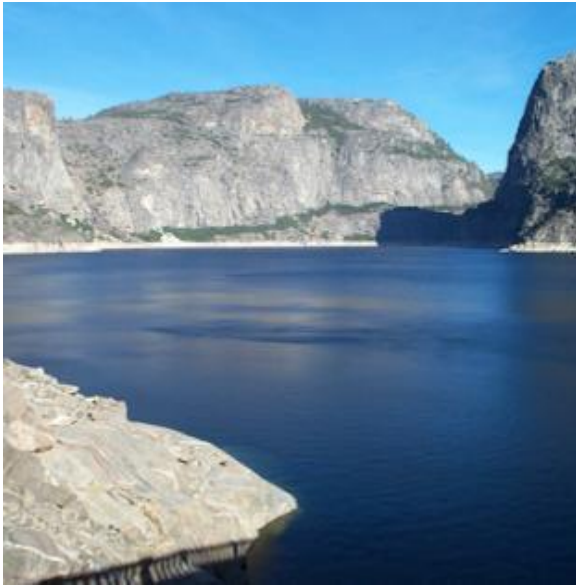


San Francisco's Non-Potable Water Program

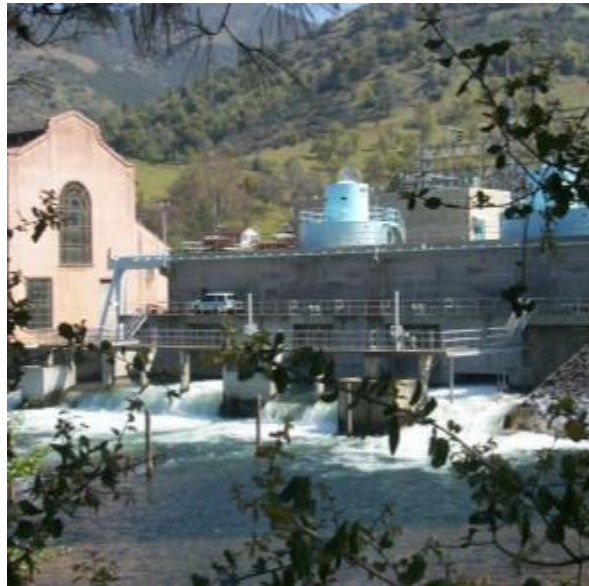
John Scarpulla
Program & Project Manager
San Francisco Public Utilities Commission
November 17, 2015



San Francisco Public Utilities Commission (SFPUC)



Water: delivering high quality water every day to 2.6 million people



Power: generating 100% greenhouse gas free energy for City services



Wastewater: protecting public health and the environment

Responding to Aging & Vulnerable Water Infrastructure

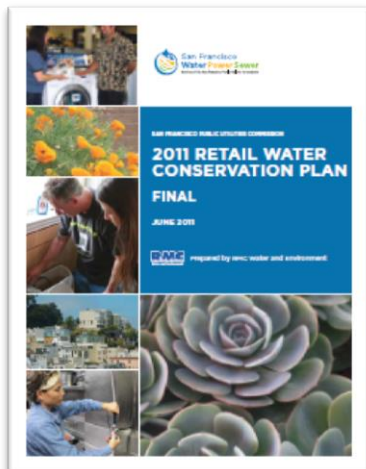
Water System Improvement Program (WSIP)

- Repair, replace, and seismically upgrade infrastructure
- \$4.8 billion
- Over 80% Complete
- **Water Supply Diversification**



San Francisco's Local Water Program

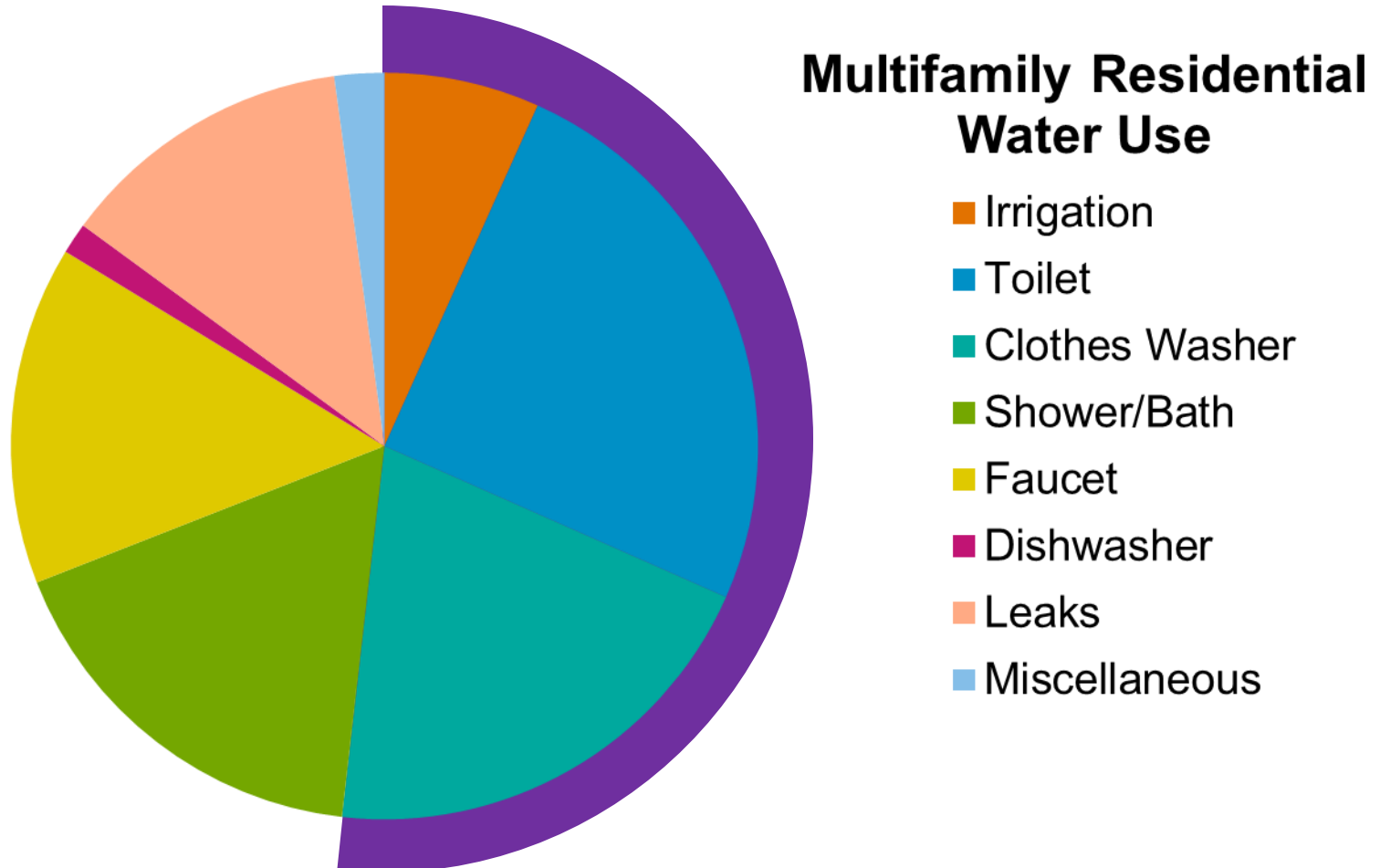
- Conservation: Reduce customer demands
- Groundwater: pump water for potable purposes during normal and drought years
- Recycled Water: produce recycled water for irrigation and toilet flushing
- **Onsite Water Systems: collection and treatment of alternate water sources for non-potable applications**



Re-think Building Design & How Water is Used in a District



Up to 50% of Demands are Non-potable in Multifamily Residential Buildings



Source: adapted from Alliance for Water Efficiency

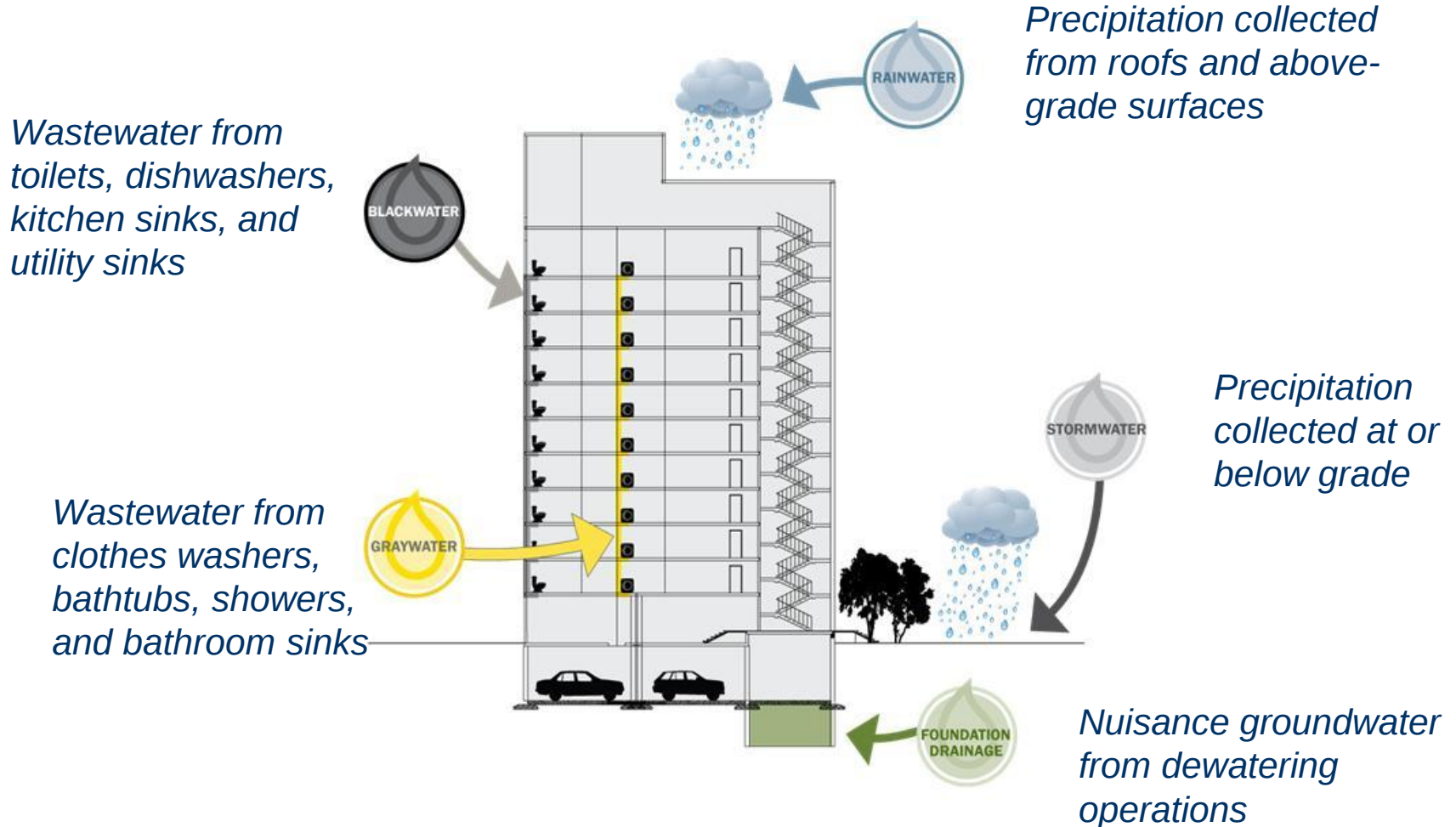
Up to 95% of Demands are Non-potable in Commercial Buildings



Office Water Use

- Sanitary
- Cooling Tower Make-up
- Irrigation
- Single-Pass Cooling
- Kitchen
- Miscellaneous

Buildings Produce Water





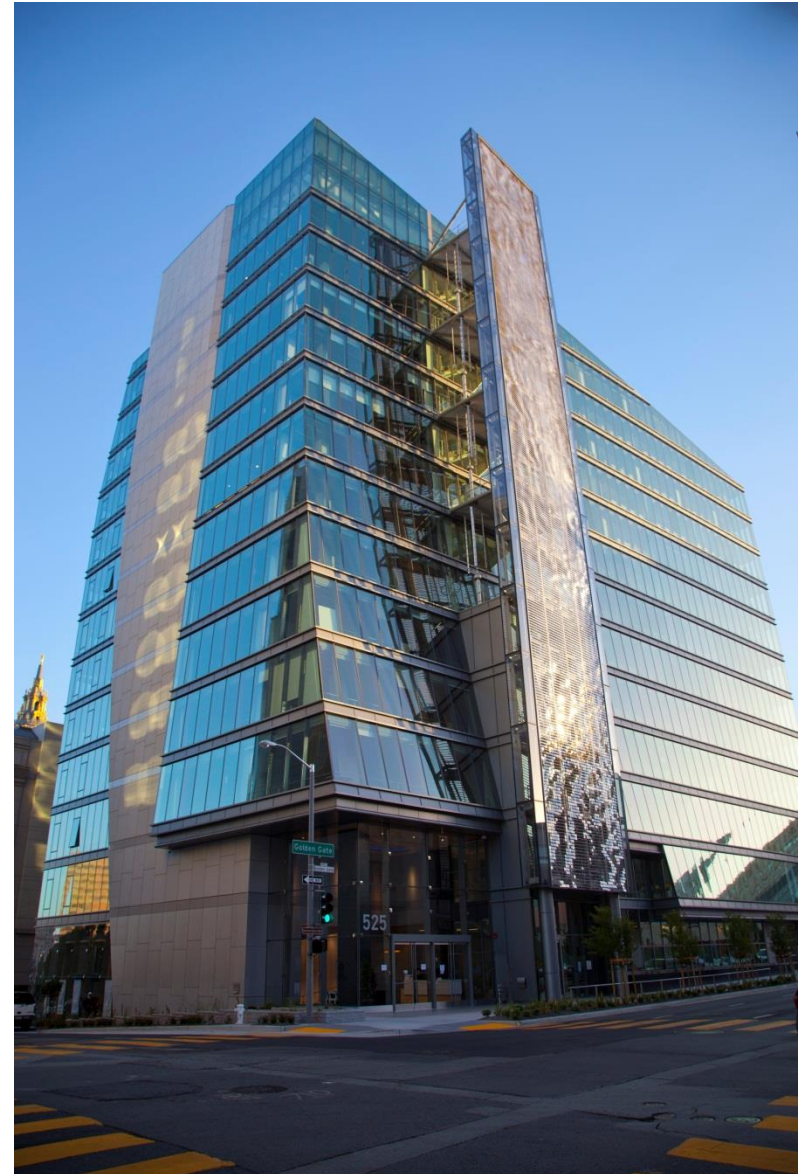
On-site Non-potable Water Use at Innovative SFPUC Headquarters

Rainwater Harvesting System

- 25,000 gallon cistern
- Reuse for irrigation

Wetland Treatment System

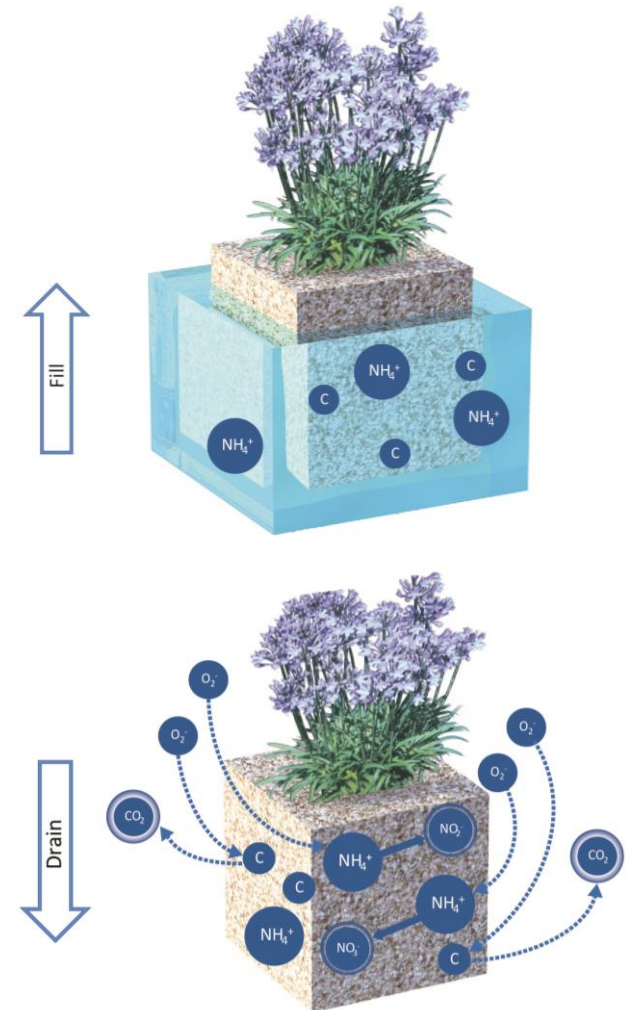
- Collects and treats building's wastewater
- Reuse for toilet flushing
- 5,000 gpd capacity



Tidal Flow Wetland



Tidal Flow Wetland



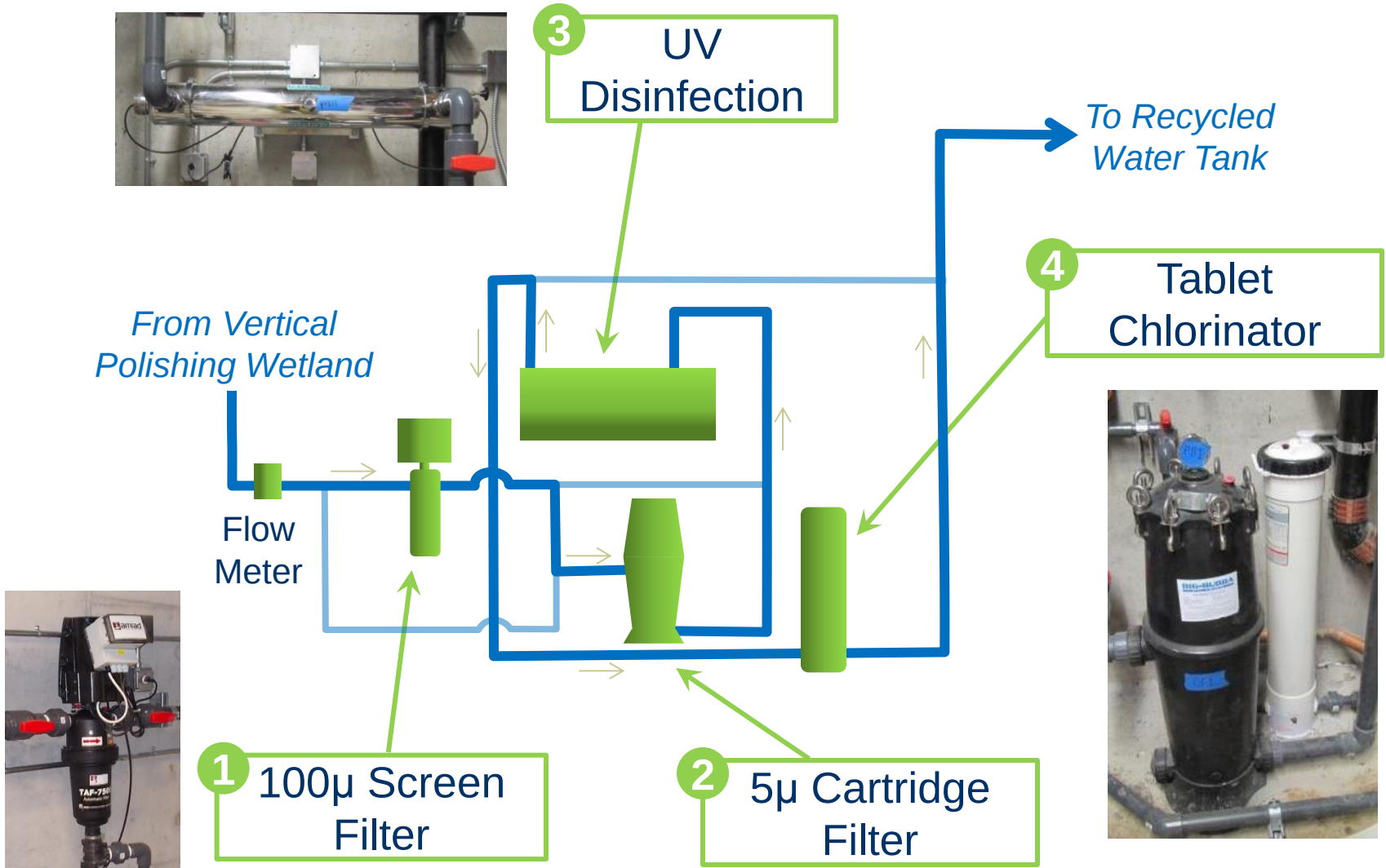
Vertical Flow Wetlands



Polishing Vertical Flow Wetlands



Disinfection System – Equipment



SFDPH Water Quality Requirements

Measure	Minimum	Average	Maximum
BOD ₅	≥ 85% removal	≤ 30 mg/L	≤ 45 mg/L
Suspended Solids	≥ 85% removal	≤ 30 mg/L	≤ 45 mg/L
pH	6.0 – 9.0		
Turbidity	n/a	5 NTU	10 NTU
Chlorine Residual	0.5 mg/L – 4.0 mg/L		
Total Coliform	n/a	≤ 2.2 MPN/100 mL	≤ 23 MPN/100 mL ≤ 240 MPN/100 mL
Odor	Non-Offensive		

What about everyone else?



- Regulatory questions:
 - Who should set water quality standards?
 - Who should issue permits and provide operational oversight?
 - What type of on-going monitoring and reporting should be implemented?



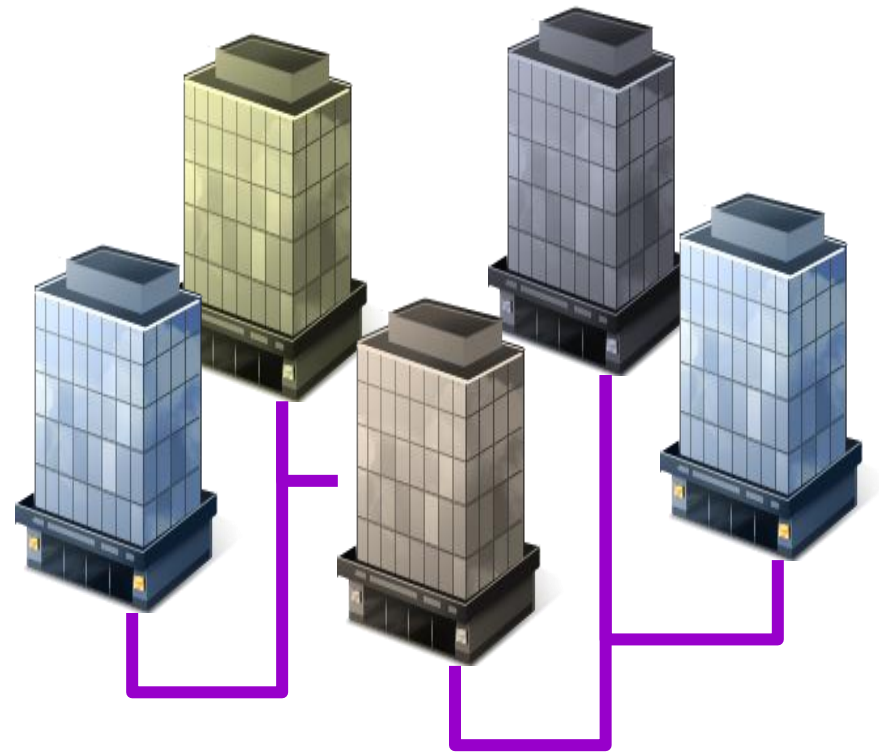
Developing SF's Local Oversight

- 2011: Began talks with City Family Agencies
- 2012: Onsite Water Reuse ordinance adopted (September)
- 2013: Extensive stakeholder outreach



Developing SF's Local Oversight

- 2013: Further talks with Developers / Designers
- 2013: Initiate talks with City Family Agencies
- 2013: Ordinance amended for district-scale (Oct)

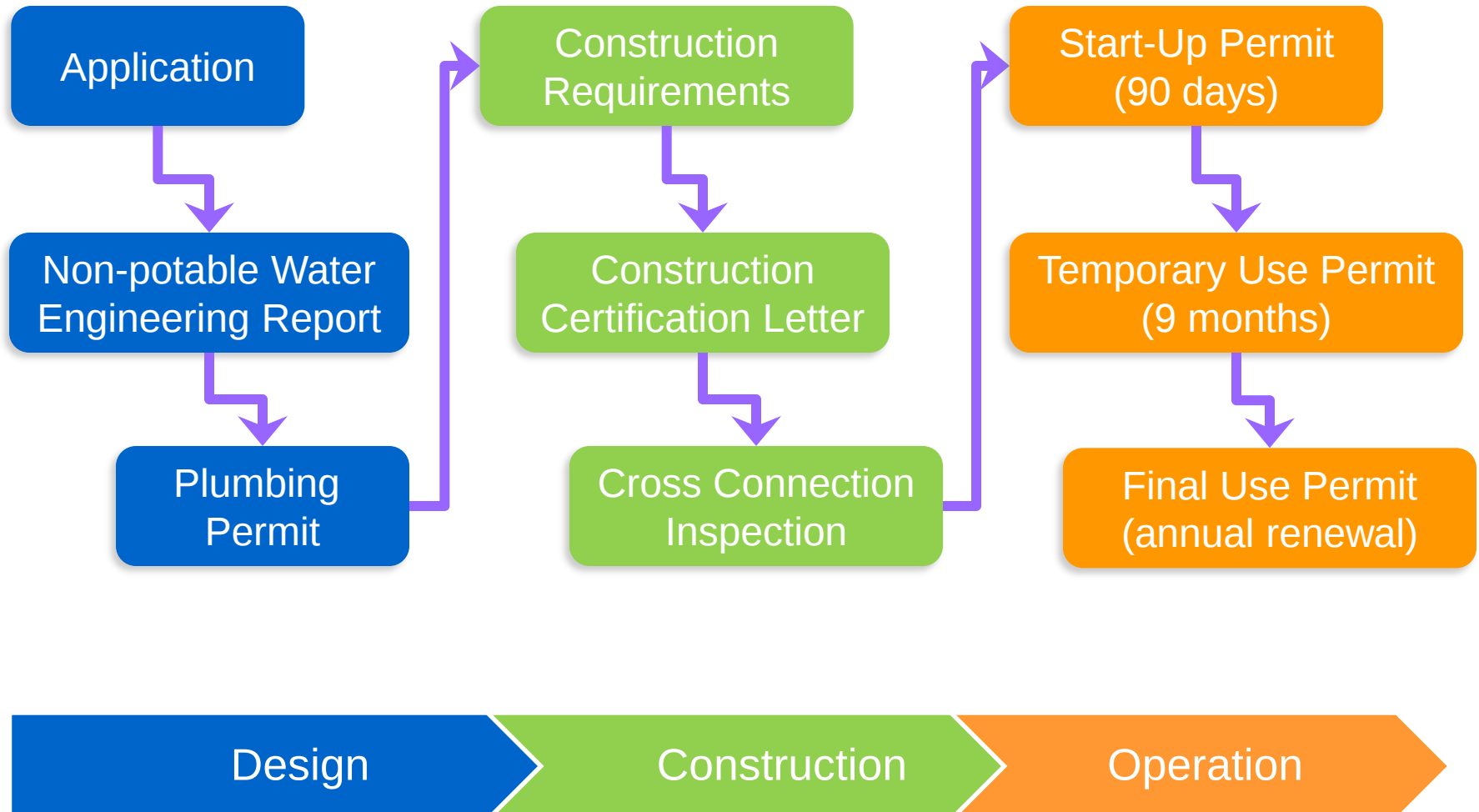


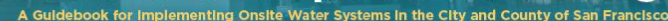


City Ordinance Codifies Program & Streamlines Process

SFPUC	SFDPH	SFDBI	SFDPW
Program Administration	Public Health	Construction	Right of Way and Mapping
Review onsite non-potable water supplies & demands Administer citywide project tracking & annual potable offset achieved Provide technical support & outreach to developers Provide financial incentives to developers	Issue water quality & monitoring requirements Review and approve non-potable engineering report Issue permit to operate onsite systems Review water quality reporting	Conduct Plumbing Plan check and issue Plumbing Permit Inspect and approve system installations	Issue Encroachment Permits as needed for infrastructure in the Right-of-Way (if needed) Includes condition on a subdivision map or a parcel map requiring compliance with the Non-potable Ordinance prior to approval and issuance of said map (if applicable)

Streamlined Process



Grant Assistance for Large Alternate Water Source Projects

San Francisco
Water
Power
Sewer

Services of the San Francisco Public Utilities Commission

Grant Assistance Overview

The SFPUC's Grant Assistance for Alternate Water Source Projects (Grant Assistance) is a program designed to encourage retail water users to implement the on-site treatment and use of non-potable water including but not limited to rainwater, stormwater, graywater, foundation drainage, and blackwater. The goal is to maximize the use of nonpotable water for toilet flushing, irrigation, and other non-potable uses. The SFPUC has approximately \$1,000,000 in funding available for two types of non-potable water projects:

- 1) district-scale projects that consist of two or more parcels that share treated alternate water sources or
- 2) building-scale projects that include any residential or non-residential building of at least 100,000 square feet or more. Grants will be awarded to those applicants who demonstrate they will significantly and permanently reduce or offset the use of existing drinking water supplies for non-potable applications.

Types of activities considered for funding include the installation of harvesting or collection systems for on-site sources, treatment systems to improve the water quality of on-site sources for beneficial reuse, and/or storage of the treated water. The SFPU anticipates funding multiple projects. The deadline for applications for Calendar Year 2014 is December 31, 2014. Provision of grant funding is based on the eligibility of the proposed activity and availability of funds. Each application will be reviewed and evaluated on a case-by-case basis. Grant funding is available on a first come, first serve basis and is limited to \$250,000 per on-site project and \$500,000 per district-scale project. Projects that meet the Grant eligibility criteria for District-scale Grant Assistance may not apply for Building-scale Grant Assistance.

Grant assistance will support customer efforts to implement sustainable water use practices in San Francisco. In addition to advancing water supply reliability, this grant assistance will support the SFPUC's Phased Water System Improvement Program Variant (WSIP) goals adopted by Resolution No. 08-200 on October 30, 2008. The WSIP included a goal of developing an additional 10 million gallons per day (mgd) of locally available water resources.

Definitions

Terms used in this grant application package have the meanings described below:

Alternate Water Source – Non-potable source of water that includes graywater, rainwater, stormwater, foundation drainage, and blackwater. The level of treatment and quality of the alternate water source shall be approved by the City's Department of Public Health and comply with all applicable federal, state, and local regulations.

Applicant—property owner that is a retail water customer of the SFPUC, proposing the installation of a building-scale or district-scale treatment system on their property, and is seeking grant funds from the SFPUC for an alternate water source project, pursuant to the instructions and guidelines set forth in this application package.

Award – the decision by the SFPUC to provide grant funds, following the review and evaluation of a completed application. An award is made through a Grant agreement.

Blackwater – wastewater containing bodily or other biological wastes, as from toilets, dishwashers, kitchen sinks and utility sinks. Because of plumbing configurations, blackwater leaving a building generally includes graywater.

San Francisco Non-potable Projects

- 34 Projects since program inception
- SFPUC Collects data on costs, drivers, potable water offsets, and end use applications



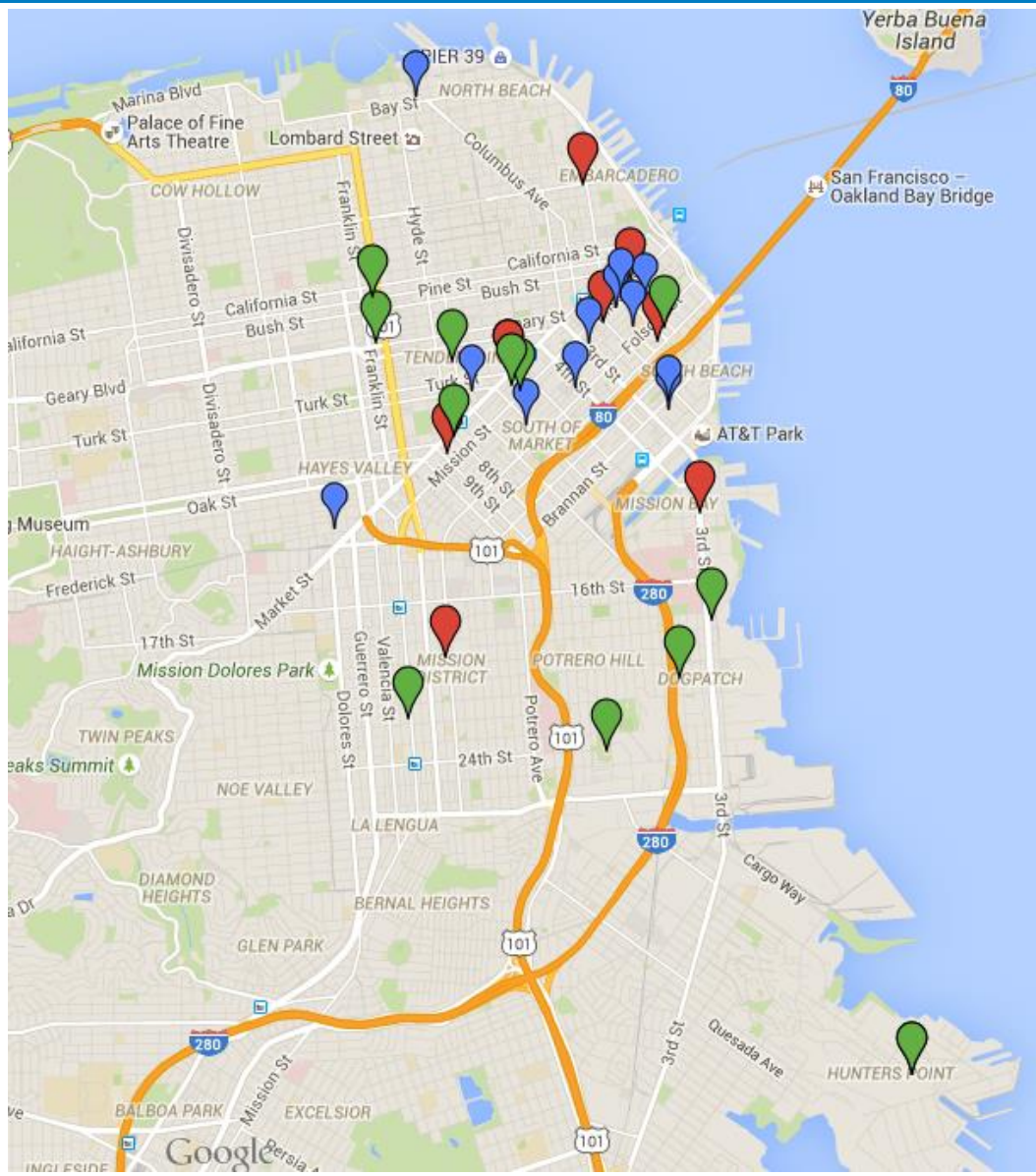
San Francisco's Non-potable Water System Projects

San Francisco Public Utilities Commission
April, 2014

Project Locations

Red: 2012-13 Projects
Blue: 2013-14 Projects
Green: 2014-2015 Projects

**Saving 24 million
gallons of drinking
water per year**



St. Anthony's Building



- Source: Rainwater
- End Use: Toilet & Urinal Flushing

- Source: Rainwater & Bay Water
- End Uses: Toilet and Urinal Flushing & Heating and Cooling System





San Francisco Public Safety Building

- Sources: Graywater, Rainwater, Condensate Drainage
- End Uses: Toilet Flushing, Cooling Tower Make-up and Irrigation



Transbay Transit Center

- Sources: Rainwater & Graywater
- End Uses: Toilet & Urinal Flushing and Irrigation
- Status: Under Construction



181 Fremont Mixed Use Development

- Source: Graywater
- End Use: Toilets & Irrigation
- Status: Under Construction



- Source: Foundation Drainage
- End Uses: Street Cleaning, Irrigation, and Fountain Make-up
- Status: Design

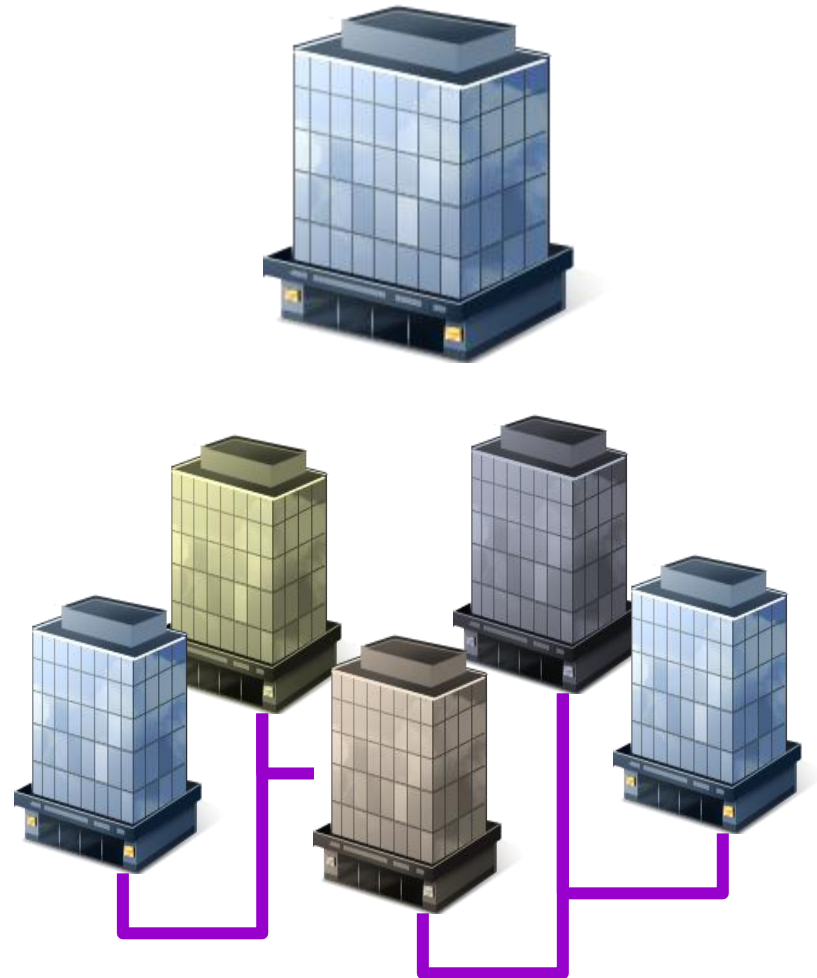


- District Project
- Source: Foundation Drainage
- End Use: Steam Heating Loop
- Status: Pre-design

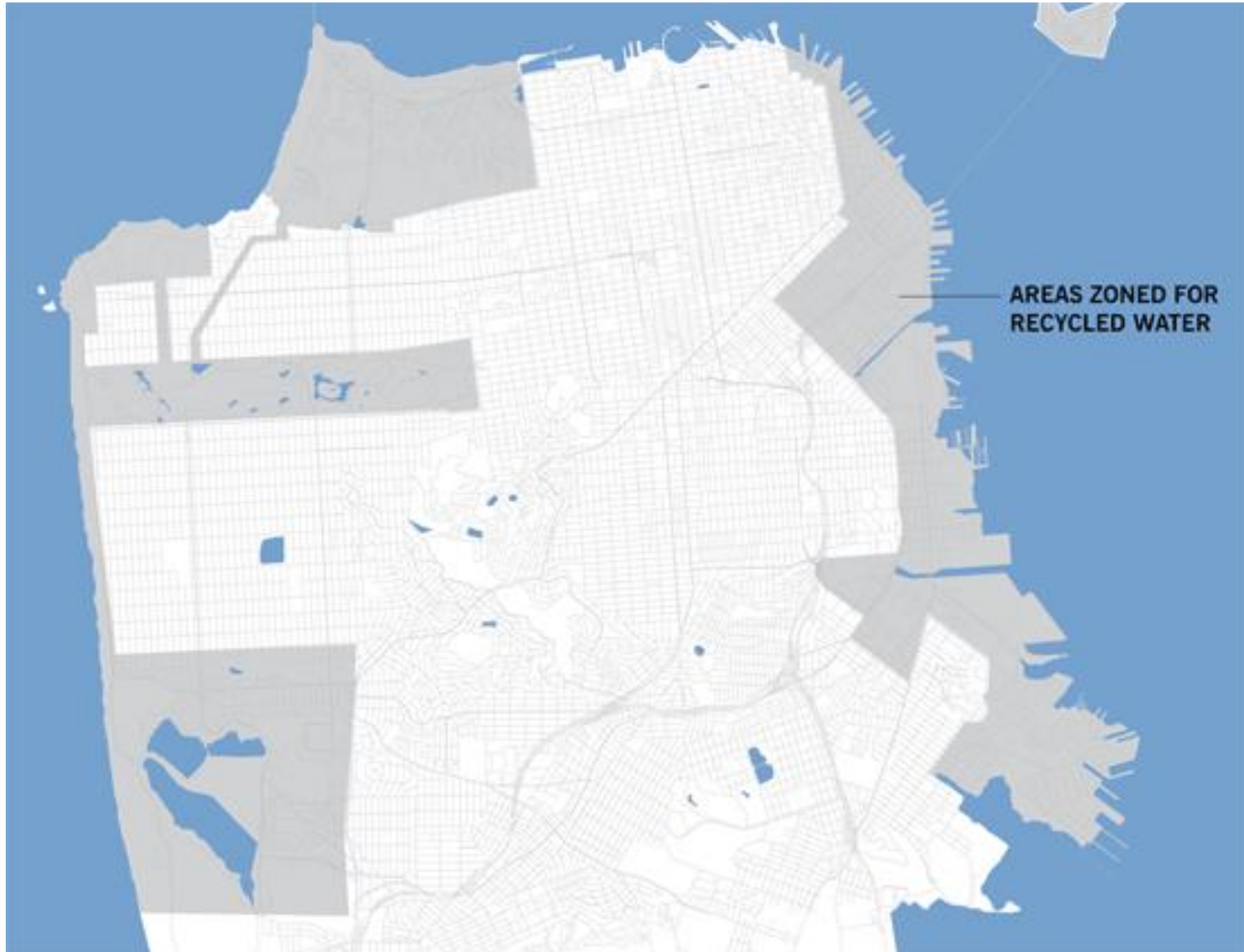


Non-potable Ordinance UPDATE

- July 2015: Ordinance amended to mandate onsite water reuse for toilet flushing and irrigation in all new developments greater than 250,000 square feet.
- Beginning Nov. 1, **2015** for all projects within Recycled Water Zone.
- Beginning Nov. 1 **2016** for all projects City-wide.



Recycled Water Zone



Grant Updates

- Generally, SFPUC Grant Programs do not provide funding to grantees to comply with requirements mandated by a City Ordinance

Eligibility Criteria for \$250,000 Grant	Eligibility Criteria for \$500,000 Grant
The proposed activity is estimated to replace at least 1,000,000 gallons of potable water per year for at least 10 years.	The proposed activity is estimated to annually replace at least 3,000,000 gallons of potable water for at least 10 years.

Projects must meet one of the following Eligibility Criteria:

- The project is a site that is voluntarily installing a non-potable water reuse system; or
- The project is a site that is voluntarily connecting to a district-scale non-potable water reuse system.

On-site Water Systems Worldwide – It's Happening Now!





San Francisco
Water
Power
Sewer

Innovation in Urban Water Systems

San Francisco • May 2014



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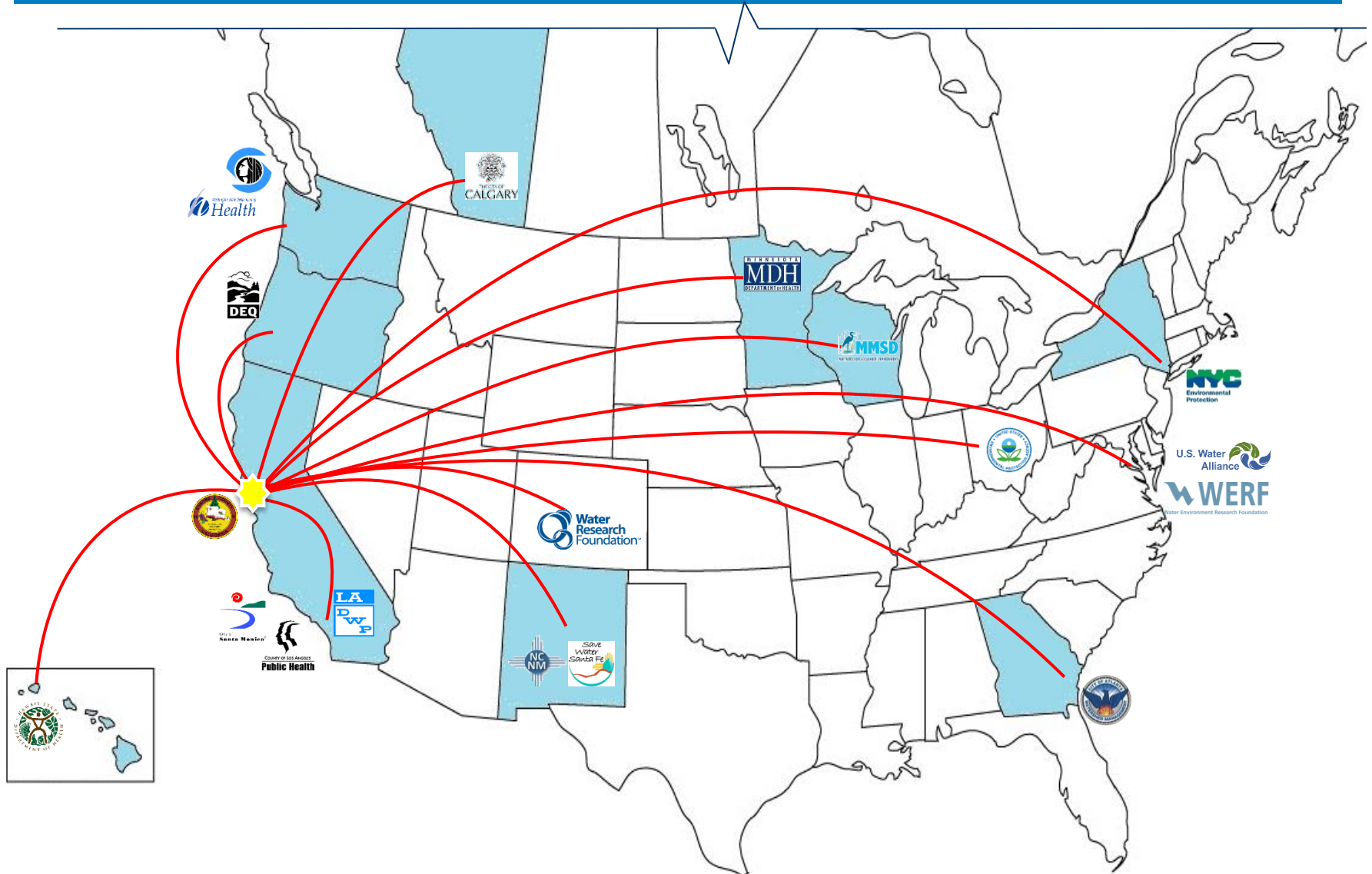


Water
Research
FoundationSM

WERF

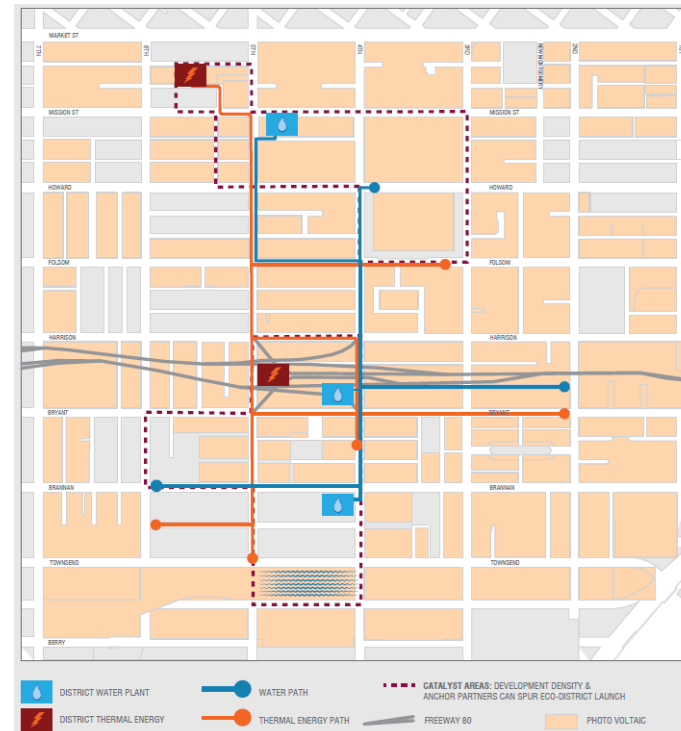
Water Environment Research Foundation

Nationwide Representation



Key Messages for Attendees

- **Local management programs are needed!**
 - Endorsing onsite systems through a policy or plan can bolster acceptability
 - Offering incentives can help generate interest
 - Water quality and monitoring are needed



BLUEPRINT for Onsite Water Systems

A Step-by-Step Guide for Developing a Local Program to Manage Onsite Water Systems



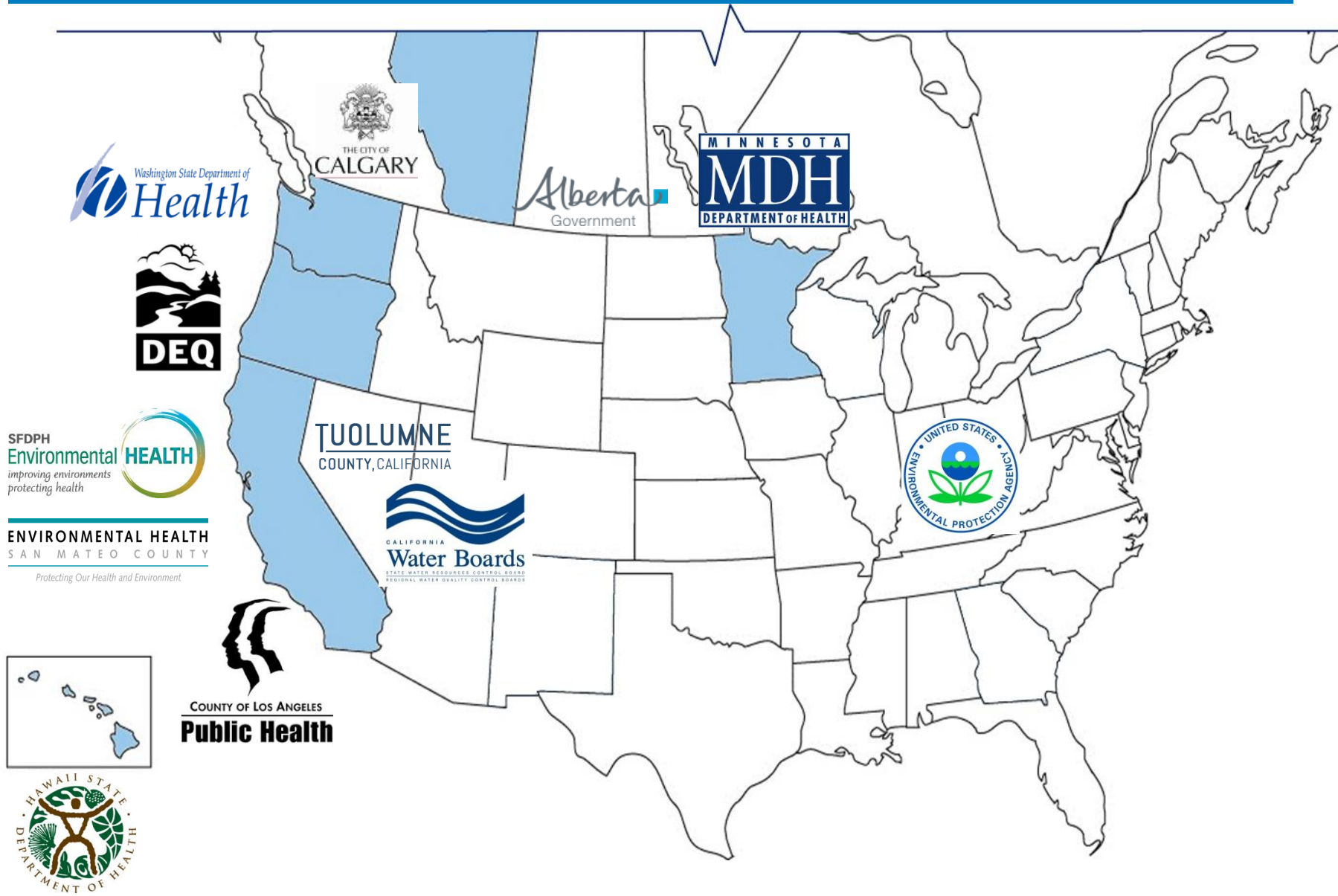


10 Steps for Developing a Local Program

Developing a local program to manage onsite water systems offers a proactive way to increase water resiliency and promote green building practices while protecting public health. The development of a program should follow a sequence of steps and associated actions, which will inform critical decisions regarding the scope, structure, and implementation of the program.

- 1 Convene a Working Group**
Establish a small working group to guide the development of the local program.
- 2 Select the Types of Alternate Water Sources**
Narrow the specific types of alternate water sources covered in the program.
- 3 Identify End Uses**
Classify specific non-potable end uses for your program.
- 4 Establish Water Quality Standards**
Establish water quality standards for each alternate water source and/or end use.
- 5 Identify and Supplement Local Building Practices**
Integrate your program into local construction requirements and building permit processes.
- 6 Establish Monitoring and Reporting Requirements**
Establish water quality monitoring and reporting requirements for ongoing operations.
- 7 Prepare an Operating Permit Process**
Establish the permit process for initial and ongoing operations for onsite water systems.
- 8 Implement Guidelines and the Program**
Publicize the program to provide clear direction for project sponsors and developers.
- 9 Evaluate the Program**
Promote best practices for onsite water systems.
- 10 Grow the Program**
Explore opportunities to expand and encourage onsite water systems.

Public Health Collaborative



Technical Guidance for Public Health Standards for Onsite Water Systems

Obtain Consensus:

- Water Quality Parameters
- Monitoring Parameters
- Technical Guidance
- **Final report**

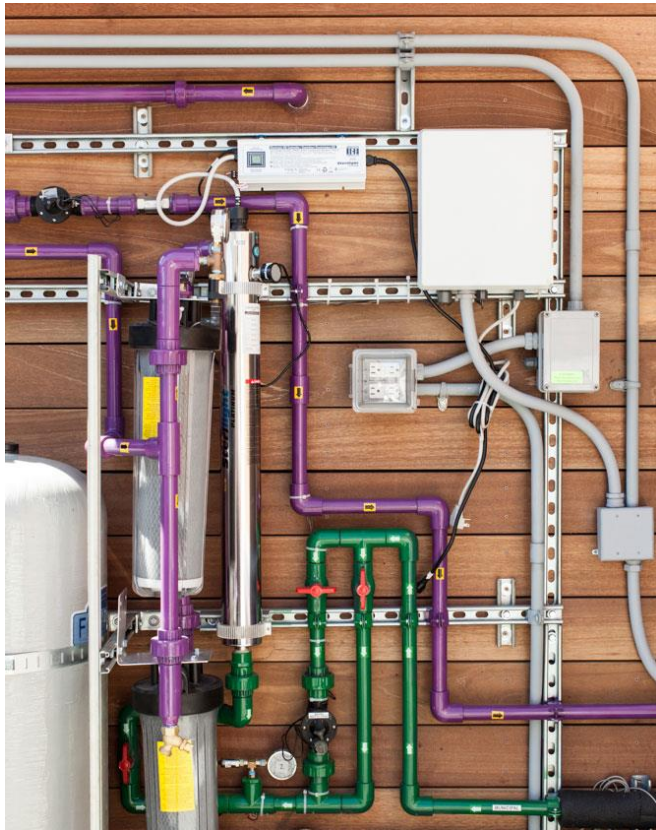


What's Next?



Potable Rainwater Pilot

- Potable Rainwater Pilot Project



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www.sfwater.org/np

