# NEW YORK STATE WATER RESOURCES INSTITUTE

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**Susan J. Riha, Ph.D.**
Hearing on draft Supplemental Generic Environmental Impact Statement governing natural gas drilling
New York State Assembly Standing Committee on Environmental Conservation
Assembly Parlor- Room 306 Capitol, Albany New York
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**Professional qualifications and experience:**

Riha is a professor in the Dept. of Earth and Atmospheric Sciences at Cornell University. She received her PhD in Soil Science from Washington State University in 1980 and shortly after joined the Cornell faculty as the Charles L. Pack Research Professor of Forest Soils. Her research interests are in soil-plant-atmosphere relations and in dynamic simulation modeling of the impact of the environment on plants. She works on both environmental and plant production problems at the state, national and international levels. Her research program has addressed major environmental issues, including climate change, land use change, deforestation, reactive nitrogen, water pollution remediation, and acid precipitation. She has published over 70 peer-reviewed articles and served as major advisor for 26 graduate students.
She chaired the committee that established an undergraduate major in Environmental Science at Cornell, and has served as co-chair of the Dept. of Earth and Atmospherics Sciences and the Director for Sponsored Research for the College of Agriculture and Life Sciences. Currently, she is the Director of the New York State Water Resources Institute at Cornell University. She is also a member of the Town of Ithaca Planning Board.

**Testimony of Susan J. Riha**:

Thank you for the opportunity to give input today on the draft Supplemental Generic Environmental Impact statement governing natural gas drilling. As Director of the New York State Water Resources Institute, I am particularly concerned about the impact of gas well drilling on New York's water resources, though several of my comments today also relate to broader issues.

After reviewing the draft sGEIS and discussions with other water resources researchers, I want to briefly summarize my concerns in two important areas in which gas well drilling could impact water resources.

1) Large withdrawals of water for fracturing rock to stimulate gas flow (hydrofracing) could disrupt ecosystem services provided by surface and ground water.

Currently, there is little regulation of water withdrawals in areas of the state outside of the Susquehanna and Delaware River Basins. There is insufficient analysis and description in the draft sGEIS of how

water withdrawals for hydrofracing will be regulated in the Great Lakes and Mohawk- Hudson River Basins to avoid damage to stream ecosystem services. For example, an analysis of gauged streams in the Southern Tier of New York using the Alternative Baseflow Method (the backup method recommended for ungauged streams) indicates that none of the streams have enough flow during August to support any water withdrawals. However, using the Natural Flow Method (the recommended method for gauged streams) would allow water withdrawals during this period. More analyses of flow conditions in New York State streams are necessary to determine minimum flow requirements.

If the goal is to only withdraw water above a target level, there must be an accurate gauging of flow. Some specifications in the sGEIS for gauging flow need to be provided. In addition, different points on the same stream may be used to supply water for hydrofracing more than a single well. If there is no coordination among multiple withdrawals, streams could be overdrawn, yet it is not clear in the sGEIS how such cumulative withdrawals will be managed outside of the Susquehanna and Delaware Basins. Also, it is not clear how groundwater withdrawals will be regulated in these areas. In summary, **the sGEIS should include a more detailed analysis and explanation of how to permit water withdrawals in currently unregulated basins**.

Limiting stream water withdrawals is only one component of minimizing the negative consequences of water withdrawals for hydrofracing. Minimally, hundreds of truck trips between the source of the water and the well site will be required to have sufficient water available on site for hydrofracing. **Places where water will be removed need to be carefully considered, not only in terms of adequacy for water withdrawals, but also in terms of adequacy of roads, capability to store on site thousands of gallons of water, appropriate protection of the water body through reasonable setbacks for truck loading pads, impact of truck traffic on local residents, etc.** These issues are not addressed in the sGEIS.

2) Improper management of drilling and hydrofracing chemicals, drilling waste and waste water could pollute surface and/or groundwater

I was pleased to see that the sGEIS recommends requiring a full and professionally developed Stormwater Pollution Prevention Plan (SWPPP) for every well pad. The SWPPP is to include plans for secondary containment of all chemicals used in drilling and hydrofracing, as well as plans for training personnel and ensuring adequate materials are on site to address any spills. However, it appears that the sGEIS is not requiring that all drilling waste (drilling muds, cuttings and flowback waters) be fully contained on site. Rather, drilling waste and flowback waters can apparently be stored in open, albeit lined, pits on site except on floodplains and the NYC watershed. It is my understanding that at least one gas company currently operating in Pennsylvania fully contains drilling waste and flowback water, and that full containment is required in some other states. In any case, there is no discussion that I can find in the draft sGEIS of why full containment should not be required for all sites. **Though full containment cannot ensure that drilling wastes and flowback water will not enter surface or groundwater, it would decrease the risks of this occurring.**

I have a number of concerns about disposal of waste. The sGEIS indicates that cuttings (rock extracted during the drilling process) may remain on site. A more environmentally cautious approach would require disposal of these cuttings in a land fill. An even larger issue is disposal of flowback water. Although requirements for disposal of flowback water via wastewater treatment plants are specified, there is no analysis of potential cumulative impacts of flowback water disposal through release to surface waters, particularly with respect to total dissolved solids (TDS). **Such an analysis could be**

**used to dictate how much flowback water can be released to surface waters via wastewater treatment plants**.

**The sGEIS should include quantification of possible cumulative impacts of gas well drilling not only on water resources, but also on community infrastructure and social services, and at least semi-quantitative analyses of a range of potential mitigation strategies. Furthermore, to minimize and mitigate potential environmental, infrastructure and social impacts of gas well drilling will require coordination among a number of state and local agencies, as well as additional funding for them. I urge this committee to consider how coordination and support for these agencies could be implemented.**

Thank you for this opportunity to express my opinions. Please feel free to contact me if you have further questions or concerns.