New Study Finds Fracking Poses High Risks in Maryland

A Maryland-specific fracking risk assessment was carried out by Ricardo-AEA[1] – one of the world's leading independent environmental consultancy firms that led the European Commission's hydraulic fracturing risk assessment/regulatory review. After reviewing evidence for environmental and health issues associated with shale gas extraction, the gas industry's standard operating practices, and Maryland's current regulatory framework, the study developed an evaluation of the potential impacts of fracking in Maryland across ten areas of concern and eight drilling project phases. This study aims to identify areas that require specific focus during the development of state policy with regard to fracking. Below is a summary of the findings.

Methodology: This analysis was carried out by evaluating the potential significance and likelihood of environmental impacts occurring. The authors first performed a literature review of over 200 documents, with a focus on peer-reviewed research where available. Maryland-specific geological, environmental and regulatory data was gathered with the assistance of Maryland state and local government officials. Risk rankings were determined through expert judgments by the study team about the potential significance of environmental hazards and their likelihood of occurring in Maryland. This study is still in draft form because the risk rankings will be re-evaluated when the state releases its Best Management Practices.

Surface Water Contamination: High Risk

Disposal of "flowback" wastewater during well "completion" can lead to increased salinity and levels of metals (arsenic, barium, strontium, selenium) and volatile organic compounds (VOCs), like benzene. In some states, there are reports that untreated wastewater has been sprayed directly on rural roads and forests, and dumped into rivers and streams, leading to radioactive wastewater being discharged into rivers used to supply drinking water in Pennsylvania and Maryland.

Groundwater Contamination: High Risk

During the fracking process, chemicals from fracking fluid can enter groundwater in various ways: 1.) through holes in the well casing 2.) by fracturing through aquifers 3.) by fracturing indirectly into aquifers through faults or pre-existing manmade structures (e.g. abandoned oil and gas wells), and 4.) through accidental surface spills. After a well has been fractured and the site is prepared for the "completion" phase, contamination can occur as operators manage large quantities of water that return to the surface as "flowback." Improper handling of flowback can contaminate water with toxic chemicals and radioactive materials. Then, during the multi-year gas production phase, groundwater risks persist as a result of failures or inadequate design of well casings.

Water Resources: High Risk

Fracking is estimated to use 3,880,000 gallons of water per well and the impacts on local drinking water could be significant. A proportion (25% to 100%) of the water used in hydraulic fracturing is lost permanently. U.S. EPA highlighted concerns that diverting potential drinking water supplies from high volume withdrawals in the Marcellus region could:

- Induce chemical changes to aquifer water, including altered salinity.
- Stimulate bacterial growth, causing taste and odor problems in drinking water.
- Result in upwelling of lower quality water from deeper reserves, and subsidence or destabilization of geology.

Garrett County already predicts a water deficit for the Mountain Lake Park/Loch Lynn Heights and Grantsville areas within the next two decades – an issue that could be exacerbated by shale development.

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[1] *Shale gas risk assessment for Maryland,* Ricardo-AEA, January 13, 2014

Air Emissions: High Risk

Drilling operations lead to air emissions from combustion in diesel-powered generators on-site and truck activities near the well pad. The main pollutants are particulate matter, nitrogen oxides, carbon monoxide, volatile organic compounds (VOC), and sulfur dioxide. When the well is prepared for production during "completion," on-site flaring results in emissions of combustion gases as well as some unburned hydrocarbons.

The majority of air emissions and associated costs are related to the activities that occur during the production stage, which persists beyond initial development. Compressor station malfunctions, pipeline leaks, and well flaring have been linked to persistent livestock exposure, and a recent study calculated a slight increase in cancer risk due to elevated levels of benzene within half a mile of gas wells in Colorado. Downstream gas compressor stations also significantly contribute to methane and VOC emissions, accounting for about 7.9% of methane emissions from the natural gas industry.

Land Take: Very High Risk

Surface installations during the fracturing and completion phases of fracking require approximately 57% more land area than conventional drilling. Additional land take and habitat fragmentation occur from the associated infrastructure (access roads and pipelines). Land take impacts were classified as "very high risk" because 1.2% of the land in Garrett or Allegany County would be needed for full development of a gas reservoir, compared to 10% and 16% of land in those counties respectively already described as "developed."

Noise Impacts: High Risk

Noise resulting from well operation and equipment could affect residential amenity and wildlife. New York's Department of Environmental Conservation estimated the level of noise from hydraulic fracturing and found that it is above the Maryland standards for both day and night time noise levels at distances of 2,000 feet from the source. Levels of noise would also exceed the Maryland standard over a distance of 2,500 to 4,400 feet from the site over periods of 2 to 5 days per well.

Risks to Biodiversity: High Risk

Fracking can affect biodiversity in many ways, including: removal of habitats, introduction of invasive species, noise disturbances, and water and land pollution. Biodiversity damage from fracking results primarily from habitat loss and forest fragmentation, but also from sediment runoff into streams and stream contamination from spills. Garrett and Allegany Counties contain significant areas of high biodiversity, including areas that provide habitats for rare and endangered species. Shale gas drilling would inevitably cause loss and fragmentation of habitat, resulting in a high risk of biodiversity impacts from wellpad development and drilling.

Visual Impact: High Risk

The use of equipment, stockpiles, fencing, site buildings, drilling rigs, etc. results in adverse visual impacts during site preparation, drilling, and fracturing, particularly in high landscape value areas or residential areas. A study of the Marcellus Shale region describes mountain top sites as resembling small towns, with the mountain top being clear cut and inhabited by dozens of trucks bulldozers and storage containers during the drilling and hydraulic fracturing stages. Furthermore, the author of New York State's Marcellus Tourism Study found that the infrastructure from drilling could "do serious damage to the tourism sector by degrading visitor experiences and creating an industrial landscape."

Traffic: High Risk

Between 625 – 1,148 truck trips would be required per well during construction, with peak periods of 250 trucks per day. The risks posed by this increased traffic include: road safety impacts, damage to roads, bridges and other infrastructure, and risks of spillages and accidents involving hazardous materials. One particular area of concern is the Georges Creek area in Allegany County, which the Allegany County Comprehensive Plan (2002) highlighted for needing additional maintenance.

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