To: Montgomery, Michael[Montgomery.Michael@epa.gov]
From: Albright, David
Sent: Mon 2/2/2015 5:41:10 PM
Subject: FW: SF Chronicle article on Calif. UICs and aquifers issue

Mike, any idea what Jared was talking about with the manila envelopes?

From: Skadowski, Suzanne
Sent: Monday, February 02, 2015 9:25 AM
To: Montgomery, Michael; Albright, David
Cc: Mogharabi, Nahal
Subject: SF Chronicle article on Calif. UICs and aquifers issue

Mike and David,

In case you missed it on Sunday, here is a link to the SF Chronicle article on Calif. UICs and aquifers issue and full text is below:

http://www.sfgate.com/business/article/State-let-oil-companies-taint-drinkable-water-in-Central-Valley

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State let oil companies taint drinkable water in Central Valley

David R. Baker | January 31, 2015

Oil companies in drought-ravaged California have, for years, pumped wastewater from their operations into aquifers that had been clean enough for people to drink. They did it with explicit

permission from state regulators, who were supposed to protect the increasingly strained groundwater supplies from contamination.

Instead, the state allowed companies to drill more than 170 waste-disposal wells into aquifers suitable for drinking or irrigation, according to data reviewed by The Chronicle. Hundreds more inject a blend of briny water, hydrocarbons and trace chemicals into lower-quality aquifers that could be used with more intense treatment. Most of the waste-injection wells lie in California's parched Central Valley, whose desperate residents are pumping so much groundwater to cope with the historic drought that the land has started to sink.

"It is an unfolding catastrophe, and it's essential that all oil and gas wastewater injection into underground drinking water stop immediately," said Kassie Siegel, director of the Climate Law Institute at the Center for Biological Diversity environmental group.

The problem developed over decades, starting with a bureaucratic snafu between state and federal regulators. It was made worse by shoddy record keeping and, critics say, plain negligence. The issue erupted into public view last summer when state officials abruptly shut down 11 waste-injection wells in Kern County, fearing they could taint groundwater supplies already feeding homes and farms.

No contamination

So far, tests of nearby drinking-water wells show no contamination, state officials say. But the federal Environmental Protection Agency, which helped uncover the practice, is threatening to seize control of regulating the waste-injection wells, a job it has left to California officials for over 30 years. The state faces a Feb. 6 deadline to tell the EPA how it plans to fix the problem and prevent it from happening again.

"If there are wells having a direct impact on drinking water, we need to shut them down now," said Jared Blumenfeld, regional adminstrator for the EPA. "Safe drinking water is only going to become more in demand."

California produces more oil than any state other than Texas and North Dakota, and its oil fields are awash in salty water. A typical Central Valley oil well pulls up nine or 10 barrels of water for every barrel of petroleum that reaches the surface. In addition, companies often flood oil reservoirs with steam to coax out the valley's thick, viscous crude, which is far heavier than petroleum found in most other states. They pump high-pressure water and chemicals underground to crack rocks in the controversial practice of hydraulic fracturing. They use acid and water to clear up debris that would otherwise clog their oil-producing wells. All of that leftover water, laced with bits of oil and other chemicals, has to go somewhere. Pumping the liquid — known in the industry as produced water — back underground is considered one of the most environmentally responsible ways to get rid of it.

"If we're not able to put the water back, there's no other viable thing to do with it," said Rock Zierman, chief executive officer of the California Independent Petroleum Association, which represents smaller oil companies in the state. "If you were to shut down hundreds of injection wells, obviously that's a lot of jobs, a lot of tax revenue."

Farmers fear that the groundwater they increasingly need to nurture their orchards and crops may one day show signs of pollution, even if it hasn't surfaced yet.

"When I'm concerned for my farm, I'm looking at future generations and reaching a point where they can't use the groundwater because of things we're doing today," said Tom Frantz, 65, a farmer and retired teacher who grows almonds near the town of Shafter (Kern County).

The wastewater injection problem stretches back to 1983. EPA officials that year signed an agreement giving California's oil field regulators — the state's Divison of Oil, Gas and Geothermal Resources — responsibility for enforcing the federal Safe Drinking Water Act. The agreement listed, by name, aquifers considered exempt, where oil companies could legally inject leftover water with a simple permit from the division. If state regulators wanted to add any aquifers to the list, they would need EPA's aproval.

But there were two signed copies of the agreement, said Steven Bohlen, the division's new supervisor. Eleven aquifers listed as exempt on one copy weren't included on the other. The state and the oil companies considered those aquifers exempt — perfectly suitable places to dispose of wastewater. The EPA didn't.

“We cannot tell, nor can the EPA, which version is correct,” said Bohlen, appointed by Gov. Jerry Brown last year.

The bureaucratic confusion didn’t stop there. In some cases, the state treated entire aquifers as exempt when, in fact, only specific portions of them had been approved for oil industry use. In other instances, the state issued injection permits for aquifers that the EPA had never declared exempt, Blumenfeld said.

Program audit

The EPA first suspected something was amiss after auditing the division’s underground injection control program in 2011 and reviewing its aquifer exemptions the following year. The division scoured its records and found that it had authorized oil companies to pump wastewater into some high-quality aquifers that were supposed to be off-limits. Poor record keeping added to the problem. Studies on the 11 disputed aquifers, Blumenfeld said, dated from the 1980s and came in printouts stored in envelopes. Vital documents went missing.

“We’d sit down with them and go through these manila envelopes, and there’d be nothing in them, and they’d say, 'Well, there’s nothing in this one,’” Blumenfeld said. “That’s when we knew we really had a problem.”

In all, 464 wells injected wastewater into aquifers that were supposed to be protected, according to state data. That includes 94 wells drilled into the 11 aquifers that the state considered exempt and the EPA didn’t. Some of the aquifers that were breached were so salty that they would be difficult to use. But a third of the aquifers are believed to hold water that — at least before injection began — was clean enough to drink, either with some treatment or none at all. To gauge water quality in a river, lake or aquifer, researchers often start with the water’s total dissolved solids — salts and other materials in the liquid. High counts don’t necessarily make water harmful to drink, but they can cloud it and give it a salty or bitter taste. In general, anything below 500 parts per million requires no treatment and is considered high quality. Water from San Francisco’s Hetch Hetchy system, piped straight from the Sierra, averages 71. State water officials want to prevent contamination of any aquifers that are below 3,000.

More permits

And yet, the oil industry drilled 171 injection wells into aquifers with counts of 3,000 parts per million or less, according to state data. Companies also received permits to drill five wells into aquifers of the same quality, but for those wells there is no record of injections. Another 253 injection wells went into saltier but potentially usable aquifers that the EPA considers protected. Companies received permits for an additional 26 wells of the same quality. Finally, companies drilled 40 injection wells into aquifers for which there is no water-quality data. A total dissolved-solids count above 1,000 may require treatment before use, either by blending it with fresher water or putting it through reverse osmosis, the process used in seawater desalination plants. But it is usable, for crops or people.

"There's a cost to this water," Blumenfeld said. "But we want to make sure — and the Safe Drinking Water Act requires us to make sure — that it's protected, because we may need it."

It's unknown exactly how much water lies in the aquifers used for waste injection. A handful of those aquifers are already used for drinking and irrigation — leading to the emergency closure of 11 injection wells in July. Three of those wells were allowed to resume operations after their owners proved that they hadn't accessed a drinking-water aquifer after all.

Officials have tested samples from nine nearby drinking wells and found elevated levels of arsenic and nitrates. But that's common for this corner of the Central Valley, where arsenic often leaches into the water from the native rocks. The drinking wells may have been protected by distance, said Jonathan Bishop, chief deputy director of the State Water Resources Control Board. Even when the oil companies injected wastewater into an aquifer used for drinking and irrigation, the injection wells were drilled deeper than the drinking wells.

"The well will pull water horizontally before it pulls it vertically," said Bishop, whose board is helping to determine whether the injection wells put any drinking water supplies at risk.

He noted, however, that pollutants can migrate over time. "We haven't found any impact, but that doesn't mean we aren't concerned about it," Bishop said. "If that aquifer has drinking water, we don't want them injecting into it."

Little rain

Even in relatively wet years, little rain falls in the southern San Joaquin Valley, forcing its farmers to rely on irrigation. Any potential threat to groundwater matters.

Mike Hopkins blames oil companies for tainting the aquifer that used to feed his cherry trees, not far from Bakersfield.

In 2010, some of their leaves started curling up and turning brown, a problem that spread the following year. He tried giving them more water, but that seemed to make things worse. Replacing some of the trees didn't work either, with the new plants quickly losing leaves to the same strange scorching. Tests of the water revealed high levels of salt and boron, both of which can damage trees. Hopkins eventually ripped out 3,500 dying trees. In September, he sued four companies that had been injecting wastewater near his orchard. The wells closest to his property do not appear to be among the injection wells being reviewed by the EPA and the state.

"That's what we do for a living — we're farmers, we grow things," said Hopkins, 67, managing partner of Palla Farms. "If we don't have water, your property's worth zero."

David R. Baker is a San Francisco Chronicle staff writer.

Running dry: Throughout 2015, The Chronicle will report stories about water growing scarce in California.