



P. O. Box 907
Binghamton, NY 13902
www.binghamtonsustainability.org

December 15, 2008

Brad Field
Attn: Scope Comments
Bureau of Oil & Gas Regulation
NYSDEC Division Of Mineral Resources
625 Broadway, third floor
Albany, NY 12233-6500

Re: Comments on the Draft Scope of Work for Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs

Dear Mr. Field;

The Binghamton Regional Sustainability Coalition is a community group dedicated to sustainable development and the healthy, long-term viability of the area. BRSC recognizes the many benefits of gas drilling and would be supportive if done responsibly. Many people along with a growing number of their elected leaders, are looking to the DEC for investigation of and protection from its adverse impacts. We expect nothing less.

"Horizontal drilling is not new. Hydraulic fracturing is not new. And drilling into the Marcellus Shale is not new," Commissioner Grannis said. But the drilling operations proposed involve all three of these elements, along with greatly increased water use. That statement from the press release for the scoping process is putting it mildly, and that was NOT the position as publicly stated by the DEC until after public outcry and the governor's order to review and revise the regulatory framework. The kind of drilling NY has seen for the last century is in no way comparable to the massive and intensive production proposed for the Marcellus. To make such a claim is like comparing the family-run fishing fleets of New England the massive industrial massive industrial trawlers.

New York must look to other areas to understand the intensity of natural gas production using modern methods in non-traditional shale play. That kind of intensity can be seen in the west, in Ft. Worth Texas, in Pennsylvania and in Ohio, where water and air contamination and other threats to human and environmental health and safety are documented. Unlike the drilling that has historically taken place in NY, the recent drilling in Ft Worth, OH and PA is in shale formations (in the case of OH and PA its part of the Marcellus), and so THAT is where we should look to evaluated the risks of this process.

It is our fervent hope that DEC has come to recognize that this is a whole new level of gas drilling activity and while we can certainly learn from the past, we cannot continue to rely on past practices to fully address what is before us. It will require creative thinking. Now, more then ever, it will require taking a hard look at long term consequences.

We will outline a few of our specific concerns below, but will stress the following:

1. Though significant data, anecdotal evidence, concern, and some peer reviewed research indicates disturbing impacts and trends, there is a dearth of scientific, peer-reviewed studies, particularly analyzing long-term impacts and health impacts. NYS cannot permit natural gas production using hydro-fracturing methods until such studies have been done. Currently, the DEC is spending millions of dollars funding studies on environmental issues, for example one study is investigating the effect the release of endocrine disruptors may have on the watershed. Certainly, the DEC can fund relevant peer-reviewed studies regarding a major industry that has already been linked to significant impacts.
2. The DEC should form an independent blue-ribbon panel to investigate these issues using proper scientific methodologies..
3. The DEC and DOH should conduct an internal investigation to ascertain what studies past and in process may currently elucidate impacts and/or concerns that should be incorporated into the SGEIS as they reflect normal regulatory practices, legal practice, or known concerns. For example, substantial documentation points to the association of Natural Gas Production with endocrine disruptors. The current multi-million dollar study of these disruptors should certainly be used by the DEC in conjunction with the DOH as they consider health impacts. The investigation should use current, scientific, sound methodologies, by the appropriate oversight agencies (i.e. DOH re health concerns, Department of Water re water concerns, etc.).
4. The DEC and DOH have made ozone and emissions abatement a priority. All relevant research, government recommendations and regulations from appropriate agencies must be considered, referenced and be part of the SGEIS, so NYS does not end up in violation of its own laws.
5. In cases in which the DOH and DEC have particular concern (ozone abatement, greenhouse gasses, lead poisoning, mercury poisoning, radon,

- exposure to arsenic, etc.) and which are associated with this form of drilling in shale formations such as the Marcellus, the DEC must investigate the association of such substances with gas drilling and prove through peer-reviewed research that these substances will not enter the air or aquifer in quantities that the DOH/ DEC have already identified as unacceptable. Cumulative impacts and long-term exposure must be taken into account, just as NYS is currently doing in its program to abate air pollution caused by trucking.
6. Methodologies must be specified in the SGEIS (both internal, i.e. which agency and by mechanism will regulations be established, permits applications investigations, and adequate enforcement be done) and external (using what specific analysis will each area be investigated. Each methodology should reflect the latest in NYS regulations and scientific knowledge.
 7. Since the short-term and long-term health of NY residents and residents in adjacent states is of paramount importance, that all methodologies demand compliance with standards used by the DOH and other agencies which monitor chemicals for human consumption. In other words, we must prove natural gas production to be safe, within reasonable limits; merely proving that danger exists is a sub-standard mechanism. Moreover, methodologies for evaluation, monitoring and enforcement should reflect criteria that ensure human health as outlined by the DOH in its regulations regarding air and water quality standards.
 8. The DEC should only permit the number of wells that it has the capacity to regulate and oversee. At current staffing levels, it would be impossible to effectively monitor an estimated 7-8,000 wells that have been proposed for the first year of production.
 9. Much greater local control is necessary for health, safety and environmental protections involving any major industry, and gas production should be no exception. Local authorities and citizens should be included as much as possible.

We first address issues that are not included in the Draft Scope which we believe are essential considerations in the SGEIS. After that, we offer our recommendations on topics that are in the Draft Scope, but which we believe merit additional evaluation.

Items that are not mentioned in the draft scope:

1.The experience of hydraulic fracturing in other states

Throughout the draft Scope there is reference to experience in NY. For example, in section 4.1.2 reference is made to using pictures of NY sites with regard to appearance. This makes no sense as there is not any sort of representative set of Marcellus-like horizontal wells in NY. Probably the only comparable mature

model would be in the Barnett shale in TX. The use of NY pictures would just not be useful.

Also, the draft Scope makes reference to experience with hydrofracturing in NY. And, again, there is no set of hydrofractured horizontal Marcellus wells from which to draw any sort of experiential lessons. The vast majority of hydrofractured NY wells are small and relatively shallow wells that are in no way comparable. The much smaller number of existing large hydrofractured horizontal wells are not configured in the multiple horizontal manner envisioned in the 2008 amendments to NY gas and oil law. These will be about a mile square, have one or just a few 5 acre well pads with a large number of horizontal wells coming from each pad – in a so-called zipper configuration. These multi wells can be drilled over a three-year period – hardly a “weeks instead of years temporary disruption” and inconvenience – more like years instead of weeks.

It is entirely appropriate to use data and experience from other states that are roughly comparable to what development will be in NY. There is no reasonable basis for relying much at all on NY experience; it would be like comparing apples to bananas. Both are a food and a fruit. The SGEIS must, then, include an analysis of the impacts of hydraulic fracturing as they have been reported and measured in other states.

2. DOH as co-lead agency

In the draft Scope there is occasional mention of health issues and occasional mention of coordination with other agencies. Under NY 617.7(c)(vii) “creation of a hazard to human health” is listed as a criterion for determining environmental impact significance. There is ample evidence that industrial processes like gas drilling and production are threats to human health. However, with regard, for example, to potable/drinkable water, although it occasionally speaks about water testing, the DEC does not have a suggested water testing protocol on its website. Certainly a substantial health-related concern is potential contamination of drinking water (surface or subsurface) by one or more of the gas development procedures. The Department of Health does have a fairly extensive water testing protocol posted.

One would think that, because perhaps the greatest overall concern with Marcellus and similar development is human health, that the DOH should be a co-lead agency. At least its participation in Scoping and supplemental GEIS development should be far clearer and much more specific. And, again, the NY experience is not particularly relevant regarding health issues because NY has not had the large scale extraction experience that is envisioned, and that has an experiential base in other states (e.g., the Barnett shale in Texas).

Because of the relatively large number of anecdotally-reported drinking water- and health-related incidents in other states where large scale gas drilling is more mature and thus more appropriate as models, we suggest that a special task

force be constructed to evaluate, using the best science possible, the likely health impact of natural gas development in NY. As far as we are aware there is no good science that proves gas drilling poses no threat. Therefore, following the precautionary principle of “first try to do no harm,” and using the clear knowledge that this is an industry that uses some very health-damaging chemicals in settings outside the fairly well-controlled industrial settings that most of us are familiar with, an unconflicted, blue-ribbon panel of experts should be assembled to consult and recommend on health matters for the SGEIS.

3. Likely health impacts

Significant anecdotal evidence suggests that even in the short-term, hydraulic fracturing can have serious health impacts, included brain damage, asthma, and reproductive disorders. A recent study by the University of Colorado, *Potential Exposure-Related Human Health Effects of Oil and Gas Development*, points to the paucity of scientific study regarding health to this point and the need for further study.

The process involves the production of waste in the form of drill cuttings with concentrated levels of heavy minerals such as mercury and lead, as well as radon. See: <http://www.earthworksaction.org/publications.cfm?pubID=113>. These substances are associated with brain damage and birth defects and are given considerable attention by the Department of Health. See the following queries to obtain multiple documents and studies concerning these substances from the New York Department of Health:

<http://w2.health.state.ny.us/query.html?col=nysdoh&qt=lead;>
<http://w2.health.state.ny.us/query.html?col=nysdoh&qt=mercury&charset=iso-8859-1;> <http://w2.health.state.ny.us/query.html?col=nysdoh&qt=radon;>

Moreover, millions of gallons of produced water, toxic and carcinogenic, are brought to the surface to be stored in open pits, to be driven to processing plants or to be stored in sub-surface injection wells.

Hydraulic fracturing has already led to thousands of instances of water contamination throughout the country, including in our neighboring state of Pennsylvania. The US Bureau of Land Management tested 4,400 new wells in Sublette County, WY recently. Tests showed contamination in 88 out of every 220 wells, and found a plume stretching 28 miles. Researchers tried to take more samples, but monitors showed they contained so much flammable gas they might explode.

The Department of Environmental Quality of Wyoming found benzene in a residential well after this kind of casing cracked.

A 2004 study of water by the EPA shows troubling information, too. The report's conclusions have been used to justify gas drilling, as the conclusions leave out

much information in the report. On page 424 of the report we learn that fluids may migrate unpredictably through different rock layers at greater distances than previously thought in about half the case studies in the USA. They found biocides and lubricants which can cause kidney, liver, heart, blood and brain damage.

The study also found that as much as 1/3 of the fluids remain underground after drilling and can be transported by groundwater. Natural gas production has also led to air pollution, not only in the evaporation of chemical residue, but in the form of methane, ozone and carbon dioxide. This does not take into account the hundreds of trucks that are needed to supply each well, or spills and other accidents that are inevitable in any large-scale industry. See:

<http://www.pnas.org/content/100/21/11975.abstract>; Steve Arnold, a planner for Colorado's Air Pollution Control Division, has stated, "In the West we've focused our efforts at the local level. But ozone is also moving across the West from California, Texas, the Four Corners region and even the Pacific" Ozone has significant health impacts. See:

http://www.denverpost.com/headlines/ci_10878107. Note that a study of the air quality in Fort Worth found that the air pollution emitted by the gas industry was more than double that created by all traffic in the area that had already been identified as at-risk prior to the beginning of gas production. New York State recognizes air pollution as negatively impacting health, as has been stated by the governor, the DOH and the DEC. See:

http://www.ny.gov/governor/press/press_1125081.html.

<http://www.dec.ny.gov/chemical/8400.html>

See the *Quality of Air Means Quality of Life Site* linked to from the DEC page for a map showing Ozone over western US: <http://airnow.gov/>

Please note that according to the NY DOH, asthma hospitalizations alone cost the state 502 million dollars in 2005. Medicaid costs for asthma related issues were over one billion dollars in 2005, or \$1,752,764,604. Given the significant anecdotal and scientific data that links natural gas production to major air pollution, the state may be seeing health impact that will cost us in dollars, and more importantly, in human lives. Scientific research must be undertaken as part of the SGEIS to analyze natural gas production's contribution to air pollution, again, as such emissions are already a priority with DOH and the governor's office.

Noted endocrinologist Theo Colburn of the Endocrine Disruption Exchange <http://www.endocrinedisruption.com/> has testified before Congress about the threats to virtually all the systems in the human body posed by the chemicals found in the gas production process. A blue-ribbon panel of experts should be created to review and recommend regulations and actions regarding the potential health effects of Marcellus-type gas drilling and production. Such analysis is outside the competence and domain of the DEC and should be coordinated by the DOH, as a co-lead agency.

4. The impact of gathering lines, transmission lines - avoid segmentation of this inherently integrated process

The dismissal of the participation of the Public Service Commission in the GEIS process is inappropriate. What is unacceptable is that the DEC refuses to assess the impact of gathering lines, transmission lines, and accidental spills or releases as part of the EIS process. This appears to be segmentation of an inherently integral process.

DEC's reasoning is that there will be no PSC involvement (regarding gathering lines) until after a well is drilled and thus no involvement with EIS issues prior to issuing a permit for a particular well - this is backward. There will be no wells without gathering and transmission lines. One of the first things that oil and gas companies do is to arrange rights of way in their leases prior to drilling so that when they drill they can market the gas.

We know that the Marcellus is a sheet/blanket formation and success is about 98%. Probably the DEC's position on excluding the PSC and gathering lines from the GEIS is an historical legacy that was somewhat appropriate for the types of wells drilled in the 1980s and 1990s that had much lower probabilities of success, but it is not now. To ignore this aspect of the production process is to segment it.

5. Setbacks from private, potable wells

The Scope should revisit the subject of gas well setbacks from private water wells for four reasons:

a) No coherent reasoning was ever presented in the 1992 GEIS for wanting a 2000 ft. setback from municipal water wells and specifying a minimum setback from private wells of only 150 ft. The language in the 1992 GEIS: "...extremely unlikely" and "...most common...was short term...problems" does not inspire confidence in individual homeowners who have only one well. The issue must be reexamined in light of the use of much larger volumes of hydraulic fracturing fluids with a wide variety of chemicals, some of which may well be synthetic ones unanticipated in 1992, and many of which are known to be dangerous to human health.

b) The setbacks suggested in 1992 were examined relative to 40 acre well spacing. The 2008 amendments to ECL allow units as large as 640 acres, with multiple horizontal wells that can be drilled over a 3-year period from a few pads within the unit. It is unclear what the implications of these very different configurations and the semi-continuous drilling over a long period of time may have.

There is anticipated to be a very large number of Marcellus wells because of the wide-area sheet configuration of the formation and the high predicted hit rate. 2000-3000 per county may be likely, assuming 25% of the total land is filled with

wells at 16 per 640 acre density. This large number of wells means that with even very small probabilities of damage to private water wells (“unlikely”), there will almost certainly be some meaningful number of water wells damaged. Current regulations and procedures require private owners to pursue damage claims versus having a presumption of causation by the gas drilling. This all imposes an unreasonable burden.

c) Again, the Scope should absolutely not limit itself to data from the NY experience. NY has little experience with this kind of drilling and there are numerous examples of potable water problems in a number of other states using horizontal hydrofracturing. Thus, the 1992 GEIS suggested there were problems, although rare; and the experiences in other states support the idea that there can be problems. With much larger and more wells, the number of problems will increase considerably.

d) The massive horizontal drilling and hydrofracturing of these “unconventional” formations uses much larger fluid volumes and there are much larger amounts of produced fluid than was ever envisioned in the 1992 GEIS. Thus simple probabilistic analysis of the almost certain accidental spills resulting in loss of control of these fluids implies strongly that there will be more opportunities for surface and groundwater contamination. This, coupled with the large number of Marcellus wells virtually insures a meaningful number of serious challenges to private water wells.

Therefore, the setback provisions for private wells should be no different than for municipal wells. Moreover, the setbacks and other protective provisions for both should be revisited, with scientifically valid analyses.

6. The impacts of undocumented, unplugged wells

These exist (acknowledged by DEC) in western counties of NY. They are typically old non-productive wells where, for example, the steel casing was pulled for salvage. There has been oil and gas drilling in western NY for many decades prior to modern regulatory practice.

The issue is that with potentially large numbers of Marcellus wells, using massive amounts of fluids, the likelihood that a hydrofracture job would communicate with an unplugged abandoned well, make a u-turn, and come back up into water bearing strata and cause serious and possibly widespread water well contamination becomes fairly high. This represents a particularly nasty problem for the landowners who do not control their mineral rights, and who probably bought their land under very different circumstances than we now face. Many may have bought with the good faith assurances that gas and oil development was just about over for this area – as it seemed until quite recently. It imposes an undue burden to expect them now to live with the consequences that could not be foreseen as little as three years ago by both the DEC and by the NY Legislature when it passed the 2005 amendments to environmental conservation

law. Dealing with this problem will be difficult but necessary. The Scope must include it.

Comments on Areas Addressed in Draft Scope

1.2 Regulatory Jurisdiction

No other industry enjoys the right to engage in major industrial activity involving dangerous substances and practices with almost no local regulation (zoning), and, in current law, they remain exempt from major federal air and water protections. If we wanted to start a farm or a dry cleaning business, or any other type of commercial activity, we would be subject to local and federal laws which mandate that we act responsibly in assuring that our activities do no harm to air or water.

1.4 State Environmental Quality Review Act

The main purpose of conducting a “generic” environmental impact statement is to eliminate the need for conducting an individual EIS for each and every drill site. Individual EISs would have been required to take into account the preceding project so that the cumulative effects would be documented. It stands to reason that a “generic” EIS that is designed to eliminate the need for these individual studies would attempt to visualize and analyze a fully built-out scenario.

This supplemental EIS must include analysis of the cumulative effects of all the individual projects whose individual EISs it is supplanting. This would take into account the total anticipated sites along with the infrastructure; the roads, collection pipes, compressors, etc. It would also take into account cumulative effects of such things as water withdrawal, waste disposal, and loss of vegetation as it relates to flood mitigation. It should provide for a complete review of geology, hydrology, environmental engineering and city/regional planning. As an alternative or a mitigation measure, DEC could very well recommend an acceptable phasing rate. This, too, should become part of the analysis. The DEC should evaluate what phasing rate makes sense to reduce impact.

Because it is difficult to know at this point what a fully built-out scenario looks like DEC should convene a group of drilling experts and other invested interests from a variety of sectors to develop a consensus or several different scenarios to be included as alternatives.

2.1.2 Hydraulic Fracturing

Although the draft scope states that gas production has existed in NY for 50 years without any known incident of drinking water contamination, it is not known that contamination hasn't occurred. We note that for the past 50 years the State of New York has not known what chemicals it has been permitting in subsurface injections. It is known that private drinking water wells have been blown out by drilling activity in North Brookfield and obvious ground water contamination has occurred in areas of Chenango County which were reported to the DEC. This event was never properly addressed as by time the DEC got to the site 4 days later the contamination had dispersed downstream.

If there have been ground water contamination issues in the past, they may not have been realized because:

- 1) There has been no requirement to test water quality before, during, or after gas well development.
- 2) Contamination is difficult to qualify and test for if the chemical constituents in the fracturing fluids have been unknown.
- 3) Much of natural gas development in NYS has occurred in rural districts where contamination issues may not be immediately obvious.
- 4) When hydraulic fracturing and other forms of stimulation have disrupted the flow or quality of private water wells the responsible driller has responded with monetary compensation and treatment equipment before the DEC is notified or even involved.

The industry frequently points to two studies that it claims prove the safety of hydraulic fracturing, a 10-year-old anecdotal study by the Interstate oil and gas commission, and a 2004 EPA study Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs. As the title suggests, the 2004 EPA study was confined to coal bed methane largely found in western states. Formations found in our region were not studied. And as investigations by Propublica's Abrahm Lustgarten <<http://www.propublica.org/feature/buried-secrets-is-natural-gas-drilling-endangering-us-water-supplies-1113/>> and the Oil and Gas Accountability Project <<http://www.earthworksaction.org/hydrfracking.cfm>>, the conclusions of that study were changed by backroom agreement with the industry so that they do not reflect troubling findings that are in the body of the study itself.

2005 exemptions to the federal clean air, water and related environmental and health protection followed that study, which the industry also cites as a sign that the process is safe. However, the exemptions were a political decision, not a scientific decision based on protecting our health and the environment. The 2005 "exemptions" legislation called for a National Academy of Sciences study of gas drilling that EPA has since refused to support - in obvious violation of the explicit wishes of the 2005 Congress.

As part of the SGEIS process, we urge the DEC to go back and test ground water quality in areas that have experienced significant natural gas development. A random sampling of drinking water wells in areas that have had significant natural gas development is appropriate, including:

Aurelius/Springport, Cayuga County
Geneva/MacDougall, Seneca County
Chautauqua County

2.1.2.1 Fluid Handling at the Well Site

In the SGEIS, the process to store, use, and dispose of the unprecedented volumes of waste materials must be evaluated using sound, scientific methodologies. Experiences of communities in Wyoming, New Mexico and Colorado, suggest that on-site burial of waste material is unacceptable.

Prohibiting the use of open pits for “produced water” should be studied as a valid alternative. After finding leakage of nearly every open pit in Wyoming and Colorado, as well as contamination of adjacent water sources, both states have either mandated or strongly recommended steel storage tanks. Colorado has experienced over 1,500 instances of contaminated groundwater. Steel tanks do not in any way impair or compromise drilling operations. These issues need to be evaluated in detail.

2.1.2.2 Fluid Removal From Well Site and Ultimate Disposition of Returned Fluids

The draft scope inadequately addresses fluid removal. It is clear that the infrastructure is not in place to ensure proper disposal for the expected high level of gas production. At present, only 2 plants in Pennsylvania can treat produced fluid and the draft does not indicate which municipal wastewater treatment plants can handle brine waste. A treatment plant in Norwich recently turned away a waste hauler with spent fluid from a drill operation, indicating that the fluid disposal can be left up to individual haulers. The DEC cannot say where the hauler ended up taking the fluid, revealing that oversight of this process is severely lacking and needs to be addressed specifically. The DEC must analyze whether there is sufficient capacity of waste disposal facilities for a full build-out model that takes into account the maximum capacity needed over the long-term period of the gas development. If such capacity is lacking, an analysis of potential mitigation measures is warranted, perhaps meriting their own EIS.

The reference to the use of injection wells in the scope as an alternate to hauling waste to treatment plants is lacking specifics of how it will be studied. It is known that injection wells in Texas and elsewhere are a concern and have caused the City of Ft. Worth to issue a moratorium against them. Fractures in the rock layers can cause chemical seepage and these threats to drinking water need to be eliminated. An analysis within the SGEIS is warranted to identify the regulations

needed for proper siting and safe use. It is neither sufficient nor good science to think that storing toxic chemicals deep in the ground will not present a future problem. It was once thought that the toxic chemical TCE was safely captured under the ground in Endicott, NY. About 24 years after TCE was first known to be in significant concentration underground, it was discovered that it would move to the surface through a process known as vapor intrusion. It entered homes and buildings at levels that were in many cases many times above the state's guidelines. Today, over 500 homes and buildings in Endicott require a ventilation system to keep the levels within the structures safe. Just as we know that we are not safe from TCE underground, we can't assume that spent fracking fluid will not find their way to the surface or into drinking water supplies.

2.1.2.3 Trade Secret Status of Additive Formulas or Constituents

Although the draft scope states that it will require information about these fracking fluid additives, this is clearly not enough protective action to ensure safeguarding of the environment and health. The DEC began asking for the exact chemical make up of fracturing fluids for the first time in June of 2008. It is known that the industry does not want to reveal their formula, which requires revealing the exact amounts of chemicals used. In the past, gas companies have only listed chemicals by the generic heading. Identifying exact names of chemicals and quantities and making the composition of fracking fluid a matter of public record is imperative if the DEC, along with the DOH is going to ensure that environmental protection and public health and safe drinking water objectives are met, which are the objectives stated in the draft scope.

A story originally reported in the Durango Herald, and then picked up nationwide in Newsweek and other publications, indicates just one risk. A nurse treating a gas worker fresh from the field nearly died from multiple organ failure due to chemical exposure to something on the workers clothing, but as the industry refused to disclose what chemicals they were using in production, its still not known what caused the incident.

The SGEIS must include the chemical make-up of the frac'ing fluid used. Industry studies of these fluids have shown them to include substances such as benzene, naphthalene, and heavy metals such as cadmium and arsenic, which are linked to severe human health effects. The Endocrine Disruption Exchange (TEDX) found 54 different federally classified hazardous chemicals in certain frac'ing fluids. If the chemical make-up cannot be included in the SGEIS, it will be impossible to evaluate fully the potential environmental impacts of the process. Without such an evaluation, it is hard to imagine how DEC can permit gas drilling while still meeting the requirements of SEQRA.

The scope should study the need to prohibit the use of all potentially toxic materials unless the levels are proven safe by EPA standards and/or DEC's

own testing. It should be noted that the Environmental Protection Agency (EPA) has not kept up with such determinations. It is in the best interest of all concerned that such studies resume. In the absence of EPA testing, DEC should conduct its own testing. We also point out that although as science advances even these safe levels come into question. As an example, because benzene has been identified as a human carcinogen, all exposure should be completely avoided because there may not be a safe level of benzene exposure. Any amount of benzene in drinking water could be considered unsafe. A million gallons of water would only need about .3 fluid ounces to exceed the level of 5 ppb that the EPA has established as unsafe. Since events of accidental discharge or improper handling can occur, as the draft scope identifies as a potential impact, or benzene and other dangerous chemicals occur naturally and can mix in with the produced fluid, an analysis of what levels should be tested for should be part of the scope. Using non-toxic fracturing fluids would help reduce the possibility of introducing toxic contamination and a study of this should also be part of the scope.

2.1.5 Well Plugging

Current regulations are inadequate in this area. Specific criteria should be established as to when and how this is done, with specific time limits, including a one-year limit on temporary abandonment with a monitoring plan for that period.

2.1.6 Well Density

The SGEIS should include evaluation of alternative technologies to reduce the foot print of the drilling activity. This may include the requirement for gas drilling consortia to combine drilling spacing units and operations and promote a longer underground reach from each site. New GPS and drilling technology enable much more controlled directional drilling and should be utilized.

Larger units would reduce environmental impact not ONLY to the extent that there might be fewer well pads, but would reduce the impacts resulting from the ancillary access roads and gas gathering or transmission pipeline network as well. Reducing the operation's footprint in turn reduces the overall impact upon the landscape, community character, habitat destruction, surface run off, and numerous other negative effects related to the surface operation.

As part of this analysis, the SGEIS should include the merits of increasing Spacing Units. The surest way to reduce the negative impacts and risks associated with gas drilling is to use the technology to our advantage. While the true limits to horizontal drilling are, at this point, unknown, recent experience in Alaska and other nations shows that horizontal drilling can extend eight miles from the well bore. If 8 mile lateral drilling was required, this would space wellheads at 16 mile intervals rather than the current proposed 6-7,000 feet maximum (roughly a mile). This would not only reduce the footprint of the

operation, but more importantly, reduce the number of times our aquifers are penetrated and compromised. These alternatives to spacing must be part of the SGEIS.

3.0 GEOLOGY

Significant evidence suggests that human activities such as gas drilling can trigger earthquakes. These can be most severe in areas that have not experienced earthquakes in the past, as such areas have not released energy from existing faults. Central New York is such an area.

Christian D. Klose of Columbia University's Lamont-Doherty Earth Observatory has studied the issue extensively. According to one study, Australia's Newcastle earthquake, which killed 13 people, injured 160 and caused 3.5 billion dollars worth of damage was probably triggered by mining activities. The Marcellus shale abuts population centers. The Binghamton area, for example, is home to about 230,000 people. Moreover, we have no scientific data to indicate how even a minor earthquake would affect wells and well casings nor if minor earthquakes could lead to the contamination of the NYC watershed.

Scientific study is needed to prove that the geology of the area is safe for drilling and that the watershed is not in danger.

Industry currently has significant data related to the geology of the region. It should share that data with independent scientists so that a proper study can be done of this issue.

In addition to the reduced impacts listed above, 14 mile pad spacing is certain to reduce the overall impact upon the landscape, community character, habitat destruction, surface run off, water retention capacity, and numerous other negative effects related to the surface operation.

4.1.1 Noise Impacts

The Scope must use best-practice models to analyze noise impacts, such as those of the Federal Highway Administration and Canada. Noise levels at specific setback distances must be disclosed, and increase for mitigation purposes. Building enclosures for compressor stations and other structures that will remain for extended periods of time must be considered.

4.1.2 Visual Impacts

As indicated elsewhere in these comments, any measures that can reduce the number of pads and increase their spacing must be considered to mitigate the considerable visual impact of this activity. In addition, phased development must be considered as an alternative.

4.1.3 Air Quality Impacts

New research on the impacts of oil and gas drilling in the Barnett Shale proves that: Toxic emissions of, NOx (Nitrogen oxide) and VOC's (hydrocarbons), directly attributable to gas drilling, are equal to ALL the motorized vehicles in the 9 county Metroplex, surrounding and including Dallas and Ft Worth. Barnett Shale production produces 262 tons per day of these pollutants.

http://www.fortworthgov.org/uploadedFiles/Gas_Wells/Emissions%20report%20for%20barnett-shale%2010-14-08.pdf

“Cost effective control strategies were identified with the potential to significantly reduce emissions from many of the sources in the Barnett Shale. Among these was the replacement of internal combustion engines with electric motors for compression power, which could eventually reduce smog forming emissions by 50 tpd. Significant emission reductions could also be achieved with the use of vapor recovery units on oil and condensate tanks, which could eliminate 190 tpd of VOC emissions. Efforts to control condensate tank emissions would easily pay for themselves in a matter of months and start generating revenue to producers because of the high value of the gas and condensate that would be captured instead of released to the atmosphere. Fugitive emissions of methane, VOC, and HAPs could be reduced with a program to replace natural gas actuated pneumatic valves and devices with units actuated with compressed air. For those devices in locations where compressed air is impractical to implement, connection of the bleed vents of the devices to sales lines would greatly reduce emissions.”

The DEC should incorporate information on similar activities with the Barnett Shale and evaluate potential adverse impacts to human health and wildlife and study ways to mitigate it in accordance with the Clean Air Act. Comparison of known impacts elsewhere with studies in New York is needed to understand the full range of impacts.

As part of the study of Cumulative Impacts, the DEC must look at the current air quality and clean air standards of the Southern Tier and Catskills and, using the likely impacts of one well, begin to assess the impact of multiple well development and the overall effect on regional air quality. Such research must take into account likely interactions with existing air-borne pollutants, both in attainment and non-attainment areas. According to EPA data, many upstate areas already suffer from higher levels of air-borne contaminants than might be assumed

<http://content.usatoday.com/news/nation/environment/smokestack/index>

4.1.3.1 Greenhouse Gas Emissions

The scope must study a plan to offset the prodigious amount of greenhouse gases produced by these new wells, as well as the health and environmental effects of increased ozone emissions. Any previous promises to curb greenhouse gases are rendered nearly meaningless with the anticipated activity around the Marcellus Shale. Such gases are emitted at various points in the gas production process from flaring, venting, vehicle and equipment engines, dehydration from pits, etc. Well casing seals are a possible source of leaks, as are various valves, connections/seals at compressors and etc. The latter affects production especially since that is over a long period of time and thus small leaks would be CUMULATIVELY very important.

This major threat to public health has not been emphasized sufficiently up to now, and should be a high priority when scoping the SGEIS. It must be considered cumulatively with other greenhouse gas emissions from other sources.

4.2.1 Water Withdrawals

The scope should study the cumulative impact of water withdrawals from surface and groundwater sources and develop and specify models and methods used.

The SGEIS must include alternatives to minimize withdrawals of water recovery and recycling of water and other fluids and compounds used in the drilling process. The use of this technology (closed loop systems) could significantly reduce the volume of fresh water withdrawals and waste produced as well as limit the amount of truck traffic needed to service drilling sites.

4.2.1.1 Susquehanna River Basin

Throughout the entire SGEIS process, every effort must be made to insure that the DEC and the Delaware and Susquehanna River Basin Commissions (SRBC) develop seamless coordination, regulation, and enforcement of water withdrawals, use and quality utilizing an integrated data system. Both agencies have admitted at public meetings that coordination between the two agencies is “good but needs work.” However, the anticipated volume of well permits and the unprecedented need for water suggests that the agencies need to improve their coordination. Part of this requires analysis of the lack of uniformity of water withdrawal monitoring throughout the state and how that would be affected if the entire state should be covered by a SRBC- like Commission or similar.

4.2.2 Groundwater Quality

Several studies call into question virtually all of the key contentions that hydro-fracturing technology is safe. According to a story released on November 11 and published in Business Week, Scientific American, and at <http://www.propublica.org/feature/buried-secrets-is-natural-gas-drilling-endangering-us-water-supplies-1113/> “more than 1000 cases of water contamination have been documented by courts and local governments in Colorado, New Mexico, Alabama, Ohio and Pennsylvania.” This is a serious issue that merits significant analysis in the SGEIS.” In addition, eleven months ago a house in Bainbridge, Oh exploded because the tap water contained so much methane that it ignited. A report just released by the state of Ohio <<http://www.dnr.state.oh.us/Portals/11/bainbridge/report.pdf>> found that hydraulic fracturing forced the gas from thousands of feet below into fissures in the aquifer

In the SGEIS, the DEC should take into account new information on these similar activities in other states and evaluate potential adverse impacts to human health and wildlife and study ways to mitigate it in accordance with the Clean Water Act.

The DEC should also evaluate the need to test water quality before, during, or after gas well development.. Pennsylvania regulations require that all water wells within 1,000 feet of proposed oil/gas well development be tested. New York State has no such requirement yet, so its inclusion in the SGEIS is critical.

Another alternative is to change regulations to assume the strict liability of drilling operators if any significant disturbance in water quality or supply occurs within the area of such operations, which can be several square miles in size, given the reach of horizontal technology. This would NOT require pre-testing, unless companies wished to be sure that no such disturbances pre-existed. Similar laws already exist or are being implemented in other gas producing states.

4.2.3.3 Erosion and Sedimentation Control

The Scope must indicate how best management practices will be developed and addressed for erosion and sediment control. The scope draft fails to reflect any consultation with those DEC division with expertise in this area. Methodologies to develop restrictions, protections and setbacks, as well as the development and implementation of a State Discharge Elimination System should be required.

4.2.3.3.1 Clean Water Act Stormwater Exemption

A concern we have is how to hold gas operators accountable to Storm Water rules so drilling and gas collection does not further exacerbate the storm water challenges this region already faces. Pad creation, access road construction, and collection pipe infrastructure collectively entail a significant amount of land clearing. Upstate municipalities, particularly those above the Marcellus Shale,

have experienced devastating flooding in the last few years, and are in the process of developing and implementing a range of flood mitigation strategies. The SGEIS must include this issue through analysis of potential impacts of different stages of the drilling and production process.

4.3 Significant Habitats and Endangered, Rare or Threatened Species

The SGEIS must include evaluations of potential damage to farmlands and wildlife habitat in order to preserve biodiversity as well as key parts of the upstate economy: agriculture, hunting and fishing. Colorado and Wyoming experienced losses in tourism dollars as the gas industry advanced on key recreational tourism land.

4.6 Road Use

The draft scope of work must analyze traffic impacts, which are considerable, and which the document fails to mention. Each well bore requires hundreds of one way trips by very large vehicles, and given the probability of multiple wells per pad, thousands of trips would be likely for one pad alone, and continuing for many months. Research to analyze damage to local roads must be developed and potential impacts studied using methodologies from the Highway Capacity Manual. Alternative methods to minimize the number of trips needed per pad must be developed.

4.7 Cumulative Impacts

The main purpose of conducting a “generic” environmental impact statement is to eliminate the need for conducting an individual EIS for each and every drill site. Individual EISs would have been required to take into account the preceding project so that the cumulative effects would be documented. It stands to reason that a “generic” EIS that is designed to eliminate the need for these individual studies would attempt to visualize and analyze a fully built-out scenario. What is the impact of a fully developed gas field?

This supplemental EIS should do its analysis of the cumulative effects of all the individual well projects whose individual EISs it is supplanting
This would take into account the total anticipated sites along with the infrastructure; the roads, gas gathering or transmission pipelines, compressors, etc. It would also take into account cumulative effects of such things as water withdrawal, waste disposal, loss of vegetation as it relates to flood mitigation, etc. All the impacts that the DEC and people at the hearings bring up needs to be analyzed within the context of the fully built-out scenario.

4.8 Community Character

Protecting the environment is not only about protecting wildlife and plants, it is about protecting our health, safety and communities. Business that rely on a clean environment (agriculture, tourism, outdoor pursuits like hunting, camping and fishing) could suffer when major industrial activity moves into the region. All of these rely on a clean and healthy environment. And those living over the IBM toxic plume know the effect that such things can have on the values of their homes, in addition to the health of their children. The health care costs over the long term are hard to gauge, but judging from experiences in other states, they will be significant. Turning a largely rural and small town region into a major industrial zone will have unanticipated costs and consequences that may be even more serious.

The emigration of workers for drilling and production will require a rapid expansion of public services and housing. The added services, including road repair, first responders and other costs will also increase taxes. A long term analysis of the effects on the tax base and on property values over time, based on what has happened in other areas of intense gas production, is needed in the SGEIS.

The Draft Scope document currently lacks any detailed analysis of most of these issues. Nor are there significant alternatives to current practices or mitigation measures identified as called for in the law governing the scoping process.

During the SGEIS process, a baseline of data, particularly regarding water, soil, air and roads, to monitor and track the industry's impacts should be established. As part of this baseline and included in the SGEIS must be:

- a. Pre-drilling testing of all adjacent water wells, underground aquifers, and wetlands;
- b. Pre-drilling air quality testing, as well as establishment of ambient noise and light levels;
- c. Road assessments and development of a methodology for charging road-impact use fees to prevent the cost of road repair from being passed on to the already overburdened taxpayer. The Sullivan County Commissioner of Planning is taking a lead on this issue and would be a good person to consult.
- d. Socio-economic impact analysis should include: Truck traffic and infrastructure, medical and emergency response, law enforcement and correctional infrastructure, housing availability, crime (e.g. drug use and prostitution), sprawl and secondary growth, wastewater treatment infrastructure.

5.1 Public and Local Government Participation

Whatever the outcome of this regulatory process, the history of extractive and other hazardous industrial processes tells us that only those citizens who are organized and act in their community interest will have any real assurance that their health and safety are protected. That, not money or politics, is the bottom

line – if we are to live in this place for generations, and look our grandchildren in the face and say we did the right thing, especially concerning:

- 1) air quality
- 2) noise
- 3) Poor working conditions and worker benefits in the gas production process itself.
- 4) Unwarranted political and economic influence by industry on local governments and
- 5) traffic and public safety issues
- 6) what few people are really thinking about: the destructive, experimental and fundamental nature of hydraulic fracturing itself, especially when combined with directional drilling: even with closed-loop systems, steel tanks, 'safer chemicals', newly-on-the-table air pollution controls, ad infinitum, you can never, ever get away from the inevitability that this high-pressure fracturing itself damages strata and causes substances of all kinds to migrate upwards using whatever newly-created paths of least resistance they find.

The State must be more proactive in helping municipalities understand and prepare for the socio-economic impacts invariably experienced from the rapid expansion of gas drilling activity. Previous cases show impacts that include but are not limited to: infrastructure costs, social services and law enforcement budgets; inflated housing costs and rents; and increased demands on emergency services (fire and hospitals), water and sewage systems, etc. The State must:

- Allow time for municipalities to make the necessary changes to regulatory instruments and agencies, zoning, legal, tax and fee structures.

7.0 Alternative Actions

The following alternatives should be considered in the SGEIS:

1. Limiting the number of permits in a phased-development in order to better protect against and address unforeseen challenges or circumstances.
2. Allowing more permits to those companies practicing “clustered development,” which reduces traffic and impact on land, and for those companies that are willing to publicly negotiate well siting and set-backs with local officials and residents. Noise and light pollution, as well as safety hazards posed by intensive heavy-vehicle traffic on rural and suburban roads, are some of the many concerns here.
3. A moratorium on new drilling activity that would last until the review plan was completed and the results used to develop a new GEIS. We propose the DEC do an analysis of the repeal of ECL 23-303 (2) which removes home rule for oil and gas drilling. This should be considered and studied as a mechanism for both mitigation of the effects of fossil fuel production and as a reasonable alternative

to the centralized regulation currently in place. The scope should take into account this possibility and revise sections to allow for more local control, such as well testing, well density, noise, visual and air quality impacts, stormwater exemptions, water resources, significant habitats, flood control, road use and cumulative impacts.

4. No action or the prohibition of gas development in the Marcellus Shale and similar formations by horizontal drilling and hydraulic fracturing.

All alternatives must be compared with a thorough risk and cost benefit analysis of the economic, environmental and social impacts of moving forward with Marcellus Shale development. They should be looked at to project the overall benefit to the state on a long term basis. There is much that is known about hydraulic fracturing and much that is not, and this analysis should not factor in the unknowns as positives. It should identify where the known negatives are and where risks may be so great that they are recognized as showstoppers.

Paramount to the DEC's ability to ensure overall benefit to the state are adequate staffing requirements. If onsite inspection at critical stages of gas production cannot be assured, then a recognition of the increased risk must be acknowledged. No amount of comprehensive scientifically-based regulations can substitute for lack of enforcement. Both are needed and an admission of increased work load for the Division of Mineral Resources should be accepted. As the natural gas broker for the citizens of the state, the DEC must be able to maintain the staff required for their mission to "conserve, improve and protect the natural resources and environment" of the state. Unless the state can demonstrate that it can offer a necessary overhaul of its capacity to thoroughly regulate the gas industry, the result of the sGEIS can be challenged.

Respectfully Submitted by the Binghamton Regional Sustainability Coalition

Chris Burger, BRSC Chair
110 Walters Rd
Whitney Point, NY 13862

Scott Lauffer, BRSC Gas Production Task Force co-Chair
513 Pleasant Hill Rd
Port Crane, NY 13833

Laura Seltz, BRSC Gas Production Task Force co-Chair
254 Kent Street
Windsor, NY 13865

Adam Flint, BRSC Gas Production Task Force, contributor
1006 Powderhouse Rd
Vestal, NY 13850

Stan Scobie, PhD, BRSC Gas Production Task Force, contributor
37 O'Connell Rd
Binghamton, NY13903

Burrell Montz, PhD, BRSC Gas Production Task Force, contributor
Department of Geography
Binghamton University
Binghamton, NY 13902