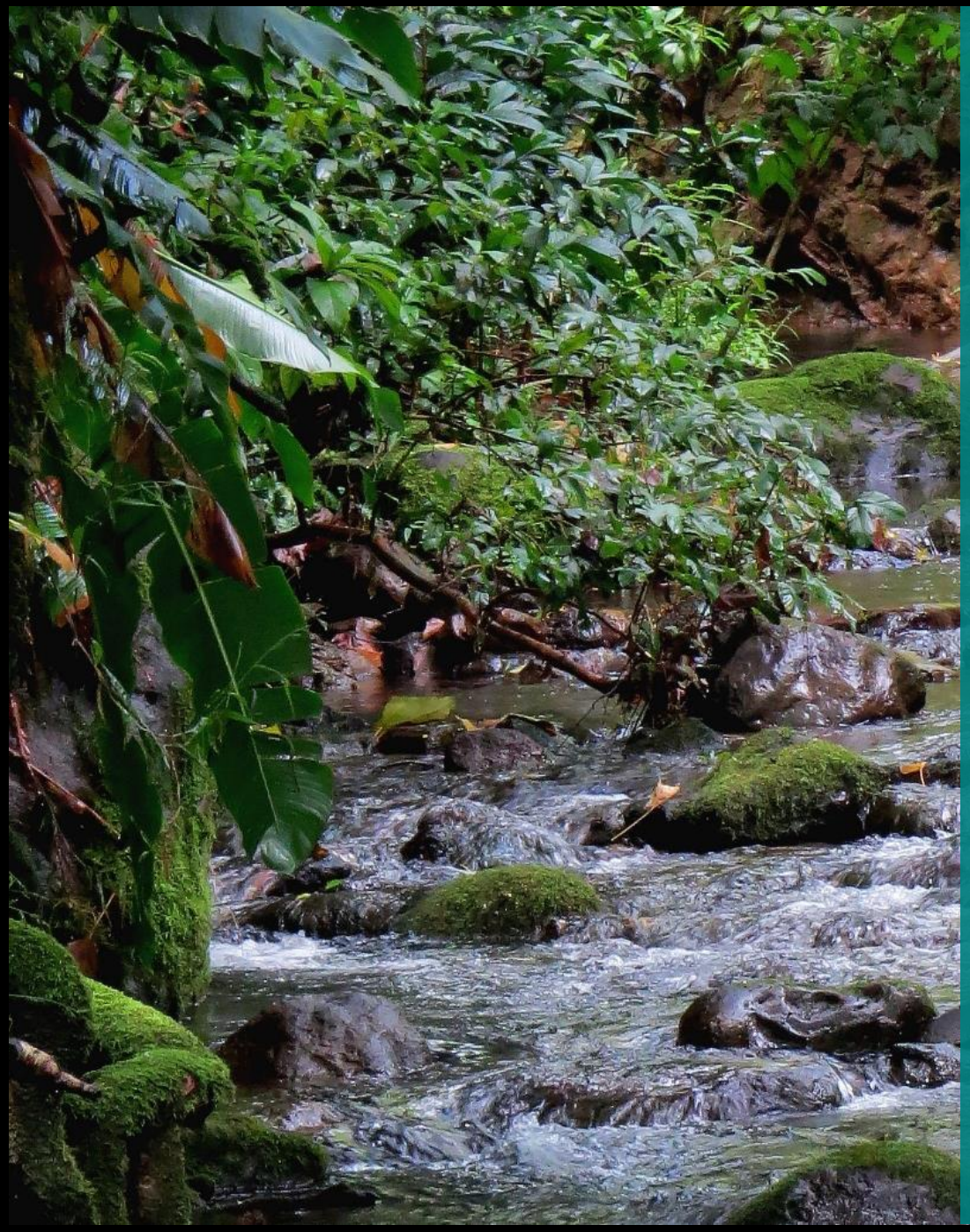


STAKEHOLDER ADVISORY GROUP

Board of Water Supply, City & County of Honolulu
October 20, 2022
Meeting 44 - Virtual

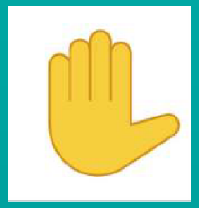
WELCOME & INTRODUCTIONS

DAVE EBERSOLD, FACILITATOR

STAKEHOLDER ADVISORY GROUP MEETING 44

OCTOBER 20, 2022

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

- Discuss Draft Water Shortage Response and Recover Plan
- Accept notes from meeting #43
- Receive input on Cost of Service and Water Rate Study
- Provide BWS updates

PUBLIC COMMENT ON AGENDA ITEMS

DRAFT WATER SHORTAGE RESPONSE AND RECOVERY PLAN

Water Resources

October 18, 2022

WATER SHORTAGE RESPONSE AND RECOVERY PLAN

TABLE OF CONTENTS

Authorization

Water Shortage Plan Objectives, Triggers and Response

Water Shortage Affecting Availability of Water

Surcharges, Exceptions, Appeals and Penalties

Declaration and Termination of Water Shortage Condition

Recovery Phase

AUTHORIZATION

BWS WATER SHORTAGE DEFINITIONS

A water shortage condition exists when water supply is not available to meet existing and/or future max day water demands due to degradation of water quality, disruptions to water system delivery infrastructure or low groundwater condition.

A low groundwater condition exists when 3 or more index well levels fall below levels designated (caution, alert, critical), and chloride levels rise for 3 consecutive months at sufficient sources to hamper operations. Sec 3-318 to 322 BWS Rules & Regulations

THE HONOLULU CITY CHARTER, ARTICLE VII SEC 7-105 (J), POWERS, DUTIES AND FUNCTIONS OF THE BOARD OF WATER SUPPLY, DIRECTS THE BOARD TO:

Prescribe and enforce Rules and Regulations having the force and effect of law to carry out the provisions of this article of the charter, including

1. The regulation of water systems and necessary appurtenances for subdivisions and other properties and requirements for adequate water supply and storage facilities for domestic use and fire protection,
2. The prevention of waste and pollution of water,
3. The manner in which new wells or shafts may be bored, drilled or excavated, cased and capped or recased,
4. The manner in which wells or shafts shall be maintained, controlled and operated to prevent waste of water or the impairment of potability,
5. The limitation to beneficial uses of all water,
6. In times of shortage or threatened shortage of water or of danger to potability of the water of any ground water basin or area by overdraft on such basin, the restriction of the drawing of water in all wells supplied from such basin on a basis proportionate to the proper and beneficial uses served by them respectively, and
7. Other matters having for their object the proper conservation and beneficial use of the water resources available for the city.

BWS RULES AND REGULATIONS

CHAPTER II: WATER SERVICE TO CONSUMERS

Sec. 2-209: Conservation Measures and Interruption of Water Supply

1. The Department will exercise reasonable diligence to deliver water to the consumer and avoid shortages or interruptions in service, but will not be liable for any interruption, shortage, insufficiency of supply, or any loss or damage occasioned thereby.

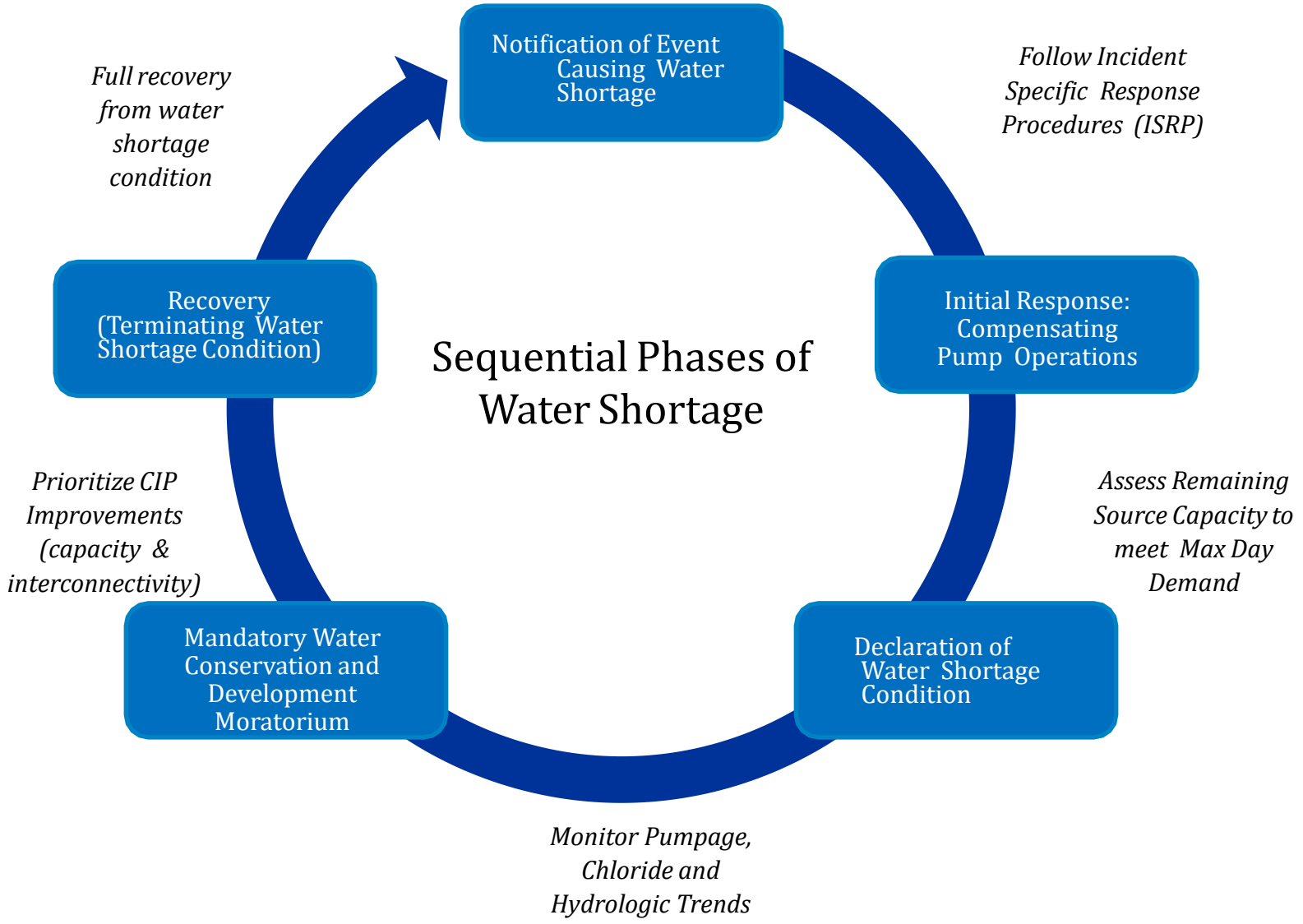
2. Whenever, in the Department's opinion, special conservation measures are advisable in order to forestall water shortages, the Department may restrict the use of water by any means or method of control.

WATER SHORTAGE PLAN OBJECTIVES, TRIGGERS AND RESPONSE

PURPOSE

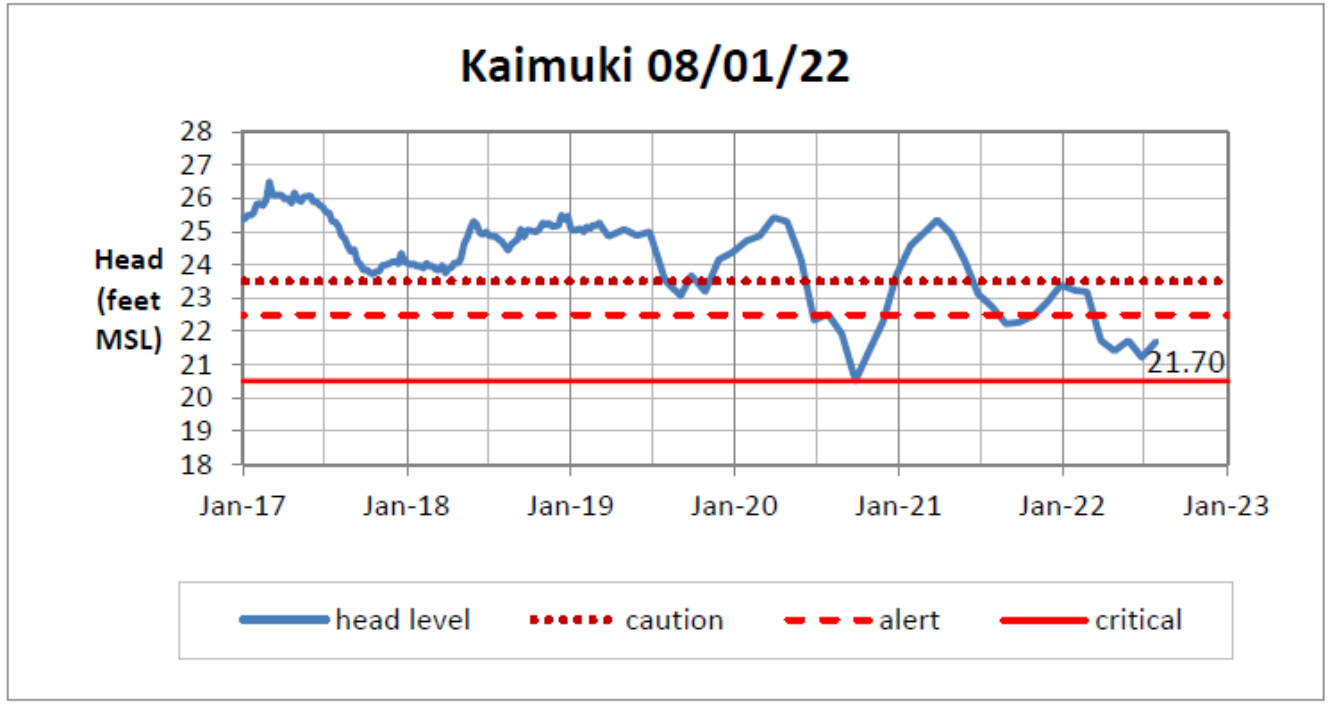
The purpose of this Water Shortage Response and Recovery Plan is to provide the BWS with strategic and tactical steps to assess the need to declare a water shortage and manage water demands related to a water shortage condition

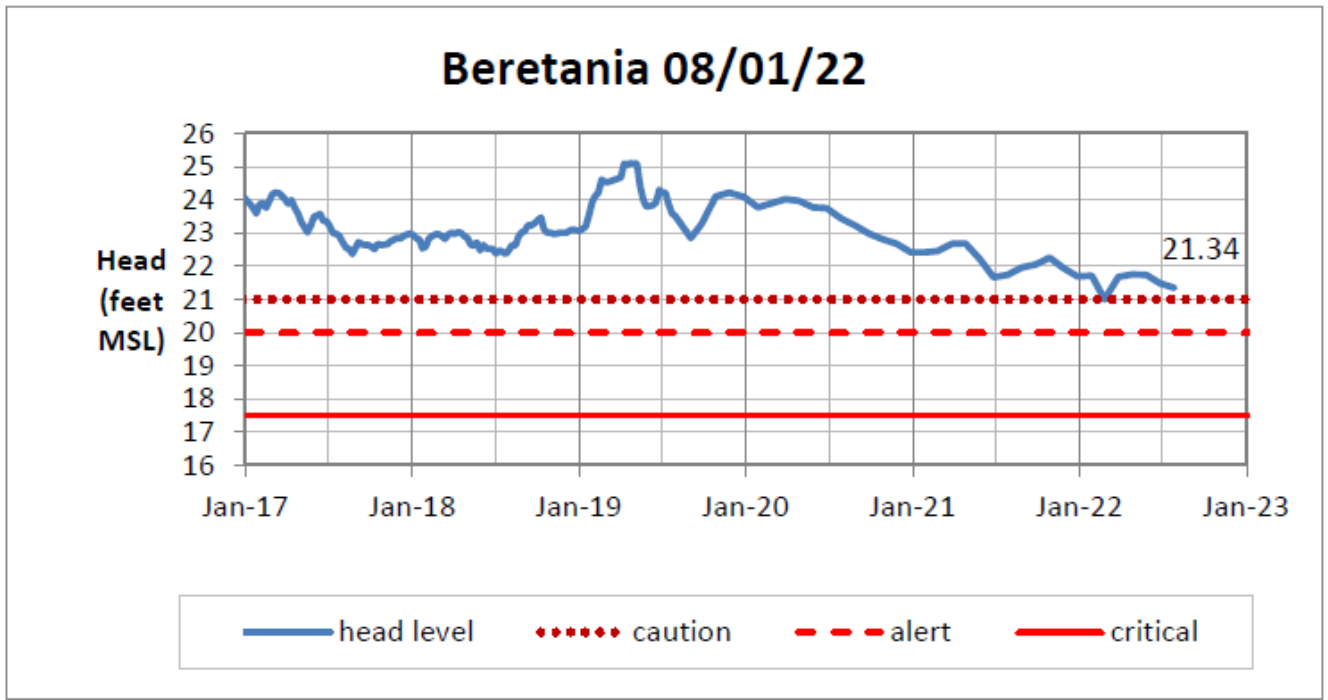
WATER SHORTAGE PLAN PHASES



BWS INDEX WELLS AND LOW GROUNDWATER CONDITION WATER LEVEL TRIGGERS

CWRM Aquifer System	BWS Index Area	BWS Index Well Name	Avg. Median GW Elevation (ft MSL)	Caution Level (ft MSL)	Alert Level (ft MSL)	Critical Level (ft MSL)
Palolo	Kaimuki	Kaimuki H.S. 25-1A Deep MW	25.0	23.5	22.5	20.5
Nuuanu	Beretania	Thomas Square 83 MW	23.0	21.0	20.0	17.5
Kalihi	Kalihi	Kalihi "Kapalama" MW	23.0	20.5	19.5	17.0
Moanalua	Moanalua	Manaiki T-24 MW	20.0	18.5	17.5	15
Waimalu	Halawa	Halawa T-45 MW	17.0	15.5	14.5	12.0
	Kalauao	Upper Waimalu T-52 MW		15.5	14.5	12.0
Waipahu-Waiawa	Pearl City	Waiawa T-27 MW	17.0	14.0	13.0	12.0
	Waipahu	Waipahu 241 Deep MW		17.0	16.0	15.0
	Hoaeae-Kunia	Kunia T-41 Deep MW		13.0	12.0	11.0
Makaha	Makaha	Makaha V Well	18	7.0	6.0	4.0
Waialua	Helemano	Helemano MW	11	11.0	10.5	10.0
Koolauloa	Punaluu	Punaluu Deep MW	18	17.0	16.0	14.0
	Kaluanui	Kaluanui Deep MW		16.0	15.0	14.0
Waialae-West	Waialae-West	Kapakahi Well (State Well Number 3-1746-003)	8	7	6.5	6


Kaimuki 08/01/22
Head (feet MSL)
28
27
26
25
24
23
22
21
20
19
18
21.70
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical


Beretania 08/01/22
Head (feet MSL)
26
25
24
23
22
21
20
19
18
17
16
21.34
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical

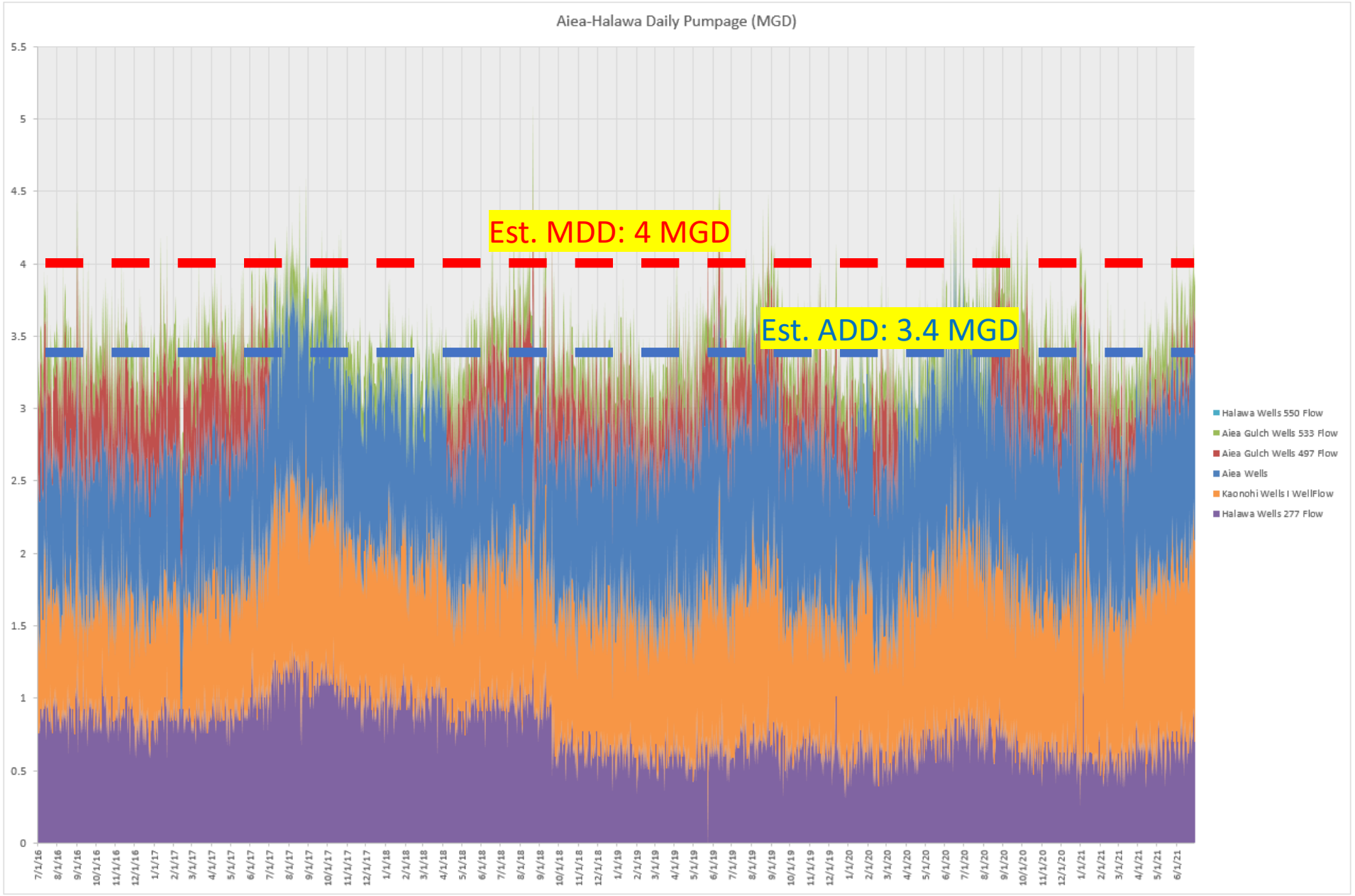
WATER SHORTAGE CONDITION TRIGGERS

Water Shortage Condition	Source Capacity Demand Trigger	Chloride Content Trigger*
No Water Shortage	Available pumping units meet max day demand in 16 hours w/ standby not included.	Stable Chloride and Head Level Trends
Alert	Available pumping units meet Q_{95} max day demand in 20 hours, standby pumps not included.*	Chloride content rises between 12 ppm and 16 ppm over three consecutive months at sufficient sources to hamper operations.
Critical	Available pumping units cannot meet Q_{95} max day demand in 22 hours, standby pumps not included*	Chloride content rises over 16 ppm over three consecutive months at sufficient sources to hamper operations.

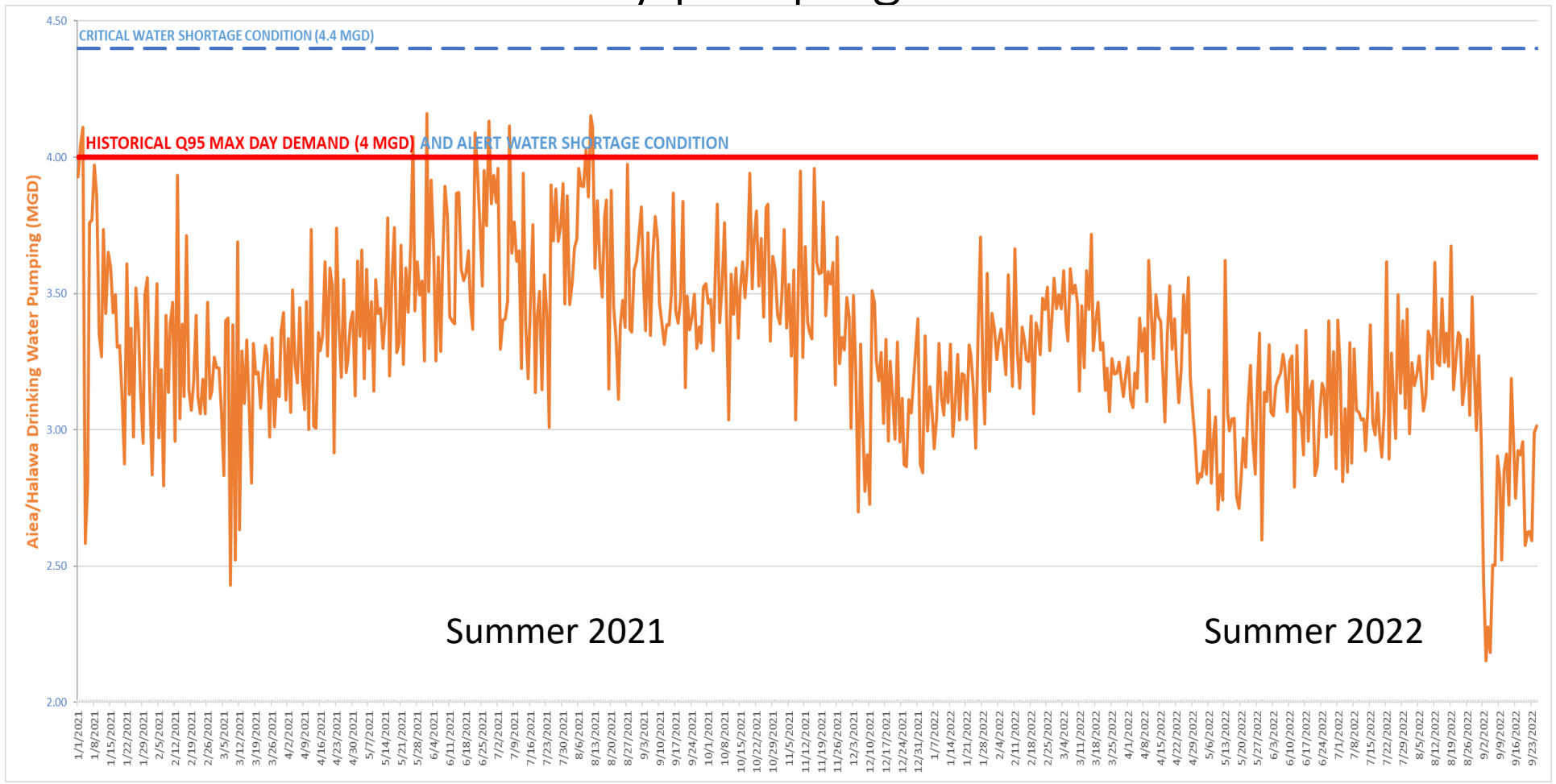
*Chloride content must rise at sufficient wells to hamper operations to activate a Low Groundwater Condition

- Note that an exceedance of either source capacity/demand or chloride trigger could result in a water shortage condition.
- A reduction in sufficient sources to hamper operations due to rising chlorides are dependent on pump operations experience and engineering judgement specific to the target water system.

Aiea Halawa Daily Pumpage FY 2017 – FY 2021

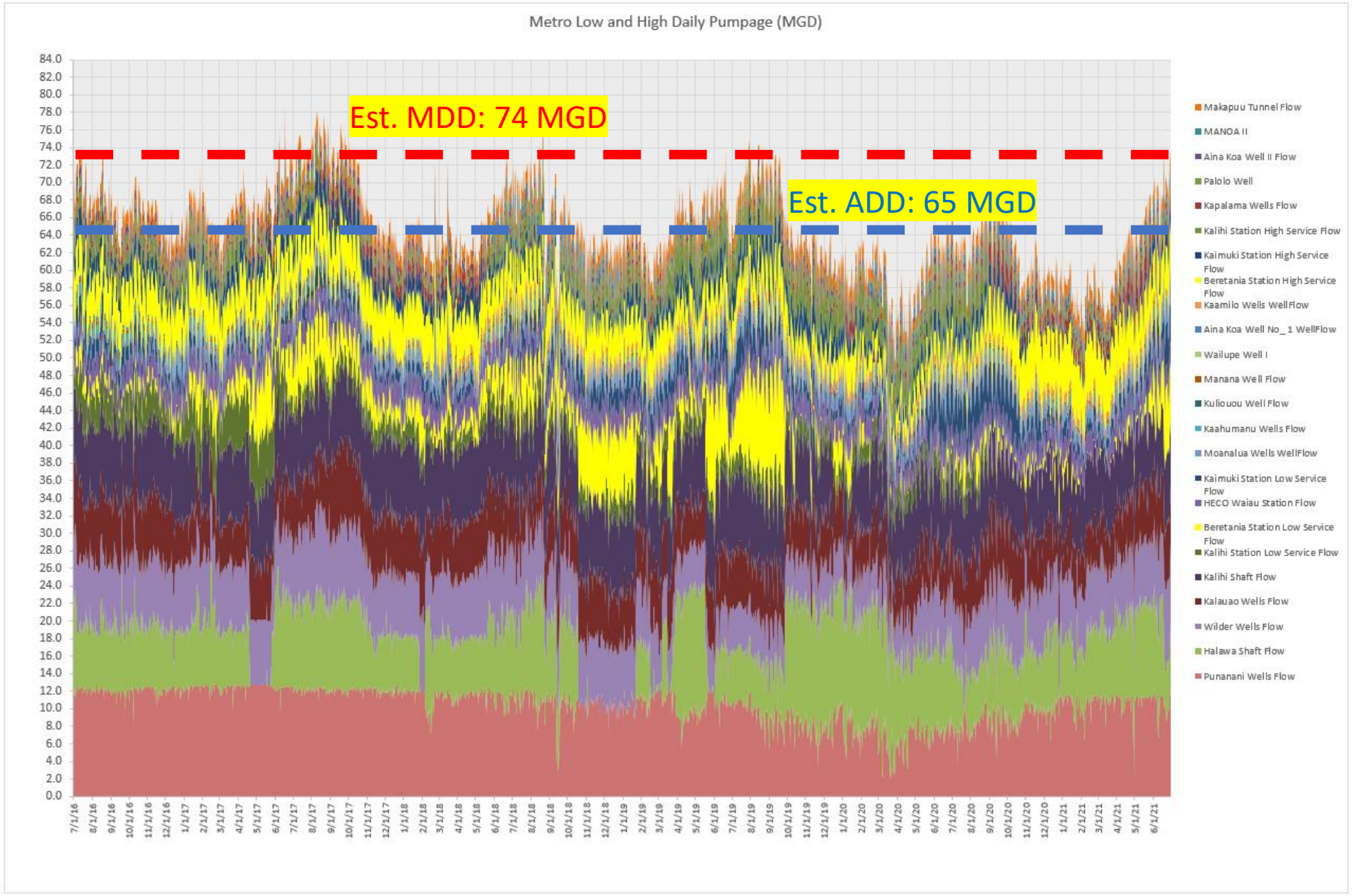


Aiea Halawa weekly pumping - Jan 2021 to Sept 2022

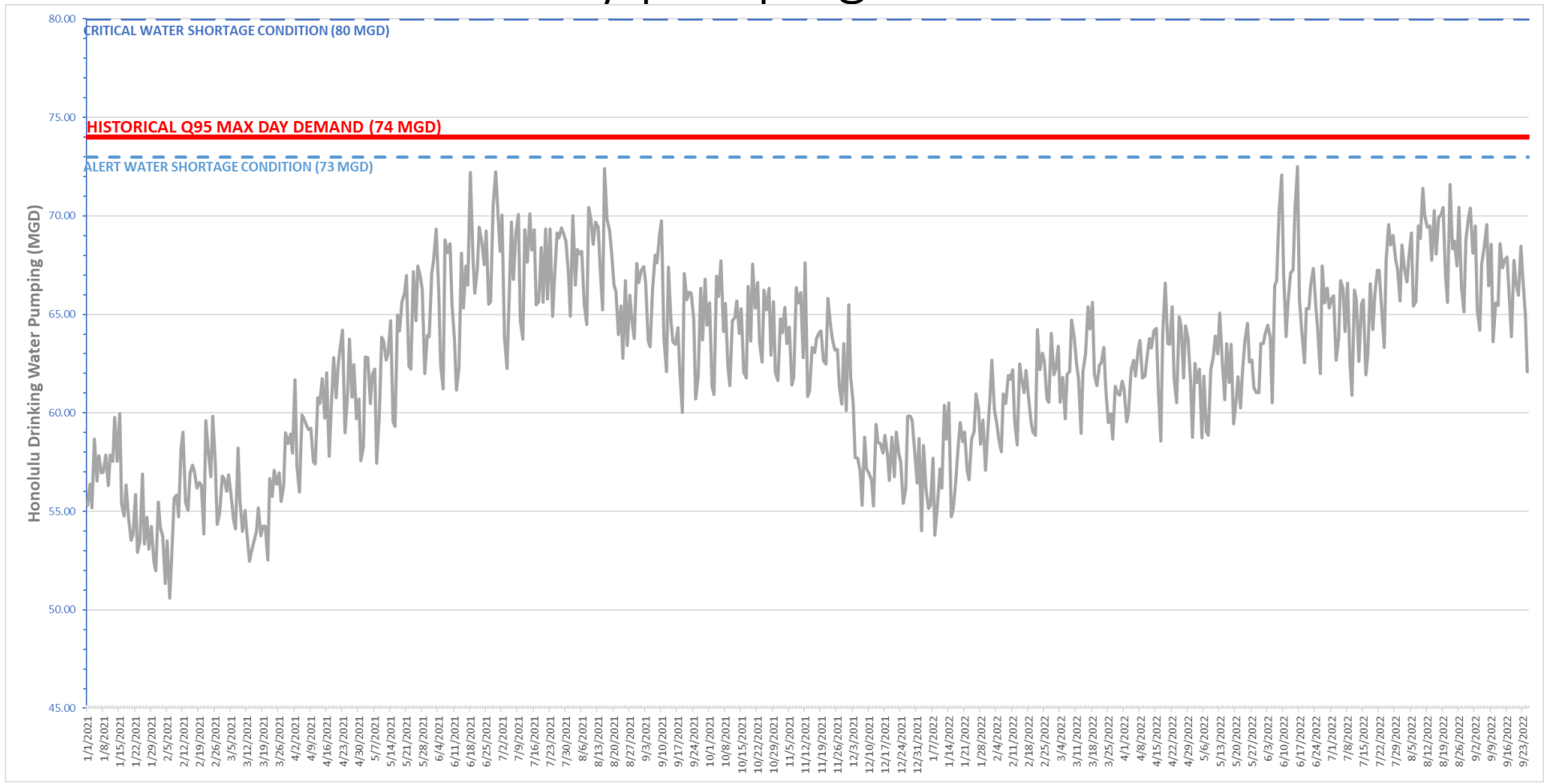


Conservation Response has been Working

Honolulu Daily Pumpage FY 2017 – FY 2021



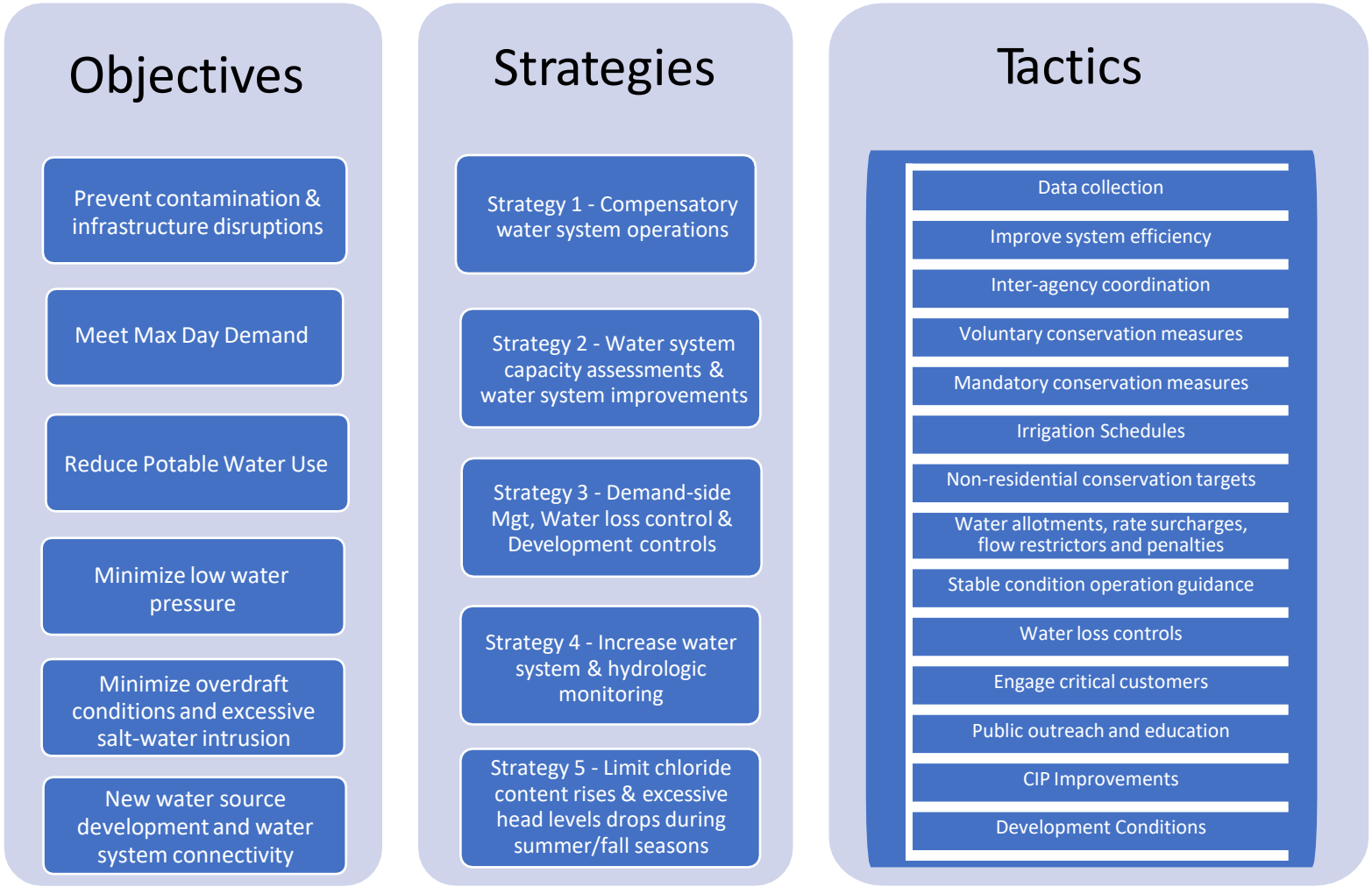
Honolulu weekly pumping - January 2021 to Sept 2022



PROGRESSIVELY RESTRICTIVE WATER CONSERVATION RESPONSES BY WATER SHORTAGE CONDITION

Water Shortage Condition	Source Capacity/Demand Trigger	Conservation Response
No Water Shortage	Available pumping units meet max day demand in 16 hours, standby pumps not included	**Voluntary** – General Seasonal Messaging
Alert	Available pumping units meet Q_{95} max day demand in 20 hours, standby pumps not included.	**Voluntary** – Targeted Seasonal Messaging Requesting 10%+ Water Use Reductions
Critical	Available pumping units cannot meet Q_{95} max day demand in 22 hours, standby pumps not included	**Mandatory** in Progressively Restrictive Order 1) Require Targeted Water Use Reductions 2) Water Allotments, Rate Surcharges and Flow Restrictors 3) Moratorium if necessary system improvements extend more than 2 years

WATER SHORTAGE OBJECTIVES AND STRATEGIES SHAPE THE COMPENSATING WATER SYSTEM OPERATIONS, WATER CONSERVATION, OUTREACH AND DEVELOPMENT CONTROL TACTICS



WATER SHORTAGE AFFECTING AVAILABILITY OF WATER

SECTION 1-101 AVAILABILITY OF WATER

Availability of Water for Proposed Developments. The Department may issue water commitments to proposed developments as follows:

- ***Category 1:* Areas with Adequate Water Supply**. *The Department may issue advance water commitments to proposed developments in areas where the water system has adequate supplies to assume new or additional services.*
- ***Category 2:* Areas with Limited Additional Water Supply**. *The Department may restrict the issuance of advance water commitments to proposed developments in areas where the water system has limited additional supplies to assume new or additional services.*
- ***Category 3:* Areas with No Additional Water Supply**. *The Department shall not issue water commitments to proposed developments in areas where the water system has no additional supplies to assume new or additional services.*

Water commitments are confirmed when residential subdivision construction plans or building permits are approved for all other developments.

Currently, Aiea-Halawa & Honolulu are in Alert Water Shortage and in Category 2. BWS is approving permits while requesting 10% voluntary conservation.

In a Critical Water Shortage Condition with Mandatory Conservation, Category 3 will apply for water systems with no additional water supply until the water system improvements to increase capacity are completed.

BUILDING MORATORIUM CONTROLS (DRAFT)

In a Critical Water Shortage Condition, if mandatory conservation measures and available pumping units are insufficient to accommodate existing and/or future growth, BWS may implement building development conditions to control the rate of water demand growth and the risk of water shortage. Limitations could include:

- Limit approvals to a single minimum size water meter for existing vacant lots.
- For redeveloped residential and non-residential parcels, limit water demands to:
  - Existing use or previous water allocations (previously paid WSFC), or
  - Existing water meter sizes, (meters may have more capacity than existing use)
- Require alternative onsite water supplies such as grey water reuse, stormwater catchments, A/C condensate recovery and high efficiency plumbing fixtures. Refer to the National Blue Ribbon Committee Distributed Nonpotable Water Manual.
- Fee In-Lieu: Retrofit another building with high efficiency plumbing fixtures and obtain fixture credits for the redevelopment, (No Net Gain in Water Use)

ADDITIONAL OPTIONS: (DRAFT) WITH NO DETRIMENTAL IMPACTS TO EXISTING CUSTOMERS

- Allow affordable and homeless housing providing critical social services.
- Allow an additional dwelling unit (ADU) on existing lots, per DPP rules
  - No increase in meter size.
- Allow Department of Hawaiian Homeland projects because of priority water rights.

DECLARATIONS AND NOTIFICATIONS FOR BUILDING MORATORIUM CONTROLS:

- Board Action for the Declaration of a Building Moratorium is required.
- Verify growth forecasts and building permit approvals against source capacity accounting for offsetting conservation trends.
- Report to the Board the status of the head and chloride levels and water system capacity; the weekly average of daily pumpage and demands; the effectiveness of the restrictions and allotments in force; recommendations to increase or reduce restrictions and allotments; and such other information.
- Notify affected elected officials, agencies, landowners and developers.
- Board Action for the Termination of a building moratorium is required

SURCHARGES, EXCEPTIONS, APPEALS AND PENALTIES

SPECIAL RATES AND CHARGES DURING CRITICAL WATER SHORTAGE CONDITIONS

During a critical water shortage condition, a surcharge schedule for excess water use may be established for customers whose monthly consumption is in excess of their water Allotment.

Gallons in Excess of Allotment for Meter Sizes 2" and Larger*	Gallons in excess of Allotment for Meter Sizes 5/8" to 1-1/2" (Monthly Billing)	Surcharge
25% or less	3,000 or less	2 Times Existing Water Rate
26% - 50%	3,001 – 6,000	3 Times Existing Water Rate
51% - 75%	6,001 – 9,000	4 Times Existing Water Rate
76% - 100%	9,001 – 12,000	12 Times Existing Water Rate
Over 100%	Over 12,000	20 Times Existing Water Rate

EXCEPTIONS AND APPEALS

- Consideration of written applications for exceptions regarding the allotment system or regulations and restrictions on water use are allowed.
- Written applications for exceptions shall be accepted, and may be granted, by the Manager.
- Denial of an application for exception may be appealed in writing to the Board.

QUALIFYING EXCEPTIONS

- Would cause an unnecessary and undue hardship, including but not limited to adverse economic impacts
- Would cause an emergency condition affecting the health, sanitation, fire protection, or safety of the Applicant or the public;
- Increase water allotment for >4 people per single family unit by 40 gal/person or allow 280 gals/unit for multi-family unit

PENALTIES

- Any violation by any person of the restrictions declared by the Board under Sections 3-319 and 3-320 of this Chapter shall be punishable according to Chapter II, Section 2-205 and Chapter V, Section 5-501 of these Rules and Regulations.
- Require flow restrictors for excess water use
- Charge $50 for installation and removal of the flow restrictor.
- Discontinue water service for violations after the flow restrictor is installed in accordance with Ch. II, Sec. 2-205
- In accordance with Ch. V, Sec. 5-501, charged with a misdemeanor, pursuant to Chapter 1, Article 3, Section 1-3.1, ROH

DECLARATION AND TERMINATION OF WATER SHORTAGE

PUBLIC NOTIFICATION REQUIREMENT FOR DECLARATION AND TERMINATION OF LOW GROUNDWATER LEVEL CONDITION CAUSING WATER SHORTAGE

The Manager shall inform the public and the Department's consumers of the declaration and termination of an alert or critical low groundwater condition by publishing the notice in a newspaper of general circulation on the island of Oahu at least once a day for three consecutive days.

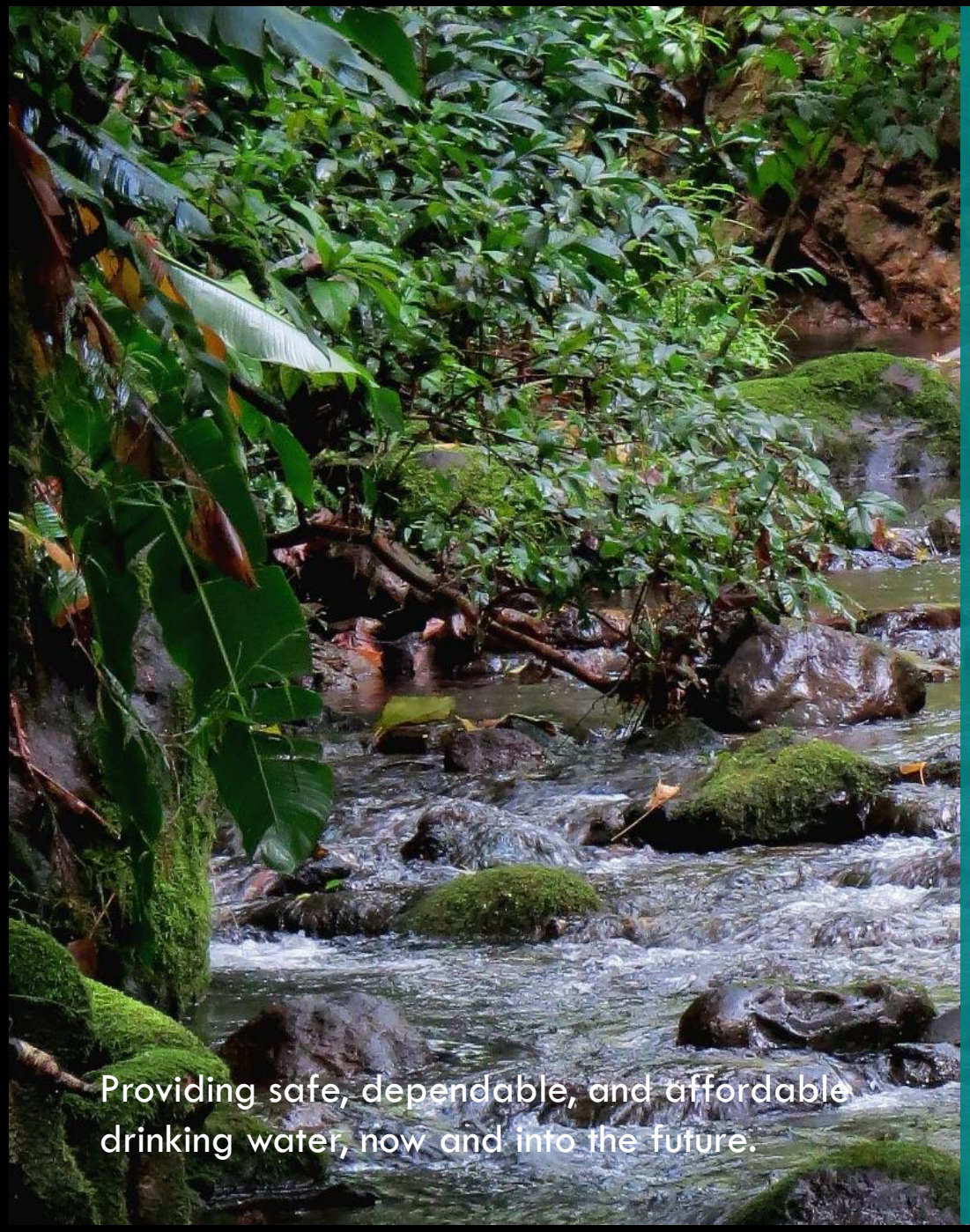
The alert or critical low groundwater condition shall begin at midnight on the third day of the publication declaring such condition.

RECOVERY

RECOVERY PHASE

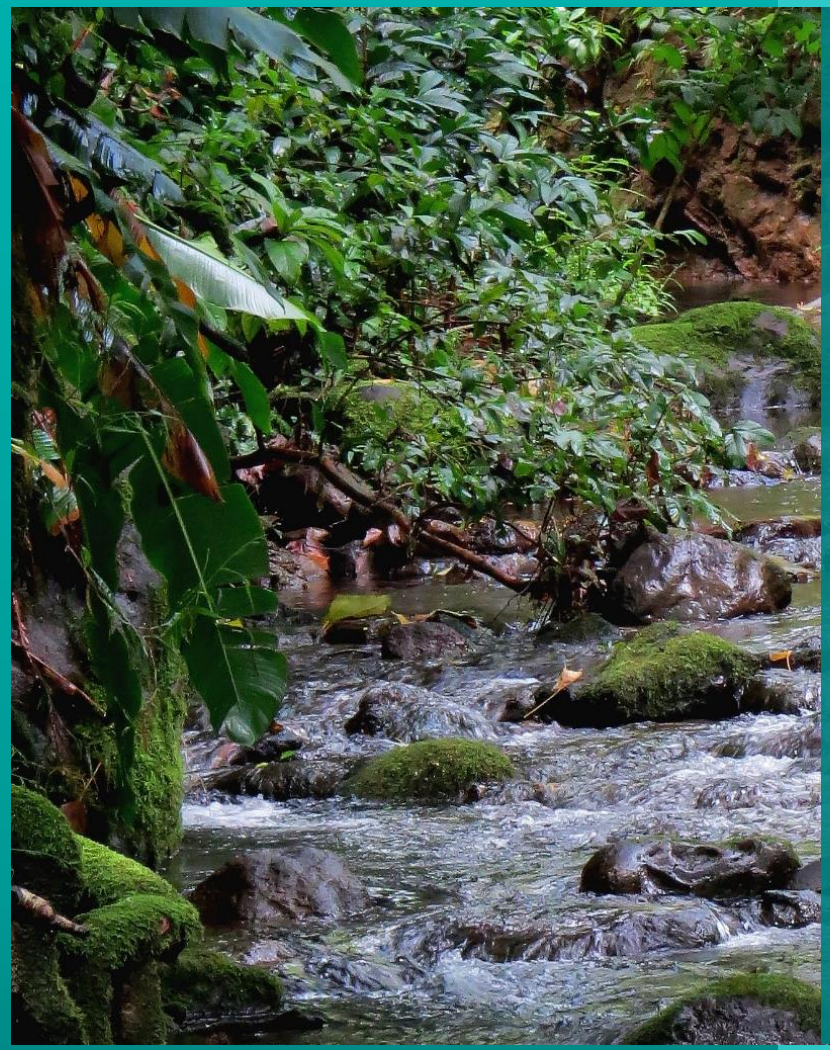
Ensure sufficient source and aquifer recovery post incident by reducing pumping when the next wet seasons reduce water demands.

- Identify pumping stations that have been pumped harder to meet max day demand and affected by drought, where chloride levels increased and head levels decreased into Alert or Critical low groundwater levels.
- Continue to monitor chloride trends and index well head levels.
- Step down water conservation measures accordingly
- Continue modified pump operations until full recovery is achieved



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

Mahalo!



WATER RATES UPDATE

Joe Cooper
Waterworks Controller

David Ebersold
Vice President, CDM Smith

October 20, 2022
boardofwatersupply.com

OBJECTIVES

- Brief refresh on cost of service and rate making process
- Understand external drivers of revenue requirement and their impact
- Seek feedback on cost of service allocations
- Provide an introduction to tradeoffs and affordability

BWS'S AUTHORITY TO MAKE RATES IS ESTABLISHED IN CITY CHARTER

- "The board shall have the power to fix and adjust reasonable rates and charges for the furnishing of water and for water services so that the revenues derived therefrom shall be sufficient to make the department self-supporting."

- PUC regulates privately owned utilities

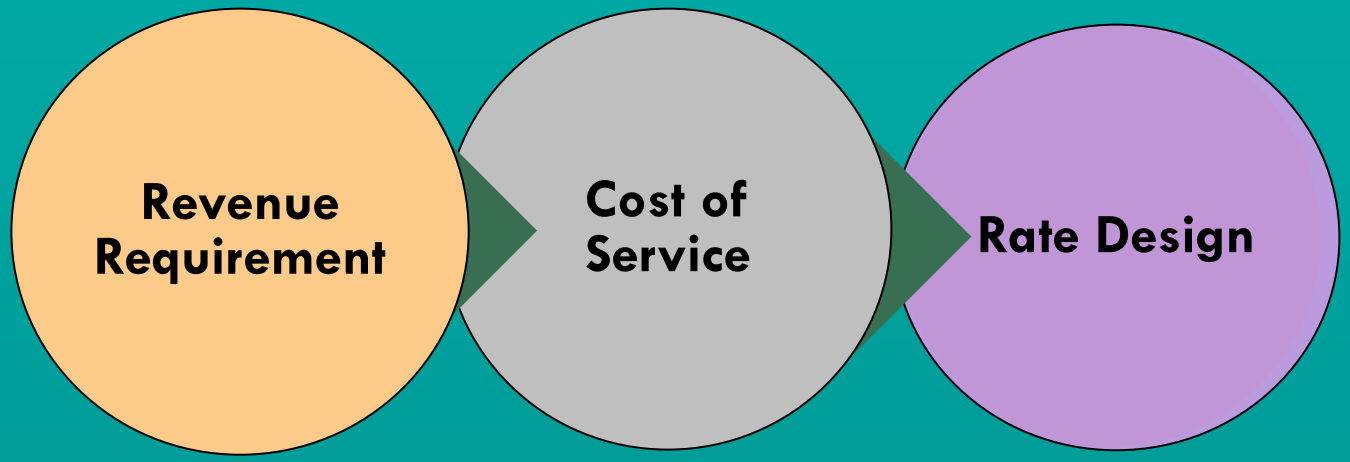
[RCH Section 7-109 Rates, Revenues and Appropriations]

COST-BASED RATEMAKING IS INTENDED TO SUPPORT 3 KEY OBJECTIVES FOR UTILITIES

- Provide sufficient funding to build, operate, maintain and reinvest
- Provide safe and reliable drinking water and fire protection
- Allow for economic development and community sustainability

[American Water Works Association Manual M1, Principles of Water Rates, Fees and Charges, 6th Edition, 2012]

THREE PRIMARY STEPS OF RATE MAKING

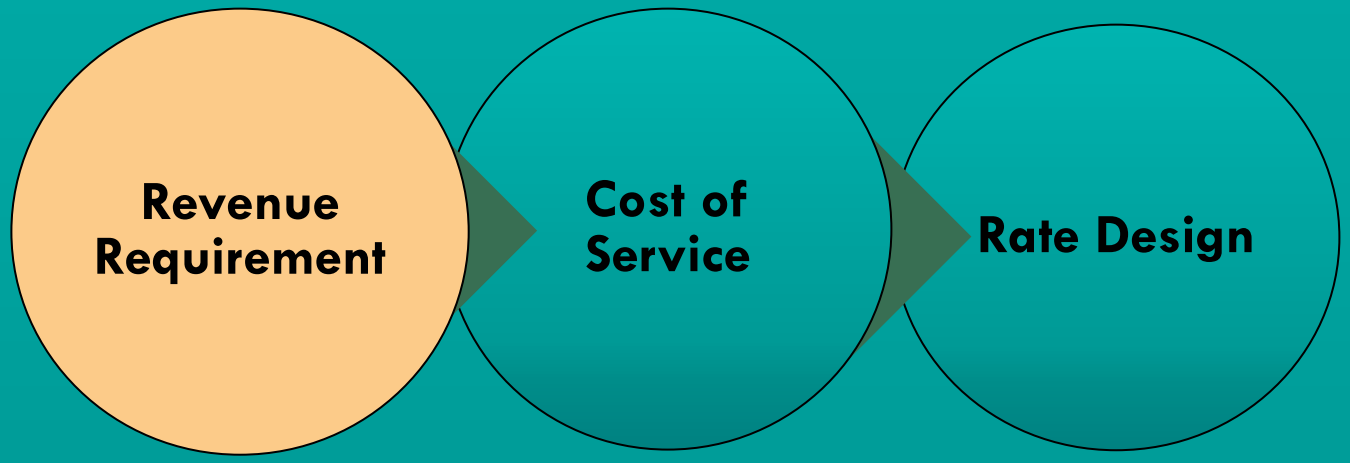


Compare revenue with operating and capital costs

Identify differences in costs to serve each of the customer classes

Consider level and structure of rate design for each class of service

THREE PRIMARY STEPS OF RATE MAKING



Compare revenue with operating and capital costs

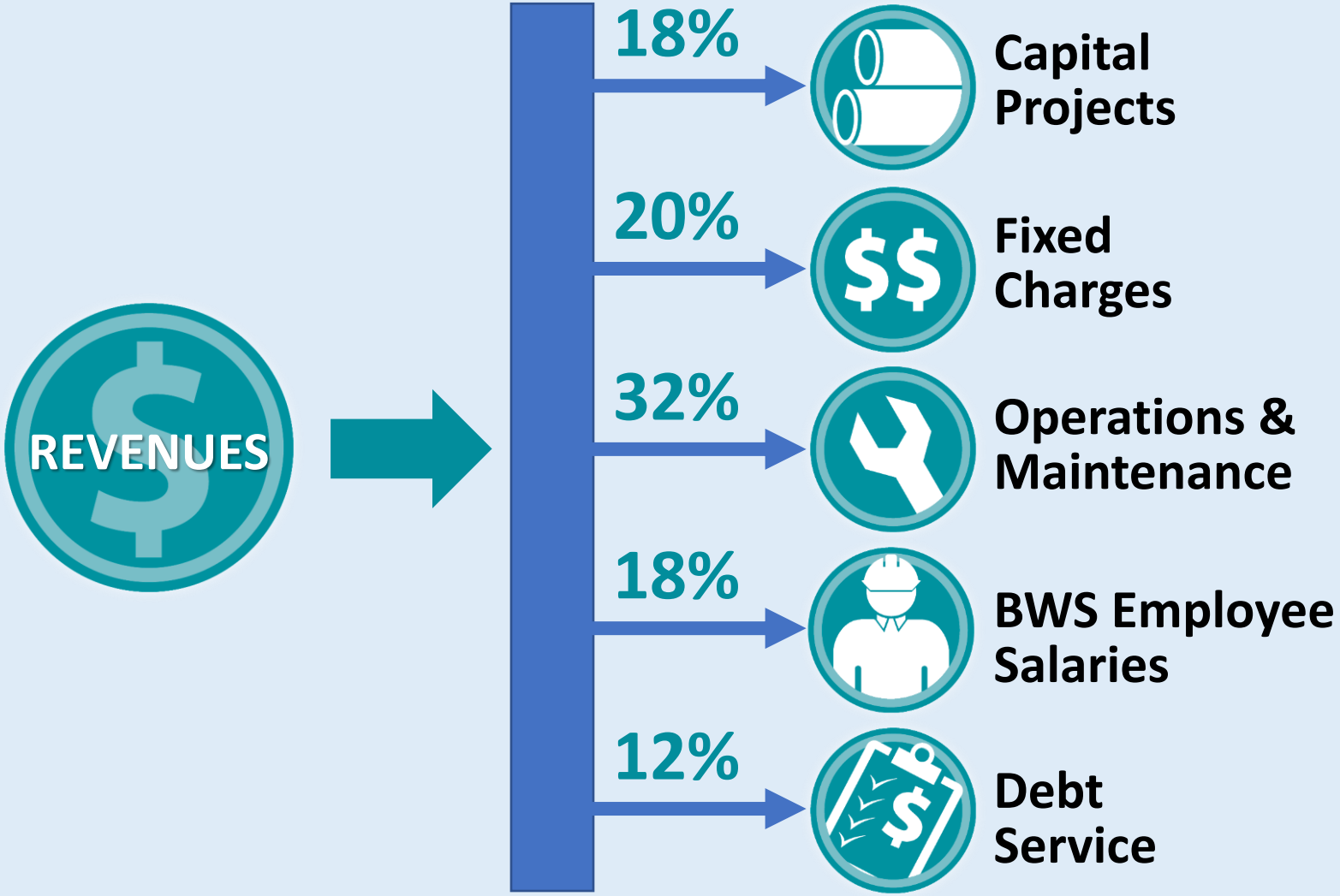
Identify differences in costs to serve each of the customer classes

Consider level and structure of rate design for each class of service

4 MAJOR DRIVERS OF REVENUE REQUIREMENT AND RATES

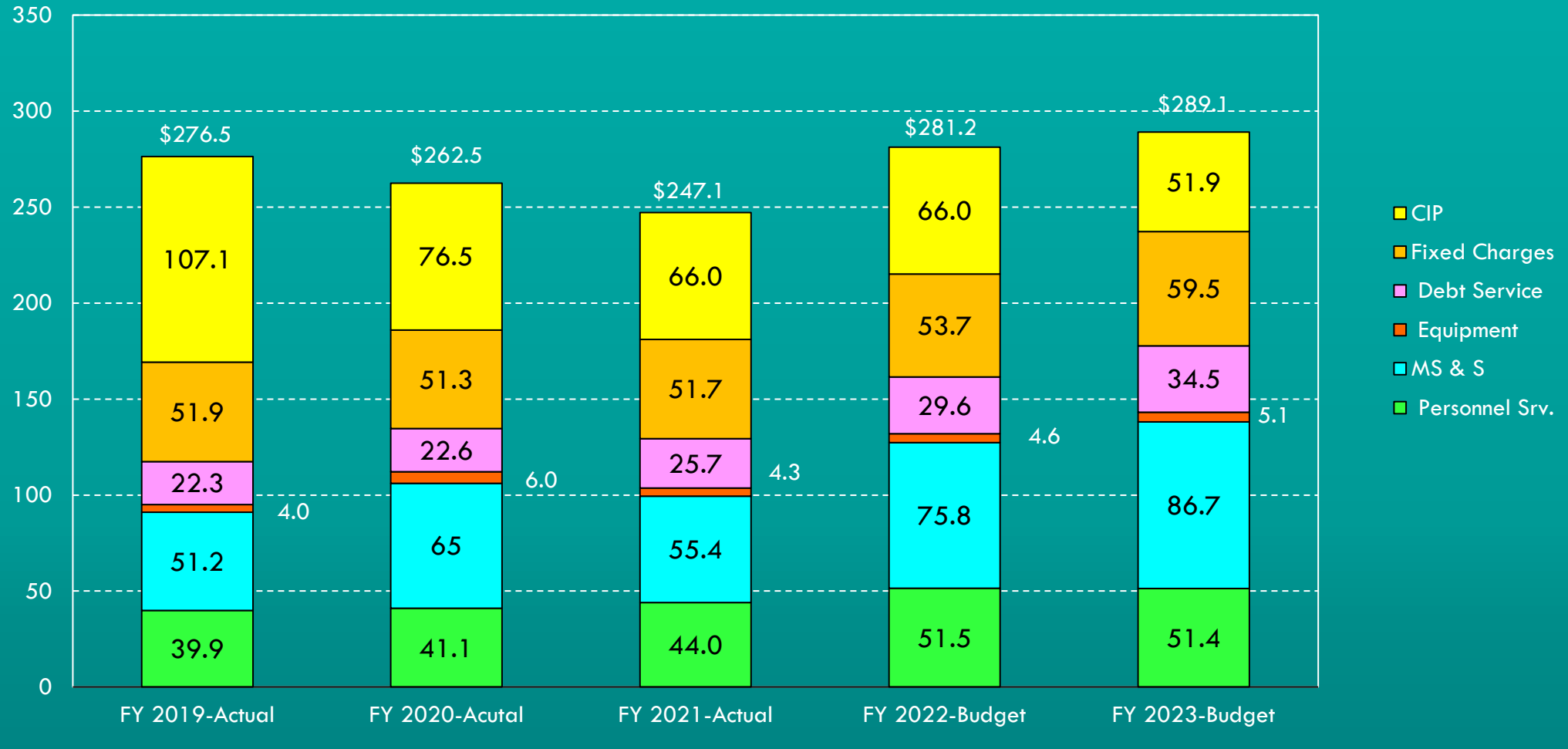
Operations & Maintenance	Operations and maintenance costs
Capital Expenses Paid in Cash vs. Debt	How the Capital Improvement Program is financed
Reserves and Working Capital	Financial policies for credit ratings and stability
Trends and Risks	Preparedness to respond to changing trends and risks

All Revenues Go to Operations, Improvement, and Growth of Water System



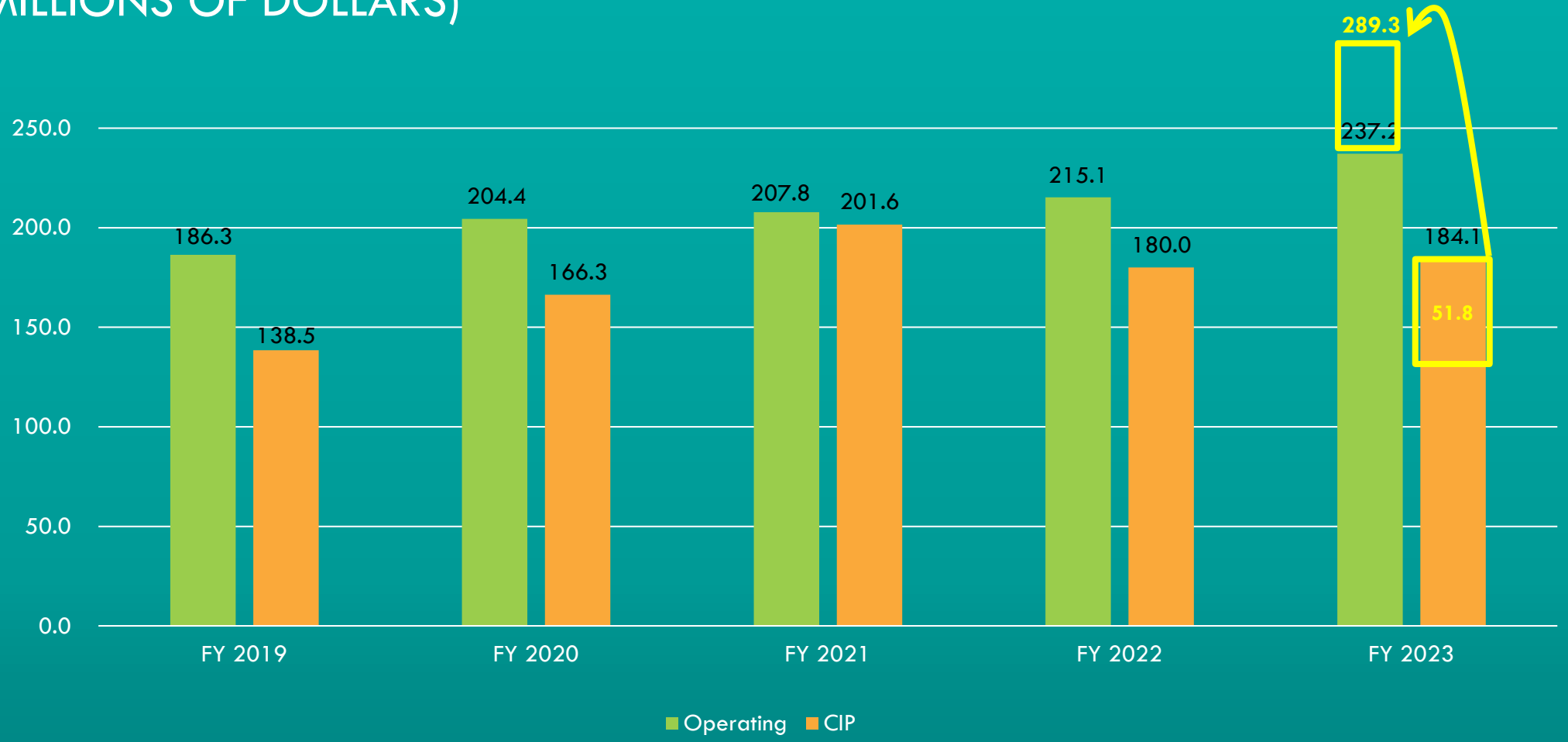
REVENUE REQUIREMENT

OPERATING FUND EXPENDITURES (MILLIONS OF DOLLARS)

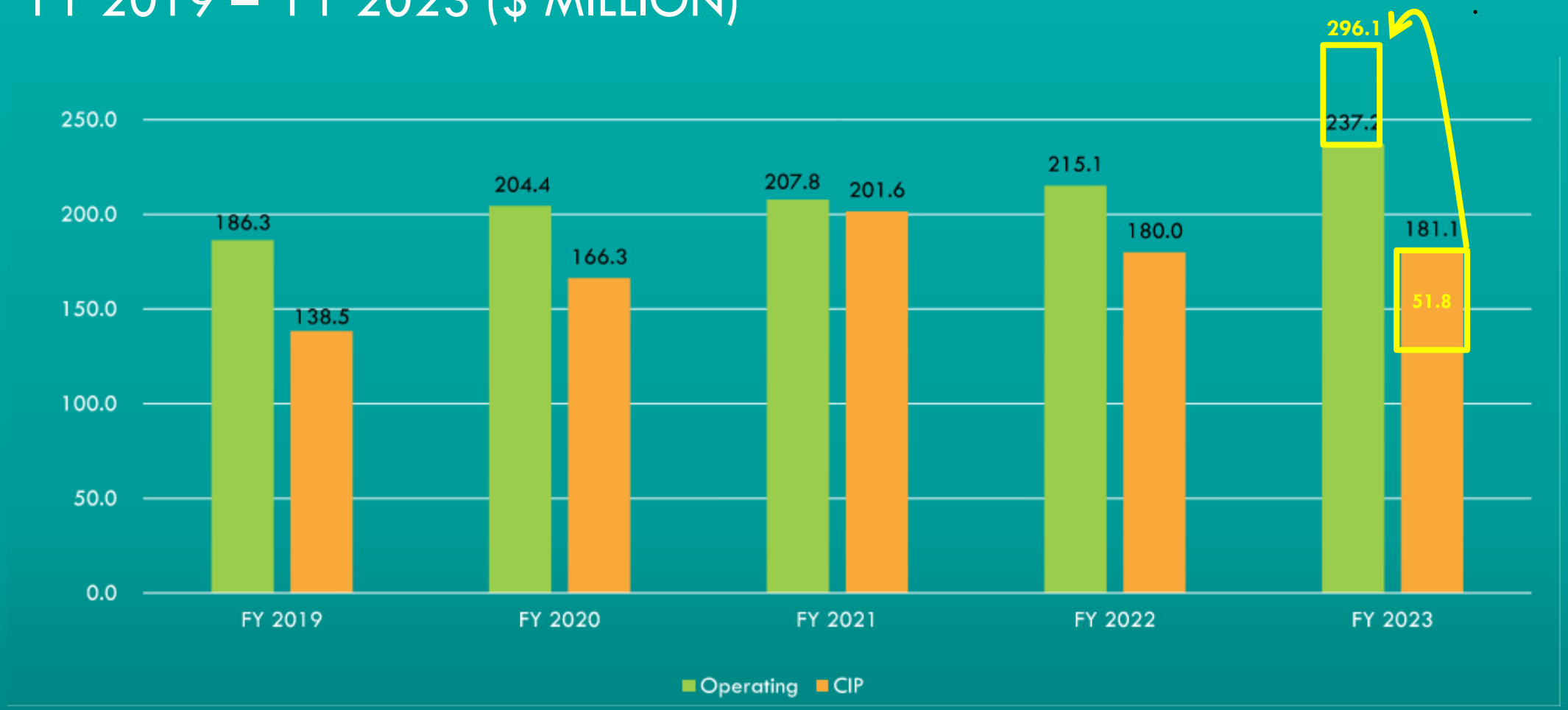


OPERATING & CIP BUDGETS FY 2019 – FY 2023

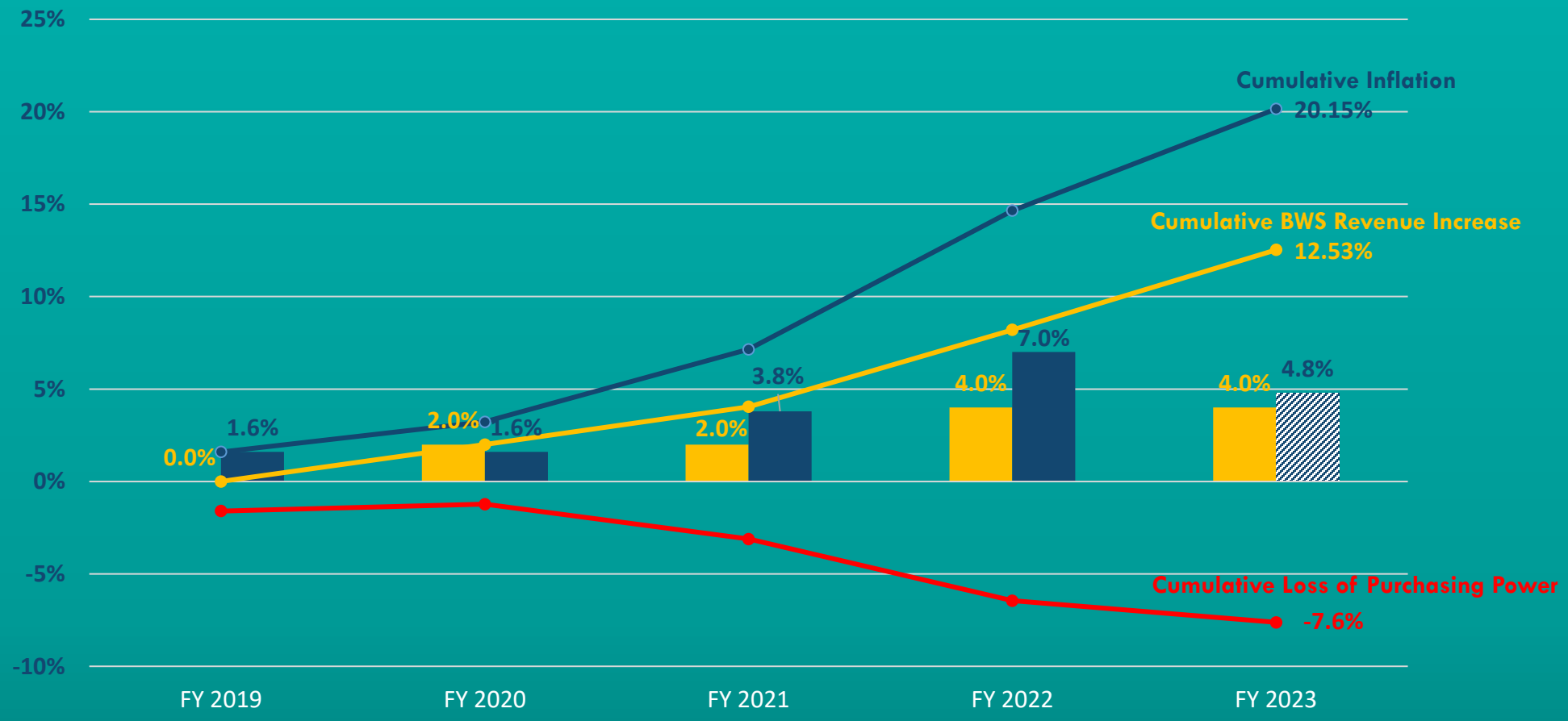
(MILLIONS OF DOLLARS)



OPERATING AND CIP BUDGETS
FY 2019 – FY 2023 ($ MILLION)



INFLATION'S IMPACT ON PURCHASING POWER



Annual Inflation Rate

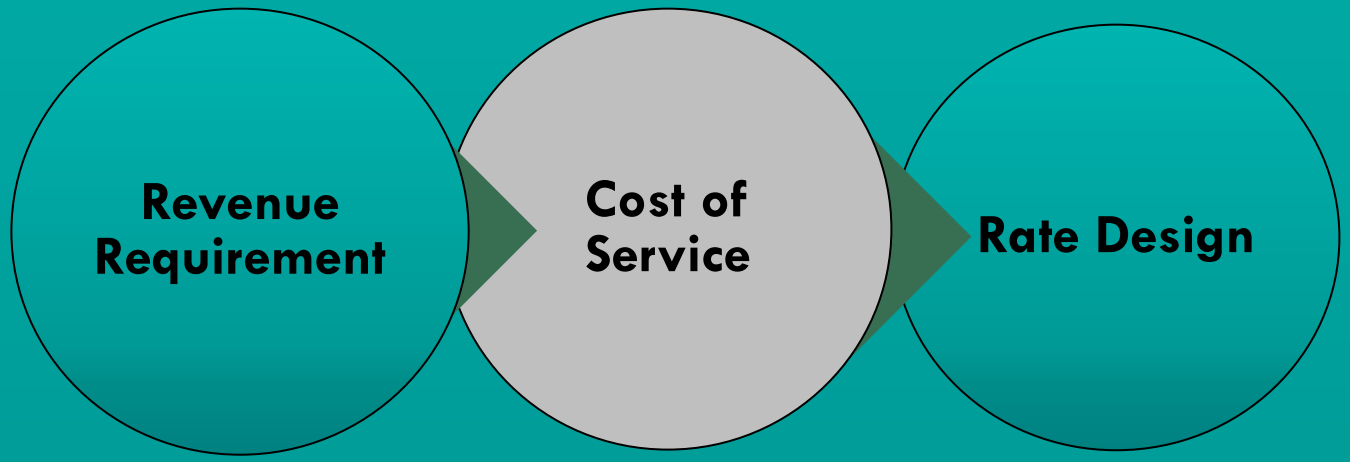
BWS Annual Revenue Increase

Inflation data/projections from UHERO, Sept. 2022

RED HILL RESPONSE REQUIRES INVESTMENTS IN NEW BWS FACILITIES IN EXCESS OF $200 MILLION

- Monitoring wells for information on how the contamination is moving and exploratory wells to find new sources outside of its path - $30 million
- Replace 17.5 million gallons per day of potable water well pumping capacity - $195 million
- Potential additional capital costs yet to be determined
- Does not include any potential increases to Operations & Maintenance costs
- Cost recovery from Navy is undetermined
- BWS has requested assistance from Hawaii Congressional Delegation

THREE PRIMARY STEPS OF RATE MAKING



Compare revenue with operating and capital costs

Identify differences in costs to serve each of the customer classes

Consider level and structure of rate design for each class of service

COST OF SERVICE DEFINED

A Cost of Service (COS) analysis determines the cost of providing water service to each distinct customer class, following guidelines from the AWWA Manual M1: *Principles of Water Rates, Fees and Charges.*

- Compare costs to rate-based revenue
- Show the impact of the rate structure on varied customer classes
- Inform rate policies and decisions about the rate structure

COST OF SERVICE IS BASED ON:

- BWS annual operation and maintenance expenses
- BWS capital-related costs
- Customer's quantity of water used
- Customer's use and stress of the system
- Number of services to each customer class
- Size of customer services (i.e. meter size)

COST OF SERVICE CONSIDERS DIFFERENCES AMONG BWS'S CUSTOMER CLASSES

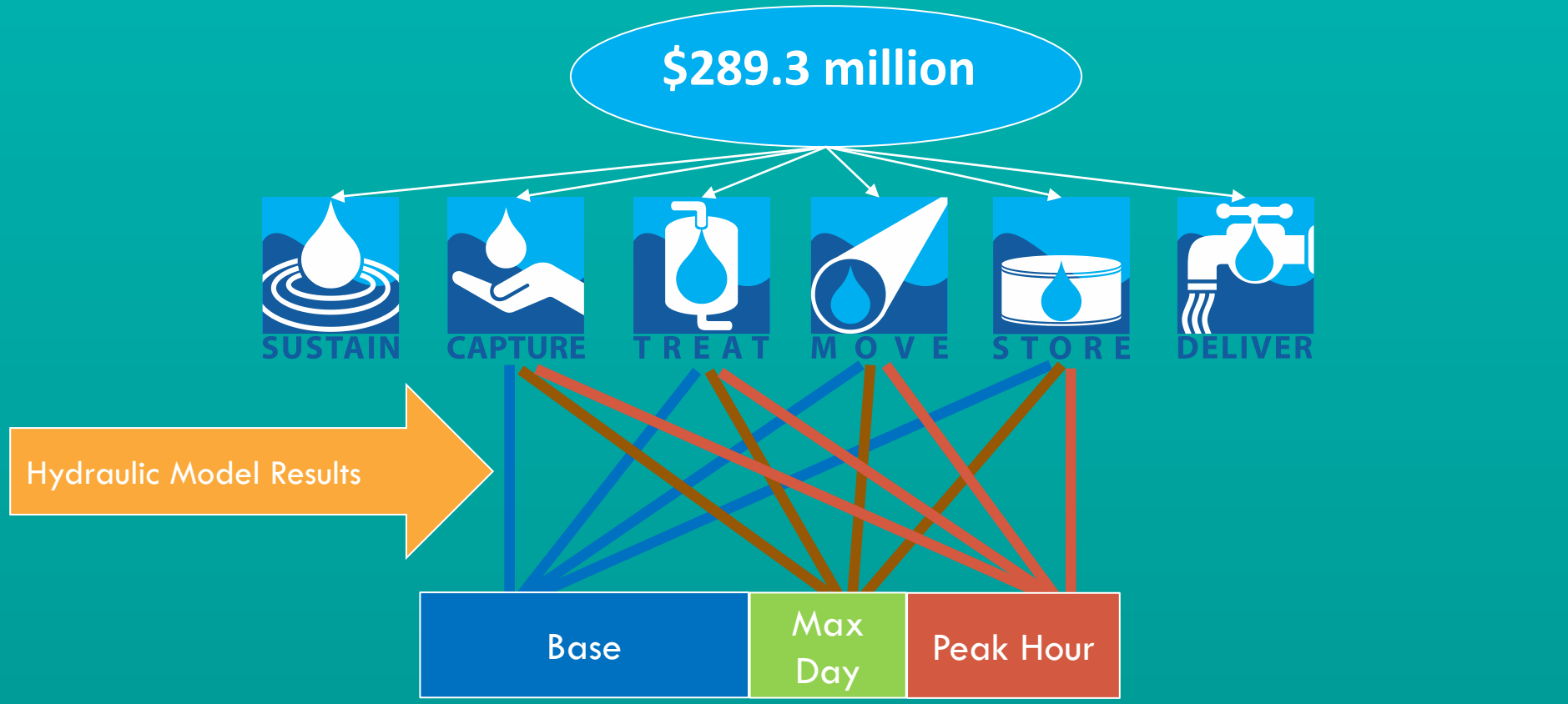
Single-family

Multi-family

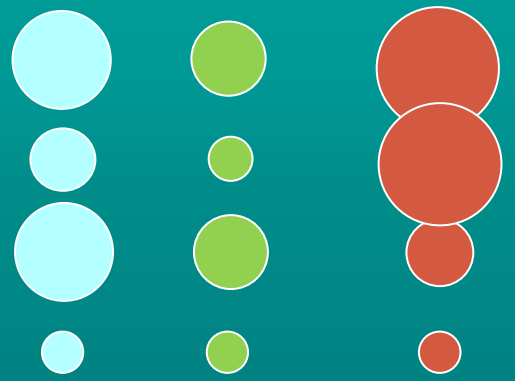
Commercial/Industrial

Agricultural

THE ASSESSMENT PROCESS

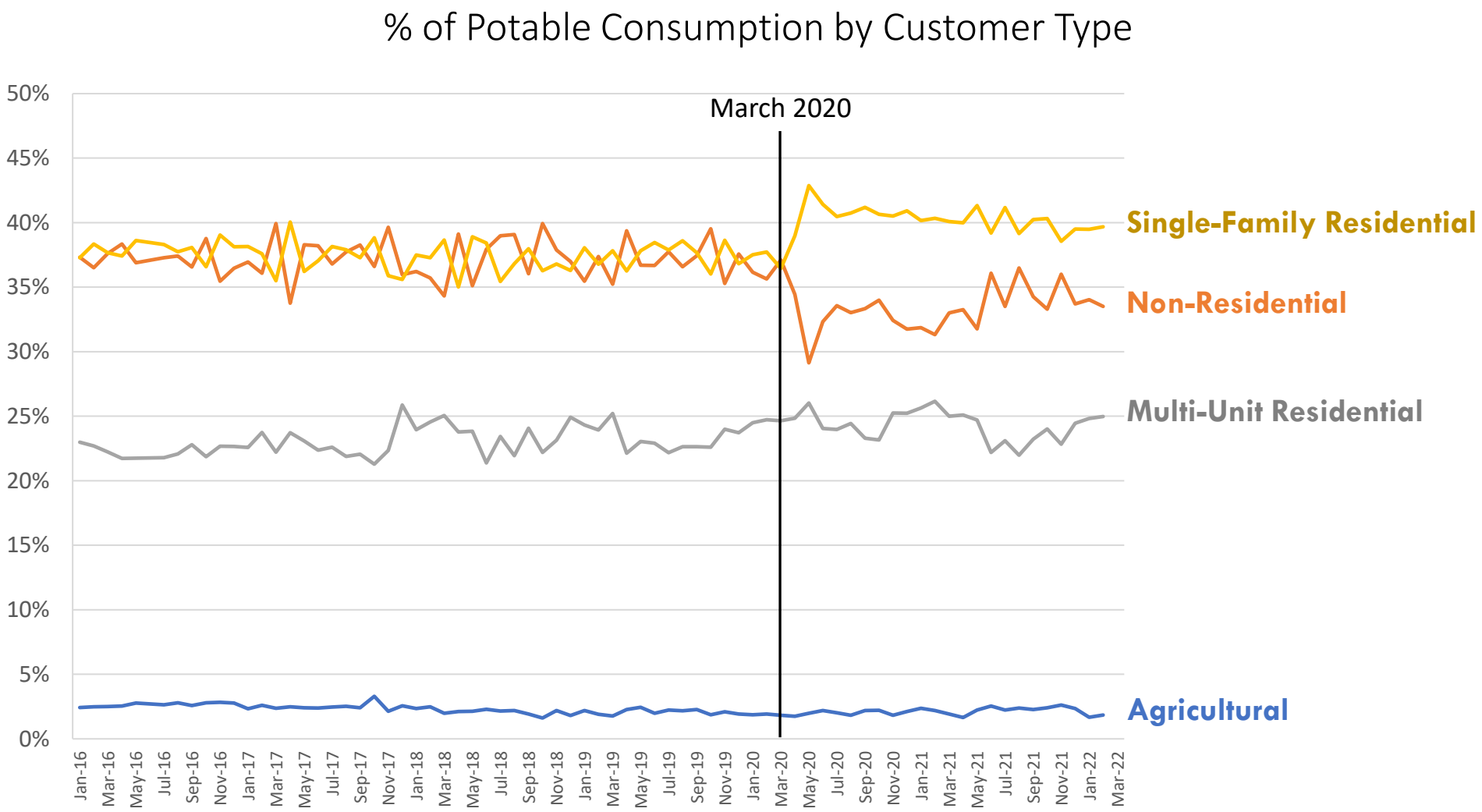


Single-Family Residential
Multi-Family Residential
Non-Residential
Agricultural

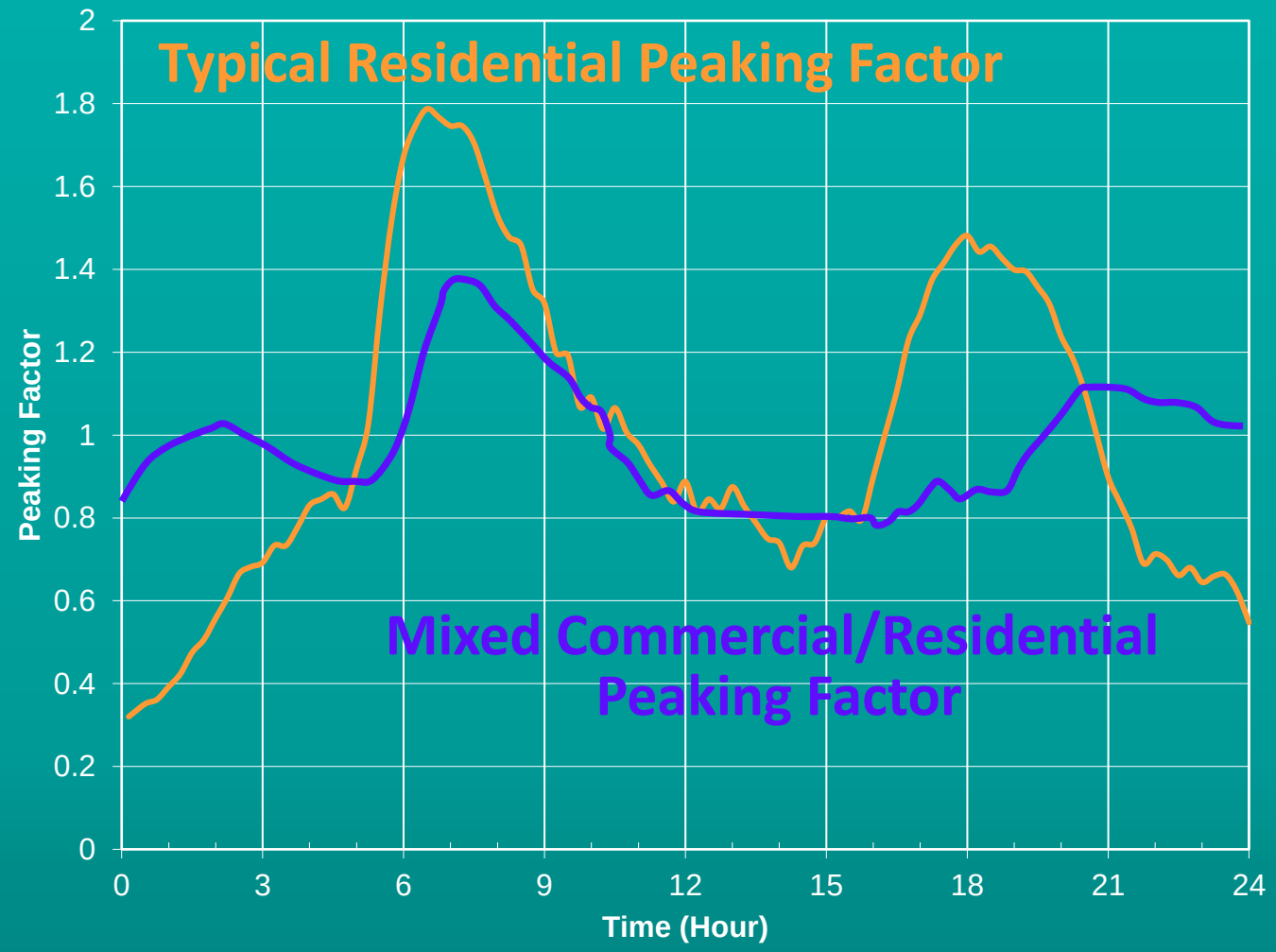


Billing Data & Engr. Judgement

COVID-19 CAUSED CHANGES IN CUSTOMER WATER USE PATTERNS



RESIDENTIAL PEAKING FACTORS ARE HIGHER THAN OTHERS



COVID-19 PANDEMIC HAS IMPACTED WATER USE PATTERNS

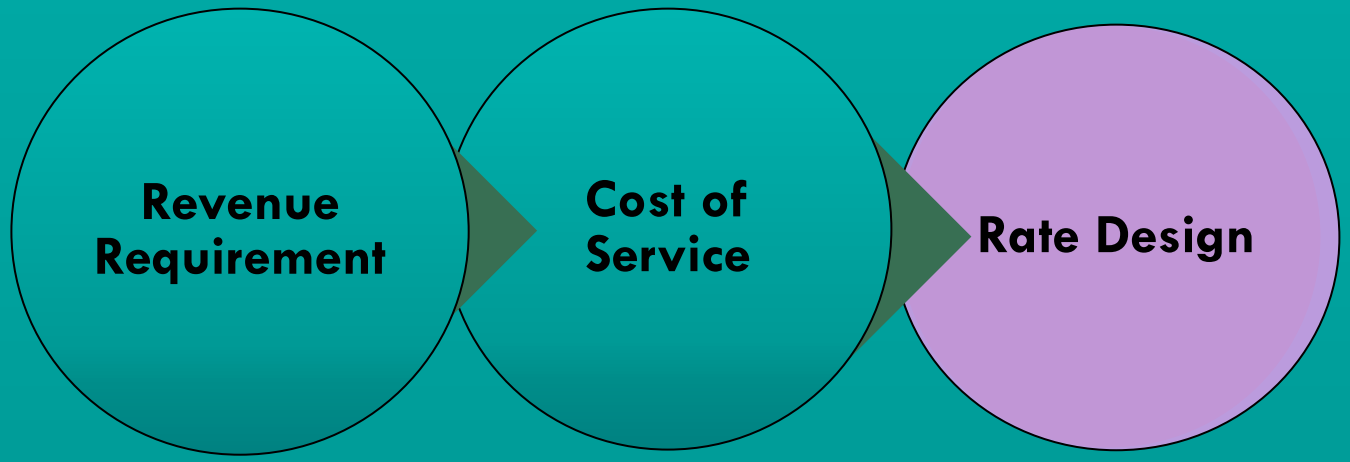
- Non-residential consumption has decreased
- Residential consumption has increased and offset non-residential decreases
- Peaking factor changes are inconsistent
- Current conditions are transient, appears to be a trend towards pre-COVID usage patterns
- Basing cost of service analysis on current conditions would likely increase the cost of service allocated to single-family residential customers

Recommendation: Maintain existing cost of service allocations until water use patterns impacted by COVID-19 stabilize

ADJUSTMENTS TO COST OF SERVICE FROM PREVIOUS RATE STUDY

Customer Class	Cost of Service Recovery FY 2019	Implemented Recommendation
Single-Family Residential	90%	About 95% recovery by FY 2023
Multi-Unit Residential	109%	Bring down to 100% by FY 2023
Agricultural	60%	Maintain 60%
Non-Potable	77%	Bring to 80%
R-1	70%	Maintain about 70%
RO	55%	Bring to about 63%
Non-Residential	120%	Balance downward and provide source of funds for community values

THREE PRIMARY STEPS OF RATE MAKING



Compare revenue with operating and capital costs

Identify differences in costs to serve each of the customer classes

Consider level and structure of rate design for each class of service

TIERED **RESIDENTIAL** WATER RATES

Single-Family

Tier	Gallons/ du/month	Current Rate
1 - EssN	0 to 2,000	$4.46
2	2,001 to 6,000	$5.25
3	6,001 to 30,000	$5.85
4	More than 30,000	$9.25

Multi-Unit

Tier	Gallons/ du/month	Current Rate
1 - EssN	0 to 2,000	$3.77
2	2,001 to 4,000	$4.43
3	4,001 to 10,000	$5.03
4	More than 10,000	$5.98

EssN – Essential needs
Rates are in $ per thousand gallons
du – dwelling unit

NON-RESIDENTIAL WATER RATES

Flat Rate
$5.27

Examples: hotels, restaurants, government, shopping centers, hospitals, retail

AGRICULTURAL WATER RATES

Tier	Gallons/ du/month	Current Rate
1 - EssN	0 to 2,000	$4.46
2	2,001 to 6,000	$5.25
3	More than 6,000	$2.12

EssN – Essential needs
Rates are in $ per thousand gallons
du – dwelling unit

NON-POTABLE AND RECYCLED WATER RATES

Type	Current Rate
Non-Potable	$2.90
R-1 Golf	$0.65
R-1 Other	$1.96
RO	$6.36

Rates are in $ per thousand gallons

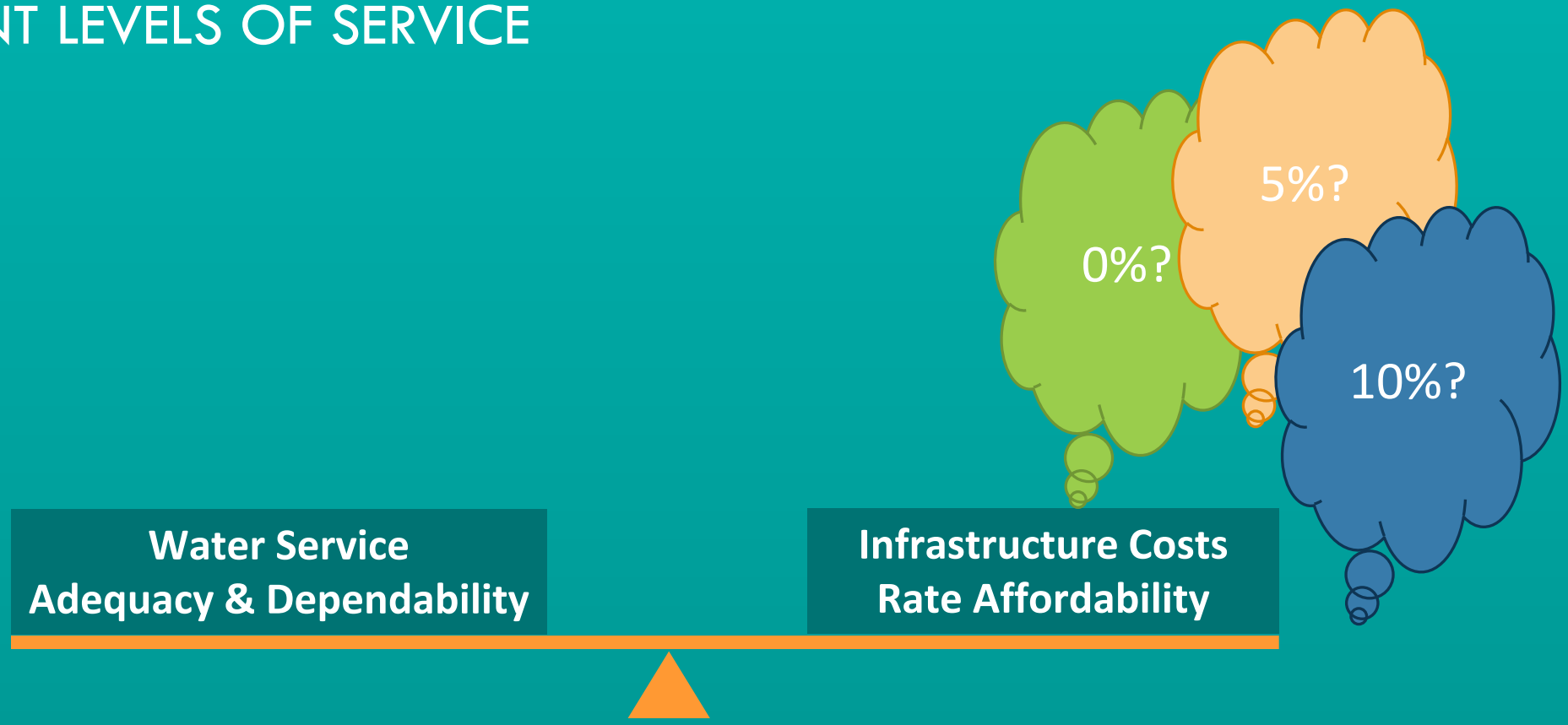
CONTINUE CURRENT SUBSIDIES?

Lower rates for
local agriculture

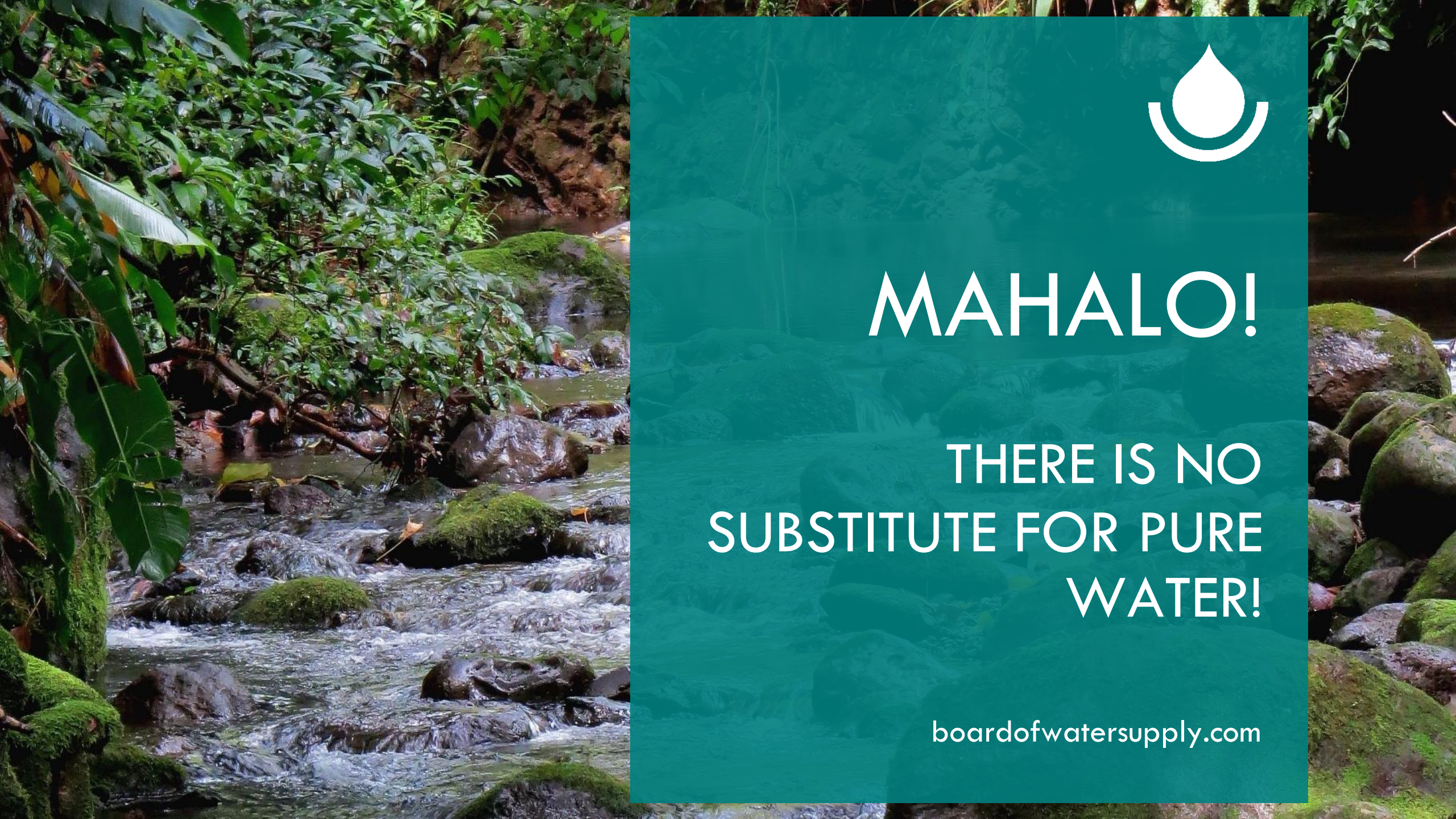
and recycled water

MAINTAIN FEE WAIVERS?

RATE INCREASES WILL BE REQUIRED TO MAINTAIN CURRENT LEVELS OF SERVICE



QUESTIONS / DISCUSSION



MAHALO!

THERE IS NO SUBSTITUTE FOR PURE WATER!

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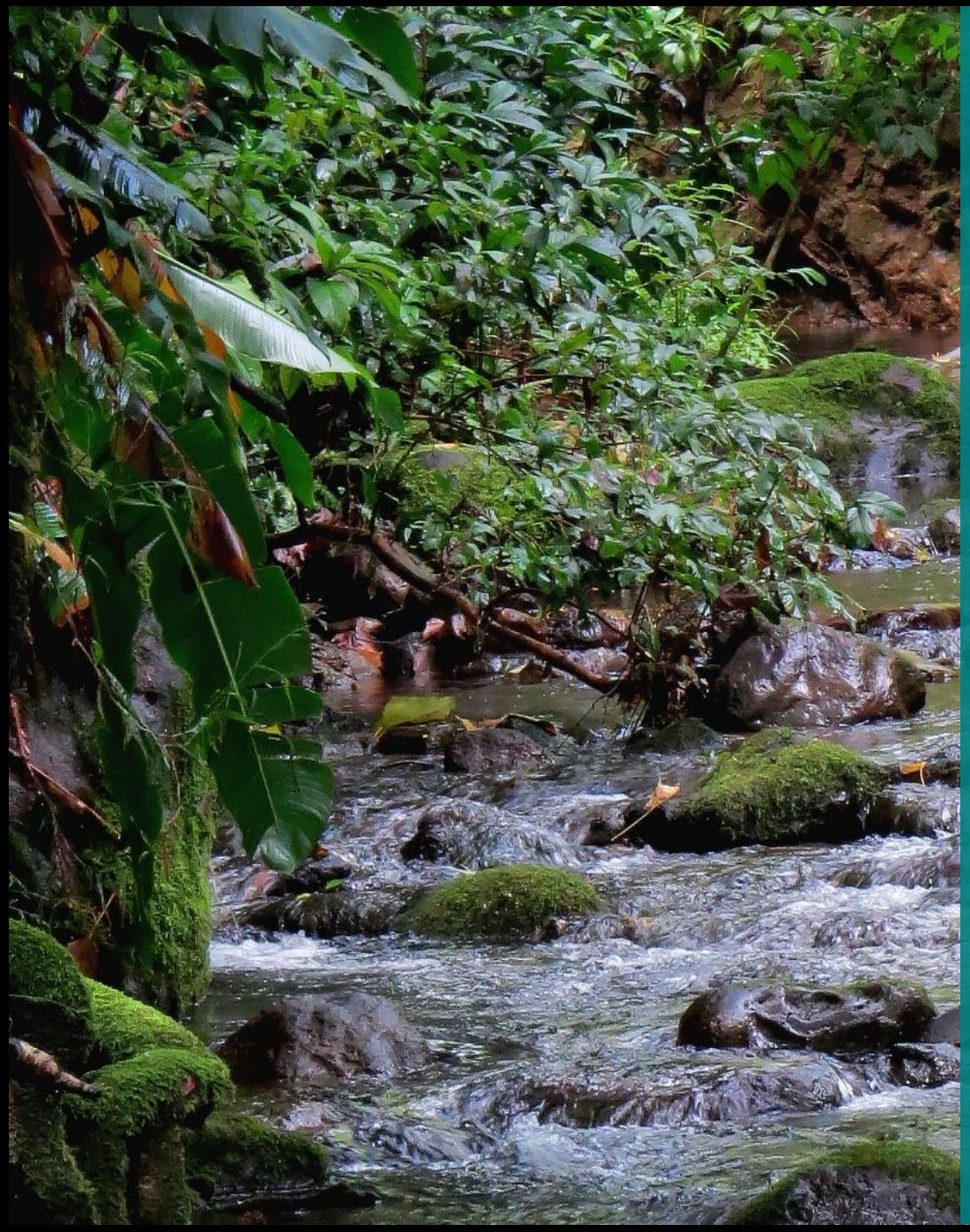
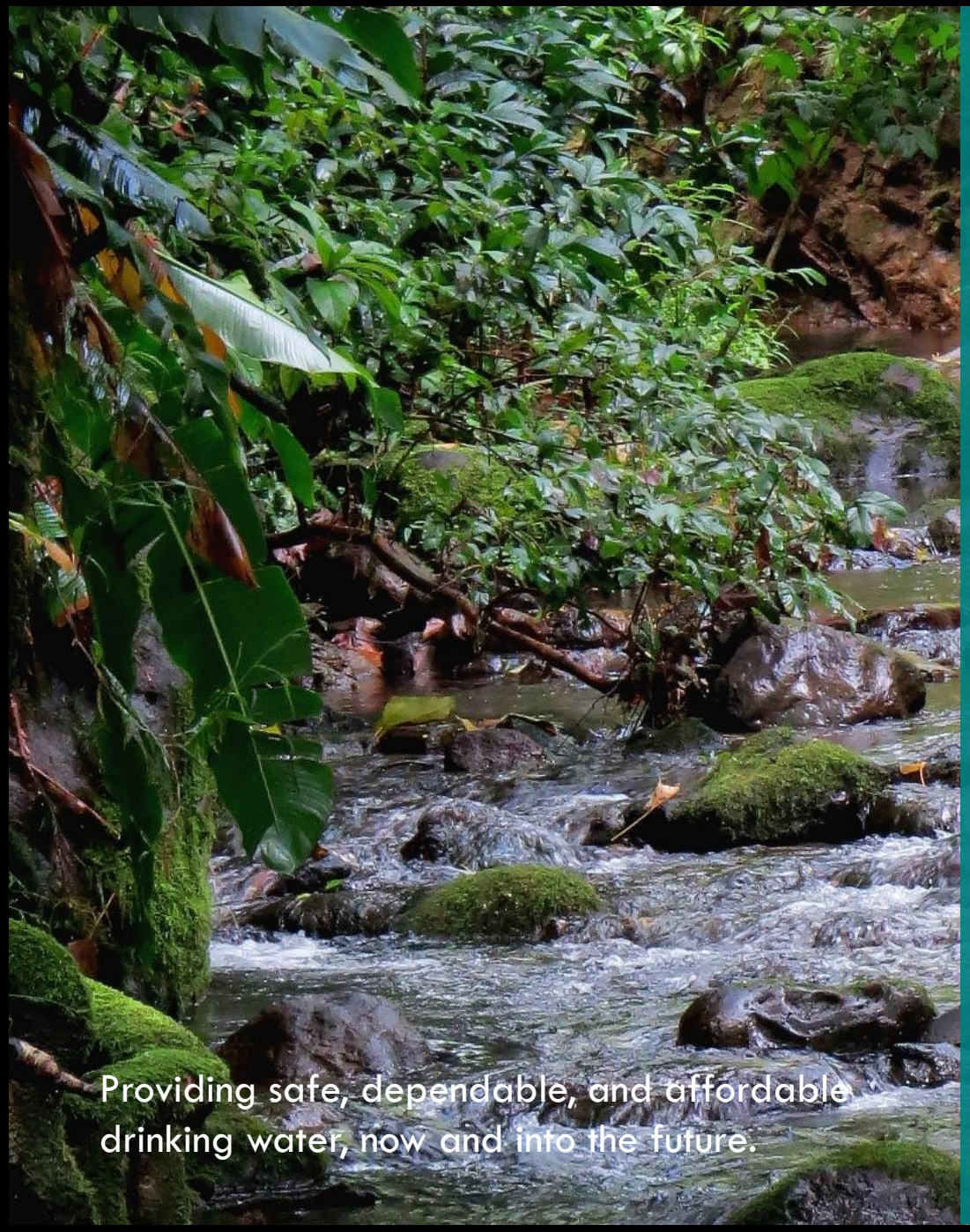


BWS UPDATES

Ernest Lau
Manager and Chief Engineer
October 20, 2022
boardofwatersupply.com

QUESTIONS / DISCUSSION



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

Mahalo!

UPCOMING STAKEHOLDER ADVISORY GROUP MEETINGS

2023

- Thursday, January 19, 2023
- Thursday, April 20, 2023
- Thursday, July 20, 2023
- Thursday, October 19, 2023