

NYS Conference of Environmental Health Directors

"Working Together to Promote Healthy Communities"

January 5, 2012

LOCAL HEALTH DEPARTMENT CONCERNS – REPORT OF ENVIRONMENTAL HEALTH RESOURCE NEEDS Prepared for the New York State High-Volume Hydraulic Fracturing Advisory Panel

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New York State High-Volume Hydraulic Fracturing Advisory Panel

1. Introduction

The New York State Department of Environmental Conservation (NYSDEC) has prepared a Supplemental Generic Environmental Impact Statement (SGEIS) for issuing well permits for High-Volume Hydraulic Fracturing (HVHF) in the Marcellus Shale and other low-permeability gas reservoirs. The draft SGEIS states:

"...county health departments are the most appropriate entity to undertake initial investigation of water well complaints. The Department (NYSDEC) proposes that county health departments retain responsibility for initial response to most water well complaints, referring them to the Department when causes other than those related to drilling have been ruled out."

As discussed in this report, gas drilling involving HVHF will have these and other impacts on Local Health Departments (LHDs). When NYSDEC begins issuing permits after the SGEIS and HVHF gas drilling regulations are finalized, LHDs will need resources to support the NYSDEC regulatory program and to address any potential public health issues that may arise.

As shown on the map in Appendix 1, the Marcellus Shale covers all or parts of 32 Southern Tier counties: Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Cortland, Delaware, Erie, Genesee, Greene, Herkimer, Livingston, Madison, Monroe, Oneida, Onondaga, Ontario, Orange, Otsego, Schoharie, Schuyler, Seneca, Steuben, Sullivan, Tioga, Tompkins, Ulster, Wyoming, and Yates. The Utica Shale covers these and all or parts of 13 additional counties: Columbia, Dutchess, Jefferson, Lewis, Montgomery, Niagara, Orleans, Oswego, Rensselaer, Saratoga, Schenectady, Washington, and Wayne.

1.1. Local Health Departments/Public Health

Local Health Departments (LHDs) provide services to communities, groups, schools, businesses and individuals that help improve health and prevent health issues. A variety of direct services are provided - nursing, public education, clinics, immunizations, and assisting with access to health care and environmental health concerns, among others. LHDs must also maintain the capability to respond to public health needs in any emergency situation.

1.1.1. New York State Association of County Health Officials

The New York State Association of County Health Officials (NYSACHO) represents LHDs in New York State. NYSACHO meets monthly to support public health programs and activities, monitor and promote public health legislative initiatives, and address program implementation and financial management issues.

1.2. Environmental Health

The NYSDEC has primary regulatory authority for drilling operations across the state. However, the New York State Department of Health (NYSDOH) and LHDs regulate public water supplies and have an obligation to respond to water quality concerns with

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regard to public and private residential water supplies. Environmental Health Divisions also regulate restaurants, hotels and motels, mobile home parks, campgrounds, and other facilities; provide many public service programs including rabies control, infestations, and toxic material exposure support; respond to emergencies with potential public health issues; and respond to nuisance and potential public health complaints.

1.2.1. Conference of Environmental Health Directors

The Conference of Environmental Health Directors (CEHD) is composed of Environmental Health Directors and meets twice a year to review program changes and proposed regulations, to discuss current issues, and promote best practices.

Each of these entities is involved in identifying and/or addressing potential public health impacts connected with gas drilling involving HVHF. This report summarizes the concerns of the CEHD related to environmental health resource needs connected with HVHF gas drilling.

1.3. Potential Public Health Impacts

With the advent of HVHF gas drilling activities in New York State, there will be an increase in the need for regulatory oversight of public health programs that will incur related direct and/or indirect impacts. Direct impacts will be felt in program areas such as oversight of public and private water systems and responding to complaints, exposures and emergencies. Secondary impacts are expected in our community service industry programs (e.g., restaurants, mobile home parks, hotels and motels, campgrounds, and other temporary housing) and support services (including sanitary wastewater disposal). Indirect impacts are expected in areas such as health status and disease occurrence (e.g., physical maladies including but not limited to such conditions as endocrine disorders, cancers, respiratory, heart disease, and non-work- related accidents) and socioeconomic impacts affecting health (lifestyle and social cohesion, education, crime, sexually transmitted infection, mental health and suicide, and substance abuse).

LHDs currently lack both the jurisdiction and the resources to adequately protect public health and safety in connection with gas drilling. Although anticipated direct impacts may be limited to the &outhern tier+counties that offer economically viable access to the Marcellus Shale which is the current interest of the gas industry, potential public health impacts are substantially broader in scope. The range of gas drilling activities will increase as alternative formations are exploited beyond the southern tier and new techniques developed. Additionally, state funds directed to counties to handle natural gas-related impacts will result in less money for the remainder of the state. Furthermore, drilling failures/accidents or inappropriate waste discharges may contaminate not only the air and waters of the involved county but others in New York State and those of neighboring states as well.

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Our goal is to ensure that actions associated with development of additional gas reserves in New York State - including drilling, production, waste handling, infrastructure development, investigation and remediation of gas-well-related impacts, etc. - are properly managed and that LHDs have the resources and authority necessary to protect the health and safety of our residents.

2. Environmental Health - Affected Program Areas

2.1. Direct Impacts

LHDs are the primary point of contact for residents and businesses who have (or are concerned that they may have) experienced a health-related impact or who are impacted by a nuisance issue. Accordingly, our function is to investigate those impacts and determine the appropriate actions necessary to ensure protection of public health and safety and/or to mitigate the nuisance.

The NYSDEC has primary regulatory authority for drilling operations across the state. However, the NYSDOH and LHDs regulate public water supplies and have an obligation to respond to water quality concerns with regard to private residential and public water supplies. While it is without a doubt warranted and in fact needs further expansion, the NYSDEC¢ intention to require testing of all water wells in proximity of gas well sites will increase the need for LHD services to respond to water well owner inquiries, to interpret water quality analyses and to address any results that may indicate unsatisfactory water quality (including investigating existing water quality issues that are identified through baseline testing), and determining the source of contamination. Due to fiscal constraints and reductions in State funding (such as reductions in Article VI State Aid and the Drinking Water Enhancement Grant), many LHDs have had to reduce services in this area in recent years, and some are no longer able to provide field services in response to individual water quality complaints.

Nuisance issues likely to be encountered as a result of gas well drilling may involve air quality, noise, and odor complaints. LHDs also expect to be involved in gas-related spills and emergencies and may need to be more involved with community concerns about Naturally Occurring Radioactive Materials (NORM).

These are the direct impacts anticipated based on NYSDEC s program as proposed in the draft SGEIS; however, the program proposed by the NYSDEC is inadequate to protect public health and to detect and remediate contamination of drinking water aquifers. The water quality monitoring program should not be complaint-based, as proposed. NYSDEC should establish a groundwater monitoring and reporting procedure that requires the applicant to submit the analytical results to the NYSDEC and local health department within a specified time period and requires the applicant to determine if there have been any significant increases in chemical or physical concentrations.

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Water quality monitoring programs should focus on monitoring the groundwater resource, not just existing drinking water wells. Water-supply wells should not be the sole means of determining if groundwater contamination has occurred near a shale gas well due to the unknown or varying construction, operation, and availability of these wells. The permit should require the applicant to install and monitor groundwater wells to detect groundwater contamination before it reaches individual or public supply wells. Installation and testing of monitoring wells located up- and down-gradient of gas well pads and at additional selected locations throughout the entire area underlain by horizontal wells should be required.

To detect longer-term cumulative impacts to the groundwater resources such as a gradual regional increase of chlorides and methane in the groundwater, the permit should require that sampling continue at a minimum number of selected wells at least annually until the gas well is decommissioned.

Additional resources not included in the estimates provided in this report would be needed if these changes to protect public health are incorporated in the final SGEIS and regulations.

2.2. Secondary Programmatic Impacts

Gas drilling is also expected to have impacts in program areas not directly connected with the drill site. These areas include an increase in restaurant, hotel and motel activity, and the possibility of man-camps. Campgrounds and mobile home parks will also be affected program areas. Local health departments are responsible for regulatory programs in each of these areas, plus addressing general sanitation conditions.

Pennsylvania has received permit applications for six horizontal Marcellus wells within 200 feet of the New York State border, and the Hornell District Office (Steuben County) is experiencing secondary impacts. Both the Hornell District Office and Chemung County have reported increases in facility inspections at mobile home parks, campgrounds, and other facilities, and facility operators expanding existing operations or adding new operations that often fall just below regulatory thresholds. These developments are resulting in an increase in investigations and enforcement actions.

2.3. Indirect Impacts

Resources will also be needed to address other indirect impacts. These include providing education to a concerned public, and answering questions from the press, elected officials, and advocacy groups, among other activities. Resources are also needed for initial program development, including establishing policies and procedures. Additional public health impacts are also expected, as summarized in the materials submitted by NYSACHO.

The impacted counties will see a substantial increase in workload, and will be unable to handle it without appropriate funding for staff, analytical support, etc. As is the case for

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funding of appropriate NYSDEC oversight activities, we believe such funding can and should be derived from the gas companies.

3. Current Impacts – Case Summaries

Traditional vertical gas drilling is an ongoing activity in New York State. LHDs in several counties have been affected by vertical gas drilling activities. These incidents illustrate some of the issues LHDs may encounter with HVHF gas drilling and are summarized below. More detail is provided in Appendix 2.

3.1. Madison County – North Brookfield

A resident of North Brookfield contacted the Madison County Health Department on a Monday in February 2007 to report that her bolted well cap had blown off the top of her well and the well was gushing muddy water 15. 20 feet into the air. The Town Highway Superintendent had observed other impacted wells, and a nearby stream was observed to be bubbling. The residents were concerned that methane gas was entering their wells and possibly their homes.

The LHD investigation identified a nearby gas well under development, and NYSDEC officials later concluded that the problem was related to the drilling operation. Officials learned that a drill bit had gotten stuck at about 350qthe previous Saturday. The gas company, Ardent, had been applying over 2500 psi pressure into their gas well continually from Saturday evening through the weekend while attempting to free the drilling tool.

While the closest water well belonging to the owner of the gas well site property was not impacted, over a dozen wells located 3/4 of a mile away were affected. The gas company secured bottled water for distribution to impacted residents as well as proceeding with the acquisition and set up of plastic Ag tanks for use as temporary water supplies. Water filtration systems and new wells were later installed where needed.

LHD activities included

- conducting the initial investigation,
- coordinating and participating in public meetings and other outreach activities,
- surveying local residents,
- determining that shallow gas deposits were not present and determining that methane was not believed to be present in the water wells,
- conducting sanitary surveys of water supplies and testing water samples,
- working with NYSDEC and the gas company on interim and final remediation activities, and
- monitoring water quality for a year following the incident.

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3.2. Madison County – Sakal Well Contamination

The Madison County Department of Health was contacted in July 2009 by a resident concerned with high levels of Total Coliform in her water well. The property is located down-gradient of a new gas well being installed on neighboring land. The gas drilling contractor, had been working on their NYSDEC Permitted well (Bramberger 2H) and had tested the Sakal water in February and March of 2009 while the initial drilling was being performed. At this time both tests came back negative for Total Coliform. The contractor came back in June to finish drilling to their permitted depth, below 1628ft., and retested the Sakal well approximately 40 days after the drilling was completed. Mrs. Sakal then had her water tested by NORNEW and the Total Coliform had climbed to >200 cfu/100ml.

The well was repeatedly shock-disinfected but continued to test positive for coliform contamination. LHD site visits found multiple problems with the well and water treatment system. Agricultural activities were also identified that could contribute to unsanitary conditions in the well. In an iterative process, system components were replaced as problems were identified and additional samples collected. It took several months before well sample results were consistently satisfactory.

3.3. Chautauqua County – Smith/Reggie Water Well Complaint

The Chautauqua County Health Department was contacted in June 2009 by a NYSDEC Environmental Conservation Officer (ECO) because a neighbor's water well went dry coincident to gas well drilling up-gradient of the water well. The resident never had any problems with the water well before, which is approximately 80 years old and 46 ft deep.

LHD staff conducted a site investigation with the NYSDEC ECO and found that the drilling company dammed up a small creek to make a pond for a source of fracking water, ~1,000 ft up-gradient of the water well. Water from the pond was pumped into portable tanks for hydrofracking the well at a later date. The LHD concluded that the small creek, located 100 ft from the water well, provides recharge to the well and when flow in the creek was cut off, the well went dry. While LHD staff was on the site, the gas drilling contractor began removing the pond dike to restore water to the creek. They had also recently pumped out the reserve (mud) pit used during the drilling process and were preparing to bury the pit liner and residual drill cuttings. The gas well drilling company offered to provide water to the resident and pay for a water well contractor to help restore water to the well. Eventually the resident's water well recovered.

3.4. Chautauqua County - Feruggia Well Contamination

The Chautauqua County Health Department was contacted in February 2008 by a resident because they noticed a change in their drinking water quality occurred in midlate 2007; this included brown mineral staining of water fixtures, a salty taste to the water and an intermittent sulfur smell, none of which they had experienced before. They built the house in 2001 including drilling a water well and installing a county-permitted on-site sewage system. A gas well was drilled 330 ft up-gradient of the resident's water well in August 2005 (NYSDEC API number 31013240990000); the water well had been

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tested by a gas well drilling company before gas well development (2005) and after the resident complained of water problems to the gas drilling company (2007). Water quality showed that after the gas well was drilled, drinking water increased in total dissolved solids, chloride, sodium, barium and hardness. Based on water quality results, LHD determined that the water did not pose a significant health risk, but it could pose a risk to anyone on a sodium restricted diet and it had some aesthetic problems. LHD provided recommendations to the homeowner for treating the water and for additional testing to be completed.

Additional information was obtained and evaluated by the LHD including a water well drillers log, topographic map, aerial photography and gas well data. Then a site visit was made by LHD staff to evaluate other possible sources of contamination (road salt, septic system, agriculture). After analyzing all data, the LHD prepared a comprehensive report concluding that the well was impacted by gas well development and referred the case to NYSDEC for further investigation. NYSDEC interviewed neighbors, evaluated their water quality results from 2005, and prepared a comprehensive report of their own disagreeing with the LHD. Both reports were sent by the LHD to representatives of the United States Geologic Survey (USGS) and State University of New York (SUNY) Fredonia Dept of Geosciences for independent evaluation. USGS and SUNY both agreed that gas well drilling could be the cause of the problem and made recommendations for further site-specific investigation. The LHD prepared an additional report and submitted it to the NYSDEC concluding that the reserve (mud) pit used during the gas well drilling operation (and previously reclaimed/buried) may be the cause of the problem and requested further action be taken. No additional follow-up or investigation has occurred.

3.5. Chautauqua County - Pine Valley Central School Gas Well Development

The Pine Valley School has its own public water supply well and they contacted the LHD for input before they drilled a gas well on their property to provide gas to the school. The LHD acted as a liaison between the gas drilling company and the school to minimize potential impacts to the school's water supply. The LHD required the school to test water for baseline contaminants that are associated with gas well drilling, some of which are not regulated contaminants and therefore not required monitoring for public water supplies. The LHD also monitored the drilling process and obtained drilling reports from the school's geologist. No impact to the school's water supply has occurred.

4. Anticipated Resource Needs

4.1. Estimated Additional Staff Needed

LHDs will require additional resources to address water quality issues; air, noise and odor complaints; spills and emergencies; secondary impacts in related programs; and indrect impacts. In several counties, LHDs are already absorbing an increased work load of up to 0.5 FTE (full-time equivalent staff) in activities related to HVHF gas drilling.

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4.1.1. Water Quality Complaints

The CEHD has developed a method for estimating average resources needed to respond to water quality complaints based on the information and approach identified in the draft SGEIS. This method and the results are summarized below and provided in more detail in Appendix 3.

Determining the extent of resources necessary to implement a drinking water well program designed to ensure potable drinking water for individual and public water systems potentially affected by natural gas drilling is a difficult task. Estimation depends on a number of variables, for which assumptions must be made. There is currently some uncertainty with regard to agency responsibilities in response to contamination of individual wells suspected to be caused by drilling operations and other resources, such as a statewide database, that would be available. The scope of the response effort in any particular county is also directly related to the numbers of gas wells developed each year in that jurisdiction and the sheer number of groundwater wells tested in the vicinity of those wells.

While admittedly an estimate based on experiences in Ohio and elsewhere, an affected county may reasonably be expected to respond to an average of 1 to 2 complaints per well each year. Response to each complaint can be expected to require 2-3 site visits, water quality testing, research, report generation, data entry, management and analysis. The approach currently used in Chautauqua County is included in Appendix 4.

Staff hours per complaint are estimated below:

Total estimated staff hours:	26 to 40 hours /complaint
Additional administrative / miscellaneous tasks	<u>= 4 to 8 hours</u>
Database maintenance	= 1 hour
Data entry / management / analysis	= 1 to 2 hours
Interagency communication	= 4 to 6 hours
Report generation	= 6 to 9 hours
Research	= 4 to 6 hours
Site visits @ 3 hours each	= 6 to 9 hours

As detailed in Appendix 3, using the range of drilling activity estimates from the draft SGEIS, these resource estimates range from to \$1.3M to \$24M each year to administer the complaint-based program for responding to water quality complaints associated with possible contamination from deep shale gas well drilling and hydraulic fracturing. These are generally conservative estimates. For example, FTE are based on working 40 hours a week for 52 weeks a year, which does not account for holidays, vacations and other leave, administrative time, etc. Additionally, while the average time responding to a complaint is in the range noted above, work at times extends for a year . as noted in the Madison County Brookfield example. The estimates are generally based on responses to bacterialogical, gas, turbidity, and similar complaints. The time and resource

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estimates would probably be conservative if chemical contamination due to fracking were to occur.

4.1.2. Staffing for Other Gas-Related Activities

The CEHD is not able to develop a method for estimating the additional staffing resources needed to handle other gas-related activities (air, noise and odor complaints; spills and emergencies; increased restaurant activity, and inspections of new, existing, and expanding campgrounds and other temporary housing facilities). Based on experiences in New York counties affected by drilling in Pennsylvania, resources will be needed for investigations and monitoring of activities in the county that fall just under the threshold for regulated facilities and for enforcement actions. Resources are also needed for time-consuming public education and outreach and responding to the seemingly unending questions from the press, elected officials, and advocacy groups, among other activities. In addition, there will be an initially significant resource need for staff training and program development and implementation. Based on impacts counties are currently experiencing, it is anticipated that a minimum of 1 FTE would be needed in each affected county for these activities.

4.2. Non-Personnel Resources and Support Needed

Well investigations, data management, analysis and report generation would be greatly facilitated by development of a new statewide geodatabase integrating NYSDEC individual water well data and water quality data generated by the drilling companies.

In addition to this, resources should be made available for additional water quality testing as needed. At a minimum, each complaint will likely generate 2 sets of water quality samples, in some instances significantly more. It is impossible to determine what the cost of each set of samples would be, but an estimate of \$300 per set would not be unreasonable. It is uncertain who would be responsible for this cost.

Standard laboratory reporting templates, such as the one developed in New Jersey, and other standardized written procedures, forms, and education and outreach materials should also be developed.

5. Institutional and Related Issues

From the LHD perspective, administrative issues that currently exist relating to water quality investigations include:

- Uncertainty regarding the agency responsible for making determination of contamination source;
- LHD notification at key stages (gas well application, permit issuance, drilling, fracking, well testing, etc.);
- Ambiguity with regard to the evidence necessary for determining contamination causality;

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- Appropriate enforcement mechanism and enforcing agency, once a drilling source is determined to cause contamination; and
- Uncertainty regarding proper follow-up procedures for complaints made to both LHDs and the NYSDEC.

The drinking water program proposed by the NYSDEC in the draft SGEIS needs to be changed to fully address potable water resource protection. Areas that need to be addressed include:

- Lack of monitoring of groundwater quality parameters through properly installed monitoring wells in addition to drinking water well sampling or when water wells are not available;
- Surface water monitoring;
- Centralized data management;
- A standardized summary report (similar to Discharge Monitoring Reports (DMRs);
- Baseline test results should be provided to LHDs before drilling begins; and
- Subsequent test results should be provided to LHDs.

Resolution of these issues has implications for the resources LHDs will require and the ease with which programs will be implemented.

LHDs represent the front line in responding to concerns about public health impacts and nuisance issues. LHDs need to have a jurisdictional voice in decisions about whether an issue is, or may be, related to gas drilling and/or production. Current law assigns sole jurisdiction over such decisions to the NYSDEC, while an existing but outdated memorandum of understanding (MOU), referenced in the SGEIS and dated December 3, 1985, assigns some investigative and/or response responsibilities to three designated counties - Allegany, Cattaraugus and Chautauqua. A new MOU is needed before permitting of HVHF gas well development to address activities of all involved LHDs and the NYSDOH. Development of a new MOU between NYSDEC and NYSDOH and the LHDs is imperative, and LHDs need to participate fully in its development.

A contract or other mechanism for transferring funds to LHDs must also be developed and executed prior to permitting of HVHF activities.

The CEHD has made a serious attempt to identify and reasonably quantify needed resources associated with HVHF gas drilling activities. These are preliminary estimates based on the draft SGEIS and other limited information currently available. For water

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quality complaints, the numbers address average conditions and actual needs may vary widely. Final cost estimates are specific to the scenarios and proposed regulatory approach outlined in the draft SGEIS. There are many unknowns and variables, most of which would increase the estimates provided in this report. Additional measures should be required in the final SGEIS and regulations to full protect public health. The CEHD requests the opportunity to revise these estimates before resource needs are determined by the State as more information is available and when the final SGEIS and regulations are issued.