



HAWAI'I COMMUNITY FOUNDATION
Amplify the Power of Giving

Planning for Hawaii's Fresh Water Security



Dana Okano, PhD, AICP
Hawai'i Congress of Planning Officials
September 12, 2019



HCF's Role

- **Trusted Convener**
- **Complex Issue and Resource**
- **Coordinate Action**



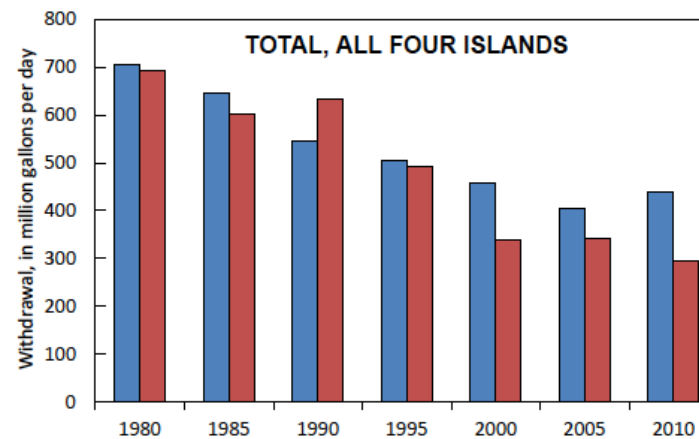
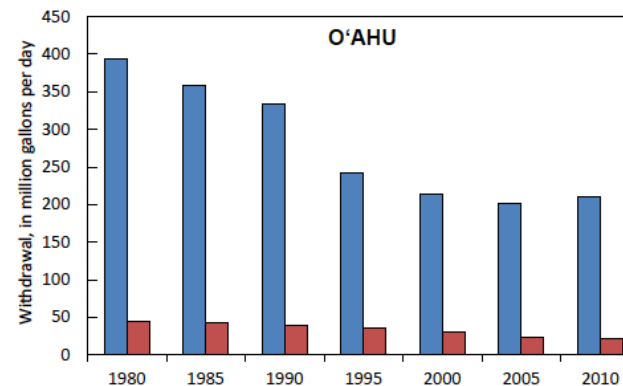


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Reliance on Groundwater

Aquifers provide 90% of all water used on O'ahu and 60% on 4 largest islands



Data from: Commission on Water Resource Management

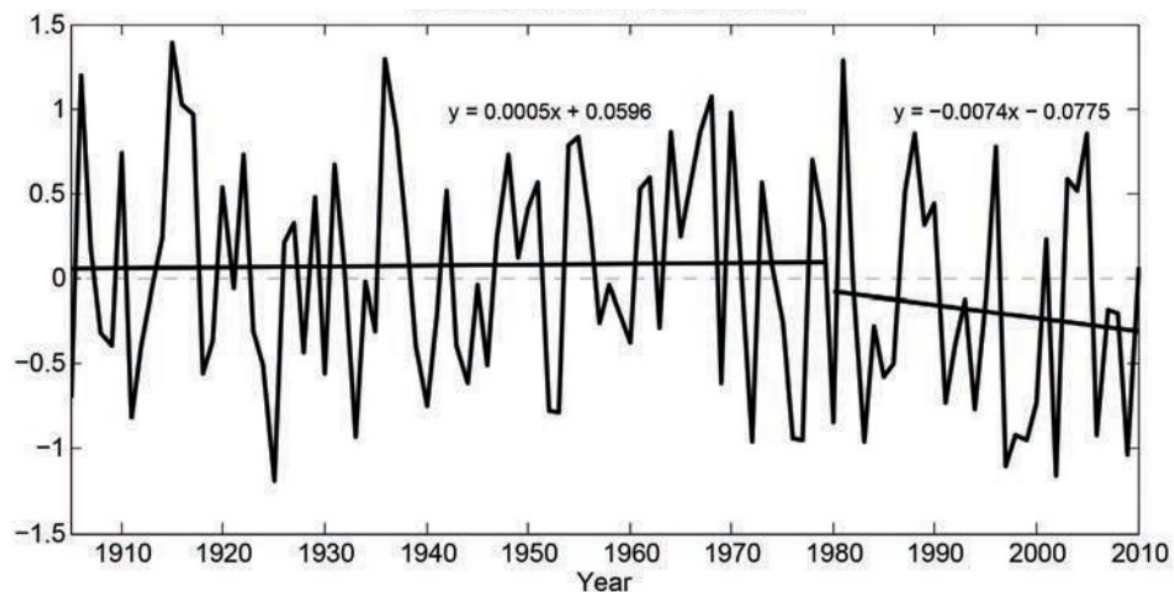


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Less Rain

**22% Decrease in
Hawai'i Rainfall
1980-2010**

Time series of Hawai'i Rainfall Index (HRI) anomalies



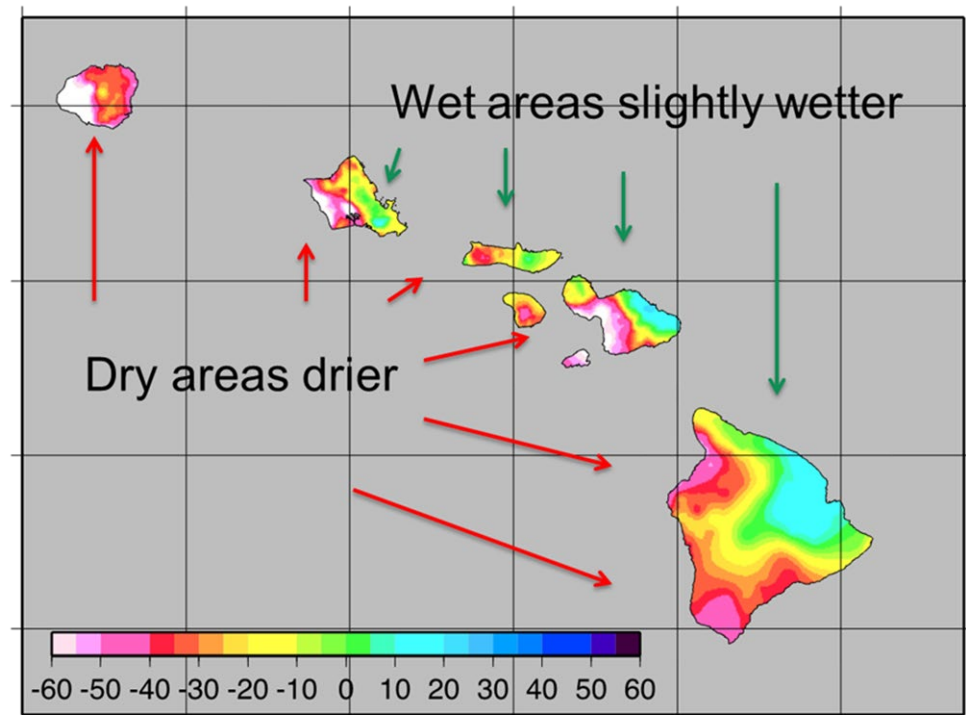
Keener and others, 2012





Projected Rainfall

Models differ, but
climate impacts are
expected to be
significant



CMIP5 ECP8.5 ensemble median scenario for late 2071-2099 average (Elison Timm and others, 2015)



Fresh Water Initiative Advisory Council



Steve Anthony*
Michael Buck
Suzanne Case
Reggie Castanares
Meredith Ching
Ka'eo Duarte
Harold Edwards

Mark Fox
Tom Giambelluca
Yvonne Izu
Tim Johns (Chair)
Ernest Lau
Kaleo Manuel
Keith Okamoto

Jeff Pearson
LeeAnn Silva
Kapua Sproat
Barry Usagawa
Bryan Weinand
Stevie Whalen

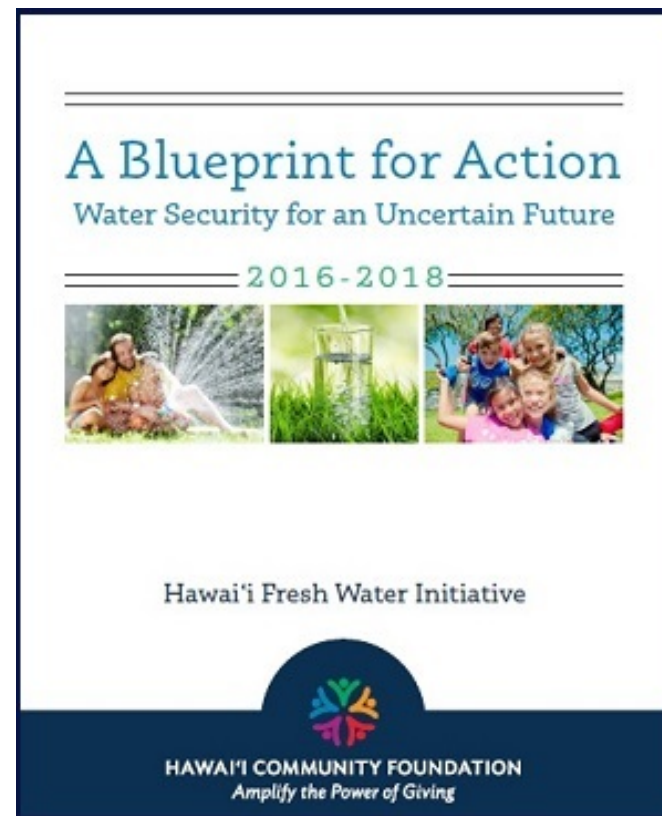


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Goal: Protect Hawai'i's Long-Term Water Supply

“No Net Loss” Goal

To achieve “no net loss” for our current aquifer water stores by creating 100 million gallons per day in additional, reliable, fresh water capacity by 2030.



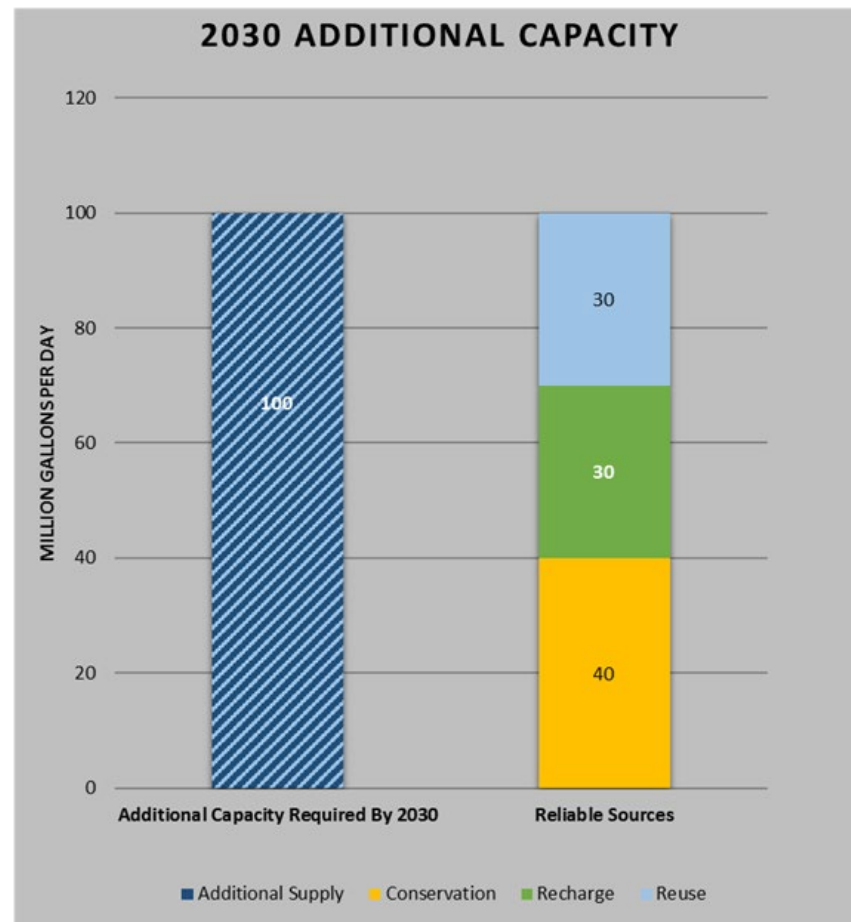


100 MGD How To Get There

Reuse (30 MGD)

Recharge (30 MGD)

Conservation (40 MGD)





Conservation (40 mgd)

Reduce Potable Water Use On Landscape Areas



Encourage Leak Detection Systems

Improve Agricultural Water Efficiency





Recharge (30 mgd)

Implement Green Infrastructure



Enhance and Increase Large
Recharge and Reservoir Areas

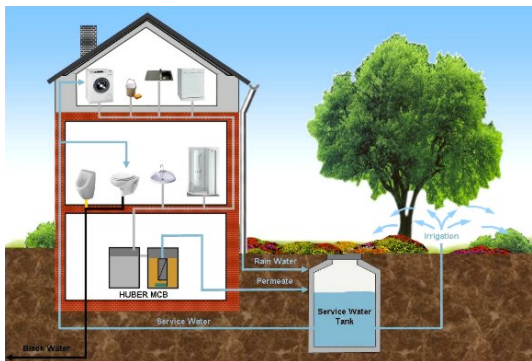
Strengthen and Expand Watershed Partnerships





Reuse (30 mgd)

Revise Water Reuse Guidelines



Increase Greywater Use

Increase Water Reuse for Large Landscape Areas





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Wai Maoli
HAWAI'I FRESH WATER INITIATIVE

Mahalo

Dana Okano, PhD, AICP
Program Director
Hawai'i Community Foundation

dokano@hcf-hawaii.org

Recycled Water Planning Honouliuli Recycled Water System, Ewa, Oahu



Hawaii Congress of Planning Officials Conference
September 12, 2019

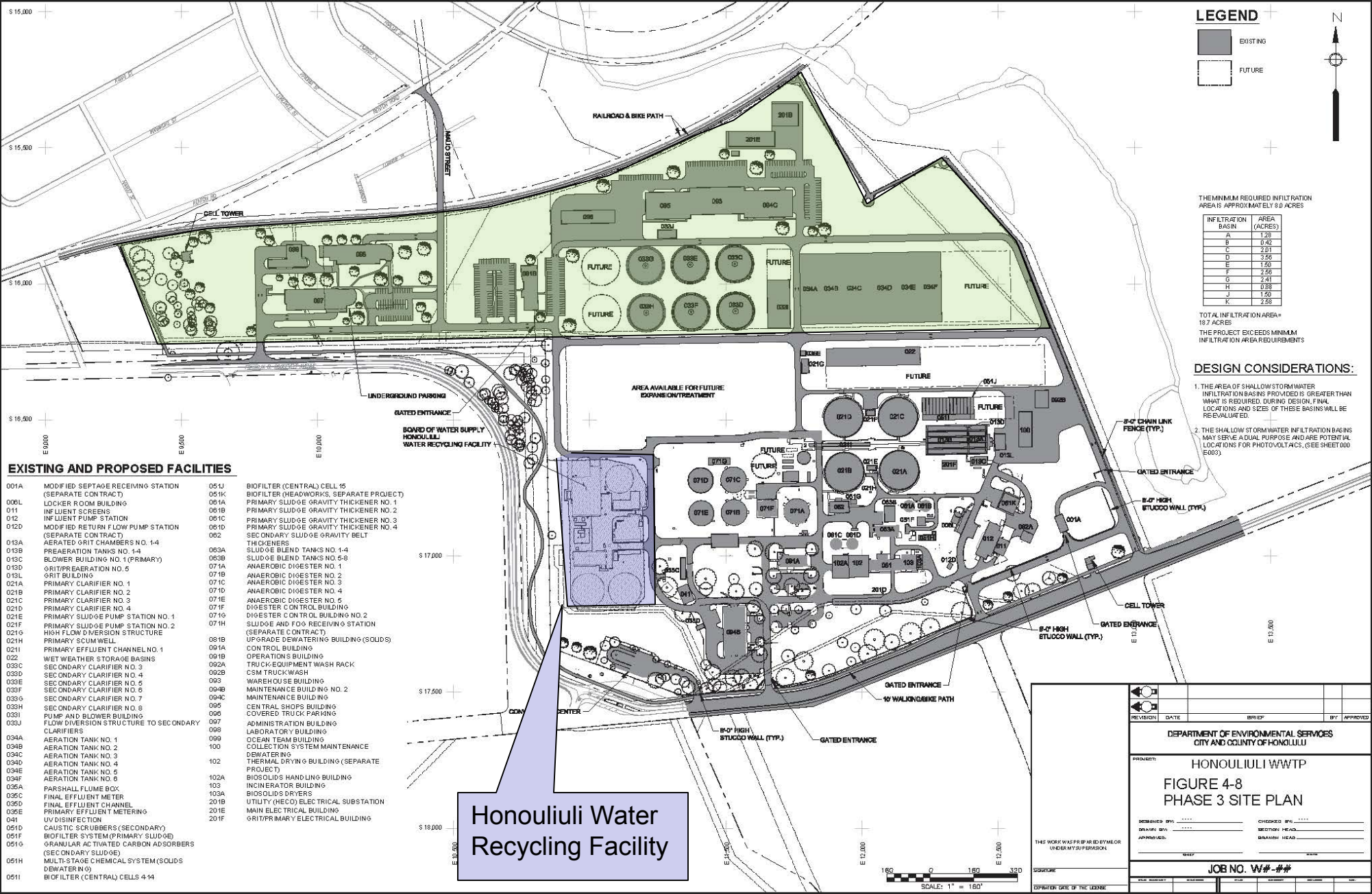
BWS Honouliuli Water Recycling Facility

- Largest in Hawaii
- 12 Million Gallons a Day
 - 10 mgd R-1
 - 2 mgd RO
- Fully Automated
- Department of Health Regulated to 1993 Reuse Guidelines



This aerial photo shows the layout of the Honouliuli Water Reclamation Facility (WRF). The various components of the WRF are highlighted in white, while the secondary treatment processes of the Honouliuli Wastewater Treatment Plant are highlighted in **yellow**.

Honouliuli WWTP Secondary Treatment Improvements, FEIS 2016



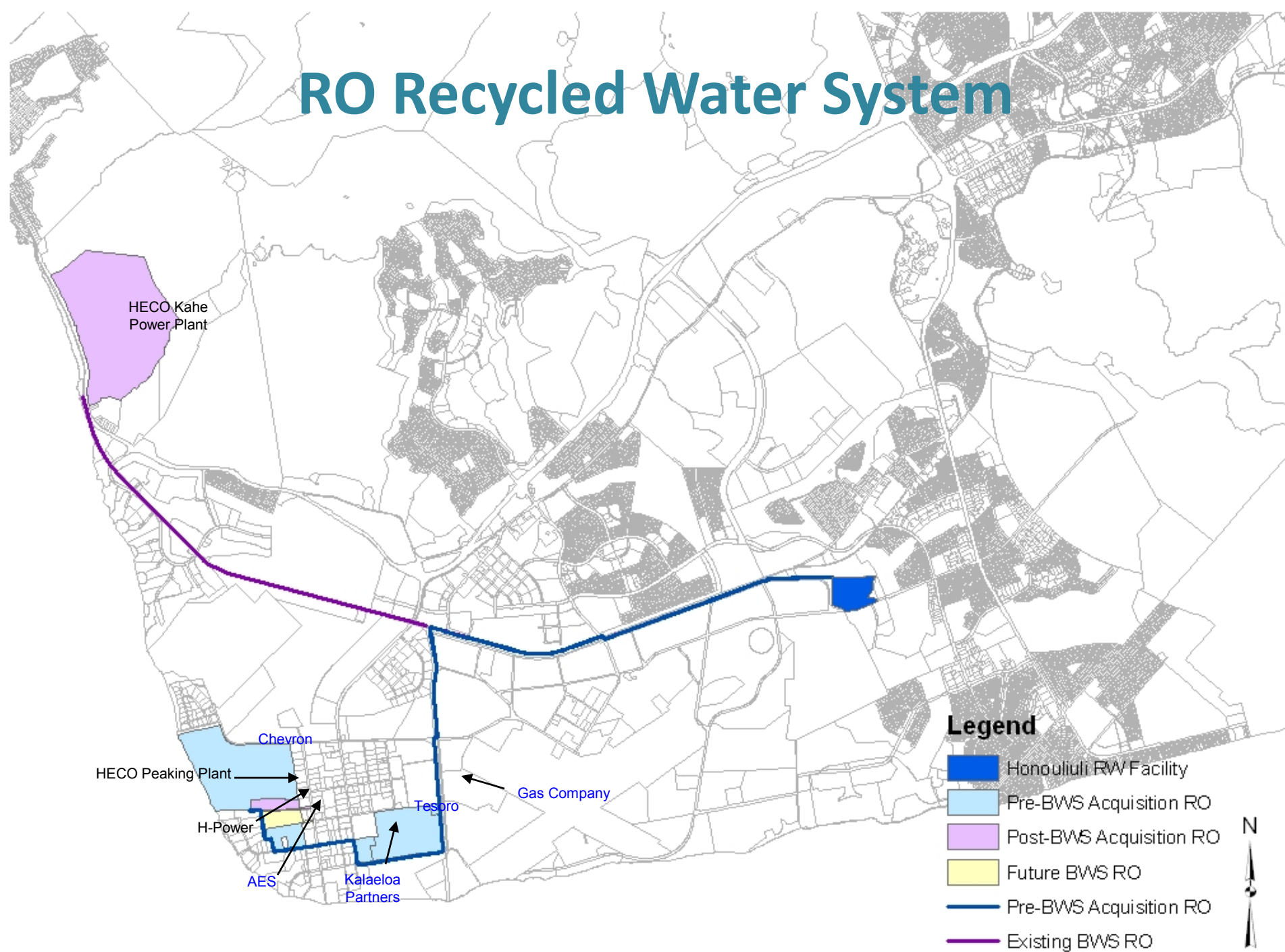
RO Recycled Water Users (1.54 mgd 2017 average use)

- 2 Oil Refineries
 - Chevron (0.32 mgd)
 - Tesoro Refinery (0.42 mgd)
- 6 Power Plants (boiler feed)
 - AES Coal (0.14 mgd)
 - Kalaeloa Cogeneration (0.35 mgd)
 - Hawaii Gas (0.05 mgd)
 - HECO Kahe & Campbell (0.20 mgd)
 - H-Power refuse to energy (0.07 mgd)



H-Power Garbage to Energy Power Plant

RO Recycled Water System

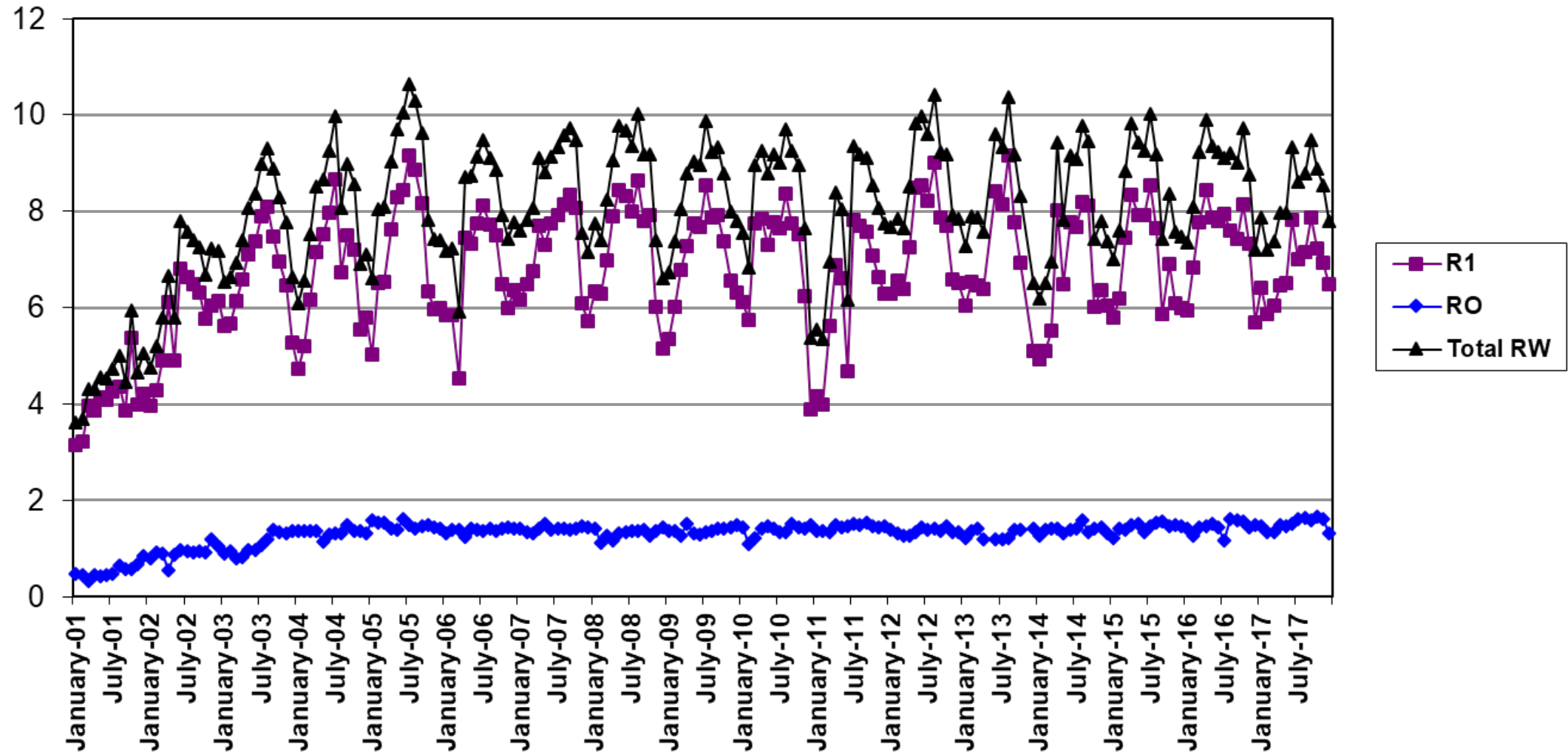


R-1 Recycled Water Users (7.0 mgd 2017 average use)

- Honouliuli WWTP (2.9 mgd)
- 8 Golf Courses
 - Ewa Villages Golf Course & Community (0.70 mgd)
 - West Loch Golf Course & Community (0.45 mgd)
 - Coral Creek Golf Course (0.56 mgd)
 - Barber's Point Golf Course (0.36 mgd)
 - Hawaii Prince Golf Course (0.90 mgd)
 - Hoakalei Country Club (0.23 mgd)
 - Kapolei Golf Course (0.30 mgd)
 - Ewa Beach Golf Course (0.44 mgd)
- Ewa Makai Middle School (0.05 mgd)
- Ocean Pointe District Park (0.02 mgd)
- Fort Weaver Rd - Medial Strip (0.01 mgd)
- Dust Control to various users (0.01 mgd)
- City of Kapolei (0.12 mgd)



BWS Honouliuli R-1 and RO Recycled Water Use 2001-2017



BWS Nonpotable Water Rules & Regulations

Sec. 1-101 Availability of Water

- *Availability of water for large landscaped areas such as golf courses, parks, schools, cemeteries, and highways. If a suitable nonpotable water supply is available, the Department shall require the use of nonpotable water for irrigation of large landscaped areas.*

Sec. 1-112: Use of Nonpotable Water Required for Large Landscaped Areas

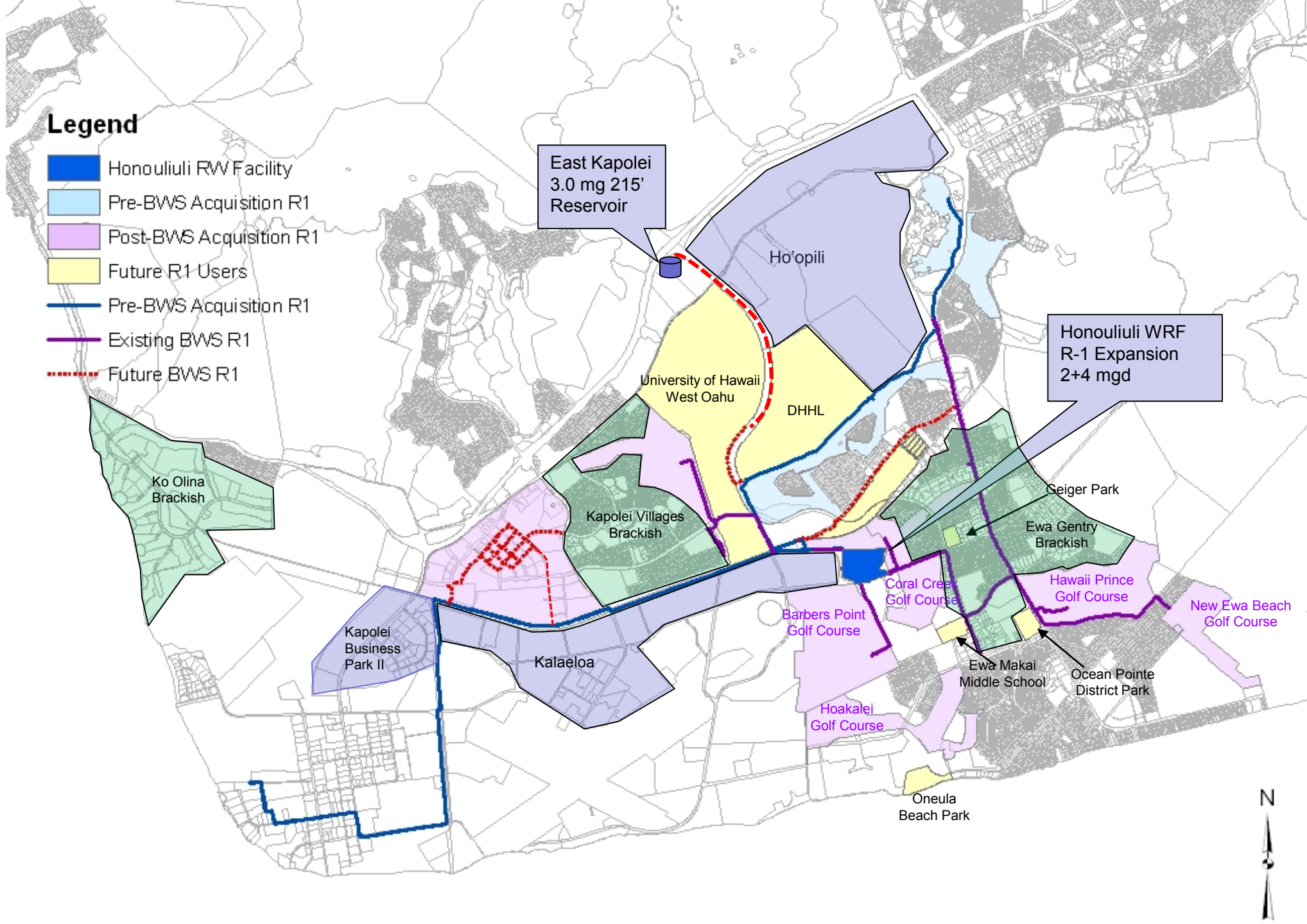
- If the Department determines that a suitable nonpotable water supply is available, the Department shall require existing services to use nonpotable water for irrigation of large landscaped areas such as golf courses, parks, schools, cemeteries, and highways.
- Upon such notification by the Department, the existing service holder(s) has no more than five (5) years to complete the conversion to nonpotable irrigation as may be required by the Department unless otherwise approved by the Manager. Failure to comply with these requirements may result in discontinuation of water service and/or penalties as authorized in Section 2-205, 2b, and Section 5-501 of these Rules and Regulations. Adopted 1991, emphasis added

NOTES:

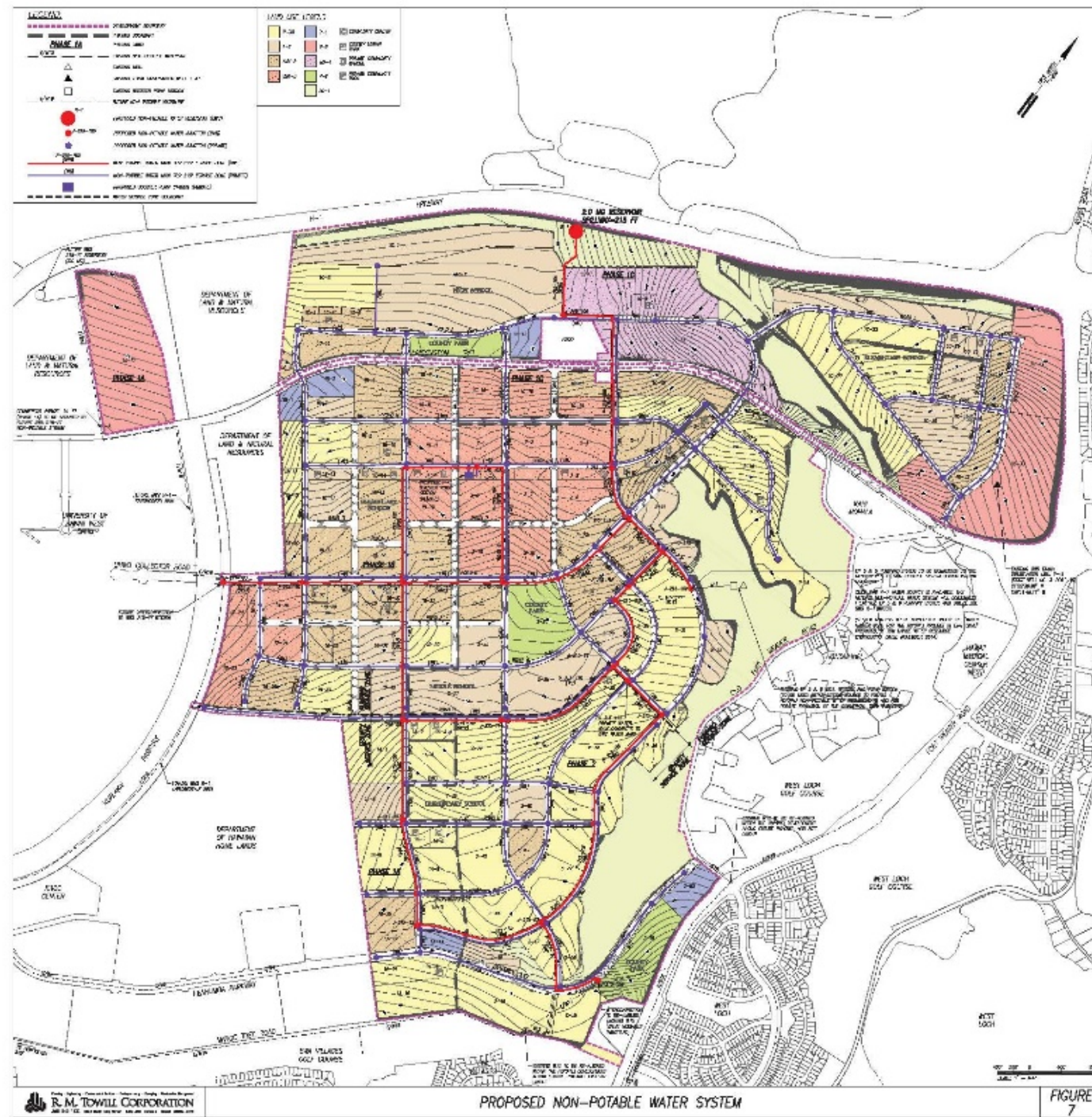
1. PROPOSED NONPOTABLE WATERLINE ALIGNMENTS AND SIZES AND FUTURE RESERVOIR SITES AND CAPACITIES ARE BASED ON PROJECTED USER LOCATION AND DEMAND, SUBJECT TO CHANGE BY BWS DURING PRELIMINARY ENGINEERING AND DESIGN STAGES.

Legend

-  Honouliuli RW Facility
-  Pre-BWS Acquisition R1
-  Post-BWS Acquisition R1
-  Future R1 Users
-  Pre-BWS Acquisition R1
-  Existing BWS R1
-  Future BWS R1



Ho'opili R-1 Water Master Plan 2015





2018 Water Reuse Task Force Report (HCR 86 SD1)

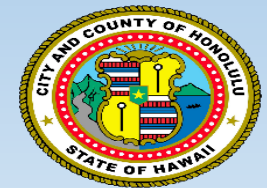
- Establish mandatory recycled water use zones
- Upgrade Water Reuse Guidelines
- Allow groundwater recharge with RW
- Recharge aquifers with runoff and RW
- New DOH positions
- Explore waivers for R-1 backup disposal and storage
- Explore Federal funding opportunities
- Mandate use of recycled water where available
- Allow residential R-1 use
- Encourage gray water reuse
- Demonstration Projects



2019 HCPO Conference

Sheraton Maui Resort and Spa

Thursday, September 12, 2019



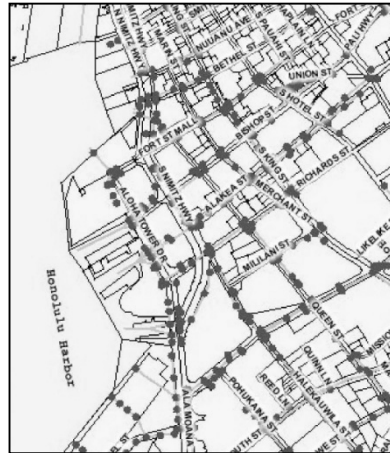
Key Areas of Focus

- EPA Clean Water Act (NPDES)
- Rules Relating to Water Quality
- Evaluation of Current Codes and Ordinances
- Green Infrastructure/Low Impact Development (LID) Design Guidelines
- Storm Water Utility Opportunity/Discussion

Clean Water Act (NPDES)



MUNICIPAL SEPARATE STORM SEWER SYSTEM



(MS4)

discharge



RECEIVING
WATERS



MS4 PERMIT

Reissued JAN 15, 2015

**Permit Became
Effective on FEB. 16,
2015**

**Permit Expires on
JAN 15, 2020**

Best Management Practices (BMPs)



Reduce Pollutants by retaining, reusing and/or infiltrating stormwater.

collect



LOW IMPACT
DEVELOPMENT

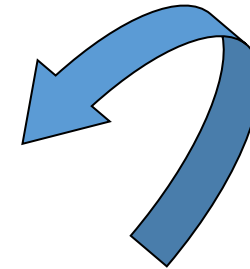


infiltrate

filter



CATCH BASIN



reuse

drain



STORM WATER MANAGEMENT PROGRAM REQUIRED ELEMENTS

Public Participation &
Outreach



Pollution Prevention
and Good Housekeeping

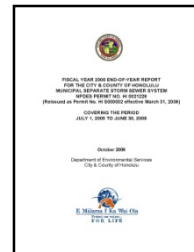
Construction
Site Runoff
Control



Post Construction
Storm Water
Management



Illicit Discharge
Detection &
Elimination



Monitoring &
Implementation
Plans



Industrial & Commercial
Discharge



City's Revised Water Quality Rules

- Effective since August 16, 2017 (Amended in December 2018)
- Construction: Requires an approved Erosion and Sediment Control Plan (i.e. temporary) for any project that has over 120 sq. ft. of disturbed land
- Post-Construction: Requires Low Impact Development designs (i.e. permanent) for all projects over 1 acres and other priority projects (Commercial, Industrial, Parking Lots, High Rises, etc.) over 5,000 sq. ft.





City's Existing Codes and Ordinances

Center for Watershed Protection – Code Review Checklist*

*Tool to assess the extent of Low Impact Development (LID) friendly regulations

City Ordinances

- ☐ Land Use Ordinance (LUO), ROH Chapter 21 and 22
- ☐ Building Code, ROH Chapter 16
- ☐ Plumbing Code Ordinance, ROH Chapter 19
- ☐ Complete Streets Ordinance, ROH Chapter 14-33
- ☐ Grading Ordinance, ROH Chapter 14-12
- ☐ Exceptional Tree Ordinance, ROH Chapter 41-13



City's Existing Codes and Ordinances

Center for Watershed Protection – Code Review Checklist (Cont'd)

Other Rules, Standards and Guides

- ☐ Subdivision Rules and Street Standards (Dec. 2000)
- ☐ Land Use Permits and Applications
- ☐ Complete Streets Design Manual (Sept. 2016)
- ☐ Standard Details for Public Works Construction (Sept. 1984)
- ☐ Rules Relating to Water Quality (Dec. 2018)
- ☐ Storm Water BMP Guide for New and Redevelopment
- ☐ Structural BMP Retrofit Technical Design Manual
- ☐ Permanent Storm Water BMP Field Manual

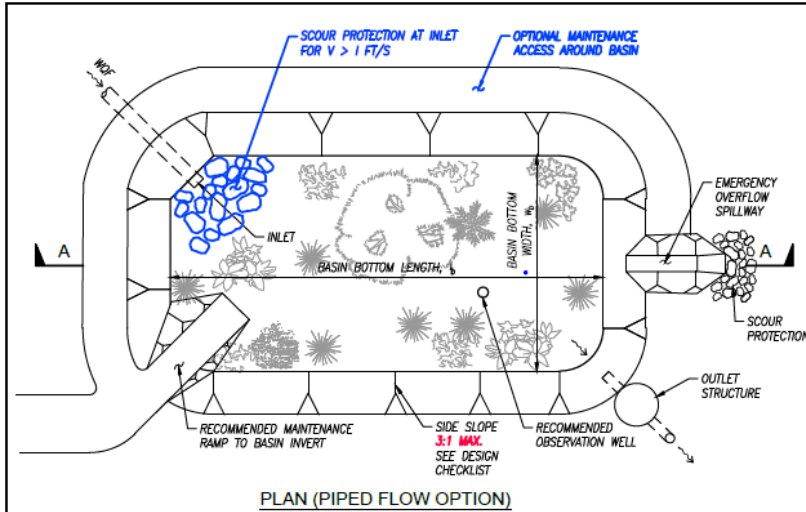


Summary of Key Findings

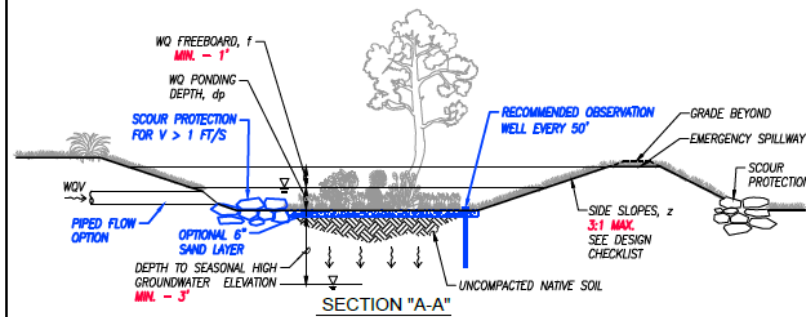
- ☐ Overall Score: 38% (33 points out of 87)
 - Scores less than 80% indicate reform of codes and ordinances are warranted in order to support Low Impact Development more broadly
- ☐ Street Sections to allow storm water discharge to landscaped medians, planters, etc.
- ☐ Reconcile conflicts with Complete Streets Manual and Water Quality Rules
- ☐ Allow permeable pavement within roadways, driveways and sidewalks
- ☐ Develop standard details for green infrastructure
- ☐ Require Storm Water Strategic Plans with various Land Use Permits (i.e. Conditional Use, SMA, Special District, Plan Review Use/Development)
- ☐ Revise Building and Plumbing codes to allow rain catchment and reuse consistent with the UPC 2012
- ☐ Revise Parking Ratios, Reduce Parking Requirements to minimize impervious surfaces and provide incentives or credits
- ☐ Develop new or expand on tree conservation and tree planting ordinances



Green Infrastructure Technical Design Guidelines



PLAN (PIPED FLOW OPTION)



SECTION "A-A"

CITY & COUNTY



OF HONOLULU

GREEN INFRASTRUCTURE
GUIDANCE DETAILS
INFILTRATION BASIN
PLAN AND SECTION
NOT TO SCALE
DEPARTMENT OF FACILITY MAINTENANCE

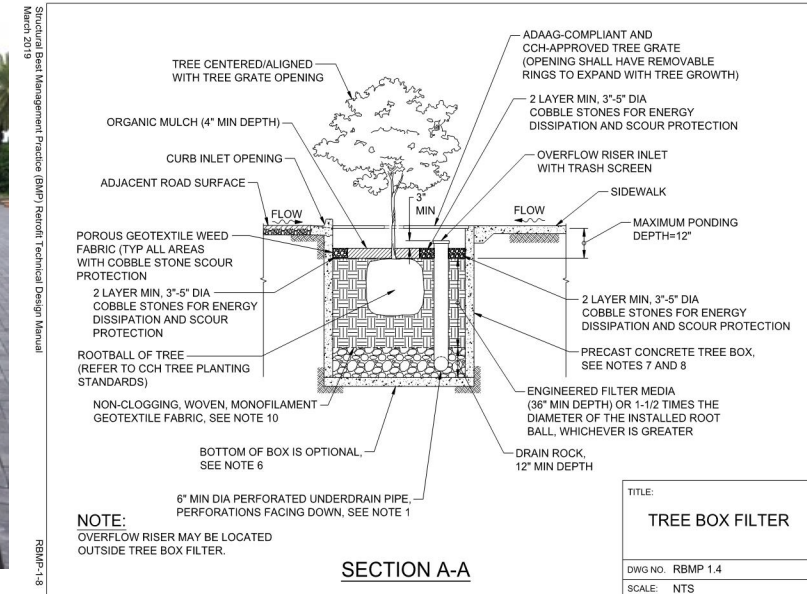
DATE
MARCH 2019

VERSION
1.0

REVISED

GI-1A

4/4/19



NOTE:
OVERFLOW RISER MAY BE LOCATED
OUTSIDE TREE BOX FILTER.

SECTION A-A

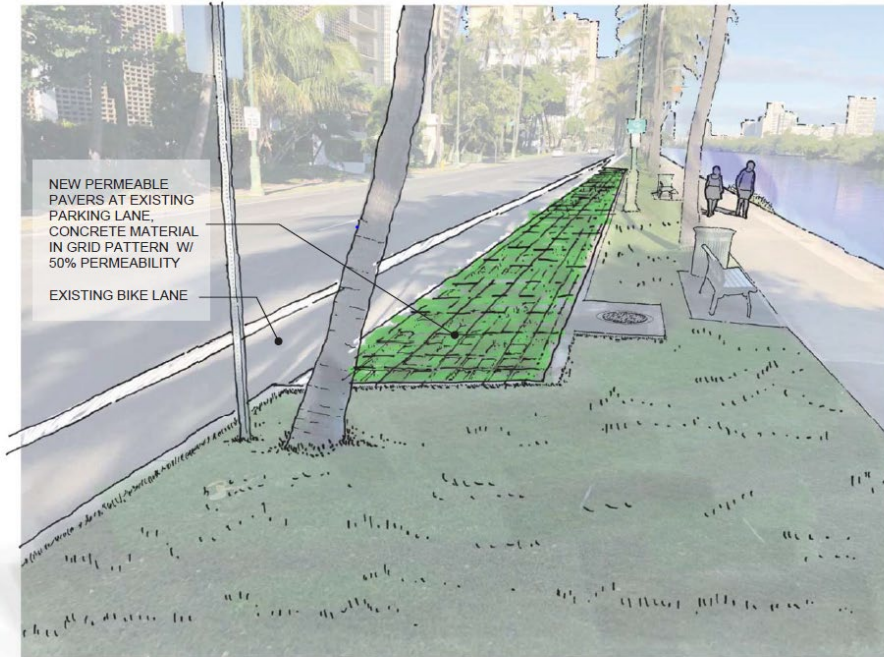
TITLE:
TREE BOX FILTER

DWG NO. RBMP 1.4

SCALE: NTS

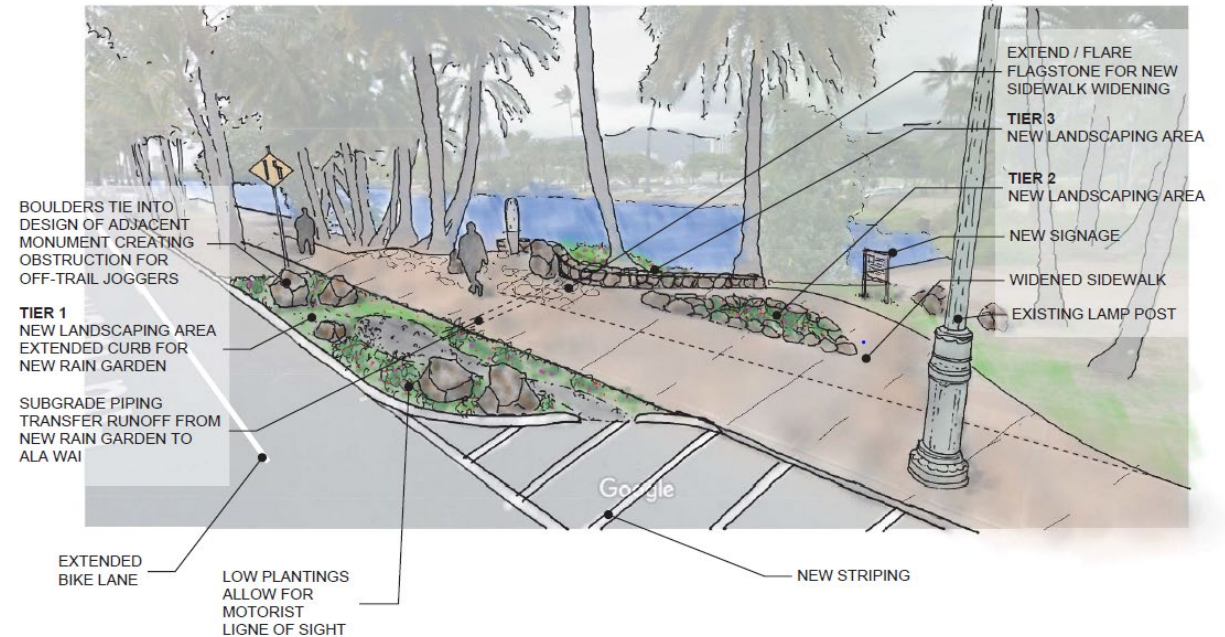
Green Infrastructure – Ala Wai Canal

Ala Wai Canal Storm Drainage BMP Improvements:
Rain Garden & Sidewalk Improvements



**NEW ALA WAI
LANDSCAPED GATEWAY:
PERMEABLE PAVERS**

Ala Wai Canal Storm Drainage BMP Improvements:
Rain Garden & Sidewalk Improvements



**NEW ALA WAI
LANDSCAPED GATEWAY:
PERSPECTIVE VIEW**

Storm Water Management (H.B. Act No. 1325)

2015

HOUSE OF REPRESENTATIVES
TWENTY-EIGHTH LEGISLATURE, 2015
STATE OF HAWAII

H.B. NO. 1325
H.D. 1
S.D. 1

A BILL FOR AN ACT

RELATING TO STORMWATER MANAGEMENT.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

1 SECTION 1. The legislature finds that climate change poses
2 a significant threat to the economy and environment of the
3 Hawaiian islands and has contributed to an eighteen per cent
4 drop in precipitation over the past thirty years. This
5 increasing drying trend, coupled with growth in the State's
6 population, will likely raise the demand for water and
7 compromise Hawaii's fresh water supplies over the coming
8 decades. If Hawaii does not begin planning ahead, ensuring the
9 islands' supply of fresh water in the future may cost the public
10 a great deal as the cost of desalination and other alternatives
11 rise.

12 The legislature further finds that changes in land use from
13 forested areas to urban development and other human uses
14 increase the amount of rain ending up as storm runoff instead of
15 replenishing the State's aquifers. Encouraging the adoption of
16 best practices and infrastructure investment by the counties to
17 capture and retain rainfall in Hawaii for potable water before
18 it becomes stormwater runoff that results in pollution to

HB1325 SD1 LRB 15-2376.doc



1

2017

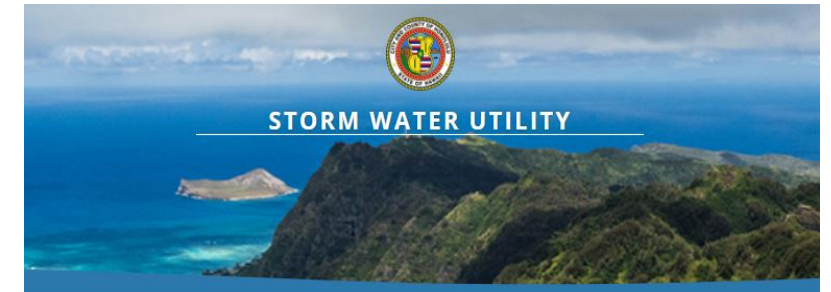
Looking Ahead: The Path to a Stormwater Utility for the City and County of Honolulu

December 2017



Prepared For: Hawaii Community Foundation & City and County of Honolulu
Prepared By: Hawaii Pacific University and One World One Water

2019



Rain—millions of gallons—flushes down rooftops, streets and other hard surfaces collecting dirt, debris, trash, and more pollutants along the way. Then, as storm water, it makes its way into ditches, drains, and channels that flow into streams and the ocean.

Urbanization and the increase in hard surfaces that don't absorb water mean much of this water is running off the mountains and land, rather than percolating back into the soil, robbing our island's groundwater supply of replenishment. This excess runoff can create localized drainage flooding issues.

In 2015, recognizing that "If Hawaii does not begin planning ahead, ensuring the islands' supply of fresh water in the future may cost the public a great deal..." Hawaii's State Legislature adopted a bill that allows counties to set up storm water utilities. A storm water utility provides municipalities with dedicated, fee-based funding available exclusively for storm water management purposes. Already in the United States, there are more than 2,000 storm water utilities across 39 states.

The City & County of Honolulu has begun a planning and stakeholder engagement process to establish such a storm water utility for Oahu. The City's Department of Facility Maintenance Storm Water Quality Branch is tasked with overseeing this process. A stakeholder advisory group, which will meet through fall 2020, will help balance community priorities with financial impacts, ensuring that a storm water utility will be responsive to Oahu's needs. The wider community also will have many opportunities to participate in shaping the storm water utility program.



Stakeholder Advisory Group Meeting

Monday, August 19th 2019, 4:00 PM - 6:30 PM
Mayor's Conference Room, Honolulu Hale, 530 South King Street
Download Agenda | Meeting Summary Report

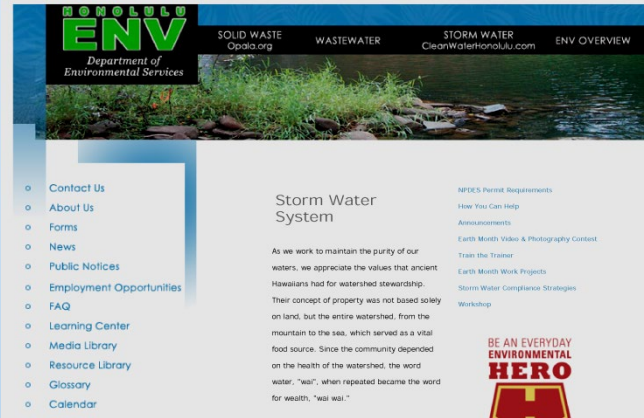
[Download Slides \(PDF\)](#)

QUESTIONS

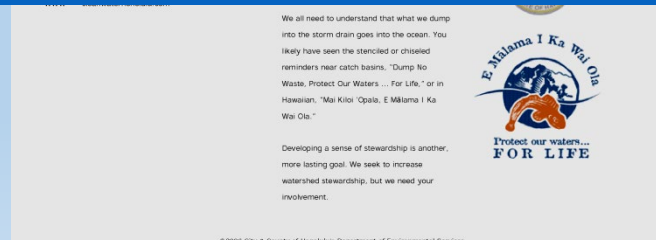


THANK YOU

**For More
Information:**



www.cleanwaterhonolulu.com



**RANDALL WAKUMOTO, BRANCH HEAD
Storm Water Quality Branch**

Ph: 768-3242

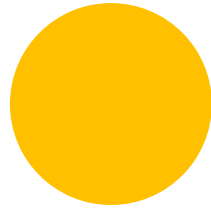
Email: rwakumoto@honolulu.gov

**City & County of Honolulu
Department of Facility
Maintenance**



Environmental Concern Line

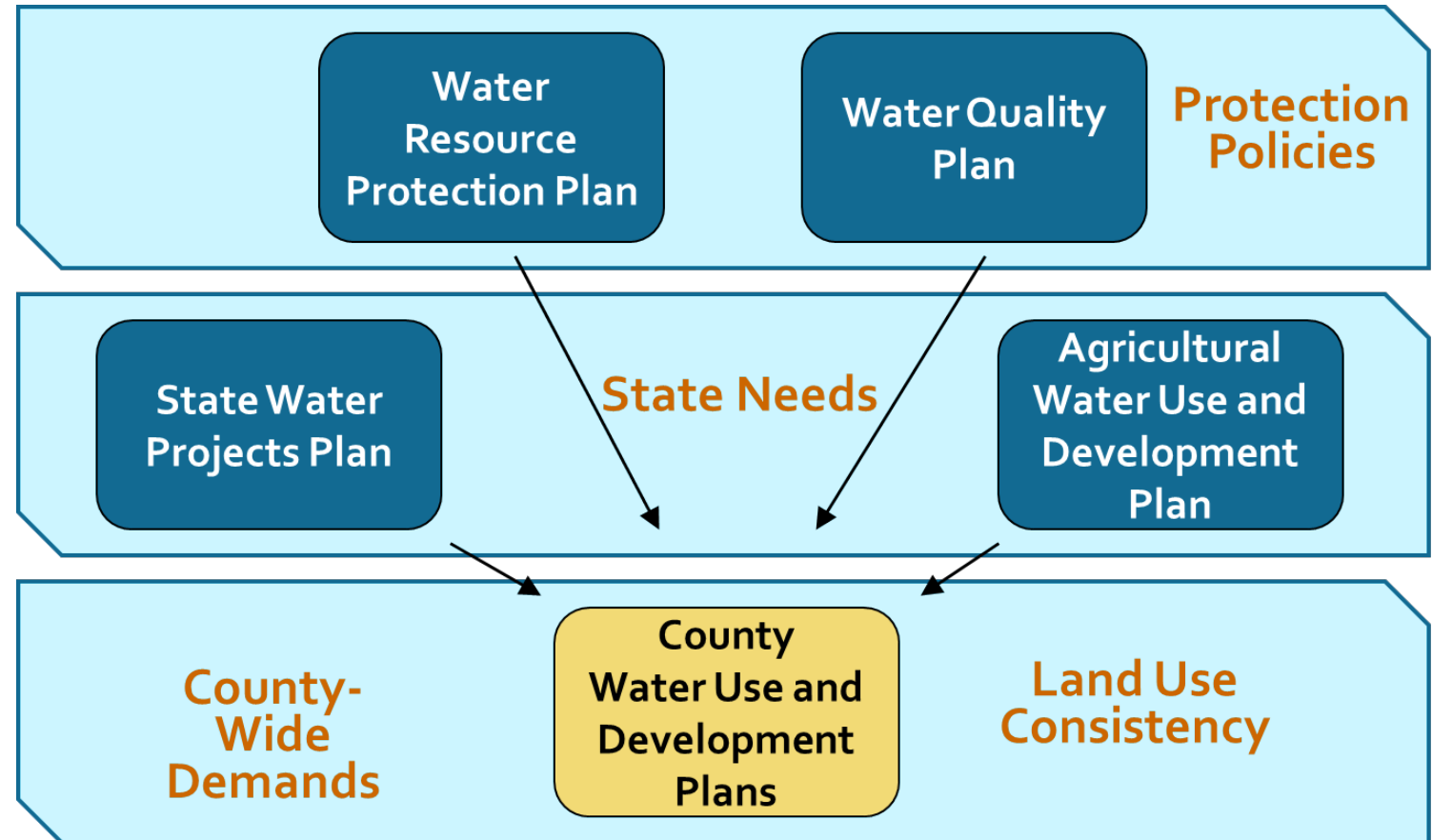
768-3300



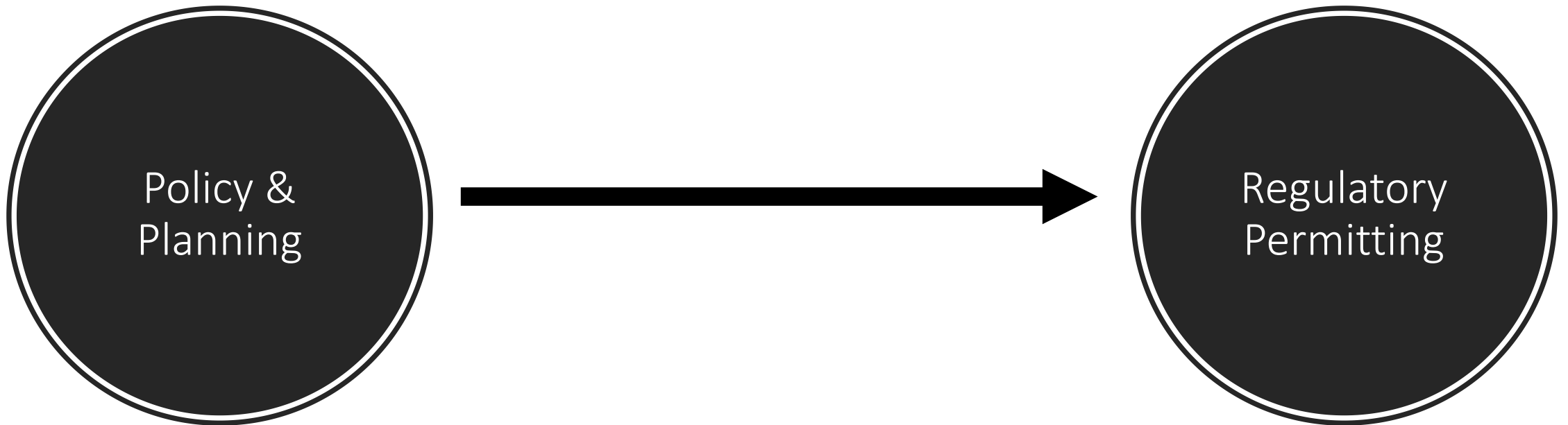
Hawaii Congress of Planning Officials
Presentation:
Planning for Hawai'i's Fresh Water Security

Kaleo Manuel
Deputy Director

Hawai'i Water Plan



Protect & Manage Water Resources

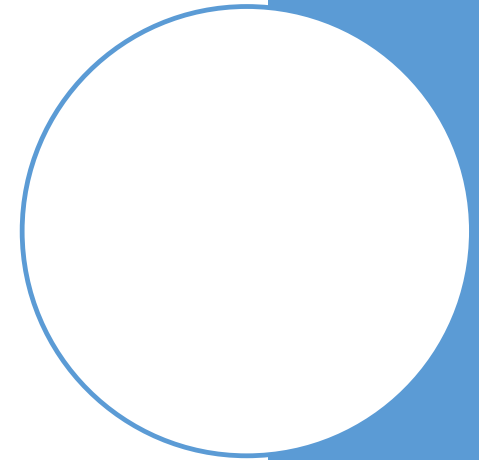


CWRM Policy – Water Resource Protection Plan

- High standards of water quality shall be maintained
- Quality of the water source should be matched to the quality of the water needed
- If there is a practical alternative water source available, that alternative source should be used in lieu of natural supplies

Regulatory Permitting

- Water Use Permit
- **Well Construction and Pump Installation Permit**
- Stream Channel Alteration Permit
- Stream Diversion Works Permit



Protect & Manage Water Resources

