STAKEHOLDER ADVISORY GROUP

Board of Water Supply, City & County of Honolulu
March 19, 2026
Meeting 59

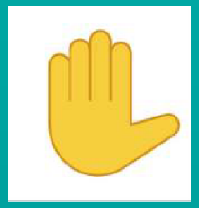
WELCOME & INTRODUCTIONS

DAVE EBERSOLD, FACILITATOR

STAKEHOLDER ADVISORY GROUP MEETING 59

MARCH 19, 2026

VIRTUAL MEETING BEST PRACTICES

- Please stay muted unless you are speaking
- Use  or meeting chat to let us know you want to ask a question
- If you don’t have the “raise hand” function or meeting chat, unmute your mic/phone and speak
- Speak one person at a time
- Expect something to go wrong

MEETING OBJECTIVES

- Welcome and public comment
- Provide BWS updates
- Climate Vulnerability Assessment Findings
- Reservoir Condition Assessment Findings
- Accept notes from meeting #57
- PFAS and Emerging Contaminants Management
- Adjourn

ROADMAP TOWARDS WMP ADOPTION

PUBLIC COMMENT ON AGENDA ITEMS

BWS UPDATES

Ernest Lau, PE
Manager and Chief Engineer

boardofwatersupply.com

CLIMATE VULNERABILITY ASSESSMENT FINDINGS

Brian O'Connor, PE
CDM Smith

boardofwatersupply.com

Agenda

1. Assessment Background
2. General Findings and Common Conditions
3. Preliminary Recommendations

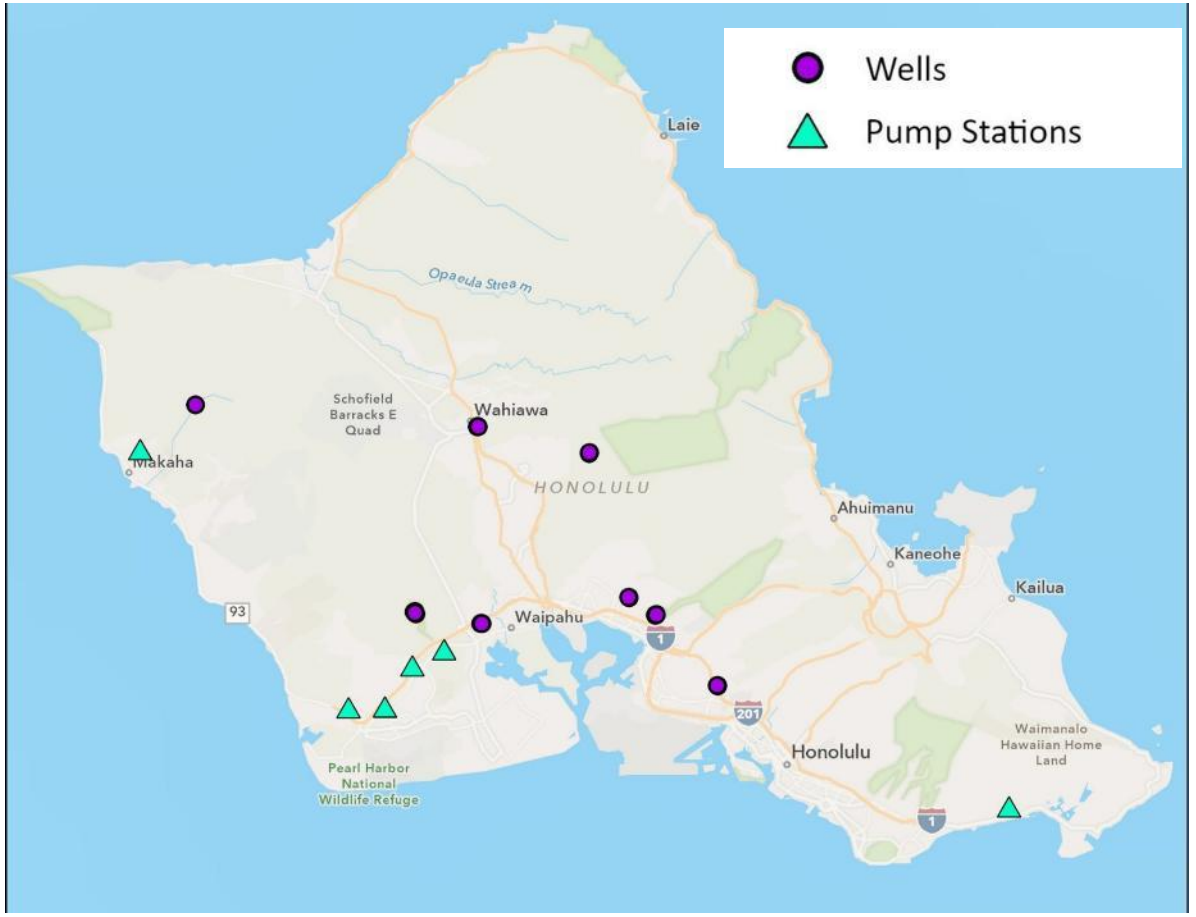
Assessment Background: Field Inspections

- Assessment types, performed at all sites:
  - Structural
  - Electrical
  - Instrumentation and Controls (I&C)
  - Climate Vulnerability
- Reality capture
  - Drone
  - LiDAR

Screenshot from LiDAR scan with added dimensions.

Assessment Background: Climate Vulnerability

- Extreme events
  - Wind/Hurricane
  - Wildfire
  - Flood
- Site selection
  - Criticality to the system
  - Likelihood of extreme events
  - Variable locations and hazards
- Fifteen sites selected
  - Pump Stations (8)
  - Wells (7)
  - Combination of both (2)



Hurricane Vulnerabilities

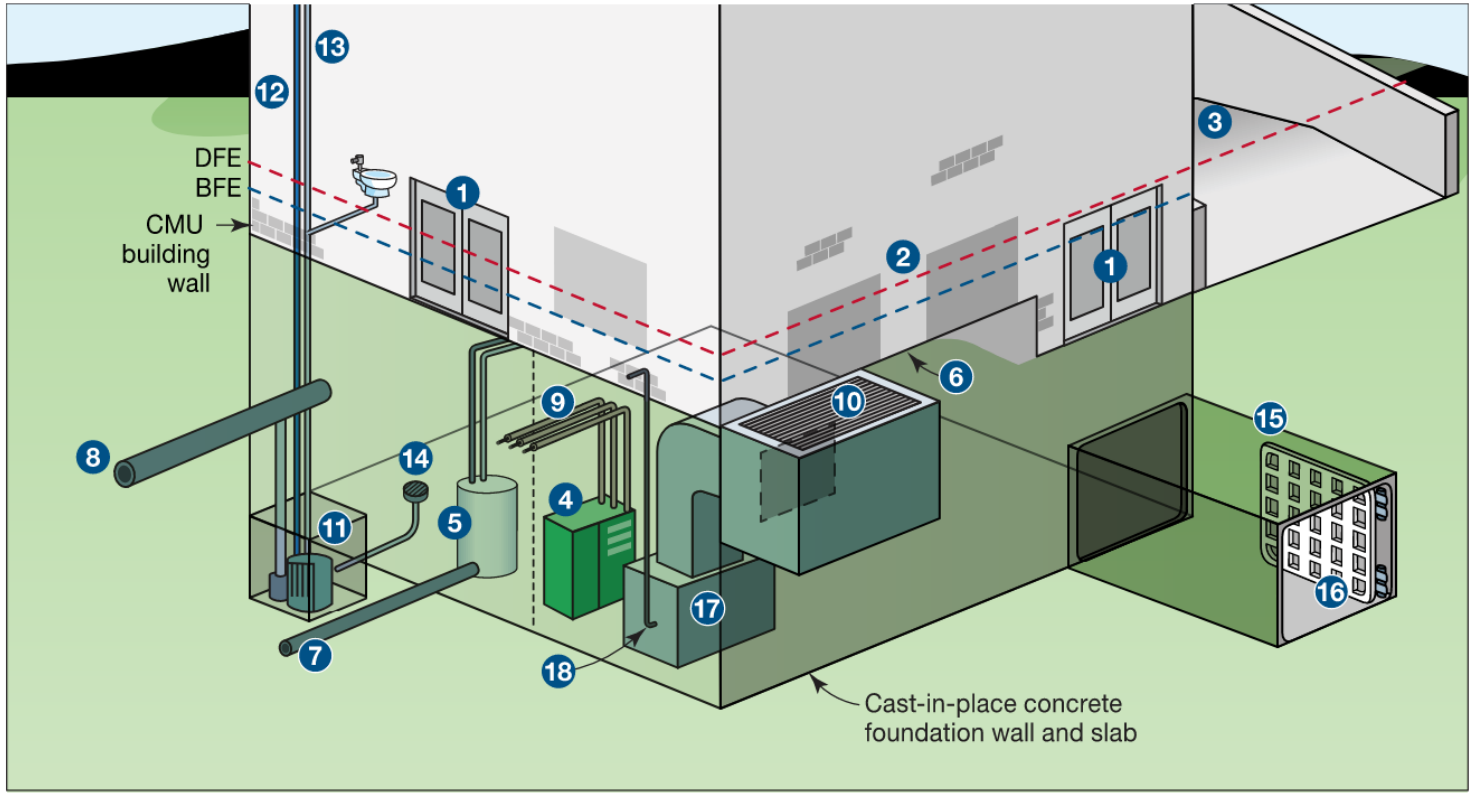
- Resilient Building Envelope
- Protected openings for wind-borne debris
- Wind-driven rain pathways into building
- Structural load path

General Hurricane Findings

- Unprotected openings: doors and louvers
  - Some openings are CMU blocks turned on side
  - Not rated for wind-borne debris impact
  - Not rated to prevent wind-driven rain intrusion
- Exterior pumps often unprotected
  - Vulnerable to all extreme event types

Flood Vulnerabilities

- Identify pathways for water to enter building
- Electrical equipment vulnerable to inundation



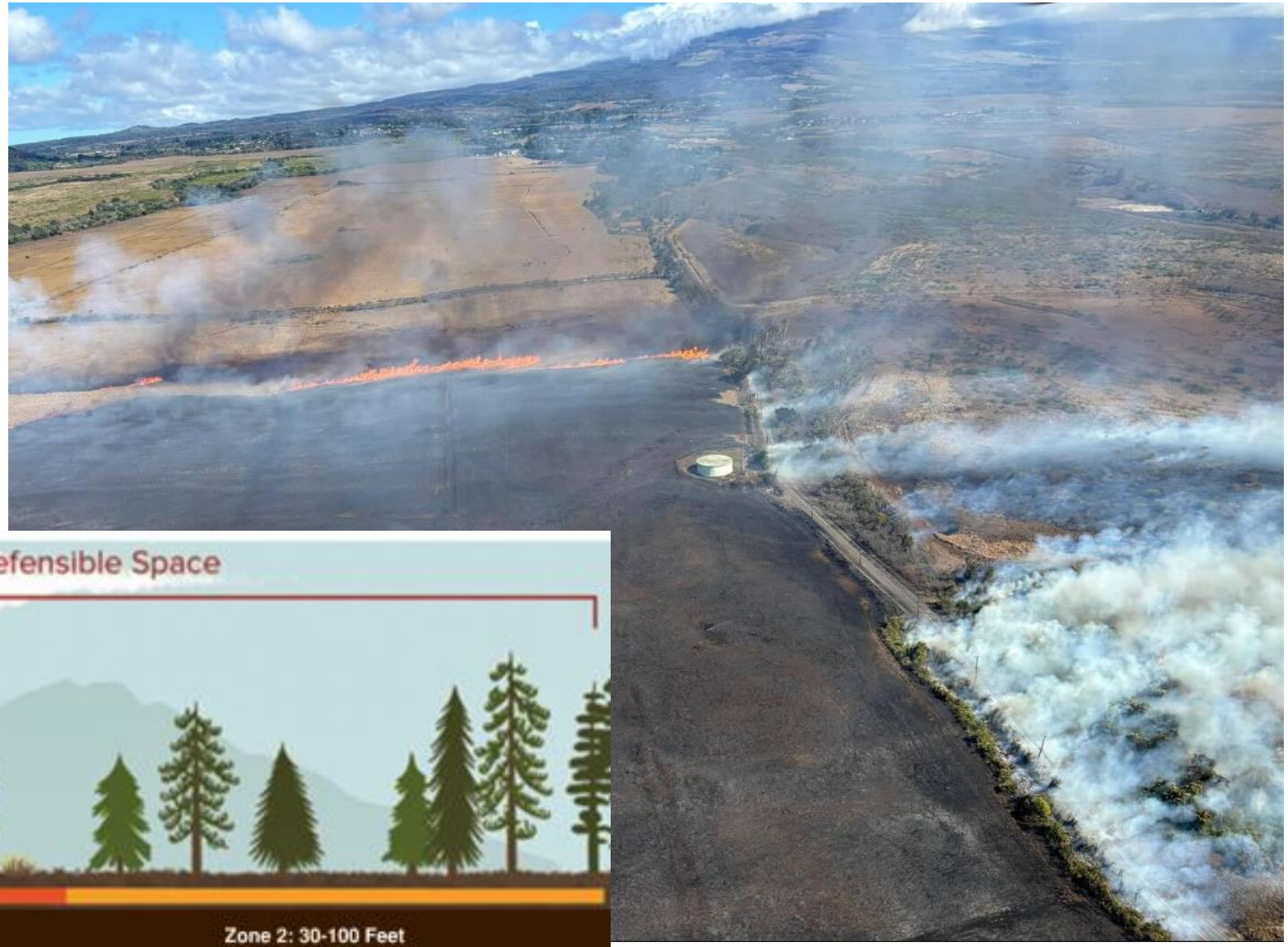
Component		
1 Building entrance	7 Water service	13 Waste line
2 Windows	8 Sewer line	14 Floor drain
3 Access ramp to loading dock	9 Utility power	15 Access tunnel to adjacent building
4 Electric service equipment room	10 Ventilation grill	16 Submarine door
5 Building central plant equipment room	11 Sump pit with sump pump	17 Backup generator with fuel tank
6 Construction joint	12 Stormwater drain	18 Fuel line

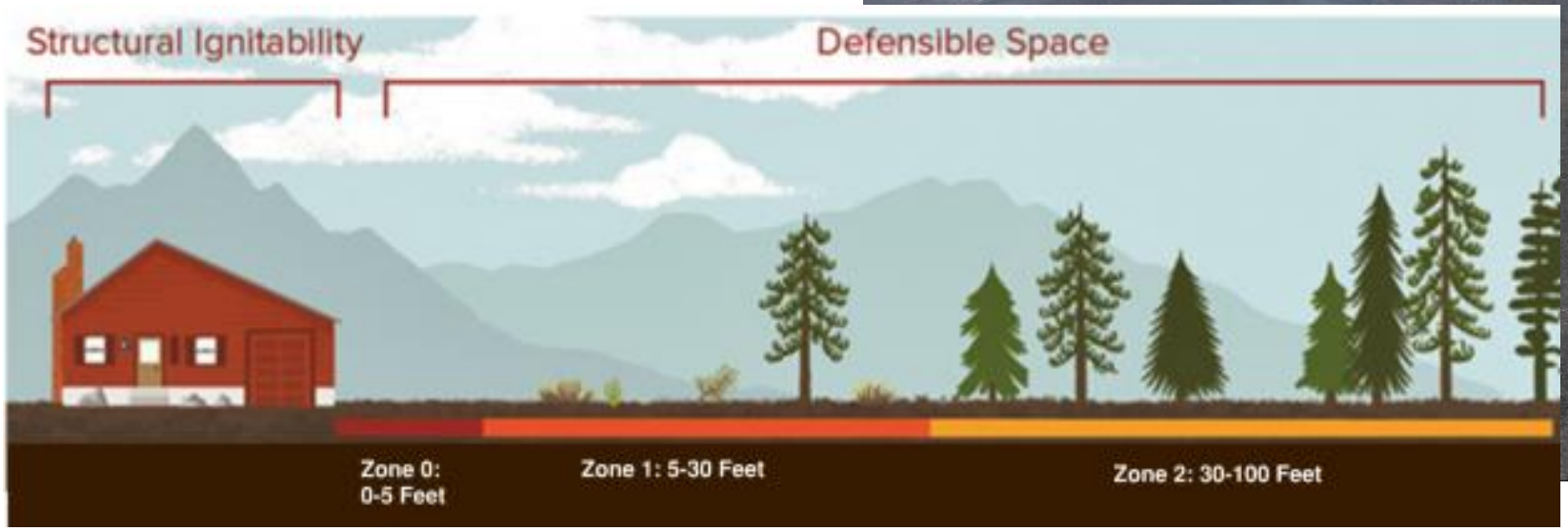
General Flood Findings

- Openings and doors would need to be protected against flood intrusion
- “Floor Drains” core-drilled thought walls
- Potential for electrical conduits to carry floodwaters into buildings
- Electrical equipment at grade

Wildfire Defensible Space

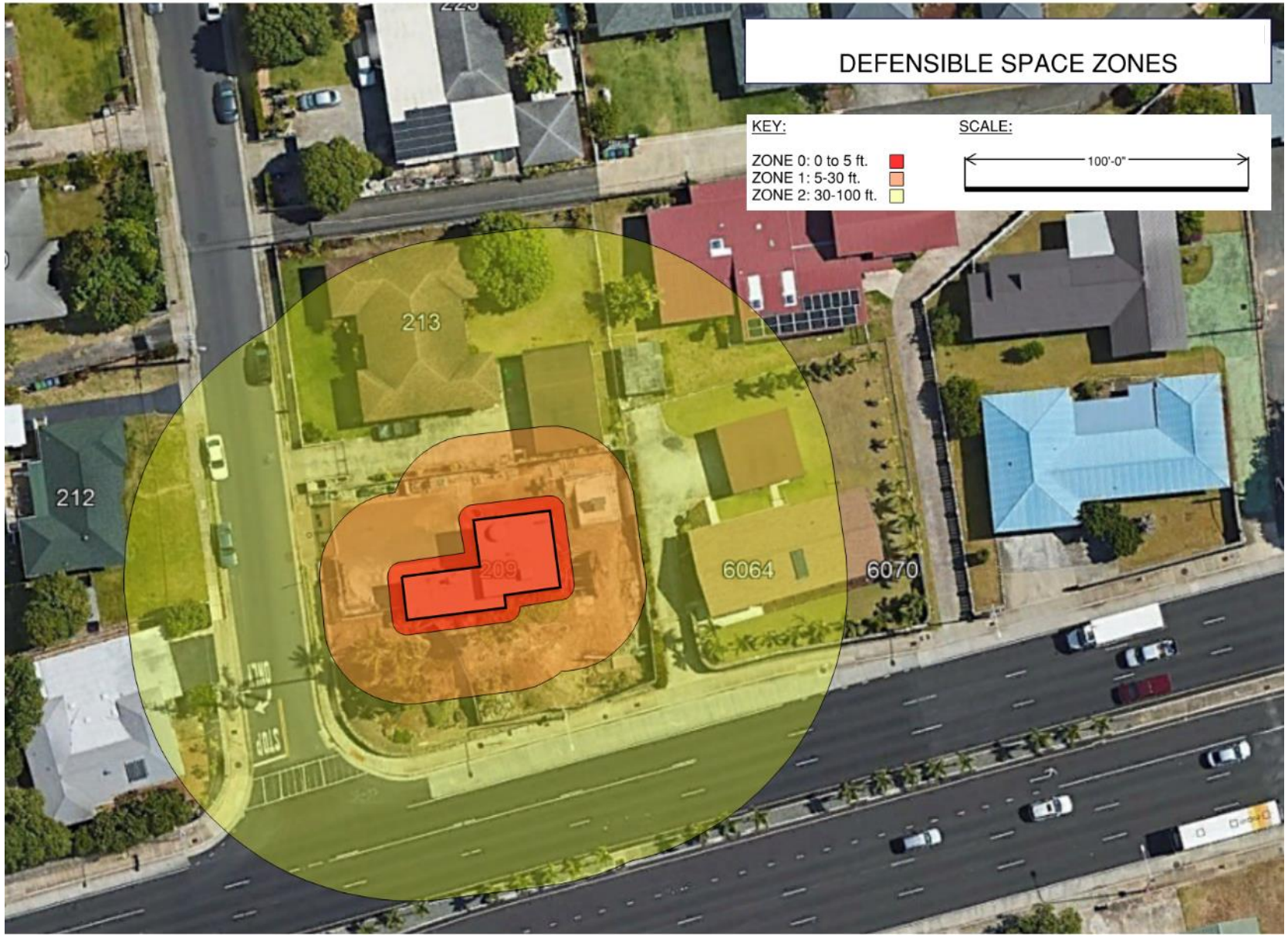
- Three Zones
  - Zone 0: 0-5 ft
    - No vegetation
  - Zone 1: 5 to 30 ft
    - Well spaced trees, short grasses (4”)
  - Zone 2: 30 to 100 ft
    - No touching tree canopies or fuel ladders





Wildfire Defensible Space

- BWS sites
  - Able to control Zone 0 effectively
  - Zone 1 and Zone 2 extend to adjacent properties
  - Ensure site structures have no pathways for ember entry or combustion sensitive materials

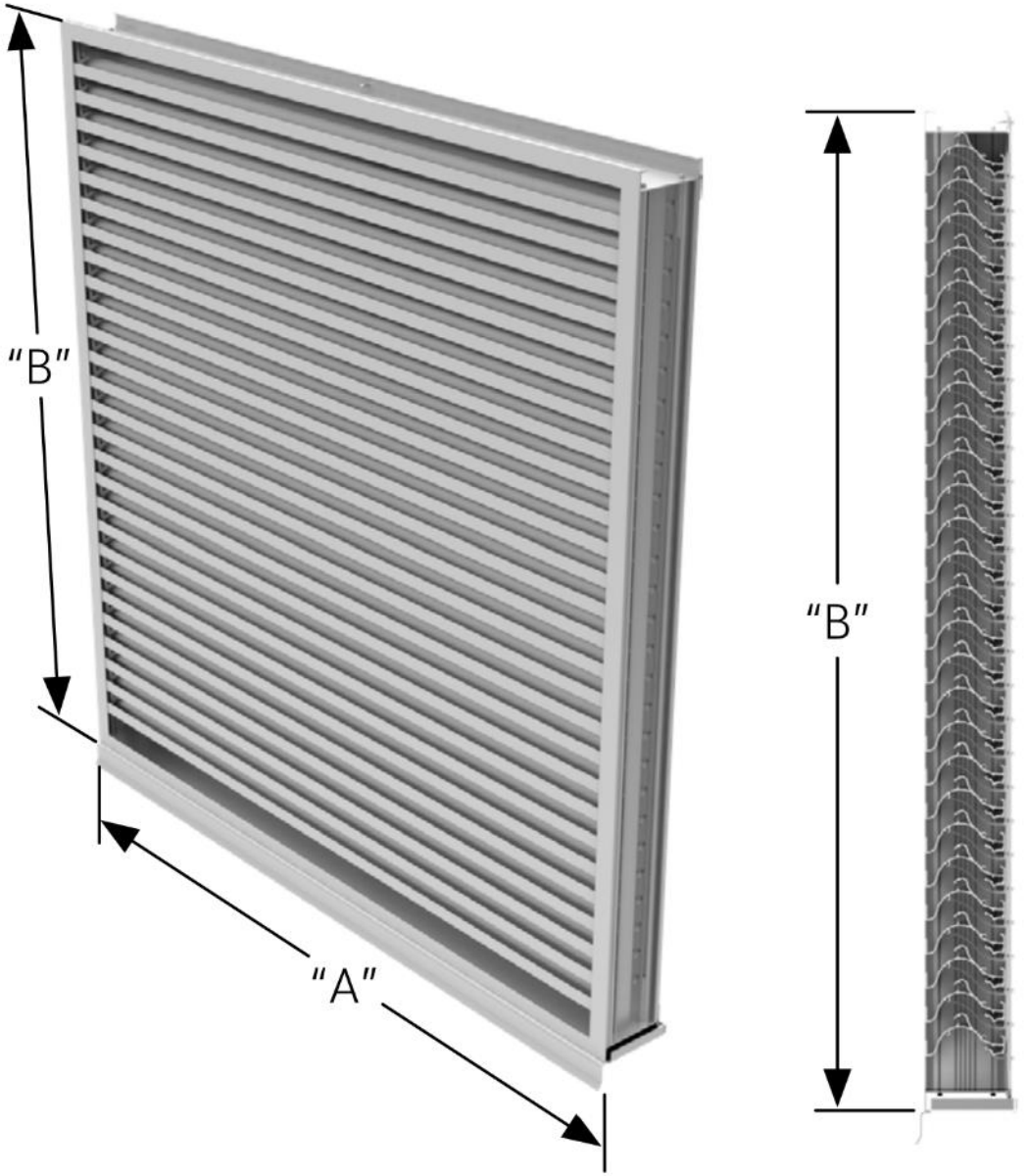


General Wildfire Findings

- Building envelopes do not have combustion sensitive materials
  - Concrete and masonry
- Isolated combustible sensitive material around the site & inside buildings
- Taller vegetation around outside equipment
- Louvers have aluminum mesh that can stop embers
  - Isolated locations where mesh is torn or missing
- Challenging defensible space limitations

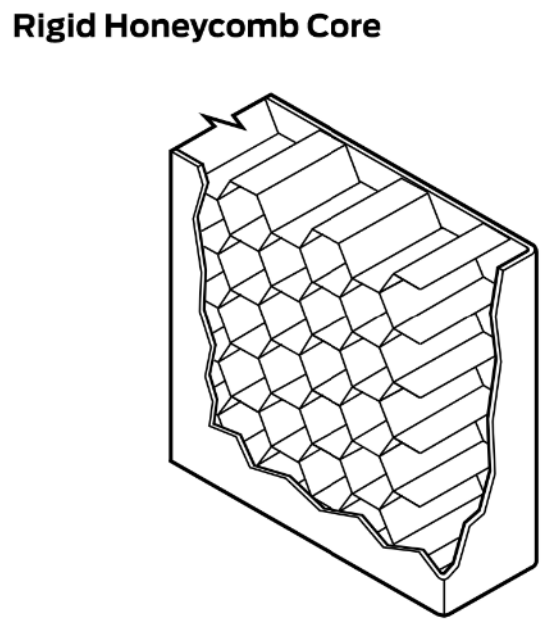
Hazard Resilient Systems: Louvers

- Replace existing louvers/screened masonry block opening
- Rated to stop wind-driven rain
- Rated for E-missile impact
- Rated for wind pressure from future events
- Louvers pre-approved by Miami-Dade County



Hazard Resilient Systems: Doors

- Replace existing doors
- Rated for E-Missile impact
- Rated for wind pressure from future events



Hazard Resilient Systems: Windows

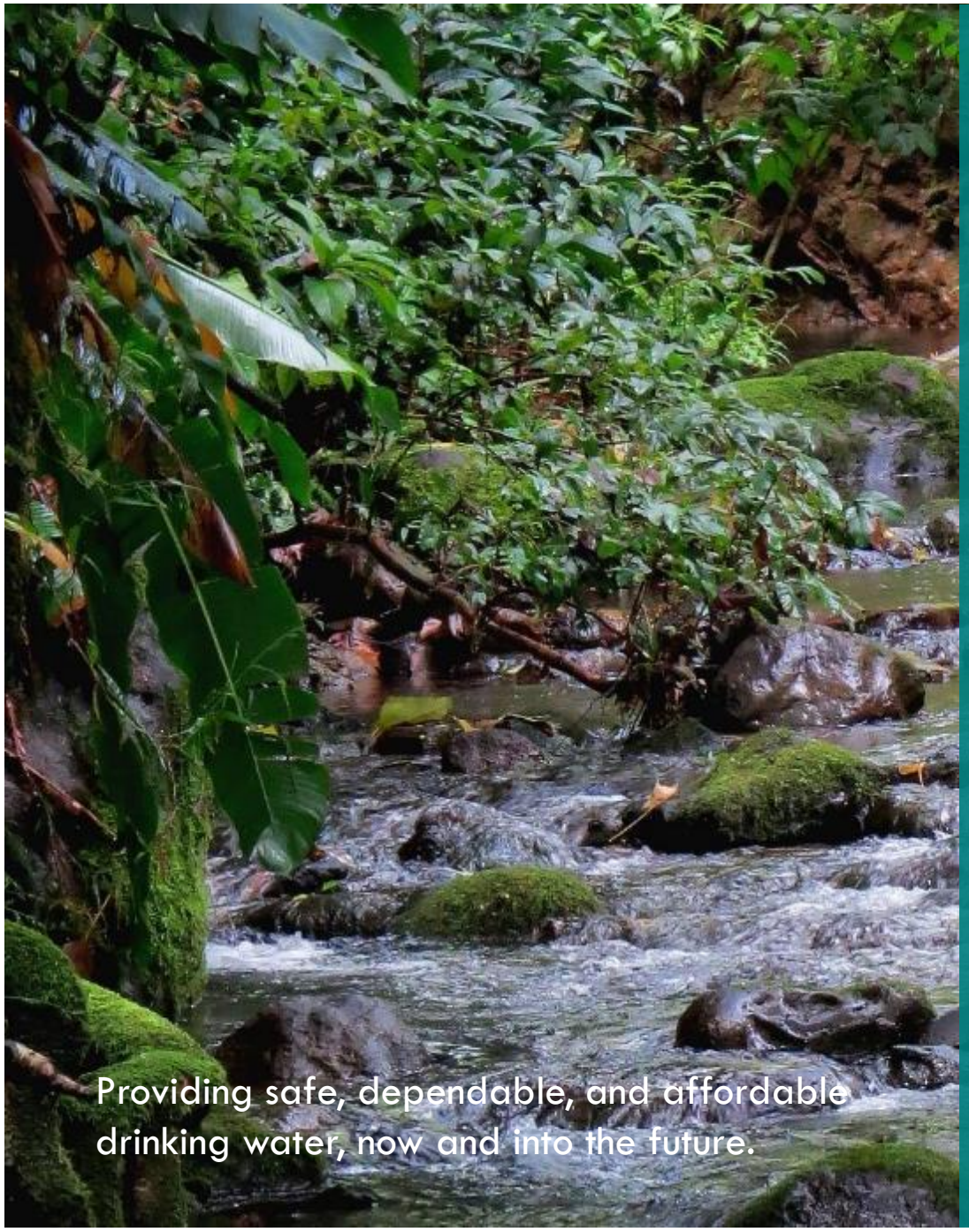
- Replace existing windows or provide shutters
- Rated for E-Missile impact
- Rated for wind pressure form future events

Hazard Resilient Systems: Flood Doors

- Replace existing doors with flood rated doors
- ANSI 2510 rated
- Flood protection always in place

Hazard Resilient Systems: Fire

- Aluminum mesh over ventilation
  - BWS has robust system in place with combination of “bird screen” and aluminum mesh
- Roofing materials that are Class A rated for fire
- Eliminate combustible materials from building envelope and Zone 0
- Reduce available fuel in Zones 1 and 2



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

Questions & Answers

RESERVOIR CONDITION ASSESSMENT FINDINGS

Brian O'Connor, PE
CDM Smith

boardofwatersupply.com

Reservoir Condition Assessment

- 13 reservoirs maintained the same overall condition assessment score
  - One tank had an increase
  - One tank had a decrease
- Structural systems are being maintained and are appropriate for climate & loads.
- Leak repairs are working

2014

2025

Reservoir Condition Assessment

- BWS is addressing identified areas of distress from 2014 inspections and 2016 Master Plan.
- 10 of the 12 reservoirs that that low scores (2 of 5) have been repaired or replaced.

2014

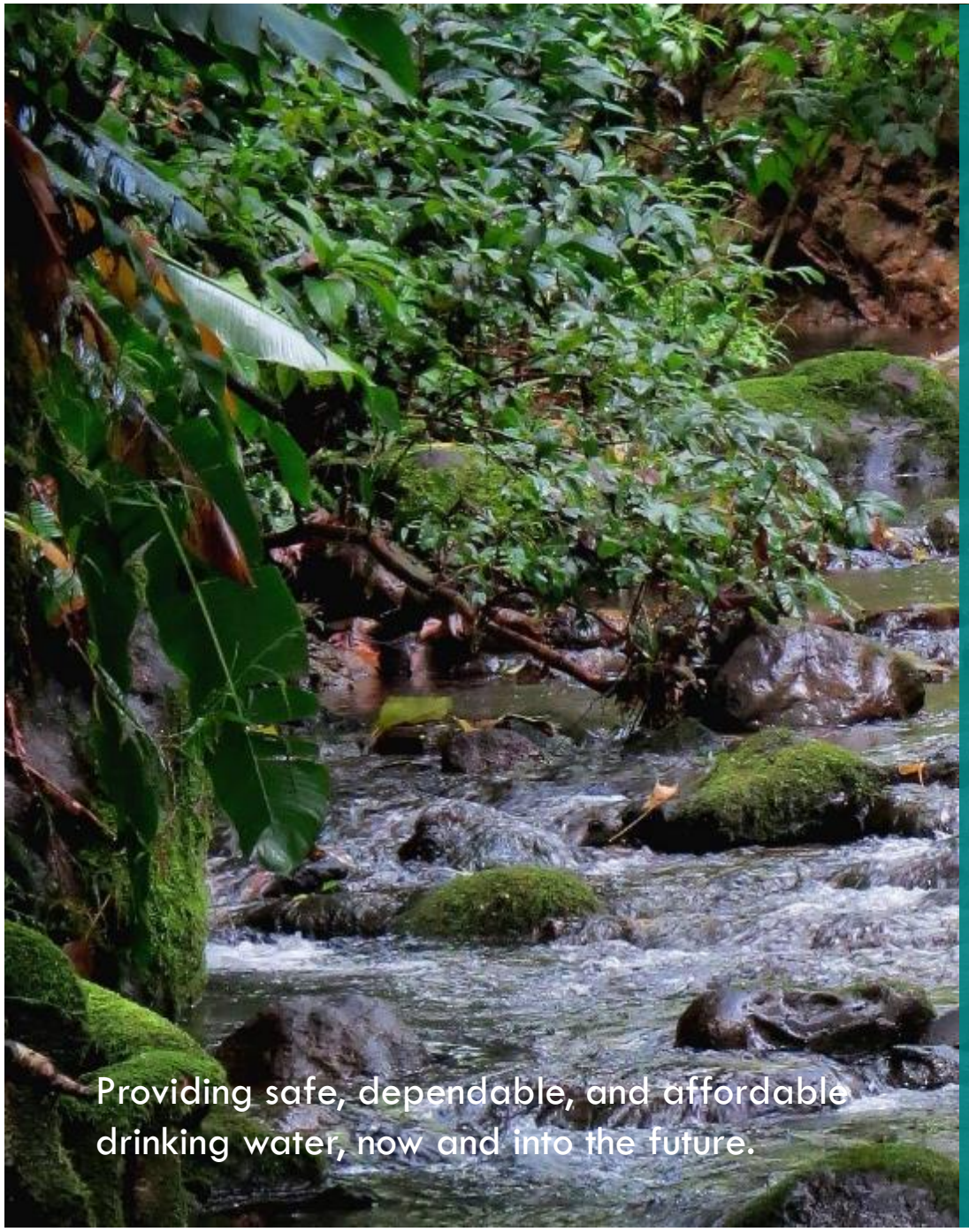
2025

Reservoir Condition Assessment

- Identified a reservoir that corrosion advanced faster than anticipated
- BWS is responding to inspection findings to address concerns with this and similar reservoirs
  - Detailed inspections to prioritize repair or replacement

2014

2025



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Questions & Answers

ACCEPT MEETING NOTES FROM MEETING 57

David Ebersold
Facilitator

www.boardofwatersupply.com

PFAS AND EMERGING CONTAMINANTS MANAGEMENT

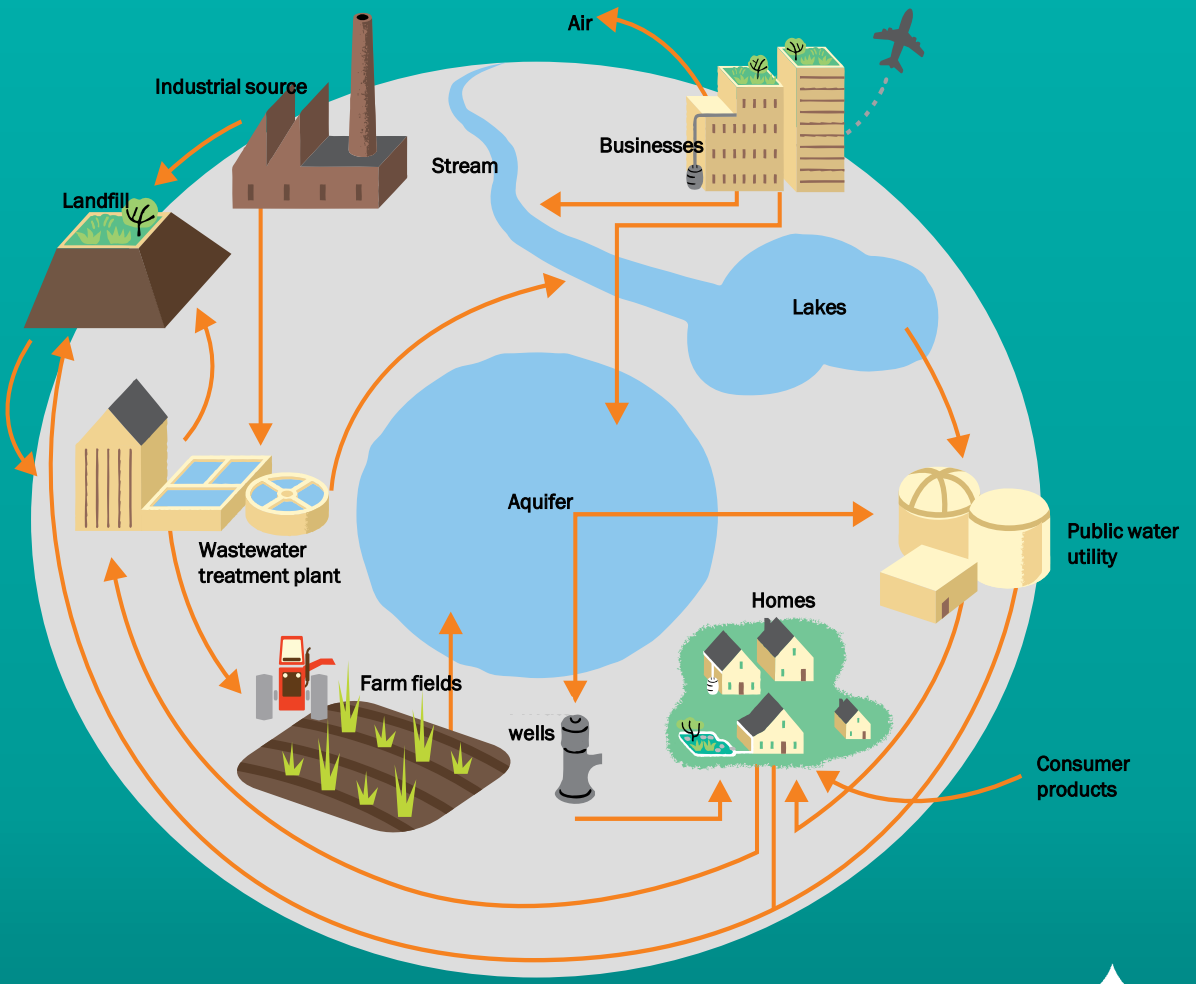
Michelle Sorensen
Sierra Johnson

Brown and Caldwell

www.boardofwatersupply.com

WHY DON'T WATER UTILITIES TREAT CONTAMINANTS TO ZERO?

- Zero not physically achievable
- Health protection is based on risk
- Treatment itself can create new risks
- Cost and energy impacts quickly escalate



PFAS and Emerging Contaminants Management

Proactively protecting public health, water quality and reliability

Stakeholder Advisory Group | March 2026

Agenda

PFAS and Emerging Contaminants Management

– PFAS overview	10 min
– Drinking water regulatory framework	10 min
– BWS's approach to PFAS management	10 min

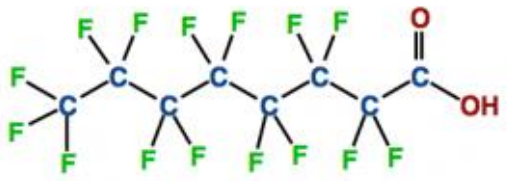
PFAS Overview

What is PFAS? Where does it come from?

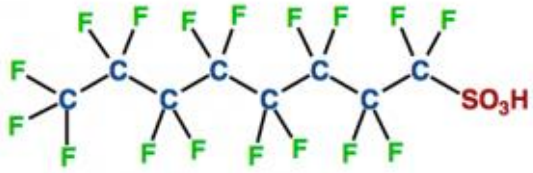
Brown AND Caldwell

What are PFAS?

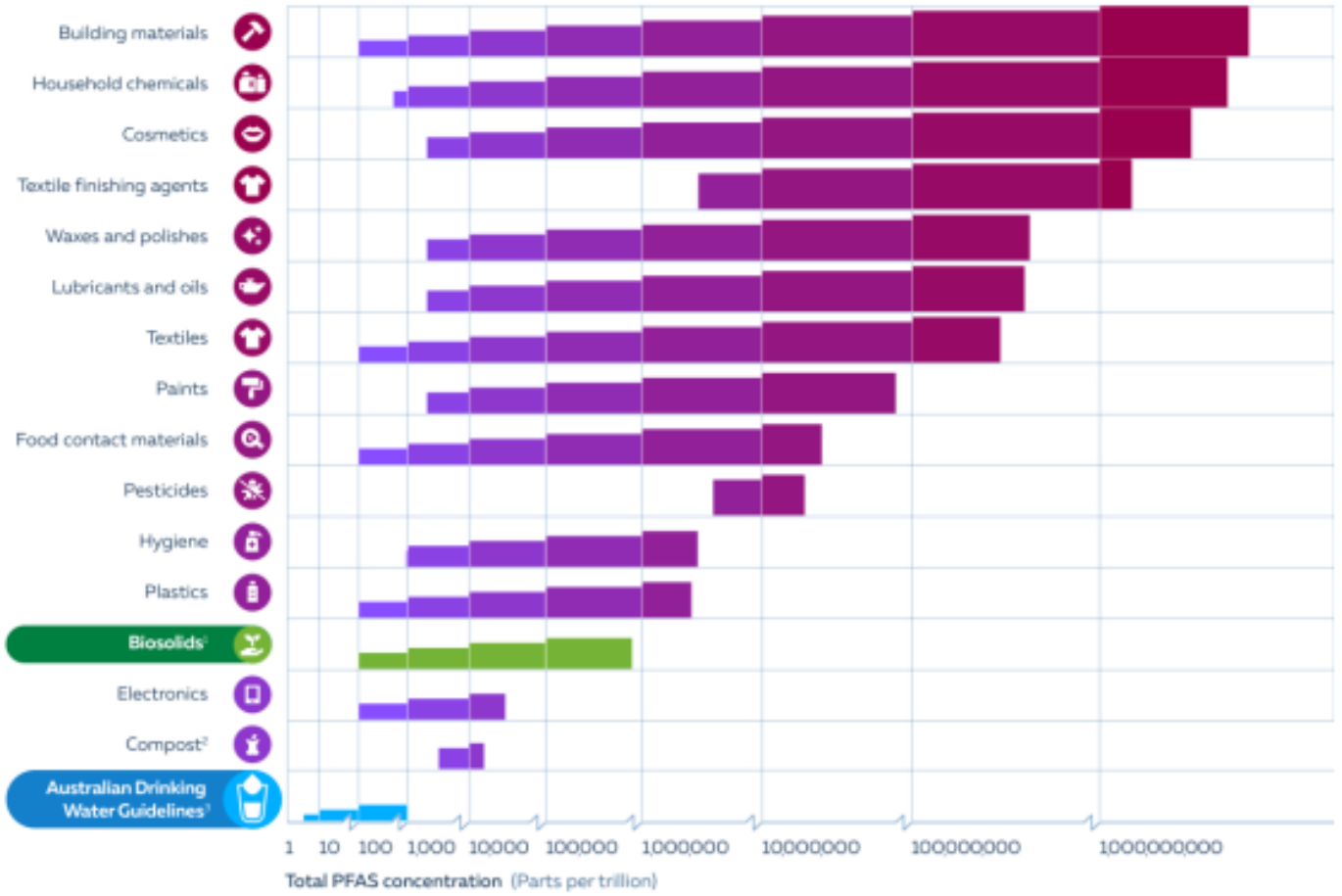
- Per and Polyfluoroalkyl Substances are a large class of synthetic chemicals (eg; PFOA, PFOS) used across diverse manufacturing and industrial applications



PFOA - perfluorooctanoic acid

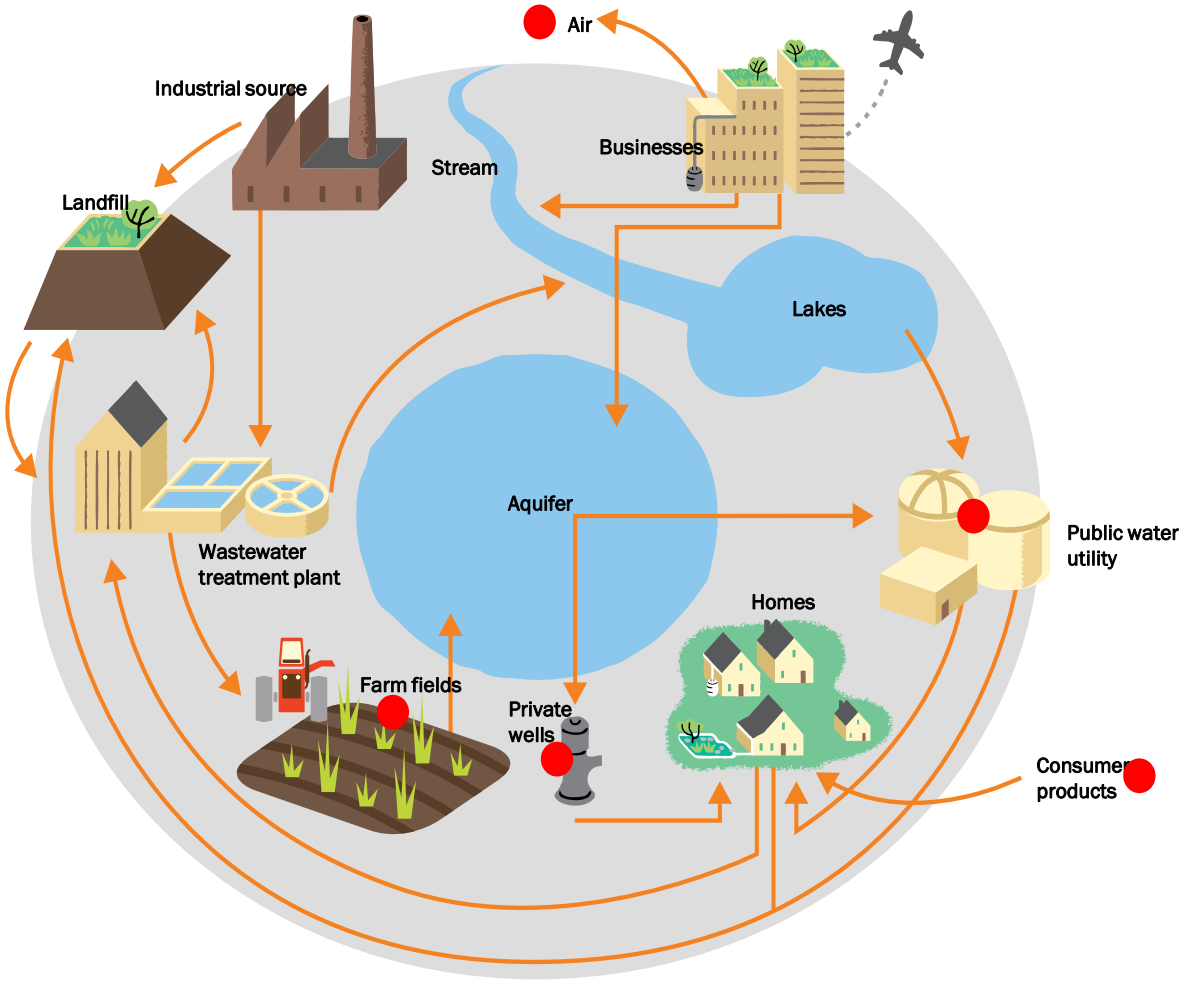


PFOS - perfluorooctanesulfonic acid



How do we get exposed to PFAS?

- PFAS are often referred to as ‘forever chemicals’ due to their stability in the environment
- As result, PFAS builds up in the environment and can be present in our water, soil, air, and food
- PFAS are present in many household products often at concentrations higher than drinking water regulations



Drinking Water Regulatory Framework

How do we ensure our drinking water is safe and clean?

Brown AND Caldwell

Who is responsible for regulating PFAS in drinking water?

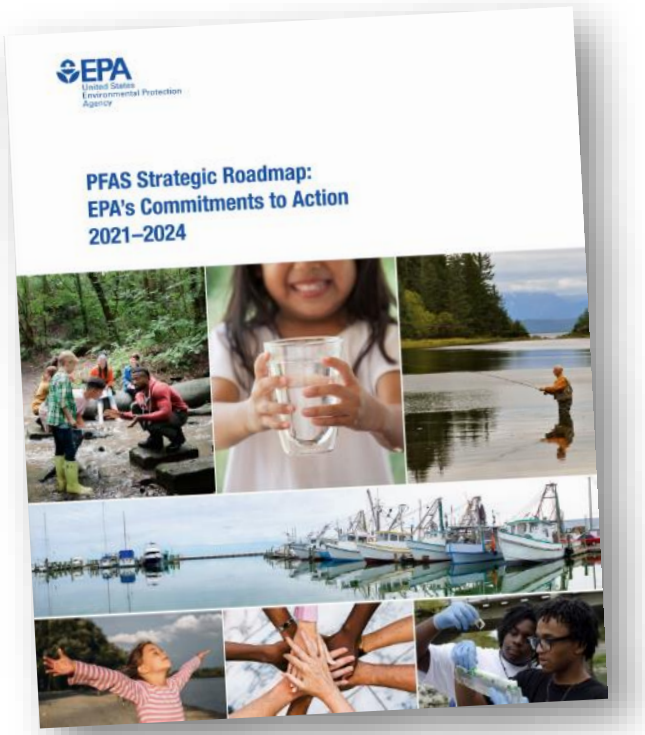
The U.S. EPA sets national drinking water regulations under the Safe Drinking Water Act, including Maximum Contaminant Levels for emerging contaminants of concern and PFAS

Hawaii DOH Safe Drinking Water Branch enforces national regulations and can set state water regulations, no less stringent than EPA

EPA's approach to establishing limits for PFAS and Emerging Contaminants of Concern (CoCs)

1. SCREENING	2. ASSESSMENT	3. FEASIBILITY	4. SELECTION
PROCESS Identify what contaminants may be present and monitor for them	Evaluate the occurrence and toxicity	Conduct benefit-cost analysis for treatment	Set feasible, risk-based water quality goals
CONSIDERATIONS *What chemicals might be released into the environment?*	*Where is it? What is the risk to human health?*	*What can we do about it? How much will it cost?*	*Do water quality goals change as we learn more?*

EPA's Current Published Maximum Contaminant Levels (MCL) for PFAS Compounds



Public Water Systems are required to meet MCLs by 2029

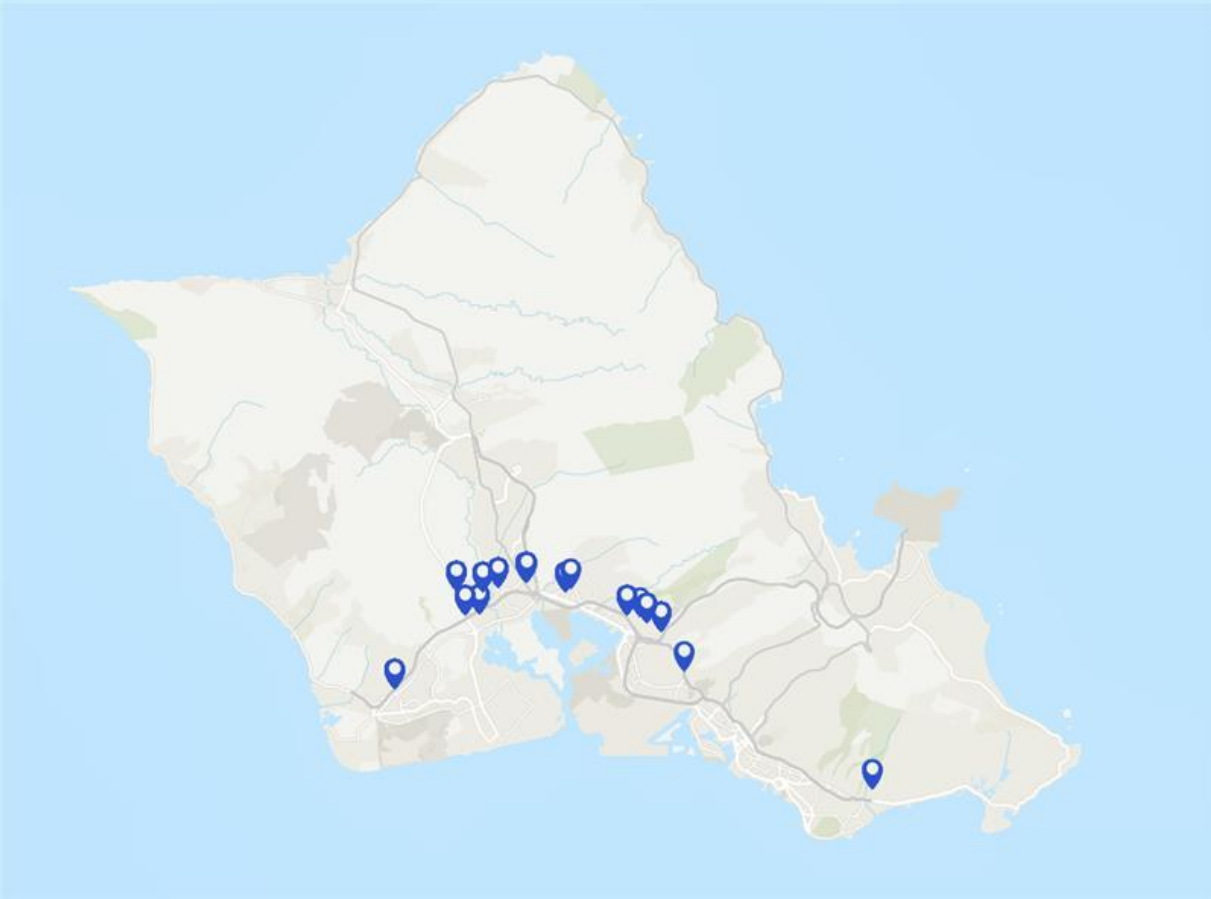
PFAS COMPOUNDS	MCL
PFOA	4.0 ppt
PFOS	4.0 ppt
PFHxS	10 ppt
PFNA	10 ppt
HFPO-DA (GenX)	10 ppt
Mixture of PFHxS, PFNA, GenX, PFBS measured as "hazard index"	

BWS Approach to Manage PFAS

How do we proactively manage risks, costs, and operations to ensure safe and reliable drinking water?

Brown AND Caldwell

BWS Sites with PFAS detections



- BWS has been monitoring for low level PFAS at all 194 wells since 2020.
- PFAS has been detected at 16 sites.
- Some PFAS samples have been above the MCLs (up to 6.1 ppt) at only 4 sites. BWS is addressing PFAS at these sites with:
  - Existing treatment
  - New treatment (with the well off until it is installed)
  - Keeping the well shut down

BWS' Approach to Managing PFAS

Immediate Priorities

- Proactive and prepared by treating sites with:
  - Regulated PFAS detection
  - No treatment (GAC) in place
  - Wells are needed to support system demand

Long-term Strategy

- Management of PFAS islandwide
  - Maintain long-term compliance
  - Prioritize sites by risk of contamination
  - Optimize for trade-offs (risks, costs, feasibility)

Immediate Priorities | Current Status & Next Steps

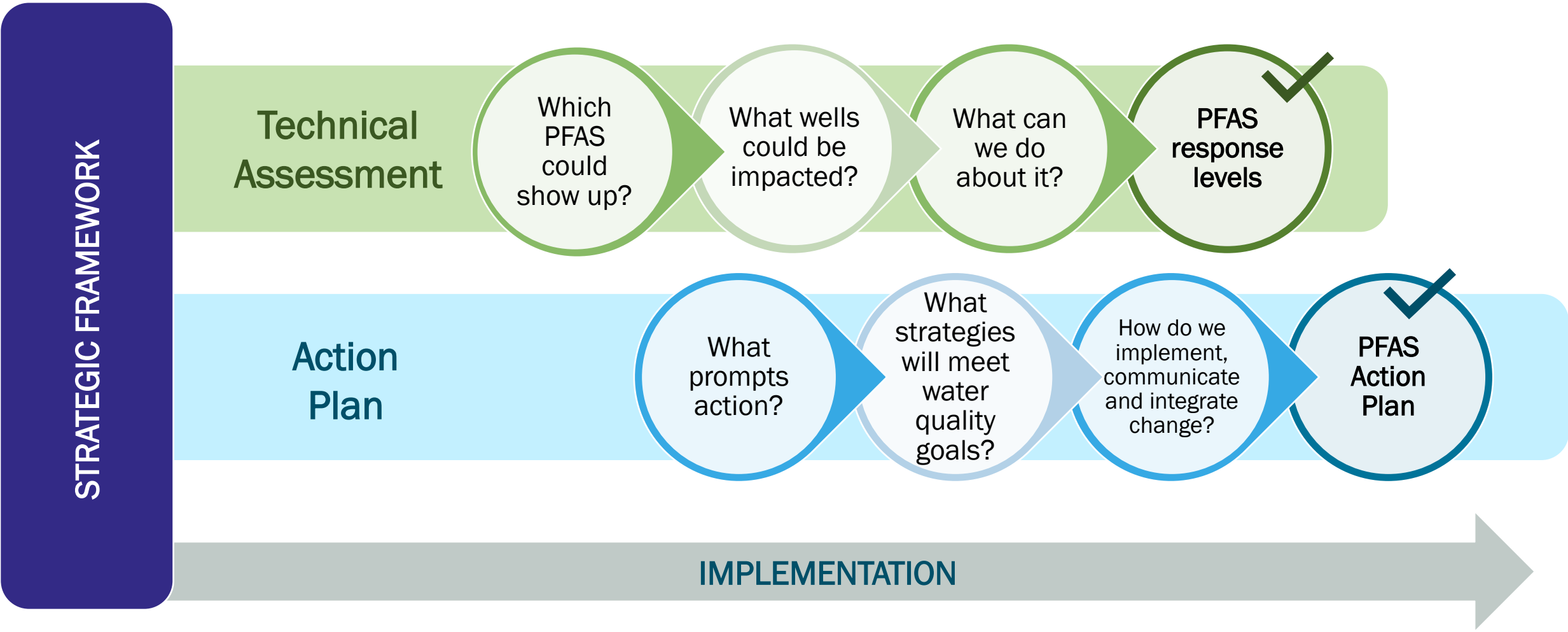
Temporary Treatment System

- **In-progress |** Temporary treatment system in commissioning at Kaʻamilo Wells
- **Next Steps |** Temporary treatment system to begin operations in summer 2026

Permanent Treatment Systems

- **In-progress |** Permanent treatment systems are being designed and constructed for 3 well sites
- **Next Steps |** Designs to go out to bid in early 2027 to meet 2029 construction completion deadline

BWS Long-Term PFAS Priority-Based Approach: The Islandwide Management Plan



Long-term Strategy | Current Status & Next Steps

Technical Assessment

- **In-progress** | Groundwater modeling
  | PFAS source identification
  | Treatment cost evaluation

- **Next Steps** | Prioritize well sites by likelihood of PFAS impact
  | Develop CIP projects

Project Schedule

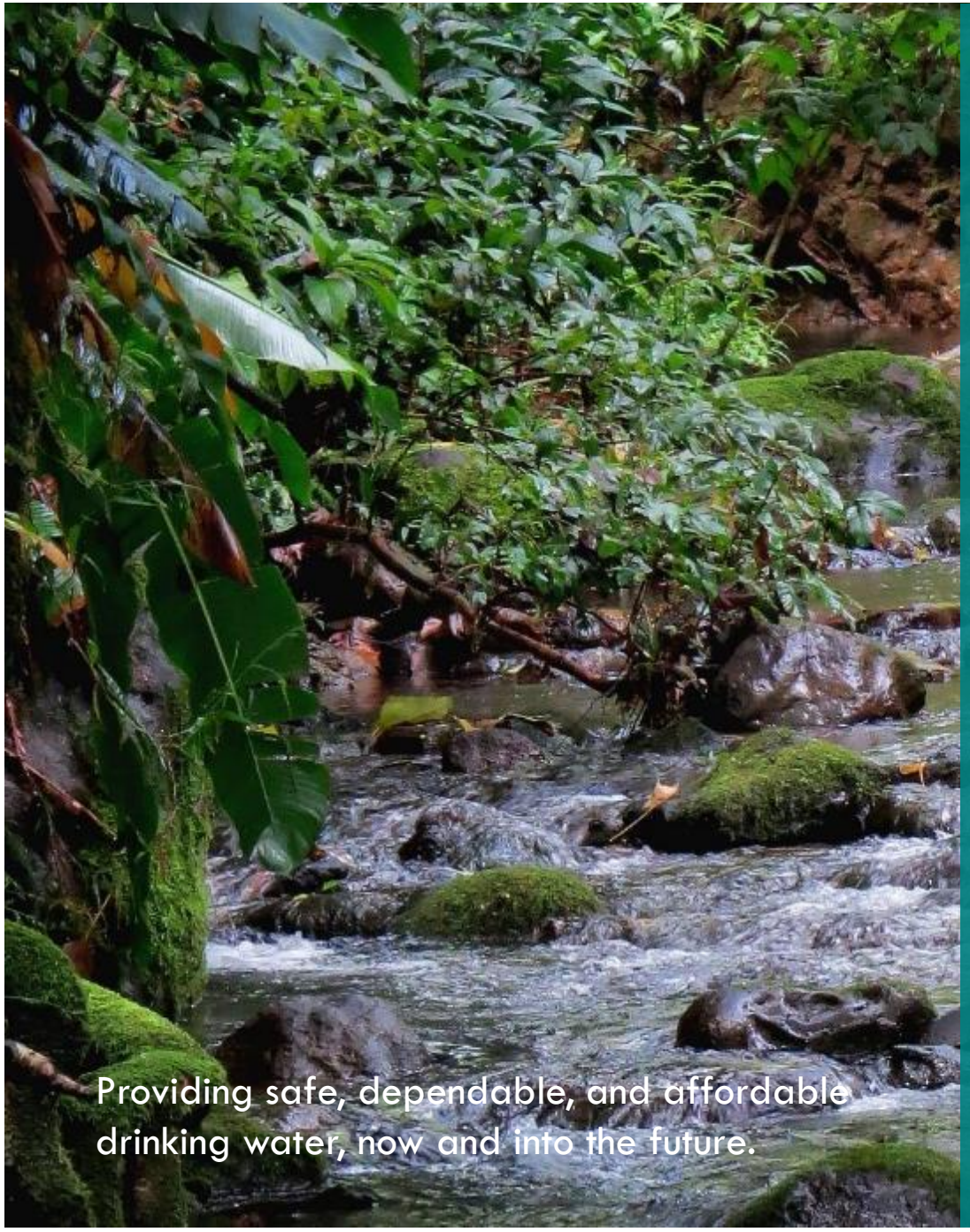
Questions

- What questions do you think the public might have that BWS should be prepared to answer?

- What should the public be informed about?

PFAS Information & Resources

- Interstate Technology & Regulatory Council (ITRC) on PFAS pfas-1.itrcweb.org/
- Hawai‘i State, Department of Health health.hawaii.gov/heer/environmental-health/highlighted-projects/pfas/
- U.S. Environmental Protection Agency (EPA) epa.gov/pfas
- CDC’s Agency for Toxic Substances and Disease Registry (ATSDR) atsdr.cdc.gov/pfas/index.html
- National Institute of Environmental Health Services (NIEHS) niehs.nih.gov/health/topics/agents/pfc/index.cfm
- Food and Drug Administration (FDA) fda.gov/food/chemicals/and-polyfluoroalkyl-substances-pfas
- Department of Defense defense.gov/Explore/Spotlight/pfas/



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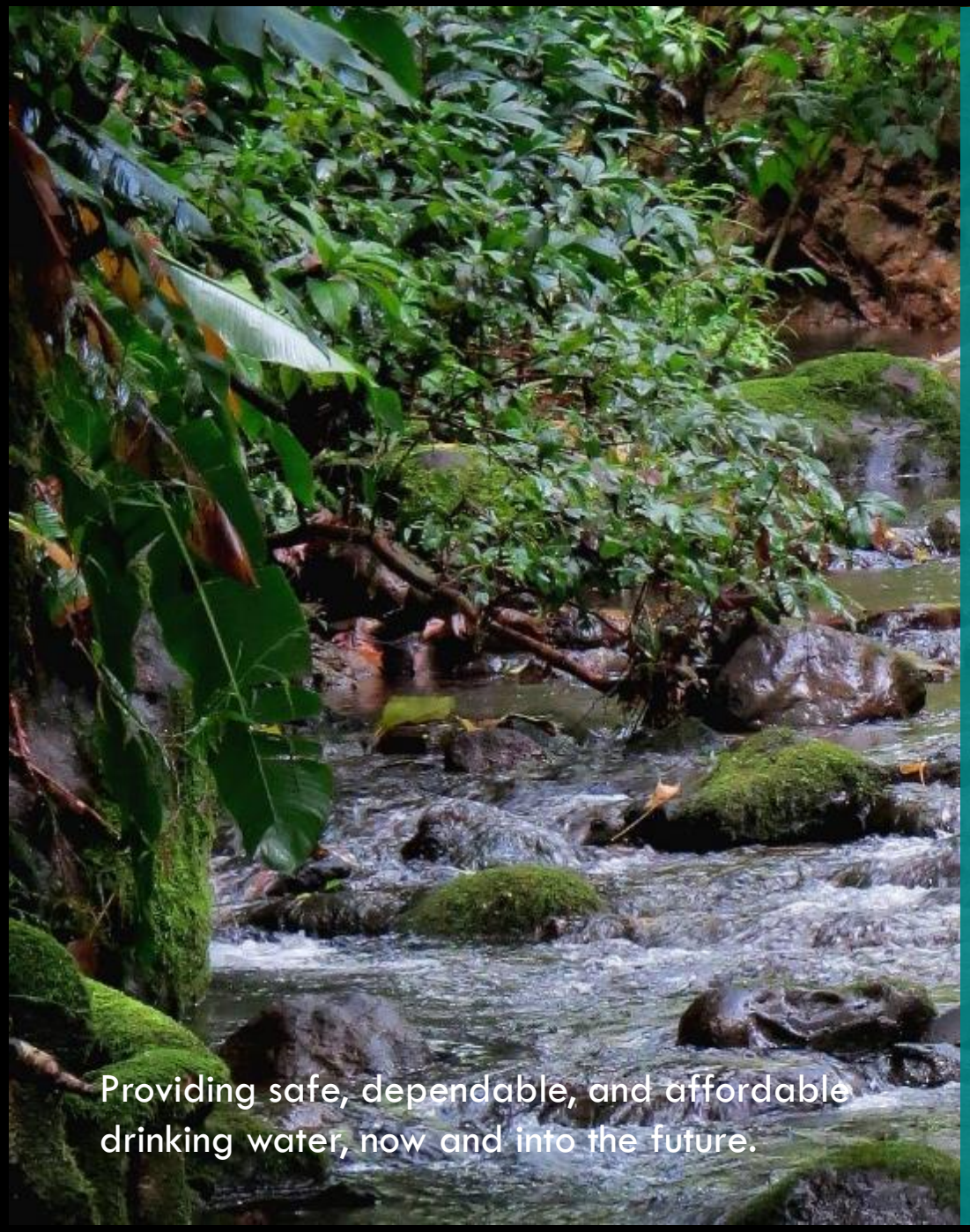
Questions & Answers

STAKEHOLDER MEETINGS THROUGH 2026

Type	Date	Topic	Stakeholder Input
In-Person	15-Jan-26	2026 WMP Roadmap CIP Process and Prioritization	WMP Input Milestones CIP Priorities
Virtual	26-Feb-26	Existing scorecard update New Scorecard Objectives CIP Prioritization Methodology	New Scorecard Priorities
Virtual	19-Mar-26	Condition Assessment Results Preliminary Climate Resilience Options	Preferences for level of climate facility mitigation
In-Person	16-Apr-26	Demand Projections Potential Additional Supplies	Preferences for supply hardening and diversification
In-Person	16-Jul-26	Major Findings Draft CIP	Input on CIP Priorities and Funding Levels
Virtual	17-Sep-26	One Water Coordination	Feedback on One Water CIP Integration
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	15-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



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Mahalo!