



Comprehensive Asset Management Plan (CAMP)

Board Presentation

Thursday, September 20, 2023

Hazen



Agenda

Review ABCWUA Asset Management History

CAMP Coverage

- Methodology of the CAMP

CAMP Risk Scoring

CAMP Cost Basis

CIP Planning

- Projected 20-year planning horizon
- Projected 100-year planning horizon

Dashboards

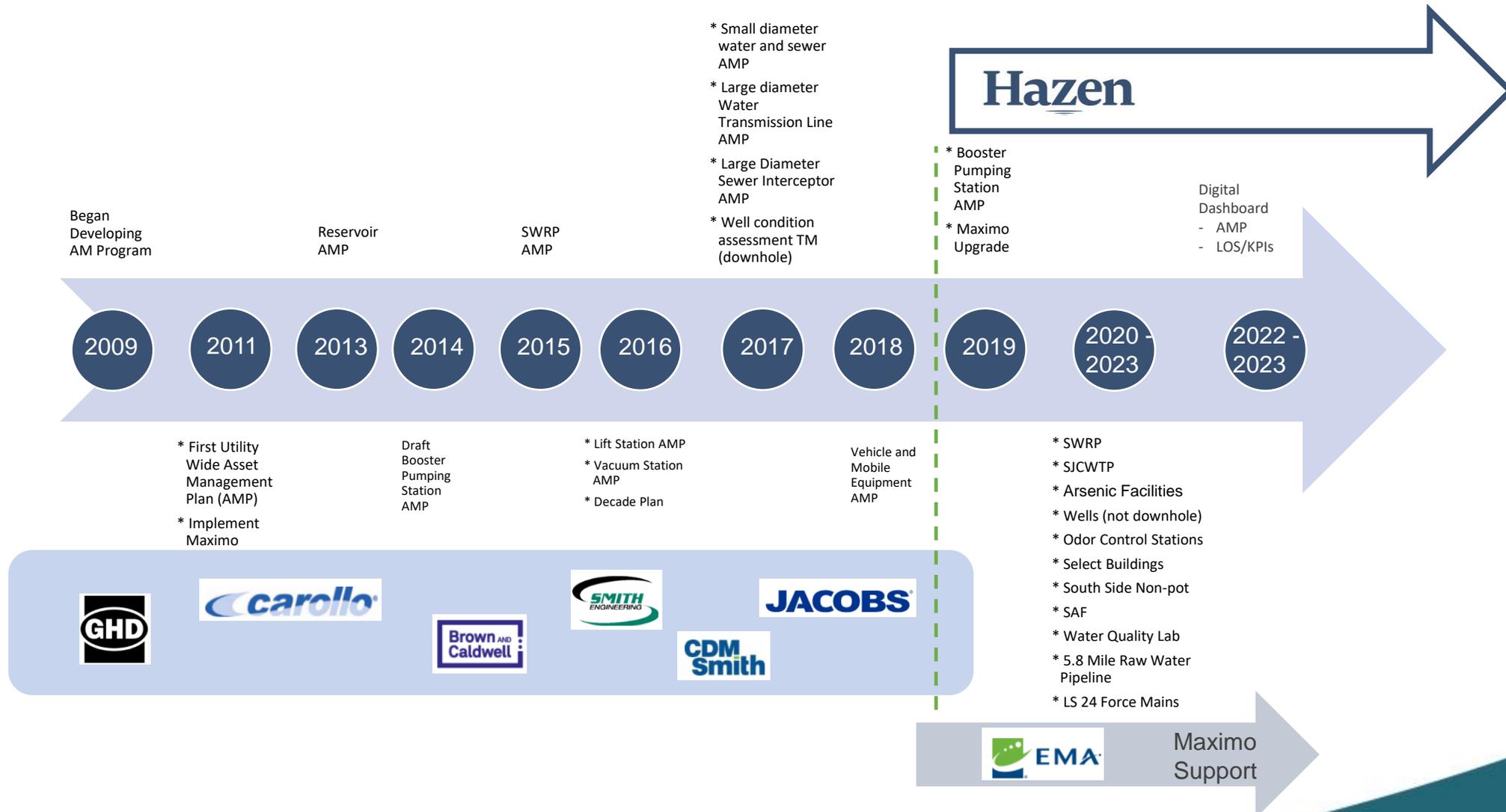
- Single location to access all AMPs
- Incorporating LOS and KPIs



ABCWUA Asset Management History



History of ABCWUA's Asset Management Program



CAMP Coverage



Individual AMPs Included in the CAMP Report

Recently Developed AMPs (Hazen)

| Facility Group | Facility Group |
|--|--|
| San Juan Chama Water Treatment Plant | Pump Stations |
| Wells (assets not previously studied) | Southside Water Reclamation Plant |
| Arsenic Treatment Plants | South Side Non-potable Facility |
| Odor Control Stations | SAF and Water Quality Lab |
| Buildings not included in other AMPs | Raw Water Pipeline |
| Conversion of previous Lift and Vacuum Station scoring to CAMP scoring | Lift Station 24 Force Mains (18-inch and 24-inch diameter) |

Historically Developed AMPs

| Facility Group |
|---|
| 2018 Well AMP Update |
| 2019 Reservoir Desktop Assessment |
| 2019 Transmission Water Line AMP |
| 2020 Large Diameter Sewer AMP Update |
| 2020 Small Diameter AMP Update |
| 2016 Lift Station and Vacuum Station Assessment |
| 2023 Manholes AMP (Draft) |



CAMP Risk Scoring



Water Authority Vertical Asset Scoring

LOF and COF Scoring - Vertical

- $LOF\ Score = (0.5 * Physical\ Condition\ Score) + (0.5 * Performance\ Score)$
 - Standard IIMM 1-5 scoring
 - If no performance score available, default is physical condition score = 100%

COF Score Components

1. Service Delivery
 2. Redundancy Criticality
 3. Safety Security
 4. Financial Impact
 5. Regulatory Compliance
 6. Public Perception
- Percentages of the COF score components tailored to each major AMP

| IIMM* Rating | Condition | Definition |
|--------------|-----------|--|
| 1 | Excellent | The physical condition of the asset is new or like-new, well maintained, fully operable, and performs at or above standards. |
| 2 | Good | Asset is sound, well maintained, delivers full efficiency with little or no performance deterioration, but may show signs of wear. |
| 3 | Average | Asset is functionally sound and shows normal signs of wear relative to age and use but may have minor failures or performance deterioration. Minor or moderate refurbishment of 10-20% of asset may be needed within next 2 years. |
| 4 | Fair | Asset functions but requires sustained high level of maintenance to remain operational. Substantial wear is visible and likely to cause significant performance deterioration. Refurbishment of 20-40% of asset may be needed within next 2 years. |
| 5 | Poor | Asset is very near, or beyond, its useful life. Incapable of performing to a satisfactory standard under normal operational conditions without ongoing or corrective maintenance. Replacement needed in the near term (less than 2 years). |

* IIMM: International Infrastructure Management Manual



Water Authority Linear Asset Scoring Summary

Unique Linear Scoring due to severity of pipe issues

LOF and COF scoring - Horizontal

- Horizontal was in bad shape
- Used standard 1-4 scoring for condition assessment
- Modified score = 5 to score = 5, 6, 7, or 8 to allow for more granularity and relative weighting among level 5 defects

| Original LOF Score | Standardized LOF Score |
|--------------------------------|------------------------|
| $0 \leq \text{LOF} < 8$ | 1 (low) |
| $8 \leq \text{LOF} < 10$ | 2 (medium) |
| $10 \leq \text{LOF} < 12$ | 3 (High) |
| $12 \leq \text{LOF} < 15.5$ | 4 (Severe) |
| $15.5 \leq \text{LOF} \leq 22$ | 5 (Extreme) |

5, 6, 7, 8

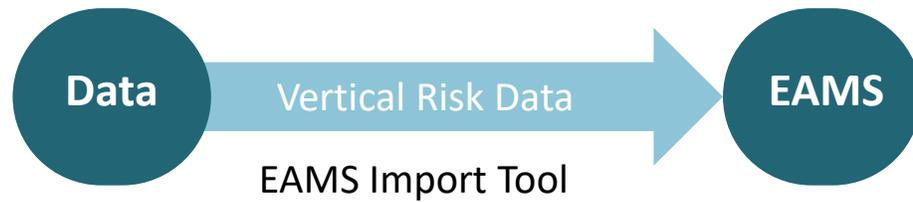
Table 16: Sewerline AMP Scoring Definitions

| SCORE | LABEL | Sewer Probability of Failure | Consequence of Failure | Risk | |
|-------|---------|---|---|--|---|
| 1 | LOW | More than 20% of service life remaining or CCTV inspection observed minimal structural defects | Small Diameter Line with no added Consequence | Risk is equal to the product of the PoF Score and the CoF Score: 1 to 25 | $(1 \times 1 = 1)$ $0 \leq \text{RISK} \leq 1$ |
| 2 | MEDIUM | Less than 20% of service life remaining or CCTV inspection observed moderate structural defects | 1 to 2 added Consequence Points | | $(2 \times 2 = 4)$ $1 < \text{RISK} \leq 4$ |
| 3 | HIGH | Beyond anticipated service life or CCTV inspection observed high structural defects (5) | 3 added Consequence Points | | $(3 \times 3 = 9)$ $4 < \text{RISK} \leq 9$ |
| 4 | SEVERE | CCTV inspection observed severe structural defects (Failure expected within 12 months) | 4 added Consequence Points | | $(4 \times 4 = 16)$ $9 < \text{RISK} \leq 16$ |
| 5 | EXTREME | CCTV inspection observed extreme structural defects (Failure expected within 6 months) | 5 or more added Consequence Points | | $(5 \times 5 = 25)$ $16 < \text{RISK} \leq 25$ |

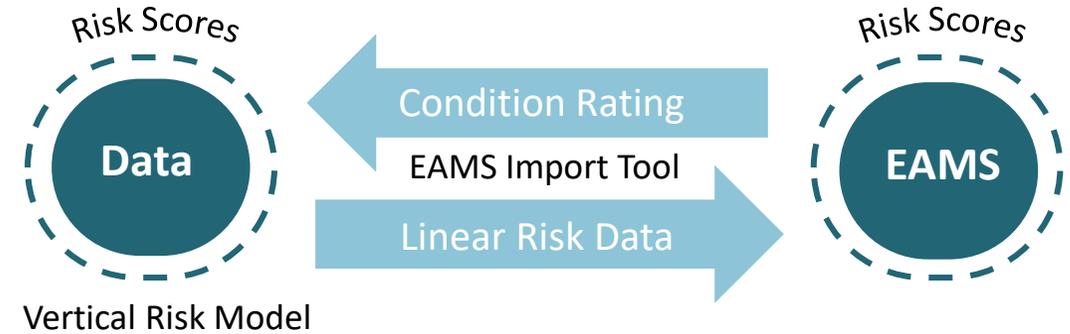
Used CCTV data to distinguish higher scores for LOF = 5



Managing Vertical Asset Risk Score



Initial load of vertical asset AMP data (LoF, CoF, Risk) loaded into EAMS using built-in EAMS tool



Vertical asset RISK score calculation is performed outside of the EAMS and kept current using EAMS built-in tool



Managing Linear Asset Risk Score



Initial load of linear asset AMP data (LoF, CoF, Risk) loaded in GIS, and brought over to EAMS using PowerSync



GIS hosts the linear (water and sewer) Risk model. The condition rating from EAMS used to recalculate the Risk scores and keep current in GIS and EAMS.

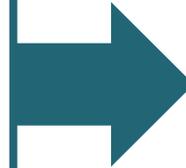


CAMP Cost Basis



Base CIP Information

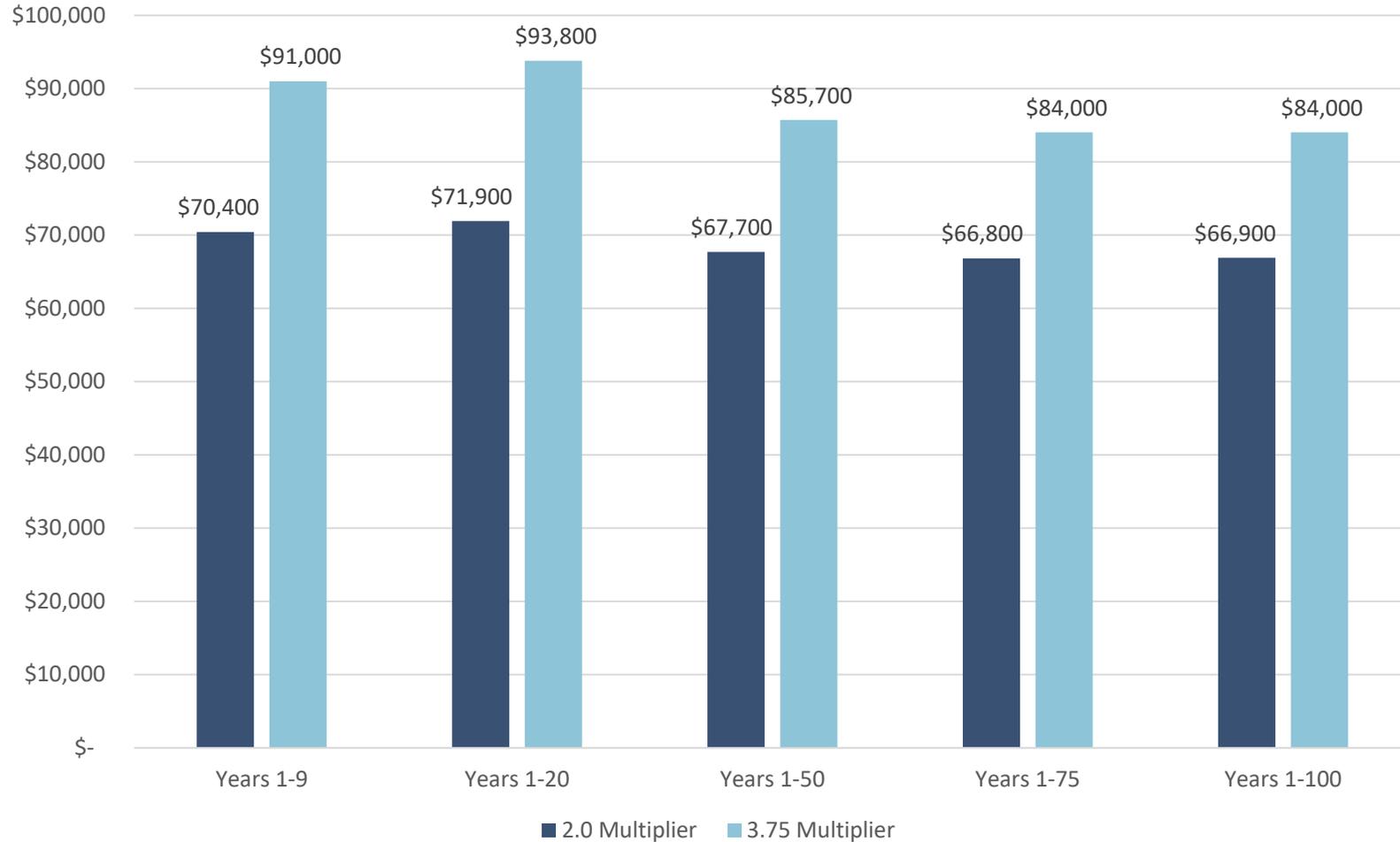
- Developed a **raw cost** for asset replacement
- Estimated actual cost additions to get to a project cost
 - Resulted in a 3.75 multiplier for full use of a 3rd party
 - Used a 2.0 multiplier for work done in-house



| Cost Additions | Percent |
|--|---------|
| Demolition, Mechanical, Structure, Civil, etc. Allowance | 35 |
| General Conditions | 15 |
| Contractor Overhead | 10 |
| Contractor Profit | 10 |
| Bonding & Insurance | 3 |
| Electrical and Instrumentation Allowance | 15 |
| Construction Contingency | 10 |
| Engineering Design | 8 |
| Construction Administration | 10 |
| Project Contingency | 30 |



CIP: 2.0 vs 3.75 Multiplier

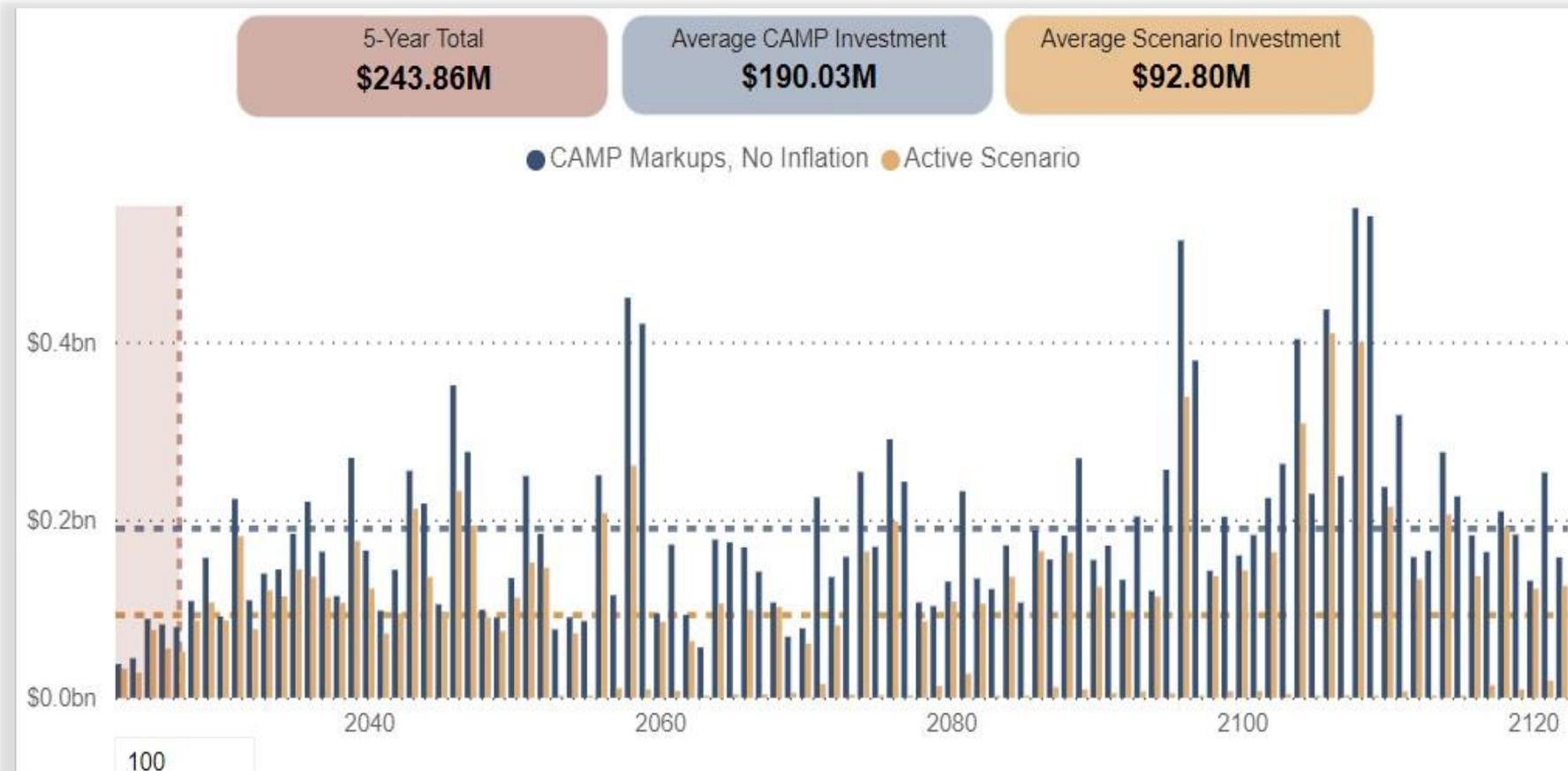


The costs represented are a snapshot in time and should be considered for illustrative purposes only. The Water Authority reviews the numbers annually, and as needed throughout the year, to update the decade plan.

(Camp final doc ES-4)



100-Year CIP Projection from Dashboard



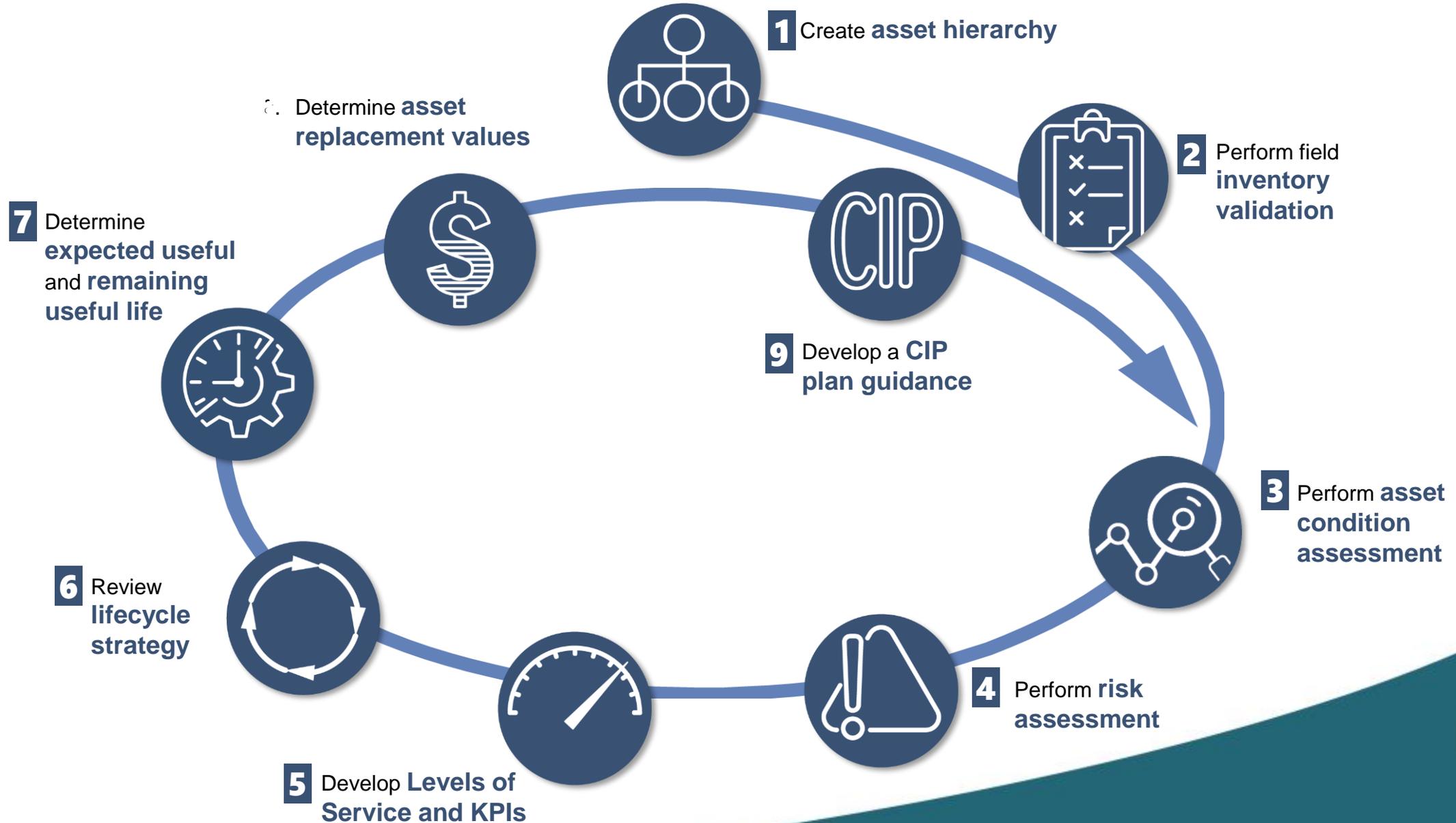
- 5-Year Total is estimate for the first 5 years
- Average CAMP Investment: uses full lifecycle logic for calculations (every rehabilitation and replacement included)
- Average Scenario Investment: First 30 years full rehabilitation and replacement, after that, full rehab only every other year replacement



CIP Planning



Consistent Process Used for Hazen Developed AMPs



Consistent Process Used for Hazen Developed AMPs



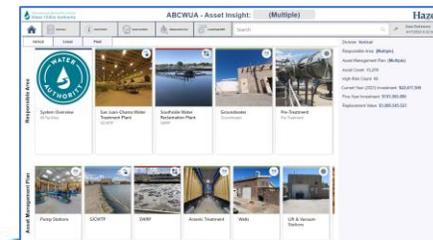
KEY HIGHLIGHTS

- **Collaborative effort** between the Water Authority and Hazen
- **> 210K assets**
- **\$9.57 billion replacement value**
- 398 High risk assets
 - 313 linear
 - 85 vertical
- Funding requirements
 - What is needed and when (CAPEX)
 - Built from asset level
- Defensible rationale for spending
- **Digital consolidation of CIP data**

18 AMPs



All AMPs came together to create the CAMP



What the Digital Consolidation Looks Like

A Primer in What You Will See with the Live Dashboard

The dashboard displays the following information:

- Summary Metrics:**
 - Asset Count: 210,248
 - Replacement Value: \$9.57bn
 - High-Risk Count: 398
 - Average Risk Score: 2.5
 - Average Condition: 1.5
- Business Risk Exposure:** A bar chart showing asset counts over time, with a callout for 5 Years: 14K and a High Risk count of 398.
- Remaining Useful Life:** A bar chart showing asset counts over time, with a callout for 5 Years: 14K.
- Investment Costs:** A bar chart showing costs over time, with a callout for 5 Years: \$332.07M and an Average Annual Investment of \$190.03M.
- Asset Count by Category:** A donut chart showing:
 - PVC: 105K (50%)
 - VCP: 17K (8%)
 - AC: 13K (6%)
 - M...: 8K (...)
 - DIP: 7K (3%)
- Likelihood of Failure:** A heatmap showing failure likelihood by consequence of failure (1-5) and asset count.
- Table:**

| ID | Description | Facility Name | Area | Subarea | Discipline | Replacement Value | Replacement Year |
|-------------|-----------------------------------|---------------|----------------|----------------|------------|-------------------|------------------|
| - | ACTIVE | Water | CORRALES | | Linear | \$3,843 | 2108 |
| 2 | ACTIVE | Water | FREEWAY | | Linear | \$3,019 | 2033 |
| Arsenic_001 | Arsenic System Bypass Flow ... | BCIP | Arsenic Rem... | Bypass Se... | Mechanical | \$18,000 | 2040 |
| Arsenic_002 | Influent Isolation Valve | BCIP | Arsenic Rem... | Bypass Se... | Mechanical | \$6,000 | 2059 |
| Arsenic_003 | Effluent Isolation Valve | BCIP | Arsenic Rem... | Bypass Se... | Mechanical | \$6,000 | 2059 |
| Arsenic_007 | Treated Water Header Check ... | BCIP | Arsenic Rem... | Treated W... | Mechanical | \$18,000 | 2044 |
| Arsenic_008 | Treated Water Flow Meter | BCIP | Arsenic Rem... | Treated W... | Mechanical | \$21,000 | 2040 |
| Arsenic_009 | Treated Water Header Gate V... | BCIP | Arsenic Rem... | Treated W... | Mechanical | \$8,000 | 2059 |
| Arsenic_010 | Influent Pressure Relief Valve | BCIP | Arsenic Rem... | Influent Tr... | Mechanical | \$31,000 | 2037 |
| Arsenic_011 | Influent Pressure Relief Valve... | BCIP | Arsenic Rem... | Influent Tr... | Mechanical | \$7,000 | 2059 |



Scenario 1: Individual Asset Information

Specific Pump



Scenario 2: Facility Level

- Any individual facility can be investigated
- All specific data shown is for the facility



ABCWUA - Asset Insight: All Facilities

AMP: All

Facility Name: **SJCWTP**

Area: All

Subarea: All

Asset Class: All

Asset Type: All

Discipline: All

Condition Score: All

[Clear Filters](#)

[Asset Details](#)

Asset Count: **2,177**

Replacement Value: **\$641.66M**

High-Risk Count: **1**

Average Risk Score: **6.6**

Average Condition: **2.2**

Business Risk Exposure

5 Years: 34

Remaining Useful Life: 0 to 50

Rehab Costs vs Replacement Costs

Average Annual Investment: \$24.41M

| ID | Description | Facility Name | Area | Subarea | Discipline | Replacement Value | Replacement Year |
|----------|------------------------------|---------------|-----------------|------------|------------|-------------------|------------------|
| SJC_0001 | GENFAC - 2" BACKFLOW P... | SJCWTP | General Faci... | BACKFLO... | Mechanical | \$15,000 | 2036 |
| SJC_0002 | GENFAC - BACKFLOW PRE... | SJCWTP | General Faci... | BACKFLO... | Mechanical | \$5,000 | 2036 |
| SJC_0003 | GENFAC - TEST VALVE, 10" ... | SJCWTP | General Faci... | BACKFLO... | Mechanical | \$62,000 | 2043 |
| SJC_0004 | GENFAC - ANNUAL BACKFL... | SJCWTP | General Faci... | BACKFLO... | Mechanical | \$62,000 | 2036 |
| SJC_0005 | GENFAC - ESP-95-5 PANEL ... | SJCWTP | General Faci... | ESP CAM... | Electrical | \$94,000 | 2039 |
| SJC_0006 | GENFAC - ESP-95-6 PANEL ... | SJCWTP | General Faci... | ESP CAM... | Electrical | \$94,000 | 2039 |
| SJC_0007 | GENFAC - ESP-95-13 PANE... | SJCWTP | General Faci... | ESP CAM... | Electrical | \$94,000 | 2039 |
| SJC_0008 | GENFAC - ESP-95-10 PANE... | SJCWTP | General Faci... | ESP CAM... | Electrical | \$94,000 | 2039 |
| SJC_0009 | GENFAC - ESP 95-9 PANEL ... | SJCWTP | General Faci... | ESP CAM... | Electrical | \$94,000 | 2039 |
| SJC_0010 | GENFAC - ESP 95-4 PANEL ... | SJCWTP | General Faci... | ESP CAM... | Electrical | \$94,000 | 2039 |

Asset Count:

I&C OK (11%)

Electrical OK (1...)

Mechanical 1K (6...)

| | | | | | |
|---|---|-----|-----|-----|-----|
| 5 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 8 | 7 | 2 | 1 |
| 3 | 5 | 210 | 64 | 44 | 73 |
| 2 | 6 | 725 | 503 | 175 | 261 |
| 1 | 0 | 36 | 40 | 7 | 10 |

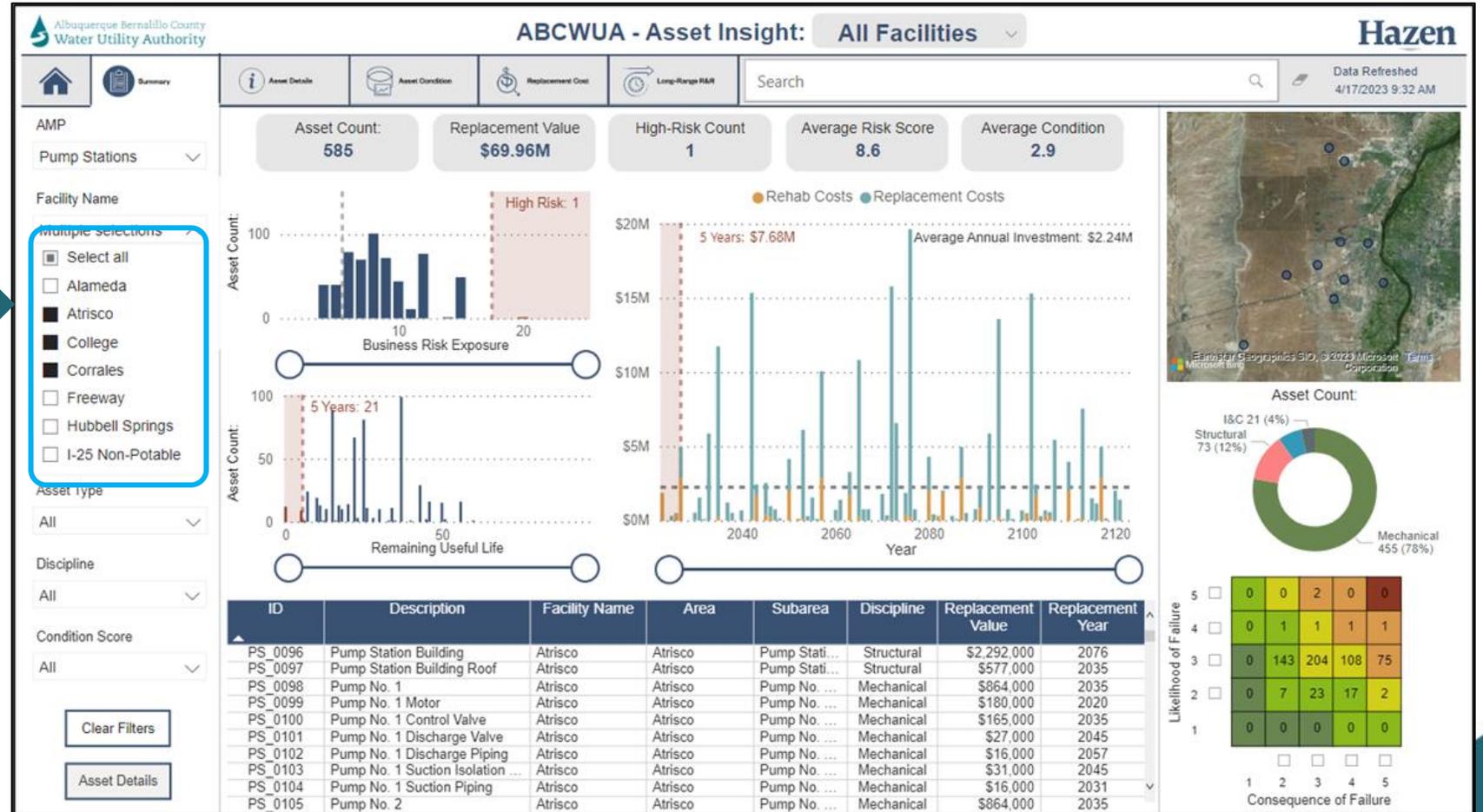
Likelihood of Failure

Consequence of Failure

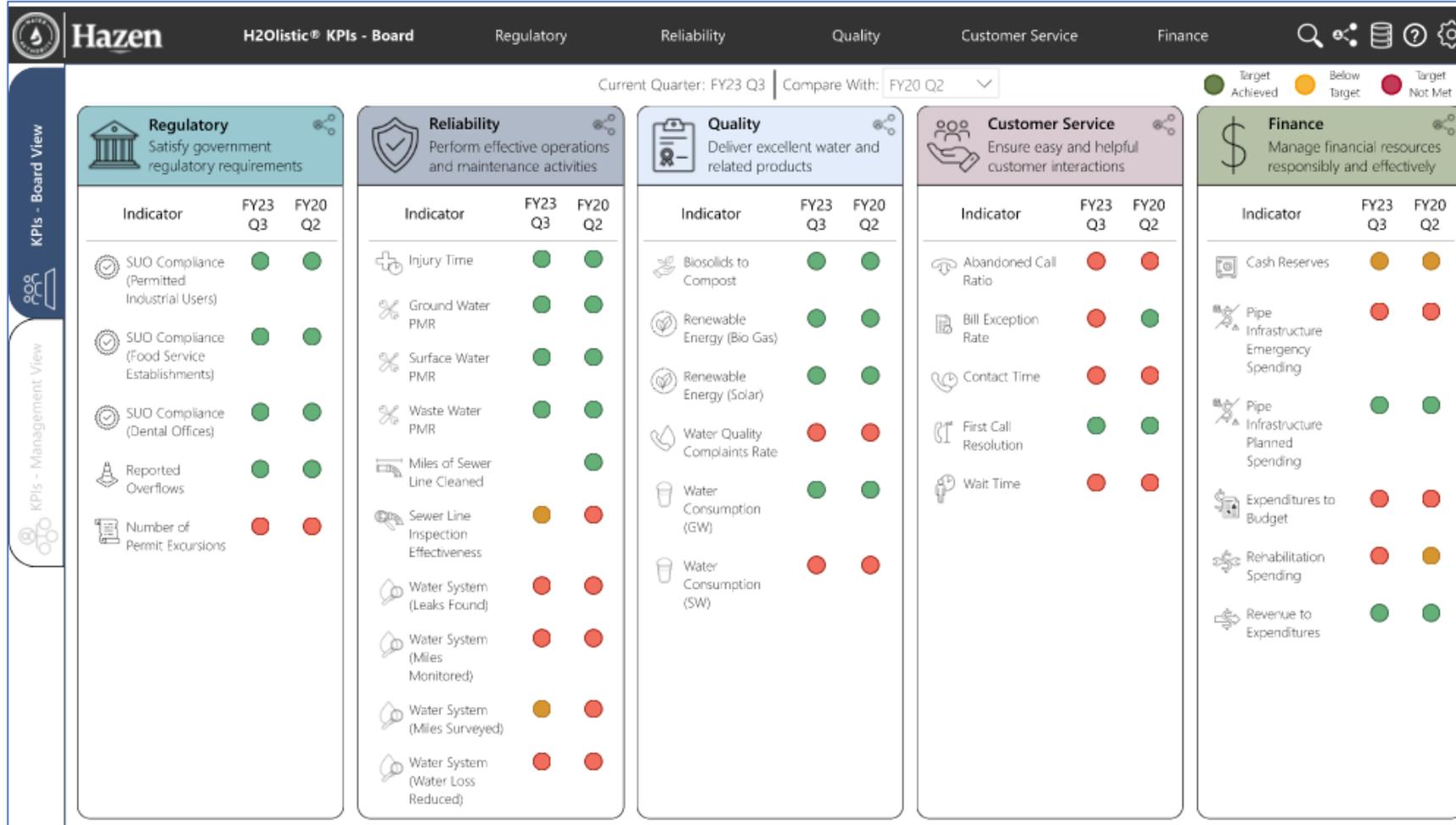


Scenario 2: Facility Level

- Can select groups of assets
- Data now reflects information within the selected grouping



New Water Authority Board Scorecard

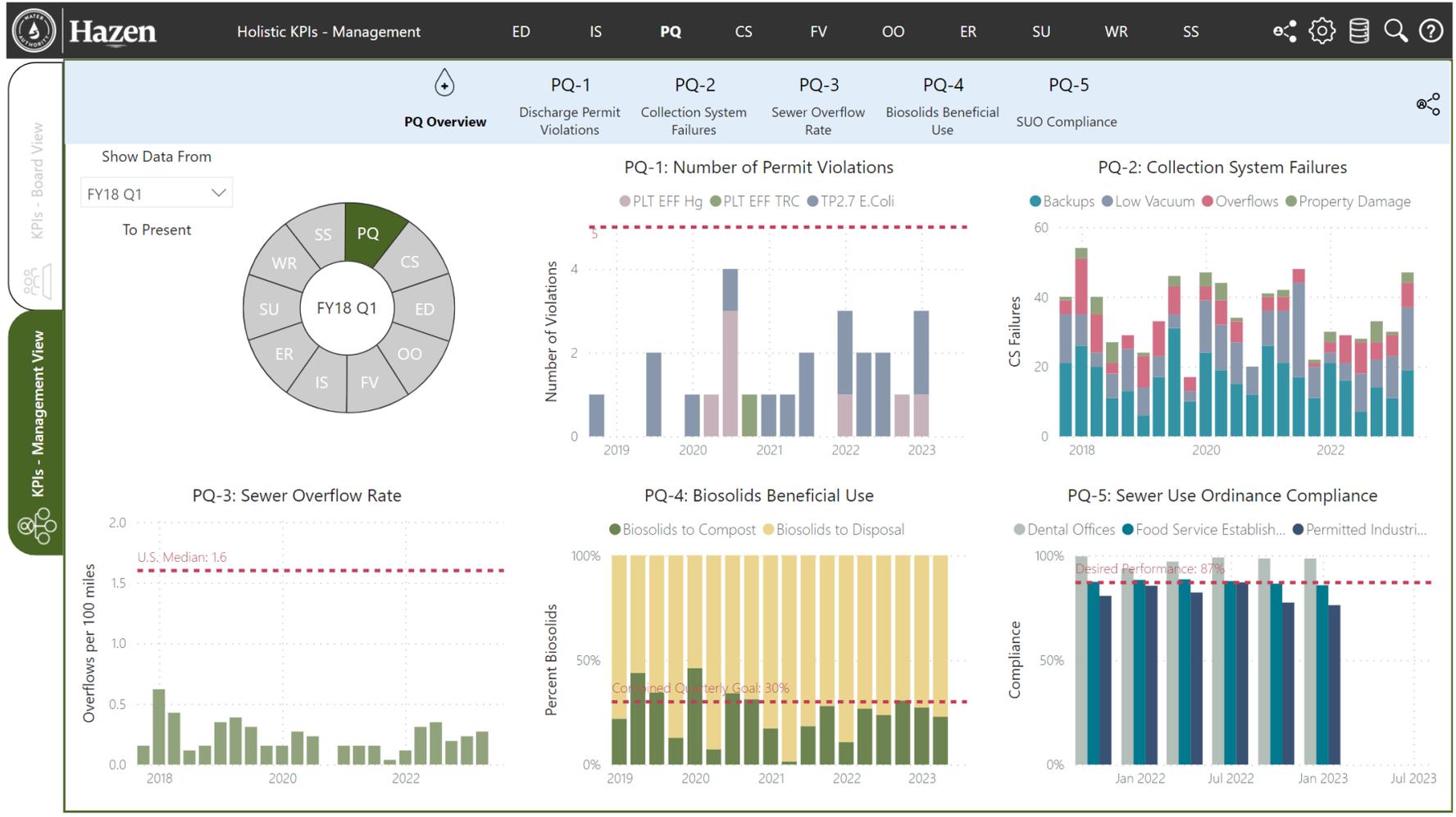


Water Authority Board Scorecard

- Standardize formatting and delivery methods for this data
- Establishment of a data warehouse



New Effective Utility Management (EUM) Dashboard



Effective Utility Management

- Taking the monthly / quarterly data and moving to a dashboard
- Greatly simplifies the compilation and displaying of reports



Next Steps



Next Steps



Develop FY25 Decade Plan using CAMP data



Develop Operational KPIs in PowerBI with each Work Group



Continue improving accuracy of Asset Register



Strive for Data Integrity and Reliability



Update CAMP Regularly (Continuously Input New Data Into Dashboards)



Questions?

