

THE SUN GAZETTE

Allensworth finds a 'Source' for clean water

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Rural, disadvantaged community may have found a solution to its century-old water quality issue by tapping the sky

ALLENSWORTH – When former slave turned U.S. Naval officer Col. Allensworth founded the town that bears his name in the southwestern corner of Tulare County in 1908, water was gushing just below the surface fed by the Tulare Lake, at one time the largest lake west of Mississippi. The town, located just a few miles from the former lake bed in Corcoran, was prospering with its train station and ample supply of water but its success, and water supply, would begin to run out.

According to the California Department of Parks and Recreation's history of Allensworth, tributaries of the lake were diverted and the marshes of the former lake were drained and converted to agriculture production in the early 19th Century. Arsenic was soon discovered in Allensworth and the need to drill a well deeper arose. Allensworth himself was working on a plan to negotiate for a deeper well when he was hit by a motorcycle and killed in 1914. Then the community was hit with a drought from 1929-1934, which coincided with the Great Depression and the loss of many jobs for those in the town who were forced to move to larger cities to look for work. By the 1940s, Allensworth became home to mostly migrant farm workers, who didn't settle there long and the homes began to deteriorate. By 1972 the population had shrunk to less than 100 and the town was almost abandoned until 1976, when it was named a state historic park and interest in preserving the town was renewed.

"In Allensworth, we know all too well that water is an issue of social equity," said long-time resident and community leader Kayode Kadara. "When Colonel Allensworth founded the town, the first in California established and governed exclusively by African Americans, he was told help for the area's water issue was coming, but it never came."

CONTAMINATED

Arsenic has plagued Allensworth's water wells since 1966, according to a 2013 engineering report of the Allensworth Community Services District (ACSD). The community water system currently serves 156 connections, according to the State Water Board. The community is served by two wells pumping groundwater which have both contained arsenic levels up to 60 percent higher than state defined safety levels for drinking water.

Arsenic occurs naturally in rocks, soil, plants and animals; however, it can also come from industrial and agricultural activities, particularly from wood preservatives, fertilizers, pesticides, animal feeding operations, and mining activities. Historically, arsenic was used in pesticides on cotton and orchards, and some forms continue to be used on cotton, which is still a major crop in southwestern Tulare County. Additionally, increased alkalinity (increased pH) may increase the levels of arsenic in groundwater because it dissolves naturally occurring arsenic in surrounding rocks and soils.

The community's eastern well was built in 1984 and was consistently in the range of 11 parts per billion (ppb) to 14 ppb, well below the California maximum contaminant level (MCL) of 50 ppb. That is until November 2008, when California revised the arsenic MCL to 10 ppb. The well has exceeded

the safe drinking water standard for arsenic 18 times between 1990 and 2012, according to a 2017 report by Tulare County.

The other well, located on the western side of Allensworth, was built in 1999 with a grant and loan from the USDA's Rural Development program. That well has failed to meet the MCL at least four times since 2010 and was drilled to replace an older well that was shut down due to high levels of arsenic.

The community's water is so bad the ACSD imposed a moratorium on new water connections and the drilling of new wells in 2010. According to the resolution, the moratorium was prompted by the high cost associated with pumping groundwater from lower depths as a result of decreased groundwater levels coupled with the District's financial inability to drill new wells and therefore meet existing rate payer demand.

The World Health Organization warns that short-term exposure to arsenic can cause stomach pain, nausea and vomiting, skin discoloration and rashes, and numbness or tingling in extremities. Long term exposure can lead to cancer, hypertension, diabetes, tremors and respiratory illnesses. Boiling water does not actually remove arsenic, but rather concentrates levels in the water.

As a result, residents travel to the next county to buy water in single-use plastic bottles or jugs.

"In a place like this, which is a Severely Disadvantaged Community, the health and economic consequences of poor drinking water quality are very real," Kadara said. "We simply don't have the financial resources to build treatment plants or new infrastructure, and the town has worked for more than a century to find a cost-effective fix."

TAPPING THE SKY

After 100 years of looking for solutions below their feet, Allensworth is now looking to the sky overhead.

Allensworth is currently collaborating with Source Global, a public benefit corporation whose mission is to innovate drinking water solutions, to outfit the community with two hydropanels.

The panels use solar energy to turn fans that draw ambient air into a hygroscopic, a patented water-absorbing material, that traps water vapor from the air, according to their website www.source.co. The water vapor is then condensed into a liquid that collects in a small tank attached to the panel. Minerals are then added to filter the water and to provide it with the flavor most people are familiar with. The panels can be piped to deliver the water directly to a faucet or fridge dispenser.

The hydropanels are being piloted in Allensworth to allow residents to taste the water and evaluate the technology, and residents are collecting water for their homes from a dispenser at the community center. Two hydropanels can produce 20 bottles of water per day, and enough drinking water for four to six people per year.

Based in Scottsdale, Ariz., Source's technology works entirely off the grid and in nearly every climate, making it well suited for places like Allensworth, a small community with little infrastructure, limited resources and a hot, arid environment. The panels are customized for the climate, such as areas with low sun and humidity, and can even work in the most arid deserts in the world, according to the company. Source claims its panels are being used in more than 40 countries, including Colombia, South Africa, United Arab Emirates.

“Applying thermodynamics, materials science, and controls technology, our hydropanel needs only sunlight and air to make perfect drinking water for schools, homes, worksites, communities, and more,” the website reads.

Looking forward, community leaders and Source plan to apply for a California Drinking Water State Revolving Fund grant that will fund panels for every home in this approximately 600-person community.

Kadara said that as a potential long-term option for the supply of arsenic-free drinking water in underserved communities around world, the system will be incorporated into the Summer Work Program administered by community leaders. The science involved with the Source system will enhance area student’s STEM (science, technology, engineering and math) experience and education and help them grow into leaders and stewards of the environment.

“Allensworth is considered ‘the community that refuses to die,’ and with the resilience and vision of the people here, we are taking control of our future and ensuring that we consider all sustainable and regenerative processes in our decision making,” Kadara said. “Source hydropanels fit into the community’s plans for a viable option for the delivery of sustainable drinking water.”

UNCLEAN

Allensworth is not alone in its fight for clean drinking water. Tulare County has the largest number of systems without safe drinking water, according to local nonprofit Community Water Center’s Drinking Water Tool. The most common contaminants found in these water systems are arsenic, nitrate, lead, copper, Uranium, and E. Coli.

Over 450,000 California residents, most living in the San Joaquin Valley, are served by a community water system serving less than 10,000 people and exceed the MCL for at least one of these contaminants. Across the nation, 40% of America’s 50,000 community water systems have had water quality violations, according to the EPA.

Evidence also shows that American households facing water insecurity and poor water quality are likely to have lower incomes and live in areas where infrastructure has been systemically underfunded.

According to a recent study commissioned by Source, just one-third of the American public feels confident about the quality of water coming out of their tap.

“While we typically think of the U.S. as having good water quality, access to safe drinking water isn’t a given for tens of thousands of communities in the nation over a million California residents,” said Rob Bartrop, chief research officer of Source Global. “As the divide between urban and rural communities gets wider and funding for infrastructure is increasingly allocated to cities, we expect to see more small towns face water challenges. Beyond that, the economic recovery of these areas, already hit hard by COVID-19, is likely to lag well behind the rest of the country, making a difficult situation worse.”