

WHEREAS, It is estimated that the geologic rock bed known as Marcellus Shale may contain up to several trillion cubic feet of natural gas, and increases in the price of crude oil have resulted in increased interest and activity relating to natural gas exploration and hydraulic fracturing;

WHEREAS, the natural gas of the Marcellus Shale is not going away (i.e. it is "gas in the bank"), but its rapid extraction via horizontal, "slick water" hydraulic fracture gas drilling (never before implemented in the state of NY) will require industrial type development with serious impact on wide areas of land and water; furthermore, EPA studies of the impact of horizontal hydraulic fracture gas drilling are currently underway in areas where this process has a history of use, and DEC regulation of gas drilling in NYS is currently being debated;

WHEREAS, Cornell University is committed to environmental leadership exemplified by the signing of the American University and College Presidents Climate Commitment by President Skorton;

WHEREAS, Cornell University has a great responsibility to preserve and protect its land and water resources, and quality of life for current and future Cornell faculty, staff and students;

WHEREAS, Cornell University is in a position to take a leadership role on the issue of horizontal hydraulic fracturing of the Marcellus Shale, on sustainability education, and on research in water management, soil health, animal and human health and medicine;

THEREFORE, BE IT RESOLVED, that the Cornell Faculty Senate hereby conveys to the executive administration, including President David Skorton, Provost Kent Fuchs, and the Board of Trustees, our opinion that

1. A moratorium should be imposed on the leasing of Cornell lands for horizontal hydraulic fracture gas drilling until a scientifically informed consensus is reached at federal, state and local levels on the long-term environmental, health, economic and community impacts of this activity, federal and state legislation for adequate regulation of this activity is in place, and the infrastructure is in place to enforce these regulations.
2. An advisory group should be constructed to advise the executive administration on future decisions regarding the leasing of Cornell lands for horizontal hydraulic fracture gas drilling, and its recommendations should be reported and made widely available to the Cornell community. This group should be composed of experts in areas such as fracture mechanics of shale, watershed and aquifer dynamics, analytical chemistry, environmental protection law and policy, water law and policy, sociology and community development, climate change, climate policy, renewable energy technology, energy economics, geologic faults of New York state, and other subjects as deemed necessary to gain an in-depth understanding of the potential impacts of hydraulic fracture gas drilling, and of alternatives for sustainable energy production. Undergraduate and graduate student representatives should also be included.

Background.

The proposed resolution is motivated by the following summarized facts, which are followed by a more detailed narrative:

- a) While gas drilling has been performed in the state of New York for decades, the **combination of horizontal drilling and hydraulic fracturing** has **not been previously implemented** in NYS. This combination introduces **serious new concerns** associated with the “slick water” hydraulic fracturing procedure that consumes enormous volumes of fresh water and generates flowback water that must be processed as toxic waste.
- b) The gas drilling industry has been **exempt** from the Clean Drinking Water Act, Clean Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Resource Conservation and Recovery act, the Safe Drinking Water Act, and the Clean Air Act. **As one consequence of these exemptions, EPA testing of gas drilling impacts on water and air was not required and was not performed.**
- c) The gas drilling industry has only **recently disclosed some of the toxic chemicals** they inject into wells under very high pressure to hydraulically fracture shale and release gas. **Time is now needed** to systematically test for the spread of these chemicals into aquifers, water wells, and other sources of drinking water in regions where this process has been employed.
- d) Although the EPA has only recently in response to complaints begun water testing near gas drilling sites, its results to date **demonstrate contamination of drinking water wells** in the vicinity of hydrofractured gas wells. In Pavillion, Wyoming, 11 of 39 (28%) of the water wells tested were **contaminated with substances used in nearby gas drilling.**
- e) **Hundreds of cases of water impairment or pollution related to the oil and gas industries in NY state** have been documented by the DEC, but a majority have not been properly remediated (www.toxicstargeting.com/MarcellusShale/drilling_spills_profiles). The issuance of permits for horizontal hydrofracture gas drilling by the DEC is anticipated to result in a dramatic increase in gas drilling activities in the state of NY.
- f) On June 9, 2009, the **Fracturing Responsibility and Awareness of Chemicals (FRAC) Act (S. 1215)** was introduced in the US Senate and was referred to the Committee on Environment and Public Works in the US Senate. This **pending bill** would **amend the Safe Drinking Water Act to repeal the exemption for hydraulic fracturing** by the gas industry.
- g) On Oct. 30, 2009, President Obama signed into law the **Interior, Environment and Related Agencies fiscal year (FY) 2010 Appropriations Bill (H.R. 2996)**. The Conference Report of this bill includes a request that the EPA re-examine the impact of hydraulic fracturing on drinking water by performing a scientifically robust and peer-reviewed study “**using a credible approach that relies on the best available science.**” This requested study will require time to complete.
(http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_reports&docid=f:hr316.111.pdf, page 109)

It is important to note that the “slick water” hydraulic fracturing process is distinctly different from current and past gas drilling methods implemented in the state of NY. As explained on the well-researched MAP – Tompkins website (www.tcgasmmap.org): “Although hydraulic fracturing has been done in NY since the 1940s, it has not been done on horizontal wells, and it only has been done using water mixed with gels or foams and other chemicals as the fracking fluid (Ref: [Grannis Testimony 10/15/08](#)). These processes use much lower volumes of fluid (20,000 to 80,000 gallons, which is roughly 0.5 to 2.3% of the volume required for the Marcellus Shale) for each well fracturing (Ref: [GEIS](#): See Chapter 9, Part F). The new type of hydraulic fracturing to be used in the Marcellus Shale, developed in the late 1990s, is called “slick water hydraulic fracturing.” It uses different chemicals, reducing the amount of gelling agents and adding friction reducers (thus the term “slick”), and requires much more fluid. Because of the increased

fluid, it is also known as “high-volume hydraulic fracturing.” (Ref: [Final Scope](#): See Section 2.1.2)."

Gas production by “slick water” hydraulic fracturing involves drilling 2,000 to 5,000 feet deep into the Marcellus Shale and then drilling as much as one mile, horizontally. Three to five million gallons of water laced with sand and 15,000 to 50,000 gallons of potentially toxic substances (approximately 0.5% – 1% of the total volume of water), including known carcinogens, endocrine disrupters, hydrochloric acid, benzene, toluene, xylene and formaldehyde, are then pumped into the well under very high pressure to fracture the shale and release the gas. The water used in this process (more water per well than the City of Ithaca uses in a day) can be removed from local streams and ponds at no cost to the gas companies.

At least 65 of the chemicals currently in use are classified as hazardous under federal laws, but are not treated as hazardous during drilling and disposal because of gas industry exemptions to the Clean Water Act, the Environmental Response, Compensation, and Liability Act (CERCLA, also known as the Superfund law), the Resource Conservation and Recovery act, and the Safe Drinking Water Act. Companies can withhold all proprietary chemical formulations of the chemicals they use in the hydraulic fracturing process. Without complete proprietary information on every chemical used, it is impossible to test for contamination of water supplies. Because compound-specific toxicity data are very limited for many chemical additives to fracturing fluids, it is of the utmost importance that studies on short and long-term health effects of such chemicals be done *before* the start of drilling, not afterwards.

Hydraulic fracturing fluids can be pumped under the homes and land of people who have not signed leases, as well as under natural areas and Cornell lands, if 60% of a designated land unit is leased (compulsory integration). The hydraulic fracturing fluid dissolves salts, radioactive material, and heavy metals (including lead, arsenic, and mercury) as it passes through the underground shale layers, so flowback from the well is more toxic than the hydraulic fracturing fluid. Once at the surface, it can accumulate as sediments in holding tanks and ponds.

To dispose of flowback fluid, gas companies may inject it deep underground and leave it, truck it to Pennsylvania, or have it treated and released locally. Current wastewater treatment facilities in the state are not able to deal with these high volume wastes without serious upgrading, and it is not even clear whether upgrading will enable them to remove these chemicals adequately. Plants that accept flowback fluids will have to establish testing and monitoring systems to ensure the discharges will not pollute neighboring bodies of water—Cayuga Lake, its inlet, reservoirs, surrounding creeks and streams.

Well pads may host one or many gas wells and may be three to five acres or larger. These pads are cleared industrial areas with roads, drill rigs, pipelines, storage tanks, dozens of tanker trucks, buildings for workers, and holding pits for hydraulic fracturing fluids and drilling refuse. The holding pits attract wildlife and cattle (due to the salt) and can be lethal to birds and other wildlife that drink from them or are coated by the fluids. Pit liners may leak, pits may overflow, and fluids may be spilled, contaminating soil, surface water, and ground water. Hydraulic fracturing is the suspected source of impaired or polluted drinking water in Pennsylvania, Texas, Colorado, and Wyoming.

Drilling for gas is a highly industrial undertaking creating both air and noise pollution: numerous truckloads of equipment, chemicals, sand and water along with generators, pumps, drilling rigs and hoists, running at all hours of the day producing noise and exhaust fumes. For example, the hydraulic fracturing process for one well requires nearly 1,000 tanker truck trips to the site. Clearly this process will have a major impact on quality of life in our area for the next decade or longer.

Given the important environmental issues associated with this new industrial process that will have a major impact on the University itself and the quality of life for students, faculty, staff and members of our community, it is essential that careful consideration be given to leasing Cornell land. An important element of Cornell's competitive advantage over peer institutions in recruitment of faculty and students is the natural beauty of the local environment surrounding us. Currently, studies are underway (funded by Cornell Cooperative Extension, the Cornell University Agricultural Experiment Station, and the Cornell Center for a Sustainable Future) to assess the environmental impact of natural gas drilling, but the results are not yet available. Furthermore, the commitment of the University to a sustainable future *requires* that it take a leadership role in New York State in this important issue.

Additional information on this issue is available at the following Web sites:

Local and well-researched resource: www.tcgasmap.org

Draft SGEIS: <http://www.dec.ny.gov/energy/58440.html>

News from PA: <http://www.tradingmarkets.com/.site/news/Stock%20News/2671509/>

News from WY: <http://www.scientificamerican.com/article.cfm?id=chemicals-found-in-drinking-water-from-natural-gas-drilling>

News from TX: <http://www.npr.org/templates/story/story.php?storyId=120043996>

News from CO: <http://coyotegulch.wordpress.com/2009/11/10/energy-policy---oil-and-gas-garfield-county-commissioners-vote-to-oppose-s-1215-the-fracturing-responsibility-and-awareness-of-chemicals-frac-act/>

News from NY: <http://www.environmentalleader.com/2009/11/03/chesapeake-energy-changes-natural-gas-drilling-over-water-concerns/>

<http://www.propublica.org/feature/buried-secrets-is-natural-gas-drilling-endangering-us-water-supplies-1113>