

Long-Term Asset Planning & Pipeline Condition Assessments

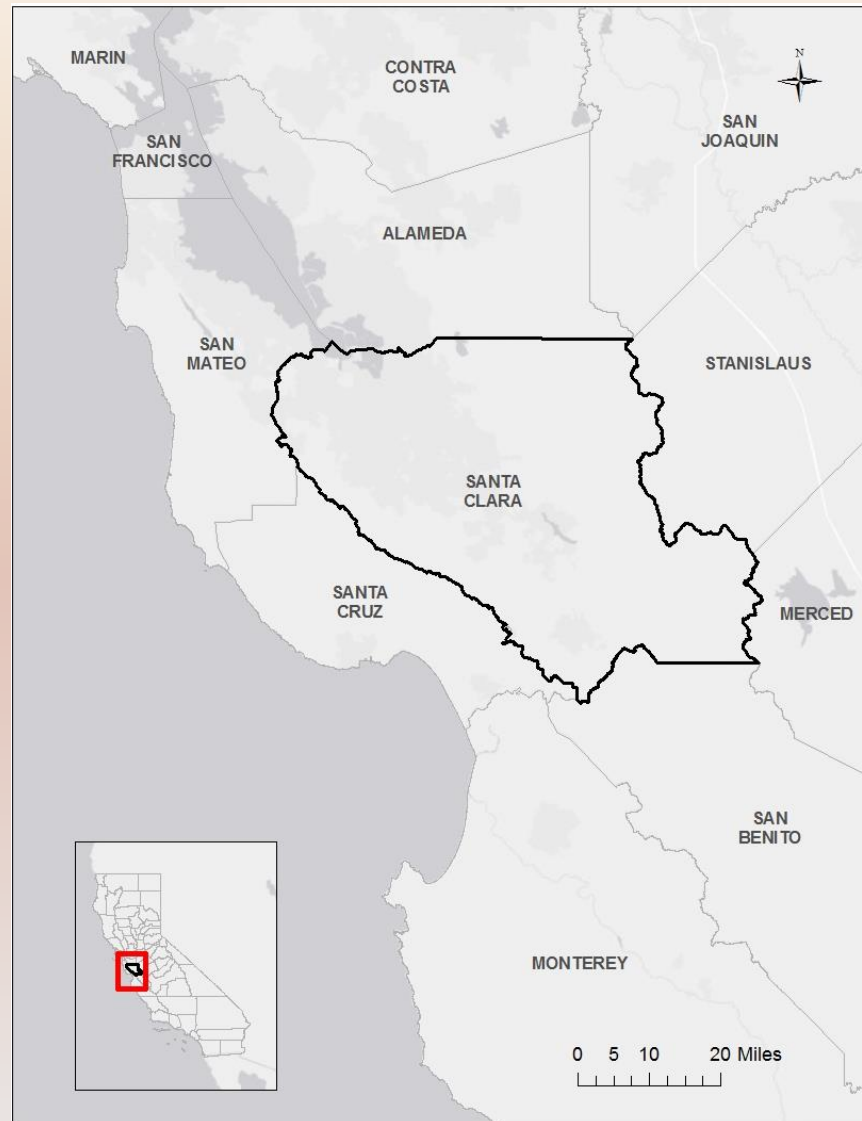


SCVWD, John McHugh, Assistant Engineer, P.G., C.Hg.
BAYWORK Maintenance & Asset Management Workshop
May 30, 2018

Overview

- ▶ SCVWD Background
- ▶ Asset Management Planning Tool
- ▶ Pipeline Condition Assessments
- ▶ Q&A

SCVWD Background

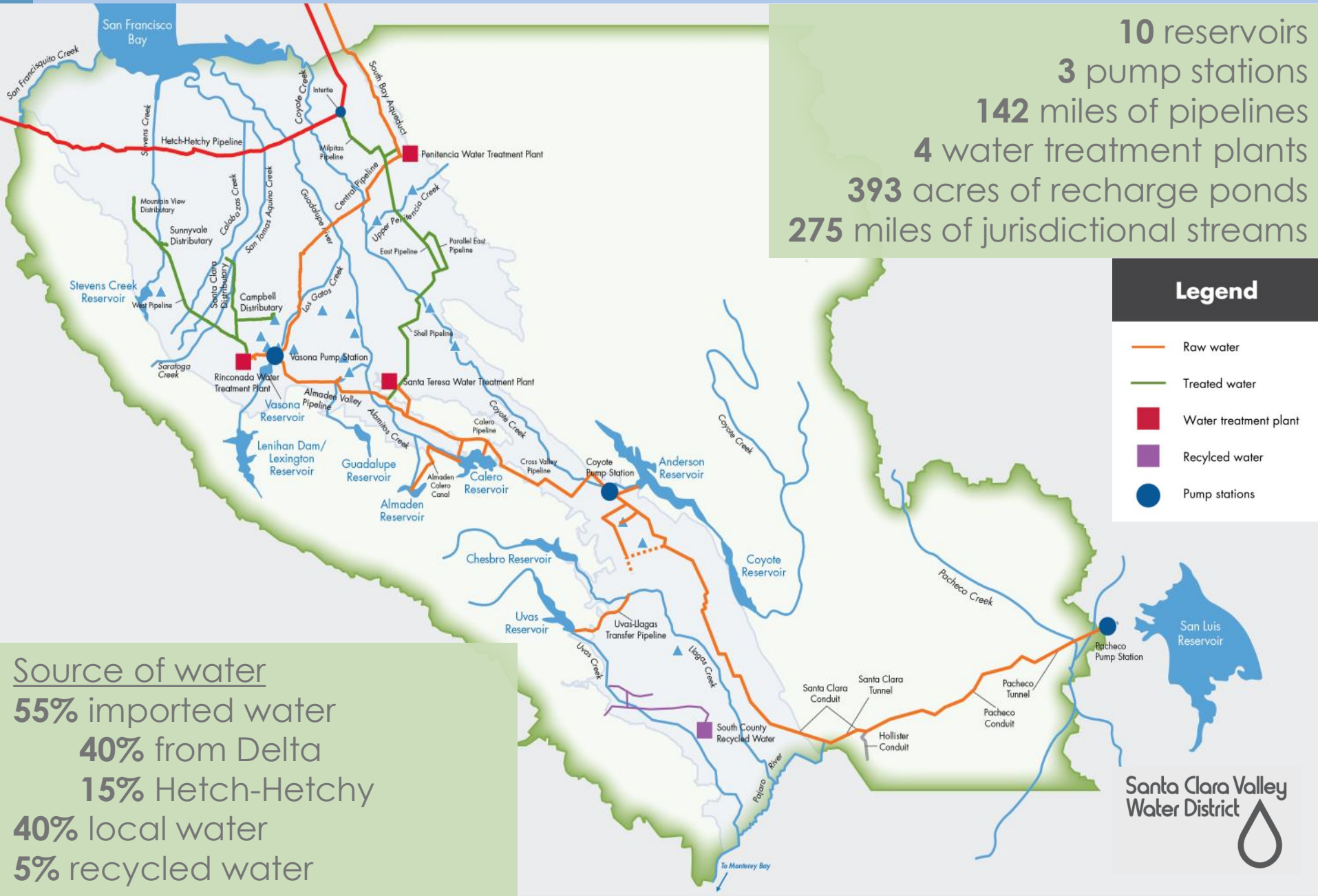


SCVWD Background

10 reservoirs
3 pump stations
142 miles of pipelines
4 water treatment plants
393 acres of recharge ponds
275 miles of jurisdictional streams

Legend

- Raw water
- Treated water
- Water treatment plant
- Recycled water
- Pump stations



Source of water

55% imported water
40% from Delta
15% Hetch-Hetchy
40% local water
5% recycled water

Santa Clara Valley
Water District



SCVWD Background

Software

- ▶ Maximo - work orders, documents maintenance and replacement of assets
- ▶ AMPT - management strategies, schedules future work and forecasts financial commitment

Asset Management Planning Tool

R & R projected 100 years

WATER UTILITY

Install Range

1932 - 2017

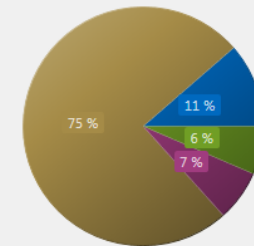
Total Annualized
R&R

\$58,223,171

Total Valuation

\$7,265,533,359

Valuation



Average % Consumed

40 %

Total Replacement
Cost

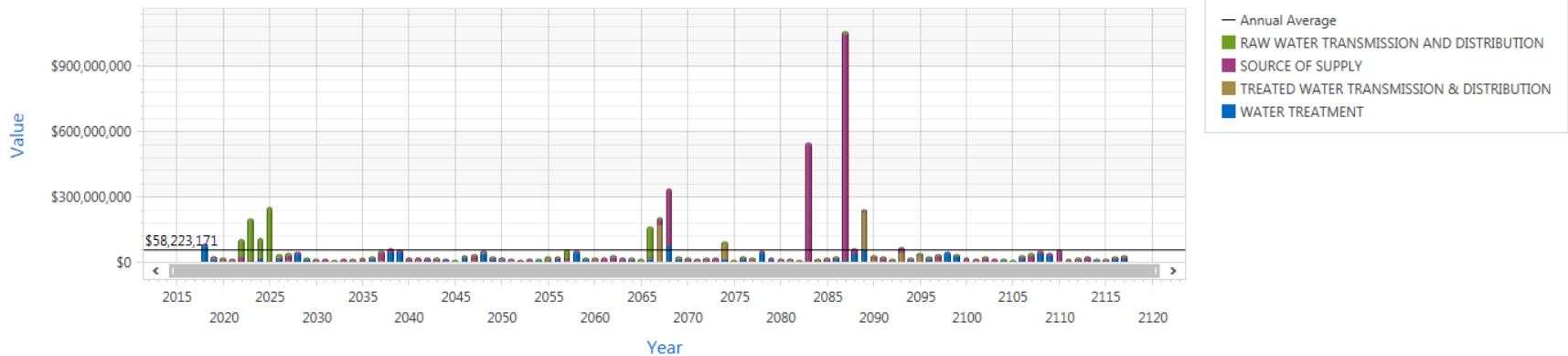
\$5,661,906,567

Total Assets

11,096

Export R&R Chart

Replacement & Rehabilitation



Asset Management Planning Tool

Registry and Management Strategy

The screenshot displays the Asset Management Planning Tool interface. On the left, the 'Asset Hierarchy' is shown, with 'Main Hierarchy' expanded to show 'SANTA CLARA VALLEY WATER DISTRICT' and 'WATER UTILITY'. The 'Assets in: PPP MAIN PUMP SYSTEM' table is visible, listing various assets such as 'PACHICO PUMP UNIT #1 MOTOR' and 'PACHICO PUMP UNIT #2 MOTOR'. The table includes columns for Level 6, Level 7, Level 8, Level 9, Level 10, ID, Name, and Install. The bottom of the table shows 'Row Count = 99' and 'Number Assets = 99, Avg % Consumed = 65 %, Total Value = \$62,085,350, Total Replacement = \$40,522,350'.

The screenshot displays the Asset Management Planning Tool interface, showing the 'Display' table and the 'Activity 2' form. The 'Display' table lists assets with columns for #, ID, and Description. The 'Activity 2' form includes fields for Activity Name, Activity Type, Notes, First Year of Activity, Final Year of Activity, Previous Year of Activity, Activity Frequency, Single Occurrence, Cost Based On, Equipment Cost, Equipment Multiplier, and Financial Smoothing.

#	ID	Description
☐	1	PU1 Centrifugat; H or V <= 2...
☐	2	PU10 Centrifugat; V 4 in; 15 - 2...
☐	3	PU11 Centrifugat; V 6 in; 10 - 5...
☐	4	PU12 Centrifugat; V 8 in; 25 - 7...
☐	5	PU13 Centrifugat; V 10 in; 30...
☐	6	PU14 Centrifugat; V 14 in; 100...
☐	7	PU15 Centrifugat; V 12 in- 30 i...
☒	8	PU16 Centrifugat; V 24 in; 2000...
☐	9	PU17 Centrifugat; submersible;...
☐	10	PU18 Positive Displacement; g...
☐	11	PU19 Positive Displacement; s...
☐	12	PU2 Centrifugat; H or V <= 2...
☐	13	PU20 Positive Displacement; <...
☐	14	PU21 Positive Displacement; 1...
☐	15	PU22 Positive Displacement; 5...
☐	16	PU23 Positive Displacement; 2...
☐	17	PU24 Positive Displacement; 1...
☐	18	PU25 Centrifugat; 4 in - 6 in; 2...

Row Count = 30

Activity 2

Activity Name: Capital

Activity Type: Rehabilitation

Notes: std. rebuild (no impeller; shaft; or bowl)

First Year of Activity: 0

Final Year of Activity: 0

Previous Year of Activity: 0

Activity Frequency: 12

Single Occurrence: False

Cost Based On: Equipment

Equipment Cost: \$2,500,000

Equipment Multiplier: 0.36

Financial Smoothing: ☐

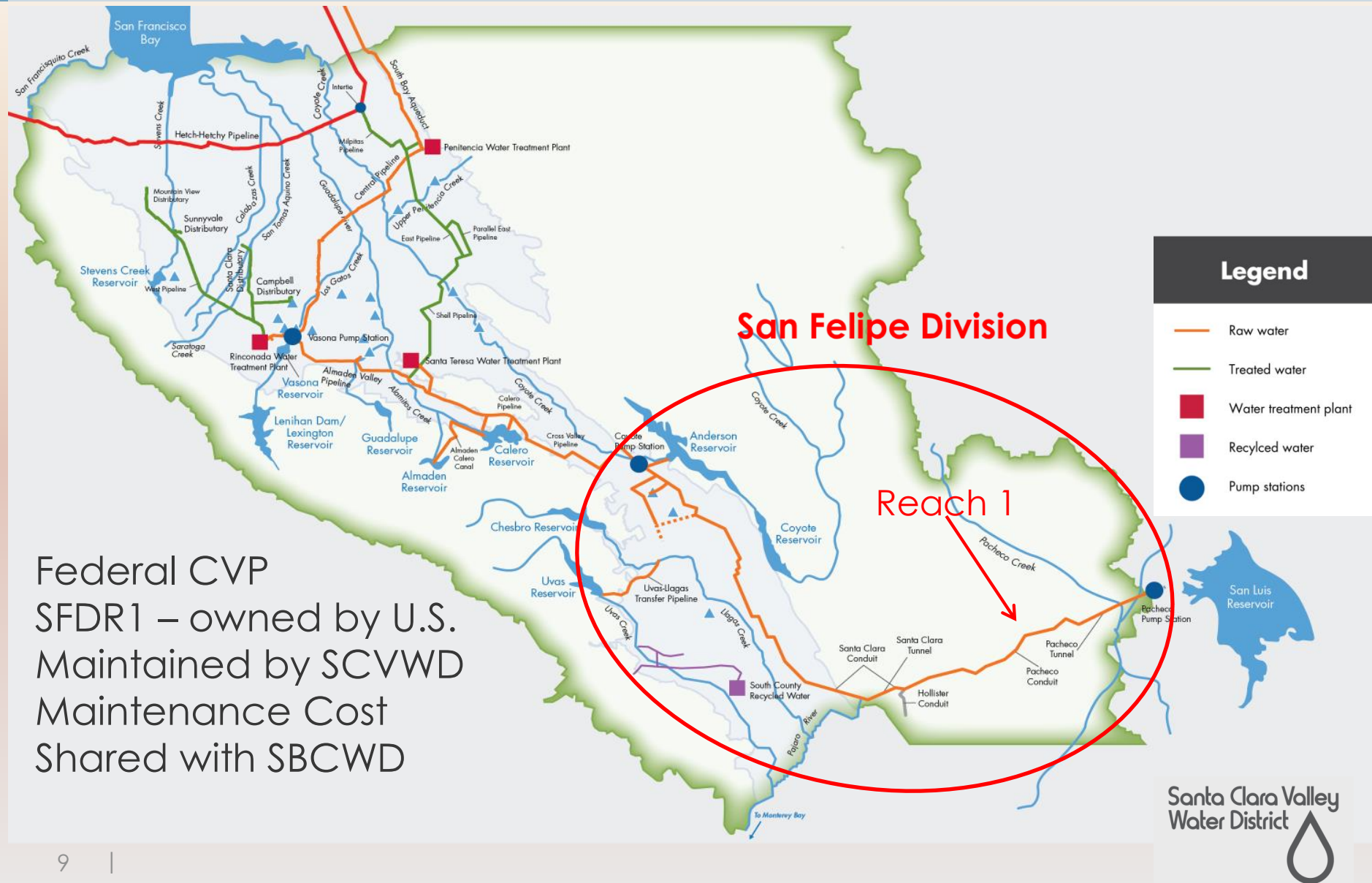
Asset Management Planning Tool

Forecasted Work

Drag a column header here to group by that column

Year of Activity ▲	Asset ID	Asset Name	Asset Class	Activity Name	Activity Type	Activity Descripti...	Useful Life	Install Year	Activity Cost	Project Type
2018	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Rehabilitation	std. rebuild (no i...	50	1987	\$900,000	Capital
2030	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Rehabilitation	std. rebuild (no i...	50	1987	\$900,000	Capital
2041	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Replacement		50	1987	\$3,125,000	Capital
2042	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Rehabilitation	std. rebuild (no i...	50	1987	\$900,000	Capital
2054	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Rehabilitation	std. rebuild (no i...	50	1987	\$900,000	Capital
2066	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Rehabilitation	std. rebuild (no i...	50	1987	\$900,000	Capital
2078	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Rehabilitation	std. rebuild (no i...	50	1987	\$900,000	Capital
2090	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Rehabilitation	std. rebuild (no i...	50	1987	\$900,000	Capital
2091	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Replacement		50	1987	\$3,125,000	Capital
2102	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Rehabilitation	std. rebuild (no i...	50	1987	\$900,000	Capital
2114	E41491	PACHECO PUMP UNIT #1...	Mechanical	Capital	Rehabilitation	std. rebuild (no i...	50	1987	\$900,000	Capital

Asset Management Planning Tool



Asset Management Planning Tool

PCCP Management Strategy

Recommended MS Activity			
MS	Type	Freq., Yr	Cost
1	Inspection - Unmanned; Eddy Current inspection. Cost is per mile. <u>Size 1 = # of miles of pipe (located in asset registry). Cost per Size 1 = \$100k/mile</u>	10	\$ 791,000
2	Inspection - Manned; Visual, Sounding, & Eddy Current inspection. Cost is per mile. <u>Size 1 = # of miles of pipe (located in asset registry). Cost per Size 1 = \$100k/mile.</u> Note: this activity needs to coincide with the dewatering activity #3.	10	\$ 791,000
3	Dewatering - Basic cost to dewater and refill pipeline. <u>Size 2 = (Diameter)x(miles of pipe), this value is located in the asset registry and is a pre-calculated value. Cost per Size 2 = \$500.</u>	10	\$ 500,000
4	Rehabilitation (This activity covers significant rehab activities like large weld repairs; composite or steel slip lining; segment replacement; etc.) Cost = \$300k/per stick and rehabbing 5 sections per repair. <u>This will be a Set Cost = \$1.5 M.</u> Note: this activity needs to coincide with the dewatering activity #3.	10	\$ 1,500,000
5	Rehabilitation - This activity covers minor anticipated internal pipe repairs i.e. Weco Seals; grouting; spot weld repairs; etc. <u>Size 1 = # of miles of pipe (located in asset registry). Cost per Size 1 = \$10k.</u> Note: this activity needs to coincide with the dewatering activity #3.	20	\$ 79,100
6	Replacement (This activity covers pipeline replacement.)	100	\$ 230,667,360



Asset Management Planning Tool

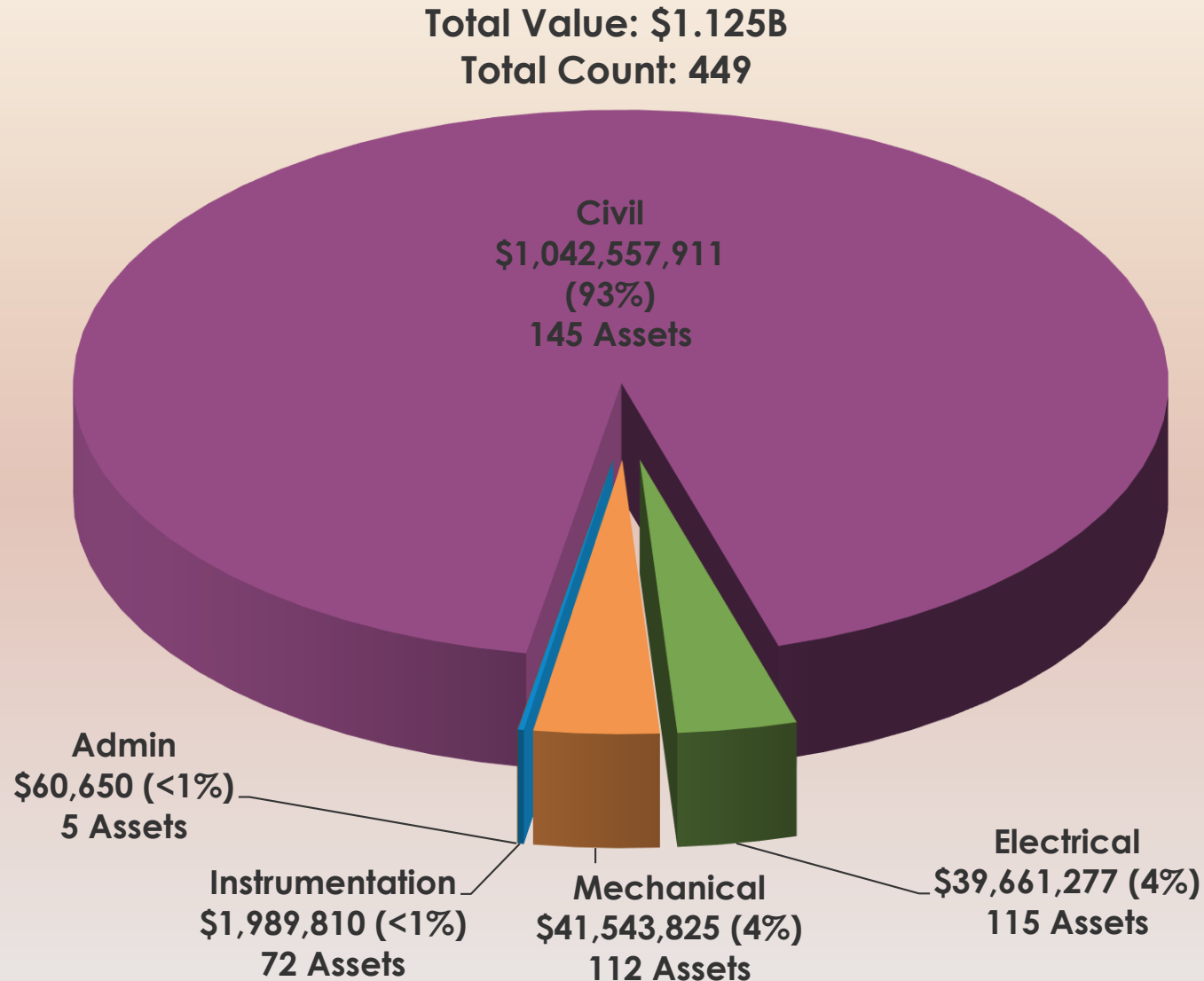
Motor Management Strategy

Recommended MS Activity			
MS	Type	Freq., Yr	Cost
1	Replacement	50	\$ 1,800,000
2	Rehabilitation (does not include brgs.)	Remove activity	
3	Rehabilitation, Motor	12	\$ 82,500
	a) bearing inspection		
	b) test motor, clean and VPI rotor & stator winding including retest. Balancing and vibration testing.		
4	Rehabilitation, Stator and/or Rotor re-wind (as needed based on test results from activity #3)	12	\$ 100,500
5	Rehabilitation, Bearings (as needed based on test results from activity #3)	12	\$ 120,000
6	Rehabilitation (cooler)	24	\$ 16,000



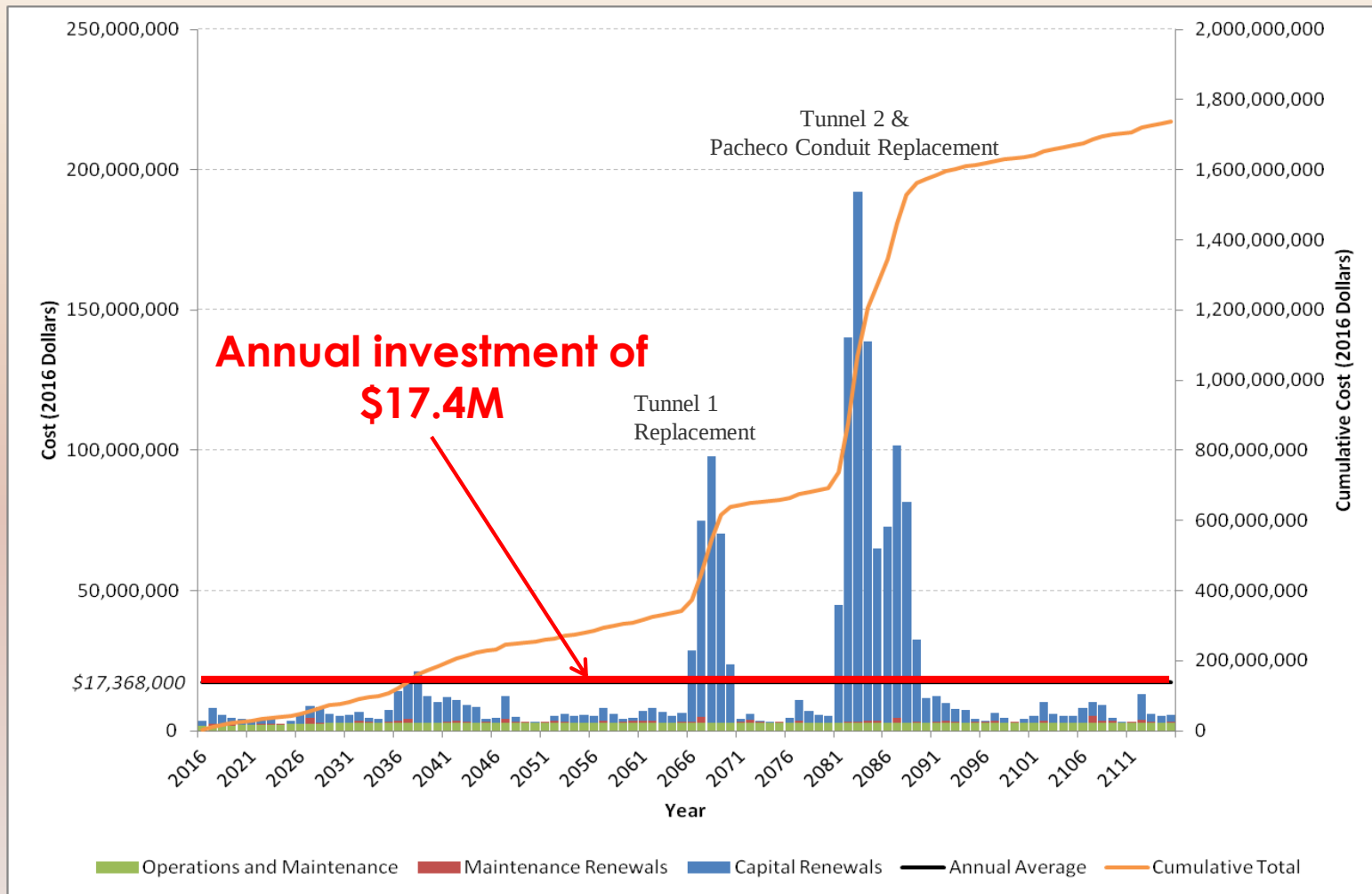
SFDR1 Asset Management Plan

Current State of our Assets



SFDR1 Asset Management Plan

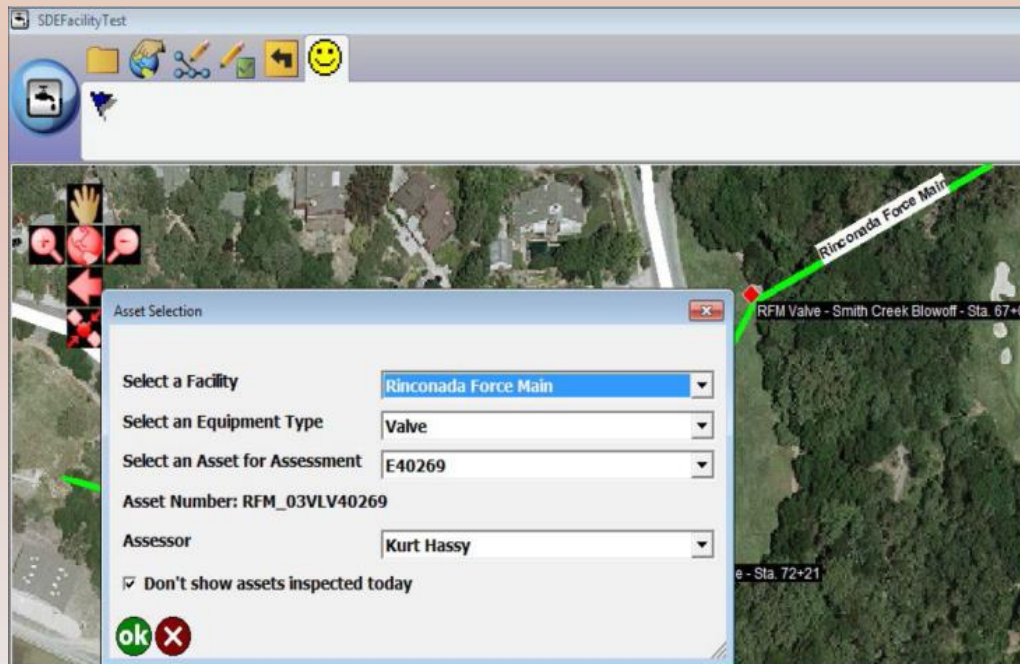
Long-term Forecast



Pipeline Condition Assessments

Traditional Condition Assessments

PoF Scale	Condition or State of Asset
1	Fully functional. New or Recently Rehabilitated. Stable
2	Fully functional. Good. Stable
3	Monitor more closely for possible deterioration; may require more frequent monitoring in subsequent years
4	Some conditions point to possible failure; corrective action or renewal maybe recommended
5	Unable to satisfy one or more level-of-service (LOS) requirement.



Pipeline Condition Assessments

Vault Condition

Poor maintenance documentation

Evidence of poor condition

Reliability concern



Pipeline Condition Assessments

Vaults

Goals:

- ▶ Detailed condition assessment
- ▶ Information for future rehabilitation project
- ▶ Digital data collection in the field

Solution:

- ▶ Mobil app with custom survey
- ▶ Data in cloud
- ▶ Easy to update vault list
- ▶ GPS & picture capture

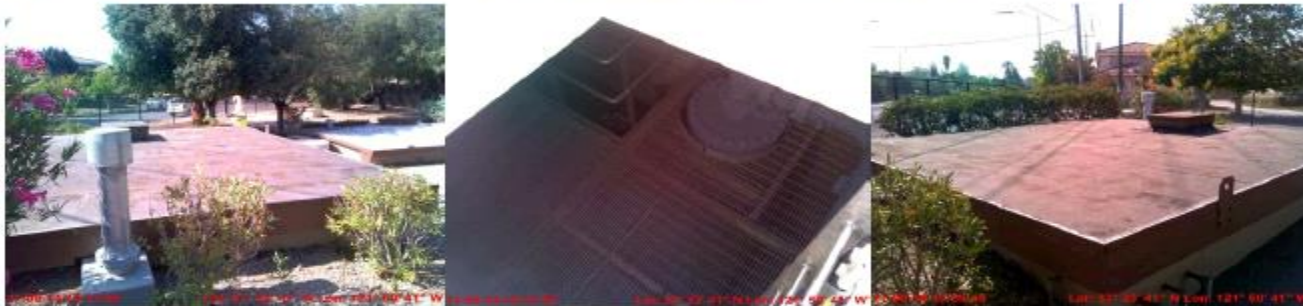
Pipeline Condition Assessments

Implementation

- ▶ New tablets
- ▶ Lists and maps
- ▶ Training
- ▶ WADITW
- ▶ Reconciling Source data
- ▶ Data Management

Pipeline Condition Assessments

Asset No.	Asset Name	Station	Location No.	Approx Location	Vault No.
E40361	MPL Line Valve Vault	10+16.08	94339009	Corner of Maxey Dr. & Piedmont Rd.	



Pipeline Condition Assessments

Survey123 for ArcGIS

Vault Condition Assessments

Date:
Monday, May 21, 2018

Choose Employee: *

Choose a System:
☐ Raw Water Transmission & Distribution
☐ Treated Water Transmission & Distribution
☐ Source of Supply

Choose a Facility: *

Choose Vault: *

▶ **Yes/No Questions**

▶ **Satisfactory Questions**

Survey123 for ArcGIS

Vault Condition Assessments

Choose Vault: *
E40361 - MPL Vault - Milpitas Line Valve Vault - Sta. 10+16.08

▼ **Yes/No Questions**

Access Issue: *
☐ Yes
☐ No

Vault Number Present Outside of Vault: *
☐ Yes
☐ No

Pipeline Marker Present: *
☐ Yes
☐ No

Access Ladder or Staircase: *
☐ Yes
☐ No

Pipeline Condition Assessments

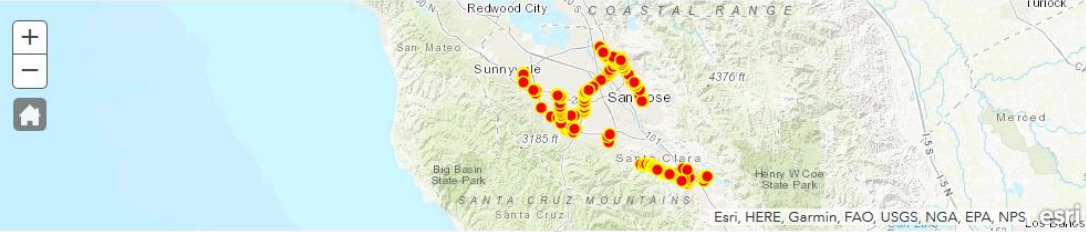
Survey uploaded to Cloud for viewing and export

Survey123 for ArcGIS

Pipeline Vault Condition Assessments

Overview Analyze Data

6/20/17 - 4/24/18 Export Open in Map Viewer Show individual response



Pipeline_Vault_Condition_Assessments (Features: 448, Selected: 1)

Date:	Choose Employee:	Choose a System:	Choose a Facility:	Choose Vault:	Access Issue:	Vault Num Present Or Vault:
Apr 12, 2018	Jaime Mendoza	Raw Water Transmission & Distribution	AFM	E45323	No	Yes
Apr 12, 2018	Jaime Mendoza	Raw Water Transmission & Distribution	AFM	E40284	No	Yes
Apr 12, 2018	Jaime Mendoza	Raw Water Transmission & Distribution	AFM	E40283	No	No

Pipeline Vault Condition Assessments

Submitted By: dhuerta_valleywater
Submitted Time: 4/12/18 8:32 AM

Date:
Apr 12, 2018

Choose Employee:
Jaime Mendoza

Choose a System:
Raw Water Transmission & Distribution

Choose a Facility:
Anderson Force Main

Pipeline Condition Assessments

- ▶ Advantages
- ▶ Lessons Learned
- ▶ Planned Improvements

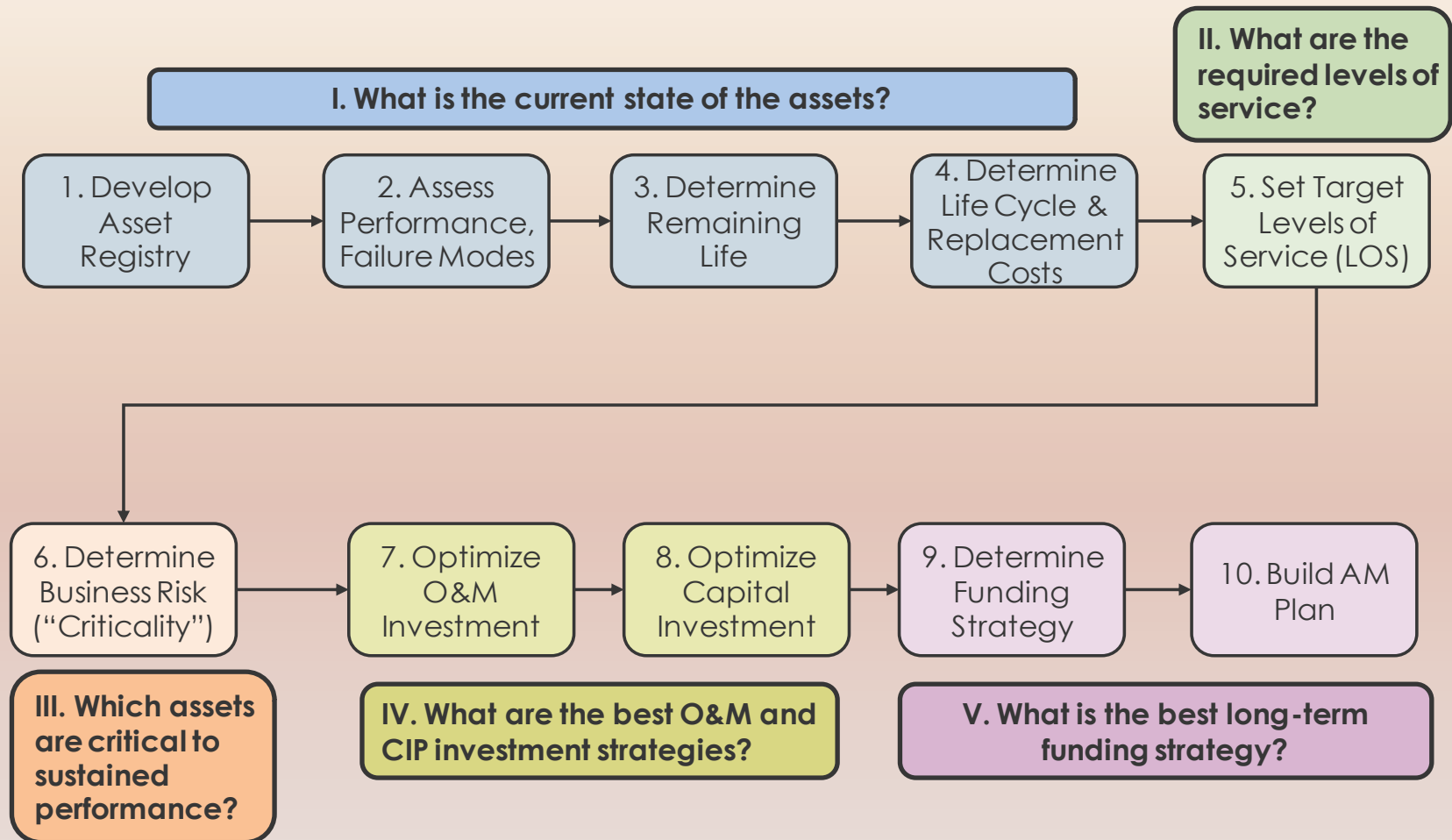
Questions?

Torrey Pines State Natural Reserve includes one of the world's rarest pine trees—*Pinus torreyana*.



Extra Slides

SCVWD Asset Management Program



SCVWD Asset Management Program

