November 29, 2011

The Honorable Andrew M. Cuomo
Governor of New York State
New York State Capitol Building
Albany, NY 12224

cc:
Joe Martens, Commissioner, NYS Department of Environmental Conservation
Dr. Nirav R. Shah, Commissioner, NYS Department of Health
Dr. Howard A. Freed, Director of the DOH Center for Environmental Health
Senate Majority Leader Dean Skelos
Assembly Speaker Sheldon Silver
Senator Greg Ball
Assemblymember Robert Sweeney
Assemblymember Richard Gottfried
Administrator Judith Enck, US Environmental Protection Agency, Region 2

Members, High-Volume Hydraulic Fracturing Advisory Panel:
Stan Lundine, former NYS Lt. Governor
Kathleen McGinty, former Chair of White House Council on Environmental Quality under President Clinton
Eric A. Goldstein and Kate Sinding, Senior Attorneys, Natural Resources Defense Council
Robert Hallman, Board Chair, NY League of Conservation Voters
Robert F. Kennedy Jr., President of the Waterkeeper Alliance
Robert Moore, Executive Director, Environmental Advocates
Mark Brownstein, Chief Counsel, Energy Program, Environmental Defense Fund
Heather Briccetti, Acting President & CEO, Business Council of New York State, Inc.
Robert B. Catell, Chairman, Advanced Energy Research and Technology Center at SUNY Stony Brook
Mark K. Boling, Executive Vice President, General Counsel and Secretary, Southwestern Energy

Senator Tom Libous, Deputy Majority Leader
Assemblymember Donna Lupardo

Dear Governor Cuomo,

We, the undersigned, represent the more than 103,000 New Yorkers diagnosed every year with cancer, as well as the loved ones of the more than 35,000 who die annually from cancer (New York State Cancer Registry, 2010). As New York State considers whether to maintain or lift its current moratorium on hydraulic fracturing, we bring to your attention the myriad ways in which the introduction of this industrial practice in New York State will raise our cancer risk even further and add more data points to the New York State Cancer Registry. As such, we echo the call of the more than 250 physicians and medical professionals who, in their letter to you of October 7, 2011, requested that the state fully assess the human health impacts of hydraulic fracturing in advance of issuing permits and as part of the decision-making process.

In our daily work we see the devastating consequences of cancer on children and adults as individuals, as well as the effects on families, workplaces, communities – indeed the entire state. These consequences include suffering, premature death, lost productivity, and ruinous health care expenses. These costs must be calculated as part of a comprehensive assessment of potential public health impacts, which, right now, is not part of the revised Supplemental Generic Environmental Impact Statement (SGEIS) issued in September of this year. We point out to you that the SGEIS contains no chapters or headings devoted to cancer or carcinogenesis. This document contains no discussion of New York's cancer registry nor any discussion of the economics of the healthcare burden likely to be caused by the release of fracking chemicals and the attendant air pollution that invariably accompanies fracking operations. In fact, the word "cancer" itself appears only ten times within the 1,537-page SGEIS document. Without a health impact assessment and a detailed cancer risk analysis, the SGEIS should not go forward and fracking should not go forward.

Many of us devote scarce resources to the effort to research, communicate, and reduce environmental risks of cancer. It is incumbent on us to speak out about the potential for a

profound increase in cancer risk in New York State by the permitting of hydraulic fracturing. We remind you that, as a percentage of US health-care spending, cancer is the third most costly condition. For an individual person, cancer is the most costly (U.S Department of Health and Human Services).

We also seek to remind you of the historic role that New York State has played in the promotion of environmental justice. From the groundbreaking investigation at Love Canal – which brought safeguards against toxic exposures to all Americans – to the pioneering Long Island Breast Cancer Study Project, New York State is known around the world for demonstrating that public health and environmental protection are inextricably bound. As we painstakingly remove carcinogenic PCBs from the sediments of the Hudson, as researchers investigate the environmental effects of the 9/11 attack on firefighters and first responders, as the Empire State Building undergoes its splendid green restoration – cutting air pollution by 105,000 metric tons a year and winning a gold Leadership in Energy and Design rating – New York State continues to be a model for the nation.

With knowledge grounded in our state's proud environmental health legacy and with the unflinching spirit of those who have confronted cancer and know its terrible costs, we offer you these observations and concerns about fracking.

Hydraulic fracturing introduces cancer risks from the start and into perpetuity. Cancer-causing chemicals are associated with all stages of the high-volume hydraulic fracturing process, from the production and use of fracking fluids, to the release of radioactive and other naturally hazardous materials from the shale, to transportation- and drilling-related air pollution, to the disposal of contaminated wastewater. The potential for accidents during the injection and transportation of fracking chemicals concerns us deeply. And, as data from other states clearly demonstrate, the storage, treatment and disposal of the contaminated water can be a source of human exposure to chemical carcinogens and their precursors (Volz, 2011). In addition, the industrialization of the landscape and congestion of small communities with truck traffic impairs the safety and healthfulness of outdoor exercise. Regular exercise is an important, established risk reducer for many cancers, including breast cancer (Bernstein, 2009). Outdoor exercise is

associated with a greater intent to continue the activity, along with other positive health indicators.

Fracking fluids contain carcinogens and cancer-promoting chemicals. More than 25% of the chemicals used in natural gas operations have been demonstrated to cause cancer or mutations (Colborn, Kwiatkowski, Schultz, & Bachran, 2011). Between 2005 and 2009, according to the Committee on Energy and Commerce, hydraulic fracturing companies used 95 products containing 13 different known and suspected carcinogens. These include naphthalene, benzene, and acrylamide (Committee Staff for Waxman, 2011). Thirty-seven percent of chemicals in fracking fluids have been identified as endocrine-disruptors. By definition, these substances have the power, at vanishingly low concentrations, to alter hormonal signaling pathways within the body. Many can place cells on the pathway to tumor formation. Exposure to endocrine-disrupting chemicals has been implicated in cancers of the breast, prostate, pituitary, testicle, and ovary (Birnbaum & Fenton, 2003; Soto & Sonnenschein, 2010). These exposures may alter gene expression in pregnancy and early life (Colborn, et al., 2011).

Fracking operations release from the earth radioactive substances, carcinogenic vapors, and toxic metals. The shale bedrock of New York State contains many highly carcinogenic substances that can be mobilized by drilling and fracturing. Among these are arsenic, chromium, benzene, uranium, radon, and radium (Bishop, 2011). Drill cuttings and flowback waste are typically contaminated with naturally occurring radioactive substances and cancer-causing metals, which would otherwise remain safely entombed underground. Flowback waste can contain up to 16,000 picoCuries per liter of radium-226, which is more than 200 times higher than the discharge limit in effluent (60 pCi/L) and more than 3,000 times higher than the US EPA drinking water standard (5 pCi/L) (NYSDOH Bureau of Environmental Radiation Protection, 2009). Traditional water filtration cannot remove these contaminants. We are especially alarmed by the ongoing practice of burying radioactive drill cuttings on-site (Bishop, 2011) and of using radioactive production brine from (currently out-of-state) fracking operations on New York State roads, for purposes of dust control and de-icing (NYSDOH Bureau of Environmental Radiation Protection, 2009). This practice exposes unknown numbers of people, without their consent, to unknown amounts of a known human carcinogen.

Fracking pollutes the air with known and suspected human carcinogens. Air pollutants from fracking take the form of diesel exhaust (from trucks, pumps, condensers, earthmoving machines, and other heavy equipment) along with volatile organic compounds, including benzene (released from the wellheads themselves) and formaldehyde (produced by compressor station engines). Exposure to these air pollutants have been demonstrably linked to lung, breast, and bladder cancers (Brody et al., 2007; Liu et al., 2009). Using US EPA risk assessment tools to examine carcinogenic effects of air quality at oil and gas sites, researchers in Colorado found excess cancer risks from air pollution alone (from 5 to 58 additional cancers per million). At 86 percent of these sites, the human carcinogen benzene was found at hazardous levels. Airborne concentrations of other carcinogens were also elevated (Witter et al., 2008).

Volatile organic compounds can combine with tailpipe emissions to create ground-level ozone. We are alarmed by studies conducted in the gas fields of Wyoming that reveal ozone non-attainment in areas with formerly pristine air quality (Wyoming Department of Environmental Quality, 2009). Ozone can travel up to 200 miles beyond the gas production area (Colborn, et al., 2011). While not a direct carcinogen, ozone exposure is strongly associated with premature death and is believed to promote the development of metastases, thus making cancer more lethal (Breslin, 1995; Fann et al., 2011). Exposure to traffic exhaust and petroleum fumes further potentiates tumor formation and increase cancer risk (Hanas et al., 2010).

Natural gas drilling in New York State is predicted to increase heavy truck traffic on local roads by as much as 1.5 million more trips per year, with an average of 90 and up to 1000 trucks per day at a single well pad (NYSDOT, 2011). For each individual site, hundreds of tanker trucks hauling fracking fluids for injection and flowback fluids for disposal will roll through our communities and neighborhoods, and yet no one has calculated the cumulative impact of the resulting particulate matter and ozone on public health. We remind the Governor that traffic exhaust, especially from diesel engines, is a well-established cause of chronic illness and premature death – even at levels well below regulatory limits. Most ominously, research is steadily corroborating the relationship between childhood leukemia and traffic density, and childhood leukemia and exposure to airborne benzene (Amigou et al., 2011; Pearson, Wachtel, & Ebi, 2000; Whitworth, Symanski, & Coker, 2008). We are also deeply concerned by the growing evidence linking lung cancer in non-smokers to air pollution, including traffic exhaust. Among

adults, non-smoker's lung cancer is now the sixth most common cancer diagnosis, and rates are rising particularly rapidly among women. A new, nationwide study finds that people who have never smoked but live in areas with higher air pollution are 20 percent more likely to die from lung cancer than people breathing cleaner air (Turner et al., 2011). Fracking will increase this lethal risk.

Fracking adds carcinogens to drinking water. Nationwide, more than a thousand different cases of water contamination have been documented near fracking sites. We draw your attention to one of these: the drinking water wells of Pavillion, Wyoming. An EPA study released just this month confirms the presence of the carcinogen 2-butoxyethanol, a widely used fracking chemical, in the aquifer under Pavillion, which is an intensively drilled community (U.S. Environmental Protection Agency, 2011). Pavillion's drinking water also contains benzene, naphthalene, and diesel fuel. We are deeply troubled that confirmation of these cancer-causing contaminants comes three years after their initial discovery and in the wake of repeated denials of responsibility by the gas industry. The story of Pavillion reveals not only that drinking water is at risk of chemical contamination from fracking operations but also that swift mitigation of such disasters is far from assured. The wheels of science grind slowly while the lives of people have remained in harm's way.

We are also troubled by the discovery that drinking water wells located near active gas wells here in the Marcellus region contain methane levels that are 17 times higher than those located near inactive wells (Holzman, 2011; Osborn, Vengosh, Warner, & Jackson, 2011) and by the reports of spiking bromide levels in the rivers of western Pennsylvania that followed discharges of fracking wastewater into sewage treatment plants last spring (Hopey, 2011).While methane and bromide are not suspected carcinogens, they serve as precursors for the creation of trihalomethanes, which can form when water is chlorinated. Trihalomethanes are associated with both bladder and colorectal cancers (Weinberg, Krasner, Richardson, & Thruston, 2002).

Preliminary evidence points to high rates of cancer in intensively drilled areas. In Texas, breast cancer rates rose significantly among women living in the six counties with the most intensive gas drilling (Heinkel-Wolfe, 2011). By contrast, over the same time period, breast cancer rates declined within the rest of Texas. In western New York State – where vertical gas

drilling has been practiced since 1821 and has resulted in significant contamination of soil and water – rural counties with historically intensive gas industry activity show consistently higher cancer death rates than rural counties without drilling activity. In women, cancers associated with residence in a historically drilling-intensive county include breast, cervix, colon, ovary, rectum, uterus, and vagina. Men living in the same region are consistently in the highest bracket for deaths from cancer of the bladder, prostate, rectum, stomach, and thyroid (Bishop, 2011), (based on National Cancer Institute cancer mortality maps and graphs, http://www3.cancer.gov/atlasplus/type.html). While these correlations do not prove a connection between abnormally high rates of cancer and gas industry pollution, they do offer clues for further inquiry. We in the cancer advocacy community believe that this inquiry must precede, not trail behind, any decision to bring hydrofracking to New York State. Benefit of the doubt goes to public health rather than to the forces that threaten it.

Fracking operations will undermine New York State efforts to prevent chronic disease. New York State currently funds important projects, such as the Creating Healthy Places To Live, Work and Play programs, many of which are being carried out in rural or small-town communities. Objectives of this initiative include increasing the availability and accessibility of places to be physically active, and creating landscapes conducive to physical activity, such as playgrounds and walking trails. It is clear that the industrialization of the landscape where fracking would occur – with increased truck traffic and reduction in air quality described above – undermines these initiatives. As cancer advocates, we know that regular physical activity lowers the risk for many common cancers. Indeed, the American Cancer Society attributes one-third of all cancer diagnoses to sedentary lifestyles, obesity, and poor diet and thus specifically advocates for land use and urban design that encourages outdoor exercise: “Let’s make our communities safer and more appealing places to walk, bike, and be active” (American Cancer Society). Fracking does the opposite. No one wants to walk, bike, or jog along roads filled with 18-wheelers hauling hazardous materials and filling the air with diesel exhaust. Changes to the built environment that discourage outdoor recreation and promote sedentary behavior will increase our state’s cancer burden and further fan the flames of rising health care costs.

The proposed mitigation strategies set forth in the revised environmental impact statement are insufficiently protective. The revised SGEIS makes no attempt to explicate the possible

human health effects that may result from permitting thousands of gas wells within New York State and from filling our roadways with the fleets of trucks that will service them – or to project the monetary costs of these health effects. Rather, the document asserts, axiomatically, that no such health effects will occur because each gas well will be surrounded by a buffer zone that sets it apart from residential areas and public drinking water sources. But set-backs, like non-smoking sections inside airplanes, are imaginary circles that cannot contain volatile, inherently toxic substances when they are released from multiple sources into interconnected environmental media. We all breathe the same air, and we all live downstream. The best science shows us that cancer is the end result of multiple stressors adding together over time to alter the genetic signaling pathways within our cells (President's Cancer Panel, 2010) When it comes to cancer, the cumulative impact of many small straws is what breaks the camel's back.

Chemical disclosure requirements, health registries, and after-the-fact biomonitoring programs cannot substitute for due diligence. Disclosing the chemicals used in fracking operations, monitoring human exposures to those chemicals, and establishing registries of those harmed by chemical exposures are useful tools for scientific study and are basic to a transparent, right-to-know democracy, but they do not, by themselves, protect public health. **Instead, we need a precautionary, prevention-oriented approach to reducing environmental cancer risk.** Drawing on scientific research conducted here in New York and concluding that "… the true burden of environmentally induced cancer has been grossly underestimated," the 2008-2009 Annual Report of the President's Cancer Panel, calls on state governments to take action to reduce and eliminate toxic exposures implicated in cancer causation *before* human harm occurs (President's Cancer Panel, 2010). To permit a form of fossil fuel extraction that opens countless portals of toxic contamination – upon commencement of the fracking operation and in perpetuity – turns us away from a meaningful approach to cancer prevention.

Governor Cuomo, New York State ranks 11th in highest overall annual incidence cancer rate in the United States at 486.2 cancer diagnoses for 100,000 New Yorkers each year – well above the national average of 455.7 (National Cancer Institute, 2011). We urge to you to improve this situation rather than risk raising our cancer rank further by allowing a carcinogen-dependent industry into our state. Instead, let's seek a plan of economic development that arises from our state's venerated identity as a world leader in environmental health – one that is worthy of the

passionate labors of its scientists and cancer survivors and that is as elegant and transformational in design as the award-winning Empire State Building itself. The state that can claim America's tallest green building deserves an energy system to match.

Sincerely,

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Lois Gibbs
Love Canal Homeowners Association
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Adelaide P. Gomer, breast cancer survivor
President, Park Foundation

Babylon Breast Cancer Coalition

Breast Cancer Action, *a national grassroots education and advocacy organization with over 2000 members in New York State*

Breast Cancer Coalition of Rochester

Breast Cancer Network of Western New York

Breast Cancer Options

Brentwood/Bayshore Breast Cancer Coalition

Cancer Action NY

Cancer Awareness Coalition

Cancer Schmancer Movement

Capital Region Action Against Breast Cancer (CRAAB!)

Great Neck Breast Cancer Coalition

Huntington Breast Cancer Action Coalition, Inc.

I'm Too Young For This! Cancer Foundation

LGBT Cancer Project

New York State Prostate Cancer Coalition

New York State Breast Cancer Network, *a statewide network of community-based, survivor-driven breast cancer organizations located in communities stretching from Buffalo to Long Island*

Physicians for Social Responsibility, New York City

Physicians for Social Responsibility, Hudson-Mohawk

Physicians Scientists & Engineers for Healthy Energy

SHARE (Self-Help for Women with Breast or Ovarian Cancer)

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