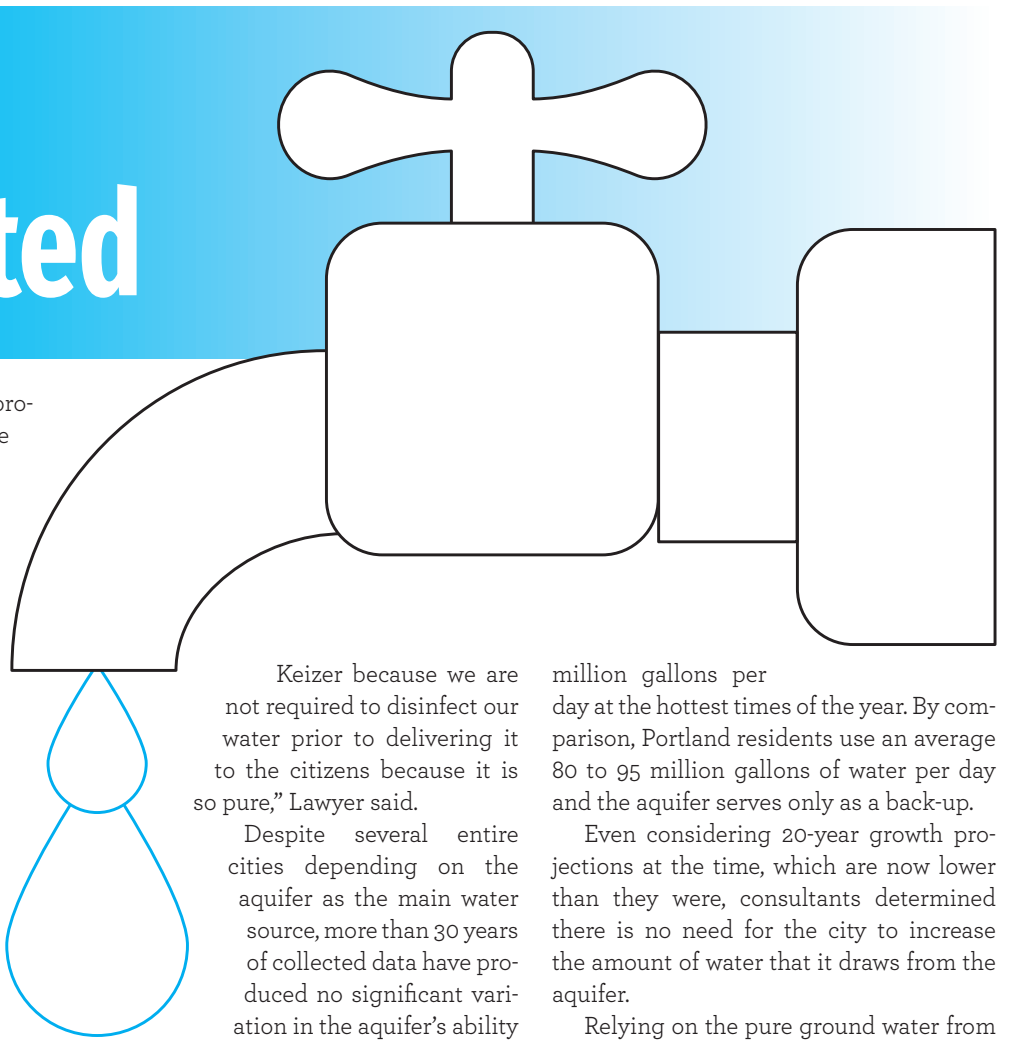
Ancient aquifer keeps city hydrated



By ERIC A. HOWALD
Of the Keizertimes

It doesn't require listening hard or long to grow concerned about water supplies.

Whether it's a shortage in far-flung countries or a chlorine treatment shortage in Oregon, the causes for water worry can be overwhelming. By contrast, Keizerites can rest easy knowing the city's water supply is clean and won't be running dry any time in the foreseeable future.

"Residents should have no concerns about rationing water for normal daily uses. If there were to be an issue with the water system that required extra conservation measures we will notify the public of the need to do so," said Bill Lawyer, director of Keizer Public Works.

That includes water for activities like drinking, cooking and bathing, as well as luxuries such as watering lawns and filling pools.

There are so few concerns about the aquifer level changes that there aren't even regional conversations about overtaxing its supply. Rampant use is ill-advised, but there are no current threats.

"We keep an eye on new water right applications submitted through the Water Resources Department that propose additional draw from the aquifer and provide comments as necessary on those applications," he said.

Keizer gets its water from wells that tap into the Troutdale Aquifer, a massive 300-square mile underground "lake" that stretches into southwest Washington and down to Eugene. That's equivalent to 145,200 football fields and more than 51 million cars could be parked in the same amount of space.

Depending on where it's measured, the aquifer is anywhere 60 to 1,500 feet thick. Not all of that space is water, but the H2O flows within a layer of sandy gravel, sandstone and basalt (volcanic rock).

Troutdale Aquifer serves as the sole source of the water that flows into the homes of residents. The quality is so high, because of the filtration that happens underground, that only a fluoride injection and a treatment that converts iron and manganese into solids for easy filtering are needed before sending it into Keizer homes.

"The chlorine shortage does not impact Keizer because we are not required to disinfect our water prior to delivering it to the citizens because it is so pure," Lawyer said.

Despite several entire cities depending on the aquifer as the main water source, more than 30 years of collected data have produced no significant variation in the aquifer's ability to recharge with runoff from High Cascades. The High Cascades is the term used for the tallest volcanic formations in the Cascade Mountains that are covered with snow and/or ice mostly year-round. The aquifer's flows are also influenced by the Columbia and Willamette Rivers.

The city taps into the aquifer through 15 wells spread throughout the seven square miles of Keizer. Wells range from 100- to 450-feet deep and are powered by electricity.

After being extracted from the aquifer to the surface, 125 miles of pipe carry water to Keizer homes or one of three above-ground storage units. Two reservoirs, one near Bair Park in north Keizer and another near Keizer Little League Park, and the water tower visible from Interstate 5 hold approximately 2.8 million gallons of water and keep water pressure consistent throughout the system.

The last time the city updated its Water Master Plan, in 2012, Keizerites used about 93 gallons of water per day, per resident, which includes system leakage pegged at 5%-8% of the overall flow. Keizerites use an average of 3.5 million gallons of water per day and consumption peaks around 8 million gallons per day at the hottest times of the year. By comparison, Portland residents use an average 80 to 95 million gallons of water per day and the aquifer serves only as a back-up.

Even considering 20-year growth projections at the time, which are now lower than they were, consultants determined there is no need for the city to increase the amount of water that it draws from the aquifer.

Relying on the pure ground water from the aquifer keeps costs to a minimum for the city's residents. On average, a Keizer household pays about $7.50 per month to be part of the system. The closest comparable city is McMinnville whose residents pay more than $23 a month.

Salem, which uses water from the Willamette River and nearby surface water sources, must pay for additional treatments before it reaches homes. Surface water is also more susceptible to contamination from natural and human-produced sources. The Troutdale Aquifer is protected by a thick layer of clay that is, by and large, a shield from surface contaminants.

Two years ago, when an algae bloom in the Santiam had residents of the Cherry City scrambling to hydrate, Keizer was able to assist without impacting the quality of services in the city and didn't have any measurable impact on the aquifer levels, according to Lawyer.

Several are equipped with back-up generators to keep the system running in the event of a citywide power outage.

When the ice storm tested the city's abilities in almost all areas earlier this year, "[The water systems] performed excellently during the power outage," Lawyer said.