T2A	Replace the existing rigid tank connection located between the tank shell and the adjacent tank shell with a connection that has a flexible pipe fitting capable of accommodating ASCE 7, Table 15.7-1 displacements for self-anchored tanks.
T3	Fill in voids below the tank perimeter with a flowable fill material.
T4	Provide a ladder guard at the access ladder.
T5	Replace the overflow pipe connection at the base with one that has an air gap.
T6	Provide bollards around tank inlet/outlet piping.
T7	Provide localized blasting and recoating of the wall base around the tank and reseal the base with a flexible joint sealant.
T8	Replace/remark the tank level gauge staff.
T9	Provide cathodic protection system.
T10	Seal ring footing cracks around the perimeter of the tank.
T11	Replace damaged tank anchors.
T12	Restore exterior surface of existing CMU retaining wall. Remove efflorescence and coat the wall with a compatible waterproofing agent.
T13	Replace/restore tank sub-base confinement with a new confinement ring and additional fill as required around the tank perimeter.
T14	Investigate and repair tank leakage.
T15	Revise site layout, realign piping, and/or a combination of each to provide the flexible pipe fitting with a full range of differential movement.
T16	Replace corroded bolts and blast and recoat corroded flange sections around corroded bolts.

Table 2.10 Recommended Project Types for Tank Sites

Project Type Number	Description
T17	Coat the exterior of the tank.
T18	Replace small section of CMU retaining wall.
T19	Coat exterior piping.
T20	Remove power utility contact from tank.
T21	Realign or reroute the overflow drain line. Re-grade the north side of the site and/or move the fence further to the north. Install retaining walls as required.
T22	Remove irrigation water connection from the tank wall.
T23	Provide a new tank ladder with security cover.
T24	Relocate the overflow further away from the edge of the tank and replace the existing drain box with one of sufficient size.
T25	Replace the drain box cover with new grating.
T26	Replace the interior safety climb on the ladder.
T27	Paint the exterior roof.
T28	Investigate site stability around the tank.
T29	Recoat the interior of the tank.

Table 2.11 Recommended Tank Site Projects for Five-Year CIP

Tank	Projects	Cost
Aerator Tank	T1, T2, T3, T4, T5, T8	$277,500
Alta Vista Tank #1	T2A, T6, T7, T29	$175,000
Alta Vista Tank #2	T2A, T6	$35,000
Big Sky #1	None	$0
Big Sky #2	T8	$5,000
Casual Court	T1, T9	$70,000
Crosby	T1	$50,000
First Street Tank #1	T1	$50,000
First Street Tank #2	T1	$50,000
First Street Tank #3	T1, T2	$142,500
First Street Tank #4	T1, T2	$142,500
Flanagan	T10, T11 (2), T12, T26	$55,000
Greystone	T1, T27	$55,000
Hidden Ranch	None	$0
Hilltop	T1, T3, T9, T29 (Completed)	$0
Lilac	T1, T8, T3, T13, T14 (2)	$225,000
Madera Tank #1	T1, T3, T7, T15, T29	$370,000
Madera Tank #2	T1	$50,000
Marr Ranch Tank #1 West	T1, T8, T29	$155,000
Marr Ranch Tank #2 East	None	$0
McCoy	T1, T9	$50,000
Mellow Lane	T1, T16, T17	$120,000
Mine Road Tank #1	T1, T7, T15	$190,000
Mine Road Tank #2 Small	T14 (2 L) , T15	$130,000
Mt. Sinai	T1, T19	$55,000
Rocketdyne	T7, T18	$45,000
Station 2	T1, T2, T4, T5, T16	$232,500
Station 3	T1, T2, T4, T5, T20	$202,500
Stearns Tank North	T1, T15	$150,000
Stearns Tank South	T1, T15	$150,000
Stow Tank #1	T1, T6, T15	$170,000
Stow Tank #2	T1, T3, T6	$150,000
Stow Tank #3	T1, T3, T6	$150,000
Stow Tank #4	T1, T3, T7	$170,000

Table 2.11 Recommended Tank Site Projects for Five-Year CIP

Tank	Projects	Cost
Thompson	T21	$75,000
Thorn Ridge	None	$0
Treatment Plant - Concentrate Tank	T25	$5,000
Treatment Plant - Finished Water Tank	None	$0
Walnut Tank #1	T1, T6, T8, T22, T28	$85,000
Walnut Tank #2	T9, T22, T28	$30,000
Wood Ranch Tank #1	T1	$50,000
Wood Ranch Tank #2	T1	$50,000
Wood Ranch 5 MG	T1	$50,000
	Total	**$4,217,500**

Note:

(1) Costs shown are planning level estimates in current dollars, July 2014 Los Angeles ENR CCI of 9035.

2.6.1.2 Ongoing Structural Projects for Tank Sites

In addition to the recommended structural projects described above, dive inspection and interior coating projects are recommended to be conducted for the tanks. Dive inspections are recommended for all tanks over the next 10 years. This cost was estimated at $15,000 dollars per tank repeated on a 10-year basis. Therefore, an annual amount of $65,000 was budgeted for dive inspections, with the specific tanks to be inspected to be determined as the timeframe nears. Coating projects were included in the current Waterworks CIP for specific tanks in the first five years of the CIP, so they were not included in the cost estimates for facility assessment projects. The previously budgeted tank coating projects include Alta Vista, Flanagan, Hilltop (completed), Madera 1, Walnut 1, and Walnut 2 Tank Sites.

2.6.1.3 Recommended Pump Station Projects

Table 2.12 shows the projects recommended at the pump stations and the estimated costs over the next 5 years. These efforts include structural, mechanical, and electrical rehabilitation or replacement efforts.

Table 2.12 Recommended Pump Station Projects for Five-Year CIP

Pump Station	Recommendations	Cost
Bridal Path 2 Pump Station	Replace Pumps #1 and #2, and Motors #1 and #2. Provide anchorage of pipe supports to the concrete floor slab.	$214,600
Crosby Pump Station	Restore surface of existing CMU wall at the interior of the pump station. Remove efflorescence and coat the wall with a compatible waterproofing agent. Replace roofing.	$10,000
Flanagan Pump Station	Replace MCC.	$126,000
Library Pump Station	Restore surface of existing CMU wall at the interior. Remove efflorescence and coat the wall with a compatible waterproofing agent. Replace guard railing at the roof.	$10,000
Madera	Replace the concrete pads at the pumps.	$5,000
Mine Road Pump Station	Replace MCC. Replace Pump #1 and Motor #1 with larger pump or otherwise add capacity. Rehab flow meter and paving/fencing. Enclose the pump station within a building.	$176,700
Station 1 Pump Station	Replace Pumps #1 and #2. Remove existing floor finish material and refinish the concrete slab. Blast and coat existing corroded pump cans near grade.	$212,200
Station 2 Pump Station	Replace Pumps #1 and #2. Rehabilitate pump cans as needed. Inject epoxy to seal cracks at the slab and thrust block.	$245,600
Stearns Pump Station	Replace the wood-framed roof with a steel-framed roof. Paint the exterior of the building.	$15,000
	Total	**$1,015,100**

Note:

(1) Costs shown are planning level estimates in current dollars, July 2014 Los Angeles ENR CCI of 9035.

2.6.1.4 Ongoing Replacement Programs

An annual amount is recommended to be budgeted for programs to replace water valves and hydrants, as needed. Per District staff, the valve replacement program is estimated at $131,000 per year, and the hydrant replacement program is estimated at $27,000 per year. These costs have been projected as ongoing rehabilitation and replacement programs.

2.6.1.5 Other Above-Ground Recommendations

Table 2.13 contains additional above-ground project recommendations that are system-wide and should be initiated at earlier stage as they will help to validate the findings of this project. These projects could also lead to the identification of additional project needs:

Table 2.13 Other Above-Ground Projects for Five-Year CIP

Project	Recommendations	Cost
Water System Analysis	Recommended to better determine the hydraulic limitations and needs of the water system. Using a hydraulic model with a recent demand allocation, the storage capacity, pump station capacity, and fire flow demands can be analyzed. This project may result in additional tank and pump station project recommendations. The cost of the study will vary depending on the available data and status of the existing hydraulic model.	$150,000
Seismic Evaluation	A more detailed seismic evaluation is recommended for all tanks. This evaluation would further investigate the seismic projects listed in the report.	$250,000
SCADA Upgrade	Recommended to upgrade the currently outdated SCADA system and software. Improvements to overall system automation, control, and integration should be implemented as part of the upgrade.	$0 (included in WW CIP)
Well Assessment Program	Conduct a more detailed assessment of production and dewatering wells to establish a rehabilitation program, and implement the program to provide reliability, water-quality, longevity, and cost-effectiveness of operation.	$0 (included in WW CIP)
	Total	**$400,000**

2.6.1.6 Previously Scheduled Above-Ground CIP Projects

The District's previously scheduled Waterworks CIP projects for above-ground assets were integrated with the recommended facility assessment projects in order to develop a complete Five-Year CIP for the water system. These projects and costs were provided by District staff and were not validated by Carollo as part of this project. The previously scheduled above-ground projects are shown in Table 2.14.

Table 2.14 Previously Scheduled Above-Ground CIP Projects

Project Name	Year Budgeted	Project Cost
Interior Tank Recoating	2015/16 – 2019/20	$1,430,000
Small Tank Replacements	2015/16	$160,000
Well Rehab Program	2015/16 – 2018/19	$285,000
SCADA Upgrade	2016/17 – 2017/18	$500,000
Emergency Generators	2015/16	$70,000
Crown-Hill Pump Tank System	2015/16 – 2017/18	$2,550,000
Stearns Yard Storage Building	2015/16	$40,000
Walnut Street Pump Station	2015/16 – 2016/17	$556,000
Water Storage Mixing Systems	2015/16 – 2016/17	$140,000
Well 32A Development	2017/18 – 2018/19	$1,000,000
Recycled Water Cost of Service Study	2015/16	$75,000
	Total	**$6,806,000**

Note:
(1) Costs were provided by District staff and have not been verified as part of this project.

2.6.2 Below-Ground Projects

2.6.2.1 Recommended High-Risk Pipeline Projects

As discussed in the risk assessment under Section 2.4.4, there were very few pipes in the highest risk category based on the desktop analysis of the water system pipelines. In addition to the pipeline needs previously identified by the District (and discussed in the following section), it is recommended that District further evaluate the specific needs of the high-risk pipelines shown in Table 2.15. Actual design and construction should be conducted after the need for each project is confirmed in a preliminary design study. Further considerations should be given to include projects that improve reliability and reduce criticality by constructing parallel water mains in places that would enable hydraulic loops, provide fire flow capacity, and potentially serve future customers. The high risk pipelines shown in Table 2.15 have been included in the recommended Five-Year CIP, and should be considered together with the immediate pipeline needs previously budgeted by the District in the Waterworks CIP.

Table 2.15 High-Risk Pipeline Projects for Five-Year CIP

Pipe Type	Average Risk	Linear Feet	Year Budgeted	Project Cost
High Risk Galvanized Steel Pipe on Hilltop Rd. (4" installed 1965)	40.00	23	2017	$10,000
High Risk Cast Iron Pipe on Madera Rd. & Lookout Rock Tr. (6-16" installed 1965)	9.17	1659	2017	$369,000
High Risk Ductile Iron Pipe on Loma Ln., Ash St., Katey Ln., & Leisure Ln. (8-16" installed 1955-1963)	3.06	725	2018	$119,000
High Risk Steel Pipe on Township Ave., Felix Ave., & Sheri Dr. (4-8" installed 1957)	2.72	679	2018	$87,000
			Total	**$585,000**

Note:
(1) Costs shown are planning level estimates in current dollars, July 2014 Los Angeles ENR CCI of 9035.

2.6.2.2 Ongoing Pipeline Replacement Program

While the District has not yet seen a notable increase in the number of water pipeline failures, this trend will be inevitable as the water system ages and the pipelines begin to deteriorate. The current water line replacement program has been primarily driven by capacity and distribution improvement needs, and has generally varied from $150,000 to $400,000 per year. The highest risk pipeline replacements recommended in the prior section are within this range of annual costs.

Projecting further into the future, based on the age of the oldest pipelines reaching 60 years or more, there are likely to be steady increases in the number of pipeline failures and replacements required in the next 5 to 20 year window. Figure 2.8 illustrates a statistical model of the District's water pipeline replacement needs, calculated using GIS data for pipeline diameters, material types, and installation dates, as well as the original useful life estimates discussed in Section 2.4.2. This model projects that the District's pipeline replacement needs over the next 20 years will vary in the general range of $200,000 to $1,000,000 per year. However, beyond the year 2035, there is a projected drastic increase in pipeline replacement costs, ranging annually from $2,000,000 to nearly $6,000,000 over a 50 year period, during which the majority of the District's ACP pipelines will have reached the end of their expected useful lives and will need to be rehabilitated or replaced.

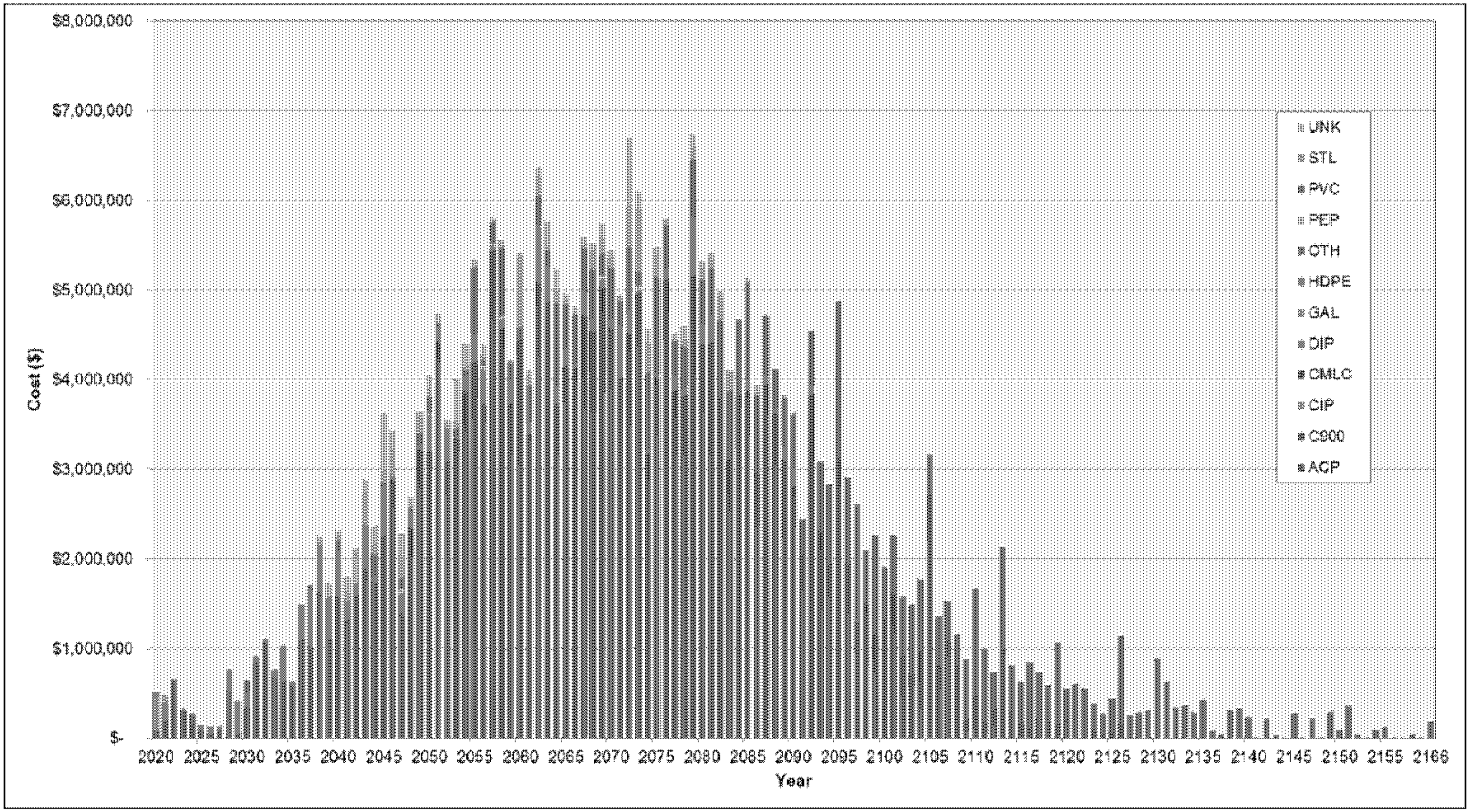


Figure 2.8 Estimated Pipeline Annual Replacement Costs by Material Type

Given the limitations of the statistical model to accurately predict the exact replacement needs, particularly in the long term, it is still useful in illustrating the ongoing need to plan for the eventual rehabilitation and replacement of all of the District's assets. From a broad perspective, with a total replacement value of $314 million, the District would need to spend $3.14 million per year on pipeline replacements, if an average 100-year useful service life is assumed. While it may be unreasonable for the District to immediately start budgeting $3 million per year for pipeline replacements that may not be needed for another 30 years, based on the model results, it is recommended that $1 million per year be targeted in the next 20 years to begin preparing for these needs. The District will also require funds to address water system capacity and reliability issues, in addition to the pipeline rehabilitation or replacement needs. Therefore, a total annual amount of $1,000,000 has been budgeted in year 5 for the water main improvement and replacement program, with more specific pipeline projects identified in years 1 through 4 of the Waterworks CIP, as shown in Table 2.17.

2.6.2.3 <u>Previously Scheduled Below-Ground CIP Projects</u>

The District's previously scheduled Waterworks CIP projects for below-ground assets were integrated with the recommended facility assessment projects in order to develop a complete Five-Year CIP for the water system. These projects and costs were provided by District staff and were not validated by Carollo as part of this project. The previously scheduled below-ground projects are shown in Table 2.16.

Table 2.16 Previously Scheduled Below-Ground CIP Projects

Project Name	Year Budgeted	Project Cost
Water Line Relocation – Box Canyon	2015/16	$40,000
Water Line Replacement – Rollins	2015/16	$105,000
Water Main Improvement / Replacement	2016/17 – 2019/20	$2,200,000
	Total	**$2,345,000**

Note:
(1) Costs were provided by District staff and have not been verified as part of this project.

2.7 CAPITAL IMPROVEMENT PROGRAM RECOMMENDATIONS

2.7.1 Five-Year CIP Recommendations

Table 2.17 shows the summary of the Five-Year Waterworks CIP for fiscal years 2015/16 through 2019/20, combining the recommended projects discussed in this report, with the previously scheduled projects provided by the District. The timing of the projects for the tank sites and pump stations have been determined based on the average risk of the site assets, with the highest risk sites scheduled for the first year, followed by the lower risk tank sites and pump stations in years 2 through 5.

Table 2.17 Five-Year CIP Recommendations

PROJECT	2015-16	2016-17	2017-18	2018-19	2019-20	TOTAL
FACILITIES ASSESSMENT PROJECTS (FA)						
PIPELINES						
High-risk 4" galv. steel on Hilltop (1965)	0	0	10,000	0	0	10,000
High-risk 6"-16" cast iron Madera & Lookout Rock (1965)	0	0	369,000	0	0	369,000
High-risk 8"-16" DI on Loma, Ash, Katey, & Leisure (1955-63)	0	0	0	119,000	0	119,000
High-risk 4"-8" steel on Township, Felix, & Sheri (1957)	0	0	0	87,000	0	87,000
SYSTEM-WIDE						
Tank Dive Inspections	65,000	65,000	65,000	65,000	65,000	325,000
Hydrant Replacement	27,000	27,000	27,000	27,000	27,000	135,000
Valve Replacement	131,000	131,000	131,000	131,000	131,000	655,000
Seismic Evaluation	250,000	0	0	0	0	250,000
Capacity Study	0	150,000	0	0	0	150,000
TREATMENT PLANT						
Concentrate Tank	0	0	0	0	5,000	5,000
RO Membranes	75,000	0	0	0	0	75,000
TANKS						
Station No. 3 Tank	202,500	0	0	0	0	202,500
Flanagan Tank	55,000	0	0	0	0	55,000
Station No. 2 Tank	232,500	0	0	0	0	232,500
Stearns Tank	300,000	0	0	0	0	300,000
Thompson Tank	75,000	0	0	0	0	75,000
Mellow Lane Tank	120,000	0	0	0	0	120,000
Stow Street Tank	0	640,000	0	0	0	640,000
Rocketdyne Tank	0	45,000	0	0	0	45,000
Lilac Tank	0	225,000	0	0	0	225,000
Madera Tank	0	370,000	0	0	0	370,000
Mine Road Tank	0	320,000	0	0	0	320,000
First Street Tank	0	0	385,000	0	0	385,000
Casual Court Tank	0	0	70,000	0	0	70,000
Aerator Tank	0	0	277,500	0	0	277,500
Alta Vista Tank	0	0	210,000	0	0	210,000
Wood Ranch Tank No. 1	0	0	0	150,000	0	150,000
McCoy Tank	0	0	0	50,000	0	50,000
Big Sky Tank	0	0	0	5,000	0	5,000
Crosby Tank	0	0	0	50,000	0	50,000
Mt. Sinai Tank	0	0	0	0	55,000	55,000
Greystone Tank	0	0	0	0	55,000	55,000
Marr Ranch Tank	0	0	0	0	155,000	155,000
Walnut Tank	0	0	0	0	115,000	115,000
Madera Tank	0	0	0	0	50,000	50,000

Table 2.17 Five-Year CIP Recommendations (cont.)

PROJECT	2015-16	2016-17	2017-18	2018-19	2019-20	TOTAL
PUMP STATIONS						
Station No. 2 Pump Sta.	245,600	0	0	0	0	245,600
Station No. 1 Pump Sta.	212,200	0	0	0	0	212,200
Mine Road Pump Sta.	0	176,700	0	0	0	176,700
Stearns Pump Sta.	0	0	15,000	0	0	15,000
Madera Pump Sta.	0	0	5,000	0	0	5,000
Library Pump Station	0	0	0	10,000	0	10,000
Bridal Path 2 Pump Sta.	0	0	0	214,600	0	214,600
Flanagan Pump Sta.	0	0	0	126,000	0	126,000
Crosby Pump Sta.	0	0	0	0	10,000	10,000
Total Facilities Assessment Projects	**1,990,800**	**2,149,700**	**1,564,500**	**1,034,600**	**668,000**	**7,407,600**
REPLACEMENT RESERVE FUND (CIP)						
Interior Tank Recoating	240,000	285,000	275,000	345,000	285,000	1,430,000
Small Tank Replacements	160,000	0	0	0	0	160,000
Water Line Relocation - Box Canyon	40,000	0	0	0	0	40,000
Water Line Replacement - Rollins	105,000	0	0	0	0	105,000
Water Main Impr / Repl	0	200,000	500,000	500,000	1,000,000	2,200,000
Well Rehab Program	80,000	80,000	80,000	45,000		285,000
SCADA Upgrade (New)	0	250,000	250,000	0	0	500,000
Total Replacement Reserve Fund	**625,000**	**815,000**	**1,105,000**	**890,000**	**1,285,000**	**4,720,000**
CAPITAL IMPROVEMENT FUND (CIP)						
Emergency Generators	70,000	0	0	0	0	70,000
Crown Hill Pump-Tank System	500,000	1,500,000	550,000	0	0	2,550,000
Stearns Yard Storage Building	40,000	0	0	0	0	40,000
Walnut Street Pump Station	342,000	214,000	0	0	0	556,000
Water Storage Mixing Systems	90,000	50,000	0	0	0	140,000
Well 32A Development	0	0	500,000	500,000	0	1,000,000
Recycled Water Cost of Service Study	75,000	0	0	0	0	75,000
Total Capital Improvement Fund	**1,117,000**	**1,764,000**	**1,050,000**	**500,000**	**0**	**4,431,000**
TOTAL 5-YR WW CIP	**1,742,000**	**2,579,000**	**2,155,000**	**1,390,000**	**1,285,000**	**9,151,000**
TOTAL CIP AND FA PROJECTS	**3,732,800**	**4,728,700**	**3,719,500**	**2,424,600**	**1,953,000**	**16,558,600**

2.7.2 Long Term Capital Improvement Program Recommendations

The twenty-year CIP is comprised of recurring costs, such as the ongoing tank coating program, as well as future R&R needs. Future R&R needs were calculated based on asset EvRUL for the first replacement, and OUL for subsequent replacements. Table 2.19 shows the summary of the Twenty-Year CIP, which incorporates the Five-Year CIP.

Table 2.18 Twenty-Year Combined CIP

Year	Above-ground Total	Below-ground Total	Total
2015	$3,587,800	$145,000	$3,732,800
2016	$4,528,700	$200,000	$4,728,700
2017	$2,840,500	$879,000	$3,719,500
2018	$1,718,600	$706,000	$2,424,600
2019	$953,000	$1,000,000	$1,953,000
2020	$473,000	$1,000,000	$1,473,000
2021	$473,000	$1,000,000	$1,473,000
2022	$548,000	$1,000,000	$1,548,000
2023	$773,600	$1,000,000	$1,773,600
2024	$923,000	$1,000,000	$1,923,000
2025	$473,000	$1,000,000	$1,473,000
2026	$1,463,300	$1,000,000	$2,463,300
2027	$473,000	$1,000,000	$1,473,000
2028	$10,500,700	$1,000,000	$11,500,700
2029	$15,548,300	$1,000,000	$16,548,300
2030	$2,452,800	$1,000,000	$3,452,800
2031	$507,800	$1,000,000	$1,507,800
2032	$2,981,600	$1,000,000	$3,981,600
2033	$473,000	$1,000,000	$1,473,000
2034	$13,097,500	$1,000,000	$14,097,500

Note:
(1) Costs shown are planning level estimates in current dollars, July 2014 Los Angeles ENR CCI of 9035.

Ongoing projects included in the long-term CIP are:

- **Water Main Improvement and Replacement Program.** As discussed in Section 2.6.2.2, an annual amount of $1,000,000 has been budgeted for water main improvements, rehabilitation, and replacement. These projects should be determined based on the highest risk pipelines and verification of needs to improve water system reliability, address capacity issues, and to rehabilitate and replace deteriorating water mains.
- **Dive inspections and Tank Coatings**. As noted above, a budget of $65,000 is recommended annually for tank dive inspections and cleaning. For coating projects, $250,000 is recommended for annual coating projects following those scheduled in the Five-Year CIP. The specific tanks to be inspected or coated will be determined as the timeframe nears a five year CIP window.
- **Valve and Hydrant Replacements**. An annual amount was budgeted for programs to replace valves as needed and hydrants as needed. Per District staff, the valve replacement program is estimated at $150,000 per year, and the hydrant replacement program is estimated at $27,000 per year.

For the 20-year timeframe, the average annual funding recommended for full lifecycle maintenance of the infrastructure is $3.9 million, for combined above and below-ground assets. In order to examine the full replacement cycle for the Waterworks assets, the above- and below-ground models were extended to a 100-year timeframe, as shown in Figure 2.9 in current dollars. The 100-year average funding requirement for all water assets is approximately $9.2 million per year, more than twice the 20-year average.

Because the District's system is relatively young, and the majority of the below-ground pipeline assets are expected to last approximately 80 to 100 years, the near-term rehabilitation and replacement requirements are much lower than in the long term. Furthermore, these graphs show that the District will likely face significant R&R needs in years beyond the twenty-year CIP. For this reason, proactive planning should be conducted and an ongoing condition assessment program initiated, based on the recommendations provided in this report. The District should also develop policies for budgeting for long-range R&R and/or strategies for mitigating risk in the system as assets deteriorate and eventually require rehabilitation or replacement.

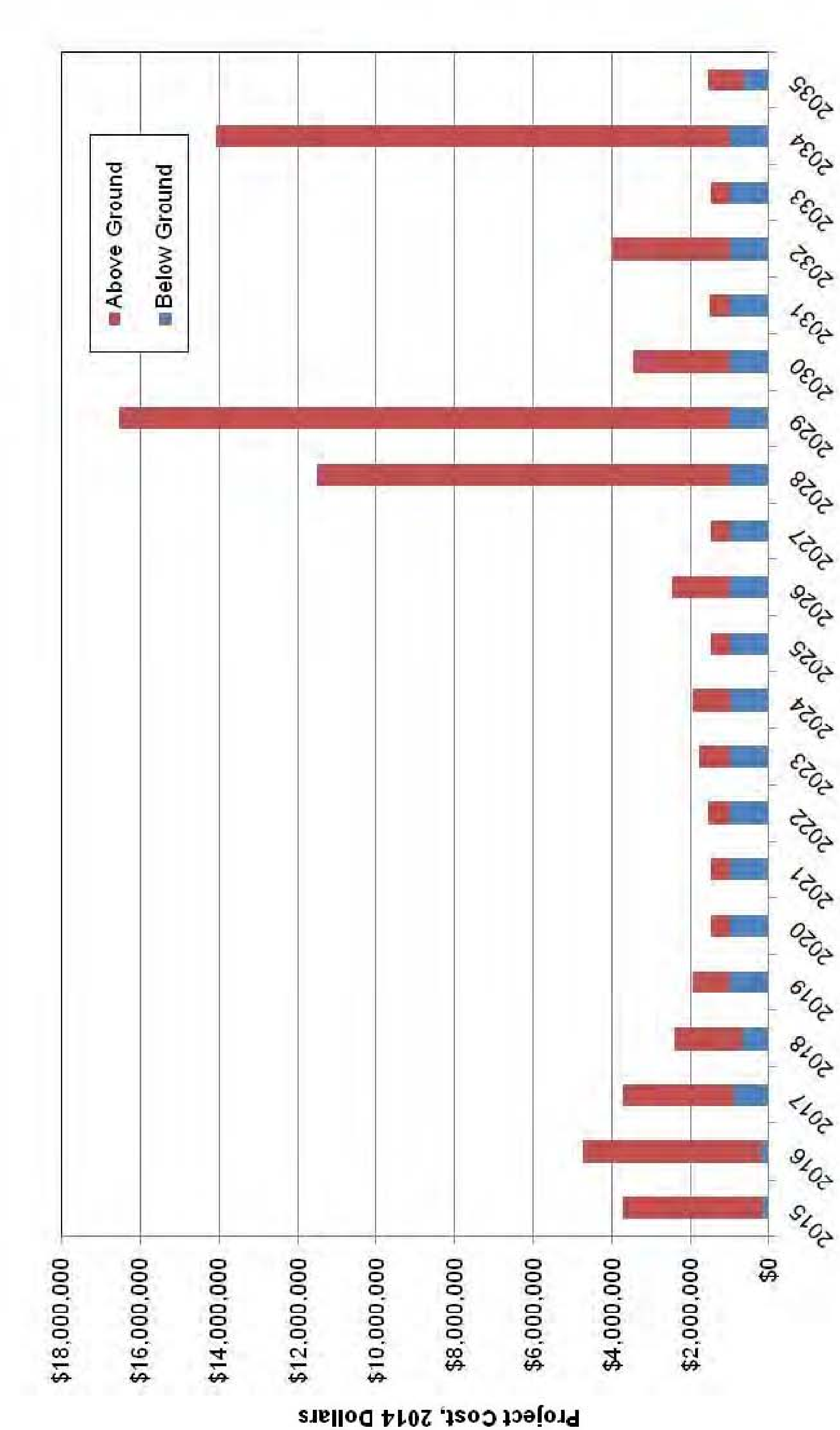


Figure 2.9 Twenty (20) Year Combined CIP

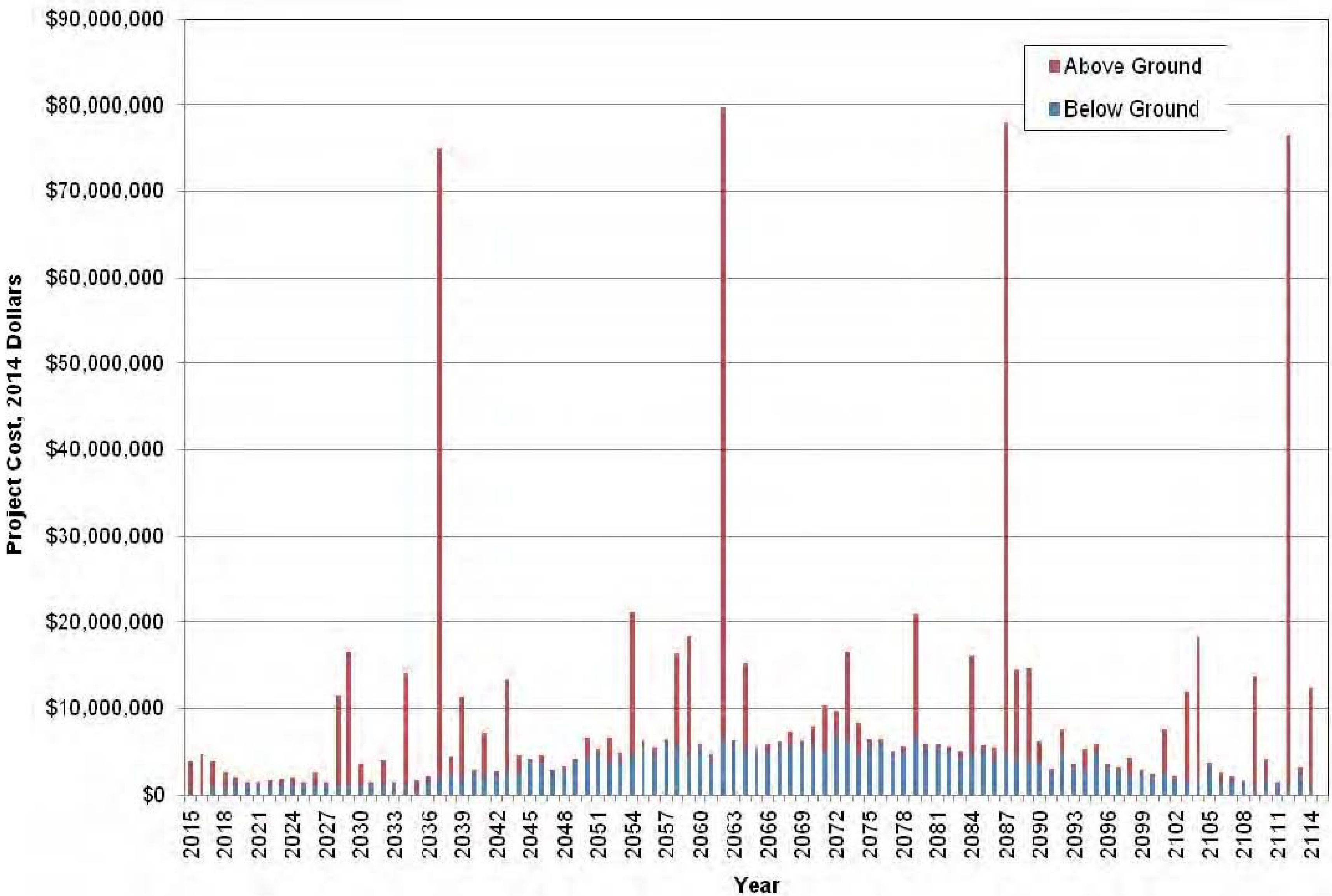


Figure 2.10 Combined 100 Year CIP

WATER REVENUE AND RATE STUDY

3.1 INTRODUCTION

This chapter presents and summarizes the findings of the Water Revenue and Rate Study for the Ventura County Waterworks District No. 8 (District) Facilities Assessment and Cost of Services Study. This task involved reviewing the District's current rates and fees, and analyzing revenue requirements, cost of service, and rate design.

3.1.1 Background

Water services in the City of Simi Valley (City) area are currently provided through two suppliers: Golden State Water Company and Ventura County Waterworks District No. 8 (District). Approximately sixty percent of the City is served by the District. Golden State Water Company is a private company, which provides water service to the other forty percent of the City.

The District currently serves approximately 25,000 water customer accounts. The approximate customer distribution is as follows: 91 percent single family residential homes; 2 percent multi-family residential; 3 percent commercial and industrial; and 3 percent landscape meters. Schools, agriculture, and pools make up the remaining one percent of users. The District's water system is comprised of 43 water storage facilities, 2,700 fire hydrants, 22 pump stations, and 357 miles of water pipelines system wide. The District currently purchases the majority of its water supply (97 percent) from Calleguas Municipal Water District (Calleguas), which is a regional importer of water from the Metropolitan Water District of Southern California (MWD). The State Water Project is the primary source of this water, with the Colorado River Aqueduct System as a secondary source. The remaining 3 percent of the District's supply comes from local groundwater extraction and recycled water.

The District is currently facing a number of challenges that necessitate the need for a review of the District's current revenue model and water rates. The cost of purchased water has increased 8.5 percent annually over the past decade. In that time however, the District has not passed on these cost increases to customers, resulting in a lack of cost recovery and an annual draw down of existing reserves.

Due to this and other factors, the District is facing chronic revenue shortfalls, such that revenues are not keeping pace with expenditures and reserves are declining. Existing reserves have dropped from $21.7 million at the end of FY 2010-11 to a projected $10.3 million at end of FY 2013-14. Recent passage of modest water rate increases will improve the situation, but without additional correction, available reserves will likely be in deficit by June 2016.

3.1.2 Current Rates and Fees

The District's existing rate structure consists of a commodity charge (variable) and a service charge (fixed). This is a commonly applied rate structure throughout the State of California and the United States. The variable commodity charge is assessed based on metered water usage per billing unit of one hundred cubic feet, and is intended to recover the cost incurred for purchasing or producing and then delivering each unit of water. In contrast with the commodity charge, the fixed service charge is intended to offset expenses that the utility incurs for every account, regardless of usage. These expenses cover primarily the operation and maintenance of District facilities and its capital program.

As part of this analysis, the current water rate structure was reviewed to determine its current efficacy in addressing the desired objectives identified throughout the rate study process. As the District looks to refine its rate structure based on changing demands, legal guidelines, and regulatory requirements, Carollo analyzed various rate structure adjustments in order to meet forecasted revenue needs and to achieve the objectives of the District.

The current rates were established in January 2010 and set for 5-years. While rates were increased as recently as July 15, 2014 for minor inflation adjustments, they do not fully fund the District's operations and the cost of purchased water. The District has used over $11 million in reserves to fund this shortfall and without correction, available reserves are forecasted to be fully depleted by June 2016.

Table 3.1 summarizes the District's current water rate structure, which is charged on a bimonthly (once every two months) basis.

Table 3.1 Existing Bimonthly Water Rate Structure

Tiered Commodity Rates (Variable)		Service Charges (Fixed)	
Allocation (HCF)	**Rate (HCF)**	**Class / Meter Size**	**Bimonthly charge**
Single Family		Single Family	$33.38
0 – 36	$2.58	Multi-Family	21.96
36 – 60	3.09	3/4"	$44.00
> 60	4.02	1"	87.99
Uniform Rates		1.5"	175.98
Commercial	$3.06	2"	307.97
Pumping Charge (per lift)	0.09	3"	659.93
Well Water	1.54	4"	1,319.86

The District's existing rate structure is divided based on the following customer classes:

- **Residential Accounts**: Single-family (SFR) and multi-family (MFR)—pay a bimonthly fixed charge. In addition, variable revenues are recovered through a three tiered rate structure based on the amount of water consumed. Tiered rate structures such as this are typically designed to encourage conservation.
- **Commercial accounts**: Accounts pay a fixed charge based on the meter size. In addition, a uniform volume rate is applied to all usage. Uniform rates, rather than tiered rates, are typically applied to customer classes whose water demands vary significantly between customers. For example, the commercial class is comprised of various and non-homogeneous users, such as a car wash (high demands) and an office building (low demands).
- **Pumping Charge**: The District currently imposes a lift charge of $0.09 per HCF per lift for customers that require water delivered to higher elevations.
- **Well Water:** Well water is provided to customers at separate rates.

3.1.3 Forward-Looking Statement

In preparation of this Report, Carollo has relied upon financial and engineering information, operations and maintenance data, assumptions, and projections that have been furnished by District personnel. Carollo believes the sources of such information, assumptions, and projections to be reasonable for the purposes of this Report. Carollo has no reason to believe that such information is unreliable for purposes of this Report. The actual results, however, achieved during the forecast period reflected in this Report may vary from those projected due to unforeseen, or changing future conditions.

The projections and forecasts of this analysis are based on reasonable expectations of future events. Should the proposed revenue increases be delayed or postponed, or cost escalation, operating expenditures, or capital needs exceed forecasted levels prior to FY 2019/20, it may be necessary for the District to begin a new Proposition 218 process to increase rates above currently projected levels. The District may similarly be required to begin a new Proposition 218 process if revenues do not materialize as projected.

3.2 OVERVIEW OF RATE SETTING PROCESS

Rate analyses are typically performed every few years so that revenues are adequately funding utility operations, maintenance, and future capital needs. By conducting these analyses, the utility can identify areas where revenues are not meeting expenses, or become aware of areas that could result in shortfalls in the future. As a result of the analyses, the utility can adjust its rates and move toward greater financial stability for the coming year.

In addition to this simple analysis of revenues and expenses during the rate setting process, utilities in California must adhere to the cost of service requirements imposed by Proposition 218 and the State Constitution. Proposition 218 requires that property related fees and charges, including water rates, do not exceed the reasonable and proportional cost of providing the service. Article X (2) of the State Constitution establishes the need to preserve the State's water supplies and discourage the wasteful or unreasonable use of water by encouraging conservation.

In effect, Proposition 218 requires that a clear and proportionate linkage exists between the costs incurred by the utility, and how rates are levied to recover those costs. Nonetheless, the District has some flexibility to develop rates that achieve its financial objectives and promote community values, while still meeting the requirements of Proposition 218. This means that rates can simultaneously promote water conservation and the efficient use of the District's natural resources, and meet revenue needs.

To achieve these varied requirements and goals, a comprehensive rate study typically consists of the following progression of three interconnected processes.

Revenue Requirement Analysis:

- Compares the existing revenues of the utility to its operating, capital, and policy driven costs to determine the adequacy of the existing rates to fully recover the utility's costs.

Cost of Service Analysis:

- Identifies and apportions annual revenue requirements to functional rate components based on its application of the utility system.

Rate Design:

- Considers both the level and structure of the rate design to collect the distributed revenue requirements from each class of service

Within the standard approach and legal requirements, there is significant flexibility in a cost-of-service application to develop rates that appropriately and adequately reflect the distinct and unique characteristics of a utility and the values of the community.

3.2.1 Assumptions & Data

3.2.1.1 Project Objectives

In preparation of this analysis, three overarching objectives were outlined:

- **Cost Recovery**: Calculate cost of service water rates and fees to support operating costs and capital needs (as partially identified in Chapter 2) for the next five years.
- **Rate Design and Adjustments:** Evaluate various rate-design approaches, which provide the District with several options to balance factors such as revenue stability, cost-of-service, and rate impact.
- **Legal Compliance:** Within the principles of Proposition 218, design rates that promote efficient use of water to meet the State's 20x2020 (SB 7x-7) mandate.

3.2.1.2 Growth and Water Demand

Water sales are the District's primary source of revenues; thus, it is critical to examine and validate potential shifts in short and long-term water demands. For the purposes of understanding potential usage reductions, Carollo prepared a water demand analysis consisting of the previous three years of billing data. This data, along with discussions with District staff, were used to develop forecasted trends. However, historical usage is not a precise proxy for future demands.

Carollo analyzed and reviewed various expected demand scenarios, and sought feedback from District officers. These demand projections are crucial in financial planning for utilities. Forecasted demand figures form the basis of distributing costs in the form of volumetric rates. If forecasts overestimate actual demand, the utility could find itself in a revenue shortfall. Therefore, it is important to carefully review projections and develop conservative water use assumptions that aim to minimize financial risk to the utility. This conservative approach shaped Carollo's water use projections, and serves as the foundation for the financial forecast.

Furthermore, contingency plans are a prudent way to deal with these shortfall scenarios. As described later within this report, the proposed reserve targets and rates are designed to mitigate some financial instability associated with usage and revenue volatility.

In FY 2013/14, total water demand was 9.3 million hundred cubic feet (HCF). The majority of consumption was by single-family residential customers, with 61 percent of annual consumption occurring within this customer class. Landscaping was the next largest consumer at 22.6 percent, followed by commercial (5.9 percent) and multi-family residential (5.2 percent). Schools, agriculture, pools, industrial, and well water all encompass less than 5 percent of total annual demand.

Water users are typically billed on a bimonthly basis. Water use in this year peaked in the October billing period (August/September) with 1.1 million HCF. This amounted to

12 percent of the total annual demand and 1.42 times the average monthly demand for the year. For the purposes of this analysis, the number of total accounts is forecasted to remain constant. The District is built-out for the most part. Over the 10-year forecast, water demand is expected to decrease by 1 percent annually, due to increased awareness of water shortages, and the installation of higher efficiency appliances, irrigation, and plumbing.

3.3 REVENUE REQUIREMENTS ANALYSIS

3.3.1 Introduction

The first step in the rate analysis is to prepare a revenue requirements forecast. This analysis has two main purposes: first, it serves as a means of evaluating the District's fiscal health and adequacy of current rate levels; and second, it sets the basis for near and long-term rate planning. Furthermore, this helps meet the Board's policy that the water system is to be fiscally self-supporting

The revenue requirements are comprised of five components: 1) Operations and Maintenance Expenditures; 2) Annual Debt Service; 3) Capital Expenditures; 4) Policy Requirements and Coverage; and 5) Offsetting Revenues.

Annual revenues are tested for feasibility against two measures: the cash flow and the bond coverage tests. These sufficiency tests are commonly used to determine the amount of annual revenue that must be generated from an agency's rates.

- **Cash Flow Sufficiency Test** – the District must generate annual utility revenues adequate to meet general cash flow needs. The cash flow test identifies the amount of annual revenues that must be generated in order to meet annual expenditure obligations. These obligations include operations and maintenance (O&M) expenses, debt service payments, policy-driven additions to working capital, replacement funding, and rate-funded capital expenditures. The expenses, less offsetting revenues from other sources, are compared to total annual projected water revenues. Any calculated shortfalls are then used to estimate the need for rate increases.
- **Bond Coverage Sufficiency Test** - Annual rate revenues must satisfy debt coverage obligations, as required by indenture. Typically, the proposed rate revenues must satisfy both tests; however, this test is currently not applicable, as the District has no existing or forecasted debt for the water system. Should the District issue new debt in the future, this test will need to be revisited and the rate structure will potentially need revision.

3.3.2 Existing Revenues

The District currently derives the majority of its revenues from user fees on water consumption. In FY 2014/15, revenues from water rates, including both fixed and variable charges, encompassed 94 percent of total revenue generated by the District.

3.3.2.1 User Rates

The current user rate structure is outlined in Table 3.1 of this report. Residential customers are charged a fixed bimonthly fee, and use is charged according to a three-tiered rate structure. Commercial and other users are charged a monthly fixed fee based on the size of their connection, and are also charged for their use according to a uniform rate structure.

Under the District's current rate structure, approximately 77 percent of the revenue from rates is derived from variable use fees (including lift charges), with the remaining revenue coming from fixed service charges (23 percent). The proposed rate adjustments take steps to gather an increased share of revenue from fixed fees (28 percent) that will not be subject to the same volatility as consumption based fees. With the adjustments, the District's rates would comply with the California Urban Water Conservation Council's (CUWCC) BMP 1.4, which advises water utilities to target collecting a maximum 30 percent of its revenue from fixed charges. Above the 30 percent threshold is thought to be detrimental to conservation messaging and price signaling. The District purchases almost all of its water supply from Calleguas Municipal Water District. The price of this water has been steadily increasing over the past decade, with an average annual increase of 8.5 percent. Since 2010, Calleguas rates have increased 27.2 percent which the District has only passed-through 5.1 percent (July 2014) onto its customers. This is the primary driver in the District's existing shortfall and need to increase rates.

3.3.2.2 Other Revenues

The overwhelming majority of the District's revenue stems from user rates and fees (94 percent). The remaining revenues are captured through a variety of sources including interagency interest earnings, rents and leases, and late charges. The largest source of remaining revenue comes from water sales to Ventura County Waterworks District #17 in nearby Bell Canyon (3.5 percent of revenue). These revenues are used as a credit to offset the revenues collected from rates.

3.3.3 Existing Operating Expenditures

The District's FY 2014/15 budget was used as the base year for O&M costs. In addition, the foundation of the analysis is based on relevant financial information provided by the District including: existing debt service and future payments, current reserve ending fund balances, other future expenses, other future revenues, and other miscellaneous financial information.

Table 3.2 identifies the expenditures and offsetting revenues for FY 2014/15 as follows:

Table 3.2 Offsetting Revenues and Expenditures

	FY 2014/15
Offsetting Revenues	
Other Revenues (non-rate revenue)	$2,360,200
Total Offsets	**$2,360,200**
Expenditures	
Personnel	$4,864,600
Supplies / Materials (including water purchases)	$29,325,700
Services	$1,434,615
Reimbursements / Transfers	$3,433,000
Capital Outlay	($321,800)
Total Expenditures	**$38,736,115**

3.3.3.1 Operating Needs

Operating needs are expenditures that the District incurs in the day-to-day operations of its systems—e.g., employee salaries and benefits, fuel, chemicals, power and water purchases. Other costs in the operating budget include costs from the District's indirect cost allocation plan.

The District's FY 2014/15 Annual Budget served as the basis for forecasting future operating expenses. The budget was compared to prior year actual financial information to identify any anomalies or one-time expenditures not appropriate for forecasting in future years. District staff also reviewed the budget for costs that may need to be adjusted due to future operational changes. Unless manually calculated, future years were forecasted using escalation factors appropriate for the type of expense. These escalation factors were assigned on a line-item basis using one of the following factors shown in Table 3.3.

Table 3.3 Escalation Factors

Escalator	Description
Labor Cost Inflation	The labor cost inflation rate was established based on discussions with District staff and is assumed to increase at 3%.
Construction Cost Inflation	Although capital cost inflation is commonly linked to the Engineering News Record (ENR) Construction Cost Index (CCI), the construction cost inflation rate assumes the ENR's long-term average of 3%.
Utilities	This factor relates to specific costs associated with the general operations of the utility plants and physical systems, including parts. The forecast assumes an annual 5% increase in utilities costs.
General Cost Inflation	The general cost inflation rate applies to most expenses in the operating expense forecast, and the District's expected long-term inflation rate of 3%.
Purchased Water Costs	Rather than build in assumed inflationary increases from Calleguas, increases will utilize a pass-through mechanism.

At 72 percent of operating expenses, the District's largest expense is the purchase of water from Calleguas. As shown in Figure 3.1, the cost of purchased water has more than doubled over the past decade. In order to better account for these costs and to include greater rate transparency, cost increases from Calleguas are recommended to be automatically passed on to customers at the time of Calleguas rate increases. Implementing a pass-through, rather than an estimated rate, would prevent the unnecessary over or under recovery of purchased water costs.

Any adjustments made to the cost of purchased water (Calleguas) will be automatically passed through to rate payers. At least 30 days before the effective date of the adjustment, the District will provide its customers with the expected adjustment(s), which will generally be calculated as the total projected cost increase divided by the projected annual water consumption. As part of its Long Range Finance Plan, Calleguas developed potential rates through 2023. These adjustments are presented in Figure 3.1.

3.3.3.2 Debt Service

The District currently has no outstanding debt service obligations. In the future, the District may take out a State Revolving Fund (SRF) loan for the expansion of its recycled water system, but this was not included in the water system revenue requirements analysis.

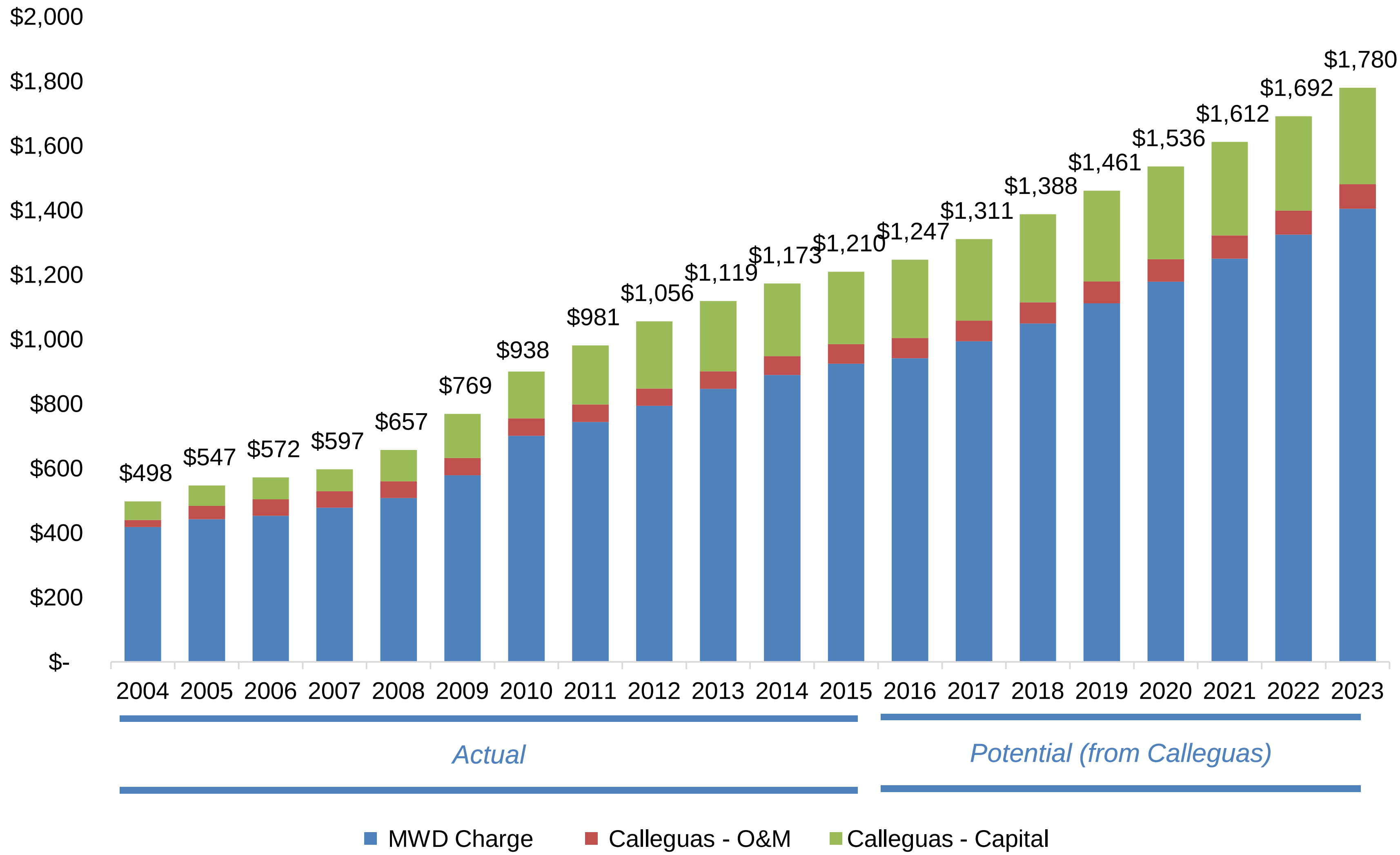


Figure 3.1 Actual & Potential Purchased Water Rates

3.3.3.3 Capital Projects

Rehabilitation and replacement projects were outlined in five- and twenty-year capital improvement plans (CIP), shown in Tables 2.17 and 2.18, and in Figure 2.9. These were developed following a complete inventory of the District's assets, taking into account the remaining useful life for each system component, and estimating the replacement costs. This process is detailed in the Facilities Assessment in Chapter 2 of this report.

The Five-Year CIP amounts developed and recommended as part of the Facilities Assessment have been included as "Rate Funded Capital" in Tables 3.4 and 3.6.

Table 3.4 Revenue Requirements Analysis (Pre-Increases, thousand dollars)

	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20
Water Revenues					
User Charges	$35,150	$34,800	$34,450	$34,110	$33,760
Other Revenues	2,450	2,550	2,650	2,750	2,860
Additional Revenues	-	-	-	-	-
Total Revenues	**$37,600**	**$37,350**	**$37,100**	**$36,860**	**$36,630**
Expenditures					
Personnel	$5,010	$5,160	$5,320	$5,480	$5,640
Supplies/materials	29,160	29,220	29,120	29,080	29,000
Services	1,490	1,550	1,610	1,670	1,740
Reimbursements/transfers	1,860	1,930	2,010	2,090	2,170
Capital outlay	30	30	30	30	30
Debt service	-	-	-	-	-
Rate funded capital	2,590	4,890	3,980	2,690	2,240
Additional O&M	-	-	-	-	-
Total expenditures	**$40,130**	**$42,780**	**$42,070**	**$41,040**	**$40,830**
Cash Flows	-$2,530	-$5,430	-$4,970	-$4,180	-$4,200
Days of Operating Reserves (Target: 90)	**30 days**	**-23 days**	**-70 days**	**-109 days**	**-149 days**

Note:
(1) Totals may not foot due to rounding.

3.3.3.4 Policy Driven Needs & Reserves

The District currently has three unrestricted reserve funds. The first is the Operating Fund (working capital). The remaining two are capital funds related to vehicle replacement and facilities Replacement. While segregated, the available funds are unrestricted monies and can be used for any purpose (operations or capital). However, for the purposes of revenue requirement analysis; Carollo retains this distinction between operating and capital funds. By keeping them separate, appropriate reserve levels and metrics can be readily identified and clearly demarcated for their intended purpose.

The revenue requirement analysis included a review of the District's capital reserve levels, and recommendations on achieving more sustainable and secure reserve levels into the future. In previous years, the District has covered cost increases (related to water purchases from Calleguas) from its reserve fund, and has not passed on these cost increases to customers. As a result, reserve levels have fallen to levels that may hinder short-term funding and operational flexibility.

In the course of this revenue requirements analysis, creating and maintaining a steady reserve of cash for the District was a priority. 90 days (or 25 percent) of O&M costs is used widely across the utility industry as a standard minimum level of cash to hold in reserves. However, given that the District's revenues are insufficient to cover expenditures, the District has utilized this reserve below this minimum target. The District is forecasted to end FY 2014/15 with 53 days (or 14 percent) of O&M costs available. Without adjustments to rates, the cash reserve is forecasted to be depleted by 2016. Consequently, obtaining sufficient reserve levels was especially important to the District.

In order to increase the level of reserves, it is recommended that the District gradually increase rates in order to raise revenues, and approach a goal of 90 days of O&M costs in reserves. If the District attempted to reach this target immediately, rates would need to increase by drastic levels. By phasing this revenue increase over the course of the next five years, the District is forecasted to reach this minimum target by year five, while maintaining reasonable rate increases.

In addition to increasing operating reserves, it is recommended that the District maintain a minimum of $1 million in its facility reserve fund, roughly equivalent to 1-year of depreciation expense. This minimum amount of reserves has been assumed in the course of this analysis, and revenue and rate recommendations reflect this assumption.

The facility reserve fund minimum is intended to protect the District in the event of unexpected financial challenges, such as emergency repairs.

3.3.4 Recommended Revenue Requirements

Over the course of developing the proposed revenue requirements, multiple rate revenue forecasts were developed to explore the feasibility of funding future capital needs and options to mitigate ratepayer impacts. The extent of the proposed revenue adjustments is largely contingent on the funding and timing of capital projects. Given the District's existing revenue shortfalls, lack of available reserves, and the annual nature and timing of the projects, the issuance of new debt was not analyzed.

Various financial scenarios were reviewed to evaluate the sensitivity and impact of conservation in relation to increasing water costs. Given the District's revenue susceptibility to future water demand reductions due to conservation measures, legislative requirements, and rate increases, the analysis assumed 1 percent annual water demand reductions, moderate growth levels, and inflationary cost escalators.

Table 3.4 details the District's financial position (revenues and expenditures) before any rate increases. In the current revenue situation shown, before any proposed rate increases, the District's cash flow is negative.

Given the forecasted revenue shortfalls, revenue increases are necessary to fully fund the District's projected expenditures. In addition to the shortfalls, the District needs to replenish reserves that were utilized to fund historical shortfalls. Despite the needs for immediate revenue right-sizing, the District was steadfast on minimizing ratepayer impacts.

Based on direction provided by the District, the proposed increases have been drawn out over the next five years, with larger increases in years 1 and 2, and inflationary adjustments in the remaining three years. Table 3.5 provides the proposed revenue adjustments and the amount of additional revenue expected from these increases.

Table 3.5 Proposed Revenue Adjustments Schedule

Fiscal Year	Proposed Revenue Adjustments* (%)	Effective Revenue Adjustments ($)	Proposed Implementation Date
FY 2015/16	8.00%	$2,811,996	July 1st, 2015
FY 2016/17	8.00%	3,006,586	July 1st, 2016
FY 2017/18	1.00%	401,830	July 1st, 2017
FY 2018/19	1.00%	401,790	July 1st, 2018
FY 2019/20	1.00%	401,750	July 1st, 2019

*Revenue adjustments do not include any forecasted increases to Calleguas purchased water rates. Any increases to the cost of purchased water would be automatically passed-through to rate payers

These revenue adjustments do not reflect any forecasted increases from Calleguas as any increase would be separately charged through a separate rate pass-through component. Potential rates projected by Calleguas are presented in Figure 3.1.

Table 3.6 provides an updated cash flow with the impacts of the proposed revenue adjustments. These rate increases generate a positive cash flow, and by FY 2018/19 and maintain an operating reserve of over 90 days, in alignment with recommendations.

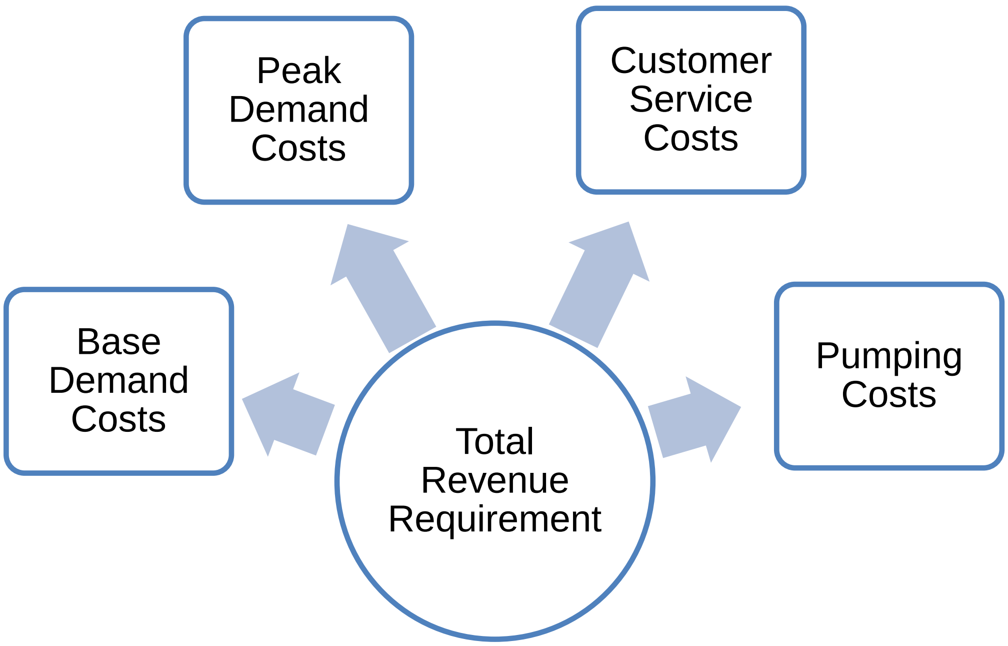
Table 3.6 Revenue Requirements Analysis (Post-Increases, thousand dollars)

	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20
Water Revenues					
User Charges	$35,150	$37,580	$40,180	$40,180	$40,170
Other Revenues	2,450	2,670	2,900	3,030	3,170
Additional Revenues	-	-	-	-	-
Revenue from Annual Rate Increase	2,810	3,010	400	400	400
Total Revenues	**$40,410**	**$43,260**	**$43,500**	**$43,610**	**$43,750**
Expenditures					
Personnel	$5,010	$5,160	$5,320	$5,480	$5,640
Supplies/materials	29,160	29,220	29,120	29,080	29,000
Services	1,490	1,550	1,610	1,670	1,740
Reimbursements/ transfers	1,860	1,930	2,010	2,090	2,170
Capital outlay	30	30	30	30	30
Debt service	-	-	-	-	-
Rate funded capital	2,590	4,890	3,980	2,690	2,240
Additional O&M	-	-	-	-	-
Total Expenditures	**$40,130**	**$42,780**	**$42,070**	**$41,040**	**$40,830**
Cash Flows	$280	$470	$1,420	$2,580	$2,920
Days of Operating Reserves (Target: 90)	**57 days**	**61 days**	**75 days**	**99 days**	**120 days**

Note:
(1) Totals may not foot due to rounding.

3.4 COST OF SERVICE ANALYSIS

The purpose of a cost-of-service analysis is to provide a rational basis for distributing the full costs of the District's service to each customer class in proportion to the demands they place on the system. Carollo developed a detailed cost allocation that serves as the basis for the proposed revenue adjustments. This analysis yields an appropriate method for allocating costs, which should be sustained unless substantial changes in cost drivers or customer consumption patterns occur.



The functional allocation assigns the annual revenue requirement outlined in Section 3.3 above for a select base year (FY 2014/15) by major function. The District's primary functions are related to base flow, peak flow, pumping, and customer costs (customer and services). While most utilities use base, peak, and customer categories for their cost of service analyses, the District is unique by applying a pumping component. These are expenses incurred by transporting water to various elevations.

The functional cost pools include the rate paid for water supplied by outside agencies, the existing O&M expenditures, debt service, and rate-funded capital costs.

The cost of service allocation completed in this study is established on the base-extra capacity method as defined by the AWWA. Under the base-extra capacity method, revenue requirements are allocated based on the demand placed on the water system.

3.4.1 Functional Cost Components

The District's FY 2014/15 Annual Budget was analyzed on a line-item-by-line-item basis and expenditures were distributed between the available functions:

- ***Customer:*** Customer costs are fixed expenditures that relate to operational support activities including accounting, billing, customer service, and administrative and technical support. These expenditures are essentially common-to-all customers and are reasonably uniform across the different customer classes.
- ***Service:*** Service costs are meter and capacity related costs, such as meter maintenance and peaking charges, that are included based on the meter's hydraulic capacity (measured in gallons per minute). Additionally, as the system's facilities are designed to meet peaking requirements, a portion of the capacity related costs, including debt service, are allocated to the service component.
- ***Base:*** Base costs are those operating and capital costs incurred by the water system to provide a basic level of demand to each customer.
- ***Peak:*** Peak costs represent those operating costs incurred to meet peak demands for water in excess of basic demand (base). The cost includes a portion of the purchased water costs, as well as infrastructure costs related providing the required system over-sizing to meet excess (peak) demands.
- ***Pumping:*** Pumping costs are variable based on the vertical distance required to deliver water to customers at higher elevations. Delivering water up to higher elevations requires extra resources, and this charge aims to identify and offset those costs.

Water purchases, for example, are allocated to the based and peak functions of the system these expenditures are wholly related to water demands. Personnel expenditures are fixed and do not vary with changes in water demands. As such, personnel expenditures are allocated between customer and capacity components to be recovered through the fixed service charge. Appendix B details the full line-item allocation to these functional categories.

3.4.2 Allocation to Functional Components

Figure 3.2 presents the results of the functional allocation. The Service and Customer components collectively represent 27.1 percent of the District's costs. These costs are typically recovered through a fixed service charge. Base and Peak components, which provide the basis for the variable rates, account for 70.4 percent of costs. The remaining 2.4 percent of costs have been allocated to the pumping component. As shown in the figure, a greater amount is recommended to be allocated and collected from the proposed service charge (Customer and Capacity components) relative to the existing allocation and bimonthly service charge.

The breakdown between functional categories is used to better understand how costs are incurred and whether they fluctuate with changes in water sales. For example, the CIP and personnel costs could be considered fixed costs as the amount of water used does not influence their magnitude, and thus could be recovered through a fixed charge. Alternatively, purchased water costs are solely related to water demand, and are therefore recovered through the variable rates.

There is significant debate in the broader industry over the proper allocation ratio. As discussed earlier, the California Urban Water Conservation Council advocates a 70/30 percent split (variable/fixed) as defined in Best Management Practice 1.4. This split is thought to provide sufficient revenue stability in the form of fixed charges, while still providing adequate conservation incentives through commodity-based pricing. However, many retail agencies have moved to a revenue model that captures greater revenues from fixed charges due to revenue fluctuations and the need for greater fiscal sustainability, and are benchmarking water demand reductions using alternative approaches allowed by the CUWCC.

Based on the results of this analysis, the proposed functional allocation is more aligned with the CUWCC recommendations and District expenditures. In contrast, the District's current rate structure collects 77 percent of revenue through variable charges, with the remainder through fixed charges. The higher variable weighting lends itself to greater revenue vulnerability due to fluctuations in water demands. Rates which are out of alignment with how costs are incurred may not fully recover costs should a significant drop in demand occur.

Carollo recommends the resulting functional allocation would better align with system expenditures and provide greater revenue stability. In allocating 27 percent of revenue to fixed charges as opposed to the current rate of 23 percent, the District could potentially hedge against revenue instability due to demand fluctuations. At the same time, it still allows the District to use its variable rates to promote conservation and efficiency.

It is important to keep in mind that this adjustment will shift some cost burden to low-volume users. A greater percentage of revenues are to be collected through the monthly meter charge, which will increase the average unit cost of water more for low volume users than for high volume users. The District might consider a phased approach to more gradually shift cost recovery from a variable to fixed rate.

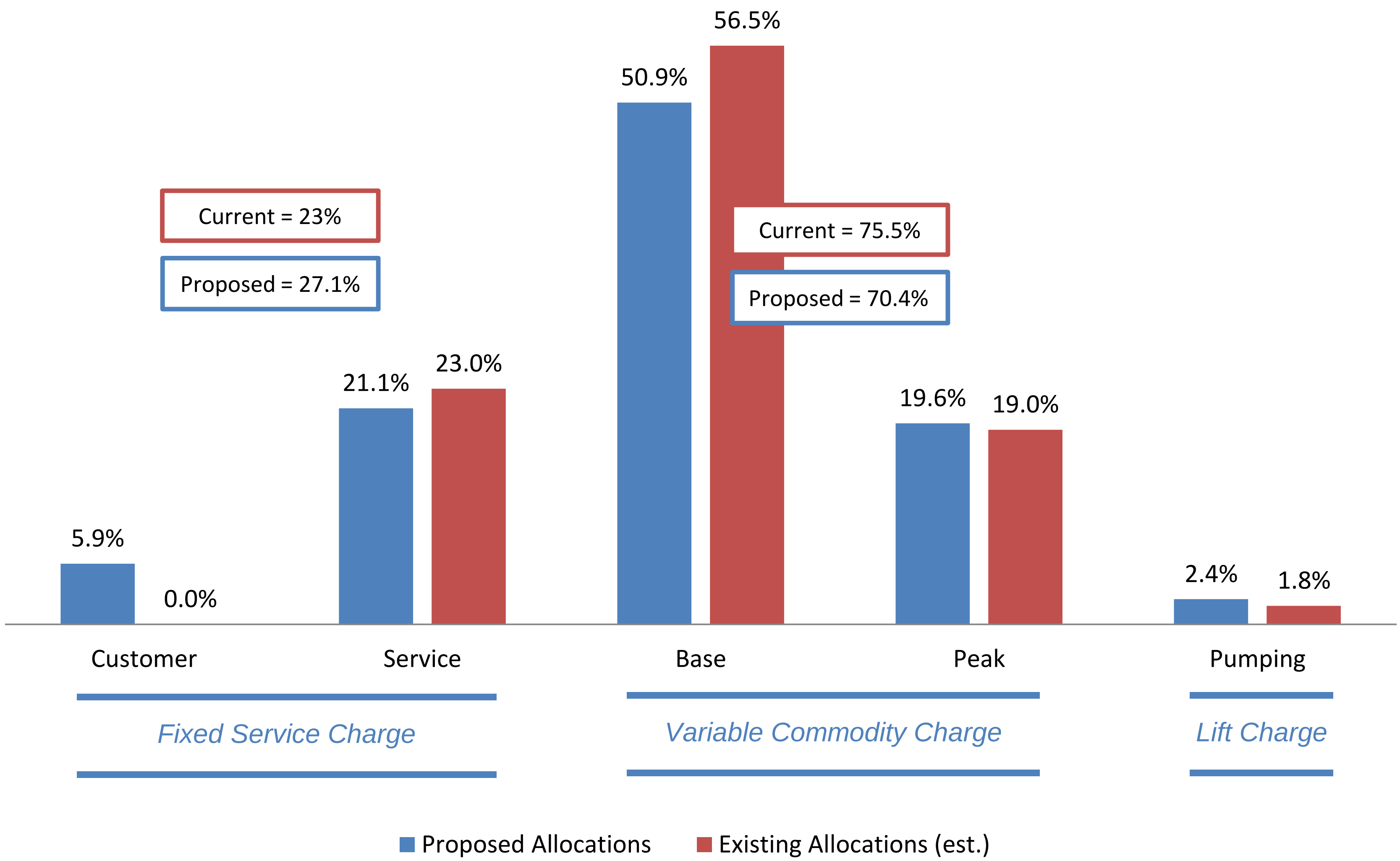


Figure 3-2 Functional Cost Allocation

3.4.3 Customer Class Allocation

To further allocate costs from each functional category to the different customer classes, demand characteristics are analyzed. The allocations developed in Figure 3.2 are then multiplied by the revenue requirements. An appropriate basis is defined for each functional allocation by which costs are distributed to each customer class.

- ***Accounts:*** Customer functions are related to operational support activities including accounting, billing, customer service, and administrative and technical support. Each customer account represents 1 unit of service.
- ***Meter Equivalents:*** To allocate Service costs (meter and capacity related costs, such as meter maintenance and peaking charges), each unit of service is defined as the meter's hydraulic capacity (measured in gallons per minute). For example, based on the AWWA meter capacity ratios, a customer that has a 1-inch meter has a demand factor of 2.5.[1]
- ***Water Usage:*** Annual water usage is used to apportion each customer class' demand of base usage.
- ***Annualized Peak:*** Annualized Peak represents each class' summer months of consumption (June – October) annualized. This figure is used to allocate peak costs.
- ***Pumping Equivalent:*** Each time a unit of water is lifted it incurs a lift charge. To account for all units of water, an equivalent pumping factor was developed. While total water delivered with a lift charge is nearly 5.7 million HCF, to account for water lifted two or three times, the total equivalent is nearly 7.4 million HCF.

Costs are allocated to each customer class based on their respective peaking factors to reflect its use of the overall system. Consumption data was analyzed by customer class to reveal how each class utilized the system differently throughout the year. This information was then utilized to allocate the functional costs between individual customer classes.

[1] A 1-inch meter has a maximum flow rate of 50 gallons per minute (gpm) compared to the 5/8 inch meter which has a safe operating capacity of 20 gpm as listed in Table B-1 in AWWA Manual M1

Table 3.7 shows the customer statistics by customer class based on FY 2013/14 billings. While the District currently defines single family and commercial rates, additional classes are defined in the billing records.

Table 3.7 Customer Class Characteristics (Baseline Demands)

Customer Class	Accounts	Meter Equivalents	Water Usage *(HCF)*	Annualized Peak *(HCF)*
Single-Family	23,358	23,358	5,644,562	7,588,980
Landscape	759	5,085	2,093,114	2,544,696
Commercial	575	2,863	544,301	1,161,960
Multi-Family	416	6,973	481,168	842,964
Schools	101	764	233,679	360,888
Agriculture	48	243	96,193	201,384
Pools	119	513	30,018	60,456
Industrial	56	291	12,163	71,364
Well Water	1	2	118,475	285,780
Total	**25,433**	**40,090**	**9,253,673**	**13,118,472**

Billing records were analyzed to determine if the existing customer classes remained appropriate. The consumption analysis was evaluated based on the detailed customer data provided by the District. The analysis revealed that usage between Landscape, Schools, Industrial, and Pools billing classes possess similar usage and demand patterns. It also revealed that Commercial and Multi-Family share common usage patterns. Landscape, Schools, Industrial, and Pools demand characteristics revealed that they had a greater "peak" on the system, likely due to irrigation needs during summer. As such, it is recommended that the District add a "Landscape / Schools / Industry" class to reflect their specific use of the system.

Based on each customer class's utilization of the system, Table 3.8 shows cost allocations for each customer using the forecasted revenue requirements. Well water is a unique customer class as it is provided water solely from well water and has no access to Calleguas water. As such, they were analyzed separately to specifically account for their demand on the system.

Table 3.8 Customer Class Costs

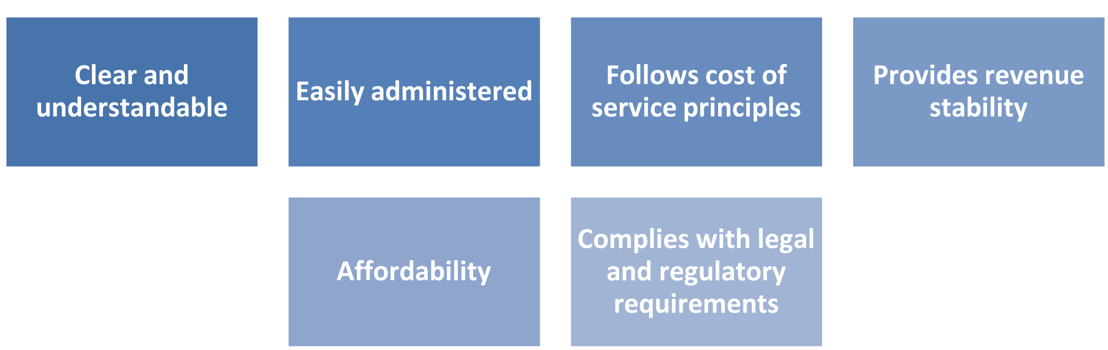
Customer Class (Allocation Basis)	Single-Family	Landscape / Schools / Industry	MF / Commercial	Total
Customer (Accounts)	$2,062,186	$95,614	$87,491	$2,245,291
Capacity (Meter Equivalent)	5,606,088	1,654,610	747,046	8,007,745
Base (Annual Demand)	11,808,375	5,157,108	2,145,272	19,110,756
Peak (Summer Demand)	4,331,794	2,325,313	789,892	7,446,999
Pumping (Equivalent HCF)	608,292	224,517	93,395	926,204
Total	**$24,416,736**	**$9,457,162**	**$3,863,097**	**$37,736,995**

3.5 RATE DESIGN ANALYSIS

The rate design analysis determines how the customer class costs identified in Table 3.8, are recovered by each customer class through water rates. The focus of this process is to achieve full cost recovery and substantiate that each customer class is paying their fair and proportionate share of system costs.

3.5.1 Selecting Rate Structures

Once costs have been equitably allocated to each customer class, the District has some flexibility in designing the rate structure in order to meet its policy objectives. In determining the appropriate rate level and structure, Carollo analyzed various rate design alternatives and the corresponding customer and utility implications. Beyond the identified study objectives, Carollo identified additional criteria for considerations and discussed them at length with District staff. Listed below is a partial list of the additional rate design elements:



Given the numerous elements that go into rate design, selecting an appropriate rate structure can be complex. There is no single structure that meets all objectives equally, nor are all objectives or elements valued the same by the utility or customers. Each criteria or element has merit and plays an important role in the implementation and overall effectiveness of the rate structure. These elements and competing objectives were discussed and evaluated at length throughout the financial and rate study process.

3.5.2 Recommended Water Rates

The District's existing rate structure provides a solid foundation, and simply needs refinement in light of the revenue requirements and costs of service analyses performed as part of this study. The proposed rates, outlined below, enhance the existing structure, and could offer greater financially stability to the District.

3.5.2.1 Service Charge (Fixed)

By design, the current monthly service charge includes a customer service component and a fixed-capacity cost component based on meter size. The customer service component recovers expenses associated with billing, collection, and customer service. This component is the same for all customers regardless of meter size. The meter capacity component captures maintenance costs related to meters and services, as well as a portion of capital costs. This component varies based on meter size to reflect the difference in potential demands that can be placed on the system by different sized meters.

Similar to the existing charge, the recommended monthly service charge is a combination of the customer service and meter charge functional components. To determine this charge, the meter charge unit cost, presented in Table 3.9, is multiplied by the meter capacity ratios previously utilized by the District to calculate the meter capacity cost. These ratios mirror the ratios identified in the AWWA M22 Manual Sizing Water Service Lines and Meters. The ratios reflect a reasonable cost and benefit factor associated with greater hydraulic flow capacity. The meter capacity cost is then added to the customer service unit cost to calculate the total monthly service charge.

Under the District's existing rate structure, the fixed charge was strictly capacity based—the service charge was developed solely on the basis of meter size, and did not factor fixed costs that are constant across customers, regardless of potential demand. This change is necessary because the prior rate structure was recovering some fixed costs through commodity rates. By allocating fixed costs to the fixed charges, the District could recover these costs with more reliability.

The fixed charges are also increasing to recover depleted operating and capital reserve funds. As discussed previously, the District covered Calleguas rate increases through the use of reserve funds. In order to replenish these funds, the fixed charges will need to be increased. While the fixed charge increase is not directly covering Calleguas cost increases, it is indirectly refunding the reserves that were drawn down to cover these costs in the past. The recommended bimonthly service charge and calculation of components are detailed in Table 3.9.

Table 3.9 Components to Proposed Service Charge (Bimonthly)

Meter Size	Capacity Ratio		Service (per Meter Equivalent)		Customer (Per Account)		Total[2]	Existing
Residential[1]	1.0	✖	$40.00	✚	$14.71	=	$54.75	$33.38
3/4"	1.5		40.00		14.71		74.75	44.00
1"	2.5		40.00		14.71		114.75	81.99
1-1/2"	5.0		40.00		14.71		214.75	175.98
2"	8.0		40.00		14.71		334.75	307.97
3"	17.5		40.00		14.71		714.75	659.93
4"	31.5		40.00		14.71		1,274.80	1,319.86
6"	70.0		40.00		14.71		2,814.80	2,629.20

Notes
(1) Residential representative of a 5/8" meter.
(2) Total has been rounded up to the nearest $0.05.

Table 3.10 identifies the proposed bimonthly fixed charges for the 5-year rate period.

Table 3.10 Proposed Service Charges (Bimonthly)

Meter Size	Current	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20
Single Family	$33.88	$54.75	$58.55	$58.50	$58.50	$58.50
Multi-Family	21.96	38.75	41.40	41.40	41.40	41.40
3/4"	44.00	74.75	79.90	79.90	79.90	79.90
1"	81.99	114.75	122.70	122.65	122.65	122.65
1-1/2"	175.98	214.75	229.60	229.60	229.55	229.55
2"	307.97	334.75	357.90	357.90	357.85	357.80
3"	659.93	714.75	764.20	764.15	764.05	764.00
4"	1,319.86	1,274.80	1,363.00	1,362.85	1,362.70	1,362.60
6"	2,629.20	2,814.80	3,009.60	3,009.30	3,009.00	3,008.70

3.5.2.2 Commodity Rates (Variable)

The commodity rates developed for each customer class are designed to recover the costs proportionate to its water demands. Cost-of-service based rates were developed for each customer class based on the principle of maintaining vertical and horizontal customer-class equity. This means that each customer class would only pay its assigned share of the costs of service for the whole system, and that each member of each class would pay their fair share of customer class costs. As discussed previously, it is recommended the District create a new "Landscape / Schools / Industry" user class for customers who place higher peak demands on the system. With this decoupling, these users will pay their higher share of costs (relative to Commercial/Multi-Family), rather than having the costs blended across multiple groups.

Customer-related commodity costs are calculated based on the class' average annual water usage and its incremental summer consumption. The water commodity rate for each customer class is calculated based on the customer class' cost (required revenues) and the forecasted annual water demands. An example of the rate calculation is provided below.

$$\textbf{Commercial/MF Rate} = \frac{(\textbf{Base Allocation} + \textbf{Peak Allocation})}{\textbf{Forecasted Annual Demand (HCF)}}$$

The proposed bimonthly commodity based rates are shown in Table 3.11.

Table 3.11 Proposed Commodity Rates (Bimonthly)

	Current	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20
Single Family				**Rate (per HCF)**		
0 - 36 (HCF)	*$2.58*	$2.44	$2.64	$2.67	$2.69	$2.72
36 – 60	*3.09*	3.44	3.71	3.75	3.79	3.83
61 +	*4.02*	4.10	4.43	4.47	4.52	4.56
Uniform Rates				**Rate (per HCF)**		
Commercial / Multi-Family	*3.06*	$2.89	$3.12	$3.15	$3.18	$3.21
Landscape / Schools / Industry	*3.06*	3.07	3.31	3.34	3.37	3.41
Pumping Charge (per lift)	*0.09*	0.13	0.14	0.14	0.14	0.15
Well Water	*1.54*	1.58	1.71	1.73	1.75	1.76

Note:
(1) FY 2015/16 proposed rates effective July 1, 2015. Additional rates to be effective July 1st.

The Single Family tiered rate is designed to encourage conservation and efficient water use. Tier 1 (0 – 36 HCF) is priced lower than Tiers 2 and 3 to reflect the greater costs associated with Peaking, similar to the price differential between Commercial/MF and Landscape/Schools/Industry.

3.5.2.2.1. Tiered Rate Structure

The City's three-tiered rate structure incentivizes conservation, and is built upon the idea that peak usage results in increasing costs for the City, unique from the costs incurred for basic service. As users increase their demand, and begin to use water in an inefficient or wasteful manner, the City must continue to produce water, typically at increasing cost compared with base demand. This involves purchasing more water from Calleguas. Peak demand also results in increased customer service and other personnel costs for the City. Without this excess demand, the City does not incur these costs, and it is therefore appropriate and necessary to create separate tiers that recognize this.

The City allocates these costs according to peaking factors for each tier. Every user “peaks” on the system in some way, either through seasonal peaking when their demand spikes in the hot summer months, or through diurnal peaking when their demand spikes in the morning and early evening. Peaking factors account for this behavior based on how significant the impact on the system is. Efficient customers have very modest peaking factors because their excess demand is limited. Customers in tiers two and three however, have higher peaking factors because their usage is significant relative to other customers, and places excess burdens on the system.

These peaking factors allow a fair and equitable distribution of peak costs to each tier. The peaking factors are calculated as a ratio of the tier breakpoint to the average usage. These ratios are outlined in Table 3.12. These ratios are then used to allocate the additional costs discussed earlier (further imported water purchases and personnel needs).

Table 3.12 Residential Peaking Factors

Tier	Usage Breakpoint (HCF)	Peaking Factor[(1)]	Peak Surcharge ($/HCF) [(2)]	Rate ($/HCF) [(3)]
1	36	0.5	$0.33	$2.44
2	60	2	1.32	3.44
3	61+	3	1.99	4.10

Notes:

(1) Peaking factor is calculated based on average residential usage of 22 HCF (bimonthly).
(2) Applies to FY 2015/16 rates.
(3) Begins with base unit cost of $2.11 per HCF.

Figure 3.3 Conceptual Outline ofFigure 3.3 provides a conceptual outline of how these peak costs are distributed. The curve represents the total consumption in the system. During the cooler, winter months, when demand is low, most usage falls within tier 1, where the City only needs to provide a base level of supply. As the summer approaches though, usage begins to escalate and the City must purchase more water and take on other costs. These additional costs are reflected in the higher tiers that fall under the curve.

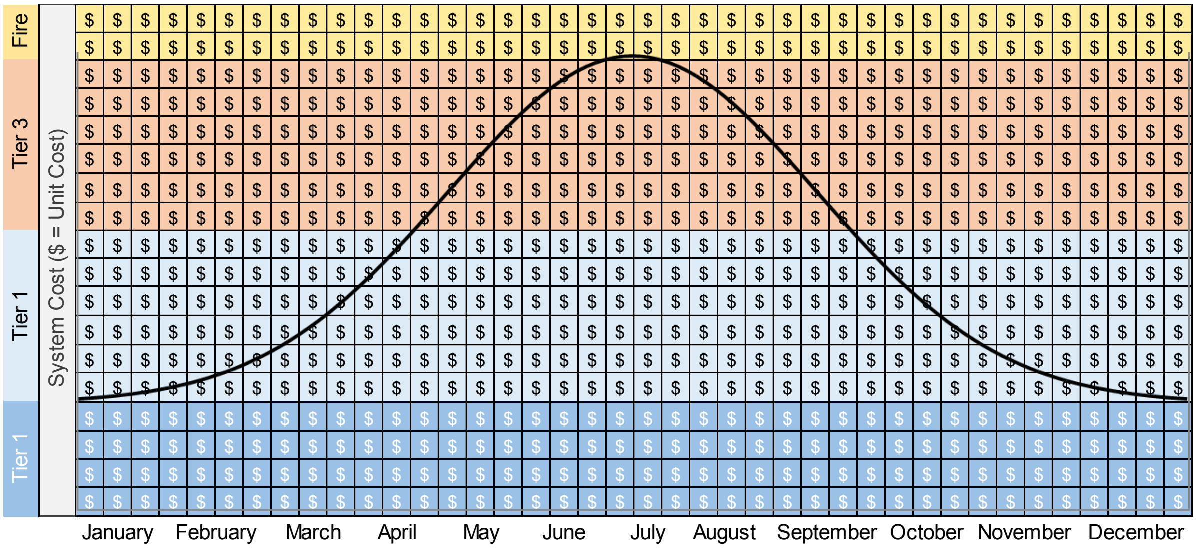


Figure 3.3 Conceptual Outline of Peak Demand and Tier Pricing

3.5.3 Customer Impacts

With the proposed rate adjustments, it can be difficult to determine the net impact to a typical ratepayer. As mentioned previously, the proposed fixed charges rates will shift some cost burden to low volume users. As a greater percentage of revenues are to be collected through the monthly meter charge, it will increase the average unit cost of water more for low volume users, than for high volume users. To minimize this impact and reflect that low volume users cause a minimal peak on the system, the rate for Tier 1 water is reduced.

Figure 3.3 provides a comparison of a single-family user using 50 and 80 HCF of water. Additional comparisons are provided in Appendix C.

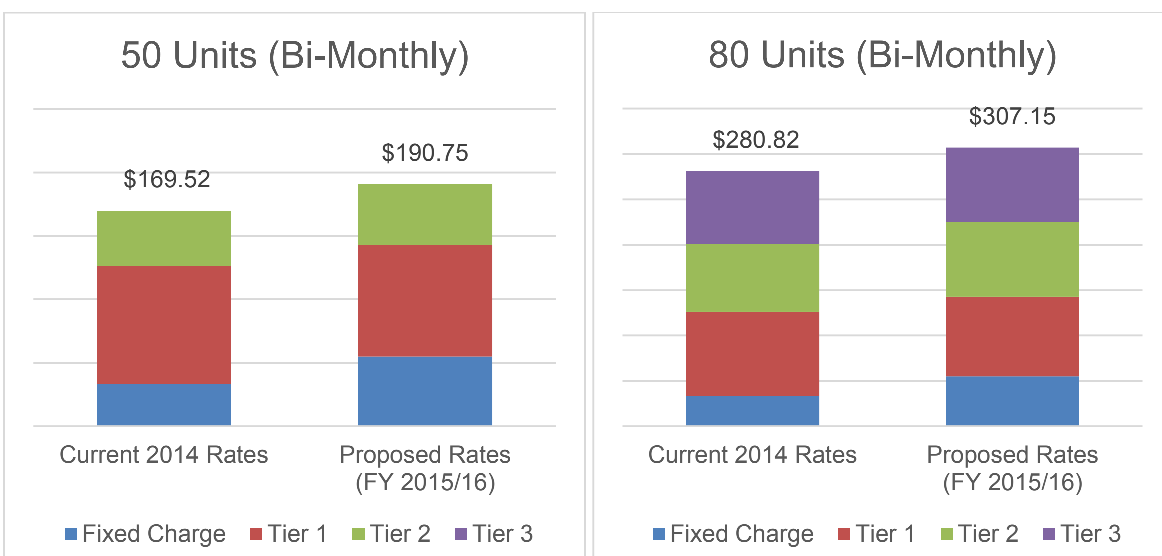


Figure 3-4 Rate Impacts for Single-Family Users

APPENDIX A – ABOVE-GROUND ASSESSMENT DETAILS

Condition Assessment Findings and Risk Scores

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk

Reservoirs

Aerator Tank Site

DateAssessed: 6/4/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Aerator Tank	1980	3	Minor undermining at SE quad. Rigid pipe connections. Ladder not secure. Staffing gauge rehab required. Strong sulfur smell.	25	20	0.50	9.25	4.63
Aerator Tank Paving/Fencing	1980	2		15	13.5	0.74	1	0.74

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Aerator Tank Remote Telemetry Unit	1980	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Alta Vista Tanks Site			DateAssessed:		5/7/2014			
Structural/Civil								
Alta Vista Tank #1	2001	2	Flex connections not present between tanks. Potential code issue. Anchored for hold down but can move laterally. Secure ladder. Detached overflow. Corrosion of overflow pipe. Minor corrosion of base.	25	22.5	0.44	9.25	4.11
Alta Vista Tank #2	2012	1	Detached overflow. Pipes connect both tanks. Anchors hold down tank but will allow lateral movement. Flex connections not present between tanks. Potential code issue. Secure ladder.	25	25	0.40	9.25	3.70
Alta Vista Tanks Paving/Fencing	2001	2		15	13.5	0.74	1.75	1.30
Electrical & Instrumentation Controls								
Alta Vista Remote Telemetry Unit	2001	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Big Sky 1 Tank Site			DateAssessed:		6/4/2014			
Structural/Civil								
Big Sky 1 Tank	2005	2	Secure stair, isolated overflow. No site issues.	25	22.5	0.44	10	4.44
Big Sky 1 Tank Paving/Fencing	2005	2		15	13.5	0.74	2.5	1.85
Electrical & Instrumentation Controls								
Big Sky 1 Tank Cathodic Protection	2005	2		20	18	0.56	2.5	1.39
Big Sky 1 Tank Remote Telemetry Unit	2005	2		15	13.5	0.74	5.5	4.07
Big Sky 2 Tank Site			DateAssessed:		6/4/2014			
Structural/Civil								
Big Sky 2 Tank	2005	1	Isolated overflow. Bollard protection on pipes. Secure stair. Bee hive in irrigation box. Staffing gauge will need rehab soon.	25	25	0.40	10	4.00
Big Sky 2 Tank Paving/Fencing	2005	2	No issues.	15	13.5	0.74	2.5	1.85
Electrical & Instrumentation Controls								

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Big Sky 2 Tank Cathodic Protection	2005	2		20	18	0.56	2.5	1.39
Big Sky 2 Tank Remote Telemetry Unit	2005	2		15	13.5	0.74	5.5	4.07

Casual Court Tank Site

DateAssessed: 5/6/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Casual Court Tank	1978	2	Contained sand foundation with confinement ring. Detached overflow. Secure ladder. Flex tend connection. No cathodic protection here.	25	22.5	0.44	10	4.44
Casual Paving/Fencing	1975	2		15	13.5	0.74	1.75	1.30

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Casual Court Tank Remote Telemetry Unit	1975	2		15	13.5	0.74	5.5	4.07

Crosby Tank Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Crosby Tank	1999	2	Detached overflow. Secure ladder. Unanchored. Flex tend connection.	25	22.5	0.44	10	4.44

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Crosby Tank Paving/Fencing	1999	2		15	13.5	0.74	1.75	1.30
Electrical & Instrumentation Controls								
Crosby Tank Cathodic Protection	1999	2		20	18	0.56	2.5	1.39
Crosby Tank Remote Telemetry Unit	1999	2		15	13.5	0.74	5.5	4.07

First St Tanks Site

DateAssessed: 5/6/2014

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Structural/Civil								
First Street Tank #1	1965	2	Detached overflow. Flex tend connections.Secure ladder.	25	22.5	0.44	10	4.44
First Street Tank #2	1992	2	Unanchored on ring wall footing. Detached overflow. Flex connections. Secure ladder. Panel distortion at overflow connection.	25	22.5	0.44	10	4.44
First Street Tank #3	1987	2	Unanchored. Contained footing with steel plate. Secure ladder. Ball joint with limited capacity to translate laterally. Detached overflow.	25	22.5	0.44	10	4.44

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
First Street Tank #4	1962	2	Unanchored. Secured ladder. Detached overflow. Contained footing with steel plate. Single ball joint with limited capacity to translate laterally.	25	22.5	0.44	10	4.44
First Street Tanks Paving/Fencing	1962	2		15	13.5	0.74	2.5	1.85

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
First Street Tanks Cathodic Protection	1965	2		20	18	0.56	2.5	1.39
First Street Tanks Remote Telemetry Unit	1965	2		15	13.5	0.74	5.5	4.07

Flanagan Tank Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Flanagan Tank	1984	4	Critical tank, no backup. Significant circumference cracking of the ring wall footing. Flex tend connection. Anchored tank. Damaged anchors. Panel distortion at on SW side. Detached overflow. Black tar on the inside of the tank. May be a need for ultrason	25	15	0.67	10	6.67

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Flanagan Tank Paving/Fencing	1984	2	Retaining wall CMU slump block has surface erosion.	15	13.5	0.74	1.75	1.30
Electrical & Instrumentation Controls								
Flanagan Tank Remote Telemetry Unit	1984	2		15	13.5	0.74	5.5	4.07
Greystone Tank Site			DateAssessed:	5/6/2014				
Structural/Civil								
Greystone Paving/Fencing	1999	2		15	13.5	0.74	1.75	1.30
Greystone Tank	1999	2	Leak at wall port. Wall panel damage at overflow connection (panel distortion). Small corrosion spots on the SW tank side adjacent to hillside. Unanchored tank.	25	22.5	0.44	10	4.44
Mechanical								
Greystone Mixer	2013	2		20	18	0.56	2.5	1.39
Electrical & Instrumentation Controls								
Greystone Cathodic Protection	1999	2		20	18	0.56	2.5	1.39

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Greystone PLC	1999	2		15	13.5	0.74	5.5	4.07
Greystone Tank Remote Telemetry Unit	1999	2		15	13.5	0.74	5.5	4.07

Hidden Ranch Tank Site

DateAssessed: 6/4/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Hidden Paving/Fencing	2004	2		15	13.5	0.74	1.75	1.30
Hidden Ranch Tank	2004	1		25	25	0.40	10	4.00

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Hidden Ranch Tank Remote Telemetry Unit	2004	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Hilltop Tank Site			DateAssessed:		5/7/2014			
Structural/Civil								
Hilltop Tank	1970	3	Base uplift along 10-ft of wall. Flex tend connection. Secure ladder. Confined ring for footing. Coal tar on inside scheduled for recoating. Detached overflow. Minor corrosion spots. Already scheduled/budgeted for epoxy. No cathodic protection.	25	20	0.50	10	5.00
Hilltop Tank Paving/Fencing	1970	2		15	13.5	0.74	1.75	1.30
Electrical & Instrumentation Controls								
Hilltop Tank Remote Telemetry Unit	1970	2		15	13.5	0.74	5.5	4.07
Lilac Tank Site			DateAssessed:		6/4/2014			
Structural/Civil								
Lilac Paving/Fencing	1991	2	No site paving or fencing.	15	13.5	0.74	1.75	1.30

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Lilac Tank	1991	3	Loss of gravel base at west edge and significant loss on east side. Secure ladder, isolated overflow, slight undermining on east side (about 40% of tank). Small welding leak and base on east side.Damage to confining ring at NE quadrant. Leak on north side	25	20	0.50	9.25	4.63
Electrical & Instrumentation Controls								
Lilac Tank Remote Telemetry Unit	1991	2		15	13.5	0.74	5.5	4.07

Madera 1 Tank Site

DateAssessed: 5/6/2014

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Structural/Civil								
Madera 1 Tank	1989	4	Tank wall is up off the ring beam by a significant amount at perimeter (Varies from 0" to 3.5"). Evidence of bottom plate corrosion at walls. Wall not bearing about 30 to 40 percent of the perimeter. Likely damaged from the 1994 Northridge Earthquake. Hyd	25	15	0.67	10	6.67
Madera 1 Tank Paving/Fencing	1989	2		15	13.5	0.74	2.5	1.85
Electrical & Instrumentation Controls								
Madera 1 Tank Cathodic Protection	1989	2		20	18	0.56	2.5	1.39

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Madera 1 Tank Remote Telemetry Unit	1989	2		15	13.5	0.74	5.5	4.07

Madera 2 Tank Site

DateAssessed: 5/6/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Madera 2 Tank	1988	2	Minor corrosion at spots on tank exterior. Pipe has EBAA Iron flex tends. Bowing of bottom panel at NW quad probobly due to EQ.	25	22.5	0.44	10	4.44
Madera 2 Tank Paving/Fencing	1988	2		15	13.5	0.74	1.75	1.30

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Madera 2 Tank Mixer	2013	2		20	18	0.56	2.5	1.39

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Madera 2 Tank Cathodic Protection	1988	2		20	18	0.56	2.5	1.39
Madera 2 Tank Remote Telemetry Unit	1988	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk

Marr Ranch Tank Site

DateAssessed: 6/4/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Marr Ranch Tank #1 West	1965	2	Interior coated 2 months ago. Secure ladder, staffing gauge needs rehab. No name plate.	25	22.5	0.44	10	4.44
Marr Ranch Tank #2 East	2005	1	Secure stair. Isolated overflow.	25	25	0.40	10	4.00
Marr Ranch Tank 1 West Paving/Fencing	1965	1		15	15	0.67	2.5	1.67

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Marr Ranch Tank #1 West Mixer	2013	2		20	18	0.56	2.5	1.39
Marr Ranch Tank #2 East Mixer	2014	2		20	18	0.56	2.5	1.39

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Marr Ranch Security Camera	1965	2		15	13.5	0.74	4.75	3.52
Marr Ranch Tank Cathodic Protection	1965	2		20	18	0.56	2.5	1.39

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Marr Ranch Tank Remote Telemetry Unit	1965	2		15	13.5	0.74	5.5	4.07

McCoy Tank Site

DateAssessed: 5/6/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
McCoy Paving/Fencing	1999	2		15	13.5	0.74	1.75	1.30
McCoy Tank	1999	2	Minor spots of corrosion. Corrosion of light base covers, but not base and bolts.	25	22.5	0.44	10	4.44

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
McCoy Security Camera	1999	2		15	13.5	0.74	4.75	3.52
McCoy Tank Cathodic Protection	1999	2		20	18	0.56	2.5	1.39
McCoy Tank Remote Telemetry Unit	1999	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Mellow Lane Tank Site			DateAssessed:	5/6/2014				
Structural/Civil								
Mellow Lane Tank	1966	3	Recently coated on the inside. Fed from Bridal Path. Unanchored. Detached overflow. Secure ladder. Flex tend connection. Isolated corrosion at bolts and seams, handful of locations. Graffiti on tank wall.	25	20	0.50	10	5.00
Mellow Lane Tank Paving/Fencing	1966	2		15	13.5	0.74	1.75	1.30
Electrical & Instrumentation Controls								
Mellow Lane Remote Telemetry Unit	1966	2		15	13.5	0.74	5.5	4.07
Mine Road Tank #1 Site			DateAssessed:	6/4/2014				
Structural/Civil								
Mine Road Paving/Fencing	1990	2		15	13.5	0.74	1.75	1.30
Mine Road Tank #1	1990	2	Partially buried. Base edge is starting to corrode.Isolated overflow. Secure ladder.	25	22.5	0.44	10	4.44

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Mine Road Tank #2 Small	1990	2	Isolated overflow, secure ladder, mis-aligned bolts at 3 locations. 2 leaks observed.	25	22.5	0.44	9.25	4.11
Electrical & Instrumentation Controls								
Mine Road Tank Remote Telemetry Unit	1990	2		15	13.5	0.74	5.5	4.07

Rocketdyne Tank Site

DateAssessed: 5/7/2014

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Structural/Civil								
Rocketdyne Tank	1992	3	Secure ladder. Ring footing cracking on south side. Tank damage to the retaining bolts from construction work.	25	20	0.50	10	5.00
Rocketdyne Tank Paving/Fencing	1992	2		15	13.5	0.74	1.75	1.30
Electrical & Instrumentation Controls								
Rocketdyne Tank Site RTU	1992	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Sinai Tank Site			DateAssessed:	6/4/2014				
Structural/Civil								
Mt. Sinai Tank	2002	2	Isolated overflow with screen. Secure stair. Birds nest within supplemental port. Piping needs new coating.	25	22.5	0.44	10	4.44
Mt. Sinai Tank Paving/Fencing	2001	1	No issues.	15	15	0.67	1.75	1.17
Electrical & Instrumentation Controls								
Mt. Sinai Tank Cathodic Protection	2001	2		20	18	0.56	2.5	1.39
Mt. Sinai Tank Remote Telemetry Unit	2001	2		15	13.5	0.74	5.5	4.07
Station 2 Tank Site			DateAssessed:	5/7/2014				
Structural/Civil								
Station 2 Tank	1980	4	Diameter to height ratio is relatively low, possible overturning concern. Ladder requires security barrier. Overflow is tied to the ground pipe, requires retrofit. Pipe inlet is rigid, requires retrofit (same as outlet). Evidence of corrosion repair.	25	15	0.67	9.25	6.17

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 2 Tank Paving/Fencing	1995	2		15	13.5	0.74	1.75	1.30

Station 3 Tank Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 3 Tank	1965	4	Currently leaking due to corrosion near the base. Overflow appears to have flex connection at top but run into the ground. Evidence of heavy corrosion at access hatch (staff indicated bottom failed and was repaired). Powerlines touching tank. Lack of sec	25	15	0.67	10	6.67
Station 3 Tank Paving/Fencing	1995	2		15	13.5	0.74	1.75	1.30

Stearns Tanks Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Stearns Tank North	1960	2	Verify need for anchorage. Restrained flex tend at grade. Detached overflow. Little to no freeboard (sloshing concern). Secure ladder.	25	22.5	0.44	10	4.44
Stearns Tank South	1960	3	Secure ladder. Detached overflow (little to no freeboard/ sloshing concern). Restrained Flex Tend at grade.	25	20	0.50	10	5.00

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Stearns Tanks Paving/Fencing	1960	2		15	13.5	0.74	2.5	1.85

Stow Tanks Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Stow Tank #1	1975	2	Secure ladder. Detached overflow. Semi-constrained pipe connections.	25	22.5	0.44	10	4.44
Stow Tank #2	1960	4	Tank wall lifted off base and east side (6" -8"). Flex tend connections. Secure ladder. Detached overflow. Semi-constrained pipe connections.	25	15	0.67	10	6.67
Stow Tank #3	1962	4	Tank wall lifted off base and east side (6" -8"). secure ladder. Semi-constrained pipe connections. Detached overflow.	25	15	0.67	10	6.67
Stow Tank #4	1995	4	Tank wall lifted off base and east side (6" -8"). Corrosion in tank base beginning. secure ladder. Semi-constrained pipe connections. Detached overflow.	25	15	0.67	10	6.67
Stow Tank Paving/Fencing	1960	2	Retaining wall falling apart on west end.	15	13.5	0.74	2.5	1.85

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Electrical & Instrumentation Controls								
Stow Tank #1 Cathodic Protection	1960	2		20	18	0.56	2.5	1.39
Stow Tank #2 Cathodic Protection	1960	2		20	18	0.56	2.5	1.39
Stow Tank #3 Cathodic Protection	1960	2		20	18	0.56	2.5	1.39
Stow Tank Remote Telemetry Unit	1960	2		15	13.5	0.74	5.5	4.07

Thompson Tank Site

DateAssessed: 6/4/2014

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Structural/Civil								
Thompson Tank	2000	2	Has issues with illegal construction. Secure ladder. Isolated overflow. Overflow drain outlet is covered by adjacent property grading. Box/pipe are plugged more or less. Overflow box backs up and sheet flows to the NE corner. Replaced a previous tank tha	25	22.5	0.44	9.25	4.11

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Thompson Tank Paving/Fencing	1996	4	North side of property has built up grade against north fence. NE corner is subsiding and has pavement damage. Property to north has cut the grade which has appeared to destablize theNE corner of the site.	15	9	1.11	1.75	1.94
Electrical & Instrumentation Controls								
Thompson Tank Remote Telemetry Unit	2000	2		15	13.5	0.74	5.5	4.07

Thorn Ridge Tank Site

DateAssessed: 6/4/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Thorn Ridge Tank	1995	2	Secure stair. No observed issues.	25	22.5	0.44	10	4.44
Thorn Ridge Tank Paving/Fencing	1995	1		15	15	0.67	1.75	1.17
Electrical & Instrumentation Controls								
Thorn Ridge Tank Cathodic Protection	1995	2		20	18	0.56	2.5	1.39
Thorn Ridge Tank Remote Telemetry Unit	1995	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Walnut Tank Site			DateAssessed:	6/4/2014				
Structural/Civil								
Walnut Tank #1	1960	2	Isolated overflow. No bollard protection of piping. Secure ladder. Staffing gauge needs rehab. Restrained irrigation link connection. Potential failure point. No name plate.	25	22.5	0.44	10	4.44
Walnut Tank #2	1992	2	Fittings protected with bollards. Secure ladder. GAP 1"-1.5" between pavement and west side of footing.	25	22.5	0.44	10	4.44
Walnut Tank East Paving/Fencing	1960	2	Fence eroded at posts and gaps below bottom.	15	13.5	0.74	2.5	1.85
Electrical & Instrumentation Controls								
Walnut Tank #1 Cathodic Protection	1960	2		20	18	0.56	2.5	1.39
Walnut Tank #2 Cathodic Protection	1960	2		20	18	0.56	2.5	1.39
Walnut Tank Cathodic Protection	1960	2		20	18	0.56	2.5	1.39

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Walnut Tank Remote Telemetry Unit	1960	2		15	13.5	0.74	5.5	4.07

Wood Ranch 1 Tank Site

DateAssessed: 5/6/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Wood Ranch 1 Tank	1986	2	Secure ladder.	25	22.5	0.44	10	4.44
Wood Ranch 1 Tank Paving/Fencing	1986	2		15	13.5	0.74	2.5	1.85

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Wood Ranch 1 Tank Cathodic Protection	1986	2		20	18	0.56	2.5	1.39
Wood Ranch 1 Tank Remote Telemetry Unit	1986	2		15	13.5	0.74	5.5	4.07

Wood Ranch 2 Tank Site

DateAssessed: 5/6/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Wood Ranch 2 Tank	1986	2		25	22.5	0.44	10	4.44

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Wood Ranch 2 Tank Paving/Fencing	1986	2		15	13.5	0.74	2.5	1.85
Electrical & Instrumentation Controls								
Wood Ranch 2 Tank Cathodic Protection	1986	2		20	18	0.56	2.5	1.39
Wood Ranch 2 Tank Remote Telemetry Unit	1986	2		15	13.5	0.74	5.5	4.07
Wood Ranch 5 MG Tank Site			DateAssessed:	5/6/2014				
Structural/Civil								
Wood Ranch 5 MG Tank	1984	2		25	22.5	0.44	10	4.44
Wood Ranch 5 MG Tank Paving/Fencing	1984	2		15	13.5	0.74	2.5	1.85
Electrical & Instrumentation Controls								
Wood Ranch 5 MG Tank Cathodic Protection	1984	2		20	18	0.56	2.5	1.39
Wood Ranch 5 MG Tank Remote Telemetry Unit	1984	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk

Pump Stations

Alta Vista Pump Station Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Alta Vista Paving/Fencing	2001	2		20	18	0.56	1	0.56

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Alta Vista Motor #1	2001	2		20	18	0.56	4.75	2.64
Alta Vista Smith Rd. Pump #1	2001	2		20	18	0.56	4.75	2.64

Big Sky 1 Pump Station Site

DateAssessed: 6/4/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Big Sky 1 Building	2005	2		50	45	0.22	7.75	1.72
Big Sky 1 Paving/Fencing	2005	2		15	13.5	0.74	1.75	1.30

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Big Sky 1 Air Handling Unit	2005	2		15	13.5	0.74	1	0.74

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Big Sky 1 Cooling Water Pump	2005	2	Built for moving large amounts of water from pumps 3 and 4 at low suction in the event of an earthquake. Provides cooling water for backup generator.	20	18	0.56	4	2.22
Big Sky 1 Evaporation Cooler	2005	2		15	13.5	0.74	1.75	1.30
Big Sky 1 Motor #1	2005	2	Always runs.	20	18	0.56	4.75	2.64
Big Sky 1 Motor #2	2005	2	Always runs.	20	18	0.56	4.75	2.64
Big Sky 1 Motor #3	2005	2	Only run to exercise.	20	18	0.56	4.75	2.64
Big Sky 1 Motor #4	2005	2	Only run to exercise.	20	18	0.56	4.75	2.64
Big Sky 1 Pump #1	2011	2		20	18	0.56	4.75	2.64
Big Sky 1 Pump #2	2005	2		20	18	0.56	4.75	2.64
Big Sky 1 Pump #3	2005	2		20	18	0.56	4.75	2.64

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Big Sky 1 Pump #4	2005	2		20	18	0.56	4.75	2.64
Electrical & Instrumentation Controls								
Big Sky 1 Flow Meter	2005	2		15	13.5	0.74	3.25	2.41
Big Sky 1 Generator	2005	2		30	27	0.37	7	2.59
Big Sky 1 MCC	2005	2		30	27	0.37	7	2.59
Big Sky 1 PLC	2005	2		15	13.5	0.74	5.5	4.07
Big Sky 1 Remote Telemetry Unit	2005	2		15	13.5	0.74	5.5	4.07

Big Sky 2 Pump Station Site

DateAssessed: 6/4/2014

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Structural/Civil								
Big Sky 2 Building	2005	2		50	45	0.22	7.75	1.72
Big Sky 2 Paving/Fencing	2005	2		15	13.5	0.74	1.75	1.30
Mechanical								

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Big Sky 2 Motor #1	2005	2		20	18	0.56	4.75	2.64
Big Sky 2 Motor #2	2005	2		20	18	0.56	4.75	2.64
Big Sky 2 Motor #3	2005	2		20	18	0.56	4.75	2.64
Big Sky 2 Pump #1	2005	2		20	18	0.56	4.75	2.64
Big Sky 2 Pump #2	2005	2		20	18	0.56	4.75	2.64
Big Sky 2 Pump #3	2005	2		20	18	0.56	4.75	2.64

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Big Sky 2 Flow meter	2005	2		15	13.5	0.74	3.25	2.41
Big Sky 2 Generator	2005	2		30	27	0.37	7	2.59
Big Sky 2 MCC	2005	2		30	27	0.37	6.25	2.31

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Big Sky 2 Pump Remote Telemetry Unit	2005	2		15	13.5	0.74	5.5	4.07

Bridal Path 1 Pump Station Site

DateAssessed: 6/4/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Bridal Path 1 Paving/Fencing	1997	2		15	13.5	0.74	1.75	1.30

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Bridal Path 1 Motor #1	1997	3		20	16	0.63	4.75	2.97
Bridal Path 1 Motor #2	1997	3		20	16	0.63	4.75	2.97
Bridal Path 1 Motor #3	2008	3		20	16	0.63	4.75	2.97
Bridal Path 1 Pump #1	1997	4	Out for repair. Obsolete.	20	12	0.83	4.75	3.96
Bridal Path 1 Pump #2	1997	3		20	16	0.63	4.75	2.97
Bridal Path 1 Pump #3	2008	3		20	16	0.63	4.75	2.97

Electrical & Instrumentation Controls

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Bridal Path 1 Flow Meter	2007	3		15	12	0.83	3.25	2.71
Bridal Path 1 Remote Telemetry Unit	1975	3		15	12	0.83	5.5	4.58

Bridal Path 2 Pump Station Site

DateAssessed: 5/6/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Bridal Path 2 Paving/Fencing	1998	3	Pipe supports are not anchored. Water transmission through wall.	15	12	0.83	1.75	1.46

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Bridal Path 2 Motor #1	1998	4		20	12	0.83	4.75	3.96
Bridal Path 2 Motor #2	1998	4		20	12	0.83	4.75	3.96
Bridal Path 2 Pump #1	2008	4		20	12	0.83	4.75	3.96
Bridal Path 2 Pump #2	1975	4		20	12	0.83	4.75	3.96

Electrical & Instrumentation Controls

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Bridal Path 2 Flow Meter	1998	2		15	13.5	0.74	3.25	2.41
Bridal Path 2 MCC	1998	3		30	24	0.42	6.25	2.60
Bridal Path 2 Pump Remote Telemetry Unit	1975	2		15	13.5	0.74	5.5	4.07

Chumash Pump Station Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Chumash Building	2001	2		50	45	0.22	7	1.56
Chumash Paving/Fencing	2001	1	Minor floor slab cracking.	15	15	0.67	1.75	1.17

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Chumash Motor #1	2001	3		20	16	0.63	4.75	2.97
Chumash Motor #2	2001	3		20	16	0.63	4.75	2.97
Chumash Motor #3	2001	3		20	16	0.63	4.75	2.97

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Chumash Pump #1	2001	3		20	16	0.63	4.75	2.97
Chumash Pump #2	2001	3		20	16	0.63	4.75	2.97
Chumash Pump #3	2001	3		20	16	0.63	4.75	2.97

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Chumash Flow Meter	2001	2		15	13.5	0.74	3.25	2.41
Chumash Generator	2001	2		30	27	0.37	7	2.59
Chumash MCC	2001	2		30	27	0.37	6.25	2.31
Chumash Remote Telemetry Unit	2001	2		15	13.5	0.74	5.5	4.07
Chumash Security Camera	2001	2		15	13.5	0.74	4.75	3.52

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk

Cochran Pump Station Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Cochran Paving/Fencing	2001	3	Pumps are not anchored to slab. Possible base restraint is needed to the can. Vibration noticeable in the concrete slab at pump 2. Minor slab cracking.	15	12	0.83	1.75	1.46

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Cochran Motor #1	2001	2		20	18	0.56	4.75	2.64
Cochran Motor #2	2001	2		20	18	0.56	4.75	2.64
Cochran Motor #3	2001	2		20	18	0.56	4.75	2.64
Cochran Pump #1	2001	3		20	16	0.63	4.75	2.97
Cochran Pump #2	2001	3		20	16	0.63	4.75	2.97
Cochran Pump #3	2001	3	Pipes and valves in good shape - welded steel.	20	16	0.63	4.75	2.97

Electrical & Instrumentation Controls

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Cochran Flow Meter	2001	2		15	13.5	0.74	3.25	2.41
Cochran Generator	2001	2		30	27	0.37	7	2.59
Cochran MCC	2001	2		30	27	0.37	6.25	2.31
Cochran Pump Remote Telemetry Unit	2001	2		15	13.5	0.74	5.5	4.07
Cochran Seismic Trigger	2001	2		15	13.5	0.74	3.25	2.41

Cottonwood Pump Station Site

DateAssessed: 5/6/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Cottonwood Building	1995	2	Site has capacity concerns.	50	45	0.22	8.5	1.89
Cottonwood Paving/Fencing	1995	1	Site has capacity concerns.	15	15	0.67	1.75	1.17

Mechanical

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Cottonwood Motor #1	1995	3	Corresponding pump too small for fire or emergency pumping. Site has capacity concerns.	20	16	0.63	4	2.50
Cottonwood Motor #2	1995	3	Site has capacity concerns.	20	16	0.63	4	2.50
Cottonwood Motor #3	1995	3	Site has capacity concerns.	20	16	0.63	4	2.50
Cottonwood Pump #1	1995	3	Not adequate for service. No flow rating on tag, type F-394-4. Pump too small for fire or emergency pumping. Pipe valves near new.Site has capacity concerns.	20	16	0.63	4	2.50
Cottonwood Pump #2	1995	3	Not adequate for service. No flow rating on tag, type F-394-4. Pump too small for fire or emergency pumping. Pipe valves near new.Site has capacity concerns.	20	16	0.63	4	2.50
Cottonwood Pump #3	1995	3	Not adequate for service. No flow rating on tag, type F-394-4. Pump too small for fire or emergency pumping. Pipe valves near new. Site has capacity concerns.	20	16	0.63	4	2.50

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Cottonwood Flow Meter	1995	2	Site has capacity concerns.	15	13.5	0.74	6.25	4.63

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Cottonwood MCC	1995	2	Site has capacity concerns.	30	27	0.37	7.75	2.87
Cottonwood Pump Remote Telemetry Unit	1995	2	Site has capacity concerns.	15	13.5	0.74	5.5	4.07
Cottonwood Security Camera	1995	2	Site has capacity concerns.	15	13.5	0.74	4.75	3.52

Crosby Pump Station Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Crosby Building	1999	3	Typical efflorescence at interior. Pumps are unanchored to connection pad. New roof required.Concrete roof with rolled out shingle tarred.	50	40	0.25	7	1.75
Crosby Paving/Fencing	1999	3		15	12	0.83	1.75	1.46

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Crosby Motor #1	1999	2		20	18	0.56	4	2.22
Crosby Motor #2	1999	2		20	18	0.56	4	2.22

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Crosby Pump #1	1999	2	Pipes and valves look good.	20	18	0.56	4.75	2.64
Crosby Pump #2	1999	2		20	18	0.56	4.75	2.64
Electrical & Instrumentation Controls								
Crosby Flow Meter	1999	3		15	12	0.83	3.25	2.71
Crosby Generator	1999	2		30	27	0.37	7	2.59
Crosby MCC	1999	3		30	24	0.42	6.25	2.60
Crosby Remote Telemetry Unit	1999	2		15	13.5	0.74	5.5	4.07

Flanagan Pump Station Site

DateAssessed: 5/7/2014

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Structural/Civil								
Flanagan Paving/Fencing	1984	3	Canopy legs damaged from previous mudslide. The wall was replaced. Minor Slab cracking.	15	12	0.83	1.75	1.46
Mechanical								
Flanagan Motor #1	1984	3		20	16	0.63	4.75	2.97

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Flanagan Motor #2	1984	3		20	16	0.63	4.75	2.97
Flanagan Motor #3	1990	2		20	18	0.56	4.75	2.64
Flanagan Pump #1	1984	3		20	16	0.63	4.75	2.97
Flanagan Pump #2	1984	3		20	16	0.63	4.75	2.97
Flanagan Pump #3	2014	2	Pipe valves old.	20	18	0.56	4.75	2.64
Electrical & Instrumentation Controls								
Flanagan Flow Meter	1984	2		15	13.5	0.74	3.25	2.41
Flanagan MCC	1984	3		20	16	0.63	6.25	3.91
Flanagan Pump Remote Telemetry Unit	1984	2		15	13.5	0.74	5.5	4.07
Flanagan Seismic Trigger	1984	3		15	12	0.83	3.25	2.71

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Library Pump Station Site			DateAssessed:	5/6/2014				
Structural/Civil								
Library Building	1989	3	Site has capacity concerns. Efflorescence at the NE corner. Corrosion of electrical equipment mounted against the wall. Severe corrosion of roof.	50	40	0.25	8.5	2.13
Library Paving/Fencing	1989	2	Severe corrosion of guard rail posts.	15	13.5	0.74	1	0.74
Mechanical								
Library Motor #1	1989	2	Site has capacity concerns.	20	18	0.56	4	2.22
Library Motor #2	1989	2	This pump has tags indicating it has been rebuilt.Site has capacity concerns.	20	18	0.56	4	2.22
Library Motor #3	1989	2	Site has capacity concerns.	20	18	0.56	4	2.22
Library Pump #1	2000	3	Site has capacity concerns.	20	16	0.63	4.75	2.97
Library Pump #2	2011	4	Not running- out of service for diagnosis of seal leak.	20	12	0.83	4.75	3.96

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Library Pump #3	2000	3	Site has capacity concerns.	20	16	0.63	4.75	2.97
Electrical & Instrumentation Controls								
Library Flow Meter	1989	2	Site has capacity concerns.	15	13.5	0.74	6.25	4.63
Library MCC	1989	3	Site has capacity concerns.	30	24	0.42	7.75	3.23
Madera Pump Station Site			DateAssessed:	5/6/2014				
Structural/Civil								
Madera Paving/Fencing	1988	3	Major cracking and spalling at the concrete pad for pumps. Cracking in the wall finish of the interior (several locations). Transformer installed in a sloped position (non-level) concrete pad appears to have settled differentially.	15	12	0.83	1.75	1.46
Mechanical								
Madera Motor #1	2010	1	No variable frequency drive.	20	20	0.50	4.75	2.38
Madera Motor #2	1988	2		20	18	0.56	4.75	2.64

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Madera Motor #3	1988	2		20	18	0.56	4.75	2.64
Madera Pump #1	2010	1		20	20	0.50	4.75	2.38
Madera Pump #2	1988	2	Minor issues with mechanical seal.	20	18	0.56	4.75	2.64
Madera Pump #3	1988	2	Minor issues with mechanical seal.	20	18	0.56	4.75	2.64
Electrical & Instrumentation Controls								
Madera Flow Meter	1988	2		15	13.5	0.74	3.25	2.41
Madera MCC	1988	3		30	24	0.42	6.25	2.60
Madera PLC	1988	3		15	12	0.83	5.5	4.58
Madera Remote Telemetry Unit	1988	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Mine Road Pump Station Site			DateAssessed:	5/7/2014				
Structural/Civil								
Mine Road Tank Paving/Fencing	1990	3	Asphalt paving, chain link fence, concrete pad and pump. Excavation for new meter. Dirt pit where vault is being installed.	15	12	0.83	1.75	1.46
Mechanical								
Mine Road Motor #1	2012	2		20	18	0.56	4.75	2.64
Mine Road Pump #1	1990	4	More flow needed, backup pump needed.	20	12	0.83	4.75	3.96
Electrical & Instrumentation Controls								
Mine Road Flow Meter	1990	3		15	12	0.83	3.25	2.71
Mine Road MCC	1990	3		30	24	0.42	6.25	2.60
Mine Road Pump Remote Telemetry Unit	1990	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln³	Criticality	Risk
Oak Knolls Pump Station Site			DateAssessed:		5/7/2014			
Structural/Civil								
Oak Knolls Building	1998	2	Site has capacity concerns.	50	45	0.22	8.5	1.89
Oak Knolls Paving/Fencing	1998	2		15	13.5	0.74	1.75	1.30
Mechanical								
Oak Knolls Motor #1	1998	1		20	20	0.50	4	2.00
Oak Knolls Pump #1	2013	1	Watts pump control valve is old-condition 3-4.	20	20	0.50	4.75	2.38
Electrical & Instrumentation Controls								
Oak Knolls Flow Meter	1995	2	Site has capacity concerns.	15	13.5	0.74	6.25	4.63
Oak Knolls Generator	2013	2	Increased residential development at higher elevations. More storage needed but at least reliability improved with generator.Site has capacity concerns.	30	27	0.37	8.5	3.15

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Oak Knolls Pump Remote Telemetry Unit	1998	2	Site has capacity concerns.	15	13.5	0.74	5.5	4.07

Station 1 Pump Station Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 1 Paving/Fencing	1998	2		15	13.5	0.74	1.75	1.30

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 1 Motor #1	1994	3		20	16	0.63	4.75	2.97
Station 1 Motor #2	2002	2		20	18	0.56	4.75	2.64
Station 1 Pump #1	1995	4	Severe corrosion to pump cans (circa 1960). Natural gas pump does not pump enough for backup. Plan to decommission natural gas pump on onsite and switch to additional electric pump. Need 3rd pump because normal oprations use 2 and 3rd is needed for back	20	12	0.83	4.75	3.96
Station 1 Pump #2	2002	4		20	12	0.83	4.75	3.96

Electrical & Instrumentation Controls

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 1 MCC	1996	2		30	27	0.37	6.25	2.31

Station 2 Pump Station Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 2 Paving/Fencing	1995	4	Heavy slab cracking throughout. Cracking and spalling of concentrated thrust block on hillside.	15	9	1.11	1.75	1.94

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 2 Motor #1	2007	3	Site has capacity concerns.	20	16	0.63	4.75	2.97
Station 2 Motor #2	1997	3	VFD driven. Site has capacity concerns.	20	16	0.63	4.75	2.97
Station 2 Pump #1	2004	4	Pump cans rotted out. No seismic restraints on pipe. Tank not bolted down. Need a third pump. Valves vary in age and rebuild date.Site has capacity concerns.	20	12	0.83	4.75	3.96
Station 2 Pump #2	1997	4	Need a third pump. Site has capacity concerns.	20	12	0.83	4.75	3.96

Electrical & Instrumentation Controls

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 2 MCC2	1995	2		30	27	0.37	6.25	2.31
Station 2 Pump Remote Telemetry Unit	1995	2		15	13.5	0.74	5.5	4.07

Station 3 Pump Station Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 3 Paving/Fencing	1997	2	45' X 22.5' Concrete pad with 2' CMU wall and chainlinked fence 10' height.	15	13.5	0.74	1.75	1.30

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 3 Motor #1	1997	2	Pump cans bad.	20	18	0.56	4.75	2.64
Station 3 Motor #2	1997	2	Pump cans bad.	20	18	0.56	4.75	2.64
Station 3 Pump #1	1995	3	Site has capacity concerns.	20	16	0.63	4.75	2.97
Station 3 Pump #2	1995	3	Cans orginal. Need a third pump- pumps running while we were there.Site has capacity concerns.	20	16	0.63	4.75	2.97

Electrical & Instrumentation Controls

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Station 3 MCC	1997	2		30	27	0.37	6.25	2.31
Station 3 Pump Remote Telemetry Unit	1995	2		15	13.5	0.74	5.5	4.07

Stearns Pump Station Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Stearns Building	1978	3	Replaced wood framing around pump access. 8" tall at the south wall. Unknown anchorage to roof. Minor corrosion of column base plate. Slab cracking at door. Exterior of block wall has non-uniform paint. Wood trim appears to be rotting. Burned wood at exh	50	40	0.25	7	1.75
Stearns Paving/Fencing	1978	4		15	9	1.11	1.75	1.94

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Stearns CAT Natural Gas Engine 3306	1970	3	Direct drive to pump.	30	24	0.42	4.75	1.98
Stearns Motor #1	1997	3		20	16	0.63	4.75	2.97

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Stearns Motor #2	1997	3		20	16	0.63	4.75	2.97
Stearns Pump #1	2013	3		20	16	0.63	4.75	2.97
Stearns Pump #2	1998	4		20	12	0.83	4.75	3.96
Stearns Pump #3 Angle Drive	1978	3		20	16	0.63	2.5	1.56

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Stearns Flow Meter	2006	3		15	12	0.83	3.25	2.71
Stearns MCC	1994	2		30	27	0.37	6.25	2.31
Stearns PLC	1978	3		15	12	0.83	5.5	4.58
Stearns Pump Remote Telemetry Unit	1993	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Tapo Street Pump Station Site			DateAssessed:		5/7/2014			
Structural/Civil								
Tapo Street Paving/Fencing	1969	4	Deteriorated wood gate. Needs to be replaced. Site is not secure. Concrete surface is eroded. Vulnerable to trespassers.	15	9	1.11	1.75	1.94
Mechanical								
Tapo Street Motor #1	2010	3	Very old- scheduled to move several times but still here.	20	16	0.63	4.75	2.97
Tapo Street Motor #2	1969	5		20	2	5.00	4.75	23.75
Tapo Street Pump #1	2010	3	Pipe and valves are condition 4. Runs 8 hours a day.	20	16	0.63	4.75	2.97
Tapo Street Pump #2	2010	3	Runs 8 hours a day.	20	16	0.63	4.75	2.97
Electrical & Instrumentation Controls								
Tapo Street Flow Meter	1998	2		15	13.5	0.74	3.25	2.41

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Tapo Street MCC	1969	2		30	27	0.37	6.25	2.31
Tapo Street Pump Remote Telemetry Unit	1969	2		15	13.5	0.74	5.5	4.07

Wood Ranch 1 Pump Station Site

DateAssessed: 5/6/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Wood Ranch 1 Paving/Fencing	1988	2	Minor wood deterioration (squirrel gnawed a hole to gain access).	15	13.5	0.74	1.75	1.30

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Wood Ranch 1 Motor #1	1984	3	Low priority for maintenance staff. Pump station rarely used.	20	16	0.63	4.75	2.97
Wood Ranch 1 Motor #2	1984	3		20	16	0.63	4.75	2.97
Wood Ranch 1 Pump #1	1984	3		20	16	0.63	4.75	2.97
Wood Ranch 1 Pump #2	1984	4	Not operating.	20	12	0.83	4.75	3.96

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Wood Ranch 1 Pump #3 Angle Drive	1984	4	Valves outdated and no parts. Not operating.	20	12	0.83	2.5	2.08
Electrical & Instrumentation Controls								
Wood Ranch 1 MCC	1984	3		30	24	0.42	6.25	2.60
Wood Ranch 1 Pump Remote Telemetry Unit	1984	2		15	13.5	0.74	5.5	4.07
Wood Ranch 1 Seismic Detection System	1984	3		15	12	0.83	3.25	2.71

Wood Ranch 2 Pump Station Site

DateAssessed: 5/6/2014

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Structural/Civil								
Wood Ranch 2 Building	1986	3		50	40	0.25	7	1.75
Wood Ranch 2 Paving/Fencing	1986	2		15	13.5	0.74	1.75	1.30
Mechanical								
Wood Ranch 2 Motor #1	1986	0	Removed, replaced by a PRV.	20			4.75	

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Wood Ranch 2 Motor #2	1986	3		20	16	0.63	4.75	2.97
Wood Ranch 2 Pump #2	1986	3	Older pump- rarely used. Except for routine exercising 60 hp U.S. electric motors.	20	16	0.63	4.75	2.97
Wood Ranch 2 Pump #3 Angle Drive	1986	4		20	12	0.83	2.5	2.08
Electrical & Instrumentation Controls								
Wood Ranch 2 Generator	1986	2		30	27	0.37	7	2.59
Wood Ranch 2 Pump MCC	1986	2		30	27	0.37	6.25	2.31
Wood Ranch 2 Pump Remote Telemetry Unit	1986	2		15	13.5	0.74	5.5	4.07

Yosemite Pump Station Site

DateAssessed: 5/7/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Yosemite Building	2001	3	6' X 6' paved CMU building with wood-frame (added at a later date).	50	40	0.25	6.25	1.56

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Yosemite Paving/Fencing	2001	2	Minor slab cracking throughout. Pumps are anchored to concrete.	15	13.5	0.74	1.75	1.30
Mechanical								
Yosemite Motor #1	2001	3	Parts likely not available in the U.S. Dependable motor though.	20	16	0.63	4.75	2.97
Yosemite Motor #2	2001	3		20	16	0.63	4.75	2.97
Yosemite Motor #3	2001	3		20	16	0.63	4.75	2.97
Yosemite Pump #1	2001	3		20	16	0.63	4.75	2.97
Yosemite Pump #2	2001	2		20	18	0.56	4.75	2.64
Yosemite Pump #3	2001	2		20	18	0.56	4.75	2.64
Electrical & Instrumentation Controls								
Yosemite Flow Meter	2001	2		15	13.5	0.74	3.25	2.41

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Yosemite MCC1	2001	3		30	24	0.42	6.25	2.60
Yosemite MCC2	2001	3		30	24	0.42	6.25	2.60
Yosemite Remote Telemetry Unit	2001	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk

Wells

Well 31 Site

DateAssessed: 6/4/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Well 31 Catch Basin	1965	2		50	45	0.22	1	0.22
Well 31 Paving/Fencing	1965	2	No paving or fencing.	15	13.5	0.74	1.75	1.30
Well 31 Tank	1965	4	Rigid pipe attachments. Tank feeds nursery and golf course. Small label at NE quad. Unsecure ladder. Corrosion stains at west wall. Undermined edge at south side and overflow pipe. Gap goes back at least 8". No name plate.	25	15	0.67	9.25	6.17

Mechanical

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Well 31 C Casing and Packing	2011	2		30	27	0.37	4	1.48
Well 31 C Motor #1	2011	2		20	18	0.56	4.75	2.64
Well 31 C Pump #1	2011	2		20	18	0.56	4.75	2.64

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Well 31 D Casing and Packing	2011	2		30	27	0.37	4	1.48
Well 31 D Motor #1	2009	3		20	16	0.63	4.75	2.97
Well 31 D Pump #1	2009	2		20	18	0.56	4.75	2.64

Electrical & Instrumentation Controls

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Well 31 C Flow Meter	2011	2		15	13.5	0.74	3.25	2.41
Well 31 D Flow Meter	2009	2		15	13.5	0.74	3.25	2.41
Well 31 MCC	2011	2		30	27	0.37	6.25	2.31
Well 31 Remote Telemetry Unit	2011	2		15	13.5	0.74	5.5	4.07

Well 32 Site

DateAssessed: 6/4/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Well 32 Paving/Fencing	1965	2	No paving or fencing.	15	13.5	0.74	1.75	1.30

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Well 32 Tank	2002	3	Isolated overflow is too high and too close to the tank. Erosion of gravel fill and undermining. Erosion at drain box is shallow and may fill and overflow. Repaired pentrations in upper shell and north side.	25	20	0.50	9.25	4.63
Mechanical								
Well 32 Casing and Packing	1965	3		30	24	0.42	4	1.67
Well 32 Motor #1	2008	3		20	16	0.63	4.75	2.97
Well 32 Pump #1	2008	3		20	16	0.63	4.75	2.97
Electrical & Instrumentation Controls								
Well 32 Flow Meter	2008	2		15	13.5	0.74	3.25	2.41
Well 32 PLC	1965	3		15	12	0.83	5.5	4.58
Well 32 Remote Telemetry Unit	1965	2		15	13.5	0.74	5.5	4.07

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk

Storage

Stearns Storage Site

DateAssessed:

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Stearns Storage Building		3					6.25	

Walnut Storage Site

DateAssessed:

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Walnut Storage Building		3					6.25	

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk

Treatment

Water Treatment Plant

DateAssessed: 6/4/2014

Structural/Civil

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Concentrate Tank	2008	2	Overflow box is blinded with plywood cover. Isolated overflow, secure ladder, restrained concentrate lines, rigid pipe connection at NE quad. Nameplate difficult to read.	25	22.5	0.44	2.5	1.11
Finished Water Tank	2008	2	Isolated overflow. Secure stair.	25	22.5	0.44	10	4.44
Finished Water Tank Paving/Fencing	2008	2		15	13.5	0.74	1.75	1.30
Water Treatment Blend Tank	2008	2		25	22.5	0.44	7.75	3.44
Water Treatment Building	2008	2		50	45	0.22	7.75	1.72
Water Treatment Caustic Tank	2008	2		25	22.5	0.44	8.5	3.78

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Water Treatment Chlorine Room T1 Tank	2008	2		25	22.5	0.44	8.5	3.78
Water Treatment Chlorine Room T2 Tank	2008	2		25	22.5	0.44	7.75	3.44
Water Treatment CIP Tank 1	2008	2		25	22.5	0.44	8.5	3.78
Water Treatment Paving/Fencing	2008	2	Chain Link 12', CMU 10'-15' rolling gate.	15	13.5	0.74	2.5	1.85
Water Treatment Propane Tank	2008	2		25	22.5	0.44	8.5	3.78
Water Treatment Tank	2008	2		25	22.5	0.44	8.5	3.78
Mechanical								
Water Treatment Cartridge Filter (2)	2008	2		7	6.3	1.59	3.25	5.16
Water Treatment Outside Pump	2010	2		20	18	0.56	4	2.22

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Water Treatment Peristaltic Pump #1	2014	1		20	20	0.50	4	2.00
Water Treatment Peristaltic Pump #2	2014	1		20	20	0.50	4	2.00
Water Treatment Process Pump	2008	2		20	18	0.56	4.75	2.64
Water Treatment Refrigerator Unit	2008	2		15	13.5	0.74	1	0.74
Water Treatment RO Membrane P1	2008	4		7	4.2	2.38	5.5	13.10
Water Treatment RO Membrane P2	2008	4		7	4.2	2.38	5.5	13.10
Electrical & Instrumentation Controls								
Finished Water Tank Cathodic Protection	2008	2		25	22.5	0.44	2.5	1.11
Water Treatment Blended Water Meter	2008	2		15	13.5	0.74	3.25	2.41

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Water Treatment Concentrate Meter	2008	2		15	13.5	0.74	3.25	2.41
Water Treatment Finished Water Flow Meter	2008	2		15	13.5	0.74	3.25	2.41
Water Treatment Groundwater Bypass Flow Meter	2008	2		15	13.5	0.74	2.5	1.85
Water Treatment Groundwater Bypass Meter	2008	2		15	13.5	0.74	3.25	2.41
Water Treatment MCC	2008	2		30	27	0.37	6.25	2.31
Water Treatment Measurement Instrument	2008	2		15	13.5	0.74	2.5	1.85
Water Treatment pH Meter	2008	2		15	13.5	0.74	2.5	1.85
Water Treatment Plant Camera Up Hill	2008	2		15	13.5	0.74	4.75	3.52

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

Component	Year	Condition	Comments	OUL[1]	EvRUL	Vuln[3]	Criticality	Risk
Water Treatment Plant Cathodic Protection	2008	2		20	18	0.56	2.5	1.39
Water Treatment Plant Infrared Sensors	2008	2		15	13.5	0.74	4.75	3.52
Water Treatment Transformer	2008	2		30	27	0.37	6.25	2.31
Water Treatment Turbidity Meter	2008	2		15	13.5	0.74	2.5	1.85
Water Treatment Water Quality Analyzer	2014	2		15	13.5	0.74	1	0.74

1. Original Useful Life
2. Evaluated Remaining Useful Life
3. Vulnerability

APPENDIX B – FUNCTIONAL ALLOCATION DETAILS

Operating Expenditures		Forecasted FY 2015/16	Allocation Basis	Customer	Capacity	Base	Peak	Pumping	As All Others	Total
PERSONNEL										
41010	Regular Salaries	$3,172,812	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41020	Temporary Salaries	$-	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41040	Overtime	$78,795	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41200	Deferred Compensation-401k	$11,227	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41210	Deferred Compensation - 457	$11,742	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41300	Vision Care	$12,360	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41350	Disability	$11,227	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41400	Group Ins/Health	$68,701	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41450	Life Insurance	$6,180	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41500	Group Ins/Dental	$45,423	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41600	Retirement/PERS	$599,769	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41650	Medicare	$55,723	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41700	Workers' Compensation	$256,676	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41620	Retirement/HRA	$-	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41800	Salary Reimbursements	$77,250	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
41900	Personnel Savings	$-	As All Others	0%	0%	0%	0%	0%	100%	100%

Operating Expenditures		Forecasted FY 2015/16	Allocation Basis		Customer	Capacity	Base	Peak	Pumping		As All Others		Total
SUPPLIES/MATERIALS													
42100	Utilities	$805,140	Pumping / Lift		0%	0%	25%	0%	75%		0%		100%
42150	Communications	$38,064	Fixed (25/75)		20%	75%	2.5%	2.5%	0%		0%		100%
42200	Computers (Non-Cap)	$-	Fixed (25/75)		20%	75%	2.5%	2.5%	0%		0%		100%
42230	Office Supplies	$11,440	Fixed (25/75)		20%	75%	2.5%	2.5%	0%		0%		100%
42235	Furnishings and Equip (Non-Cap)	$15,600	Fixed (25/75)		20%	75%	2.5%	2.5%	0%		0%		100%
42310	Rentals	$2,080	Fixed (25/75)		20%	75%	2.5%	2.5%	0%		0%		100%
42410	Uniform/Clothing Supply	$13,000	Fixed (25/75)		20%	75%	2.5%	2.5%	0%		0%		100%
42440	Memberships and Dues	$13,624	Fixed (25/75)		20%	75%	2.5%	2.5%	0%		0%		100%
42450	Subscriptions and Books	$2,184	Fixed (25/75)		20%	75%	2.5%	2.5%	0%		0%		100%
42520	Water Meters	$470,184	Capacity Only		0%	100%	0%	0%	0%		0%		100%
42540	Water Purchase	$27,448,209	System Peaking Factors		0%	0%	71%	29%	0%		0%		100%
42541	Recycled Water Purchases	$54,080	Base Only		0%	0%	100%	0%	0%		0%		100%
42550	Small Tools/Equipment	$17,160	Customer Only		70%	25%	5%	0%	0%		0%		100%
42560	Operating Supplies	$162,760	Pumping / Lift		0%	0%	25%	0%	75%		0%		100%
42720	Travel, Conferences, Meetings	$6,032	Customer Only		70%	25%	5%	0%	0%		0%		100%
42730	Training	$25,584	Customer Only		70%	25%	5%	0%	0%		0%		100%
42790	Mileage	$520	Customer Only		70%	25%	5%	0%	0%		0%		100%

Operating Expenditures		Forecasted FY 2015/16	Allocation Basis	Customer	Capacity	Base	Peak	Pumping	As All Others	Total
SERVICES										
44010	Professional/Special Services	$418,288	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
44012	Outside Legal Services	$-	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
44310	Maintenance of Equipment	$481,624	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
44410	Maint of Buildings/Grounds	$5,200	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
44490	Other Contract Services	$413,608	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
44590	Insurance Charges	$169,312	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
44491	FIS Operations	$-	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
44492	GIS Operations	$-	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
REIMBURSEMENTS/TRANSFERS										
45805	Reimb From Workers' Comp.	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
46100	Reimb to General Fund	$1,761,552	Customer Only	70%	25%	5%	0%	0%	0%	100%
49297	Transfer to Retiree Benefits	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
49648	Transfer to Computer Equip.	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
49600	Transfer to Streets & Roads	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
49649	Transfer to GIS Capital	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
49656	Transfer to FIS Capital	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
49763	Transfer to Vehicle Replacement	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
49763	Transfer to Facilities Replacement	$-	As All Others	0%	0%	0%	0%	0%	100%	100%

Operating Expenditures		Forecasted FY 2015/16	Allocation Basis	Customer	Capacity	Base	Peak	Pumping	As All Others	Total
CAPITAL OUTLAY										
47020	Furnishings & Equipment	$-	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
47028	Computers (Capital)	$-	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
47030	Vehicles	$29,328	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
0	Anticipated Under expenditures	$-	Fixed (25/75)	20%	75%	2.5%	2.5%	0%	0%	100%
Operating Expenditures Sub Total		**$36,772,458**		**$2,471,841**	**$5,438,824**	**$20,060,467**	**$8,075,401**	**$725,925**	**$-**	**$36,772,458**
Reallocation of "As All Others"				**$-**	**$-**	**$-**	**$-**	**$-**	**$-**	
Total Allocation		**$36,772,458**		$2,471,841	$5,438,824	$20,060,467	$8,075,401	$725,925	$-	
Percentage Allocation		**100.0%**		6.7%	14.8%	54.6%	22.0%	2.0%	0.0%	

Rate Revenue Requirement	FY 2015/16	Allocation	Customer	Capacity	Base	Peak	Pumping	As All Others	Total
Operating Expenses	$36,772,458	As O&M	7%	15%	55%	22%	2%	0%	100%
Additional O&M	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
Debt	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
Rate Funded Capital	$4,894,205	Fixed (25/75)	0%	69%	25%	3%	6%	0%	100%
Replacement Funding (Depreciation Funding)	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
Transfers to Capital Reserve	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
Coverage Driven Increase		As All Others	0%	0%	0%	0%	0%	100%	100%
Less Offsetting Revenues									
Cash Flow	$280,771	As All Others	0%	0%	0%	0%	0%	100%	100%
Total Other Revenues	$(2,452,808)	As All Others	0%	0%	0%	0%	0%	100%	100%
Total Additional Revenues	$-	As All Others	0%	0%	0%	0%	0%	100%	100%
Total Rate Revenues to be Collected	**$39,494,625**		**$2,471,841**	**$8,815,825**	**$21,284,825**	**$8,197,757**	**$1,019,577**	**$(2,294,392)**	**$39,494,625**
Reallocation of "As All Others"			**$(135,714)**	**$(484,026)**	**$(1,168,582)**	**$(450,091)**	**$(55,979)**	**$2,294,392**	
Total Allocation	**$39,494,625**		**$2,336,127**	**$8,331,799**	**$20,115,436**	**$7,747,665**	**$963,598**	**$-**	
Percentage Allocation	100.0%		5.9%	21.1%	50.9%	19.6%	2.4%	0.0%	

APPENDIX C – SAMPLE BILL COMPARISONS

SINGLE FAMILY RESIDENTIAL CUSTOMER BILLS								
For 50 BU Customer		**Current Rate**			**Proposed 2015/16 Rate**			**BILL INCREASE**
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	SF		$33.38	$33.38		$54.90	$54.90	
Water Usage: Tier 1		36	$2.58	$92.88	36	$2.44	$87.84	
Tier 2		14	$3.09	$43.26	14	$3.44	$48.16	
Tier 3								
Total Water Charges:				**$169.52**			**$190.90**	**12.61%**
For 80 BU Customer		**Current Rate**			**Proposed 2015/16 Rate**			**BILL INCREASE**
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	SF		$33.38	$33.38		$54.90	$54.90	
Water Usage: Tier 1		36	$2.58	$92.88	36	$2.44	$87.84	
Tier 2		24	$3.09	$74.16	24	$3.44	$82.56	
Tier 3		20	$4.02	$80.40	20	$4.10	$82.00	
Total Water Charges:				**$280.82**			**$306.30**	**9.43%**
For 100 BU Customer		**Current Rate**			**Proposed 2015/16 Rate**			**BILL INCREASE**
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	SF		$33.38	$33.38		$54.90	$54.90	
Water Usage: Tier 1		36	$2.58	$92.88	36	$2.44	$87.84	
Tier 2		24	$3.09	$74.16	24	$3.44	$82.56	
Tier 3		40	$4.02	$160.80	40	$4.10	$164.00	
Total Water Charges:				**$361.22**			**$389.30**	**7.77%**

MULT-FAMILY CUSTOMER BILLS								
For 10 BU Customer		**Current Rate**			**Proposed 2015/16 Rate**			**BILL INCREASE**
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	MF		$21.96	$21.96		$38.85	$38.85	
Water Usage: Tier 1		10	$3.06	$30.60	10	$2.89	$28.90	
Total Water Charges:				**$52.56**			**$67.75**	**28.90%**
For 20 BU Customer		**Current Rate**			**Proposed 2015/16 Rate**			**BILL INCREASE**
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	MF		$21.96	$21.96		$38.85	$38.85	
Water Usage: Tier 1		20	$3.06	$61.20	20	$2.89	$57.80	
Total Water Charges:				**$83.16**			**$96.65**	**16.22%**

COMMERCIAL CUSTOMER BILLS

For 80 BU Customer	Meter	BU	Rate	Charge	BU	Rate	Charge	BILL INCREASE
		Current Rate			Proposed 2015/16 Rate			
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	1"		$87.99	$87.99		$115.10	$115.10	
Water Usage: Tier 1		80	$3.06	$244.80	80	$2.89	$231.20	
Total Water Charges:				**$332.79**			**$346.30**	**4.06%**

For 100 BU Customer	Meter	BU	Rate	Charge	BU	Rate	Charge	BILL INCREASE
		Current Rate			Proposed 2015/16 Rate			
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	1-1/2"		$175.98	$175.98		$215.40	$215.40	
Water Usage: Tier 1		100	$3.06	$306.00	100	$2.89	$289.00	
Total Water Charges:				**$481.98**			**$504.40**	**4.65%**

For 200 BU Customer	Meter	BU	Rate	Charge	BU	Rate	Charge	BILL INCREASE
		Current Rate			Proposed 2015/16 Rate			
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	2"		$307.97	$307.97		$335.75	$335.75	
Water Usage: Tier 1		200	$3.06	$612.00	200	$2.89	$578.00	
Total Water Charges:				**$919.97**			**$913.75**	**-0.68%**

SCHOOLS, POOLS, ETC - CUSTOMER BILLS

For 80 BU Customer	Meter	BU	Rate	Charge	BU	Rate	Charge	BILL INCREASE
		Current Rate			Proposed 2015/16 Rate			
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	1"		$87.99	$87.99		$115.10	$115.10	
Water Usage: Tier 1		80	$3.06	$244.80	80	$3.06	$244.80	
Total Water Charges:				**$332.79**			**$359.90**	**8.15%**

For 100 BU Customer	Meter	BU	Rate	Charge	BU	Rate	Charge	BILL INCREASE
		Current Rate			Proposed 2015/16 Rate			
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	1-1/2"		$175.98	$175.98		$215.40	$215.40	
Water Usage: Tier 1		100	$3.06	$306.00	100	$3.06	$306.00	
Total Water Charges:				**$481.98**			**$521.40**	**8.18%**

For 200 BU Customer	Meter	BU	Rate	Charge	BU	Rate	Charge	BILL INCREASE
		Current Rate			Proposed 2015/16 Rate			
	Meter	BU	Rate	Charge	BU	Rate	Charge	
Water Srv Chrge/Unit	2"		$307.97	$307.97		$335.75	$335.75	
Water Usage: Tier 1		200	$3.06	$612.00	200	$3.06	$612.00	
Total Water Charges:				**$919.97**			**$947.75**	**3.02%**