***regulating environmental impacts of ‘fracking’ in the UK: Lessons Learned from New york and california***

Miriam R. Aczel, Centre for Environmental Policy, Imperial College London. Phone: +1 202 848 6549.

Email: miriam.aczel14@imperial.ac.uk

Supervised by Karen E. Makuch, Centre for Environmental Policy, Imperial College London.

k.e.makuch@imperial.ac.uk

## Overview

## While debate continues about the economic benefits and health and environmental risks of using hydraulic fracturing (fracking) for oil/gas extraction, proponents in the UK cite the U.S. experience to argue that it is safe and economically viable. The UK is in the early stages of exploration and development of its shale gas resources, and appears poised for commercial drilling to begin.

## Fracking remains controversial due to public and scientific concern that the technology may harm water supplies, affect air quality, trigger earthquakes, or pose other environmental or health risks. Sources of risk include: potential migration of pollutants from fluids used in the extraction process, migration of toxic gases, liquids and solids that exist naturally underground, and impact on water supply due to the high water volume used in production. Studies have shown that there is potential for contamination leading to environmental and public health effects at all stages of the development of the natural gas well site, from site preparation to decommissioning at the end of the well’s functional life.

Two case studies were conducted to evaluate the role of Environmental Impact Assessments in regulating environmental and health impacts. The two U.S. states examined—New York and California—had different methodologies for managing risks, due to differences in these state’s Environmental Protection Acts.

## Methods

## A comprehensive literature review was conducted to identify environmental and public health risks associated with hydraulic fracturing, as well as gaps in the current regulatory frameworks in both the U.S. and UK; stakeholder interviews supplemented the literature review by highlighting differing opinions on key concepts.

## Two case studies on legislation and policy related to fracking to extract natural gas in the U.S. states of California and New York were identified and their relative Environmental Impact Assessment (EIA) processes analysed to understand how policy-making entities view similar data but reach opposing conclusions.

## Results

**New York State Case Study**

• EIA mandated by NY State Environmental Protection Act

• Conducted seven year EIA (State Environmental Quality Review)

• Public Health Impact Assessment—Health Commissioner found ‘significant uncertainties’

• Delaware River supplies water for 15.6 million people

• A key difference was the amount of feedback–over 260,000public comments received, which took a long time to respond to and incorporate

• Concluded review on June 29th, 2015, with a ban on High Volume Hydraulic Fracturing

**California Case Study**

• EIA mandated by state’s Senate Bill No.4

• California conducted 1 year EIA

• No Health Impact Assessment conducted

• Environmental groups criticized EIA report for lack of critical information on the lifecycle effects and overly narrow objectives

• Natural Resource’s Agency commissioned independent review by state’s Council on Science and Technology (CCST) but CCST report was released *after* final Environmental Impact Statement

• Concluded that hydraulic fracturing to extract shale gas can proceed in the state, relatively unabated

## Conclusions

## Fracking technology--and its application--has developed rapidly. In 2000 there were 26,000 hydraulically-fracked wells comprising about 7% of the U.S. total gas production; by 2015 the number of wells had increased to 300,000 or 67% of gas output. With this rapid expansion, the potential for impacts is more pronounced.

## Fracking is regulated within an existing framework that was not developed specifically for this technology and its potential impacts, so Environmental Impact Assessments are an important step in identification and regulation of impacts.

## New York’s thorough, seven-year review concluded that due to gaps in available data, potential impacts from fracking cannot be avoided or mitigated with current knowledge and technology, and led to a statewide ban.

## California’s study took only one year, and concluded that a majority of the environmental and health impacts could be “reduced to a level of less than significant.” However, considering the knowledge gaps identified by the CCST report (not included in the final EIS) and in other studies, California’s Department of Conservation cannot definitively conclude that negative impacts of fracking can be minimized or prevented.

## The fact that these states followed different procedures for evaluating environmental risk illustrates the result of a lack of federal regulation governing risk and impact management. These two cases demonstrate the difficulty and complications in regulating hydraulic fracturing due to the patchwork of federal, state, and local regulations in the U.S.

## References

Christopher W. Moore et al. ‘Air Impacts of Increased Natural Gas Acquisition, Processing, and Use: A Critical Review,’ Environmental Science & Technology, (2014).

New York Department of Health. (2014) A Public Health Review of High Volume Hydraulic Fracturing for Shale Gas Development. <http://www.health.ny.gov/press/reports/docs/high_volume_hydraulic_fracturing.pdf>

California Council on Science and Technology. An Independent Scientific Assessment of Well Stimulation in California: Summary Report. An Examination of Hydraulic Fracturing and Acid Stimulations in the Oil and Gas Industry. (Sacramento, CA: CCST, CNRA, 2015).  <https://ccst.us/publications/2015/2015SB4summary.pdf>

U.S. EPA. http://www2.epa.gov/hfstudy/hydraulic-fracturing-water-cycle

U.S. EIA. <http://www.eia.gov/todayinenergy/detail.php?id=26112>

C.S. Guilia Good Stefani, ‘California's Final Fracking EIR Leaves Communities to Protect Themselves’. NRDC SwitchBoard (July 2, 2015). <http://switchboard.nrdc.org/blogs/ggoodstefani/californias_final_fracking_eir.html>

Natural Resources Defense Council, Center for Biologic Diversity, Sierra Club, and Los Angeles Waterkeeper. Response to Department of Conservation’s Draft Environmental Impact Report (DEIR) for Well Stimulation in California, (Sacramento, CA: March 16, 2015).

See also: Aczel, MA., Makuch, KE. (2018) Environmental Impact Assessments and Hydraulic Fracturing: Lessons from Two U.S. States, Case Studies in the Environment. doi/10.1525/cse.2017.000638