

# Dry wells linked to mining areas

**Alex MacLean, Sonora Union Democrat, 9-8-15**

Tuolumne County officials tracking the number of private wells going dry due to the four-year drought have found that many areas with the highest concentrations are in parts of the county where historic gold mining activity is known to have occurred.

“You can see how these failed wells are following these mining claims,” said county Environmental Health Director Rob Kostlivi. “There is a possibility now that these wells can be connected and the old mines themselves could be acting as water storage that’s been in effect for 100-plus years.”

The county has recorded 215 wells and 11 springs that have gone dry over the past year, affecting more than 311 homes. Kostlivi said the county is averaging at least one well failure per day.

A program launched late last year to provide assistance for homeowners without water due to drought-related well failures has allowed the county to map their locations, which led to the discovery.

The possible correlation was revealed through a map developed by Larry Beil, the county’s GIS coordinator, overlaying the locations of the well failures with the locations of historic mining claims.

“It really does follow that trend,” Kostlivi said. “It’s pretty telling.”

Groundwater in the area runs through fractures in bedrock as opposed to underground basins like those in the Central Valley. It’s difficult to predict the amount water that wells drilled into fractured rock will yield because they have a high variability depending on the fracture.

Kostlivi spoke with colleagues in Nevada County and Colorado who said they saw the same trend with fractured rock wells producing greater yields around areas that had a high incidence of mining activity.

“What we’re seeing here in Tuolumne County is, had there been no mining activity at all, the actual well yield might only one to two gallons a minute,” he said. “However, with these mines acting as cisterns, it’s giving false readings.”

Much of the historic mining activity followed fault lines that cut through the Mother Lode, said Jeff Tolhurst, an earth sciences professor at Columbia College. Gold and quartz was generated along the fault lines due to plate tectonic movement more than a 100 million years ago.

“Those fault structures were the gold producers,” Tolhurst said. “The old timers didn’t know that and they would just follow the quartz, and it turns out they were delineating some of those faults.”

Early prospectors during the days of the Gold Rush mostly panned for placer gold along area streams. Many towns that sprung up during the initial boom became deserted after the 1860s, such as Montezuma, Springfield and Sawmill Flat.

The area experienced a second boom period in the late 1800s with the introduction of hard rock mining, said Bob Holton, a Mother Lode historian and Union Democrat columnist.

“They called it a second Gold Rush,” he said. “They had big stamp mills that would crush the ore and chemically treat it to retrieve the gold. All throughout our area you could hear those things just pounding away 24 hours a day.”

Holton said water was continuously pumped from the area's mines, some of which went as deep as 4,000 feet underground.

The government made gold mining illegal shortly after the start of World War II, effectively putting an end to the "second Gold Rush." Many of the mines flooded and were never re-opened when the government lifted the ban after the war.

Many parts of the county that have the highest concentrations of dry wells are also close to where much of the hard rock mining occurred, such as Tuttle town, Quartz and Stent.

However, a connection between these historic mines and the productivity of area wells still warrants further research. Scientists from the U.S. Geological Survey are planning to conduct studies in the coming months, Kostlivi said.

Assistance for residents with dry wells is available through a state-funded program administered by the county. As of earlier this week, more than 100 emergency water tanks had been installed throughout the county.

"We're still asking for all the residents to be prepared, conserve and really be diligent when it comes to water conservation," Kostlivi said. "It is so imperative."