Potable Reuse Demonstration Test Plan

Purified Water Results from Water Quality Testing and Systems Monitoring

Valley Water

Overview

The Santa Clara Valley Water District (Valley Water) is the primary water resources management agency for Santa Clara County and is responsible for meeting the county's water supply demands. To achieve this, Valley Water plans to produce up to 24,000 acre-feet per year of highly purified water for potable (drinkable) reuse by the year 2028. This amounts to 8 billion gallons a year of new fresh water that's drought-resistant. That's enough water to serve 74,000 households of five each year in Silicon Valley that we would not otherwise have.

The Silicon Valley Advanced Water Purification Center (SVAWPC), which opened in March of 2014, receives secondary-treated wastewater and uses microfiltration, reverse osmosis, and ultraviolet light disinfection to produce highly purified water that meets California's drinking water standards.

The purified water produced by the SVAWPC is not currently used for potable purposes, but instead is blended with tertiary-treated recycled water and used for a variety of non-potable purposes such as irrigation, cooling towers, and industrial applications.

Valley Water is considering expanding the SVAWPC as well as constructing other similar facilities to produce additional purified water for potable purposes. This would most likely be accomplished through replenishment of the groundwater basin with purified water that is later pumped out of the ground and used for drinking.

As part of this effort, Valley Water staff completed the Potable Reuse Demonstration Test Plan (Test Plan) to provide systems monitoring and water quality testing data about the SVAWPC during its first two years of operation. This was also done to demonstrate that the SVAWPC meets the regulations for potable reuse in California which includes, but is not limited to, meeting California primary and secondary drinking water standards.

Potable Reuse Demonstration Test Plan

The Test Plan thoroughly investigated the performance of each component of the purification process (i.e., microfiltration, reverse osmosis, and ultraviolet disinfection) at the SVAWPC. The Test Plan demonstrated effective removal of all tested contaminants, such as:

1. industrial chemicals
2. pharmaceuticals
3. personal care products
4. biological pathogens, which are microorganisms that can cause illness (e.g., viruses, bacteria, and protozoa such as Giardia and Cryptosporidium)

The Test Plan produced comprehensive water quality data for future potable reuse applications and showcased Valley Water's ability to reliably and consistently produce clean, safe drinking water when treating secondary-treated wastewater for potable reuse.

The Test Plan also included the evaluation of an additional treatment process called advanced oxidation. This process was added to the ultraviolet disinfection treatment component to produce a test production of purified water acceptable for potable reuse and demonstrate its production process.

By the Numbers

For over a 15-month period...

284 different constituents tested every 3 months.

4,000 total water quality samples collected and analyzed.

Advanced oxidation works with the ultraviolet light treatment to provide robust disinfection and removal of concerning contaminants.

Additionally, the purification processes (i.e., microfiltration, reverse osmosis, and ultraviolet disinfection) at the SVAWPC were subjected to a rigorous set of challenge tests that intentionally stressed each treatment process to determine whether it still performed as expected.

Finally, the treatment processes were monitored during the Test Plan period to get a better understanding of their operation over time and to identify key parameters that can be used to monitor process performance.

An Independent Advisory Panel, comprised of six internationally known experts from government, academia, and consulting, reviewed the planning and execution of the Test Plan, including the results contained within the Test Plan Final Report. This report discusses the results of the Test Plan as well as recommendations for future operation and design improvements.

Key Results

- All purification processes at the SVAWPC exhibited excellent performance.
- Purification processes exhibited excellent removal of pathogens and contaminants, such as pharmaceuticals and endocrine disruptors.
- Purified water produced by the SVAWPC with advanced oxidation meets CA drinking water standards, including all potable reuse regulations for groundwater replenishment.
- New ways of monitoring were proven to accurately verify the removal of pathogens and contaminants.
- Key parameters termed "Critical Control Points," that will ensure highest water quality, were identified.
- Staff gained valuable understanding of what design, operational, and monitoring changes will be important for the future production of purified water at the SVAWPC.

Ongoing Monitoring at the SVAWPC

Valley Water will incorporate components of the water quality monitoring done as part of the Test Plan into its ongoing water quality sampling program, continuing to gather information to support potable reuse efforts. Valley Water's state-certified water quality laboratory, which is backed by a rigorous quality control program, will ensure that purified water produced by the SVAWPC is analyzed to the highest possible water quality standards.

Valley Water's laboratory has the ability to monitor for 354 target contaminants and is continuously developing new test methods, using the best available technology, for contaminants of emerging concern. The Valley Water's laboratory will provide ongoing support for the potable reuse program.

For final report and glossary of terms, visit: ***https://delivr.com/2h628***.

CONTACT US

To find out the latest information on Valley Water projects or to submit questions or comments, email **Medi Sinaki** at ***msinaki@valleywater.org*** or use our **Access Valley Water** customer request system at ***https://deliver.com/2yukx***.

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