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30 March 2018

Delaware River Basin Commission (DRBC)
P.O. Box 7360
West Trenton, NJ 08628-0360
Via http://dockets.drbc.commentinput.com/?id=PGChb

RE: Proposed Draft Regulations Addressing Hydraulic Fracturing and Additional Clarifying Amendments. Special Regulations Part 440 - Hydraulic Fracturing in Shale and Other Formations. Revisions to the Commission's classifications for project review set forth at 18 CFR 401.35. Revisions to the Commission's regulatory program fees set at 18 CFR 401.43. Guidance for Determining Background Concentrations in Surface Waters

The Adirondack Mountain Club (ADK) appreciates the opportunity to comment on the Proposed Draft Regulations Addressing Hydraulic Fracturing and Additional Clarifying Amendments.

Adirondack Mountain Club (ADK) is dedicated to the conservation, preservation, and responsible recreational use of the New York State Forest Preserve and other parks, wild lands, and waters vital to our members and chapters. ADK is a nonprofit organization with 30,000 members in 27 statewide chapters served by a year-round staff offering programs that help people discover, play in, and protect natural places. Since its founding in 1922, The Adirondack Mountain Club has protected wild lands and waters through the work of its dedicated member volunteers and staff. ADK members hike, camp, snowshoe, cross-country ski, paddle, and cycle the lands and waters of the Adirondack Park.

ADK strongly urges the Delaware River Basin Commission (DRBC) to use their rulemaking process on Hydraulic Fracturing to ban fracking and all associated processes from taking place in the basin. Currently, the regulations leave the door open to both fracking waste and water withdrawals for fracking, threatening the drinking water source for millions of New York City residents and other New Yorkers. There must be a complete and permanent ban on natural gas drilling and fracking and all related activities (including wastewater processing and discharges from and water withdrawals for drilling and fracking operations) throughout the Delaware River Watershed.

Background, Delaware River Watershed in regional/national context

Since 2010 there has been a DRBC moratorium on all gas drilling, hydraulic fracturing (fracking), water withdrawals for and wastewater treatment and discharges from fracking throughout the entire Delaware River Basin. 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.

The Delaware River is a designated national Wild and Scenic River by Congress because of its outstanding features, irreplaceable resources, exceptional water quality and scenic and recreational value. These prized assets provide important economic benefit to all four states whose tributaries flow to the Delaware River. These values are gravely jeopardized by fracking and its polluting operations and must be protected for the public and future generations. The entire nontidal Delaware River is protected by DRBC's Special Protection Waters regulations that do not allow water quality to be diminished in any way. We are dependent on this protection to keep our water safe.

After exhaustive study, the State of New York prohibited fracking based on environmental and public health analysis. The NY Department of Health concluded that the overall weight of the evidence demonstrated the likelihood that adverse health outcomes and environmental impacts from fracking could not be prevented, leading to the Governor's decision to ban high volume hydraulic fracturing in the state.[1] The State of Maryland permanently banned fracking after 2 years of study, based on the potential for adverse public health and environmental impacts.[2]

Unfortunately, the natural gas industry has received unprecedented exemptions from our nation's most important environmental and public health laws, including the Safe Drinking Water Act, Clean Air Act, and the Clean Water Act.[3]

Hydraulic Fracturing (Fracking) Harms

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]

Pennsylvania Department of Environmental Protection (PADEP) has determined that there are 301 cases of private water well contamination caused by oil and gas operations in the Commonwealth[6]; over 4,400 water complaints related to oil and gas have been filed by the public with PADEP. Between 2004 and November 2016, PADEP lists 9,443 public complaints about environmental problems in shale gas drilling areas.[7]

EPA's most recently released fracking study provides scientific evidence that fracking activities can impact drinking water resources and includes water impacts from shale gas in the Pennsylvania community of Dimock.[8]

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 century[11] - 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]

Natural gas is primarily methane, a greenhouse gas 86 times more efficient at warming the atmosphere than carbon over a 20 year time frame[14] and its effects persist for hundreds of years[15] The well documented vented and fugitive losses from natural gas systems contribute to atmospheric warming; current technology and practices have not controlled these releases. The emissions from shale gas development are so great that it is projected that their release from the build out Pennsylvania's Marcellus shale will prevent the achievement of global warming goals in the state, accelerating climate change.[16] Climate change impacts on the basin's water resources include changes in precipitation and runoff that increase flooding and drought, impairment of habitats and water quality (including salt water intrusion to Delaware Estuary water supplies) and sea level rise[17].

Changes to stream water quality occur where gas drilling and related activities are located. For instance, a publication of the Proceedings of the National Academy of Sciences found streams adjacent to gas wells are negatively impacted by runoff and sedimentation (Total Suspended Solids), harming benthic life, fish and wildlife and causing streams to be eroded and destabilized.[18] Substantial damage is caused by the toxic wastewater produced by fracking which contains many dangerous pollutants, including naturally occurring radioactive materials, that cannot be fully removed by treatment and those damages can substantially harm the water quality of our streams and the life in them. Pollutants will inevitably spread downstream to negatively impact all of the watershed states, the habitats, fish, wildlife, and recreational values of the river and our vulnerable drinking water supplies.

Fracking uses proppants such as silica sand that is mined in the Midwest, states such as Wisconsin, Minnesota, and Iowa, to prop open the fractures in the rock caused by the fracking process. The sand mining activities are having devastating impacts in the sand regions and pose serious health impacts for workers.[19] The sand is primarily transported by rail, often on heavy, mile-long trains, and then offloaded onto trucks to be carried into the well site.

Some Local/Regional Impacts from Fracking

For the local region, fracking and its activities will cause increased truck traffic. Every gas well results in at least 1400 truck trips to bring in and take out chemicals, fracking proppants, equipment, water and wastewater. As well bores lengthen, the number of truck trips increase up to 2200 per well. Air emissions and water pollution have greater adverse health impacts on those who reside, work, go to school, or frequent the zone within approximately 2 miles from the gas operation. Studies show that those closest have greater exposure and are more likely to develop disease and other health problems.[20] [21] Noise, lights, and changes in quality of life occur in areas where gas drilling and related operations occur. Drilling of a gas well, for instance, takes many days and cannot be interrupted, causing round the clock noise and lights.

DRBC Draft Fracking Regulations and WATER

Considering that only 1% of the earth's water is drinkable, how we manage water will define our future and the future of the planet. Since 99% of that water is groundwater[22], how we look after our aquifers is the most critical component involved. Little is being done nationally or on a global scale about our high water consumption and out of date planning. An article in the Harvard Business School's Working Knowledge points out that by 2050, the Earth's population will likely exceed 9 billion people, many expected to live in cities yet in terms of urban planning, "Water is often planned last and gets short shrift," said John Briscoe, a professor at the Harvard School of Engineering and Applied Sciences, who participated in a panel a session dedicated to water. "Water is absolutely the poor cousin of the utilities." In the Delaware River Watershed, water supplies contribute 3.82 billion dollars in annual value to the regional economy and water quality brings $2.5M in annual economic benefit to the Basin, according to a study out of the University of Delaware.[23] When water is depleted, it has real economic impacts for the source watershed that has lost the value of that water. Fracking uses enormous volumes of water, approximately 5-10 million gallons per well, and increases of 10-20 million gallons are becoming more frequent. The old estimates of 4-5 million gallons, used by DRBC, are no longer valid as well bores lengthen. Technology used today can lengthen horizontal well bores up to 4 miles.[24] Dr. Ted Auch of Fractracker Alliance reports there has been an 8-12% increase 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% per 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% and 10% of Marcellus Shale frack water is returned to the surface, meaning up to 90% of the injected water stays underground.) This consumption depletes the surface waterway and/or groundwater from where it is taken. The water injected for fracking is not only "consumed," but is a total loss to its source. Evaporative losses for uses such as agriculture, power plants or golf courses use water that evaporates to the atmosphere, essentially recycling the water used into the air where it returns as precipitation. But the water used for fracking is no longer available to the hydrologic cycle because most of it is left sequestered deep in the ground, cut off from the natural water cycle, compounding the impacts of the loss.

The DRBC Water Code establishes "Policy of Protection and Preservation" that states,

> "The waters of the Delaware River Basin are limited in quantity and the Basin is frequently subject to drought warnings and drought declarations due to limited water supply storage and streamflow during dry periods. Therefore, it shall be the policy of the Commission to discourage the exportation of water from the Delaware River Basin."[26]

The DRBC Water Code's Policy of Protection and Preservation also states,

> "The Basin waters have limited assimilative capacity and limited capacity to accept conservative substances without significant impacts. Accordingly, it also shall be the policy of the Commission to discourage the importation of wastewater into the Delaware River Basin that would significantly reduce the assimilative capacity of the receiving stream on the basis that the ability of Delaware River Basin streams to accept wastewater discharges should be reserved for users within the Basin."[27]

The draft regulations at proposed 18CFR Part 440.4 and 401.35 say the transfer, diversion, or exportation of water for fracking is to be discouraged and that the transfer of ANY AMOUNT of surface or groundwater, treated wastewater or mine drainage for fracking (not only high volume hydraulic fracturing) outside of the basin requires DRBC approval (raising the threshold for DRBC review from 100,000 gallons of water per day).[28] It is unclear what "discourage" means but DRBC's Water Code does require, on a case by case basis, review of several issues when considering an application for water transfer out of the basin. These conditions were not changed or supplemented for the use of water for fracking; they are the same for all uses. They require: consideration of alternatives, including "no project"; conservation or development of resources outside of the basin be developed first; consideration of economic and social impacts of available alternatives; consideration of amount, timing, and duration of the proposed transfer and its relationship to passing flow requirements, hydrologic conditions, and impacts on instream uses and downstream assimilation capacity; benefits to the basin; how the volume of transfer relates to DRBC actions; how the volume relates to all other diversions; and any significant benefit or impairment to the basin.[29]

DRBC regulates withdrawals from streams with the use of a "pass-by flow" that limits the amount of water that can be withdrawn to protect streams from being overdrawn. However, a pass-by flow that is based on using the Q7-10 (the flow which occurs for a period of seven consecutive days one time in 10 years – considered "drought flow") is not adequate to protect waterways and the life that depends on them[30] and can be expected to cause direct harm to the habitats and water quality of the stream.[31] Using the Q7-10 allows the stream's flow to be artificially "flattened" because the natural flow regime and seasonality will be disrupted and potentially eliminated. An ecological flow analysis of the waterway is required to measure the natural variation of the waterway's flows in terms of volume, rate, temperature, stream stricture, and quality. This analysis should be completed before any withdrawal of surface water in order to provide an ecologically-based flow regime that will give needed protection to the habitats, species and water quality of that particular stream. Water withdrawals from surface waterways have the potential to deplete downstream groundwater resources if set based on pass-by flows that do not take seasonality into account, including local benefits of high flows such as springtime flows or heavy precipitation events. Such a withdrawal may downstream cause some additional discharge from the aquifer to make up the loss of stream flow. This additional base flow will be contributed by shallow groundwater downstream of the withdrawal site, impacting aquifers. This presents the potential for loss of groundwater reserves that will discharge to the stressed waterway to maintain base flow that was lost to the withdrawal.[32]

The withdrawal of water from a waterway or groundwater has the potential to directly disrupt or diminish the flow of water to hydrologically connected wetlands or other water-dependent bodies such as open ponds and springs. The removal of water from aquifers or surface water bodies reduces the amount of fresh water available to dilute the input of pollutants. Pumping of aquifers has the potential to cause a pollution plume to move toward the pump location, spreading the pathway of pollution and/or the rate of movement. Pumping of aquifers has the potential to disrupt the flow of groundwater that feeds existing water supply wells or natural resources such as wetlands, seeps, and springs. It can also diminish and/or disrupt available groundwater that supports forests and other vegetation, including agriculture, harming existing uses.

DRBC Draft Fracking Regulations and WASTEWATER

The supersized wells, with horizontal well bores up to 4 miles long[33], as discussed under WATER above, use 10-20 million gallons of water per well.[34] This means not only more water is needed but also means there are greater volumes of wastewater produced by these wells as well. Gone are the old estimates of flowback from a well of approximately 10-15% of 5 million gallons; the new normal is steadily climbing to 10-15% of 10 to 20 million gallons being produced short term at the fracked well site. That translates into between 1-1.5 million gallons of wastewater (at 10M gal. of water) to between 2 and 3 million gallons of wastewater (at 20M gal. of water) per well, increasing the volumes three to four times over – a new glut of wastewater that has to go somewhere. The need for more places to get rid of this wastewater is a problem becoming so acute that the industry is now targeting the Delaware River Basin and, with these draft regulations, the DRBC is opening the door. The Delaware River Watershed's proximity to one of the most productive regions of the Marcellus Shale play, in the northeastern portion of the Susquehanna Watershed, makes it especially attractive.

DRBC proposes to require Treatability Studies for the treatment of frack wastewater at Centralized Wastewater Treatment Facilities that plan to discharge to the Watershed. These studies are to show that the Pollutants of Concern are addressed, using USEPA Tables from the agency's technical document on oil and gas waste discharges to define the Pollutants of Concern.[35] There are 78 pollutants listed but those are not all the toxic and/or hazardous pollutants contained in frack wastewater. For instance, NYDEC listed 154 parameters in frack wastewater they sampled from the Marcellus in Pennsylvania and West Virginia.[36] Over 1000 additives are in the fluids used to frack wells today[37,38]; many are carried into the frack wastewater produced by the well. Many of these frack fluids are toxic and/or have harmful health effects for humans or fish, wildlife and plant life. DRBC proposes, in certain circumstances, to use the "background concentration" of a pollutant, or the measurement of the existing level of a pollutant in a waterway, as the amount that a discharger of effluent must not exceed. The problem with this approach is the waterway will, effectively, be doomed to maintaining that concentration of a pollutant if the effluent discharged simply meets the background; the stream won't have a chance to become cleaner. This is especially problematic where concentrations of some pollutants are too high. In the Estuary parameters such as Total Dissolved Solids and some toxics already far exceed healthy conditions and are in need of improvement. DRBC and the states, under federal EPA regulatory requirements such as the Clean Water Act, work regularly on plans to minimize pollution to restore healthy water quality but the background concentration approach undermines those efforts.

DRBC says they have not yet developed the analytical methods, method detection limits, and quantification limits that a discharger must use to define the background concentration of a pollutant so there is no certainty about its accuracy or reliability. Total Dissolved Solids are extremely high in frack wastewater and constitute, by sheer mass, the largest pollutant, containing potent salts. In such huge amounts, TDS is very difficult to keep under control. DRBC proposes a limit of 500 mg/l of TDS, or not to exceed background, for zones of the river as far south as River Mile 95, located roughly at the southern part of the Philadelphia region. However, 500 mg/l is not protective of aquatic life. For instance, 350 mg/l TDS reduced spawning of Striped bass (Morone saxatilis) in the San Francisco Bay-Delta region, and concentrations below 200 mg/l promoted even healthier spawning conditions for fish.[39] And in the Truckee River, the EPA found that juvenile Lahonton cutthroat trout were subject to higher mortality when exposed to thermal pollution stress combined with high total dissolved solids concentrations.[40] In Zones 4 to 6[41], encompassing most of the Estuary south to the Bay and Ocean, DRBC is allowing a TDS standard of "not to exceed 1,000 mg/l" "or a concentration established by the Commission that is compatible with designated water uses and stream quality objectives". In the Estuary drinking water is not a protected use, so safe drinking water standards don't apply, allowing less strict pollution controls. DRBC also allows "mixing zones" there, which means pollution in wastewater that doesn't meet clean water standards can be mixed, or diluted by the waterway, before meeting a required standard. This spells DOOM for this region, affecting resources of Pennsylvania, New Jersey and Delaware. This threatens all life in these zones of the Estuary and Bay. And since the tides carry pollutants, including increased salinity, upstream and into tributaries, areas that do provide drinking water (including the State of Delaware's tributary drinking water intakes, and Philadelphia and south Jersey drinking water intakes serving millions of people) and upstream river zones that are tidally influenced will all be negatively impacted to some degree.

Allowing DRBC flexibility to set a TDS concentration (as stated in the bullet point above: "…or a concentration established by the Commission that is compatible with designated water uses and stream quality objectives") is not reliable or protective because DRBC currently grants variances for TDS loadings from wastewater into these areas now. DRBC even has a form that a discharger fills out to explain why they can't meet TDS limits and why they need a mixing zone – it is that standard a practice. Examples of specific approvals for permits where DRBC has been lax in applying TDS limits are Global Advanced Metals Industrial Wastewater Treatment Facility, Schuylkill River, Perkiomen Creek, Swamp Creek, PA[42] (TDS of 15,000 mg/l) and JBS Souderton Industrial Wastewater Treatment Facility for a meat packing plant, Schuylkill River, Perkiomen Creek, Skippack Creek, PA[43] (TDS of 3,100mg/l). Even when it is known that a discharger could not possibly meet required standards throughout the year due to high levels of pollution in the wastewater, DRBC currently bends the rules by allowing open lagoons to temporarily store wastewater that at certain times cannot be discharged due to conditions in the receiving waterway, such as low flows. So not only are the regulations not strict enough but DRBC already goes around the rules and allows for pollution by TDS. DRBC simply can't be relied on to stick to what is in the rules. Monitoring and reporting of numeric effluent limits is not a requirement in the draft regulations, only "may" be required. DRBC has no enforcement police. Whole Effluent Toxicity (WET) testing should only be the first stage in a risk assessment; WET testing identifies a hazard(s), not how much risk is associated with that hazard. WET testing used to assess the effect of all pollutants in a facility's effluent is not conclusive.[44] DRBC should not rely on WET testing to predict toxic effects.

Frack wastewater contains many dangerous and toxic constituents and properties including: Total Dissolved Solids (TDS), Total Kjeldahl Nitrogen (TKN), Ammonia Nitrogen, Nitrate–N, 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% of 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] In its national study of fracking and drinking water, EPA identified 1,606 chemicals in fracking fluid or drilling wastewater including 1,084 identified in fracking fluid and 599 identified in wastewater, yet only 173 had toxicity values from sources that met EPA's standards for conducting risk assessments. "This missing information represents a significant data gap that makes it difficult to fully understand the severity of potential impacts on drinking water resources." However, EPA also reported that "health effects associated with chronic oral exposure to these chemicals include carcinogenicity, neurotoxicity, immune system effects, changes in body weight, changes in blood chemistry, liver and kidney toxicity, and reproductive and developmental toxicity."[48] It is highly likely that at least some of these chemicals will leak, spill, or migrate into water supplies. Therefore, allowing drilling and fracking activities in the Delaware River Basin amounts to a huge gamble with people's health. (EPA did not mention that the agency's own failure to request health testing for new chemicals proposed for oil and gas drilling and regulated by EPA under the Toxic Substances Control Act contributed to the lack of information about chemical risks.)[49]

EPA officials could not be certain about the accuracy of their list of chemicals found in fracking fluid and wastewater in part because the list did not include confidential chemicals used by drilling companies for hydraulic fracturing. Drilling companies have withheld fracking chemical identities from the public as confidential thousands of times. Two Harvard researchers found that 92 percent of the well-by-well fracking chemical disclosures submitted to the non-governmental organization FracFocus between approximately March 2011 and April 2015 included at least one chemical identity withheld from the public as confidential business information (CBI).[50] FracFocus is the nation's leading repository of fracking chemical disclosure information and currently contains disclosures from more than 127,000 wells.[51]

EPA commented that "when chemicals are claimed as CBI, there is no public means of accessing information on these chemicals. Furthermore, many of the chemicals and chemical mixtures disclosed, or those detected in produced water, lack information on properties affecting their movement, persistence, and toxicity in the environment should they be spilled."[52] This information, too, shows that allowing drilling and fracking activities in the basin would be a huge roll of the dice with public health and the environment. It also raises questions about how water treatment facilities would be able to treat fracking wastewater if neither they nor EPA know what's in it.

Bromide is a contaminant consistently found in frack wastewater. Pennsylvania Department of Environmental Protection acknowledges that bromide is a key parameter of concern in the effluent because it can form brominated disinfection by- products (DBP's) in water supplies.[53] These are a drinking water hazard because of the propensity for the brominated DBP's to form trihalomethanes and haloacetic acid, which can cause cancer.[54] An example of how difficult it is to control bromides and the far-reaching effect high concentrations can have is the Monongahela River in Pennsylvania in 2010–2011. Bromide concentrations increased significantly, leading to increases in trihalomethane and haloacetic acids from mixing with drinking water supply disinfectants. For more detail on the contamination, which affected the drinking water for millions of people in the Pittsburgh region, see "Bromide levels in Monongahela River rose in 2010, remain high",[55] Pittsburgh Post-Gazette and "Bromide pollution persists in Allegheny River in Western Pa.," Associated Press.[56]

It is well known and long understood that the Marcellus Shale formation is radioactive[57]. Wastewater contaminated with radioactivity is unavoidable. Exposure to these radioactive materials by the public will occur as a result of flowback produced by fracking through one pathway or another, as discussed in this document, increasing the likelihood of cancers[58]. Radium-226 has a half-life of 1,600 years, so it will be present in the environment for thousands of years. It is also water soluble, meaning it easily travels with water.[59] Radionuclides can also be trapped in drill cuttings and residual solids, providing another pathway for the release to the environment, increasing human exposure and a legacy of enduring environmental contamination. Interstitial or formation water (the brine in the shale formation) can be highly radioactive (as concentrated as 15,000 pCi/L), so each time the water is reused, the radium is concentrated. This will result in TENORM, or Technically Enhanced Naturally Occurring Radioactive Materials.[60] Frack wastewater containing TENORM is not properly regulated by the federal government or the states due to lack of requirements for monitoring/testing for TENORM at crucial junctures in the waste stream where it should be targeted for detection and removal. For instance, the concentrated residuals that are filtered from wastewater at treatment plants can occur at levels that are so dangerous they would need to be removed to a specially designed storage facility, such as those used for nuclear waste. DRBC states in the proposed regulations that residuals from wastewater treatment should not beaffected by the treatment process but radioactive properties inevitably pose a treatment challenge that will affect both the waste liquids and solids, including residuals; the radioactivity doesn't just disappear. In addition, the lack of testing at the well site and related lack of truck signage ("placarding") that accurately reflects the level of radioactivity of the wastewater that is transported[61] adds great risk to the transport of the untreated, toxic wastewater from wells outside of the basin to the Delaware River Watershed for treatment and disposal.

Sampling and data-gathering by New York State detected radiological parameters in Marcellus Shale flowback, including Radium-226, the longest lived isotope of radium with a half-life of 1600 years. Gross Alpha, Gross Beta, Total Alpha Radium and Radium-228 were also found.[62] This is a significant wastewater management issue because radioactivity poses human health risks. A Duke University study of a stream in Pennsylvania below a frack wastewater plant found radium 226 levels in stream sediments at the point of discharge were ~200 times greater (544–8759 Bq/kg) than upstream sediments and background sediments (22–44 Bq/kg) and above radioactive waste disposal threshold regulations.[63]

Although not directly addressed in the draft regulations, the rules may allow the injection of wastewater within the Basin. Injection of wastewater does not "treat" waste or remove contaminants, it simply moves the potential for the toxic wastewater to cause environmental and water resource pollution and water quality degradation from one place and time to another. It also risks the migration of untreated wastewater to aquifers and surface water through leaks from the injection well and spills and accidental releases while being handled.[64] The draft regulations do allow the storage of wastewater and DRBC currently allows storage of untreated wastewater in lagoons. Injection wells are causing earthquakes in Ohio and Oklahoma as well as other locations and are not leak-proof, exposing groundwater and aquifers to contamination from the toxic mix that constitutes untreated frack wastewater.

<u>Other considerations</u>

Also, not directly addressed in the draft regulations is the storage of natural gas liquids in the Watershed. These hazardous liquids cannot be stored safely in underground caverns, which are prone to leakage and are unstable.

<u>**A complete and permanent ban on natural gas drilling and fracking and all related activities (including wastewater processing and discharges from and water withdrawals for drilling and fracking operations) throughout the Delaware River Watershed is needed because the only sure way to prevent pollution from fracking and its activities is to totally ban it. It makes no sense to ban fracking but allow its toxic waste to be dumped in the Watershed and our precious fresh water to be depleted for fracking.**</u>

The Delaware River is essential to the wellbeing of New Yorkers and wildlife. The DRBC has the opportunity to get this right by banning fracking and all of its associated practices through their rulemaking process. We urge the DRBC to make the decisions that are most protective of public health and our environment.

Thank you for the opportunity to provide comment on the Proposed Draft Regulations Addressing Hydraulic Fracturing and Additional Clarifying Amendments.

Sincerely,

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Sources and End Notes:

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