

SUMMARY OF NJDEP COMMENTS ON “PFOS and PFOA in Drinking-water Background document for development of WHO Guidelines for Drinking-water Quality; 29 September 2022. Version for public review”

The draft World Health Organization (WHO) document (posted at https://cdn.who.int/media/docs/default-source/wash-documents/wash-chemicals/pfos-pfoa-gdwq-bd-working-draft-for-public-review-29.9.22.pdf?sfvrsn=eac28c23_3) was reviewed by NJDEP scientists and technical staff with extensive expertise and experience in development of drinking water standards for PFAS, including health effects, analytical limitations, and treatment removal capabilities. NJDEP began evaluating PFAS in drinking water in 2006, conducted the first statewide study of the occurrence of PFAS in drinking water in the U.S. in 2006, and established the first drinking water standard (Maximum Contaminant Level) for a PFAS in the U.S. in 2015. As shown at <https://www.nj.gov/dep/dsr/pfas.htm>, NJDEP scientists and technical staff are the authors and co-authors of numerous peer-reviewed publications on PFAS in drinking water including several highly cited reviews.

NJDEP submitted both detailed (line-by-line) and general comments on the draft WHO document. A summary of the NJDEP comments is found in the Additional Comments section at the end of the NJDEP comment document, beginning on p. 47. NJDEP stressed that its comments were submitted with a constructive intent and that it hopes that the comments will be helpful to WHO. NJDEP identified the need for many revisions in both the factual information and the conclusions about health effects, treatment removal, and other topics discussed in the draft WHO document. In summary, NJDEP concluded that the provisional drinking water guideline values of 100 nanograms per liter (parts per trillion; which is the same as 0.1 micrograms per liter, parts per billion) proposed by WHO for PFOA and PFOS, the two most commonly found PFAS, are not public health-protective or scientifically supportable. Because of the many problematic issue with the draft document’s information and conclusion, NJDEP recommended that WHO should not proceed to establish drinking water quality guidelines for PFOA and PFOS unless the draft document is extensively and appropriately revised.

The provisional drinking water guideline values for PFOA and PFOS of 100 nanograms per liter proposed by WHO are much higher than recent drinking water guidelines for these two PFAS developed by New Jersey, USEPA, and other states. WHO stated that there is too much uncertainty about health effects of PFOA and PFOS to develop health-based drinking water guidelines. Instead, WHO based the proposed provisional guideline values on treatment removal. Specifically, the provisional guidelines of 100 ng/L are based on assuming 90% removal from source water that is contaminated with 1000 nanograms per liter PFOA or PFOS. This is a very high concentration that rarely occurs in drinking water sources; levels of PFOA and PFOS in water used as a drinking water source are almost always far lower. It is well established that PFOA and PFOS can be removed to non-detectable levels (e.g., less than 2.5 nanograms per liter) from source water that contains even high (e.g., 1000 nanograms per liter or higher) concentrations. NJDEP commented that WHO did not provide sufficient justification for selection of the treatment-based values of 100 nanograms per liter and that the choice of these values appeared to be arbitrary. NJDEP is concerned that drinking water systems with PFOA or PFOS below 100 nanograms per liter in their source water may not take actions to reduce levels in their finished water even though the health risks of exposure to concentrations below 100 nanograms per liter are clear.

Regarding health effects, NJDEP commented that there is more information from both human and laboratory animal studies and less uncertainty about health effects of PFOA and PFOS than for many of

the other contaminants for which WHO has developed health-based guidelines. WHO stated that it relied primarily on reviews of health effects by other authoritative bodies including USEPA, ATSDR (U.S. Centers for Disease Control's Agency for Toxic Substances and Disease Registry), and EFSA (European Food Safety Authority). However, the draft WHO document minimizes and/or dismisses many of the conclusions about the health effects of PFOA and PFOS that have been accepted by all of these authoritative bodies and by the scientific community in general. In contrast to USEPA, ATSDR and EFSA, WHO minimized and/or dismissed much of the human epidemiology data that indicate that PFOA and PFOS cause adverse human health effects, and WHO also dismissed the toxicity of PFOA and PFOS in laboratory animals by stating that it is uncertain if the effects in animals are relevant to humans.

NJDEP also identified numerous instances in which the draft WHO document does not accurately represent the information from the sources that are cited and other instances where key information is omitted. As one important example, the ranges of international drinking water guidelines for PFOA and PFOS presented in the draft WHO document omit values developed by Denmark and USEPA that are lower than values included by WHO.

NJDEP also commented that draft WHO document often emphasizes relatively unimportant details and does not discuss the fundamental reasons why PFOA and PFOS differ from other drinking water contaminants and why they are of high concern when found in drinking water. Specifically, WHO did not discuss that PFOA, PFOS, and other PFAS differ from other drinking water contaminants because they are highly persistent in the environment and bioaccumulate in humans. For example, the PFOA level in an individual's blood serum builds up to more than 100 times the level in the person's drinking water, and it takes many years for the elevated levels in the body to decrease after exposure to contaminated drinking water ends. Exposure to even low levels of PFOA and PFOS in drinking water is of concern because multiple human health effects are found within the exposure range common in the general population, even without additional exposure from drinking water. PFOA and PFOS also cause multiple types of toxicity in laboratory animals, including at low doses, and these effects (e.g., liver toxicity, developmental delays, immune system suppression, tumors) are generally consistent with the health effects reported in human epidemiology studies. Importantly, infants, particularly those who are breastfed, receive much higher exposures than older individuals from contaminated drinking water. These higher exposure and serum levels are of particular concern because infants are a sensitive subpopulation for developmental effects of PFOA and PFOS.