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Drinking Water Contaminant Candidate List 4 –Draft

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My name is Joseph A Cotruvo. I am president of Joseph Cotruvo & Associates LLC, in Washington, DC. I was director of EPA's ODW Criteria and Standards Division and of OPPT's Risk Assessment Division. These are my comments to the record for the draft Drinking Water Contaminant Candidate List 4. FR 80, 6076-6084, Feb 4, 2015.

The primary purpose of the CCL, UCMR and other related SDWA assessment activities is to identify substances that are plausible candidates for drinking water regulatory activity.

Section 1412(b)(1)(A) of the 1996 Safe Drinking Water Act (SDWA) lists three criteria for listing of contaminants for consideration for potential national drinking water regulations:

1. The contaminant may have an adverse health effect;
2. The contaminant occurs, or is likely to occur, at a level and frequency of public health concern;
3. A national regulation provides a meaningful opportunity for health risk reduction.

2 on level and frequency of occurrence is really the most significant discriminator relative to health risk, since every substance (#1) may have an adverse effect on health at some dose level, and #3 is judgmental and not reviewable.

The CCLs should provide a list of priority candidates to be considered for potential regulation, but also they should identify contaminants of potential concern where additional data need to be generated for further evaluation. The list should assist both EPA and the numerous stakeholders to prioritize their workloads and research and data collection activities regarding potential future drinking water regulatory and Health Advisory concerns. The current CCL List 3 and the proposed CCL List 4 list are much too lengthy and they contain substances that obviously would never be serious candidates for regulation, because they would not meet the #2 or #3 regulatory criteria. In addition, several of them would not meet practical objective chemical and physical

criteria that would render them extremely improbable to be present in drinking water sources or finished water at frequencies and levels of health concern. Thus, the excessively long lists provide virtually no useful guidance for prioritizing efforts associated with drinking water concerns, and so they dilute both EPA's and stakeholder efforts, such as selection of useful UCMR candidates, and they drain limited resources for all concerned.

UCMRs provide national data to assist in the frequency and exposure elements that are essential to the regulatory determinations, so it is also important that those monitoring lists are judiciously selected to support the regulatory decision making process without causing unnecessarily excessive costs. Well over 100 million dollars has been spent on generating the data from the prior UCMRs and it would be interesting to see what has been the decision making value of the data generated to date.

It would be beneficial if EPA would update and develop more reliable screening criteria for the CCLs (and UCMRs) and also provide a broader review process by qualified outside experts so that valid contaminant candidates are selected and inappropriate candidates are eliminated at an early stage prior to proposal in the FR.

Below is a list of recommendations with brief explanations. Some of the drop candidates should be put on the priority list for Drinking Water Health Advisories.

Additions

Chlorate--- chlorate is appropriate because of the common source from hypochlorite and chlorine dioxide usage, even though the reference concentration of 210 ppb is not a potential MCL. The WHO guideline value is 700 ppb, which would convert to 840 ppb in the U.S. for 80% relative source contribution. The California Notification level is 800 ppb.

Manganese ---although an essential nutrient should be added because it is frequently occurring in water, and because the dose related neurotox potential from ingestion is being studied. Inhalation neurotox in irrelevant in the water context, and it probably confounds some of the Canadian epidemiology studies because manganese based gasoline additives were allowed there until 2004.

Cyanotoxins—A specific list of selected individual or appropriate groups of microcystins, saxitoxins, cylindrospermopsin, anatoxins with sufficient occurrence and concentrations during algal blooms should be added. There is need to produce more toxicology information so that appropriate acceptable concentration values for exposure periods can be developed. Short term exposure values rather than chronic levels are most useful, so perhaps they are most appropriate as Drinking Water Health Advisories rather than as MCLs.

Questionable Additions

1,4-dioxane –probably has sufficient frequency to list but in UCMR3 only 6.8% of systems exceeded the conservative 10^{-6} reference concentration and none exceed the 10^{-4} value. An MCL would be extremely costly because there is no practical water treatment available. The best regulatory approach would be via local NPDES permits and pretreatment controls on dischargers, which has been effective in Orange County, CA. There are available alternative substitute less toxic chemicals (1,3-dioxolanes) with very similar chemical and physical properties.

1,2,3-TCP—barely makes it on a potential list because it has a very conservative reference concentration, but low occurrence; only 1.2% exceeded the 40 ppt 10^{-4} reference concentration in UCMR3 for which an MCL would be difficult to justify and implement in that range.

Nonylphenol- Suggested addition by EPA. Poor choice because of limited water exposure potential, and even if it were present to some degree in source waters, as an activated phenol it would readily chlorinate or be oxidized during water treatment. If present at least a portion would most likely exist as one of several polyethoxylates. "The calculated dose received from background pollution from the environment on a daily basis is 5.13*10-3 mg/kg/day, which is below levels of concern" NOAEL 15 mg/kg/day from
http://www.who.int/ipcs/methods/Nonylphenol.pdf

Deletions

1,3-butadiene---is a gas under normal conditions that would be extremely unlikely to be even in groundwaters at significant levels, let alone surface water sources. 1 positive detection was found out of 3584 UCMR3 systems.

Chloromethane ------is a gas under normal conditions that would be unlikely to be even in groundwaters at significant levels, let alone surface water sources. UCMR3 had low occurrence for either reference concentration.

Bromomethane ---is volatile and had zero UCMR3 detections in UCMR3 above the reference concentration and low toxicity.

1,1-dichloroethane—is a VOC with low toxicity and low UCMR3 occurrence with none exceeding the hypothetical 10^{-4} value.

HCFC-22--- is a gas under normal conditions that would be unlikely to be even in groundwaters at significant levels, let alone surface water sources. Low toxicity and half- life of a few minutes. No reference concentration was provided by EPA..

Halon-1011--- 0 occurrence in UCMR3 above the reference concentration and low toxicity.

PFOS and PFOA—very low occurrences in UCMR3 above reference concentrations.

5 estrogens—very low occurrence. It is essential to validate the analytical results in the ppt range.

Butanol— very low toxicity and likely very low exposure. Biodegradable.

Acrolein—very low potential exposure from water, and readily detectable because of its acrid burnt grease odor.

n-propylbenzene and sec butylbenzene– low toxicity, low exposure potential.

RDX and nitroglycerin and nitrobenzene—very low exposure potential.

Ethylene oxide, oxirane, methyl (propylene oxide), toluene diisocyanate , cumene hydroperoxide--- These chemicals are reactive with water or reactive during disinfection processes.

Hexane-low exposure potential except from a gasoline spill.

Hydrazine- low exposure potential.

5 Nitrosamines—low exposure potential and not all are carcinogens. Volatile nitrosamines were found in chlorinated and chloraminated water at low ppt levels, and recent papers by Fristachi and Rice, and Hrudey et al demonstrate very high >>99% of daily exposure from endogenous production with water being much less than from food in the remaining minute exposure sources.

Benzyl chloride –Hydrolyses to benzyl alcohol in water and biodegradable. Low occurrence potential.

BHT—This is an approved GRAS food additive, with low toxicity and likely very low occurrence in water.

Cobalt-low toxicity and negligible occurrence. The NIRS found 1 at 6 ug/L out of 989 locations.

Germanium- low exposure potential. The NIRS found 3 of 989 locations with > 0.2 mg/L. 982 were less than 0.022 mg/L

Vanadium- Low toxicity and low occurrence. ATSDR reported stomach cramps as an adverse effect in a study of people taking about 13 mg vanadium/day as a pharmaceutical. The NIRS found 18 of 989 locations with > 0.02 mg/L. 843 were less than 0.003 mg/L. Not a drinking water concern.

Tellurium- Low water exposure potential. The NIRS found 3 of 989 locations with > 0.012 mg/L. Not a drinking water concern.

Formaldehyde and acetaldehyde---These are food metabolites and primarily of concern by inhalation. They are very soluble in water so there is low inhalation exposure potential from water. WHO tolerable value for ingested formaldehyde is 2.6 mg/L.

Molybdenum- is an essential nutrient, with low toxicity and low occurrence distribution. NAS IOM Tolerable Upper Intake level is 2 mg/day. 37 of 989 systems ranged from 0.01 to 0.055 mg/L in the NIRS with 952 lower than 0.01 mg/L.

Methanol—biodegradable and low exposure except from a spill, and low toxicity. IRIS reference dose is 2 mg/kg/day or ~70 mg/L.

Vinclozolin and erythromycin-Antibiotics, low exposure potential, large Margin of Exposure and unlikely to survive water treatment.

Triphenyltin hydroxide is a PVC pipe stabilizer- Low presence in source or treated water. Best managed by ANSI/NSF pipe standards rather than an MCL.

Aniline, acetamide. O-toluidine, quinoline. Low occurrence potential. Aniline and o-toluidine and possibly quinoline would rapidly chlorinate during drinking water treatment.

Pesticides-There are at least 39 pesticides or metabolites on the list. Most would readily drop if EPA OGWDW combed the OPP Registration Eligibility Documents (REDs) and the 350+ Pesticides Benchmarks, because of use patterns, biodegradability, low water contamination potential, or low relative toxicity.

Microbials

Almost all microbials including most of the 12 listed candidates are already covered by filtration and disinfection regulations, and individual MCLs and monitoring would not be appropriate or feasible.

Legionella is theoretically regulated with an MCLG and treatment requirement, and probably beyond SDWA MCL reach because it is a plumbing problem not in direct control of the PWS.

E coli 0157 is already regulated among the *E coli.*

Naegleria has some undefined occurrence in source water, although it should be removed by filtration (LT2), but it can be found in some biofilms especially in warmer climates.

Mycobacterium is a distribution system colonization issue so perhaps it should remain on the list for now for further study.

Aerobic spores are not necessarily harmful, and they are removed by filtration and a good marker for crypto removal.

Helicobacter are a GI problem, but treated water is not a likely source.

The best rationale would be to focus priorities on distribution and plumbing system biofilm concerns as a topic area, including Mycobacterium avium, Naeglaria fowleri, and Legionella pneumophila. These probably represent the most significant U.S. human microbial health risks from exposures via distributed drinking water. Whether or not any regulation would become feasible, their presence on the CCL4 would focus research and technology and analytical development and mitigation efforts on those three microbes as indicative of distribution and plumbing related risks.