PureWaterSF

Innovate. Research. Explore.

May 2019

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

The San Francisco Public Utilities Commission (SFPUC) is leading innovative research to explore how we can treat our building's wastewater to create a high-quality water supply.

What is PureWaterSF?

The PureWaterSF project is a research project that explores how we can treat and reliably produce purified water on a small (building) scale using wastewater generated onsite. For this project, we will take approximately 80% of the recycled water currently produced by our constructed wetland treatment system (the Living Machine™) and purify it to a level that is expected to meet or exceed drinking water standards. We are collecting data for analysis before the water we produce is returned to the building's non-potable system, which is used for toilet flushing.

What is recycled water?

Recycled water is wastewater that has been treated for end uses like landscape irrigation and toilet flushing.

irrigation flushing cooling

What is purified water?

Putting recycled water through a multi-stage advanced purification process produces high-quality water that can meet state and federal drinking water standards. **This is referred to as purified water. Similar processes and technologies are being used for different kinds of projects including:**

at NASA on cruise ships at Disneyland

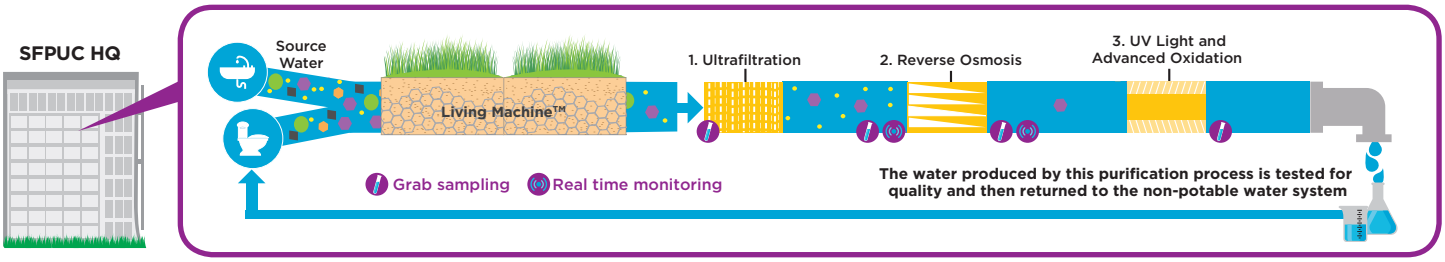
Why research purified water?

San Francisco is fortunate to have an excellent and reliable regional water supply and local groundwater, in addition to long-standing and successful water conservation efforts. But there are few other opportunities to diversify our drinking water resources locally to meet future needs and emergencies. Research into how reliably recycled water can be treated, monitored, and reused will help us explore opportunities for the future. By purifying recycled water to levels that are comparable to or extend beyond drinking water standards, we could develop a future resource that is local and drought-resistant, and can be used for many of our diverse needs.

How does PureWaterSF work?

The PureWaterSF system starts by taking recycled water from the Living Machine™ (a wetland treatment system that takes and treats wastewater from the SFPUC building). The water then undergoes three treatment steps in the purification process.

The PureWaterSF purification process



1. The first step is an **"ultrafiltration"** process that removes bacteria and protozoa.
2. The next step is **"reverse osmosis"**, which removes viruses, trace organics, and salts.
3. The last step is **ultraviolet "UV" light** which sterilizes the water and destroys any remaining trace level chemical pollutants. The quality of the purified water is measured for research and returned into the building's non-potable system.

Sampling and critical control point monitoring occurs throughout the PureWaterSF purification process, testing water quality before and after each process.

For more information on the PureWater Project, please visit **sfwater.org/purewater**

How are we innovating with PureWaterSF?

The goal of this research project is to demonstrate how advanced water purification and monitoring technologies can reliably convert building-sourced wastewaters into a high-quality supply to meet diverse end uses. Several objectives help us achieve this goal:

1. Examine reliability of a water purification system at building-scale

The research examines the reliability of a purification system measuring common parameters such as chlorine, pH, turbidity (how clear the water is), and temperature. This information is regularly collected using real-time monitoring and provides valuable information about the reliability of these systems at a building level.

2. Create a research baseline through advanced water quality analytics

The project follows recommendations from state experts to use specific water quality analytics to address knowledge gaps in the industry. These analytics include non-target analyses (NTA), which measure substances we have not typically measured or created targets for before, and biological assessments, which can test the overall level of toxicity in water samples. Data from this research can help inform statewide regulatory deliberations.

3. Promote transparent science through outreach and communication

The project focuses on promoting transparent scientific practices through outreach and communication by using: factsheets, a digital wall display, a digital tour video, in-person tours and the project's website. All of these components work toward fostering a greater understanding of purified water in our communities. Feedback will further inform future work by the SFPUC.

4. Provide new opportunities with on-site operator training

PureWaterSF provides a unique opportunity for operators to receive onsite training with a building-scale water purification system at the SFPUC headquarters. Operator feedback will help inform planning and system development.

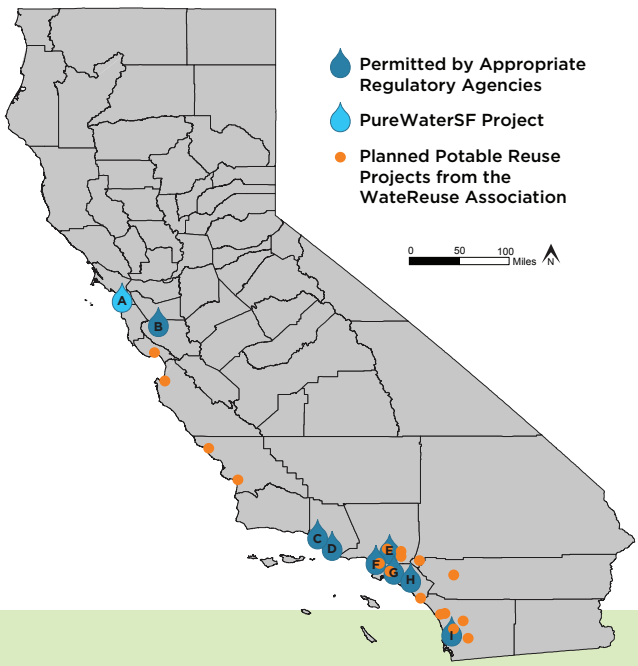
The SFPUC has engaged in the PureWaterSF project to ensure sound science informs development of our future water resources.

The PureWaterSF project draws its source water from the Living Machine™ and its active wetland cells (pictured below) at the SFPUC Headquarters.

Advancing water reuse in California

The PureWaterSF project contributes to the ongoing research and development of water reuse and purified water projects emerging across the state, the country, and beyond. In California, there are projects from Orange County to Monterey, and in San Diego, Los Angeles, and Santa Clara. The research from PureWaterSF will build upon these projects, bringing its own unique advancements in scale and monitoring technologies.

A. PureWater SF Project
B. Santa Clara Valley Water District
C. Ventura Water
D. City of Oxnard
E. City of Los Angeles
F. West Basin Municipal Water District
G. Water Replenishment District of Southern California
H. Orange County Water District
I. City of San Diego



Thinking ahead

Research and new discoveries in water reuse helps us explore options and take steps toward ensuring we will have a sustainable water future for generations to come.

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