Caroline Ashurst

To Whom It May Concern:

There is a moratorium on all gas drilling, hydraulic fracturing (fracking), water withdrawals for and wastewater treatment and discharges from fracking throughout the entire Delaware River Basin today, since 2010.

The moratorium was put in place by the Delaware River Basin Commission (DRBC), the federal-interstate agency that manages the water resources of the Delaware River Watershed. The DRBC members the Governors of Pennsylvania, New York, New Jersey, and Delaware, and the federal government have the responsibility of protecting the shared waters that provide 15-17 million people in all four of the Watershed states with drinking water, including New York City and Philadelphia.

There is significant evidence that natural gas development, and its related operations, which include all the phases of the hydraulic fracturing ("fracking") process, from the first stage of industrial land preparation; to the storage, handling, and use of chemicals and additives for extraction and stimulation; to drilling and fracking; to the withdrawal of and degradation of large volumes of water and its discharge and disposal as waste, has substantial adverse effects on public health, property interests, agriculture, and on our air, water, and land.4

The most recent statistical analysis of the body of scientific literature by the Concerned Health Professionals of New York and Physicians for Social Responsibility, 685 peer-reviewed papers examining gas drilling and/or hydraulic fracturing ("fracking") were reviewed and the overwhelming majority of studies found evidence of or potential adverse impacts on water, air, and human health.5

Fracking pollutes groundwater, destroying the quality of aquifers for generations to come. The chemicals in fracking fluids will migrate to drinking water aquifers and to the surface it is not a question of "if", but "when".9 Considering groundwater flow, time, and the corrosive downhole environment created by gas extraction processes, including the lack of durability of the cement sealant and steel well casings, aquifers and surface waters are not sufficiently isolated from the toxic fluids and deep geology pollutants that are distributed by drilling and fracking.10 Aquifers could be impacted quickly, such as when there is a faulty cement seal or casing during construction, or over time. But it is certain that the life of the cement and/or steel (usually 80 to 100 years or less) is less than the life of the aquifer - so even if there is no evidence in the near term, the eventual pollution likely occur in less than a century11 - ruining water sources for the generations that will follow. The potential for fracking fluids to move from the production zone of a gas well to water resources "cannot be engineered out of the process (Gassiat et al. 2013). In other words, the process of injecting fluids into and fracturing the shale causes the potential pollution problem."12 Contaminated fluids from the fracking process can move from the deep shale to water resources through various pathways including fractures and natural vertical flow, in thousands of years or in less than ten years, polluting groundwater.13

Dr. Ted Auch of Fractracker Alliance reports there has been an 8-12% icrease in lateral length of well bores each year since 2013 in the major shale gas and oil basins. This increases the amount of water used per fracked well to 9.7 mg on average. In the Marcellus Shale, horizontal well bores are increasing at 11% pr year, today reaching from a mile or two up to 4 miles. This increases the volume of water used to frack each well to between 10 and 20 million gallons. There are wells in Ohio that have used as much as 87 million gallons of water per "super lateral" well.25

The use of water for fracking is "depletive" - all of the water is lost either by being polluted or by being consumed since most of the water injected for fracking is not recovered and is not returned to the source (PADEP reports that between 8% ad 10% o Marcellus Shale frack water is returned to the surface, meaning up to 90% o the injected water stays underground.) This consumption depletes the surface waterway and/or groundwater from where it is taken.

Frack wastewater contains many dangerous and toxic constituents and properties including: Total Dissolved Solids (TDS), Total Kjeldahl Nitrogen (TKN), Ammonia Nitrogen, NitrateN, Chloride, Bromide, Sodium, Sulfate, Oil and Grease, BTEX (benzene, toluene, ethylbenzene, xylene), VOC (volatile organic compounds), Naturally Occurring Radioactive Materials (NORM), Barium, and Strontium.45 Some are carcinogenic, some have known health effects, and some are toxic to aquatic life and plant life.

Yale University School of Public Health, in a study of chemicals used in fracking, found that of the 119 compounds with sufficient data to classify them in terms of carcinogenicity (only 20% o chemicals in use had sufficient data a problem in itself), "44 percent of the water pollutants and 60 percent of air pollutants were either confirmed or possible

carcinogens."46 55 unique compounds with carcinogenic potential could be released to both water or air and 20 chemicals had evidence of increased risk for leukemia or lymphoma specifically.47

As a business owner who works in the Health Field, I am strongly against fracking. It is a hazard to our health and the health of generations to come! WE REJECT THIS!!!

Sincerely,
Caroline Grace Ashurst, M.Ac, L.Ac.

4 PSE Healthy Energy Library, https://www.zotero.org/groups/pse_study_citation_database/items; See Compendium, http://concernedhealthny.org/compendium/, p. 4; Environmental Protection Agency (EPA). 2015. U.S. EPA. Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-16/236F, 2016. Available at: www.epa.gov/hfstudy and https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=332990; PADEP, accessed 10.25.2017 at: http://files.dep.state.pa.us/OilGas/BOGM/BOGMPortalFiles/OilGasReports/Determination_Letters/Regional_Determination_Letters.pdf
5 PSE Healthy Energy Library, https://www.zotero.org/groups/pse_study_citation_database/items; See Compendium, http://concernedhealthny.org/compendium/, p. 4
Delaware Riverkeeper Network, "Unsafe and Unsustainable,"
9 Rubin, Paul, 2014. "Unsafe and Unsustainable", Delaware Riverkeeper Network, p. 36, 38 and 39.
10 Rubin, Paul, 2014. "Unsafe and Unsustainable", Delaware Riverkeeper Network, p. 27.
11 Rubin, Paul, 2014. "Unsafe and Unsustainable", Delaware Riverkeeper Network, p. 36, 38 and 39.
12 Myers, T., 2014. "Unsafe and Unsustainable", Delaware Riverkeeper Network, p. 56.
13 Myers, T., 2012. Potential contaminant pathways from hydraulically fractured shale to aquifers. Ground Water 50(6): 872-882 doi: 10.1111/j.1745-6584.2012.00933.x
25 Ted Auch, Fractracker Alliance, "The Freshwater and Liquid Waste Impact of Unconventional Oil and Gas in Ohio and West Virginia", //midatlanticwrc.org/event-info/agenda/the-freshwater-and-liquid-waste-impact-of-unconventional-oil-and-gas-in-ohio-and-west-virginia/
45 NRDC Document, "In Fracking's Wake: New Rules are Needed to Protect Our Health and Environment from Contaminated Wastewater", May 2012 d:12-05-A, Table 1.
46 Yale University School of Public Health, https://publichealth.yale.edu/news/article.aspx?id=13714
47 Ibid.