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# Watershed *Sentinel*

Environmental News from BC and the World  
**20th**  
Anniversary Year



March/April 2010  
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**Nuclear Waste Across Canada**

**Fracking -- Gas Attack on Water**

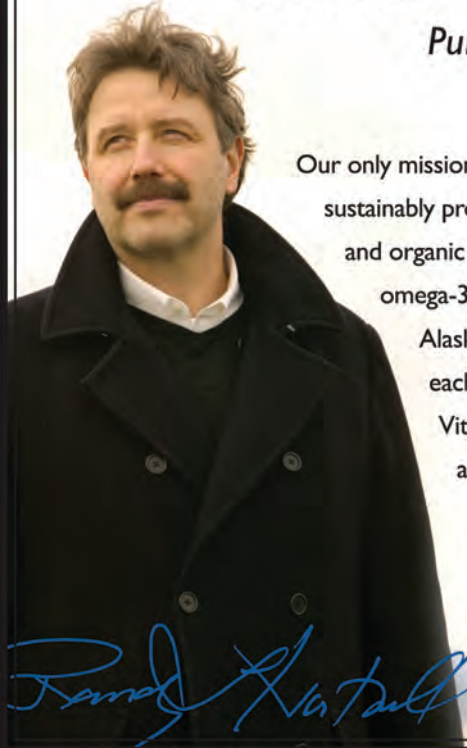
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## "The Dawn of Free Speech in Alberta"

When the residents of Weberville Alberta, which has been targeted by Bruce Power for a nuclear power plant to supply energy to the Tar Sands, were ordered by Alberta Transportation to remove their 2' x 4' "No to Nuclear" sign, they responded with gusto. In January, they replied in the press that their wall of signs would expand to include:

- The names of politicians who refuse to answer our questions
- The names of politicians who will not let us speak to their councils
- The names of Bruce Power employees who've lied to us
- The names of ex-MLAs working for the companies that will profit
- The cheaper and cleaner alternatives"

**They are certainly right to be alarmed.**

**Anna Tilman's Yellowcake Trail: Part Four reveals the heavy burden nuclear waste has placed on communities across Canada.**

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Photo by Juri Agapow

# Watershed *Sentinel*



March-April 2010

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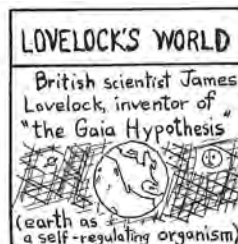
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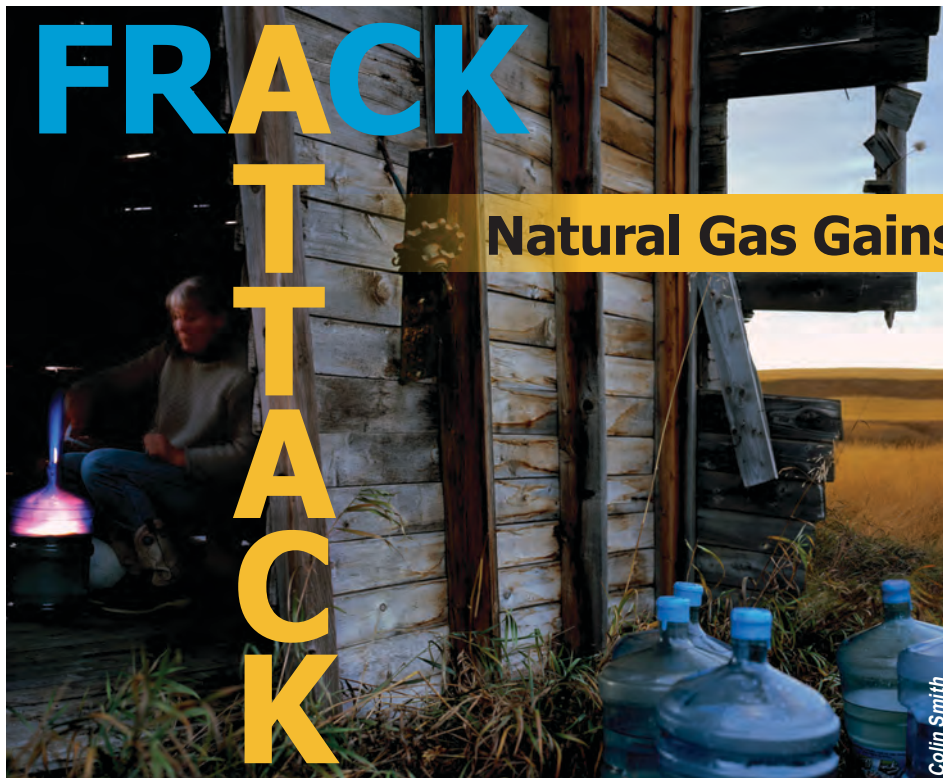
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## Natural Gas Gains, Water Loses



by Joyce Nelson

In our phone interview, Jessica Ernst says she's "still getting used to" being compared to Erin Brockovich (the environmental activist made famous by Julia Robert's film portrayal ten years ago). The comparison comes easy because the outspoken Ernst, a landowner in the town of Rosebud, Alberta, is one of the few Albertans who have publicly criticized hydraulic fracturing (called "fracking," in the trade). This is a technology used by the oil and gas industry to access "unconventional" natural gas deposits trapped in shale, coalbed, and tight-sand formations – potentially at the expense of underground water supplies.

After her well water was contaminated by nearby fracking, Ernst decided to go public in 2006, showing visiting reporters how she could light her tap water on fire, and speaking out about Alberta land owners' problems with the industry, especially Calgary-based EnCana. EnCana is Canada's second biggest energy company (after

Suncor) and is now also a major player in BC, with hundreds of natural-gas wells in the province.

Ernst, a biologist and environmental consultant to the oil and gas industry, says EnCana "told us 'we would never fracture near your water.' But the company fracked into our aquifer in that same year [2004]." By 2005, she says, "My water began dra-



After her well water was contaminated by nearby fracking, Ernst decided to go public, showing visiting reporters how she could light her tap water on fire.

matically changing, going bad. I was getting horrible burns and rashes from taking a shower, and then my dogs refused to drink the water. That's when I began to pay attention." At least fifteen water-wells had gone bad in the little community.

Tests revealed high levels of ethane, methane, and benzene in Ernst's water. "EnCana told us they use the same gelled [fracking] fluids as in the States." Fracking has become a huge controversy in the US, with

pending legislation that would impact its regulation.

Ernst says she heard from "at least fifty other landowners the first year" she went public, and she continues to get calls. Groundwater contamination from fracking "is pretty widespread" in Alberta, "but they're trying to keep it hidden."

Canada has no national water standards and conducts little information gathering about groundwater.

### Chromium-6 in the Water

Being an activist on behalf of her community is not the only connection Ernst has with Brockovich. Through expensive Freedom of Information requests, Ernst obtained post-fracking water well monitoring data that showed the Alberta Environment people had found hexavalent chromium in Rosebud's well water. "The government hasn't told this to people" in the hamlet, says Ernst.

Hexavalent chromium, otherwise known as chromium-6, is the extremely toxic substance Brockovich found in the drinking water in Hin-

kley, California, which led to a major class action lawsuit against Pacific Gas & Electric, which finally paid the plaintiffs more than \$200 million in 2006.

Ernst, who knows the industry well, says chromium-6 “is used in fracking and drilling.”

In an odd coincidence, Erin Brockovich herself is currently involved in investigating a mile-long plume of chromium-6 contamination of drinking water – apparently caused by fracking and drilling – in Midland, Texas. In July 2009, Brockovich investigators told the press they have evidence that hydraulic fracturing specialist Schlumberger is to blame. In the continuing case, Brockovich is representing 40 householders whose water has been contaminated.

**Trade Secrets**

In 2006, when EnCana was fined \$266,000 by the state of Colorado for “failure to protect water bearing formations,” a company spokesman complained to the press that environmentalists had been spreading “misinformation” about fracking and creating a climate of fear about hydraulic fracturing fluids.

The public however, has no way of knowing what’s in the fracking fluids because the chemicals used are considered a “trade secret” – or rather, many trade secrets.

Oil and gas companies like EnCana, Imperial Oil, Suncor, ConocoPhillips, ExxonMobil, etc. generally don’t do the hydraulic fracturing themselves, but instead hire specialty services to do it. Each of the big players in the multi-billion-dollar fracking industry – Halliburton, Calfrac Well Services, Schlumberger, BJ Services (all of which operate in Western Canada) – has its own recipe for fracking fluids, of which it is fiercely protective.

The precise nature and concentrations of the chemicals in these

“proprietary fluids” are not even fully known to government regulatory agencies.

By examining drillers’ patent applications and government worker health and safety records, some environmentalists and regulators in the US have been able to piece together a list of some of the fracking fluid ingredients. These include potentially toxic substances such as diesel fuel (which contains benzene, ethylbenzene, toluene, xylene, and naphthalene), 2-butoxyethanol, polycyclic aromatic hydrocarbons, methanol, formaldehyde, ethylene, glycol, glycol ethers, hydrochloric acid, and sodium hydroxide.

**US Fracking Controversy**

As a sign of just how controversial hydraulic fracturing has become in the US, Exxon Mobil Corp.’s Decem-

ber \$29 billion takeover of fracking specialist XTO Energy Inc. includes a clause stating that any changes to US law that make fracking “illegal or commercially impracticable” would allow the companies to terminate their deal without paying a \$900 million breakup fee.

By 2007, there were 449,000 natural gas wells in 32 US states, an increase of more than 30 percent since 2000, with serious episodes of groundwater contamination near drilling sites documented in seven states.

Companion legislation (S.1215/H.R.2766) – the *Fracturing Responsibility and Awareness of Chemicals (FRAC) Act* – is currently before Congress to require regulation of hydraulic fracturing under the federal *US Safe Drinking Water Act*, as well

*Continued on Page 8* ➔

**Hydraulic Fracturing 101**

Invented in the 1950s by Halliburton Co., hydraulic fracking was initially used for drilling only about one in a hundred natural gas wells, but now it’s being applied to most of the gas production in North America. Once the wellbore has been drilled and prepared, fracking is used to create fractures that extend into the surrounding rock or shale formation, allowing the gas to travel more easily from the rock pores to the production well. To create these fractures, a mixture of water, proppants (sand or ceramic beads), and chemical fracking fluid “stimulants” is injected under extreme pressure into the formation several stages.

One “frac-job” of a single well can utilize millions of gallons of water and tons of sand, mixed with tens of thousands of gallons of fracking fluid chemicals. The huge volumes of water used in fracking are taken from rivers, lakes, private water sources, or municipal water sources.

Eventually the underground formation is not able to absorb the huge amount of fluids as quickly as it is being injected, and the pressure causes it to crack. These fractures are held open by the proppants, and the gas is then able to flow along the lubricated fissures to the well.

Some of the fracturing fluids are pumped out of the well and into surface pits or holding tanks during the process of extracting the gas and contaminated water, but even the industry now admits that as much as 85 percent of the original fracturing fluid volume may remain underground.

Fracking fluids and natural gas can both migrate underground from the fracture site. According to *Business Week* (Nov. 11, 2008), a 2004 US Environmental Protection Agency study found that “fracturing fluids migrated unpredictably through rock layers in half the cases studied,” and the injected fluids are “likely transported by groundwater.”

## ⇐ *Frack Attack continued*

as disclosure of all chemicals used in fracking fluids. New York City Council, the mayor of New York, and a *New York Times* editorial have all called for a ban on hydraulic fracturing throughout the watershed from which the city obtains its drinking water.

That watershed is part of the huge Marcellus shale area being staked out for natural gas drilling and fracking of tens of thousands of wells.

### Drilling in Canada

Meanwhile, the BC government has been pushing drilling for unconventional sources of natural gas since at least 2005, offering \$50,000 royalty credits for every well drilled before December 2008, and selling oil and gas “sub-surface rights” at a fever pitch.

Both BC and Saskatchewan have been courting the industry with lax or no environmental regulations and promises of low royalties charged to the companies. The Petroleum Services Association of Canada (PSAC) predicts a 10 percent increase in drilling in BC in 2010, mostly in the Montney shale field of northeastern BC and the Horn River Basin near Fort Nelson.

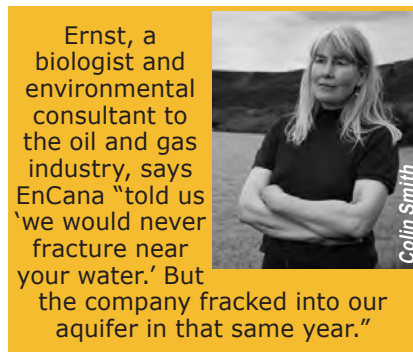
In 2006, researchers for West Coast Environmental Law published a report noting that the oil and gas industry had identified at least six areas of BC holding coalbed methane (CBM) natural gas potential: Peace country in the north east; Elk Valley in the southeast; Vancouver Island; the south central interior (around Merritt and Princeton); northwestern BC (around Telkwa and Iskut); and the Queen Charlotte Islands.

*Nanaimo Daily News* (Nov. 7, 2009) has reported that Vancouver Island’s CBM gas deposits – stretching from Chemainus to Parksville, and in the Comox-Campbell River area – are currently not of interest to the industry. Nonetheless, a group called Citizens Concerned About Coalbed

Methane-Vancouver Island, has for the past year been pushing for development under its action plan, “Building a Safe Future for CBM.”

In 2008, BC took in a record \$2.4 billion from these leases, which is now its biggest source of royalties income.

Fracking is also in high demand in the Bakken natural gas field in southern Saskatchewan, where 1,000 wells have been drilled and fracked



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over the past five years. PSAC is predicting 1,935 new wells will be drilled there in 2010, and 300 new wells in Manitoba.

As a result, Alberta has just announced that it is removing environmental and regulatory “hurdles” in order to entice the natural-gas industry back.

Huge shale developments are also planned for Quebec, New Brunswick and Nova Scotia. The Utica shale gas play in Quebec covers an area of 5,000 square kilometres that runs along the St. Lawrence River from Montreal to Quebec City.

The industry is especially interested in the Utica shale because it is close to the New York City market, with export capacity available on TransCanada Corp.’s pipeline system. If the US curtails natural gas development in the Marcellus shale, the Utica could provide gas to the New York market.

### Horizontal Drilling Added

The newest technology used by the industry increases the scope of fracking. By drilling horizontal wells, where the drill bit is steered along a horizontal trajectory, the well bore is exposed to as much of the shale gas reservoir as possible. Combined with hydraulic fracturing, the two technologies create many kilometres of contact area for natural gas to flow into a well, giving the operator a fast payback.

BC energy activist Arthur Caldicott, a frequent contributor to the *Watershed Sentinel*, explained by email: Fracking “is a nearly-continuous operation in shale gas production. Wells may be fracked up to seventeen times along their entire length.”

Now some geologists are saying that the use of horizontal drilling and fracking for shale production exhausts the well within a mere eight years, with a decline in output of 75 percent in the first year alone. Some are even calling the sector “a speculative bubble.”

In other words, the drilling and fracking endanger the groundwater and deplete rivers and lakes all for a quick payoff to the industry and the province, after which the taxpayer is left with the clean up.

A new report from BC Auditor-General John Doyle states that the BC oil and gas commission must “improve its oversight” of the industry in order to adequately manage the risks of contamination during drilling, production and final site restoration. The minimum cost to restore one well site is \$100,000.

While natural gas is touted as a “clean energy” source, the method of extracting this fossil fuel is dirty indeed.



Joyce Nelson is a freelance writer/researcher and the author of five books.