



January 11, 2012

Attn: dSGEIS Comments  
New York State Department of Environmental Conservation  
625 Broadway  
Albany, NY 12233-6510

**Re: Revised dSGEIS Comments, Proposed Regulations for HVHF; primarily Sections 6.1 and 7.1**

Delaware Riverkeeper Network (DRN) submits these comments as supplemental to other comments we have submitted regarding the revised dSGEIS. In this comment letter, we focus on impacts to water resources, addressed primarily in Section 6.1 and 7.1 of the SGEIS.

DRN already submitted as comment on the revised dSGEIS to New York State Department of Environmental Conservation (DEC) a copy of reports commissioned by DRN prepared for the Delaware River Basin Commission's (DRBC) draft natural gas development regulations (April 2011). We include the reports with attachments by Paul Rubin, hydrogeologist (Attachment 1) and Piotr Parasiewicz, stream ecologist (Attachment 2) again with this letter for easy reference. These reports contain technical information that, while specifically addressing DRBC proposed regulations, are relevant to the revised dSGEIS. Also attached are two fact sheets and two figures that are discussed in this letter.

**Section 6.1.1 and 7.1.1** We support the application of a natural flow regime to govern withdrawals from surface waters and groundwater protection that considers aquifer recharge and groundwater contributions to stream base flow and associated hydrologically connected features (such as wetlands and vernal pools). We do not consider the DRBC's current pass-by flow requirements and water withdrawal regulations (discussed at Section 1.1.3) to be sufficient to protect the water resources of the Basin, including habitats. This is discussed in Piotr Parasiewicz's report.

DEC acknowledges in the revised dSGEIS that water depletion for High Volume Hydraulic Fracturing (HVHF) could have significant negative impacts. DRN advocates that DEC conduct further analysis of the assumptions of how much water will be depleted by this activity. The projections should not be based on current Pennsylvania development, which may not be determinative of the development patterns of gas in New York. The high quality, headwater and first order streams in New York's shale region, for instance, may experience degradation more quickly and/or development patterns may require higher volumes of water than in Pennsylvania.

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We do support a requirement that a seasonally adjusted natural flow regime analysis be applied to protect stream flows from water withdrawals. But we stress that the data used to develop the flows is critical to success in maintaining natural stream flows. Habitat and species research is essential to establish needed protection and to provide conditions that will allow species to thrive. It is essential to maintain habitat and ecological flows to insure the continued viability and health of species dependent on the natural flow regime. This habitat and species data should be gathered from the specific stream before water withdrawals are allowed. Also, the modeling assumptions used should provide a wide margin of safety (be very conservative towards ecological protections) and should be re-evaluated as time goes by since other change-forcing activities, weather patterns and larger climate changes can be expected to cause shifts in current stream conditions.

Regarding groundwater, DRN does not agree that there should be a hierarchy of classification with different mitigation measures based on the number of people served by an aquifer (such as setbacks, Section 7.1.3.5). DEC should treat all aquifers equally in terms of protection because of the responsibility of the State to protect the resource, not solely the population (as required pursuant to the Environment Conservation Law). Further, DEC cannot mandate population growth and what is today a "Principal" aquifer may tomorrow be a "Primary" aquifer. Also, aquifers in reality are not divided neatly into separate pots of water serving populations; aquifers intermingle. The classification of aquifers based on use cannot be expected to be accurate in terms of mapping. The revised dSGEIS should abandon this classification of levels of protection.

The most reliable means of protecting aquifers is to prevent pollution to the surface and to the subsurface equally with aquifer protection made the highest of priorities. Restoring polluted aquifers to pristine condition is impossible and remediation to improve degraded conditions is extremely expensive, if not prohibitive. The precautionary principle is the only reasonable approach to groundwater protection and this requires the prevention of pollution that is applied across the board and in perpetuity (as opposed to a two-year review when setbacks may be removed or lessened, Section 7.1.3.5).

DEC should adopt water withdrawal regulations under their new water withdrawal program that will codify ecological flow regime requirements and not move ahead with water withdrawal approvals based solely on permit conditions. We bring to DEC's attention that all projects and uses within New York's portion of the Delaware River Basin are subject to the DRBC's regulations and statutory requirements, including water withdrawals. DRBC's Special Protection Waters (SPW) Water Code classification of the Delaware River sets a high standard that protects the existing high water quality of the River. DRBC Water Code Section 3.10.3 et seq. codifies this anti-degradation program which requires that there be "no measurable change except towards natural conditions" in the River. New York is required to maintain this high bar for its portion of drainage to the Delaware River.

Piotr Parasiewicz' report explains the need for an ecological flow regime and connects the importance of preserving and enhancing natural flows to protect water quality and habitat. We point out that the federally endangered dwarf wedge mussel (*Alismidonta heterodon*) is present in the Upper Delaware River, which includes New York, and has historically been present in the Neversink River in New York, with a small population verified in 2006. Dr. Parasiewicz examines the potential impacts of water withdrawals locally and regionally in this context.

**Section 6.1.4 and 7.1.4** DRN does not agree with the conclusions in the revised dSGEIS that: it is unlikely that fluids will migrate to the aquifer from a wellbore for hydraulic fracturing; that gas

migration is solely a function of poor well construction; and that there is no significant adverse impact to water resources from migration of fracturing fluids, assuming that the targeted nature of hydraulic fracturing insures that fractures do not leave the fractured zone. Paul Rubin explains the potential for all of these eventualities in the attached report. While there are measurable improvements to the cementing and casing requirements that are proposed, the practice of hydraulic fracturing poses risks that cannot be mitigated with present techniques. As explained by Mr. Rubin, aquifers need to be protected into the future and the long life of aquifers and their irreplaceable nature require that the measures used to isolate gas and pollutants from water must be long-lived as well. Cement and steel casing now available and employed will fail in 100 years or less. This means that wells will inevitably leak gas and contaminated fluids into aquifers within 100 years, adversely impacting the use of groundwater by future generations. Attached is a Figure illustrating the process of hydraulic fracturing and how contaminated fluids and gas can mix with aquifers and drinking water wells (Attachment 5).

Also attached is a Fact Sheet “Aquifer Protection” illustrating the concept of the “Life of Aquifers” and suggesting minimum setback distances (Attachment 3). A closer examination of the well array and how to measure a setback is illustrated in Attachment 6. If a gas well is hydraulically fractured, it should be required that the setback distance be measured from the terminus of the horizontal well bore (which in multiple wells on a pad will form a “well array”) so that any fractures that leave the intended zone or that communicate with other fractures can be kept at a distance from the nearest environmental feature (water well, water body, wetland, etc.). DRN emphasizes that DRN’s recommended 2100 foot setback from the well array is a minimum setback and that site specific analysis of local geology should be required to map fractures, faults, and the dip and strike of the local geology; the data gathered should be used to establish final setbacks. Also, as discussed in Paul Rubin’s report an aquifer pump test should be performed to map the aquifer and reveal the likelihood of connection between the proposed gas well and adjacent water wells. If a gas well is not hydraulically fractured, the setback proposed by the revised dSGEIS from the features the revised dSGEIS identifies as the most sensitive (i.e. 4000 feet buffers around FAD watersheds) should be uniformly applied to all water-related features as a minimum setback. Again, the actual setback should be established based on local geology mapping and an aquifer test. This test should be a mandatory requirement.

A Fact Sheet on “Seismic Risk and Aquifer Degradation” illustrates the risks of placing wells in seismically active areas and the presence of natural fractures and faults that can carry contaminants upward, impacting aquifers and water wells (Attachment 4). Seismic activity and events in New York is examined in the revised dSGEIS in **Section 4.5**. There has been new information regarding induced seismic activity from hydraulic fracturing since the revised dSGEIS was issued and, most recently, in Ohio from underground injection wells. This issue is emerging as a technical challenge that should be revisited by DEC in a more in-depth analysis than is currently provided. The Revised dSGEIS does not require any action on the part of drillers to address this issue. Attachment 4 discusses the likelihood that cement sheathes can be cracked and other gas operations affected by seismic activity, including orphaned wells that are not properly sealed. DEC regulations should require that seismic analysis be done and areas where seismic activity is likely to occur be avoided. Also, monitoring of areas where old/abandoned wells may be located through the use of monitoring wells that can locate pollution plumes is needed and should be required by DEC when a driller is in proximity to old/abandoned wells.

The Wild and Scenic Delaware River is not recognized in the revised dSGEIS as an important feature that requires specific mitigation to prevent degradation of its exceptional water quality and

natural and recreational features. The Upper Delaware Scenic and Recreational River is located in New York. Under the Wild and Scenic Rivers Act, it is protected by an anti-degradation program adopted in 1990 by the DRBC in response to a Petition filed by Delaware Riverkeeper Network. New York supported the rulemaking that created the program. New York also supported the subsequent action by the DRBC to grant the Upper and Middle Delaware River Special Protection Waters status. The Lower Delaware River was added to the SPW program in 2008, after it was designated Wild and Scenic by Congress, again with New York's support. New York, at the head of the Delaware, impacts the entire Delaware River with its activities in its portion of the Delaware River Basin. SPW classification of the Delaware River sets a high bar that protects the River's existing high water quality. The mitigation offered in the revised dSGEIS in regards to water resource protection from HVHF in New York's portion of the Delaware River Basin does not meet the anti-degradation standard that has been codified by the DRBC – that there be “no measurable change except towards natural conditions” in the River. DRN advocates that DEC revisit this issue, analyze fully the potential impact on the Delaware River's water resources, and add the Delaware River Watershed - water supply to more than 15 million people - to the list of areas where HVHF cannot be practiced. We further advocate that subsurface access also not be allowed and that this be permanent, not one that would be revisited in two years.

Based on the inadequate assessment of the potential harms to water resources in New York, DEC should not proceed with the dSGEIS. The underlying assumption that the harms are adequately mitigated and the benefits outweigh them is unfounded. This means that DEC's decision not to recommend the “no action” alternative (Sect. 9.1) cannot be relied upon. The dSGEIS must revisit this conclusion with reliable information in the context that meets the State's requirement that they “conserve, improve, and protect its natural resources and environment”.

DRN champions the rights of our communities to a Delaware River and tributary streams that are free-flowing, clean and healthy. DRN is a nonprofit membership organization dedicated to the protection and restoration of the Delaware River Watershed representing communities - human and nonhuman - throughout its ~13,000 square miles with many members in New York State. Based on these comments and the attached expert reports, DRN respectfully requests that DEC reject the water resource analysis and proposed mitigation in the dSGEIS and not proceed under the document's flawed assumptions. Alternatively, DRN requests that the “no action” alternative be recommended by DEC.

Thank you for the opportunity to submit this comment.

Sincerely,

Maya K. van Rossum  
the Delaware Riverkeeper

Tracy Carluccio  
Deputy Director

Attachments: 1: Paul Rubin Report, April 2011  
2: Piotr Parasiewicz Report, April 2011  
3: Aquifer Fact Sheet  
4: Seismic Risk Fact Sheet  
5: Figure Hydraulic Fracturing  
6: Figure Well Array Setbacks