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A Hydrofracking ‘Heads-Up’

Editorial By Charles Rich

At least half the population of the United States depends upon present-day and future underground sources of drinking water. The proposed practice of hydrofracking natural gas wells, if poorly regulated, has the potential to seriously and chronically contaminate groundwater on a localized basis. Hydrofracking is a drilling method using as much as 1 million gallons per day per well of injected water mixed with sand and chemicals to enhance production of natural gas from densely-layered bedrock.

This drilling practice, although popular, is controversial environmentally, and oftentimes polarizes concerned parties. In New York State, public hearings now underway must inform the public and assist in the development of suitable and even-handed rules to adequately regulate ‘frack’ gas wells.

The proprietary ‘mystery liquids’ used by energy companies for hydrofracking are augmented further with more toxins and carcinogens added by the chemicals used in the drilling process. Most of this injected fracking fluid stays in the ground as natural gas is released from the well. However, as much as 35% is brought back up to the surface to become wastewater



fluid that may contain at a minimum, naturally-occurring corrosive salts, carcinogens, and largely untreatable radioactive elements. That wastewater that can no longer be recycled must be transported considerable distances to be disposed of at ‘yet-to-

be-built’ wastewater treatment facilities with appropriate treatment capacity, equipment, and technical expertise to do so. Resulting effluents are typically discharged to the nearest surface water.

The wastewater stored in unlined impoundments or lagoons at the drill site may also provide a potential threat to underlying groundwater and/or to nearby rural drainageways in the event of flooding or lax storm water runoff controls.

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‘Liberty’ for a Community

By Jessica Proscia

Over three years ago, award-winning real estate developer Dunn Development Corp. (Dunn) requested CA RICH Consultants, Inc. be their ‘environmental consultants’ on one of their new affordable and supportive housing developments.

The 30,000 square foot lot located on Liberty Avenue in Brooklyn had been long-abandoned and vacant. The development team including Dunn, along with their development partners, the local non-profit Cypress Hills Local Development Corporation, transformed this block-long patch of vacant land into the Liberty Apartments, a high quality housing development for low and middle-income residents that was long awaited by the Cypress Hills and East New York neighborhoods.



Previous environmental investigations at the property identified historic ‘urban fill’ conditions. Additionally, underground storage tanks (USTs) associated with a previous on-site residential building were discovered.

CA RICH was pleased to embrace this new environmental challenge, and performed a Phase II Environmental Site Assessment (ESA) to assess the current soil and groundwa-

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Because groundwater and surface water are intimately interrelated in shallow-depth watersheds (e.g. Delaware & Catskill Watersheds), clean rivers and clean ground water within these watersheds must be subject to a number of new regulations at State levels to ensure that fracking will be safe and protective of human



health and the environment. However, to date, legal controls for gas drilling in the northeast are weak at all levels of government and administrative budgets to enforce certain laws and policies that do exist are under increasing pressure during extended recessionary economic cycles. Simply put, agency budgets are being reduced, not expanded.

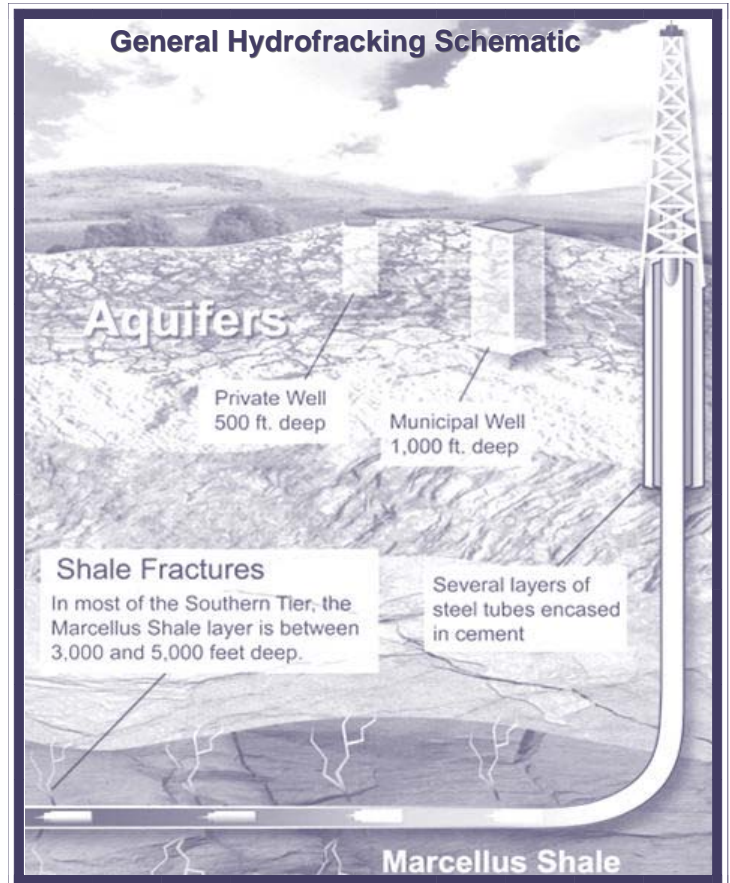
Fracking is certainly not new and is productively applied in western states. Additionally, oil & gas exploration in New York State has been ongoing for decades and the industry has become adept at predicting and geologically mapping formation depths (e.g. approx. 3,000-5,000' depth horizon for the Marcellus Shale along the Southern Tier). Such knowledge and experience should theoretically result in improved gas well yields (at least initially), and minimal gas well-related accidents. However, the potential future proliferation of thousands of new gas wells within natural watersheds in a heretofore under-regulated environment could ultimately result in serious and long-standing environmental degradation. As such, we strongly recommend that hydrofracking only be applied in those hydrogeological settings where subsurface conditions can adequately preclude the probability of contamination.

Alternatively, if hydrofracking is permitted in subwatersheds where hydrogeologic conditions are sensitive, the process should certainly be subject to protective well casing designs, industry procedural protocols, stringent regulatory compliance requirements, enforcement-related fines and penalties, and an appreciation and recognition of homeowner water rights and the likely gradual diminution of property values.

Incidental leakages of potentially hazardous wastewater must be readily detected, contained, subject to feasible corrective actions, and monitored at levels satisfactory to concerned parties. Regulations applicable to abandoned fracked gas well closures are equally important to new exploration & development activities.

Out-of-sight fracking problems related to the natural environment include the prospect of contaminating drinking water in private and municipal supply wells, methane gas migration or emissions, heightened and harmful ozone levels at drill sites, and degraded groundwater (or improperly treated wastewater) impacting surface water quality.

There are also other less obvious threats. For example, the increased water demand needed for gas drilling in rural areas may compete with limited private or municipal potable water supplies, necessitating that water be imported substantial distances, perhaps from one sub-watershed to another. Water wells drilled into fractured bedrock (where pumped withdrawals come from interconnected saturated fracture zones) have a greater 'radius of influence' geographically than an equivalent water well drilled into more permeable and homogeneous sand & gravel aquifers that exhibit primary porosity and permeability aquifer characteristics.



Water wells near gas wells are more sensitive to well water level drawdown and/or the threat of potential gas well migration horizontally if subjected to competing pumpages, interwell interferences, and/or drought conditions over time.

“As new gas wells mushroom over the Marcellus... the public-at-large must become informed”

Earthquakes are often thought to be a ‘western’ problem. However, the seismic risk here in the northeast is just as high as it is in California and numerous earthquakes routinely

occur in New York State except they are comparably smaller, undetectable to most, and uneventful. Hydrofracking presents the potential for increased seismic risk by weakening sedimentary rock layers at depth. Weakening may occur from the increasing interstitial pore fluid pressures created by the injection of the high volumes of fracking fluids into the wells. Fracturing, faulting, and/or ground subsidence, can be the cause of considerable infrastructure damage, water level fluctuations, and reduced well yields over time.

The popularity of hydrofracking within the last few years is chiefly due to advances in drilling technology. The geographic location of the gas well drill site upon the land surface is no longer necessarily the location of the bottom of the well beneath it due to advances in directional drilling that can expand access to buried gas reserves. For example, wells are typically drilled vertically downward 4,000 or 5,000 feet deep to the target depth horizon, and may then be turned horizontally by remote control to advance the drill bit(s) as much as a mile radially-outward to reach out and tap shale gas further within extended fractured layers or along bedrock bedding planes.

Natural gas drilling enhanced by hydrofracking is not the harmless panacea the industry and many industry advocates may want the public to believe. However, the sheer development potential from the huge volume of natural gas reserves within the Marcellus & Utica Shales represents an enormously valuable natural resource that can bring associated economic benefits to rural communities. Simplistically, there is no recession in those communities welcoming and encouraging the natural gas industry and the entire new infrastructure required to develop and distribute this cheaper form of energy. As new gas wells mushroom over the Marcellus in the next several decades to take advantage of this resource, the public-at-large must become informed and be prepared to sensibly manage the cost-benefit of cheaper energy against the threat of contaminating local drinking water supplies: indisputably, the most precious and nonrenewable resource of all.

Liberty... Continued from page 1)

ter conditions at the site. Based on the results of the Phase II ESA, a Remedial Action Plan or “RAP” was prepared. CA RICH then worked closely with the New York City Department of Housing Preservation and Development (NYCHPD) and the New York City Department of Environmental Protection (NYCDEP) to obtain an approved Remedial Action Plan (RAP).

The approved RAP was implemented as part of site preparation and construction activities and included: 1) excavation and removal of six buried USTs as well as preparation and submittal of a Tank Closure Report; 2) removal of over 8,000 tons of soil as part of site redevelopment; 3) installation of an engineered vapor barrier; and, 4) installation of demarcation barrier and two-foot clean fill buffer. All of the regulated environmental activities outlined in CA RICH’s RAP were documented in a Site Closure Report. Dunn Development subsequently received the important ‘Notice of Satisfaction’ from the NYCDEP indicating that all environmental work included in the Site Closure Report was acceptable and deemed complete.

Thanks to the hard work and dedication by all team members involved, this former neighborhood eyesore was readily transformed into a 3-story 44,000 square foot residential building with 43 units. These 43 units of housing serve two income tiers as well as specialty units that aid adults with developmental disabilities.

As an additional ‘sustainability’ bonus, the building achieved NYSERDA’s Energy \$mart Certification through the use of high performance and energy efficient details, such as Energy Recovery Ventilators and Constant Air Regulators for high-efficiency ventilation; low-flow plumbing fixtures; and high efficiency condensing boilers for heating and hot water.



Playground area at Liberty Apartments

What's new at CA RICH

CA RICH is in the final stages of remediation and reporting for the Via Verde New York State Brownfield Cleanup Program (BCP) Site in the Bronx with State issuance of a Certificate of Completion scheduled this year.

CA RICH is currently conducting remedial action at the Chelsea Green New York City BCP Site in lower Manhattan under the auspices of the New York City Office of Environmental Remediation (OER).

We are pleased to announce that another beneficial redevelopment project: the Lebanon West Farms Site in the Bronx has been accepted into the New York State BCP through approval of CA RICH's recently submitted BCP Application and RI Work Plan.

Congratulations to our own Charles Rich for his recent election as Chairman of the Real Estate Practitioners Institute of Long Island (REPI). The Real Estate Institute, started back in 1973, is newly-affiliated with SUNY Stony Brook University. REPI promotes professionalism and ethics within the real estate field and offers seminars and educational courses to working professionals in the industry. Visit their web site (repili.com) for more information.

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CA RICH CONSULTANTS, INC.

A full-service environmental consulting firm providing strategic consulting and on-site support to help business owners manage all their environmental issues. CA RICH, independently-owned since 1982, is staffed by experienced environmental professionals skilled at understanding the intent behind environmental regulations, balancing business needs with environmental practicalities.

The Company supplies environmental consulting; Phase I & II assessments; compliance audits; investigation; remediation; groundwater resource management; storage tank; indoor air quality & hazardous waste management; soil vapor intrusion mitigation; brownfield redevelopment; sustainability, expert testimony; strategic thinking; dispute resolution; and all other professional services related to meeting evolving environmental regulations.

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