STAKEHOLDER ADVISORY GROUP

Board of Water Supply, City & County of Honolulu
July 16, 2026
Meeting 61

WELCOME & INTRODUCTIONS

DAVE EBERSOLD, FACILITATOR

STAKEHOLDER ADVISORY GROUP MEETING 61

JULY 16, 2026

MEETING OBJECTIVES

- Welcome and public comment
- BWS Updates
- Pumping Capacity Analysis
- Accept notes from meeting #60
- Major Findings
- Adjourn

ROADMAP TOWARDS WMP ADOPTION

PUBLIC COMMENT ON AGENDA ITEMS

BWS UPDATES

Ernest Lau, PE
Manager and Chief Engineer

boardofwatersupply.com

PURPOSE OF TODAY'S MEETING

WHAT WOULD WE LIKE TO ACCOMPLISH TODAY?

- Inform Stakeholders about the pump capacity analysis
- Present the draft Major Findings that follow from the last ~ 2 years of evaluations
- Hear from the Stakeholders whether these findings resonate, and if there are other items they feel should be included

WHERE DO WE GO FROM HERE?

- These findings may result in recommendations in the WMP
- Recommendations will inform the Capital Improvement Program and other initiatives

PUMPING CAPACITY ANALYSIS

Carl Lundin, PE, PMP

boardofwatersupply.com

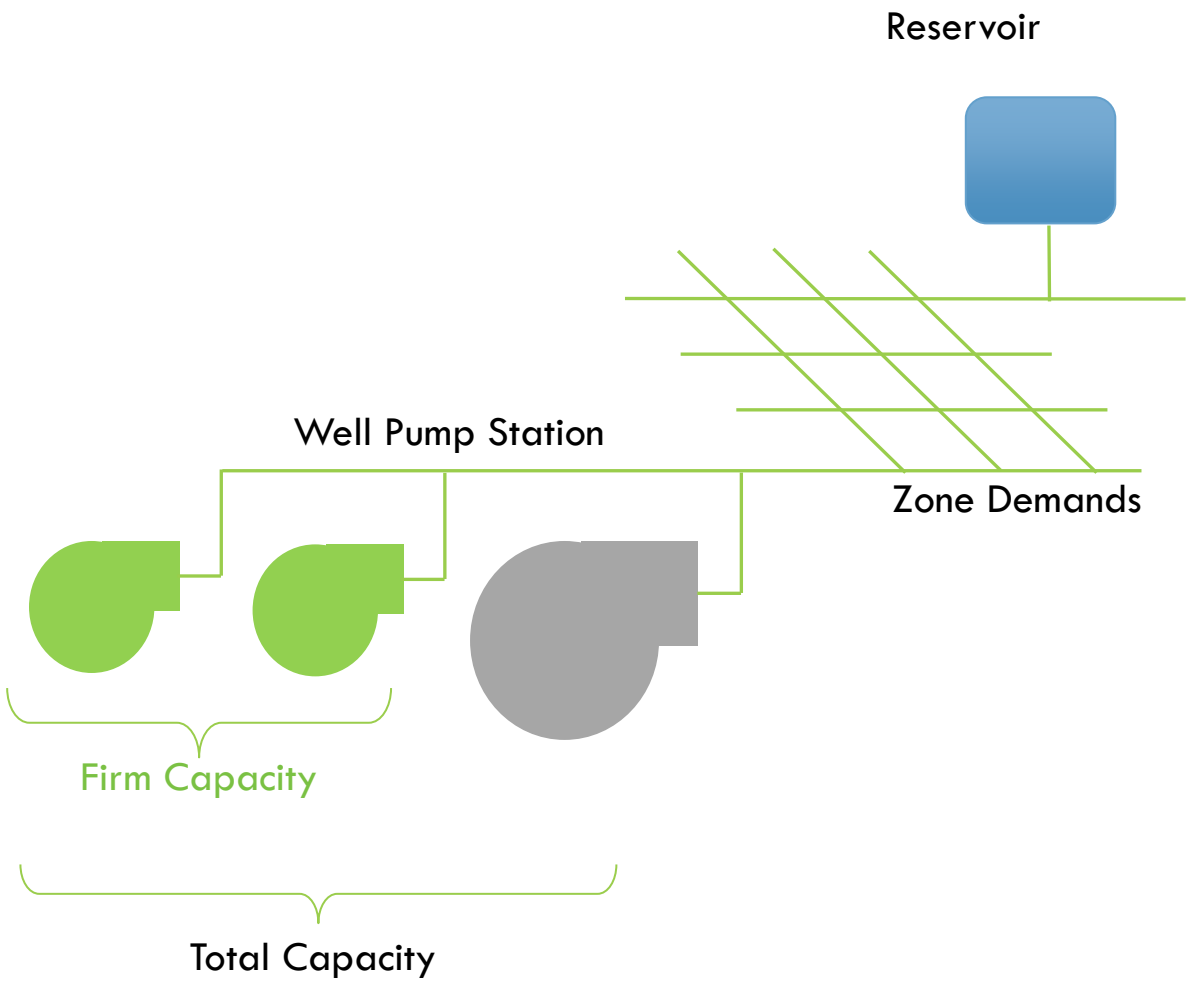
PUMPING CAPACITY EVALUATION

- Confirm ability to move water where and when needed
- Based on BWS Water System Standards (WSS)
- Designing to WSS provides adequate pumping capacity plus margin of safety when designing new pumping system
- Overall, current installed pumping capacity is adequate to serve existing demands

PUMPING CAPACITY ANALYSIS OVERVIEW

- Compares demands to pumping capacity within each of BWS' 110 distribution system pressure zones, or groups of zones

Firm Pumping Capacity: How much water the station can pump even if its largest pump stops working



Firm Pumping Capacity – Water Demands = (+) surplus or (–) need

ISLAND-WIDE DEMANDS VS. PRESSURE ZONE PUMPING CAPACITY

ISLAND-WIDE DEMANDS

- DBEDT 3.6% population increase (2050)
- 13-14% per-person usage decrease (2055)
- Island-wide demands decrease

PRESSURE ZONE PUMPING CAPACITY

- Population shifts around island, especially Transit Oriented Development (TOD)
- Local shifting of up to 28 mgd of demands around different pressure zones
- Some zones' demands decrease, some increase

DBEDT: Hawaii Department of Business, Economic Development, and Tourism

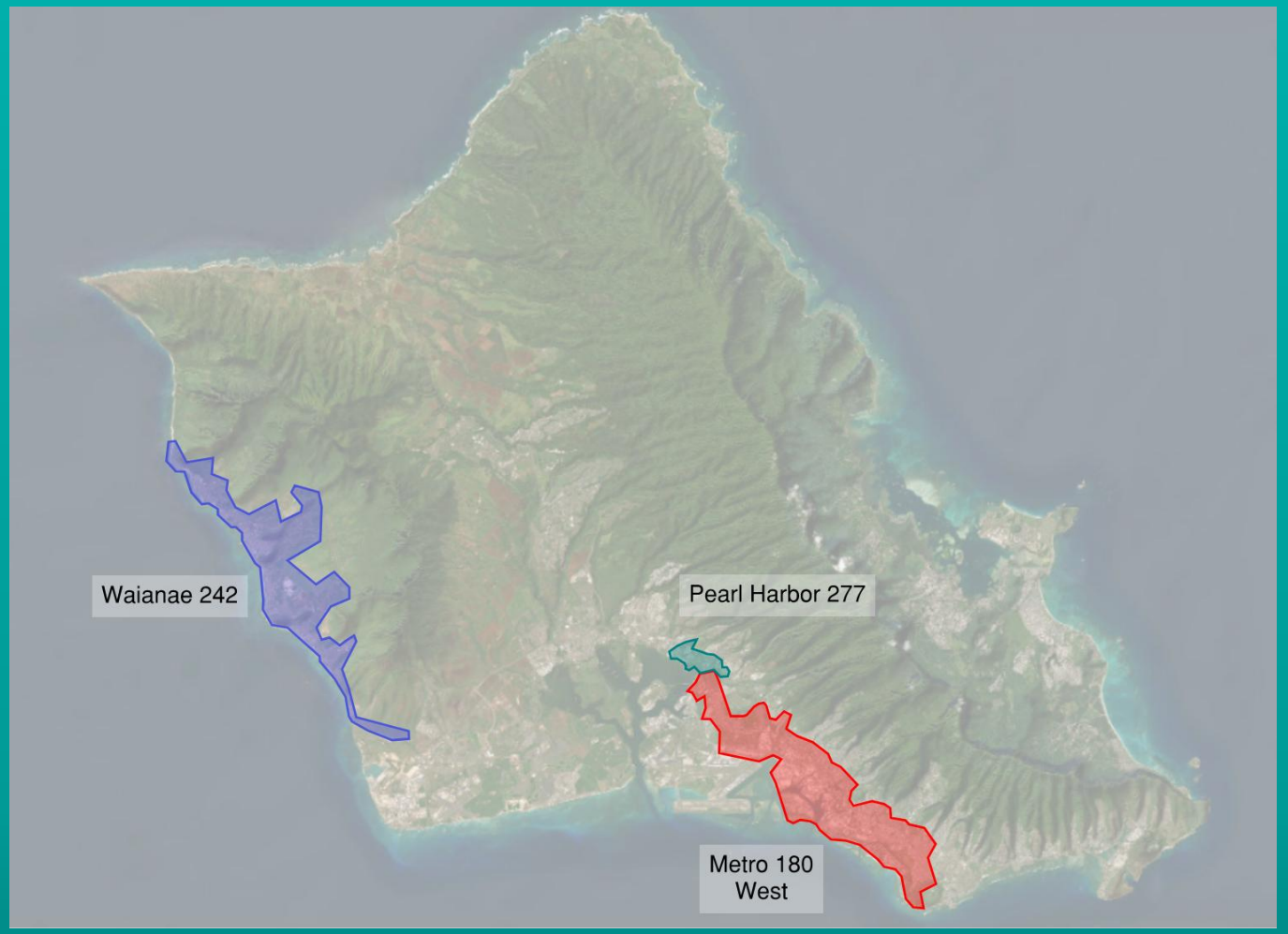
UNCERTAINTIES IN DEMANDS

- DBEDT may not fully account for all potential developments
- Actual reductions in per-person usage are not guaranteed
- Timing of TOD/Development is uncertain

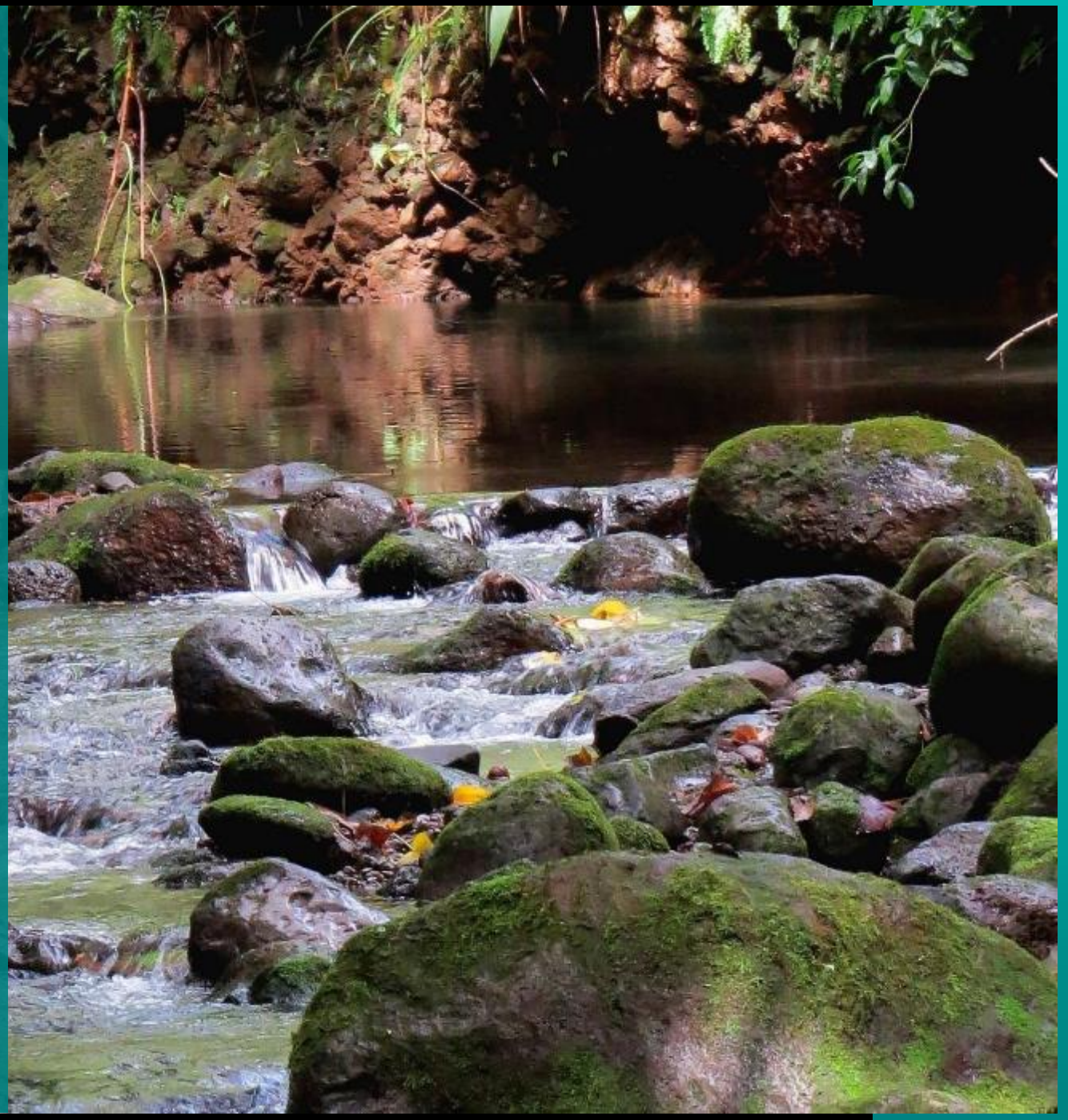
This is a projection of the state of the system in 30-years.
Monitor and reevaluate over time

AREAS WITH HIGHEST PUMP CAPACITY NEEDS

- Between 16 and 40 zones have some sort of need, generally minor
- May result in additional sources, booster pumping, or other projects
- Zones with Current Needs:
  - WAIANAE 242
    (up to 2.6mgd/25% need)
- Zones exacerbated by TOD:
  - METRO 180
    (14mgd/19% need)
  - PEARL HARBOR 277
    (2.6mgd/62% need)



QUESTIONS?



ACCEPT MEETING NOTES FROM MEETING 60

David Ebersold
Facilitator

www.boardofwatersupply.com

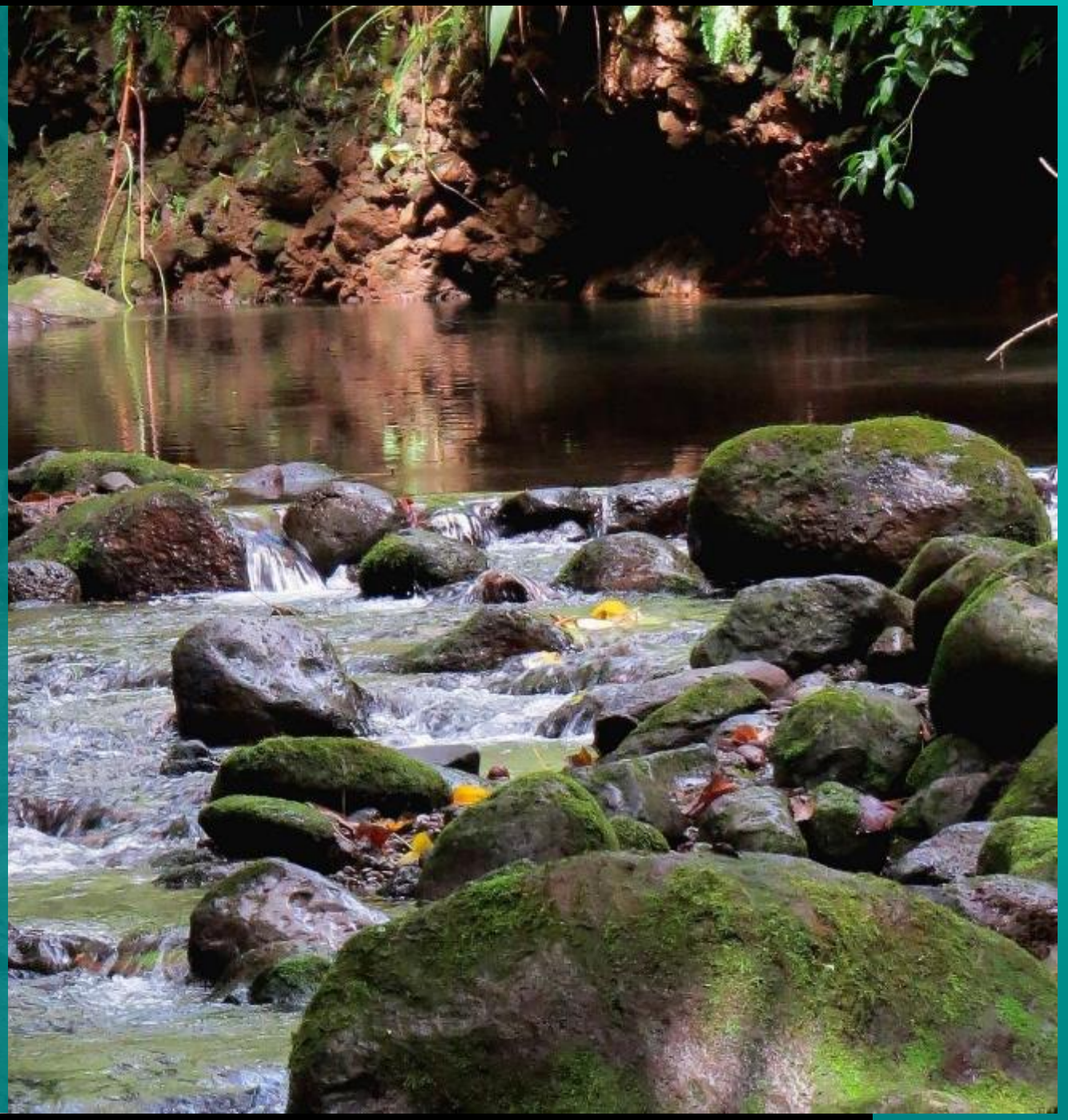
MAJOR FINDINGS

Carl Lundin and Bill Fernandez

KEY FINDINGS ORDER OF DISCUSSION

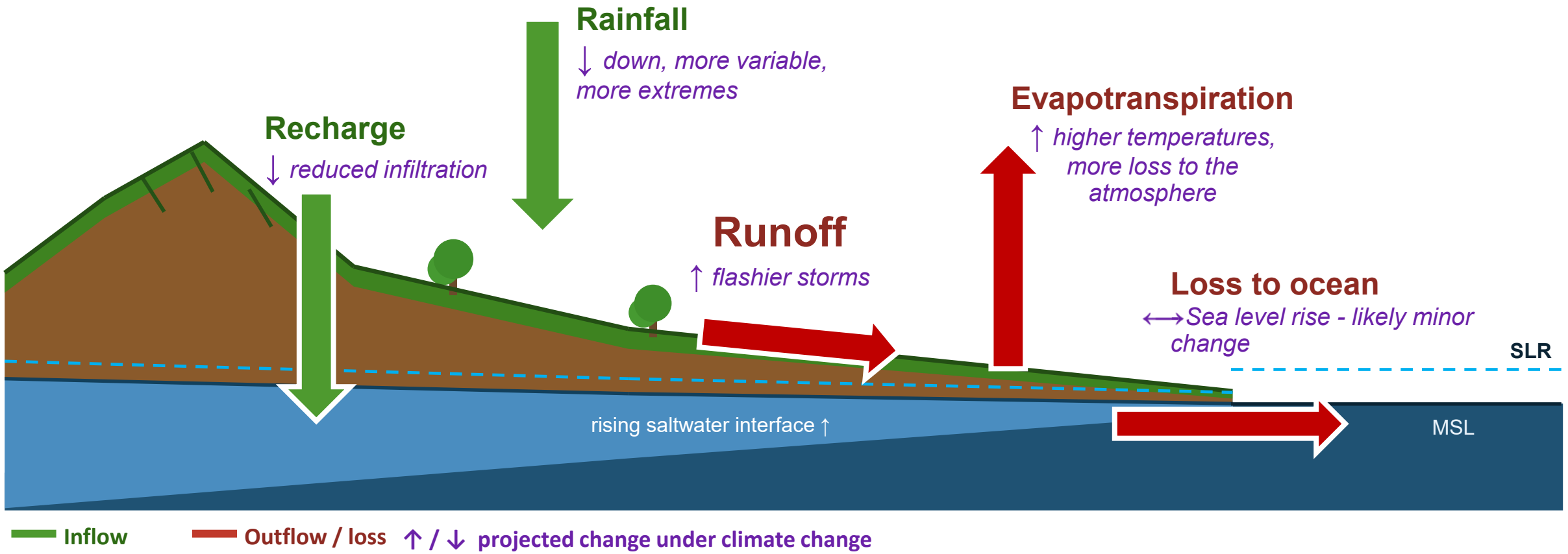
- Climate
  - Water Balance Variability
  - Sea Level Rise
  - Resiliency
- Condition Assessment
  - Pumps
  - Reservoirs
  - Water Loss
- Sources and Pumping
  - Demand
  - Pump Station Capacity
  - Sustainable Yield
  - Source Water Protection
  - PFAS
  - Alternative Supplies

CLIMATE



KEY FINDINGS – CLIMATE – WATER BALANCE VARIABILITY

- **Climate variability** is expected to increase, requiring continued monitoring of groundwater levels, recharge, and water quality indicators. This also means making production and distribution infrastructure more resilient to extreme events.
- **Metrics for aquifer health** may need to be revised (e.g., depth of water + MSL, depth/width of transition zone).



KEY FINDINGS – CLIMATE – SEA LEVEL RISE

- **Sea-level rise is expected to:**
  - mask groundwater aquifer storage declines
  - increase corrosion of low-lying pipes
  - make main break repairs in those areas more difficult
  - raise groundwater to the point of mobilizing subsurface contaminants toward the surface

KEY FINDINGS – CLIMATE – ADAPTIVE MANAGEMENT

Adaptive management is a repeating cycle of
"**Assess, Plan, Act, Monitor, Learn, Adjust**"
– used when the future is uncertain and getting it exactly right the first time isn't possible.

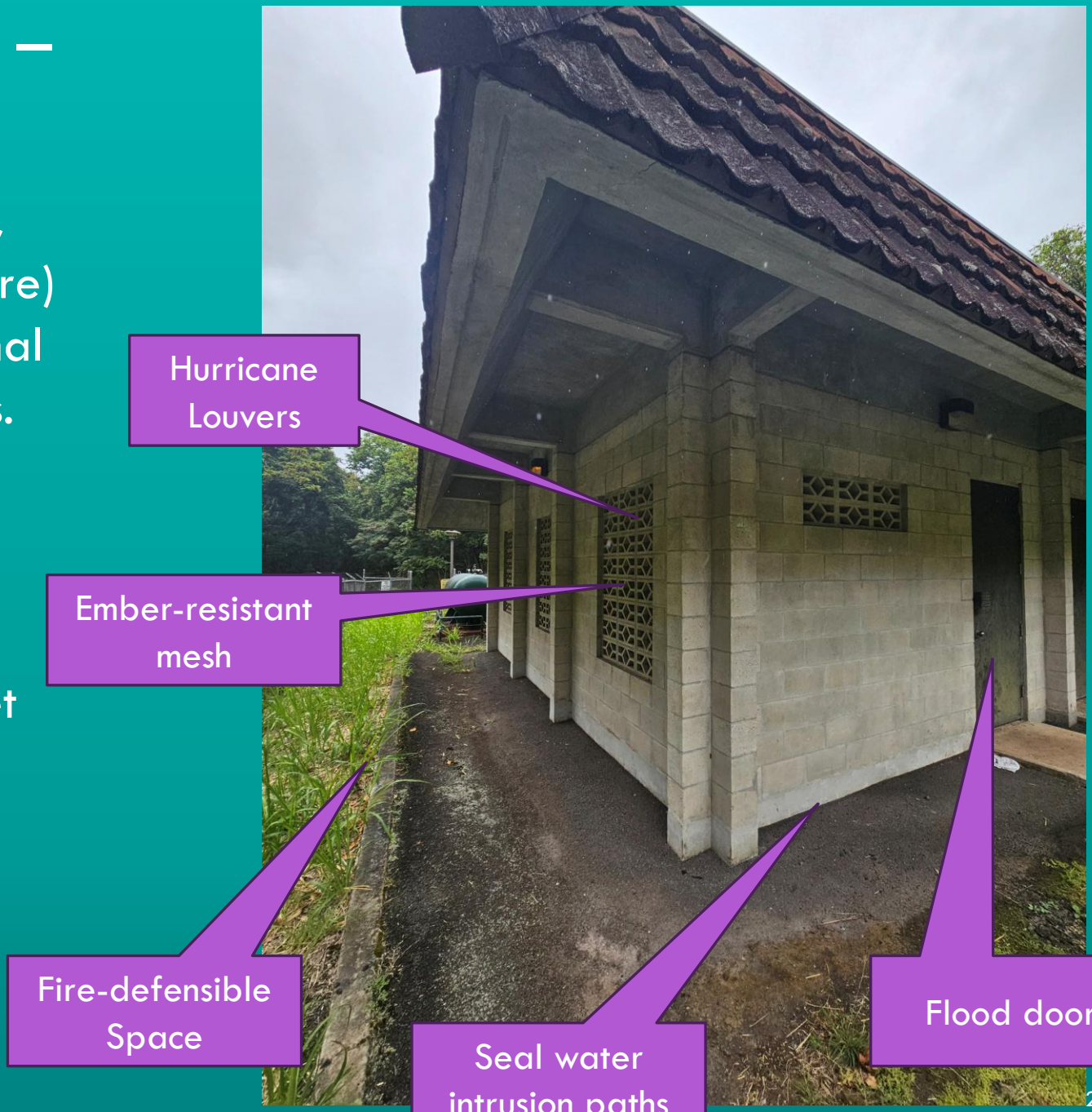
- Climate uncertainty requires adaptive management (both capital and operational)
- Adaptive management schedules investments with actual need
- Projections vs. actual and impact of departures are monitored
- Groundwater availability may be significantly reduced by mid- to late-century under some climate scenarios requiring alternative supply development (e.g., desalination, reuse)

KEY FINDINGS – CLIMATE – POWER RELIABILITY

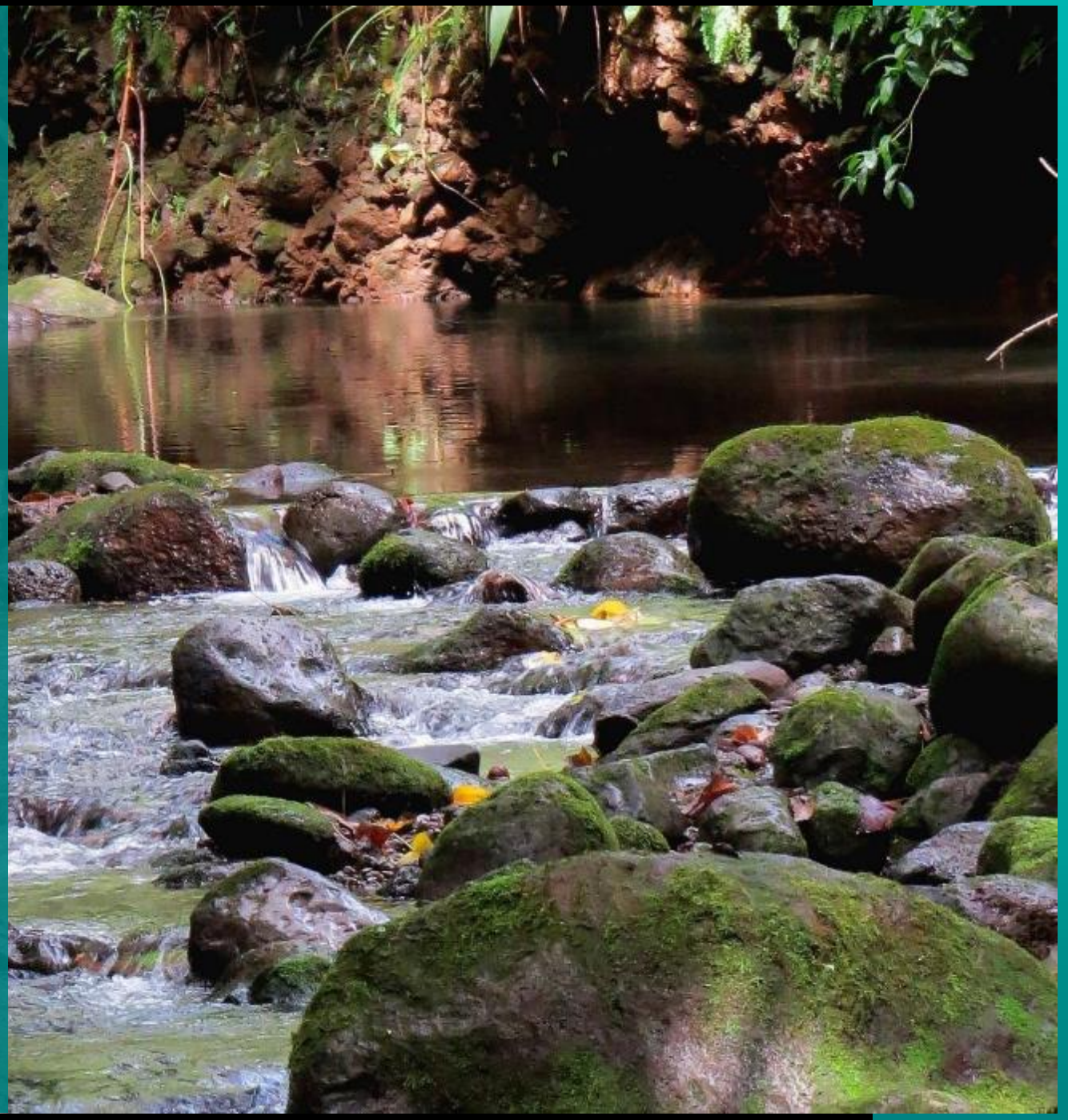
- Current backup power is sufficient for normal conditions
- Increasing wildfire risks and increasing storm intensity stress systems
- Ability to operate without mains power is becoming an increasing need
- Consider installation of additional generators/ portable generators

KEY FINDINGS – CLIMATE – RESILIENCY

- Climate resiliency measures (e.g., hardening against flood/wind/fire) can be implemented during normal rehab and maintenance activities.
- Integrate climate resilience into design criteria.
- Update specifications to include products and standards that meet future conditions requirements.

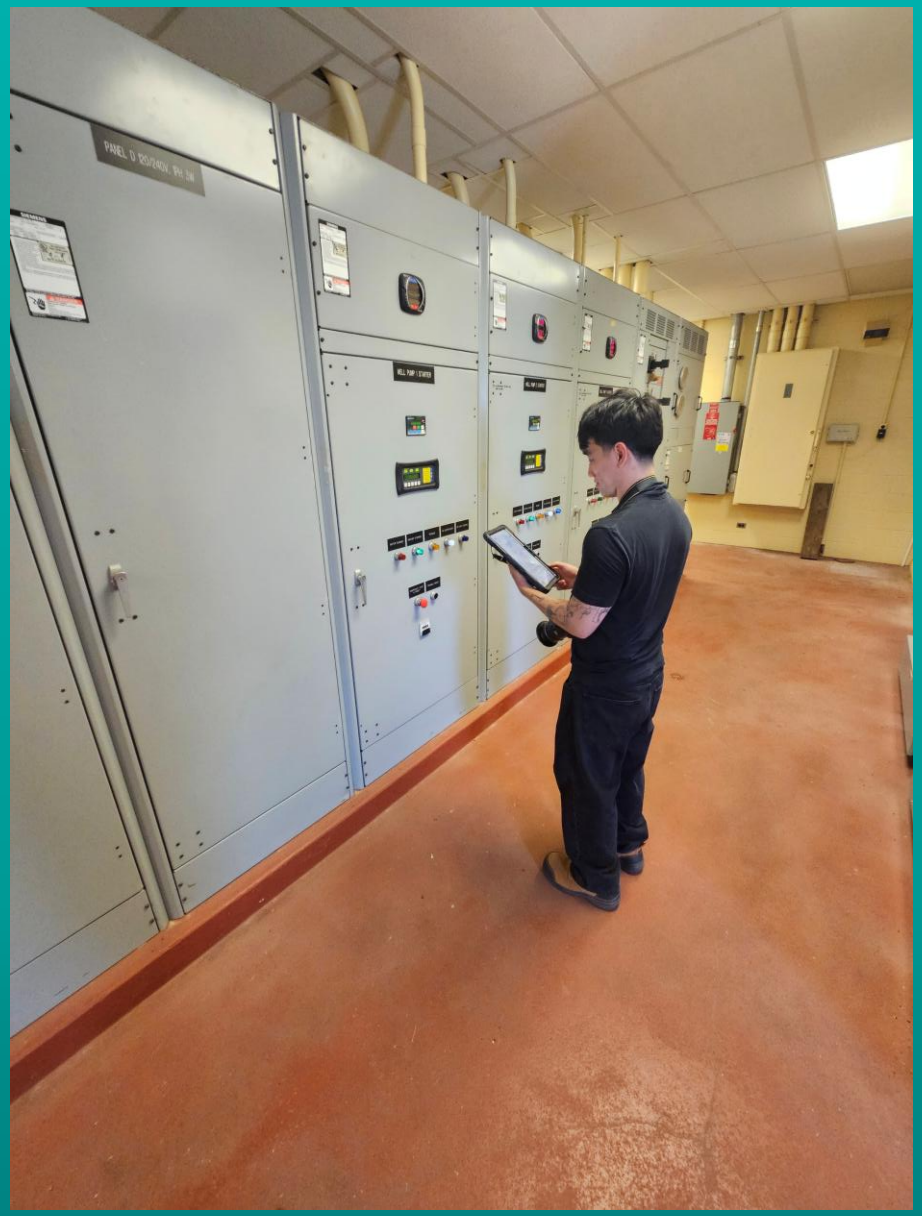


CONDITION ASSESSMENT



KEY FINDINGS – CONDITION ASSESSMENT

- System condition is manageable, with significant progress on R&R projects recommended in 2016 Water Master Plan
- Routine condition assessment programs are working, and annual inspections and continued asset management planning remain essential
- Access to some sites remains challenging
- Risk reduction should remain focused on critical assets, including high-consequence transmission mains, exterior post-tensioned reservoirs, pump rehabilitation, and treatment.
- Workforce enablement and increased project delivery capacity will be needed to sustain implementation of maintenance, rehabilitation, and replacement programs



KEY FINDINGS – CONDITION ASSESSMENT – PIPELINES AND MAINBREAKS

KEY FINDINGS – CONDITION ASSESSMENT - PUMPS

- Offline pumps are an operational risk (Currently 33%)
- Develop pump asset management program to track out of service and prioritize pump maintenance activities

KEY FINDINGS – CONDITION ASSESSMENT - RESERVOIRS

- Traditional cast-in-place concrete reservoirs continue to be in acceptable condition, especially when considering their age.
- Seven external post-tensioned tendon tanks- replacement/rehabilitation is critical
- Overall, reservoirs aging at slow, consistent rate; general maintenance is sufficient for most reservoirs.

External Post-Tensioned Tank

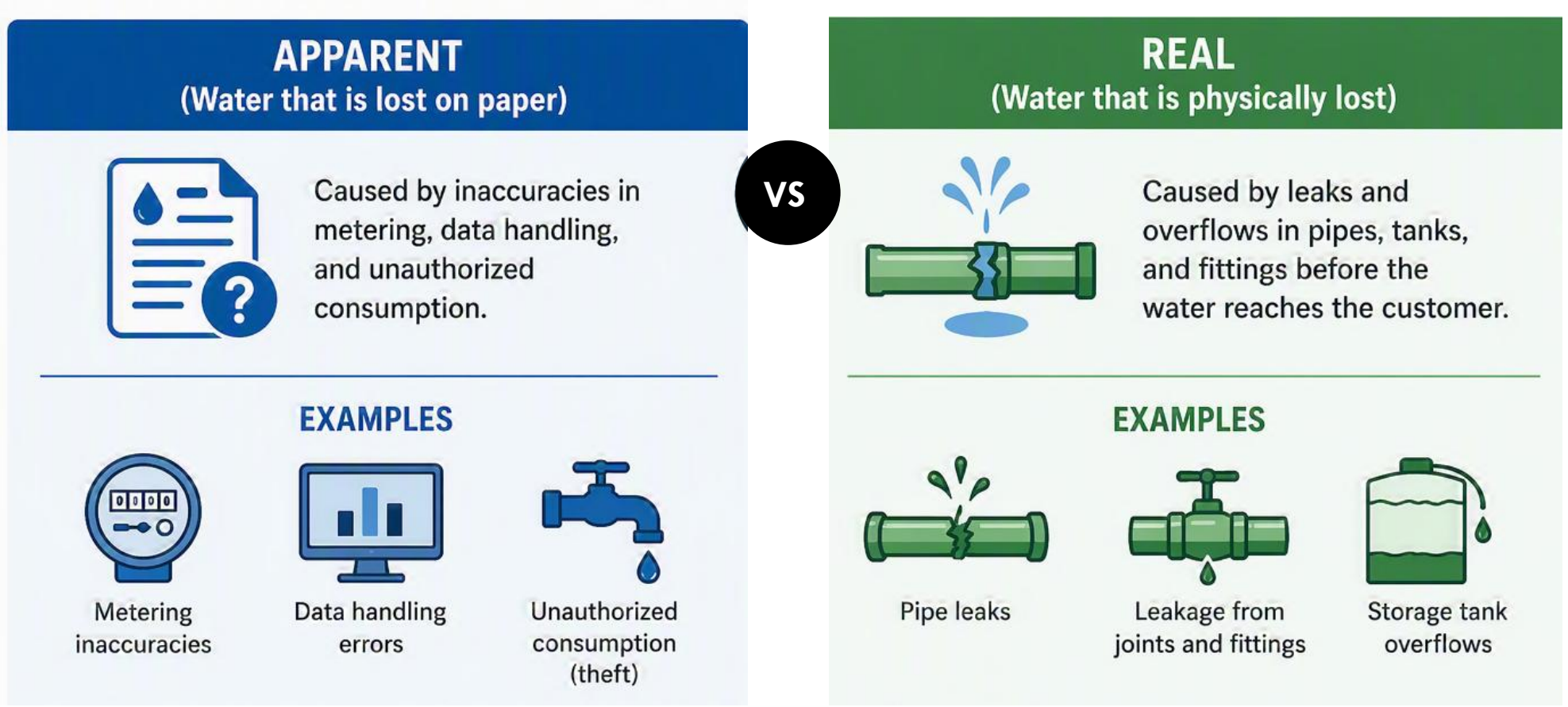
July 2014

July 2025

KEY FINDINGS – CONDITION ASSESSMENT – ELECTRICAL AND CONTROLS

- Most electrical and control equipment is in acceptable condition
- Some electrical components appear to be approaching or exceeding their expected service life
- Electrical and control systems can be repaired or replaced during routine refurbishment projects
- Indoor equipment is in much better condition than outdoors

KEY FINDINGS – CONDITION ASSESSMENT – WATER LOSSES

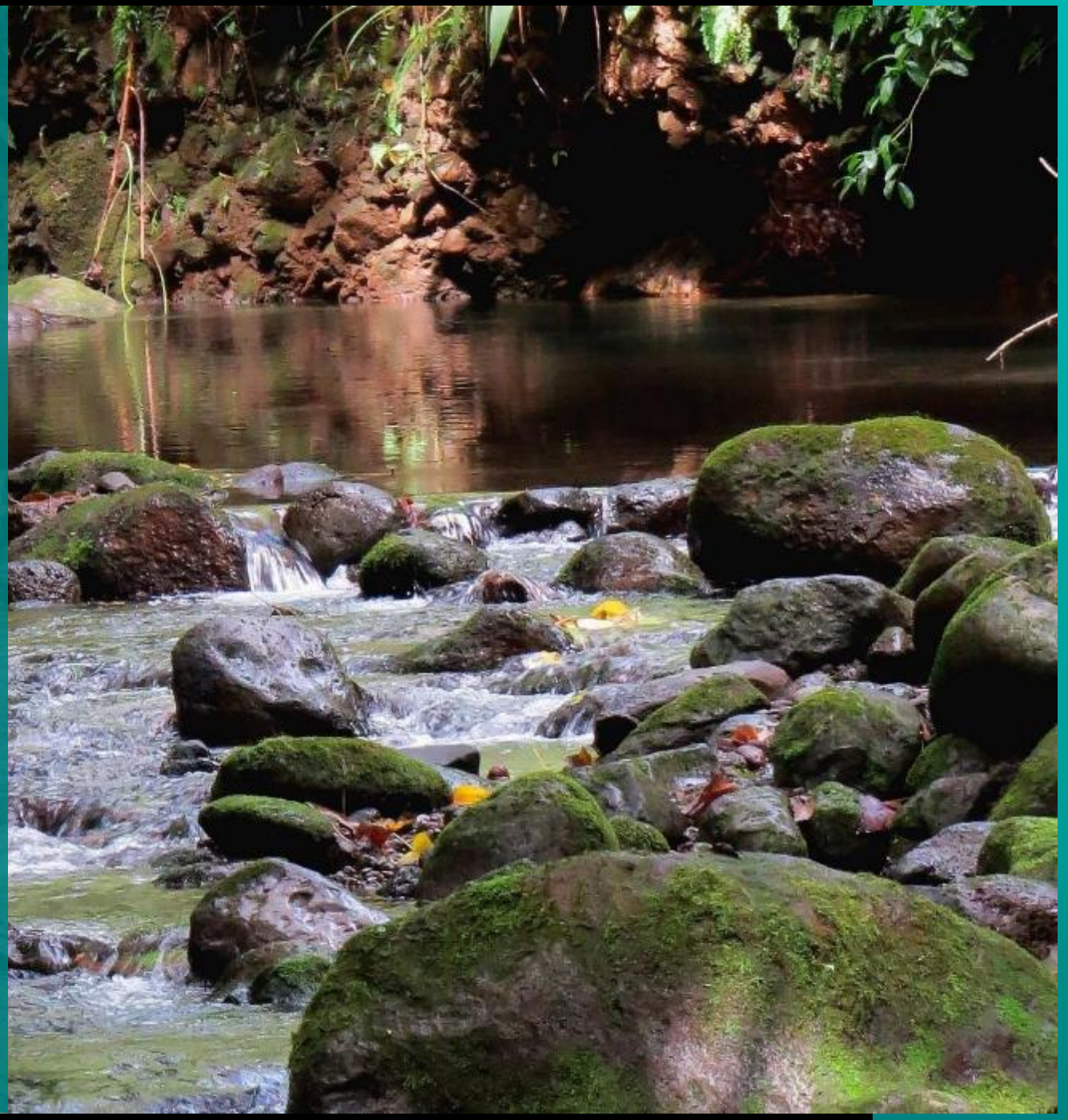


AWWA M36: Water Audits and Loss Control Programs

KEY FINDINGS – CONDITION ASSESSMENT – WATER LOSSES

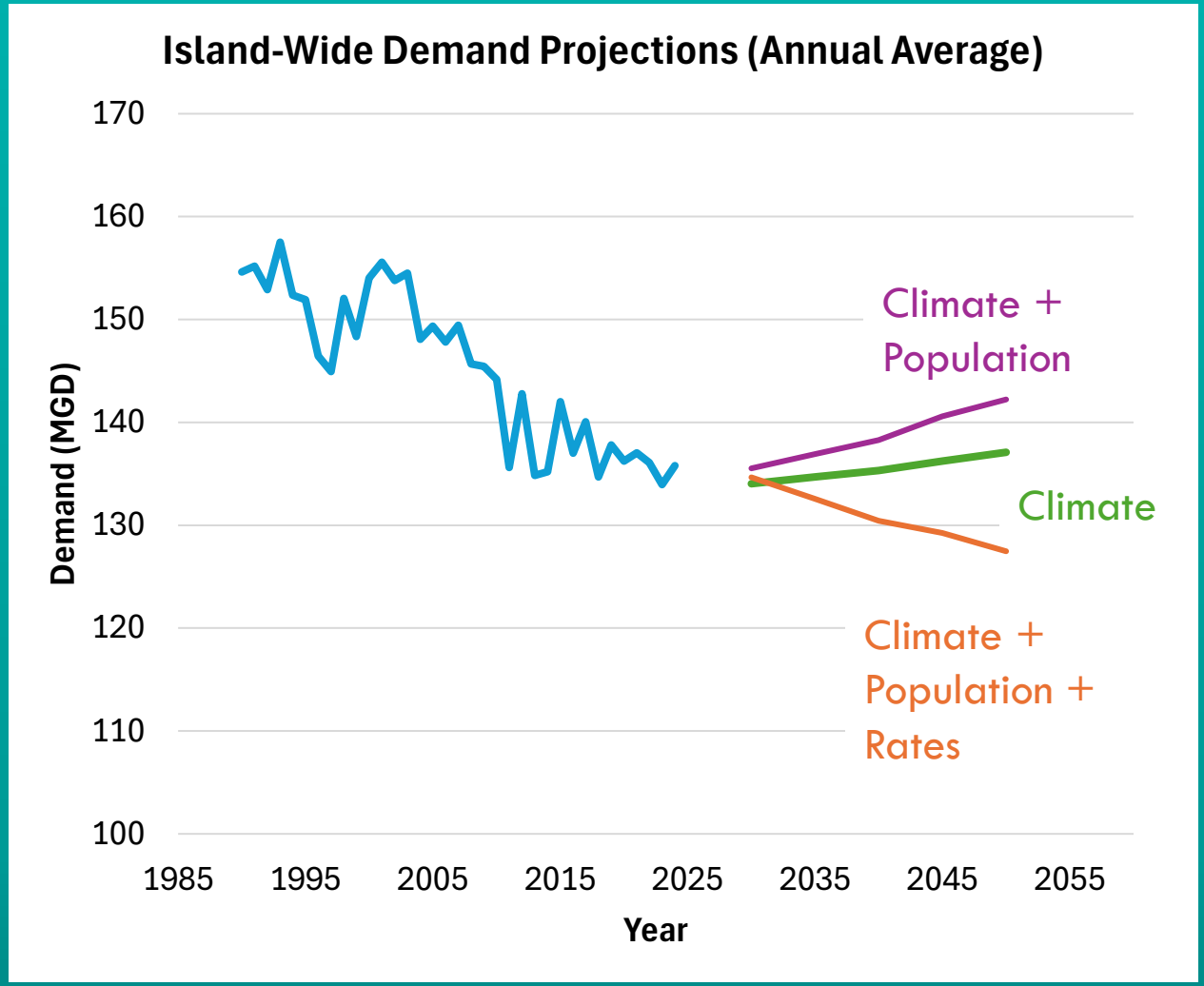
- Large pump stations are the primary contributors to *apparent* water losses
- Reducing apparent water losses will allow accounting/repair of real water losses (physical water lost through leaks, overflows, etc.)
- Develop comprehensive asset management program to address:
  - Leaking bypass valves
  - Overflowing tanks
  - Inaccurate flow meters
  - Data handling errors

SOURCES AND PUMPING CAPACITY



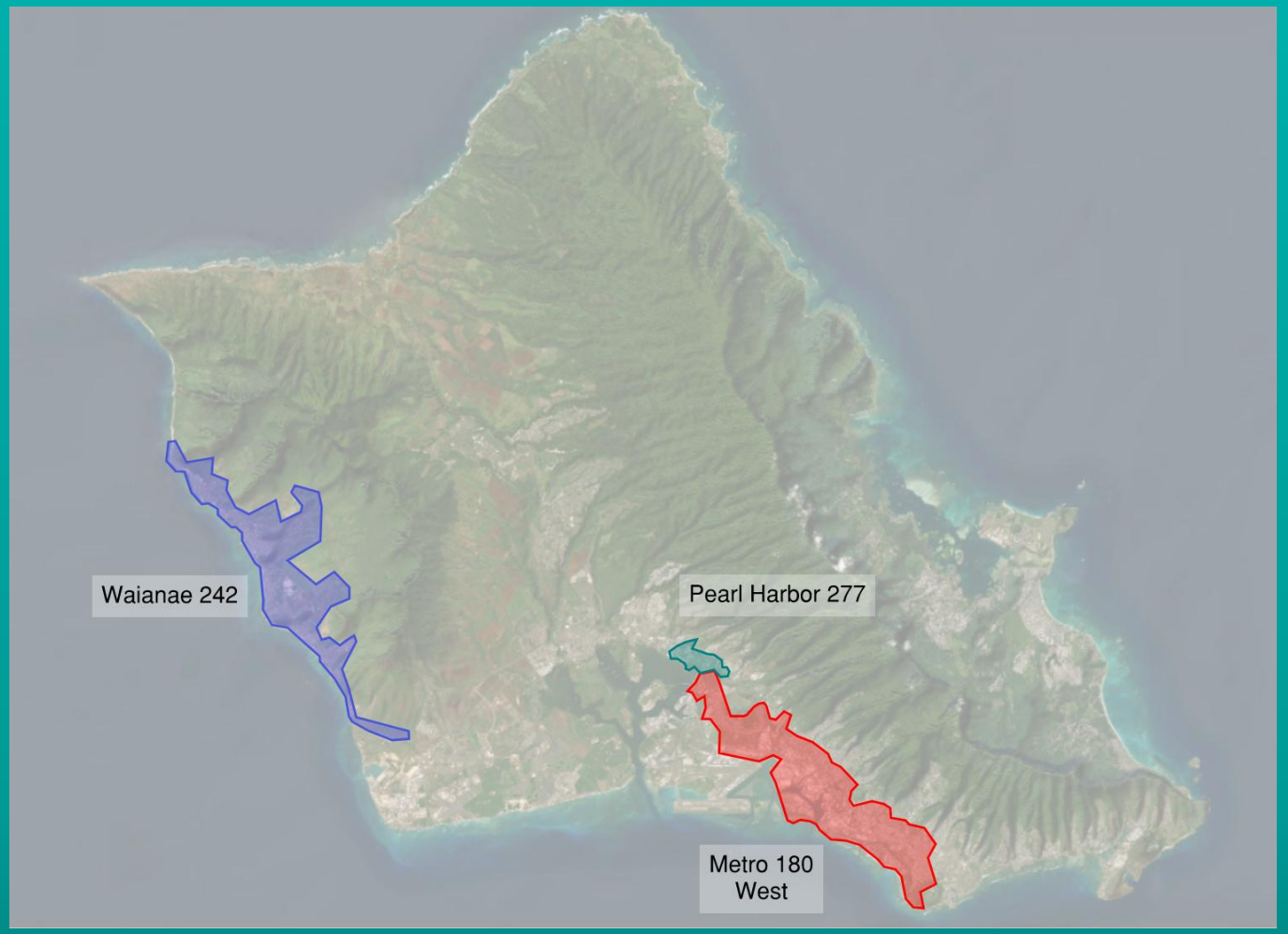
KEY FINDINGS – SOURCES AND PUMPING – WATER DEMAND

- Water demand is influenced by climate and socioeconomic factors, with water rates being the most significant
- Groundwater sustainability and water quality concerns are important drivers of future source development



KEY FINDINGS – SOURCES AND PUMPING – PUMP STATION CAPACITY

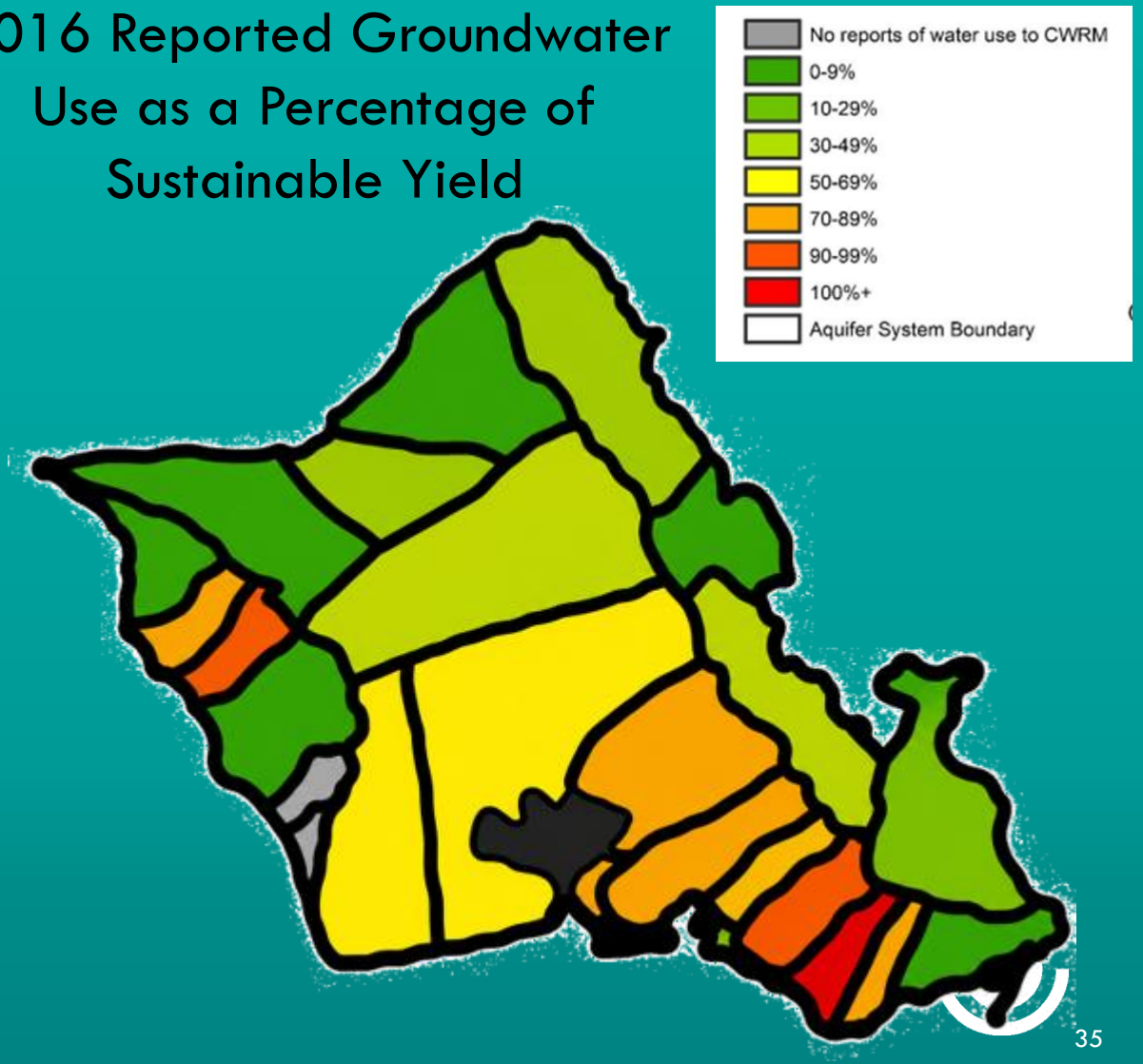
- Several zones have moderate needs, additional pumping capacity or other operational improvements are being considered at these zones
- Adaptive management to TOD demand is essential to efficiently implement infrastructure expansion



KEY FINDINGS – SOURCES AND PUMPING – FUTURE AQUIFER SUSTAINABLE YIELD

- Long-term groundwater sustainable yield, in light of climate change, is the largest uncertainty affecting future water supply adequacy
- Significant reductions in sustainable yield may affect pumping distribution and would likely be a primary driver for development of alternative/additional supply sources
- Watershed Management Plans consider the balance of potential growth scenarios with various supply options

2016 Reported Groundwater Use as a Percentage of Sustainable Yield



KEY FINDINGS – SOURCES AND PUMPING – IMPACT OF PUMPING ON CHLORIDES

- Evaluations compared pumping rates to water quality data over the last 15 years to identify rates that contributed to stable water quality conditions
- Recent well evaluations identified only modest operational reductions to maintain water quality (chlorides).
- Continue monitoring water quality trends in wells (e.g., chloride, PFAS, etc.) that may impact operations.

2016 Water Master Plan

6 most critical supply wells: **0.4 mgd** (of 41 mgd, average of previous 5 years) reduction advised – 1%

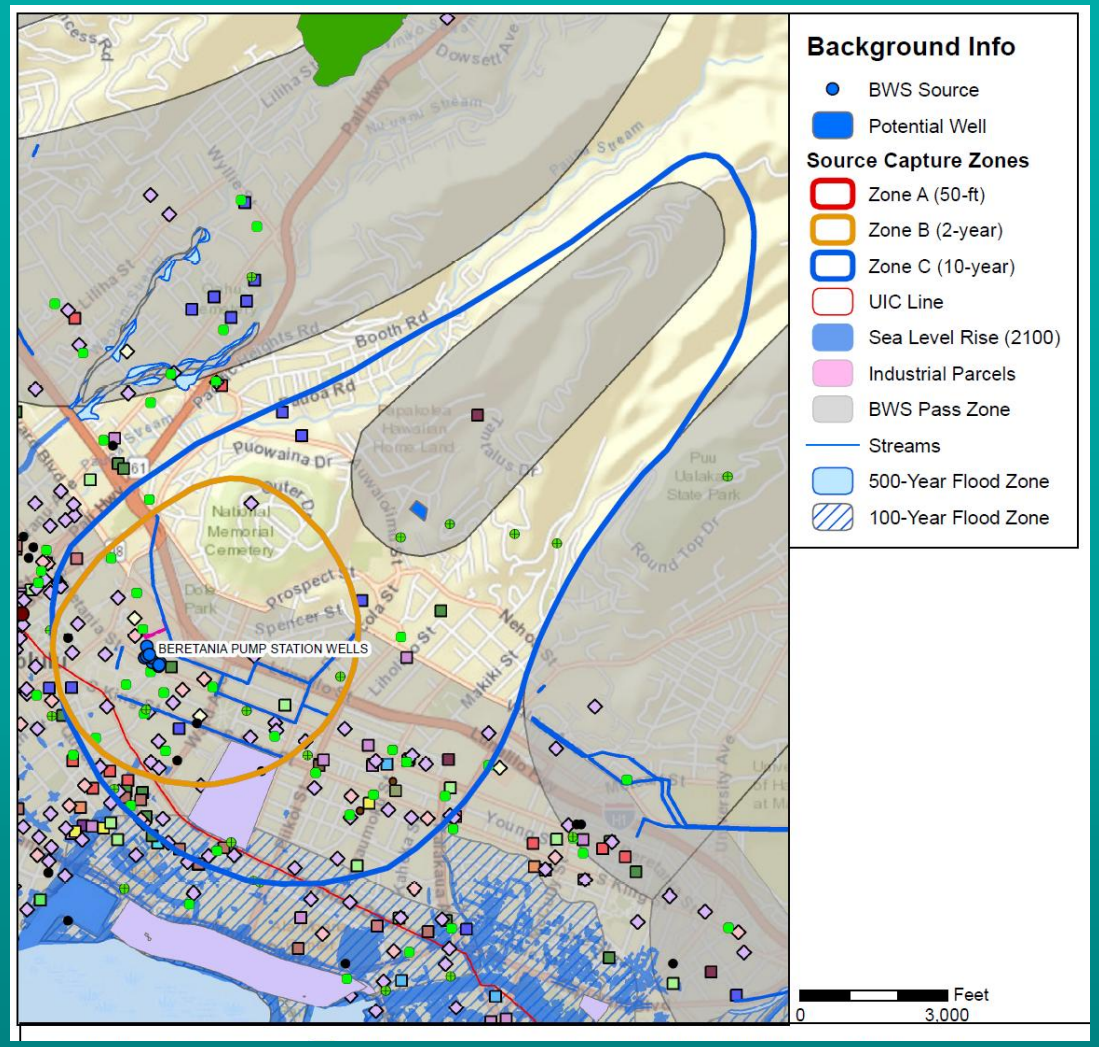
2026 Water Master Plan

14 next most critical supply wells: **0.2 mgd** (of 32.3 mgd, average of previous 5 years) reduction advised – 1%

KEY FINDINGS – SOURCES AND PUMPING - RESILIENCY AND SOURCE WATER PROTECTION

- Proactive source water protection helps anticipate contamination threats, respond through treatment, relocation to unaffected sources, or alternative supplies
  - Hawaii's Source Water Assessment Program
  - BWS's Source Water Protection Plan
- Contamination events may require source replacement, development, or treatment, and production cuts could create localized deficits even when island-wide supply stays adequate – this may result in new infrastructure
- Evolving regulations may necessitate additional treatment requirements and systems (e.g., PFAS, microplastics)

Typical Groundwater Supply Well Capture Zone



KEY FINDINGS – SOURCES AND PUMPING - PFAS

- PFAS has been detected at 16 sites, above MCLs at 4 sites
- Treatment being designed/installed at three priority sites (within the next 5 years)
- Plan for remaining sites (~10-13) at risk for contamination, monitor for trigger level

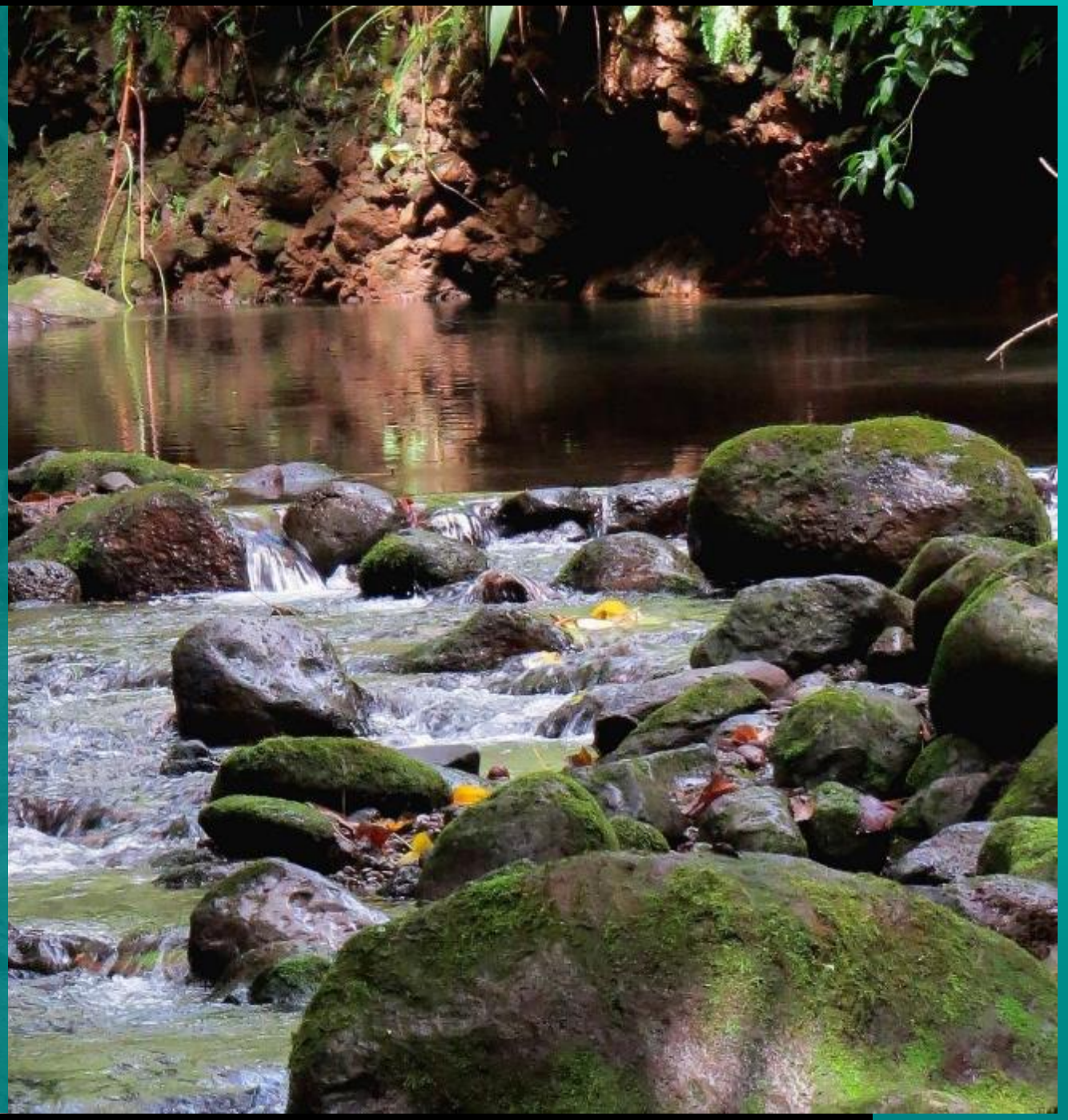
KEY FINDINGS – SOURCES AND PUMPING – ALTERNATIVE SUPPLIES

- Alternative water supplies improve resiliency and reduce dependence on groundwater but require substantial planning, engineering, and infrastructure investments
  - Continued conservation
  - Increase non-potable use
  - Seawater desalination (in progress)
  - Potable reuse planning
- As storms become more intense in the future, increasing the ability to capture rainfall and increase recharge during storms will benefit groundwater aquifer sustainability
  - Nuuanu managed aquifer recharge

Typical RO treatment facility – Kalaeloa Desalco

Geological Investigation – Nuuanu Valley

QUESTIONS?

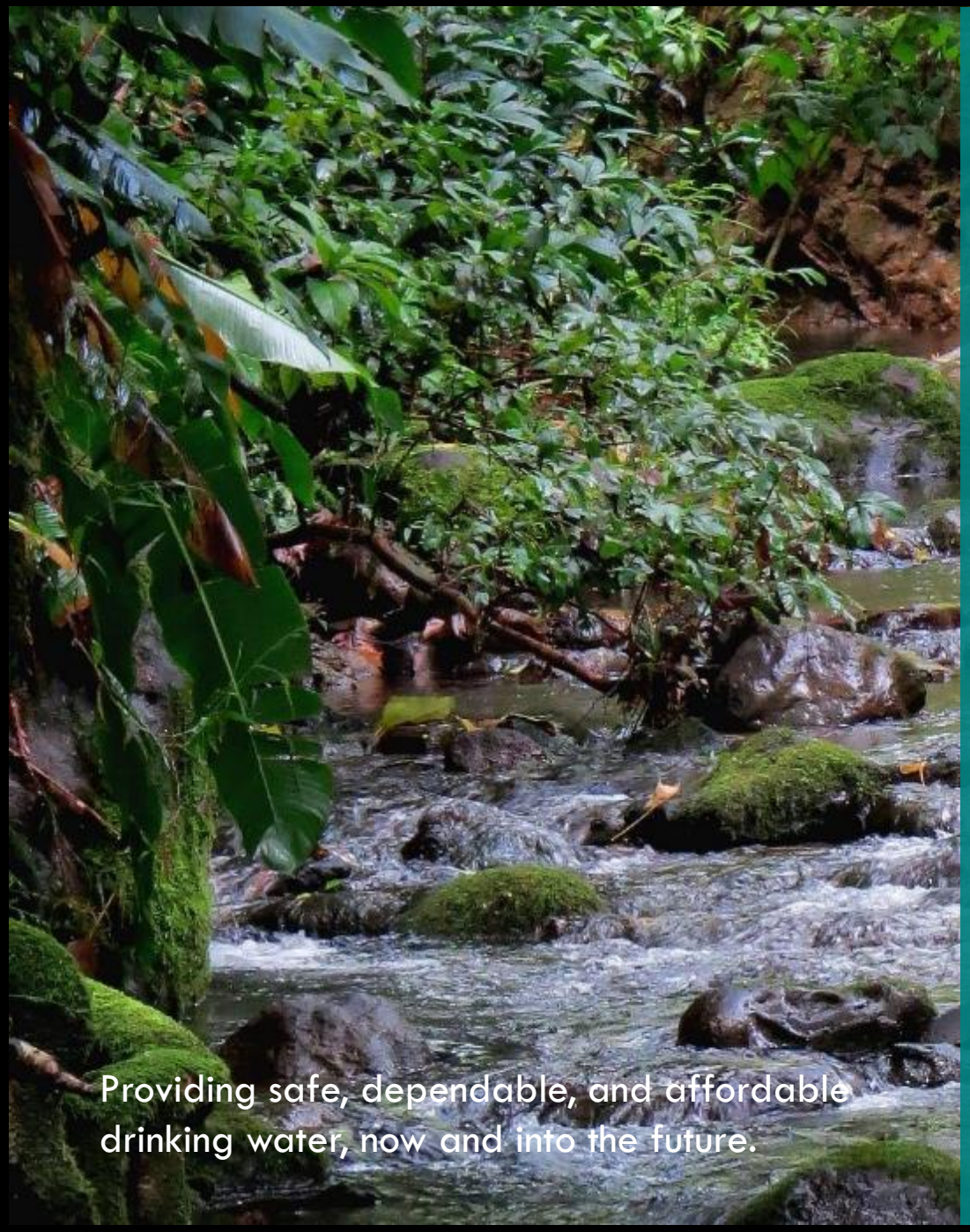


DO THESE FINDINGS RESONATE?

ARE THERE OTHER ITEMS YOU FEEL SHOULD BE INCLUDED?

UPCOMING STAKEHOLDER MEETINGS THROUGH 2027

Type	Date	Topic	Stakeholder Input
In-Person	16-Jul-26	Pumping Capacity Analysis Major Findings	Input on WMP Priorities
Virtual	17-Sep-26	Pipelines / Draft CIP	Input on CIP Funding
In-Person	15-Oct-26	Draft Reports and Policy Feedback: WMP, CIP, LRFP, WSFC	Feedback on overall plan and policy recommendations to BWS Board
Virtual	19-Nov-26	Feedback and Discussion	Feedback on overall plan and policy recommendations to BWS Board
In-Person	21-Jan-27	Recommendations to the Board: WMP, CIP, LRFP, WSFC	Feedback on overall plan and policy recommendations to BWS Board
In-Person	15-Apr-27	Draft WMP Final Review	Concurrence with Board-approved Draft WMP
In-Person	15-Jul-27	Final WMP and Summaries (pending Board Adoption)	Recommendation for Board adoption of Final WMP



Mahalo!

Providing safe, dependable, and affordable drinking water, now and into the future.