

Buffalo Niagara RIVERKEEPER® Comments
High Volume Hydraulic Fracturing dSGEIS
January 10, 2012

Buffalo Niagara Riverkeeper is Western New York's only science-based, community-focused, advocacy organization that is dedicated to protecting and restoring the quality and quantity of our water. We are committed to improving the legacy we leave for future generations. Our goal is for everyone to have access to fishable, swimmable and drinkable waterways throughout the Buffalo Niagara region.

High Volume Hydraulic Fracturing (HVHF) activities in both the Marcellus and Utica Shale formations within New York State and other areas of the Great Lakes Basin have the potential to impact both the *quality and quantity* of freshwater resources within our region. On September 7, 2011, NYSDEC issued a 1,537 page "Revised Draft Supplemental Generic Environmental Impact Statement" (dSGEIS) and associated "Economic Assessment Report". DEC is accepting public comment through January 11, 2012. Pursuant to the NYS Governor's 2010 Executive Order "*that no permits authorizing high-volume hydraulic fracturing would be issued until the dSGEIS was finalized*", it is of critical concern that the review and comments on this dSGEIS be conducted in a thorough and transparent manner, as any newly developed regulations adopted by DEC will govern the conditions under which HVHF could occur in New York State for the foreseeable future.

Based upon the technical review of the dSGEIS, Buffalo Niagara Riverkeeper concludes that HVHF activities cannot be conducted in a manner that is protective of both human health and the environment until the issues related to water quality and water quantity impacts outlined in the following memo are addressed.

The Executive Summary of dSGEIS highlights the two most important and immediate impacts that Western New York and the Great Lakes Basin may face associated with HVHF activities; 1) water quality impacts and 2) large volume water withdrawals, transfers or consumptive uses. New York State "*acknowledges that hydraulic fracturing requires chemical additives, some of which may pose hazards when highly concentrated. The extra water associated with such drilling may also result in significant adverse impacts relating to water supplies, wastewater treatment and disposal and truck traffic*"(dSGEISp.ES-1).

Based upon thorough review of the DEC's dSGEIS, local knowledge of the Niagara region's waterways and their current impairments, review of HVHF industry best management practices, and evaluation of current environmental regulations and policies, Buffalo Niagara Riverkeeper has identified the following four focus areas on which our technical comments are based:

- Regulatory Standards & Policy
- Chemical Constituents in Wastewater
- Large Volume Water Withdrawals and Transfers
- Environmental Enforcement and Reclamation

I. REGULATORY STANDARDS & POLICY

Comment 1: In New York State, there are no municipal or industrial wastewater facilities in existence that currently have the ability to accept, adequately process or treat hydrofracking wastewater. The Department acknowledges in Appendix 22, page 3 "*this disposal option is limited to the extent that municipal POTWs which utilize biological wastewater treatment are generally optimized for the removal of domestic wastewater and as such are not designed to treat several of the contaminants present in high-volume hydraulic fracturing wastewater.*"

Therefore, it is Riverkeeper's position that DEC should not issue HVHF drilling permits unless an adequate wastewater management system has been identified and permitted by New York State.

Whereas the dSGEIS identifies that "[t]he disposal of flowback water could cause a significant adverse impact if the wastewater was not properly treated prior to disposal. Residual fracturing chemicals and naturally-occurring constituents from the rock formation could be present in flowback water and could result in treatment, sludge disposal, and receiving-water impacts. Salts and dissolved solids may not be sufficiently treated by municipal biological treatment and/or other treatment technologies which are not designed to remove pollutants of this nature. Mitigation measures have been identified that would eliminate any potential significant adverse impact from flowback water or treatment of other liquid wastes associated with high-volume hydraulic fracturing" (dSGEIS p. ES 12).

The dSGEIS clearly identifies many of the potential environmental impacts associated with wastewater handling and treatment, and does begin to identify potential mitigation measures to offset these impacts (Chapter 7). However, the claims that these mitigation measures would "eliminate or mitigate significant adverse impacts" (dSGEIS p. ES-19) on all of the region's waterways is misleading. For example, mitigation measures for "Protection of Aquatic Ecosystems," 6NYCRR Part 608- Use and Protection of Waters "does not regulate disturbances of the many streams classified as "C" or below" (dSGEIS p. 7-5), of which numerous waterways and stream segments in the Niagara River watershed and Great Lakes Basin have "C" classifications.

Comment 2: **Riverkeeper believes that HVHF wastewater permit standards should be based on strong science and independently verified.** The dSGEIS states that "to ensure that wastewater from high-volume hydraulic fracturing operation is properly disposed, the Department proposes to require that before any permit is issued the operator have Department-approved plans in place for disposing of flowback water and production brine. In addition, the Department proposes to require a tracking system, similar to what is in place for medical waste, for all liquid and solid wastes generated in connection with high-volume hydraulic fracturing operations" (dSGEIS p. ES-23). *Permission to treat such wastewater at a treatment plant in New York State would not be granted without a demonstrable showing that such wastewater can be properly treated at the plant" (dSGEIS p. ES-25).*

This process is flawed in that DEC has not defined a regulatory standard for "proper[] dispos[al]." The dSGEIS effectively postpones many of the decisions on appropriate handling of

HVHF wastewater to individual permit applications. This is a missed opportunity to use the dSGEIS process to minimize ad hoc, repetitive and potentially inconsistent decisions on particular permit applications. It also tends to drive decision-making toward lower levels of the agency, specifically, the regional office water engineers, with apparently limited oversight by DEC central office personnel and USEPA.

Pushing key decisions down to the individual permit-writers and wastewater treatment plants also exacerbates problems of institutional capacity. *“NYSDEC has determined, based on industry projections, that it may receive applications to drill approximately 1,700 - 2,500 horizontal and vertical wells for development of the Marcellus Shale by high-volume hydraulic fracturing during a “peak development” year. An average year may see 1,600 or more applications”* (dSGEIS p. ES-4). While HVHF operations seem certain to impose a huge burden of permitting, monitoring and enforcement on the DEC, the human resources in the Division of Water also appear to be at historic lows. The dSGEIS does not adequately address these crucial limitations in regulatory capacity, nor how they will be addressed at projected levels of HVHF activity.

According to DEC-Region 9, *“all proposed new waste streams are evaluated by the POTW for waste characteristics so that they can make the determination whether they have capacity to treat the waste stream. In the case of existing vertical hydrofractured wells in NYS, current DEC policy requires the POTW to have an approved pretreatment or mini-pretreatment program and headworks analysis for the proposed wastewater to ensure that the POTW would have required treatment capacity. The DEC must also give prior approval to the POTW before it accepts such waste streams. A similar process is proposed for wastewater from horizontal high volume hydraulic fracturing activities in the dSGEIS”* (Pers comm, Jeff Konsella, P.E, Regional Water Engineer, NYSDEC Region 9, 1/9/12).

The uncertainty with the decision making process continues with what defines a *“new waste stream.”* Flowback and production brine are inherently different based upon their chemical constituents, of which these chemical combinations can also vary over the production life of each well. The dSGEIS is currently inadequate to support characterization of wastes at this broad level. Uncertainty also remains as to how the current Environmental Assessment process would inform these wastewater management decisions. (Refer to Comment 3).

In addition, Riverkeeper is concerned about the dSGEIS’s failure to address risks to New York State’s environment from out-of-state transport of HVHF wastewater, and deference to other states’ standards. Anecdotal reports indicate that HVHF wastes are being disposed of in Ohio and Pennsylvania (i.e.: deep well injection) and both of these states are partially within the Lake Erie watershed and are upstream from New York State. The problems and unknowns in proper handling and transshipment of HVHF wastewater within New York State seem equally applicable when wastes are transported to the upstream portions of the Lake Erie watershed. HVHF wastewater accepted in other Great Lakes Basin geographic areas (i.e.: Pennsylvania and Ohio) has the potential to be “received” by the Niagara River, an international boundary water. **Therefore, Riverkeeper supports the integration of interstate and international regulation and standards.**

In allowing haulers to transport HVHF wastes out of state, NYSDEC should require reasonable assurance that the wastes can be and will be handled properly in the receiving jurisdiction, so that there is reasonable assurance the contaminants will not later cause harm to the people, waters and lands of New York State. Such a requirement should not be considered an undue burden on interstate commerce pursuant to *United Haulers' Ass'n, Inc. v. Oneida-Herkimer Solid Waste Management Authority*, 550 U.S. 330 (2007) or *C & A Carbone, Inc. v. Town of Clarkstown*, 511 U.S. 383 (1994), because it does not have the purpose or effect of discriminating in favor of local waste management providers at the expense of out-of-state competitors.

Comment 3: Riverkeeper believes the current dSGEIS does not adequately capture the potential localized and site specific water quality and quantity impacts. Even though each permit applicant is required to complete an Environmental Assessment Form (EAF) and a new “EAF Addendum” (August 2011) has been proposed specific to HVHF activities, it is unclear in the current dSGEIS if and how there will be a meaningful EAF process associated with HVHF to adequately address potential cumulative and localized impacts (i.e.: groundwater, aquifers, wetlands, intermittent streams, etc.) and associated wastewater treatment and disposal. The dSGEIS does recognize six conditions that would trigger a full supplemental Environmental Impact Statement; however, Riverkeeper believes that this requirement does not go far enough in protecting or assessing all potential cumulative or significant localized impacts in the Great Lakes Basin.

Comment 4: Since the final GEIS will govern the conditions under which HVHF can occur in New York State for the foreseeable future, Riverkeeper recommends that DEC take as much time as necessary to properly receive, review and address public comments prior to completing the final GEIS document. Over 20,000 public comments to date indicate that the public does not believe the dSGEIS is adequate.

II. CHEMICAL CONSTITUENTS IN WASTEWATER

Comment 5: Riverkeeper supports the full disclosure of all chemical constituents expected to be contained in recovered wastewater (including but not limited to “flowback fluid” or “production brine”) and at any point that the water use or wastewater discharge could potentially impact a publicly-owned treatment plant, waterway, groundwater, or aquifer. In addition, since there is little information on the fate and transport of unrecovered chemicals, constituents in fluid that would not be returned to the surface for processing should also be disclosed.

Public disclosure of chemical constituents is a concern during the permitting process as proceedings may be less transparent and participatory. In respect to the dSGEIS statements regarding disclosure, “*if any confidentiality is allowed under State law based upon proprietary material [in fracking additives], that fact may be noted in the submission. However, in no circumstance shall a fracturing additive be approved or evaluated in a headworks analysis without adequate toxicity data*” (dSGEIS p. 6-59).

In addition, although NYSDEC is requiring “*Mandatory Disclosure of Hydraulic Fracturing Additives and Alternatives Analysis*” as a mitigation measure, this requirement is not enforceable because the dSGEIS states that “*the Department will publicly disclose the identities of hydraulic fracturing fluid additive products and their Material Safety Data Sheets, provided that information which meets the confidential business information exception to the Department’s records access program will not be subject to public disclosure*” (dSGEIS p.ES-22).

Ultimately, **Riverkeeper’s interpretation of these statements imply that even though the industry is obligated to provide complete disclosure of all chemical constituents to NYSDEC, the public participation in the permitting process and public disclosure of chemical additives can be severely limited by industry claims of proprietary data or information.**

Comment 6: Riverkeeper believes that DEC needs to assess both the potential individual and cumulative impacts from potential chemical use, reactions, and combinations prior to the issuance of permits and acceptance of wastewater discharges into the environment.

Additional toxicity assessment is needed on the various chemical combinations to predict potential real-world ecological community impacts.

In Western New York, the Niagara River and many of its tributaries are already deemed “impaired” for aquatic life and habitat, largely due to historical toxic contamination issues. In addition, NYSDEC’s Comprehensive Wildlife Conservation Strategy rates the Niagara region’s ecosystem as “poor”. Individual contributions of chemical loadings to the Niagara watershed and Great Lakes Basin may be considered negligible on a permit by permit basis, however through local experience Riverkeeper has seen first hand the cumulative chemical impacts on the Great Lakes ecosystem. Therefore, it is scientifically defensible and justifiable to require an assessment of potential cumulative impacts as part of the permitting process.

Regulatory and DEC capacity issues arise again in association with potential impacts of individual or cumulative chemical impacts, which are highlighted by the many blank squares in Table 6-1, (dSGEIS pages 6-19 through 6-35) comparing known HVHF additives to existing regulatory standards and guidance values. Many of these additives and chemical constituents of HVHF wastewater have not been adequately regulated as individual chemical entities, under the assumption that they have not previously appeared in industrial waste streams frequently enough to warrant either toxicological research or regulatory activity. Potential environmental and human health impacts of many unique mixtures of these toxic and conventional pollutants have also not been evaluated. This will leave enormous discretion in the hands of the individual permit writer and wastewater treatment plant (WWTP) operator as they exercise their “best professional judgment.”

When HVHF wastewater is proposed to be treated in a New York WWTP, the key regulatory document, as noted in the dSGEIS, will be the *Division of Water Technical and Operational Guidance Series* (TOGS) 1.3.8. This seventeen-year old guidance document does not have force and effect of law, and definitely is not designed to provide much guidance for permit-writers who are confronted with HVHF wastewater. For example, TOGS 1.3.8 defines “bioaccumulative and persistent substances” by incorporating a very short and very outdated list

of chemicals (Appendix 3 Attachment C to TOGS 1.3.8), most of which have been banned for decades. The list is evidently taken from EPA's prohibition on use of mixing zone analysis in the Great Lakes Region for this small number of chemicals (less than thirty). By contrast, the Great Lakes Water Quality Agreement defines a "persistent toxic substance" as one which has "a half-life in water greater than eight weeks" (Annex 12.1(a)) and notes that "the philosophy adopted for control of inputs of persistent toxic substances shall be zero discharge." It seems highly likely that many of the additive chemicals used in HVHF would meet the Great Lakes Water Quality Agreement definition of persistent, yet they would not be adequately assessed through TOGS 1.3.8.

When HVHF wastes are taken to a WWTP, key protection for human health and the environment is the Maximum Allowable Headworks Analysis. As described in the dSGEIS and TOGS 1.3.8, this analysis appears to be potentially vulnerable to manipulation. Since most of the levels in Appendix C to TOGS 1.3.8 are concentration-based limits only, with no mass loadings limits, they may be susceptible to a "dilution solution", in other words the inputs of uncontaminated water to drop concentrations below allowable or detectable levels. In addition, the variability of HVHF wastewater contents will raise questions about whether a Headworks Analysis, as well as characterization of a particular truckload of wastewater, can capture all of the relevant parameters. The dSGEIS notes that the physical and chemical constituents of flowback and production brine vary materially, that the quality and composition from flowback from a single well can also change even within a few days after the well is fractured and that the data underlying the list of potential fracking additives in Table 6-1 is unreliable. In these circumstances, the adequacy of protection provided by the approach outlined in TOGS 1.3.8 is questionable.

NYSDEC assesses that *"based upon currently available information it is anticipated that flowback water would not contain levels of NORM of significance, whereas production brine could contain elevated NORM levels. Also, wastes from the treatment of production waters may contain concentrated NORM and, if so, controls would be required to limit radiation exposure to workers handling this material as well as to ensure that this material is disposed of in accordance with applicable regulatory requirements"* (dSGEIS p.ES-19). Based on this, **Riverkeeper believes there is a need to better assess the potential cumulative impacts associated with "NORM" (Normally Occurring Radioactive Material) and the dSGEIS should be more specific about what the prescribed "controls" will be.** Although radioactivity in shale is naturally occurring, expected, and poses little risk when in isolation, HVHF has the potential to free-up and concentrate NORM in the form of liquid radioactive waste.

III. HIGH VOLUME WATER WITHDRAWAL

Comment 7: Although DEC proposes to *"review and consider the use of alternative additive products that may pose less risk to the environment, including water resources, and to publicly disclose the chemicals that make up these additives"* (dSGEIS p. ES-28), it is merely a suggestion "wherever feasible", and does not enforce permit conditions to reduce the use of large volumes of water or less toxic chemical additives. **If HVHF activities are permitted, the dSGEIS does not provide for an adequate review of alternative processes or technologies.**

Comment 8: Chapter 6 of the dSGEIS concludes that, “*without proper controls on the rate, timing and location of [such] water withdrawals, the cumulative impacts of such withdrawals could cause modifications to groundwater levels, surface water levels, and stream flow that could result in significant adverse impacts, including but not limited to impacts to the aquatic ecosystem, downstream river channel and riparian resources, wetlands, and aquifer supplies*” (dSGEIS p. 6-2). **Therefore, Riverkeeper recommends the DEC should assess potential localized impacts of large volume water withdrawals, associated with any HVHF activity in New York State. This includes the need for adequate mapping, modeling, testing and monitoring plans associated with large volume withdrawals from surface and sub-surface water resources before permits are evaluated and issued.**

There are several interstate watershed-based commissions (i.e.: Susquehanna River Basin Commission [SRBC] and Delaware River Basin [DRBC]) that have jurisdiction and regulatory authority for implementing watershed-based regulations and permitting. Both of these Commissions have utilized independent water use classifications and water quality standards as well as incorporated regulations that address potential cumulative water withdrawal impacts specific to seasonal hydrological fluctuations, timing, and individual tributary systems. Though New York State has recently put regulations in place that require permits for any water withdrawals more than 100,000 gallons per day, the Great Lakes Basin does not have the benefit of a comparable “watershed-based commission”, like the SRBC and DRBC, and therefore the basins in Western New York do not currently have the comparable levels of protection for cumulative water quantity impacts nor do they have local control over their “best use” water classification; two key factors in water quality and regulatory standard determinations.

The dSGEIS identifies that “[DEC] prefers the DRBC’s method and the SRBC’s method and the Natural Flow Regime Method (NFRM), which is preferred by the Department for purposes of the development of gas reserves as described in this document and are proposed to be enforced as permit conditions until further regulatory guidance or regulations are formally adopted. Mitigation of cumulative impacts is also addressed” (dSGEIS p. 7-2). The dSGEIS is inadequate as it does not identify how the flow regimes will be measured or monitored and how cumulative impacts of water withdrawals will be mitigated.

Comment 9: In order to protect the ecological integrity of tributary systems and watersheds throughout New York State and the Great Lakes Basin, Riverkeeper insists on full compliance with the Great Lakes Compact regarding large scale withdrawals from the Great Lakes Basin, including surface waters, tributaries and groundwater aquifers.

The Great Lakes Compact covers three kinds of water movements within or out of the Basin: a) withdrawals, b) diversions and c) consumptive uses. HVHF in New York State has the potential for water use classified as a “withdrawal” or “consumptive use”. For example, if water is taken from a stream, lake or groundwater source in-basin, and injected below the water table during or after HVHF, it should be considered “withdrawn.” And, since some significant portion of the water used in HVHF does not flow back to the surface, its use should be considered a “consumptive use” within the meaning of the Compact. Further, in Section 4.11 – Decision Making Standard of the Compact, the second criteria states the following: “*The Withdrawal or Consumptive Use will be implemented so as to ensure that the Proposal will result in no*

significant individual or cumulative adverse impacts to the quantity or quality of the Waters and Water Dependent Natural Resources and the applicable Source Watershed”.

The Great Lakes Compact has quantity thresholds that trigger its regulatory requirements, so that small-volume uses may not be regulated. The Compact specifies that “*any Person who Withdraws Water in an amount of 100,000 gallons per day or greater average in any 30-day period from all sources, or Diverts Water, shall register the Withdrawal or Diversion.*” Since HVHF operations use water in the range of a million gallons or more, and the time during which the actual HVHF takes place is apparently relatively short, a single fracking operation could easily exceed this quantity threshold and therefore trigger Compact review. However, a possible loophole exists insofar as the requirement applies to a “person” and since corporations are persons within the contemplation of the law, it might be possible to establish a series of corporations to take less than 100,000 gallons each, or to have a series of natural persons each take less than 100,000 gallons each, and therefore prevent implementation of the Great Lakes Compact associated with HVHF operations. In regards to large volume withdrawals or transfers into the Basin where the Compact regulatory requirements do not exist, the establishment of watershed-based commissions (detailed in Comment 8) could provide additional protections associated with cumulative impacts of water quantity.

IV. RECLAMATION AND MITIGATION

Comment 10: Riverkeeper supports an industry fee structure that would allow DEC to increase its staffing capacity in direct association with the increased demand for permit review, processing, approvals, monitoring and enforcement. This supports the DEC’s position that the “*Department proposes to limit permit issuance to match the Department resources that are made available to review and approve permit applications, and to adequately inspect well pads and enforce permit conditions and regulations*” (dSGEIS p. ES-28).)

Comment 11: Riverkeeper supports the NYS Comptroller’s draft program bill that would seek to “remediate contamination and establish an industry-supported fund to recover damages caused by accidents related to natural gas production.”¹ Established through a surcharge on the industry, commensurate with potential loss, and included as part of EIS process under mitigation measures to determine scale, this program would provide long term accountability and secure source of funding to mitigate unknown, unforeseen and unintended consequences. It avoids lengthy litigation and allows for quick response and clean up of contamination associated with any component of the HVHF process.

1- (<http://solidshale.wordpress.com/2011/08/09/nys-comptrollers-office-to-put-forward-program-bill-on-hydrofracking-requiring-bonding/>)