

SUNDAY FEATURES

SUNDAY, OCTOBER 4, 2009

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Water worries

threaten US push for natural gas

Americans living near drilling facilities have complained that their water has turned cloudy, foul-smelling, or even black as a result of a technique called 'fracking'

BY JON HURDLE
REUTERS, PAVILLION, WYOMING

Louis Meeks, a burly 59-year-old alfalfa farmer, fills a metal trough with water from his well and watches an oily sheen form on the surface that gives off a faint odor of paint. He points to small bubbles that appear in the water, and a thin ring of foam around the edge.

Meeks is convinced that energy companies drilling for natural gas in this central Wyoming farming community have poisoned his water and ruined his health.

A recent report by the Environmental Protection Agency suggests he just might have a case — and that the multi-billion US dollar industry may have a problem on its hands. EPA tests found his well contained what it termed 14 “contaminants of concern.”

It tested 39 wells in the Pavillion area this year, and said in August that 11 were contaminated. The agency did not identify the cause but said gas drilling was a possibility.

What’s happened to the water supply in Pavillion could have repercussions for the nation’s energy policies. As a clean-burning fuel with giant reserves in the US, natural gas is central to plans for reducing US dependence on foreign oil.

But aggressive development is drawing new scrutiny from residents who live near gas fields, even in energy-intensive states such as Wyoming, where one in five jobs are linked to oil and gas which contributed US\$15 billion the state economy in 2007.

People living near gas drilling facilities in states including Pennsylvania, Colorado, New Mexico and Wyoming have complained that their water has turned cloudy, foul-smelling, or even black as a result of chemicals used in a drilling technique called hydraulic fracturing, or “fracking.”

The industry contends drilling chemicals are heavily diluted and injected safely into

gas reservoirs thousands of meters beneath aquifers, so they will never seep into drinking water supplies.

“There has never been a documented case of fracking that’s contaminated wells or groundwater,” said Randy Teeuwen, a spokesman for EnCana Corp., Canada’s second-largest energy company, which operates 248 wells in the Pavillion and nearby Muddy Ridge fields.

“We know they don’t have the science to prove what they say,” Teeuwen said of those who criticize fracking.

HARD TO PROVE SOURCE OF CONTAMINATION

Critics say their kids have got sick, their animals have died, and their water has in some cases become flammable because of methane escaped into aquifers from gas wells.

But they have been unable to prove their case because drilling companies are not required to disclose exactly what chemicals they use, thanks to an exemption to a federal clean water law granted to the oil and gas industry in 2005.

The EPA, in its first tests in response to concerns over gas drilling and water quality, has not positively identified the source of the Pavillion contamination but it did name gas drilling as a possible cause. The agency is continuing its tests and expects to issue a report in spring 2010.

Luke Chavez, an EPA scientist leading the investigation, said he will now seek to determine the quantities of a range of contaminants and their health effects.

“We’re taking a shotgun approach,” he said. In Pavillion, residents are on edge.

Meeks’ neighbor Donnet Baughman said she does not mind companies drilling for gas in her backyard, as long as it doesn’t poison her water.



“We are not against the oil and gas industry at all,” she said during an interview in her living room. “We just want them to do it right.”

Baughman’s water was clean, according to the EPA tests, but she is uneasy with the findings since she has a gas separation tank about 50m from her house, and some of her neighbors, including Meeks, were found to have bad water.

Three wells in the EPA’s sample contained 2-BE, a potentially carcinogenic substance that’s used as a lubricant in drilling, and in some household cleaning products.

GAS LIES WELL BELOW AQUIFERS

Stung by grassroots complaints, and by a bill in Congress that would require disclosure of fracking chemicals, the industry says it is using the latest technology to keep fracking safe.

At the Frenchie Draw drilling rig 100km east of Pavillion, EnCana workers used automated machinery to join 9m lengths of pipe and insert them into a new well, which extends 3,394m below ground.

The steel pipe can withstand pressure up to 9,800 pounds per square inch. It is encased in concrete to 762m, well below aquifers,

said John Schmidt, an EnCana field leader.

The pipes allow EnCana to inject a fracking fluid of water, sand and chemicals at high pressure into the gas-bearing rock.

At specific depths identified by geologists, the pipe is perforated with small holes by controlled explosions. The fracking mixture then breaks up the rock, allowing natural gas to rush to the surface.

About 70 percent of the water mixture remains underground, while the rest is pumped back up and later re-injected into 3,000m disposal wells, Schmidt said. In 2010, EnCana plans to start treating and reusing the water.

Despite the industry’s precautions, spills of fracking fluids occur.

On Sept. 25, Pennsylvania regulators ordered Cabot Oil & Gas Corp to halt fracking operations in one county after it admitted three recent spills of fracking fluid.

TO STAY OR TO GO?

In Pavillion, Meeks said he suffers pulmonary hypertension and neuropathy in his legs. “They have ruined my life,” he said. “I would like to get out of here.”

He said EnCana stopped supplying him free drinking water this month, after he



Above: Louis Meeks, a farmer who lives near Pavillion, Wyoming, fills a trough with water from his well. Meeks believes that energy companies drilling for natural gas have poisoned his water and ruined his health.

Left: A worker at EnCana’s Frenchie Draw gas field in central Wyoming guides sections of steel pipe into a 3,400m well.

PHOTOS: REUTERS

publicly opposed fracking practices.

“They are trying to punish me,” Meeks said. “I’m a thorn in their side.”

A kilometer from Meeks’ house, across a valley dotted with gas wells, separation tanks and compressor stations, Rhonda Locker, 48, said she stopped drinking her water after it “went bad” in the early 1990s.

She started drinking it again about five years ago after installing a reverse-osmosis filter, but within six months started having seizures, bone pain, and cognitive problems.

Frustrated by not knowing what was causing her illness, she tried again early last month to drink the water, and experienced the same symptoms.

“It’s like you have the flu every day,” Locker said.

Locker, who has two gas wells within 150m of her house, said she has been diagnosed with a neurological disorder, which her doctors have failed to pin on any particular cause, but which she blames on a history of drinking the water.

Locker also suspects water contamination is to blame for her 26-year-old daughter’s termination of three pregnancies, and for liver disease in her 24-year-old son.

In a shed outside, Locker’s husband Jeff, a 56-year-old farmer, removed the filter from the reverse-osmosis mechanism that cleans their water sufficiently for bathing, revealing a cylinder turned jet black by the incoming well water. Like many of their neighbors, they drink only bottled water.

[SCIENCE]

Today’s babies are likely to live to 100, doctors predict

The authors of a recent report see no lifespan limit in developed nations, a prospect that poses a severe challenge for modern welfare states

BY SARAH BOSELEY
THE GUARDIAN, LONDON

Most babies born in the past few years in the UK will live to be 100 if current trends continue, experts said Friday.

And people could be living not only longer, but better, according to doctors writing in the *Lancet* medical journal, who say that most evidence shows the under-85s are tending to remain more capable and mobile than before. They have more chronic illnesses, such as cancers and heart conditions, but people survive them because they are diagnosed earlier and get better treatment.

Kaare Christensen and colleagues at the ageing research center at the University of Southern Denmark calculate that at least half the babies born in the UK in the year 2000 will reach their 100th birthday. Life expectancy is increasing so fast that half the babies born in 2007 will live to be at least 103, while half the Japanese babies born in the same year will reach the age of 107.

The bad news is that the ageing

populations of rich countries such as the UK threaten to unbalance the population. It “poses severe challenges for the traditional social welfare state,” write Christensen and colleagues.

But they have a radical solution: young and old should work fewer hours a week. Over a lifetime, we would all spend the same total amount of time at work as we do now, but spread out over the years.

“The 20th century was a century of redistribution of income. The 21st century could be a century of redistribution of work,” they write. “Redistribution would spread work more evenly across populations and over the ages of life. Individuals could combine work, education, leisure and child rearing in varying amounts at different ages.”

It is a theory that is beginning to receive “some preliminary attention,” the authors say, citing a study in the *Science* journal three years ago which suggested that shorter working weeks would help young people and increase Western Europe’s flagging birth rate.

Shorter working weeks might further increase health and life expectancy, Christensen and colleagues write. But redistribution of work will not solve all the problems caused by a society with a large number of very old people. Beyond a certain point, the old will need younger people to look after them — although technology is likely to provide some help in advanced countries such as the UK.

Over the 20th century there have been huge increases in life expectancy — more than 30 years — in most developed countries.

Breakthroughs in saving babies from infectious diseases and mothers from the complications of childbirth were responsible for the big increases in life expectancy until the 1920s. Then people started to live to greater ages. “This reduction in old-age mortality was unprecedented and unexpected,” the authors write. “Since the 1950s, and especially since the 1970s, mortality at ages 80 years and older has continued to fall, in some countries even at an accelerating pace.”



An elderly woman is led to a temple in Tokyo. Japan has the highest ratio of centenarians in the world.

PHOTO: REUTERS

Japan holds the record. In 2007, the life expectancy of a woman was 86 years — confounding theorists who had suggested in 1980 that 85 years was the limit for human life expectancy.

The Danish authors say they see no reason why life expectancy should

not continue to rise. “The linear increase in record life expectancy for more than 165 years does not suggest a looming limit to human lifespan,” they write. “If life expectancy was approaching a limit, some deceleration of progress would probably occur. Continued progress in the longest-living populations suggests that we are not close to a limit, and further rise in life expectancy seems likely.”

But with low mortality and people having fewer babies in developed countries, further population ageing is inevitable. They cite Germany as an example. Even allowing for immigration, its population in 2050, they say, “will be substantially older and smaller” than it is now.

The analysis suggests, however, that the health of the elderly is improving. Studies have rarely looked at people over 85, but improvements in their health are likely to translate into improvements also for the very elderly.

Although the number of cancers is rising as people live longer, and chronic diseases such as diabetes and

arthritis are increasing, better diagnosis and treatment means that people can live good lives in spite of them. Obesity is expected to cause more health problems, but its consequences can be modified by the use of drugs.

“Traditionally, man has three major periods of life: childhood, adulthood and old age,” they write. “Old age is now evolving into two segments, a third age [young old] and a fourth age [oldest old].”

Some experts have said the prospects for the fourth age are poor — “characterized by vulnerability, with little identity, psychological autonomy and personal control.” But a Danish study found that 30 percent to 40 percent of people today were independent between the ages of 92 and 100. A US study showed that 40 percent of 32 supercentenarians (those more than 110 years old) needed little assistance or were independent. These studies, Christensen and colleagues write, “do not accord with the prediction that the fourth age is in a vegetative state.”