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Independent Regulatory Review Commission

David Thomas Roberts, Executive Committee Member, Water Quality
Sierra Club Moshannon Group Pennsylvania Chapter
March 22, 2022 comments regarding:
ENVIRONMENTAL QUALITY BOARD [25 PA. CODE CH. 109]
Safe Drinking Water PFAS MCL Rule
PENNSYLVANIA BULLETIN, VOL. 52, NO. 9, FEBRUARY 26, 2022

Thank you for the opportunity to comment on this proposal to promulgate a Safe Drinking Water PFAS MCL Rule. I am David Thomas Roberts residing at 1995 Valley View Road, Bellefonte, Pennsylvania 16823 in Benner Township of Centre County. I am speaking for the Sierra Club Moshannon Group as Executive Committee Member for Water Quality.

The Sierra Club Moshannon Group supports Pennsylvania's rule promulgation to set limits on the PFAS compounds PFOA and PFOS in drinking water. Regulation of PFAS compounds is also needed for our air, ground water, surface water, and soils.

Studies have linked per and polyfluoroalkyl substances PFOA and PFOS to many adverse health effects including organ and brain developmental problems in prenatal and infant children. PFAS chemicals and their derivatives have also been linked to cancer and other adverse effects to vital human organs and the human endocrine systems.

Scientific studies have linked many toxic PFAS compounds in addition to PFOA and PFOS to detrimental effects on prenatal development, childhood growth, adult human health, and the environment. Control of PFAS compounds must include additional PFAS compounds beyond merely PFOA and PFOS to adequately protect environmental and public heath.

Investigative testing by PADEP of 175 public water supplies for PFAS compounds using EPA Method 537.1 have shown PFAS chemicals in addition to PFOA and PFOS in Pennsylvania's public water supplies. The PFAS chemicals detected include:
PFOS at 103 sites,
PFOA at 112 sites,
PFHxA at 80 sites,
PFBS at 66 sites,
PFHpA at 49 sites,
PFHxS at 52 sites,
PFNA at 23 sites, and
PFUnA at 2 sites.

Although many studies have focused on the toxicity of long chain PFOS and PFOA the potential toxicity of short-chain PFAS has not been given sufficient attention. The following excerpts describing the toxicity of the six PFAS compounds so far found in Pennsylvania's drinking water supplies in addition to PFOS and PFOA are cited in the Moshannon Group's written comments.

PFNA Perfluorononanoic acid is similar to PFOA causing neonatal mortality and growth deficits. PFNA has been found to be more potent than PFOA dependent on bioaccumulation rates and longer half life. PFNA has been shown to increase liver weight in mice and is a ubiquitous, persistent environmental contaminant. *Reproductive Toxicology Volume 51, January 2015: Developmental toxicity of perfluorononanoic acid in mice.*

PFHxS Perfluorohexane Sulfonate can induce developmental toxicity in combination with endocrine disrupting substances. Risk assessments may underestimate PFHxS toxicity when co-existing chemical cocktails and endocrine-disrupting chemicals in the environment are not taken into account. *Toxicology Science 2018 Jun 1;163(2):579-591: Perfluorohexane Sulfonate (PFHxS) and a Mixture of Endocrine Disrupters Reduce Thyroxine Levels and Cause Antiandrogenic Effects in Rats*

PFHpA Perfluoroheptanoic acid induces Leydig cell hyperplasia (enlargement of cells in the testes). *Toxicology January 2021: Perfluoroheptanoic acid induces Leydig cell hyperplasia but inhibits spermatogenesis in rats after pubertal exposure*.

PFBS Perfluorobutane sulfonate is considered a less-toxic replacement for PFOS however findings indicate that both chemicals reduce egg production and brood number of the nematode Caenorhabditis elegans. *Ecotoxicology Environmental Safety Journal*

PFHxA Perfluorohexanoic acid is also toxic. Although PFHxA exposure effects to the kidney are considered in some studies to be mild and reversible, a chronic human-health-based oral reference dose of 0.25 mg/kg-day has been calculated for kidney renal papillary necrosis from PFHxA. *Regulatory Toxicology and Pharmacology: Perfluorohexanoic acid toxicity, part I: Development of a chronic human health toxicity value for use in risk assessment.*

PFHxA has been found to have toxic effects on human stem cells. Evaluation of the toxicity of PFBS, PFHxS, PFBA and PFHxA with human mesenchymal stem cells demonstrated potential developmental toxicity. *Journal of Environmental Science 2020: The short-chain perfluorinated compounds PFBS, PFHxS, PFBA and PFHxA, disrupt human mesenchymal stem cell self-renewal and adipogenic differentiation.*

Epidemiological study data published by the Center for Disease Control suggest associations between PFAS exposure and negative health outcomes including:
Hepatic effects and liver alterations from PFOA, PFOS, and PFHxS;
Increases in serum lipid levels, total cholesterol and LDL cholesterol from PFOA, PFOS, PFNA, and PFDA;
Cardiovascular effects and pregnancy-induced hypertension and pre-eclampsia from PFOA and PFOS;
Immune effects and decreased antibody responses to vaccines from PFOA, PFOS, PFHxS, PFDA, lPFNA, PFUnA, and PFDoDA; and
Developmental effects and decreases in birth weight from PFOA and PFOS.

Results of animal study data published by CDC include:
Acute, intermediate, and chronic hepatic effects indicating the liver is a sensitive target of PFOA, PFOS, PFHxS, PFNA, PFDA, PFUnA, PFBA, PFBS, PFDoDA, and PFHpA;
Impaired response to antigens suggesting the immune systems are sensitive targets of PFOA and PFOS;
Impaired mammary gland development suggesting reproductive organs are sensitive targets to PFAS; and
Decreased pup body weight, decreases in pup survival, and alterations in locomotor activity suggesting developmental effects from PFOA, PFOS, PFHxS, PFNA, PFDA, PFUnA, and PFBA.

Although the toxic effects of PFAS are somewhat poorly studied and understood, current studies provide evidence that many PFAS compounds in addition to PFOA and PFOS need to be controlled and regulated to protect public health.

PFAS compounds are extremely retentive within tissues and bio-accumulate through exposure over time. Exponential bio-concentration of PFAS chemicals occur in organisms high on the food chain. As humans are top consumers we are exposed to the highest concentrations of PFAS.

Laboratory methods have advanced beyond the limited detection parameters of the EPA 537 Method. Laboratory analysis is now available to detect over 30 PFAS compounds. The Sierra Club requests that Pennsylvania expand PFAS testing to detect as many PFAS compounds as possible.

Although PADEP tested 175 public water supplies in the initial investigation there are many additional water supplies that need to be tested. Samples taken and tested by PADEP from a private drinking water well in proximity to one of the investigatory sample sites in Benner Township, Centre County showed high levels of PFAS compounds toxic to human health and child development. PFAS sampling and analysis needs to be greatly expanded to determine the extent of PFAS contamination and the pathways and sources of PFAS in the environment and in both public and private drinking water supplies.

PFAS contamination of Pennsylvania's water is an urgent public health threat requiring swift and comprehensive actions including expanded testing, public notification, mitigation, and remediation.

There is deep concern about PFAS chemicals entering our waste water disposal systems. Most waste water treatment plants are unable to remove PFAS chemicals. PFAS in the waste water stream results in PFAS cycling into the environment from discharge of treatment plant effluent to surface waters. PFAS also contaminates waste sludge used as biosolids applied to farm fields.

It has been widely documented that toxic PFAS is contaminating our food sources including farm produce, meat products, dairy milk, and wild game. Biosolids testing for PFAS should be required at all waste water treatment plants to help eliminate PFAS contamination of our foods.

PFAS entering our surface waters from the effluent of waste water treatment plants and stormwater runoff is contaminating our warm and cold water fisheries. A number of states have implemented Fish Consumption Advisories due to PFAS contamination in surface waters. Pennsylvania must expand testing of our surface waters and begin testing our game fish in order to protect the health of our aquatic ecosystems, to protect human health, and to limit toxic PFAS exposure to Pennsylvania's resident fishermen, fisherwomen, their children, and visiting tourists.

PFAS contamination of aquifers and surface waters have endangered public health and our rural and city environments across Pennsylvania. PFAS toxicity confronts us all. The Sierra Club asks PADEP to contact the US Environmental Protection Agency to request all available assistance to control PFAS contamination in Pennsylvania.

The Sierra Club supports PADEP setting MCL standards of 18 ppt for PFOS and 14 ppt for PFOA. However PADEP should also set limits for other PFAS compounds.

In conclusion the Sierra Club asks PADEP to set drinking water standards that are protective of adult and children's health. The Sierra Club advocates for exposures in water to be limited to less than 10 parts per trillion for all PFAS chemicals. The Sierra Club asks Pennsylvania to provide robust and swift enforcement of the MCL standards to assure that all residents relying on Pennsylvania's water resources are equally protected from PFAS exposure.

Thank you.