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Comments on the draft Supplemental GEIS of
The Oil, Gas and Solution Mining Regulatory Program

Potential Impacts of Gas Drilling on Agriculture in the Marcellus Shale Region of New York State

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This paper presents questions and comments on the impact of horizontal gas drilling and high-volume high-pressure hydraulic fracturing on agricultural lands and food production. The original GEIS addressed agricultural issues based on data that came from 1988 and earlier. These agricultural data are very outdated. I urge the DEC to include agriculture in the draft SGEIS using current data and to study not only the impacts on individual sites but also the cumulative impacts on agriculture in NY State. The original GEIS notes that agricultural lands are highly sensitive to disturbance and thus require preparation of environmental impact statements. The draft scope for the Supplemental GEIS does not address the impacts of this new type of horizontal drilling with its enormous scale of land and water usage. The original GEIS, chapter 6, section I. states that "33% of the State's land resources are devoted to farm ownership and $2.8 billion in farm commodities are produced annually," a citation from 1985. Many other figures on agriculture date from the early eighties and even the seventies. All these figures need to be updated in the draft Supplemental GEIS, and cumulative impacts need to be studied and included.

The Marcellus Shale formation covers an area that includes 27 counties across the state of New York. From the US Census Bureau figures, I estimate that, of the 19,300,000 people living in New York State, approximately 3 million New Yorkers reside somewhere over the Marcellus Shale formation. The Supplemental GEIS needs to look closely at the numbers of people that could be impacted by the local and regional effects of drilling, particularly in terms of availability of clean, uncontaminated food and water from local sources.

New York ranks in the top 5 states for production of dairy, cherries, apples, cabbage, potatoes, onions and maple syrup. The counties covering the Marcellus Shale formation include an agricultural region called the plateau country which is known for its production of dairy, beef, vegetables, wine, potatoes, and many other foods. It is the largest agricultural region in the state. The impact on farming in this region of the State was never studied in the original GEIS, nor is it dealt with in the Supplemental GEIS. Given this region's emphasis on farming, its importance to NY agriculture and the vast scale of drilling operations and water usage being contemplated, the people of New York deserve a detailed analysis of the specific potential impacts on agriculture in the Marcellus Shale region.

Recent trends have emerged since the writing of the GEIS, including a surge in the movement among New York farmers and related organizations to strengthen local and regional food markets, the establishment of local and regional green markets throughout the state, and the increase in organic and natural farming methods. These trends have occurred partly because the average consumer has become more aware of eating locally produced foods. This shift comes when the nation and the world are facing an eventual depletion of available fossil fuel resources for transportation, industry, and agriculture. The food on our tables travels an average of 1500 miles from farm to table. The movement toward locally

grown food is a long term strategy for mitigating the effects of fossil fuel depletion. All New York citizens can start to view our state as the local and regional food shed.

These trends can be seen in the number of organizations that have consumer education programs promoting local food as well as organizations supporting local farming and development of local and regional markets. I attended a summit on July 17th of this year held by the Cornell Cooperative Extension's Small Farms Program. There were 56 participants from around the state discussing issues involving local food production, distribution and markets.

A 2002 census of agriculture shows that 42% of the farms in NY are between 1 and 99 acres and some 32,000 farms were owned as single-family sole-proprietor businesses. The average farm size was 206 acres. These census figures show a slight trend toward an increase in smaller family owned farms compared to the previous census.

The number of NOFA-NY certified organic farms increased from 218 in 2002 to 590 in 2008 with a concentration of organic farms in the Marcellus Shale region. The number of actual certified organic farms represents a fraction of the farms practicing natural farming methods and many of these farms are working toward organic certification. The local organic food market is a rapidly growing sector of New York agriculture and highly valued by green market patrons in New York City and its suburbs.

Another trend that has recently come to light is the contamination of food from foreign sources, such as China. People are placing more and more importance on obtaining pure food from reliable sources.

Worldwide the UN cites that due to rising food prices, 40 million more people will become "food insecure" this year bringing the number to 1 billion. Food security worldwide and in this country is becoming an increasingly important issue. Any potential threats to our regional food security such as Marcellus Shale gas drilling operations, need to be closely examined and regulated.

For some farmers, the monetary benefits of gas drilling may outweigh the damaging effects and they may not be invested in continuing to farm. However, for New Yorkers in general, it behooves the DEC to examine these trends and to study the need for NY State, and particularly NY City to view this area as their food shed. When food from far off locations like China, California, New Zealand, and Peru, will become increasingly expensive, we will need to depend more on our regional and local markets.

The following are several questions which warrant further study:

- What is the actual percentage of farmers that will benefit monetarily from gas drilling?
- What percentage are absentee landlords with no investment in the region's or communities?
- What is the number of people who will receive royalties versus the number of people living in this region who will see no direct economic benefit?

- What is the demographic breakdown of the farmers - per town and per county - and the number of acres they own and lease?

- What do these farmers grow? How much do they produce? What is the dollar value for their produce and what are the secondary economic impacts of farming?

- What is the number of people who live in each town and county who own land and the amount of land they own?

- What is the number of people who live in each town and county who rent homes or apartments?

- What chemicals will be used in the fracking fluid and what data exists in other states about the health effects of these particular chemicals?
  - What data exists about the uptake of these chemicals by plants and animals?
  - What are the impacts of these chemicals on the food chain including crop yields, food contamination, damage to livestock and levels of toxicity that pose a health risk?
  - What is the data from other states showing how long these contaminants linger in the environment?
  - What are their patterns and time frames for decomposition?
  - What is the data from other states on the contamination by these chemicals of the water table and wells?

- The same data needs to be found for toxic chemicals from the drilling process that may occur naturally.

- What would be the impact on the dairy industry when cows ingest these toxic chemicals?
  - What is the rate and level of concentration of these chemicals in ruminants when they ingest contaminated forage as they graze?
  - What would be acceptable levels of toxins in milk and other dairy products?
  - What data exists in other states testing milk for toxins that are involved in gas drilling?

- What is known about the effects of endocrine disruptors in fracking fluids and what effects would these have in disturbing and decreasing reproduction of livestock and humans? Dr. Theo Colborn, endocrinologist has done extensive research in this area with data from soil and water collected at drill sites.

- What data from other states indicates the alteration and depletion of water tables by the gas drilling industry's use of billions of gallons of clean water?
  - What impact would decreased water levels have on crop yields and livestock?
  - What impact would contaminated water have on crop yields and livestock?

- How would the disturbance of land and water increase the vulnerability of agricultural lands to flooding, especially in light of changing climate conditions and increased incidence of extreme weather conditions?

- How would transportation - and distribution of agricultural products in particular - be affected by extensive use and damage to roads by large trucks used for gas drilling?

- What would be the impact on farm work - such as the normal movement of farm vehicles?

- What would be the overall economic impact on small farmers in this region?

- What would be the impact on organic standards for organic farms, a rapidly growing sector of NY agriculture?

- What would be the impact on marketing campaigns that attempt to brand foods from a particular region to revive a depressed economy, like the Watershed Ag Council's campaign?
  – Would this area and these foods be branded as toxic thus jeopardizing the sale of foods from this region?

- What would be the impact on agro-tourism when part of building the locavore, or local food movement, is consumers becoming more aware and involved in the origins of their food?

- What is the number of businesses dependent on local and/or organic food production in the area covering the Marcellus Shale formation?

In Chapter 6, section I. of the GEIS, you note that "significant investment of private and public time and money has gone into improving NY State's agricultural land resources" including improving soil productivity, soil moisture capability, soil retention systems and drainage systems.

In the GEIS, chapter 8 section F., part 1, you state that construction of access roads and well sites and/or the travel of heavy equipment over them can damage tile drainage systems. I urge you to come up with data that calculates the maximum cumulative number of heavy trucks that will be used in gas drilling in NYS and the maximum number of agricultural acres that will impacted. Also, to estimate the cumulative economic cost of damaged tile systems and crops affected by increased moisture levels.

In part 2 of the same section and chapter, you discuss the acreage that would be lost to agricultural production because of placement of access roads and drill sites, and the number of agricultural acres that would require adequate reclamation. Given the scale of operations being considered, what would be the numbers of acres of agricultural land that would be taken out of production both temporarily and permanently?

Additional studies should be made as to what would constitute "adequate reclamation." Adequate reclamation should be studied in terms of defining acceptable levels and types of contaminants left behind in the reclaimed soils, including specific ingredients from fracking fluid chemicals, naturally occurring chemicals and radioactive material unnaturally brought to the soil surface. Best soil testing methods should be researched for these specific constituents to accurately quantify presence or absence in the soil. Data should be gathered regarding all toxic substances involved in gas drilling in terms of persistence in the environment and rate of decomposition.

Under chapter 8, section F. part 3, you state that disturbance of the soil in terms of sink holes and ruts as well as poorly buried garbage, pose a risk to both the farmer and farm animals. Because of the volume of drilling being contemplated in this supplement, it is necessary, at minimum, to study the cumulative

impacts and gather the raw data for how many farming operations will be impacted by the reshaping of the land in terms of average number of farm accidents and damage to livestock.

Another issue that was briefly addressed in the GEIS was that of crop yields. However, in light of the potential number of drilling operations, throughout the region, the sheer scale of Marcellus gas drilling demands projection of how overall crop yields in NY State will be affected. While the issue of soil damage and poor site reclamation was briefly reviewed, the impact of ozone levels on crop production was not addressed at all.

Low-lying ozone greatly increases with the presence of diesel-burning vehicles. What is the number of heavy trucks and equipment that will be run on diesel, the projected level of ozone pollution from these machines, and the air-flow patterns in the region? These data can then be correlated with an MIT study and other studies indicating that ozone can reduce crop production by as much as 40%. These data must then be correlated with current levels of crop yields and the economic cost of yield reductions.

In chapter 8 section F., part 4 of the GEIS, you address contamination of water supplies used for livestock, irrigation and other agricultural purposes. You also acknowledge that the source of contaminants is difficult to determine without prior testing of the water. Studies need to be done to determine the impacts of using the best methods of testing agricultural water supplies before drilling operations begin, as opposed to no testing at all. That would include a comparison of no testing, testing for a standard array of contaminants as is currently used for most water testing and testing for specific contaminants that are determined to be used in fracking fluid at a particular drill site, as well as naturally occurring contaminants that result directly from drilling operations.

In light of climate change and increased incidents of flooding, especially areas not originally considered flood plains, the SGEIS should include an updated study of flooding around drill pits and nearby agricultural lands.

In chapter 8, section F, part 5, titled Leas Terms, the GEIS refers to how farmers can safeguard their farming operations with guidelines set up by the State Soil and Water Conservation Committee, and another document by the Farm Bureau and District Attorney. But these documents date back to 1982 and 1983 and warrant a thorough review as to the applicability and appropriateness, especially given the scale of drilling operations being considered. What will be the impact on NY State agricultural production and economics if farmers are forced to personally safeguard their land from drilling operations based on these outdated documents?

Article 23 of the Environmental Law requires reporting of non-routine incidents, including accidents. Reporting is left up to the well operator or its agent. Required well logs, well samples and other drill site information are also left up to the operator. How will the DEC monitor and enforce adherence to reporting guidelines for the drilling process?

In chapter 8, section F. part 6 titled “DEC Permit Conditions” you mention that DEC staff may attach conditions to permits requiring a list of stipulations regarding erosion, topsoil, timetable for reclamation, and the siting of wells. Will these requirements be consistently applied to all agricultural lands for which a drill permit is sought? How will the DEC, which is currently woefully understaffed, be able to adequately oversee these requirements as well as the basic requirements for the drilling process and waste water management?

How does the regulation of drilling operations supersede or conflict with the New York State Ag and Markets Law, Article 25AA? The law states that each agricultural district is "consistent with the law and overall purpose" including (1) constraints on regulations that could hinder farming, (2) requirements that State Agencies adopt policies to encourage and support farming, and (3) special review of public funding and land acquisitions in Agricultural Districts. It also calls for a soil and water Conservation Plan for all landowners with 25 acres or more and the requirement of the SEQR process for projects involving 25 acres or more.

To properly safeguard each farm and its unique characteristics, a specific SEQR review may be required. Therefore please produce the raw data to show how individual SEQR for Type I actions compared with a generic environmental impact statement would cumulatively affect farm productivity in terms of crop production, uncontaminated products, and economic costs and benefits.

Also, no review impact statement was made in the GEIS on the effect of drilling operations on farms neighboring a drill site, including farms with an "organic" certification. A study of the impact on neighboring farms in terms of soil, water and air quality, as well as degradation of roads, needs to be made along the same lines as for farmers who have signed leases. Similarly, what would be the impact on farms that do not sign a lease but would be compulsorily integrated?

In chapter 7.0 of the draft scope for the SGEIS, prohibition of development of Marcellus Shale and other low permeability reservoirs by horizontal drilling and high-volume hydraulic fracturing is slated for review. Due to the many crucial questions that should be answered before drilling commences, it appears necessary that the DEC declare a moratorium or prohibition on gas drilling operations, including lease procurements, unless and until all these questions have been addressed, and comprehensive safeguards of the health of our citizens and our land are firmly in place.

On closer inspection, it may become apparent that current gas drilling technology is not congruent with the maintenance of the safety and economic viability of New York agriculture.

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