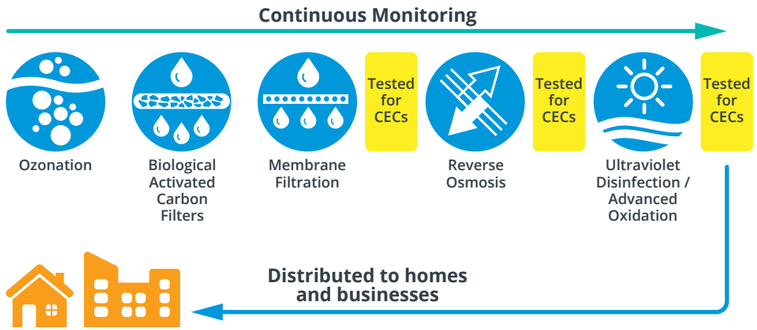
Monitoring Contaminants of Emerging Concern

Both pharmaceuticals and PFAS are classified as contaminants of emerging concern (CECs). Recycled water, or tertiary effluent, is analyzed for CECs before and after the reverse osmosis process and in the final product water. System analyzers continuously monitor the water throughout each step of the treatment process. The North City Pure Water Demonstration Facility helped prove effective removal of pharmaceuticals and PFAS, based on water quality results effectively absent of these contaminants. Once the purified water reaches Miramar Reservoir, the City's water quality team tests it once more for CECs before it travels back to the drinking water plant, where it is treated again and distributed to homes and businesses.

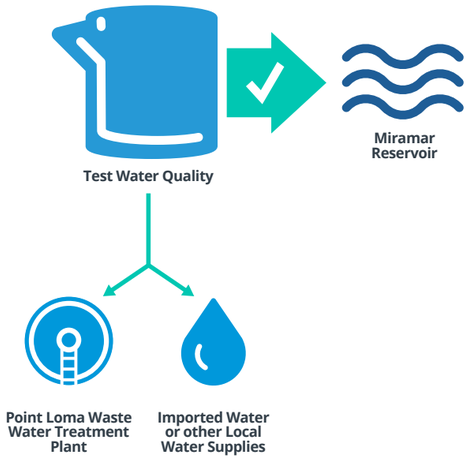


Advanced Water Purification Certification

To operate advanced water purification plants, operators must obtain the proper certification through a rigorous training and testing process prepared by state regulators and public health officials. A long history of successful potable reuse plant operations demonstrates the reliability of the technology used, the monitoring and testing of the water that occurs, and the knowledge of how to operate such systems. In Southern California, a similar facility in Orange County has been in operation since January 2008.

Fail-Safe Processes Protect Public Health

The purification process has redundancy to ensure that if one treatment process does not fully perform, other treatment processes can make up the difference to produce purified water that meets all regulatory standards. If water did not meet these drinking water standards, the City has options to prevent the purified water from entering its destination – Miramar Reservoir. It can be bypassed to the Point Loma Wastewater Treatment Plant before entering the advanced pure water facility or after each subsequent treatment step. If water did not meet strict real-time monitoring requirements, the City could rely on imported water or other local water supplies instead.



How Can I Help?

- Always flush smart: the only things you should flush down the toilet are toilet paper and human waste.
- Dispose of food wrappers, personal care products, and other plastic waste in the garbage.
- Avoid flushing unused or expired medication down the toilet. Check with your local pharmacy about a medication disposal program.

Want to Learn More?

Visit **purewatersd.org** to take a virtual tour of the North City Pure Water Demonstration Facility.

Follow us on social!

@PureWaterSD

Contact us:

Pure Water San Diego Program
9192 Topaz Way
San Diego, CA 92123
purewatersd@sandiego.gov
(619) 533 -7572

Pure Water San Diego

The City *of* SAN DIEGO

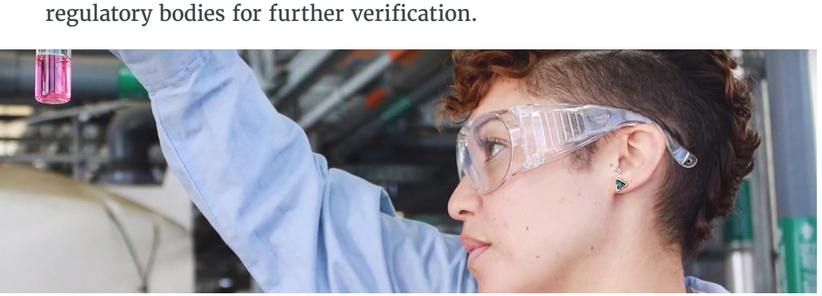
Explore the water quality testing and monitoring plan behind

Pure Water San Diego

Meeting and Exceeding Water Quality Requirements

As the first Surface Water Augmentation Potable Reuse Project in California, Pure Water Phase 1 will deliver 30 million gallons per day to Miramar Reservoir. Maintaining drinking water quality is critical for public health, and the City of San Diego takes this job seriously. The City's drinking water – from all sources and water treatment plants – meets state and federal drinking water standards. Continuous and daily monitoring of each water treatment step is ongoing to ensure integrity throughout the process. The Pure Water Program is regulated in accordance with a rigorous Monitoring and Reporting Program specified by a National Pollutant Discharge Elimination System Permit that is issued by the Regional Water Quality Control Board (RWQCB) and informed by the State Water Resources Control Board Division of Drinking Water (DDW). The Program is also overseen by an Independent Advisory Panel, which consists of public health experts, scientists and other professionals who have vetted the cutting-edge technology used in the Program.

Scientists in the City's laboratories, as well as third-party laboratories, verify water quality. Water quality test results are submitted to state regulatory bodies for further verification.



North City Pure Water Demonstration Facility

More than 145,000 water samples from the North City Pure Water Demonstration Facility have been collected and tested to date. The Demonstration Facility was the pilot facility for the program and continues to actively operate for testing, innovation and education purposes at the North City Water Reclamation Plant on Eastgate Mall. While not part of the City's drinking water system, water produced at the facility is used for recycled water blending and is an integral part of the recycled water distribution system.

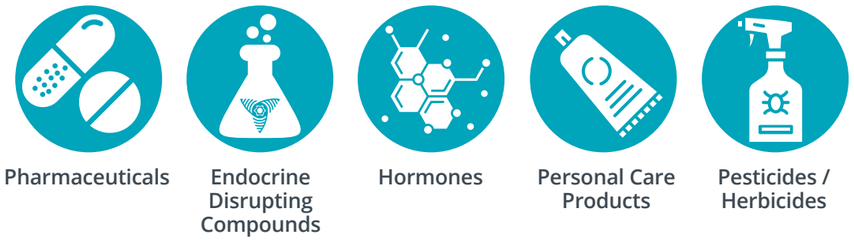
How Does the City of San Diego Purify Recycled Water?

The City of San Diego purifies recycled water through a proven, state-of-the-art advanced purification process. The advanced purification process starts with water that has already been cleaned three times – known as "recycled water." Recycled water moves through five subsequent treatment processes: ozonation, biologically activated carbon filtration, membrane filtration, reverse osmosis and ultraviolet light with advanced oxidation. These processes have been tested and refined at the North City Pure Water Demonstration Facility, which has produced one million gallons per day of advanced purified water since 2011.

Removing Pharmaceuticals

During ozonation, ozone gas destroys microorganisms and breaks down organic substances and contaminants. Ozonation acts as a pretreatment, initially destroying microorganisms and breaking down contaminants before water continues through the treatment process.

Ozone reacts with many types of compounds that may be present in wastewater, including pharmaceuticals, endocrine-disrupting compounds, hormones, personal care products, pesticides and herbicides, and others, breaking down their chemical bonds and forming smaller molecules for removal by the biological activated carbon (BAC) filters.



After undergoing the Ozone and BAC treatment processes, any remaining compounds are removed by physico-chemical separation* during reverse osmosis. Finally, advanced oxidation acts as a "catch-all" to inactivate the minute percentage of particles that could remain.

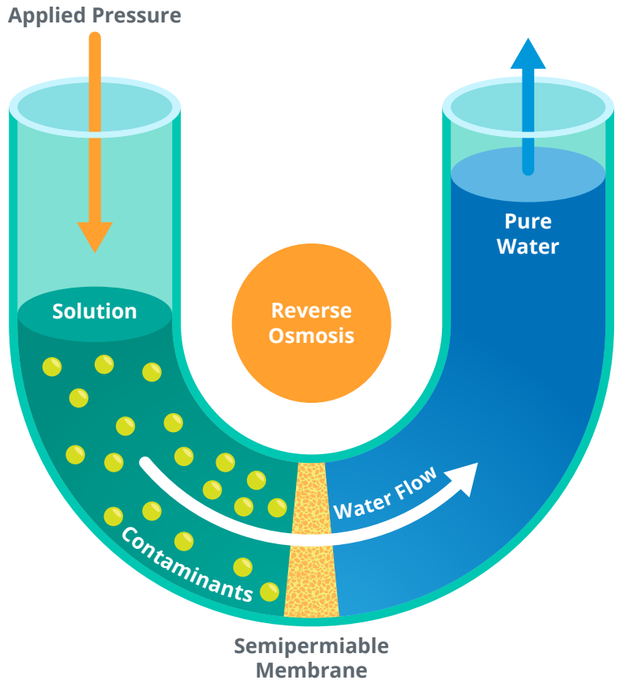
**Physico-chemical separation is a method used to separate different substances based on physical or chemical properties. For example, using a filter to separate dirt from water. It cleans materials without changing their basic structure.*

Removing PFAS

The advanced purification process has been proven to effectively remove PFAS (per- and polyfluoroalkyl substances) in purified water.

PFAS are persistent man-made chemicals found in items such as personal care products, electronics, batteries, or food wrappers. The U.S. Environmental Protection Agency (EPA) has set enforceable limits for certain PFAS in public water systems.

Reverse osmosis is considered one of the most effective methods for removing PFAS. During reverse osmosis, pressurized water is pumped through a semi-permeable membrane. The membrane can filter contaminants as small as a single atom, including PFAS.



This process removes approximately 99.9% of salts, metals, dissolved organic molecules and other materials, many of which are more than 50,000 times smaller than the smallest bacteria or virus. After passing through the membrane, the water is so clean it's near distilled quality.