



# Capital Improvement Program for Water



September 29, 2021



# CITY OF CORONA

ADOPTED CAPITAL IMPROVEMENT PLAN FY 2022 TO FY 2026



## Ask

- ◆ We are seeking Council review and feedback on the capital improvement project (CIP) program for the Utilities Department for the next five-year period.

# Agenda

- ◆ Overview
- ◆ Financial Overview
- ◆ System Overview
- ◆ Project Categories
  - ◆ CIP List Review
- ◆ Recommendations

# Overview



**Now Speaking: Tom Moody**

- ◆ Capital planning and execution is essential to a well maintained and operating utility
- ◆ Capital projects require financial and physical resources to get accomplished.
- ◆ The Utilities Department does financial capital resource planning annually during the budget process
- ◆ The Utilities Department uses the Public Works CIP Division staff to accomplish its program.

# Financial Overview



Now Speaking: Erin Kunkle

# Potable Water Rate Study Updates

## ◆ Rate Study Timeline

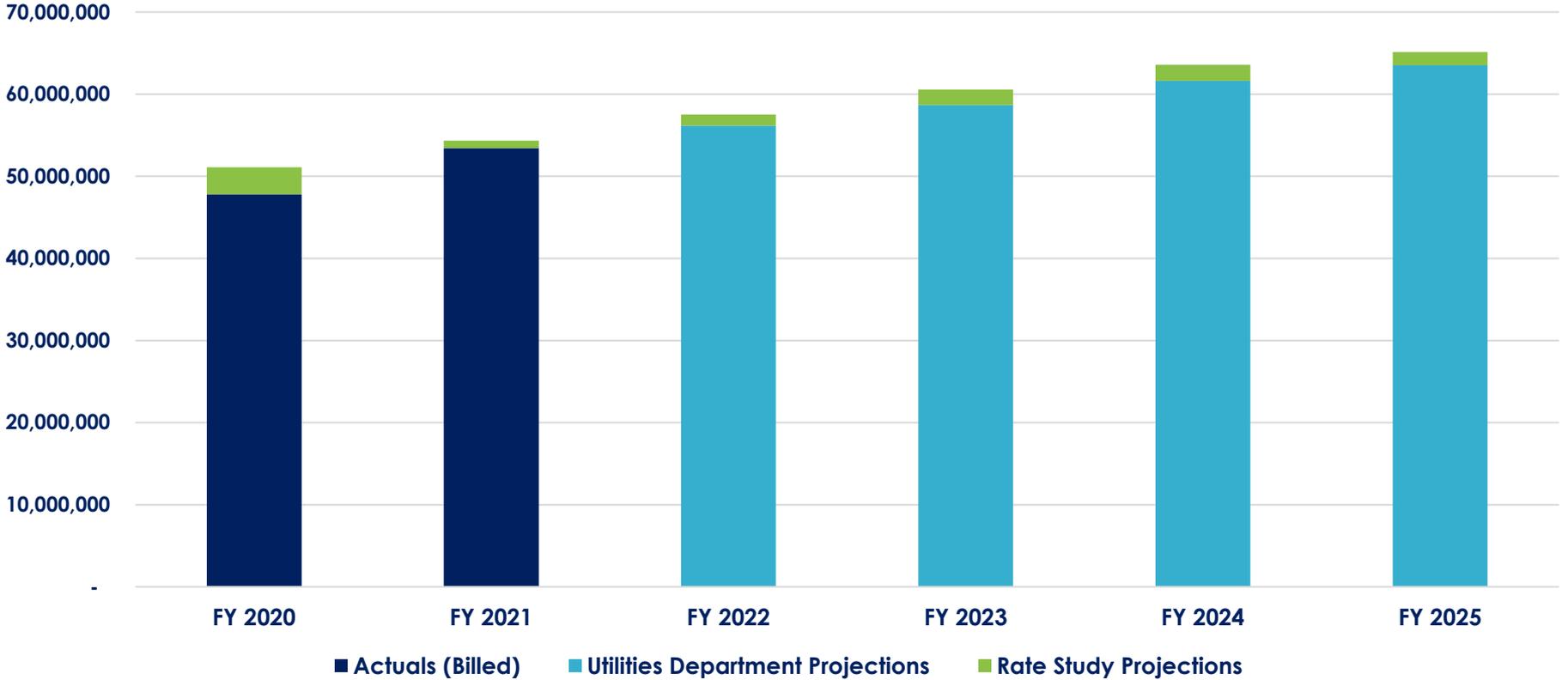
- ◆ Completed in October 2019
- ◆ Approved at City Council in December 2019
- ◆ Rates went into effect mid-January 2020
- ◆ Revenue collection began in March 2020\*

\*Though rates went into effect in January 2020, the revenues from this rate increase do not begin to be realized until March 2020. This is a decrease in revenue in comparison to rate study calculations. The same decrease is seen each FY as rate implementation occurs before revenue is realized.

# Components of a Water Rate

<b>Ready to Serve (RTS) Charges (38%)</b>	<b>Commodity Charges (Water Sales) (62%)</b>	<b>Monthly Customer Charges</b>
<b>A</b>	<b>B</b>	<b>A + B = Cost</b>
<p>The City incurs fixed costs in connection with operating and maintaining the potable water system regardless if a customer uses any water. The RTS charge allows the utility to be prepared to provide water to its customers regardless of water usage.</p>	<p>The commodity charge allows the utility to charge for actual variable usage of water. It includes rate components such as supply, delivery, peaking, and conservation costs.</p>	<p>Monthly the customers are billed the RTS and for the quantity of water used during the billing period.</p>

# Rate Study Revenue Projections vs. Actuals and Utilities Department Projections



# Revenue Projection Update

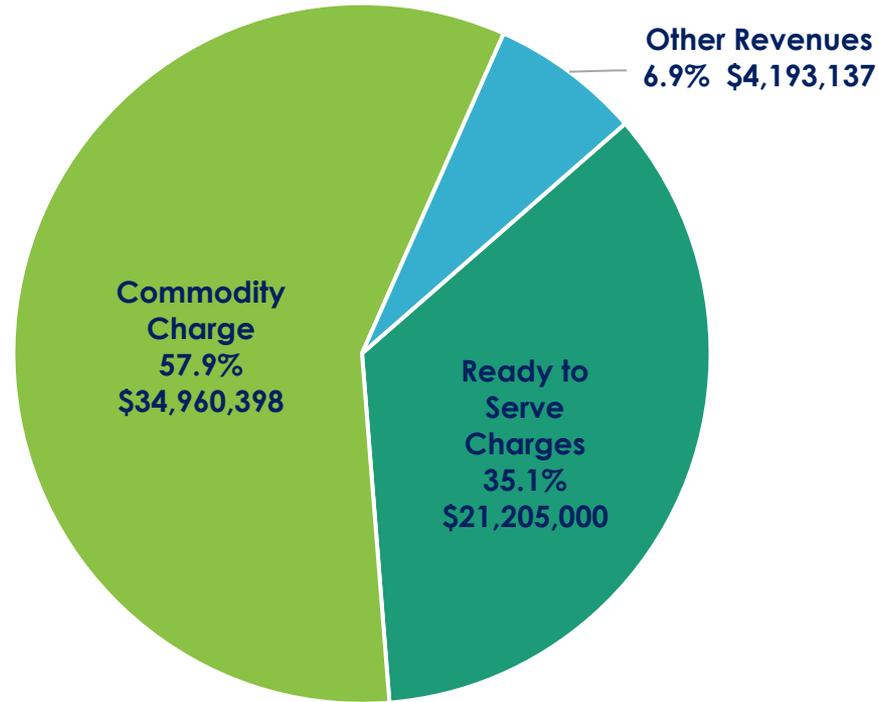
**Updated actuals and projections place revenue approximately \$11 million lower for the period of FY20-FY25 than previously projected.**

## Why?

- ◆ Revenue will be realized approximately two months later than projected in the rate study each fiscal year. This loss is compounded annually as the rates go into effect.
- ◆ The COVID-19 pandemic had an unexpected impact on how customers were using water and changed from the rate study's original projections.
- ◆ Fixed revenue collected only covers 38% of the actual costs of running the utility. Therefore, changes in commodity use affect overall revenue.
- ◆ Revenue loss does not account for potential bad debt expense.

# Potable Water Fund 570 FY22 Projected Inflows\*

**Total Projected  
Inflows**  
\$60,358,535

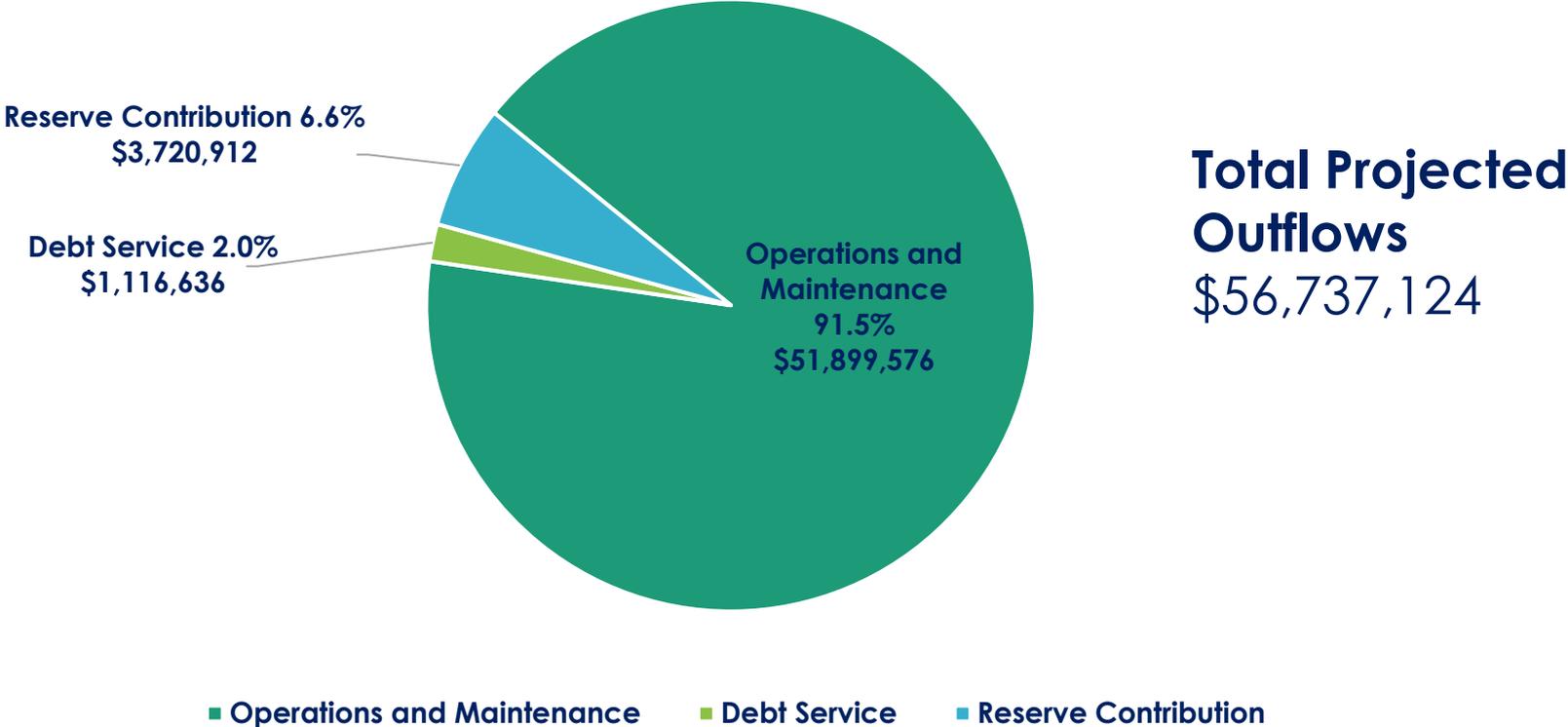


■ Ready to Serve Charges ■ Commodity Charge ■ Other Revenues

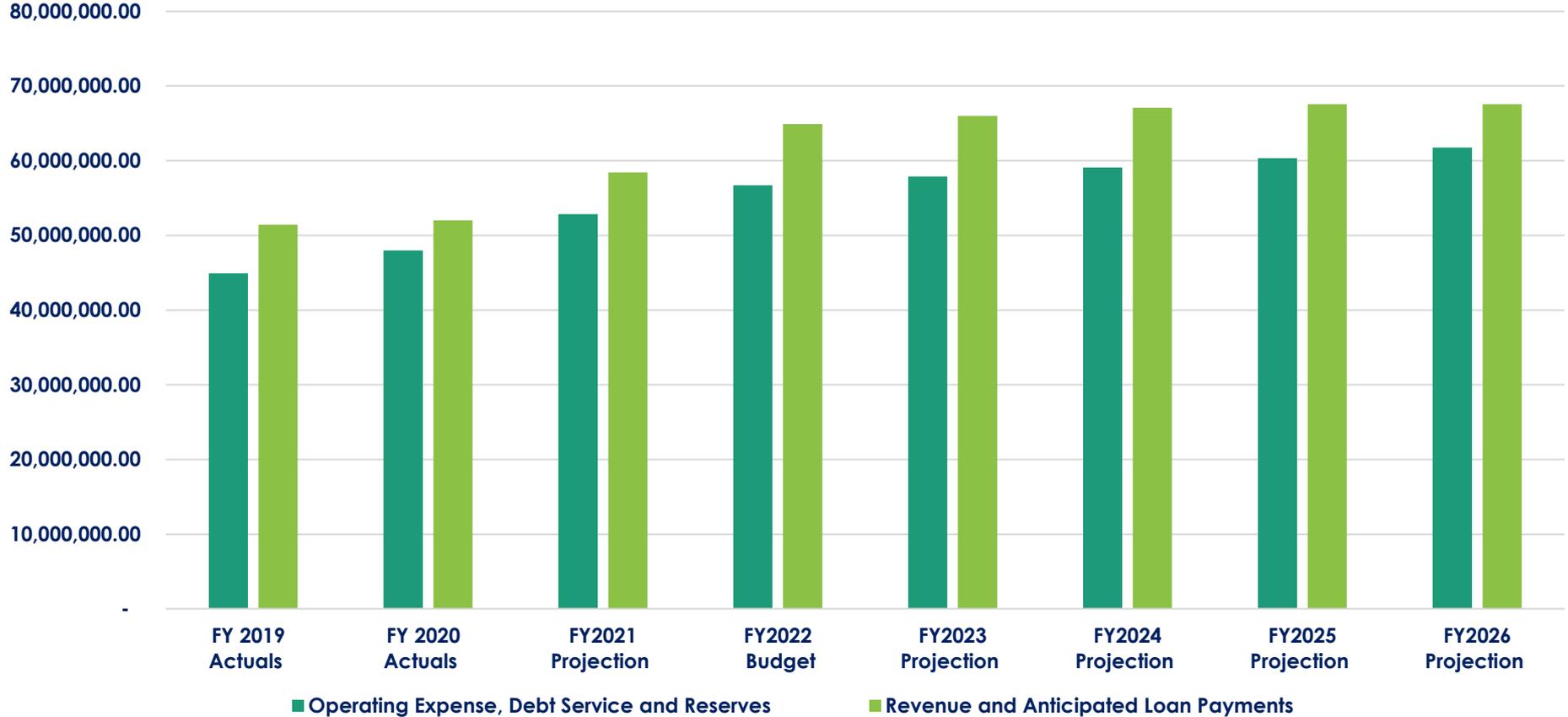
*\*Excludes Water Capacity fund projected interfund loan payments.*

# Potable Water Fund 570 FY22 Projected Outflows

(excluding CIP)



# Potable Water Utility Fund 570 Inflows vs. Outflows



# Potable Water Fund 570 Financial Projections

Financial Projections	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total 5 Years
Operating Expense	51,899,576	52,937,567	53,996,319	55,076,245	56,177,770	270,087,477
Debt Service	1,116,636	1,155,602	1,206,178	1,259,373	1,310,699	6,048,488
Reserve Contribution	3,720,912	3,785,787	3,874,016	4,009,007	4,284,388	19,674,109
<b>Total Outflows</b>	<b>56,737,124</b>	<b>57,878,956</b>	<b>59,076,513</b>	<b>60,344,625</b>	<b>61,772,857</b>	<b>295,810,074</b>
Commodity Charge	34,960,398	36,479,000	38,303,000	39,507,000	39,507,000	188,756,398
Ready to Serve Charge	21,205,000	22,215,000	23,329,000	24,017,000	24,017,000	114,783,000
Other Revenues	4,193,137	4,321,318	4,220,849	4,053,384	4,053,384	20,842,072
Anticipated Loan Payments	4,544,110	2,971,508	1,257,806	-	-	8,773,424
<b>Total Inflows</b>	<b>64,902,645</b>	<b>65,986,826</b>	<b>67,110,655</b>	<b>67,577,384</b>	<b>67,577,384</b>	<b>333,154,894</b>
Total Working Capital Balance	26,964,223	35,129,744	43,237,615	51,271,757	58,504,516	
<b>Total Working Capital Available for CIP</b>	<b>35,129,744</b>	<b>43,237,615</b>	<b>51,271,757</b>	<b>58,504,516</b>	<b>64,309,043</b>	<b>64,309,043</b>

Total projected 5-year working capital available for CIP \$64,309,043.

Total 5-year CIP Plan \$82,650,614. Deficit = \$18,341,571

# Potable Water Utility Fund 570 Projected Working Capital



# System Overview



Now Speaking: Kristian Alfelor

# Potable Water System – Major Components

## Supply



Lake Mathews - MWD

## Treatment



Temescal Desalter

## Distribution



Storage Tank



Groundwater Well



Ion Exchange

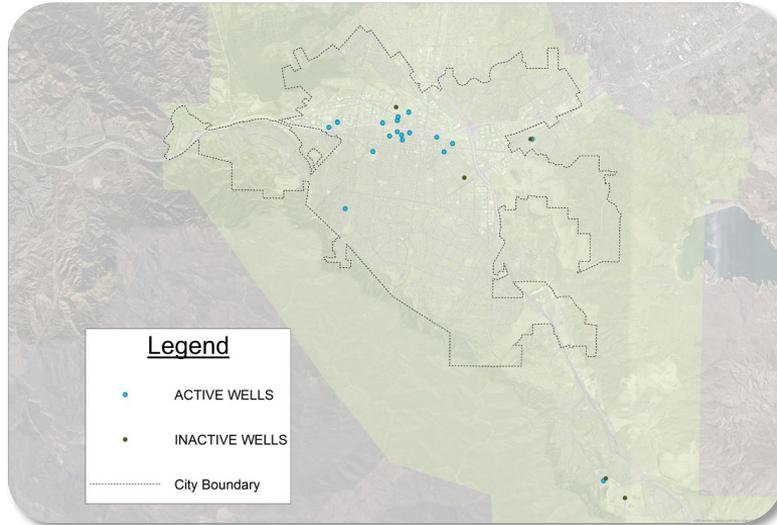


Booster Pump Station

# Supply

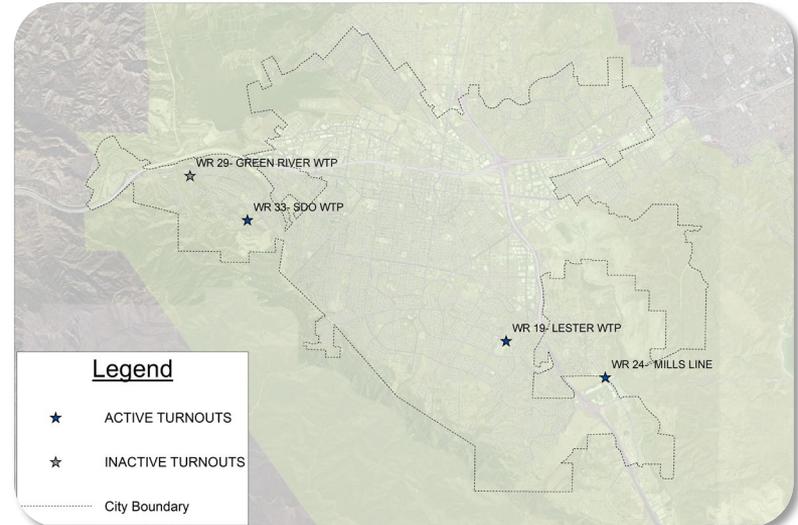
## Groundwater Wells

Local Groundwater – 23 Wells  
(18 Active / 5 Inactive)



## Imported Water

MWD Turnouts



# Groundwater Wells

## Well Condition

- 7 Active wells are at or beyond their useful life
- 5 Inactive wells require major rehabilitation or treatment

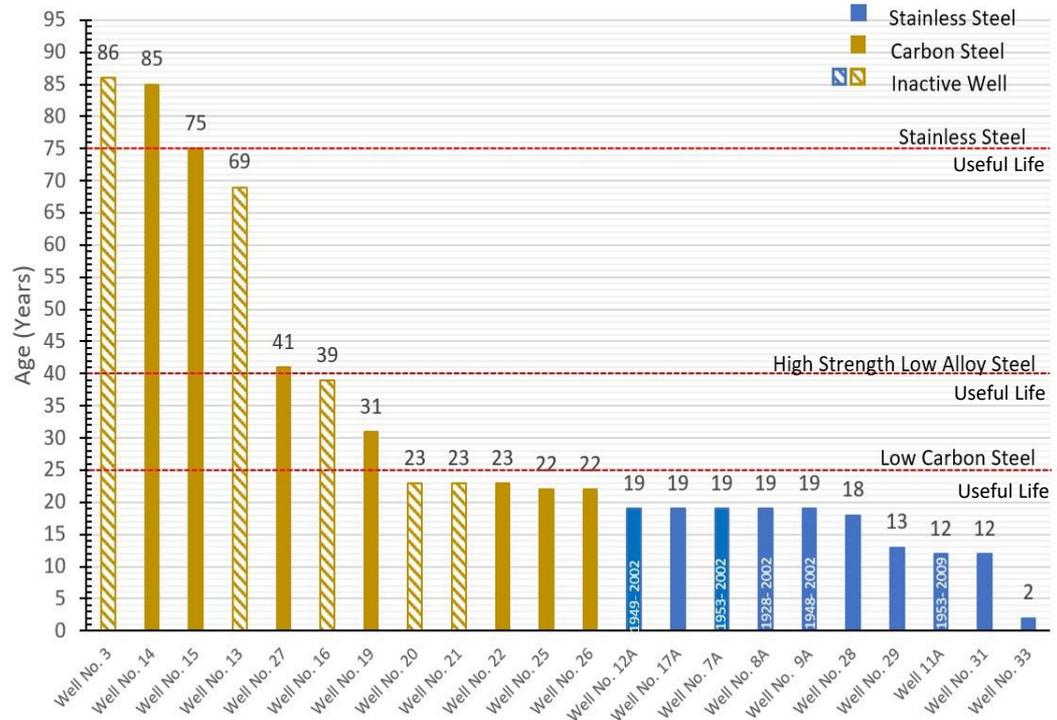
## Well Rehabilitation

- Minor – Inspect screen and casing, brush & bail, chemical cleaning, check gravel pack, pump & motor replacement, test pumping - \$150,000 to \$300,000
- Major – New casing/screen sleeve, update electrical & SCADA, pump & motor replacement - \$500,000 to \$600,000

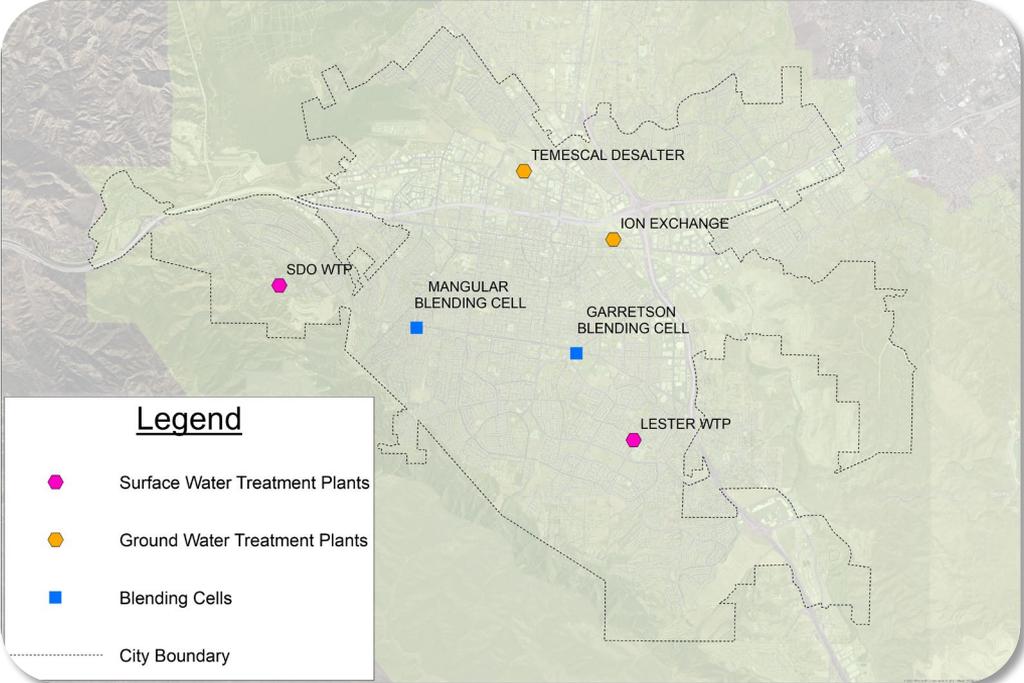
## New Well Construction

- Land acquisition
- Drilling
- Equipping
- Pipeline to well collection system
- \$1,500,000 - \$2,000,000

- Well Equipment**  
20 to 30-year useful life
- Wellhouse Structure**  
50-year useful life



# Treatment



# Water Treatment Plants

- **Water Treatment Plant Processes**

- Lester and Sierra del Oro Surface Water Treatment – sand/antracite filters followed by disinfection
- Temescal Desalter – reverse osmosis groundwater treatment to remove dissolved solids for groundwater blending
- Ion Exchange – resin treatment to remove nitrate and perchlorate for groundwater blending
- Lester, Garretson and Mangular Blending Cells – blend treated water with raw groundwater to manage nitrates, perchlorates, and other constituents followed by disinfection



Lester WTP



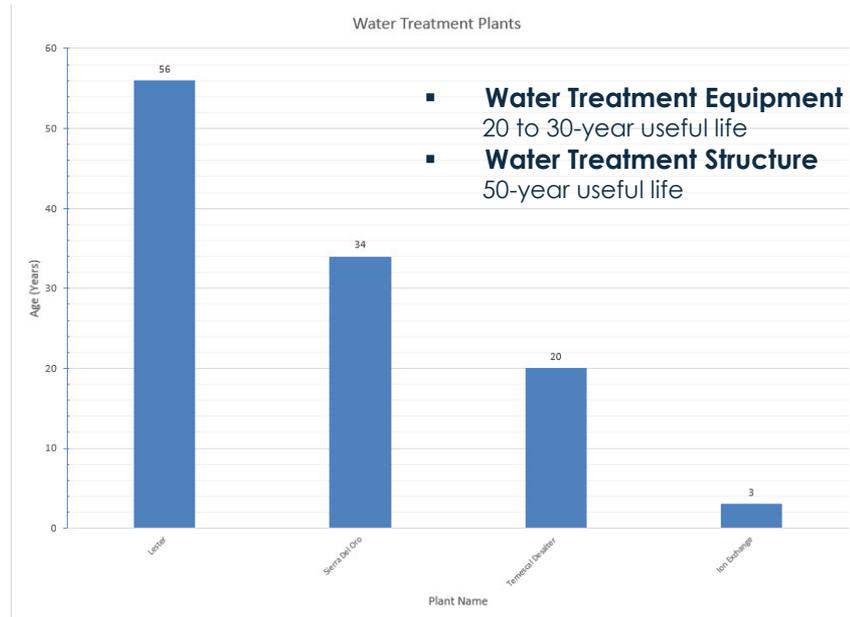
Garretson Blending Cell



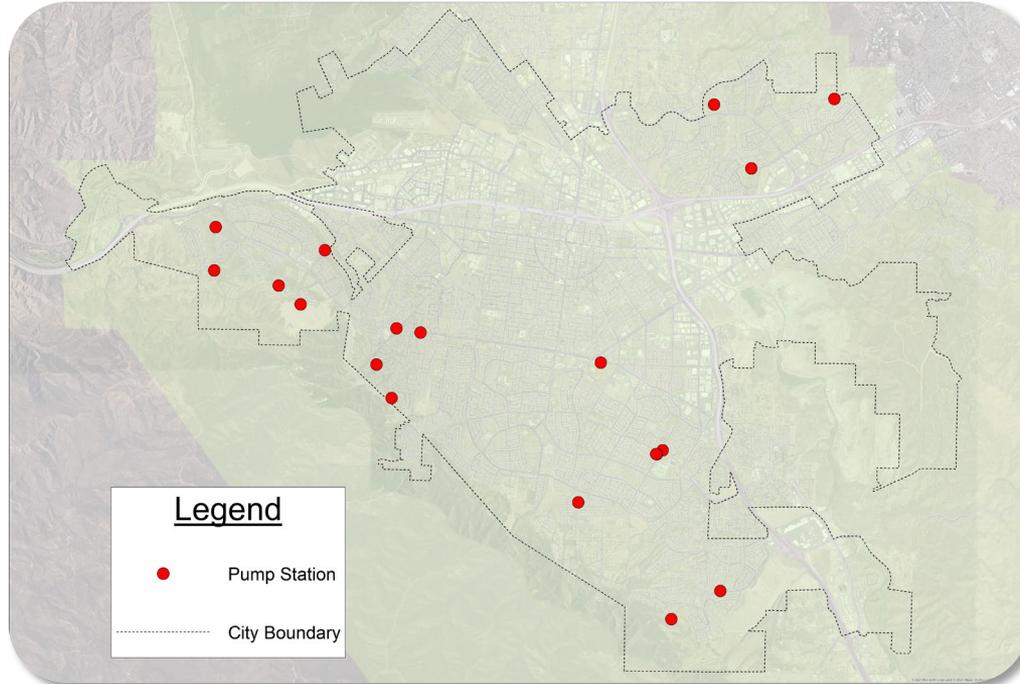
Temescal Desalter

# Water Treatment Plants

- **WTP repair and rehabilitation costs can vary significantly depending on the treatment process**
  - Desalter – membranes, pumps, motors, and electrical are costly replacement items
  - Ion Exchange – nitrate and perchlorate resin replacement is costly
  - 3 of the 4 water treatment plants are approaching structural or component useful lives
  - Lester, Mangalar, and Garretson provide blending treatment – facility components includes tanks and booster pump stations



# Distribution – 20 Pump Stations

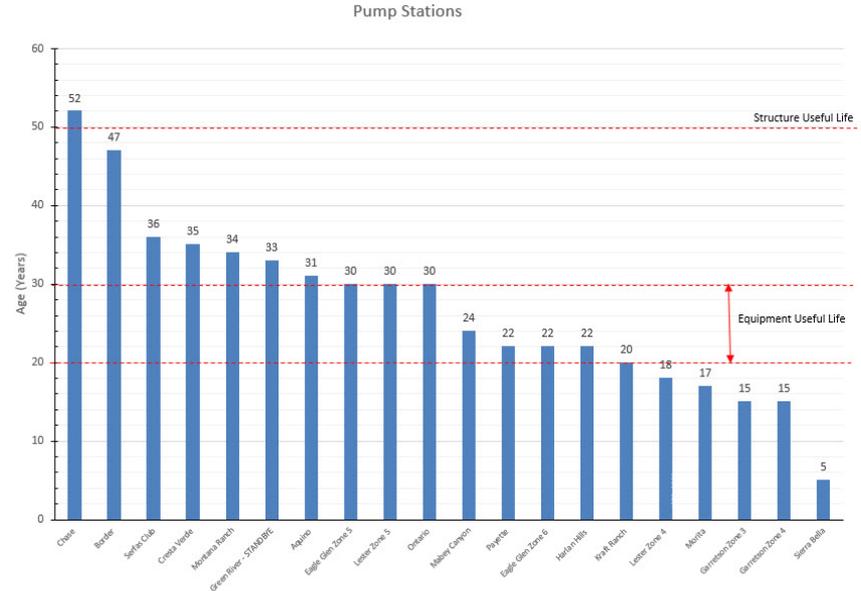


Now Speaking: Vernon Weisman

# Pump Stations

- **2 Pump stations at useful structure life**
- **13 Pump stations at useful equipment life**
- **Pump station rehabilitation**
  - Minor – replace pump & motor, maintenance - \$25,000 to \$100,000
  - Major – replace pump & motor, update electrical & SCADA, replace piping and valves, site improvements, roof - \$100,000 to \$800,000
- **New pump station construction**
  - Land acquisition
  - Building & site work / utilities
  - Mechanical & electrical equipping
  - \$3,000,000 - \$6,000,000

- **Pump Station Equipment**  
20 to 30-year useful life
- **Pump Station Structure**  
50-year useful life



# Sierra Bella Booster Pump Station New Construction

- 1,500 gpm design flow – 2 vertical turbine pumps
- Pumphouse, emergency generator, fuel tank
- Developer paid for designed and constructed
- Total cost = \$2,600,000
- Design started 2015
- Construction completed 2019



# Chase Booster Pump Station Rehabilitation

- **Constructed in 1969 – Rehabilitated in 2012 at a cost of \$750,000 -**
  - Upgraded Motor Control Center and SCADA equipment
  - Relocated discharge piping and installed new flowmeter
  - Replaced roof and adding hatches for pump access
  - Removed natural gas service
  - Concrete masonry wall
  - Isolation valves
  - Flow control valves
  - Check valves
  - Replaced fence gates



New Pumps & Piping



New Electrical Motor Control Center

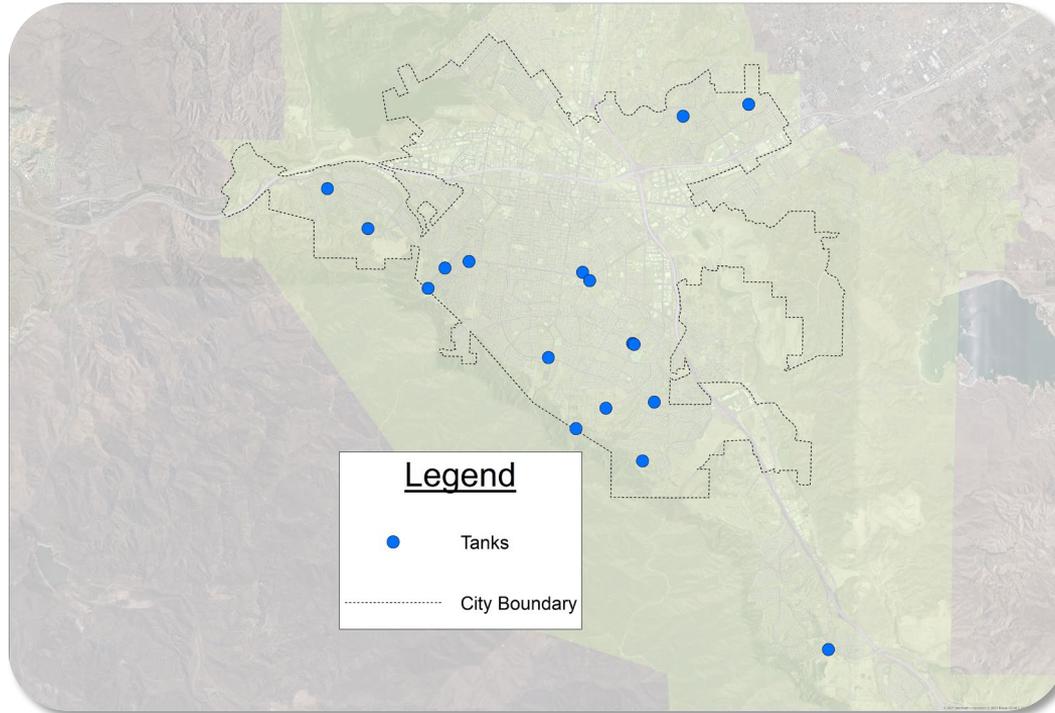


Old Pumps & Piping



Old Electrical Equipment

# Distribution – 18 Storage Tanks



# Storage Tanks

- 7 out of 18 tanks are at 75% of their useful life

Mangular Blending Tank  
1.5 MG



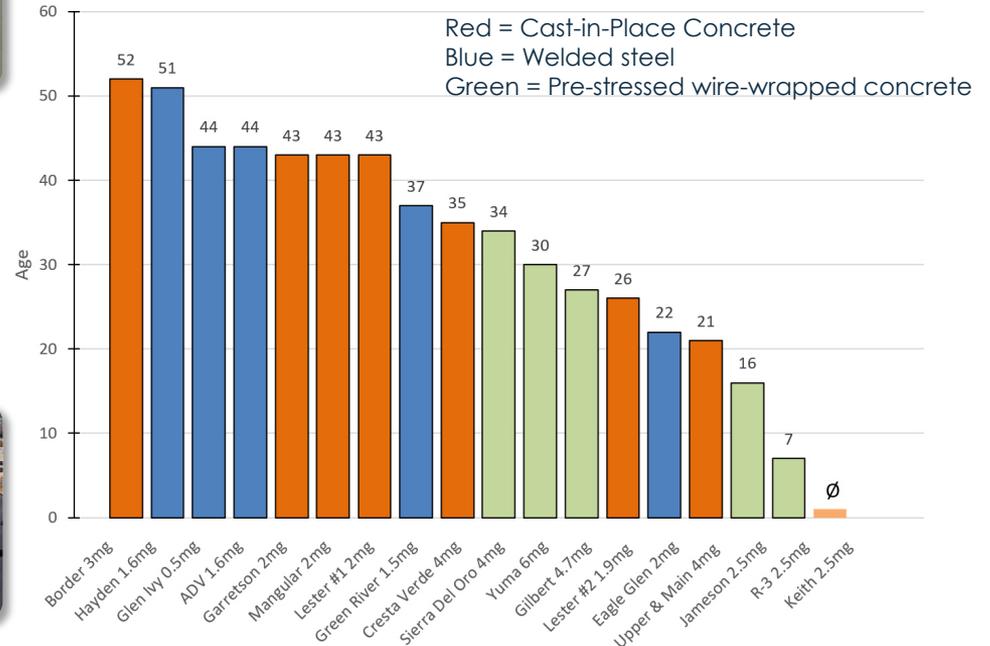
Eagle Glen Tank  
2.0 MG

Keith Tank  
2.5 MG



- Cast-in-Place Concrete**  
50 to 75-year useful life
- Welded Steel**  
50 to 75-year useful life
- Wire-Wrapped Pre-Stressed Concrete**  
75 to 100-year useful life

Water Storage Tanks



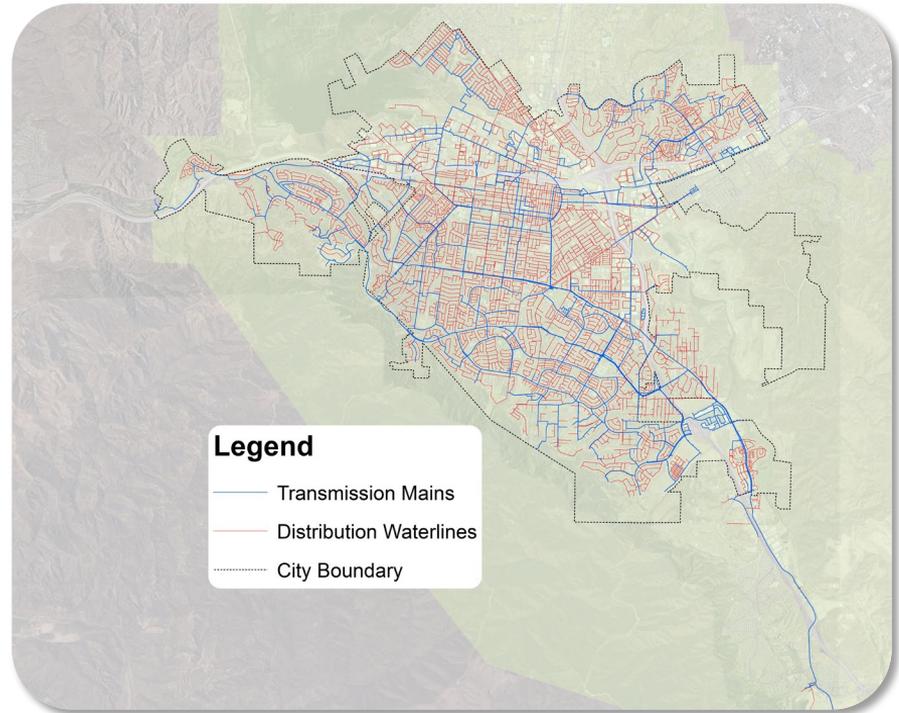
# Storage Tanks

- **Cast-in-Place Concrete**
  - Simple construction
  - Concrete may crack and lead to reinforcing steel corrosion
  - Well suited for buried locations
  - Footprint adjustable to match site constraints
- **Welded Steel**
  - Lower capital costs
  - Higher maintenance cost
    - Inspection/cleaning/minor repairs every 5 years - \$10,000
    - Interior recoating/repairs every 10 to 20 years - \$300,000
  - Tank shell buckling in earthquakes
  - Above-ground construction only
- **Type 1 Pre-Stressed Concrete (Best Type)**
  - Current City standard
  - Superior performance – successful history in California
  - Lower maintenance cost
  - Fully exposed or fully buried locations
- **Replacement Cost – 2.5 MG Pre-Stressed Concrete Tank**
  - \$10 to \$15 million depending on location



# Transmission and Distribution – 643 Miles of Pipe

- 92 Miles of transmission main – larger than 12"
- 551 Miles of distribution pipe – up to 12"
- Approximately 45,000 services

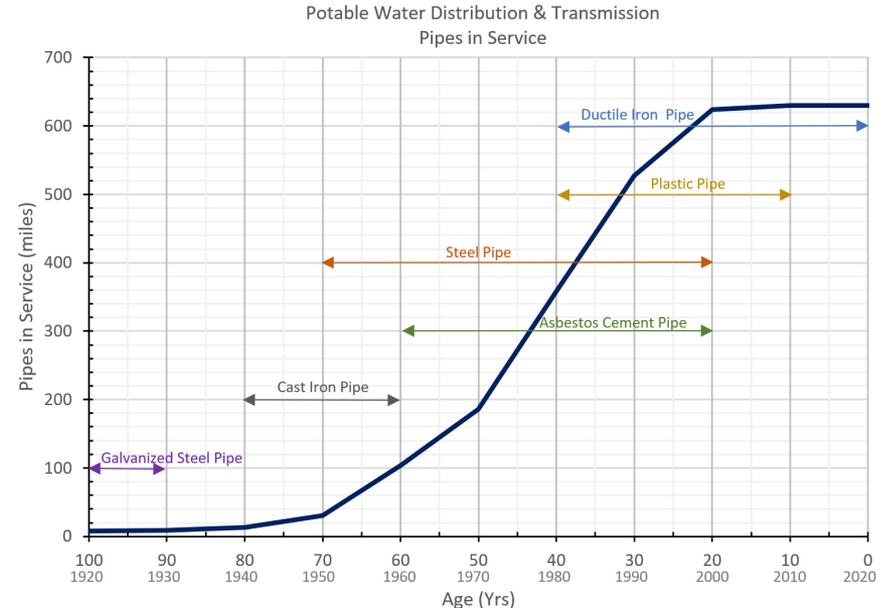


# Corona Waterline Development

## ■ Pipe Materials

- 2" Galvanized Steel Pipe - Used within the circle 100 Years Ago
- Cast Iron Pipe – Introduced in the US in 1817 in Philadelphia. Commonly used from late 1800's to mid-20th century. Lined and unlined.
- Steel Pipe – Commonly used from late 1800's to today – well suited for large diameter pipes
- Asbestos Cement – Introduced as plumbing pipe in 1931, developed after World War II as a non-corrosive water distribution pipe
- PVC Plastic Pipe – Introduced in the US in 1952, non-corrosive, proper installation important for long-term service, commonly used
- Ductile Iron Pipe - Introduced in the US in 1955, strong and durable, corrosion resistant with linings, coatings and exterior plastic wrap, commonly used – **City standard**

Pipe Material	Typical Useful Life
Asbestos Cement (AC)	40 – 65 years
Cast Iron Cement Lined (CICL)	80 – 100 years
Polyvinyl Chloride (PVC)	50 – 75 years
Ductile Iron Cement Lined (DICL)	80 – 100 years
Mild Steel Cement Lined (MSCL)	80 – 100 years



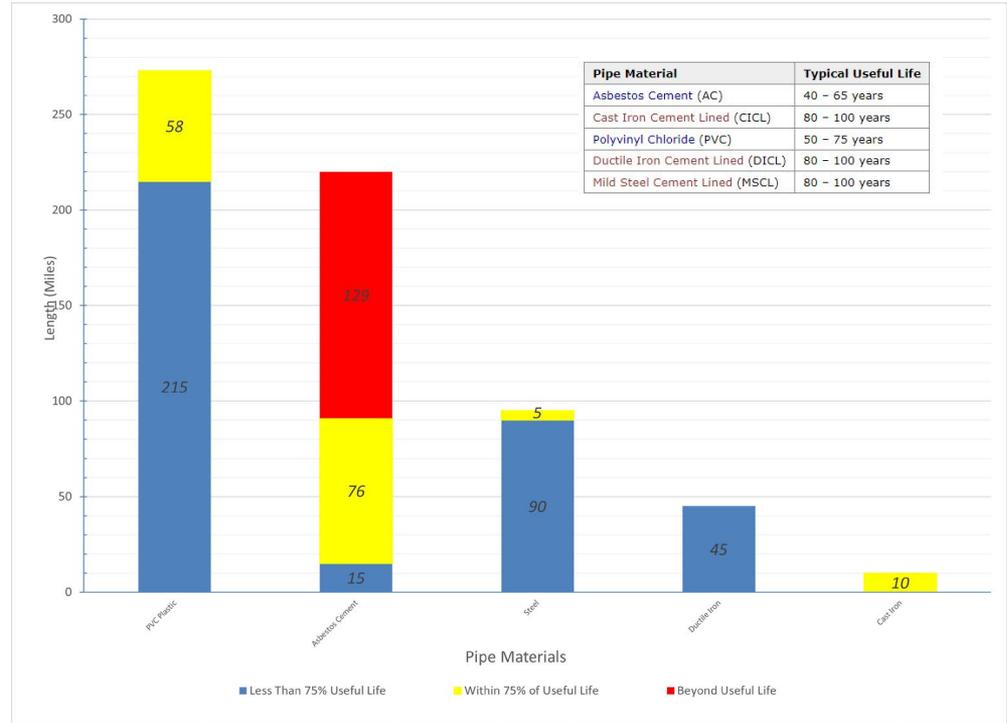
# Pipe Inventory

- **Pipe Total – 643 Miles**

- PVC plastic – 273 Miles
- Asbestos cement – 220 Miles
- Steel – 95 Miles
- Ductile iron – 45 Miles
- Cast iron – 10 Miles

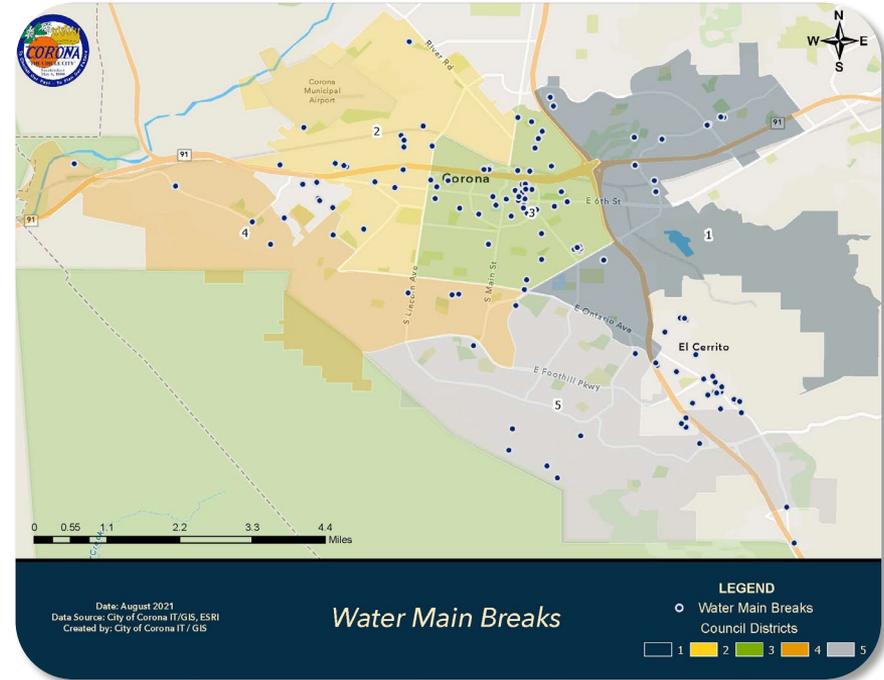
- **Pipe Replacement Cost**

- 8" Ductile iron pipe = \$3.0 million/mile
- 12" Ductile iron pipe = \$3.25 million/mile
- 24" Ductile iron pipe = \$3.5 million/mile



# Water Main Break History – Jan 2018 to July 2021

- Total breaks during reporting period – 152
- 6.75 breaks/100 miles of pipe/yr
- Industry standard – 9.7 breaks/100 miles of pipe/yr (CA-NV)
- Average of 1 waterline break every 8 days
- At Risk - cast iron, unlined steel, and asbestos cement pipes
- Common Causes
  - Corrosion – cast iron and steel
  - Cement Degradation – asbestos cement
  - Age – as a function of material degradation
  - Soil Conditions – corrosive soil
  - Tree Roots – high winds, movement
  - Operating Pressure – high pressure, surges
  - Water Temperature – water source, seasonal
  - Substandard installation



# Sixth Street & Yorba Street Waterline Replacement

- 10-inch Steel Pipe installed in 1956 (failed at 75% of useful life)
- Six leaks in sidewalk in front of Jack-in-the-Box from 10/22/2016 to 8/4/2017



- Design Started April 2018 – Construction Completed August 2020
- 1,200 LF 12" Ductile Iron Pipe Replaced in 2020
- Construction Cost = \$733,806
- Total Project Cost = \$925,000

# Projects Needed to Address Recent Leaks

- **Cottonwood Court – 6" Asbestos Cement (Installed 1972)**
  - Three Leaks from 4/15/2019 to 5/13/2021
  - Need to Replace with 850 LF of 8" Ductile Iron Pipe - **\$500,000**
  - Status - **Not Currently on CIP List**
- **Sherman Avenue – 10" Steel (Installed 1958) and 8" Asbestos Cement (Installed 1960-64)**
  - Six Leaks from 5/18/2017 to 2/10/2021
  - Need to Replace with 2,500 LF of 12" Ductile Iron Pipe - **\$1,700,000**
  - Status – **Planned for 2024, Not Currently on CIP List**
- **Liberty Avenue & Jolara Avenue – 10" Steel (Installed 1958)**
  - Leaked on 4/23/2021 - Flooding Private Property
  - Need to Replace 3,700 LF with 12" Ductile Iron Pipe - **\$2,400,000**
  - Status – **Recently Added to CIP List – High Priority**
- **Canary Lane – 6" Asbestos Cement -(Installed 1962)**
  - Four Leaks from 9/16/2016 to 8/05/2019
  - Replaced Two Broken Valves in 2019 and 2020
  - Need to Replace with 425 LF of 8" Ductile Iron Pipe - **\$250,000**
  - Status – **Not Currently on CIP List**

# What is the Long-Term Plan?

## Maintain What We Own



## Support Development



## Respond to Regulatory, Technology, and Climate Changes



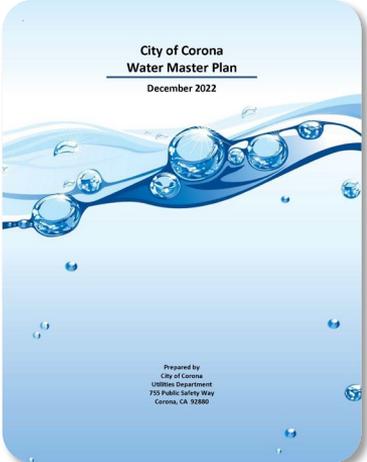
## Summary

Facilities that will be at or beyond useful life within 20 Years

Facilities	Current Replacement Unit Cost	Replacement Cost
12 Wells	\$1,750,000 per well	\$21 Million
2 Treatment plants	\$15,000,000 per treatment plant	\$30 Million
10 Pump stations	\$4,500,000 per pump station	\$45 Million
11 Storage tanks	\$12,500,000 per storage tank	\$137.5 Million
315 Miles of pipelines	\$3,250,000 per mile of pipeline	<u>\$1,024 Million</u> \$1,257.5 Million

Anticipated Capital needed within 20  
years \$1.26 billion

# What is Needed to Get Us There?



# Project Categories



Now Speaking: Tom Moody

# Project Categories – 5 Year Plan

Development	Operational Need	Regulatory and Safety	Reliability and Redundancy	Efficiency
<p>1 Project:</p> <ul style="list-style-type: none"> <li>Development Meters \$884k</li> </ul>	<p>6 Projects:</p> <ul style="list-style-type: none"> <li>1 Major Project: Waterline Infrastructure \$6.8 Mil</li> <li>5 Minor Projects \$2.1 Mil</li> </ul>	<p>7 Projects:</p> <ul style="list-style-type: none"> <li>7 Minor Projects \$1.1 Mil</li> </ul>	<p>28 Projects:</p> <ul style="list-style-type: none"> <li>4 major projects \$22.9 Mil:               <ul style="list-style-type: none"> <li>Mangular Blending Facility</li> <li>SE Grand Quadrant Waterline Replacement</li> <li>Well Rehabilitation</li> <li>1220 Zone BS Pump Station</li> </ul> </li> <li>24 Minor Projects \$26.4 Mil</li> </ul>	<p>7 Projects:</p> <ul style="list-style-type: none"> <li>1 Major Project : AMI Meter Replacement \$18.5 mil</li> <li>6 Minor Projects \$3.9 Mil</li> </ul>

Total 5 Year CIP Plan \$82.6 Million

# Capital Improvement Plan Review



# Recommendations



Now Speaking: Tom Moody



# CITY OF CORONA

ADOPTED CAPITAL IMPROVEMENT PLAN FY 2022 TO FY 2026



## Ask

- ◆ We are seeking Council review and feedback on the capital improvement project (CIP) program for the Utilities Department for the next five-year period.

# Recommendations



- Maintain current funding plan to ensure future financial support and plan for a rate study in FY24
- Onboard engineering staff and consultants to complete projects
- Continue planning and investing in the utility for reliability

Pros	Cons
<p>Proactive: Pennies today generate dollars tomorrow and helps prevent future rate spikes</p> <p>Planned replacement of infrastructure is more efficient and can save on costly maintenance</p> <p>Investment + planning = <b>Reliability</b></p>	<p>Delaying current rate increases will prohibit the utility from investing in needed infrastructure</p> <p>Not investing leads to reactive response which is more costly than planned investments</p> <p>Delaying projects could result in increased project costs further impacting future rates</p>

# QUESTIONS?

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