

PureWaterSF: Researching Direct Potable Reuse in San Francisco

Manisha Kothari

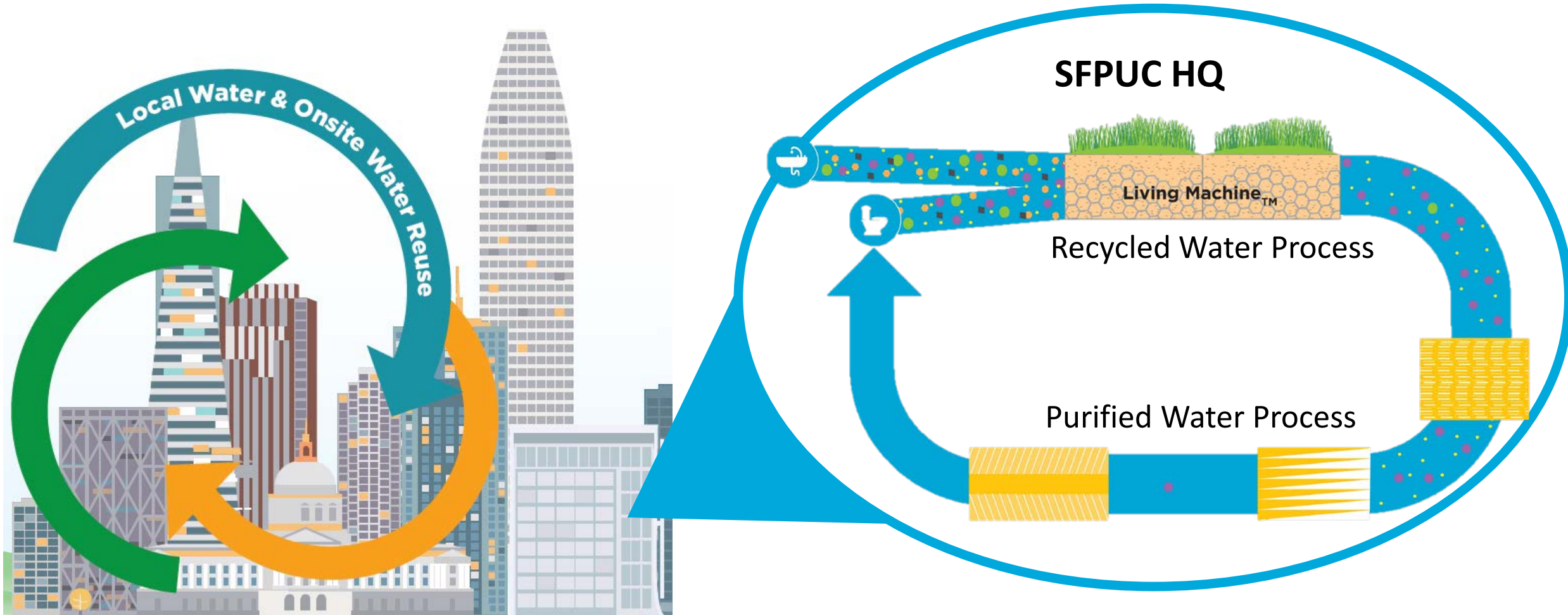
December 6, 2019

Traditional Resource Management



OneWaterSF

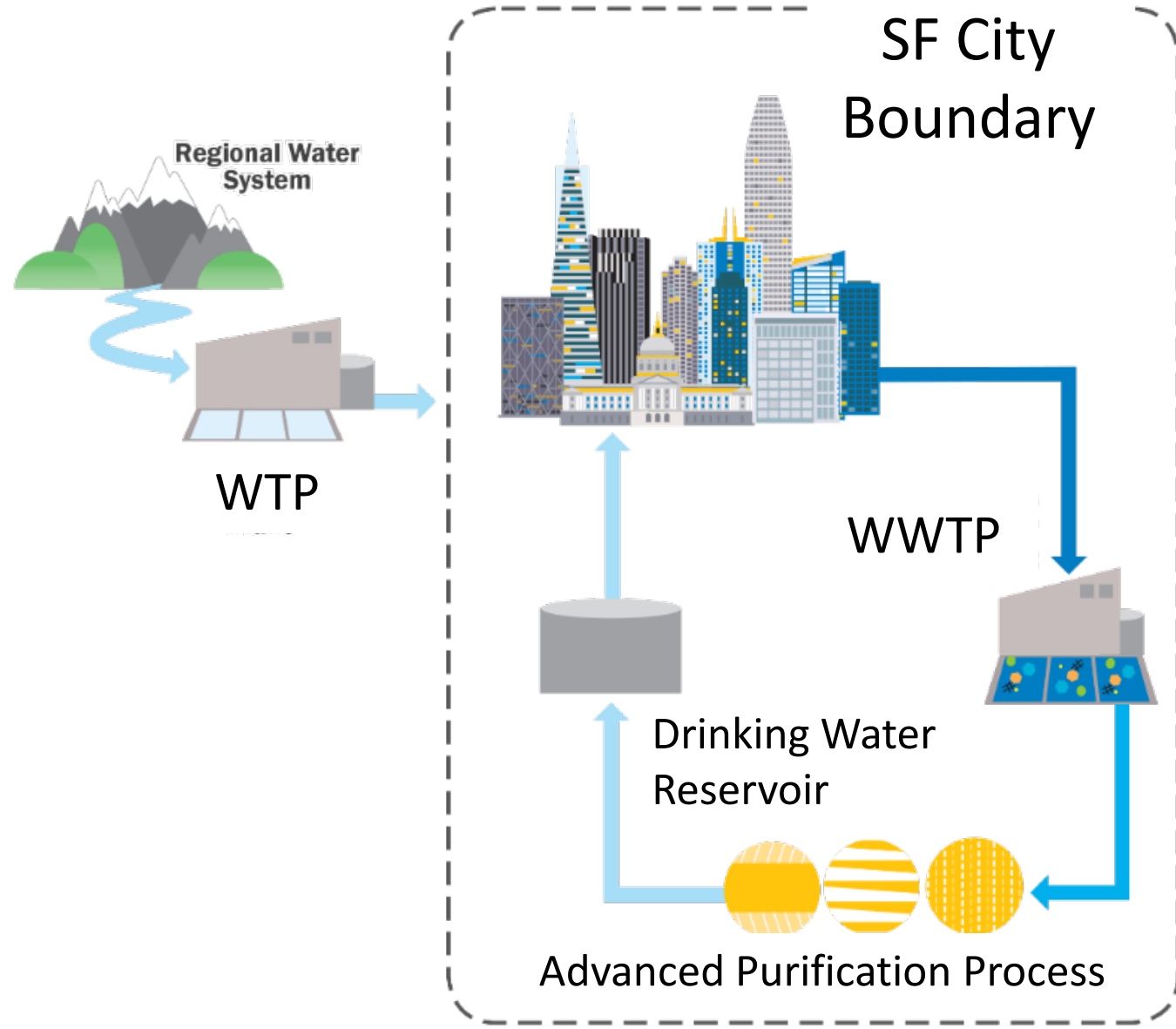




Diversifying Water Supplies in SF

PureWaterSF

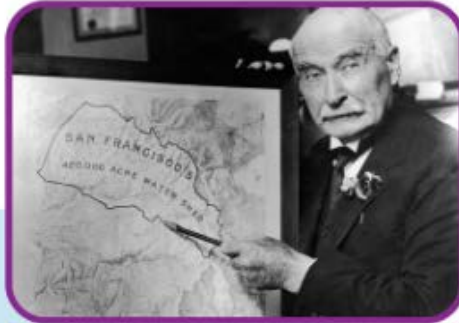
begins the process of evaluating the feasibility of direct potable reuse as part of San Francisco's water supply portfolio



PureWaterSF

Researching Direct Potable Reuse at the Building Scale

Building on our values



INNOVATION

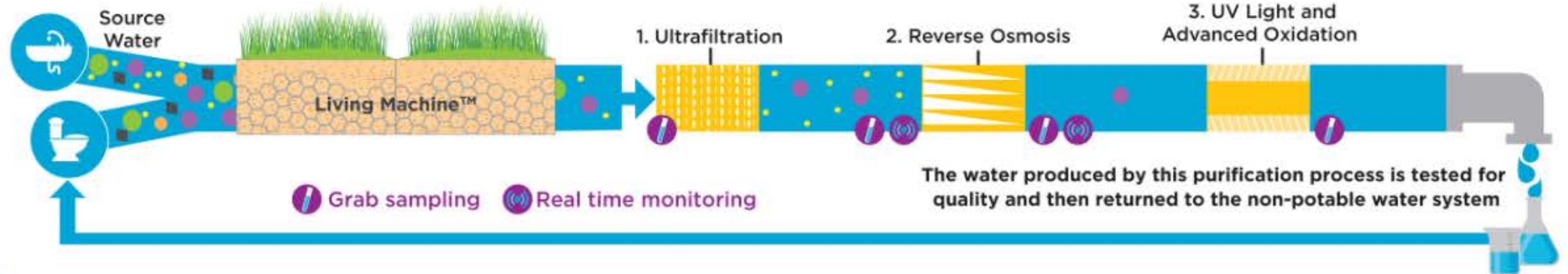
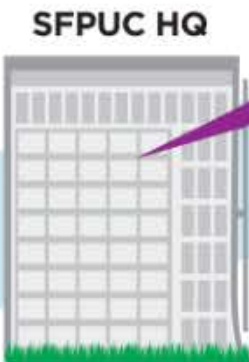


RESEARCH



EXPLORATION

How does PureWaterSF work?







PureWaterSF Project Details

- Pilot system design and operated by SFPUC and Carollo
- Pilot system components:
 - UF: WesTech with Toray
 - RO: Evoqua
 - UV (AOP): Xylem
 - Online Monitoring: s::can
- Analytics
 - Eurofins
 - BioVir
 - Southern Nevada Water Authority
 - UC Davis (Denison Lab)
 - University of Arizona (Gerba Lab)
 - Stanford University (Mitch Lab)

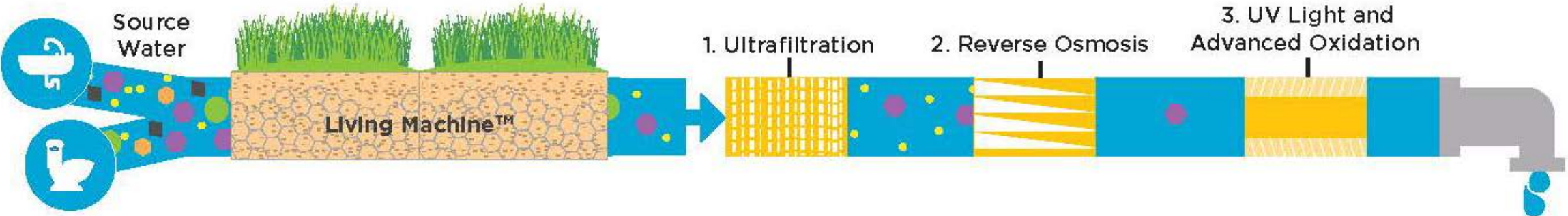


PureWaterSF

A Research Project with Multiple Benefits

-  Building confidence in treatment process reliability and purified water quality
-  Enabling “in-reach” to SFPUC staff, community outreach, and stakeholder engagement
-  Developing SFPUC operator and internal technical capacity
-  Advancing development of statewide regulations and supporting national research objectives





Treatment Process Performance	Online		Continuous		1
Regulated Chemicals (e.g. metals, pesticides, hydrocarbons)	2				2
Contaminants of Emerging Concern (e.g. pharmaceuticals, PFAS)	22			22	22
Non-Targeted Analyses (looking for unknowns)			14	14	15
Pathogens & Surrogates (e.g. virus, protozoa)	14	8	8	8	

Chemical Reduction Performance Goals

Constituent Group	Treatment Goal
Known Knowns	
Regulated Constituents	<MCL, AL, NL
DBPs	<MCL
PPCPs	<MRL
Nitrosamines	40% NDMA reduction
PFAS	<MRL
Unknown Unknowns	
Fluorescence	Clean fingerprint
Bioassays	n/a
Non-Targeted Analysis	n/a

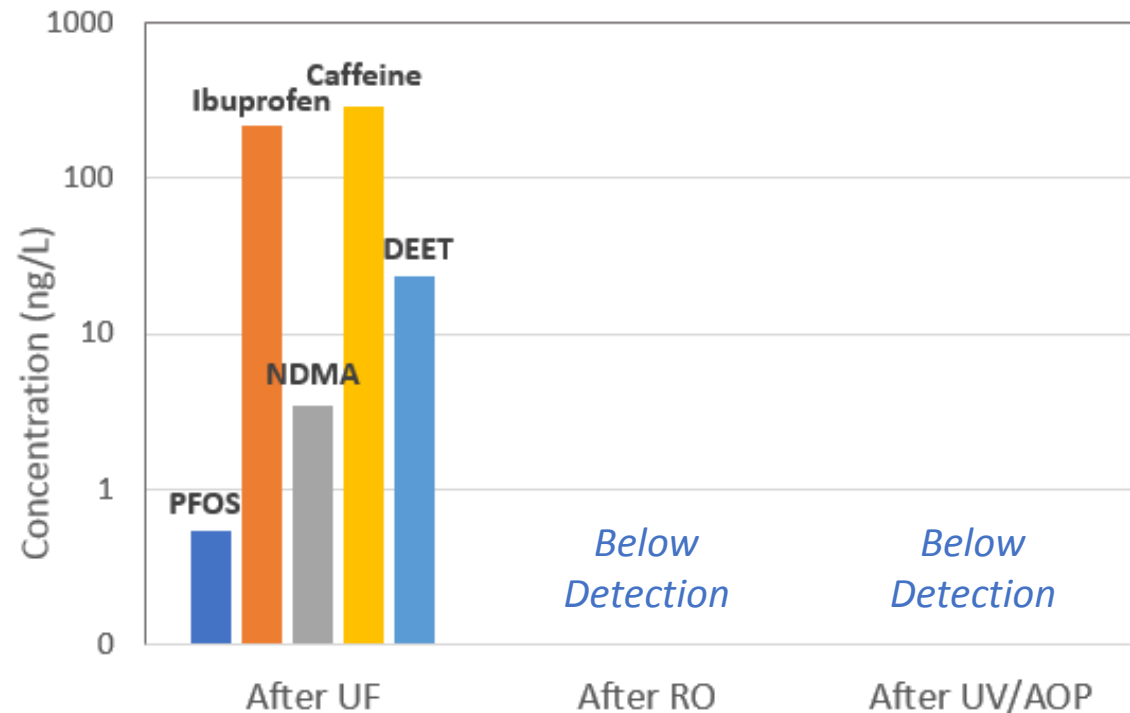
Findings: Water Quality and Treatment Performance



>1,300 individual analyses performed

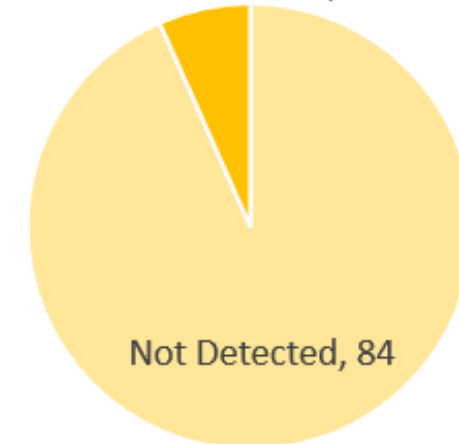


Pharmaceuticals & other CECs are removed well through treatment train



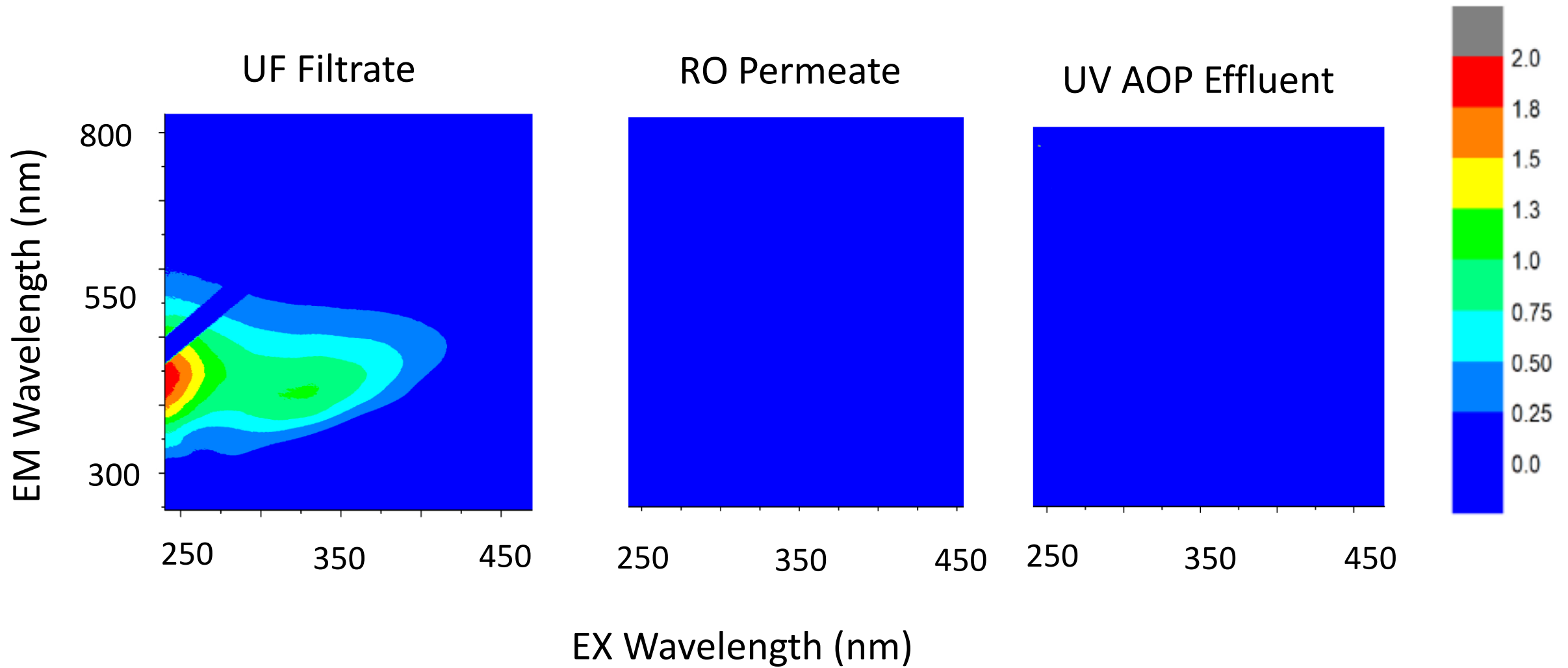
Chemicals are below regulatory limits in finished water

Detected Below MCL, 6



Treatment processes achieved pathogen removal goals

Fluorescence



Through tours and presentations, we are hearing that people are:

Excited About...

- ✓ Water security
- ✓ Efficient use of resources
- ✓ Drought resilience

Curious About...

- ❖ Timing
- ❖ Cost
- ❖ Obstacles

Apprehensive About...

- Safety
- Taste
- Energy usage



San Francisco Chronicle

LOCAL // BAY AREA & STATE

From toilets to taps: SF tests new water recycling program



Dominic Fracassa | Nov. 20, 2019 | Updated: Nov. 20, 2019 4:56 p.m.

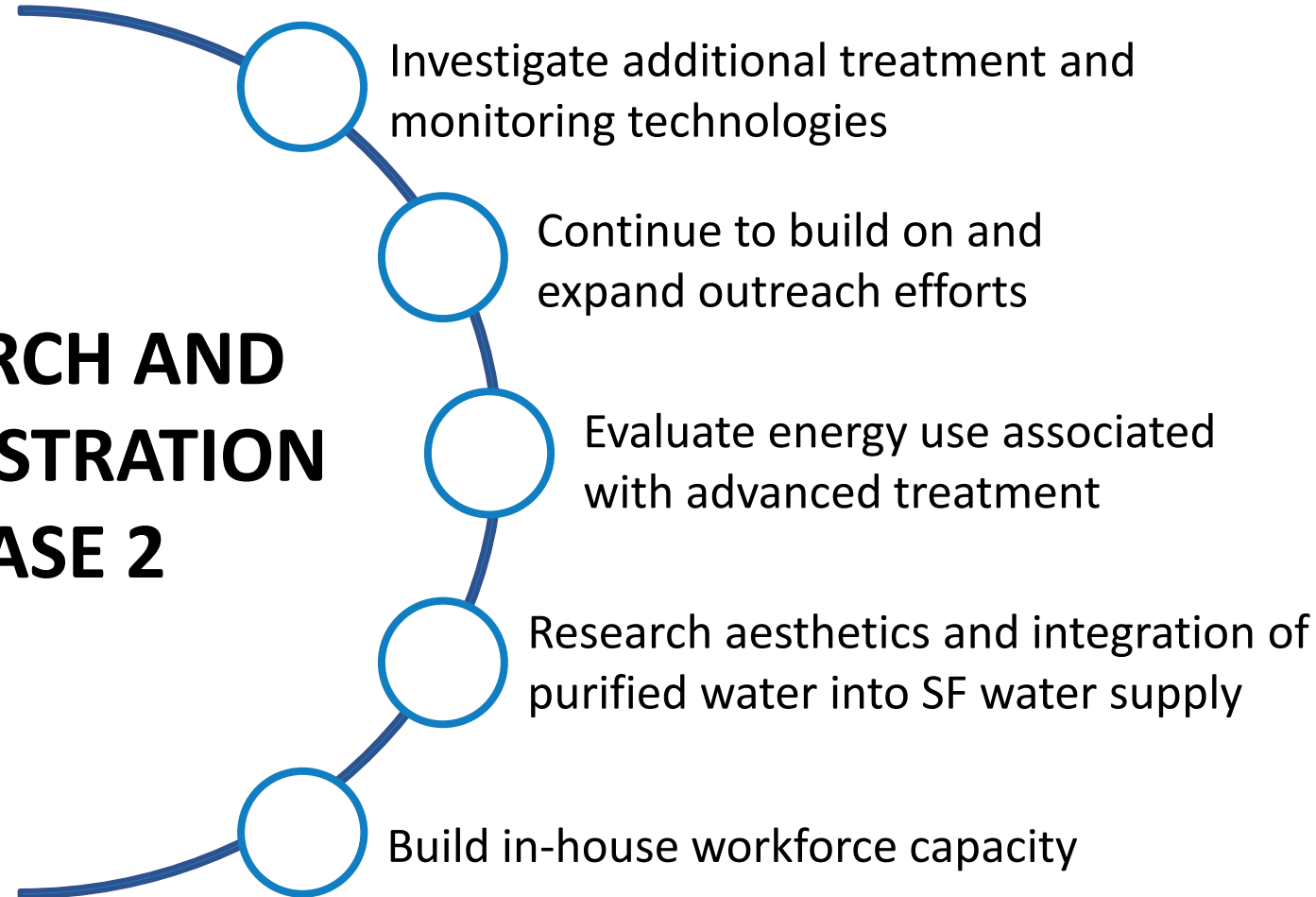


KPIX CBS SF BayArea



San Francisco Recycled Water Program Pushing Wastewater Towards Drinkability

RESEARCH AND DEMONSTRATION PHASE 2



PureWaterSF is the first step in developing purified water for San Francisco