

The hazardous race for petroleum profits in North Dakota

Gary Joad
20 February 2014

According to the US Department of Energy, more than two million oil and gas wells in the US have been hydraulically fractured as of 2013. Some 95 percent of all currently completed US oil and gas wells are being hydraulically fractured. Hydraulic fracturing, or hydrofracturing is the environmentally harmful process commonly called “fracking.” Of all US oil production, hydraulically fractured wells make up 43 percent. Natural gas is even higher, at 67 percent.

The spread of hydrofracturing has opened up vast drilling operations in just the last decade. In western North Dakota, the Williston Basin is a geologic region named after the city of Williston. This is the site of the now-famed Bakken formation, where so-called massive hydraulic fracturing is used to access the extremely low permeability layers of shale and dolomite, which are saturated with natural gas and oil, several thousand feet below the earth’s surface.

Oil and gas were found in the rock formation in 1951, but the technique of efficient extraction awaited further development, until about 2000. Since 2006 production from the Bakken formation has increase by 150 times.

Some decades ago, the US exhausted almost all of the readily extractable, by means of conventional vertical drilling, crude oil and natural gas reserves from reservoirs in the geologic seams nearer the surface of the earth on the North American continent.

The process of hydrofracturing was devised in Texas and Oklahoma in 1947. The practice proved profitable by 1949, when the technique was patented by Stanolind Oil and exclusively licensed to Halliburton Oil Well Cementing Company. Today, hydrofracturing has quickly come to dominate new on-land oil and gas production in North America and much of the rest of the world.

Wells are first drilled vertically about two miles into the Bakken Middle Member (see illustration), and then horizontally to as much as ten thousand feet. Segments of metal casings support the well-bore, which is “sealed” with layers of cement.

A silica sand, water, and a multi-chemical slurry of as much as 330,000 pounds is pumped into the wellhead under 15,000 pounds per square inch of pressure. The slurry contains a “fracking” chemical cocktail known to include as many as 750 compounds, according to a report prepared for the US Congress in 2011. The identities of many compounds are hidden from the public by the industry. The mix is known to include benzene, toluene, xylene, ethylbenzene, and a series of radio-nucleotides, a significant number of which are known to be extremely toxic and carcinogenic.

Within the Bakken Middle Member and along the horizontal well-bore, countless seams are burst open under the enormous fluid pressures, releasing “sweet” crude and natural gas. The purpose of the chemical mix, often called “slick-water,” is to facilitate the easier flow of oil and gas back to the wellhead. Radioactive elements, frequently including Iodine 131, a known cause of thyroid cancer, are used as tracers for mapping the result and effectiveness of the well fracturing operation.

Silica sand, referred to in the hydrofracturing industry as “proppant,” is used to hold open the many millions of fracture lines, averaging about a millimeter in diameter, so that embedded petroleum and gas return in the “flowback.”

The United States Geologic Survey reported in April 2008 that the amount of recoverable oil from the Williston Basin using hydrofracturing technology was estimated at 3.65 billion barrels. In April of 2013, the

USGS released updated figures, reporting that 7.4 billions of barrels were ultimately recoverable, from an estimated total reserve of about 25 billions of barrels.

The petroleum formations, referred to as “trends” and “plays,” in the Williston Basin have over two hundred active rigs and are presently adding about 1800 wells per year. The Bakken formation encompasses some 200,000 square miles of western North Dakota, eastern Montana, southern Saskatchewan and Manitoba.

The US Energy Information Administration in November last year projected that by December 2013, North Dakota and Montana oil output would exceed one million barrels a day. In December of 2012, the Bakken wells of Saskatchewan exceeded 71,000 barrels a day.

The amount of natural gas and crude departing the Bakken formation on a daily basis far outstrips the petroleum shipping infrastructure. Aged rail beds and tanker cars, put in service in 1964, and which were designed to haul fertilizer, transport much of the crude.

On July 6, 2013, a 74 car oil tanker train derailed in Lac-Megantic, Quebec carrying Bakken crude, resulting in a multi-tanker derailment, with fires and explosions killing 47 persons and burning some 30 downtown buildings.

On Monday afternoon, December 23, 2013 an eastbound Burlington Northern Santa Fe tanker train with 106 crude oil cars struck a derailed westbound soybean train about a mile west of Casselton, North Dakota. According to a preliminary report by the National Transportation and Safety Board, 18 of the 20 oil tankers that derailed ruptured and exploded in a spectacular fire and black smoke plume near the town of 2300 persons which lies 25 miles west of Fargo. The entire community was evacuated for about 24 hours, and no one was injured.

Casselton’s fire chief, Tim McLean, told the *New York Times* for an article appearing January 25 that, had the oil train tankers derailed in town, “There’s virtually no way we could protect these buildings [downtown retail stores and homes],” given the presence of a large propane supply tank, which would erupt “like a bomb.” Two gasoline stations and a lumber yard would potentially add to the conflagration, as would ignited crude entering storm sewers.

Adrian Kieffer, an assistant fire chief, told the *New York Times* that he’d spent 12 hours at the fire west of

town and returned home that night to tell his wife, “let’s sell our home and move.”

The North Dakota derailment was at least the fourth North American oil train derailment and explosion in 2013. The *New York Times* reports that about two thirds of the Bakken crude is shipped by rail, which courses through such highly populated areas as Milwaukee, Chicago, St. Louis, and Kansas City.

Since March of last year, 10 large oil spills occurred in the US and Canada. Citing federal records, the *Times* reports that railroads spilled 800,000 gallons of crude oil from 1975-2012.

In data from the Pipeline and Hazardous Materials Safety Administration and analysis done by McClatchy Newspapers, oil rail carriers spilled over 1.15 million gallons of crude in 2013 alone, which includes about 400,000 gallons spilled at Casselton.

The operative fossil fuel policy for America’s capitalist class is to extract the maximum amount of crude oil, natural gas, and coal from wherever on the earth it can be most readily obtained at the least financial outlay to big business. Such a policy is at the opposite pole of a rationally and scientifically planned use of world resources, striving first and foremost to meet humankind’s worldwide social and energy needs.



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