OARS
FOR THE ASSABET SUDBURY & CONCORD RIVERS
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July 19, 2019

Elizabeth Callahan
Massachusetts DEP
One Winter Street, 5th Floor
Boston, MA 02108

Re: Comments on proposed revisions to the Massachusetts Contingency Plan

Dear Ms. Callahan,

OARS, the watershed organization for the Assabet, Sudbury and Concord Rivers, appreciates this opportunity to comment on the proposed revisions to the Massachusetts Contingency Plan related to perfluoroalkyl and polyfluoroalkyl substances ("PFAS"), including proposed cleanup standards for soil and groundwater, toxicity values for use in site-specific risk assessment, and notification criteria for soil and groundwater. We have also testified at the Public Hearing on May 23 on the same; these written comments supplement that oral testimony.

We would like to see the standards and monitoring strengthened specifically to protect aquatic life. In particular, we believe the proposed revisions at 40.0993(3)—Method 3 Human Health Risk Characterization—should also be applied, as relevant, to 40.0995(3)—Method 3 Environmental Risk Characterization. It is also important that PFAS are included in the Massachusetts Surface Water Quality Standards

OARS has a particular interest in PFAS contamination of streams due to the discovery of PFAS contamination of groundwater in Hudson, Mass. The contamination of the town of Hudson's Cranberry Well in the Cranberry Brook wetland is of particular concern. Cranberry Brook is a state-designated Coldwater Fishery Resource and is home to populations of wild Eastern Brook trout (*Salvelinus fontinalis*), a keystone species in the northeastern US. In eastern Massachusetts, the survival of these remaining populations is threatened by the pressures of human development. OARS has been monitoring the water and air temperature in Cranberry Brook and other streams as part of an on-going study of the impacts of temperature change on coldwater fish. OARS' study found that the stream quality of Cranberry Brook was excellent. (See: http://www.oars3rivers.org/our-work/monitoring/trout-streams.) However, PFAS contamination of the stream's water could change that conclusion significantly.

We would like to emphasize that while effects on human health are important, the effects on ecosystem health must also be given due consideration in site cleanup and monitoring. Fish and other aquatic life, in particular, may get far more exposure than humans due to the fact that they would be in constant contact with contaminated water. Recent research shows that PFAS compounds can bioaccumulate in fish tissue at levels that can affect fish edibility ("Perfluoroalkyl substances (PFASs) in edible fish species from Charleston Harbor and tributaries, South Carolina, United States: Exposure and risk assessment," P.A. Fair et al., *Environmental Research* 171 (2019) 266–277). Minnesota, Michigan, and New Jersey, among other states, have issued fish consumption advisories based on PFAS contamination of fish tissue (e.g., www.michigan.gov/pfasresponse/0,9038,7-365-86512_88987_88989---,00.html;). In New Jersey, for

example, “largemouth bass at Little Pine Lake at Pemberton in Burlington County should not be eaten more than once a year because samples of the fish there were found to contain the chemical PFOS at 73 parts per billion, or in the range at which only annual consumption is recommended, the DEP’s report said.” (https://stateimpact.npr.org/pennsylvania/2018/07/20/new-jersey-issues-first-advisories-for-consumption-of-fish-containing-pfas-chemicals/)

Unfortunately, there has been less research on the impact of PFAS on fish health than on human health (e.g., see *Toxicology Letters* 231 (2014) 233–238). However, as known or suspected carcinogens, mutagens and endocrine disruptors in humans, there is reason to believe that chemicals in the PFAS family may have similar effects on aquatic wildlife. We already know that there are intersex fish in the Assabet and Sudbury Rivers and endocrine disruption is a cause for concern regarding maintaining healthy reproducing fish populations (“Evidence of estrogenic endocrine disruption in smallmouth and largemouth bass inhabiting Northeast U.S. National Wildlife Refuge Waters: a reconnaissance study,” Iwanowicz et al., 2013; see: www.oars3rivers.org/threats/water-pollution/edcs/studies). We ask that MassDEP, if it has not already done so, seek input from MassWildlife on impacts on aquatic health and acceptable exposure levels for PFAS.

We support the proposed Method 1 GW-1 Standard and RCGW-1 Reportable Concentrations for PFAS applicable to groundwater protected for its current and/or future use as drinking water. We understand that the revisions propose Method 1 GW-3 Standards of 40,000 ug/l and 500 ug/l, which are applicable to groundwater that may discharge and impact aquatic receptors in surface water bodies. It is important that standards and methods for groundwater reflect that it constitutes the base flow for streams and other surface waters inhabited by aquatic species. For example, the location of test wells should be such that the samples collected provide information relevant to determining potential contamination of streams, particularly during sensitive seasons, such as spawning and during juvenile fish development when organisms are particularly sensitive to endocrine disruption, etc. Further, that test results are used to establish cleanup protocols and requirements that will in fact protect those surface waters.

The proposed revisions at 40.0993(3)—Method 3 Human Health Risk Characterization—should also be applied, as relevant, to 40.0995(3)—Method 3 Environmental Risk Characterization. It seems clear that the Method 3 approach to “Potential exposures to Human and Environmental Receptors” is intended to consider the environmental receptors both as possible conduits of harm to humans and be concerned with the harm to the “environmental receptors” themselves (aka aquatic biota/ wildlife). We believe that the latter interpretation should be clearly understood and utilized in cases involving PFAS falling under the MCP.

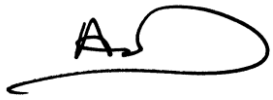
Under Method 3 Environmental Risk Characterization (310 CMR 40.0995) “The characterization of risk of harm to the environment shall be conducted for all current and reasonably foreseeable Site Activities and Uses identified in 310 CMR 40.0923. Characterization of the risk of harm to the environment shall include an assessment of chemical data, potential contaminant migration pathways, and an evaluation of biota and habitats at and in the vicinity of the disposal site . . .”

Under the MCP regulations 310 CMR 40.0995(3)(b)(2), a determination of “readily apparent harm” depends on visual evidence of stressed biota (e.g., fish kill), visible presence of the pollutant, or concentrations which exceed Massachusetts Surface Water Standards (314 CMR 4.00, which include USEPA Ambient Water Quality Criteria, 314 CMR 4.05(5)(e)). It is important that PFAS are included in the Massachusetts Surface Water Quality Standards as well as the Massachusetts Drinking Water Quality Standards (310 CMR 22.00) since PFAS is unlikely to result in immediate mortality of biota or be visibly present. We understand that Massachusetts currently relies on the Minnesota Pollution Control Agency

Surface Water Criteria for PFAS with 1,705 ug/l as the LOEC, and 19 ug/l as the LOEC for PFOS and PFHxS. While we are not in a position to judge the adequacy of these criteria, it is important to insure that the criteria are suitable and will protect the sensitive receptors found in Massachusetts.

We hope these comments are useful. Please don't hesitate to contact me if you have any questions.

Yours sincerely,



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