



Fall 2016

FSTRAC Newsletter

FEDERAL-STATE TOXICOLOGY RISK ANALYSIS COMMITTEE

What Is FSTRAC?

In 1985, Drs. Joseph Cotruvo, Edward Ohanian, and Penny Fenner-Crisp of the U.S. Environmental Protection Agency's (EPA's) Office of Science and Technology, Health and Ecological Criteria Division, started FSTRAC to build a better relationship with states and tribes to exchange research priorities and results, policy concerns regarding water-related human health risk assessment, and technical information. FSTRAC is made up of representatives from state and tribal health and environmental agencies and EPA Headquarters and Regional personnel. As described on the EPA FSTRAC Web page (<http://www2.epa.gov/water-research/basic-information-fstrac>), FSTRAC is an integral part of EPA's communication strategy with states and tribes. FSTRAC fosters cooperation, consistency, and an understanding of EPA's and different states' and tribe's goals and problems in human health risk assessment. It allows states, tribes and the federal government to work together on issues related to the development and implementation of regulations and criteria under the Safe Drinking Water Act and Clean Water Act.

Recent Webinars

FSTRAC holds several webinars each year to share information through presentations and discussions regarding human health risk analysis and the water medium of exposure.

April 2016 FSTRAC Webinar

EPA held a FSTRAC Webinar in April 2016 during which the following topics were discussed:

2016 Priorities for EPA's Health and Ecological Criteria Division (presented by Ms. Colleen Flaherty, OW/EPA): Ms. Flaherty presented an overview of EPA Office of Science and Technology, Health and Ecological Criteria Division's priorities for 2016 in the areas of human health and aquatic life criteria, and drinking water health advisories.

Unregulated Contaminant Monitoring Rule (UCMR 3) Update (presented by Ms. Melissa Simic, EPA/OW): Ms. Simic provided an overview of EPA's UCMR program which

collects national occurrence data for suspected drinking water contaminants to support future regulatory decisions. Ms. Simic presented a summary of UCMR 3 results, minimum reporting limits, and reference concentrations. She also presented a table of proposed UCMR 4 analytes; monitoring for UCMR 4 is tentatively scheduled to start in 2018.

Arsenic Exposure in Maine Homes with POU Treatment or Bottled Water Use (presented by Drs. Andrew Smith and Thomas Simones, Maine Center for Disease Control & Prevention): The Maine Center for Disease Control & Prevention (CDC) and the U.S. CDC examined arsenic exposure sources in Maine households that have switched to bottled water or installed an arsenic treatment system at the kitchen sink to reduce exposure from arsenic contaminated well water. Occasional use of untreated water for drinking and cooking accounted for the majority of the remaining arsenic exposure for adults. For children, the majority

The purpose of this newsletter is to keep Federal-State Toxicology and Risk Analysis Committee (FSTRAC) members up-to-date on current developments in toxicology, risk analysis, and water quality criteria and standards. This newsletter also provides information on recent FSTRAC webinars and upcoming events. Please share this newsletter with anyone you think might be interested in these topics. If you are interested in joining FSTRAC, please contact the FSTRAC Chair, Dr. Shamima Akhter (Akhter.Shamima@epa.gov).

of remaining arsenic exposure was unexplained water-related exposure. Bathing in well water high in arsenic was not a significant exposure source for either children or adults. The study confirms the need for private well owners to practice vigilance in avoiding use of untreated water, especially if arsenic levels are greater than 40 µg/L, and especially if children are present in the home.

The Impact of High Early Life Water Intake Rates and Short-Term Effects for Deriving Health-Protective Drinking Water Criteria (presented by Dr. Helen Goeden, Minnesota Department of Health): To date, Minnesota Department of Health has conducted multiple duration assessments for 73 chemicals. As expected, reference doses (RfDs) typically decreased as exposure duration increased, however, the majority of the chronic RfDs were less than four-fold lower than the short-term RfDs. Intake rates during early life can be nearly seven-fold higher than chronic water intake rates. As a result, the short-term health-based guidance (HBG) values were lower than the chronic-based HBG values in nearly half of the assessments. The results demonstrate the importance of evaluating shorter durations to ensure protectiveness.

October 2016 FSTRAC Webinar

EPA held a FSTRAC Webinar in October 2016 during which the following topics were discussed:

HECD Accomplishments and Workplan for FY 2017 (presented by Ms. Betsy Behl, OW/EPA): Ms. Behl presented an overview of EPA Office of Science and Technology, Health and Ecological Criteria Division's 2016 accomplishments and priorities for 2017 in the areas of human health, nutrients, biocriteria, and aquatic life.

U.S. EPA's Current Approach to Developing Aquatic Life Ambient Water Quality Criteria and Effort to Update EPA's Methodology for Deriving Criteria (presented by Dr. Kathryn Gallagher, OW/EPA): Dr. Gallagher described EPA's current guidelines methods for developing aquatic life criteria. The current guidelines methods have led to the development of approximately 50 Aquatic Life Criteria for toxic pollutants. Dr. Gallagher also discussed EPA's plan for updating the guidelines methods for developing aquatic life criteria using a

two-pronged approach, which includes developing and implementing an expedited criteria development method as well as a comprehensive criteria development method.

U.S. EPA Office of Water's Communication and Other Activities Related to Cyanotoxins (presented by Dr. Lesley D'Anglada, OW/EPA): Dr. D'Anglada described EPA Office of Water's efforts related to cyanotoxins in drinking water and recreational water. Outreach and communication activities include websites, fact sheets and newsletters, webinars and workshops, and partnerships and collaborations. Dr. D'Anglada also discussed future activities at EPA's Office of Water for cyanotoxins.

New Jersey Drinking Water Quality Institute (DWQI) Draft Reports to Support an MCL Recommendation for PFOA (presented by Dr. Gloria Post, New Jersey Department of Environmental Protection): Dr. Post provided an overview of the New Jersey DWQI's extensive evaluation of perfluorooctanoic acid (PFOA). The DWQI is a legislatively-established advisory body charged with recommending MCLs to NJDEP. In September 2016, public review drafts of DWQI Subcommittee reports recommending a Health-based MCL of 14 ng/L and an analytical Practical Quantitation Level of 6 ng/L, and concluding that treatment technologies can remove PFOA to these levels, were posted for public comment. These draft reports support an MCL recommendation of 14 ng/L. They are posted at http://www.nj.gov/dep/watersupply/g_boards_dwqi.html, and comments may be submitted to watersupply@dep.nj.gov until November 21, 2016.

Setting Site-Specific Selenium Criteria in a Transboundary Waterbody (Dr. Terri Mavencamp, Montana Department of Environmental Quality): Dr. Terri Mavencamp presented an overview of Montana DEQ's and British Columbia Ministry of Environment's development of selenium aquatic life criteria and objectives for Lake Koocanusa, Montana and BC. Data from ongoing research projects will help inform a site-specific conceptual model from which selenium criteria for Lake Koocanusa will be determined. The third face-to-face meeting of LKWG will take place this month (October) in Cranbrook, BC.

Information from States Developing Guidance for Specific Chemicals

Criteria Values

Minnesota Department of Health

The Minnesota Department of Health has recently completed reviews and generated health-based guidance for the following chemicals: anatoxin-a; clothianidin; 2,4-D; 17-alpha ethinylestradiol; mestranol; and tetrahydrofuran. Additional information (e.g., values, calculations) can be found on MDH's website at: <http://www.health.state.mn.us/divs/eh/risk/guidance/gw/table.html>

The following chemicals are currently in review: glyphosate and degradate AMPA; dinoseb; PFOA; PFOS; and thiamethoxam.

New Jersey's Draft Drinking Water Quality Institute (DWQI) Recommended Health-based MCL for PFOA Posted for Public Comment

New Jersey's DWQI drafted a recommended Health-based Maximum Contaminant Level (Health-based MCL) for perfluorooctanoic acid (PFOA, C8) using a risk assessment approach intended to protect for chronic (lifetime) drinking water exposure. This

document, as well as a *Report on the Development of a Practical Quantitation Level for Perfluorooctanoic Acid (PFOA) in Drinking Water, and Addendum to Appendix C: Recommendation on Perfluorinated Compound Treatment Options for Drinking Water*, are posted on the New Jersey Department of Environmental Protection's New Jersey Drinking Water Quality Institute website (http://www.nj.gov/dep/watersupply/g_boards_dwqi.html). The following PowerPoint presentations about the three documents from the September 22 meeting of the DWQI are also posted at this link:

- Health Effects Subcommittee: Health-Based PFOA MCL Recommendation
- Testing Subcommittee
- Treatment Subcommittee: Addendum to *"Recommendation of Perfluorinated Compound Treatment Options for Drinking Water"*

The DWQI is holding a 60-day public comment period on the three documents from September 22, 2016 until 5 p.m. on November 21, 2016. All comments should be submitted to watersupply@dep.nj.gov.

Risk Assessment

Drinking Water

EPA Office of Water Health Advisories for PFOA and PFOS

In May 2016, the EPA Office of Science and Technology, Health and Ecological Criteria Division released Drinking Water Health Advisories of 70 ppt for PFOA and PFOS and for the two chemicals combined. The Health Advisories were derived from the reference doses for PFOA and PFOS (0.00002 mg/kg/day) calculated using modeled animal serum levels to calculate equivalent external doses applicable to humans. This approach accounted for pharmacokinetic differences between the animal and human responses to exposure to both chemicals. Lactating women were selected as the most sensitive population for the Health Advisory calculation because of their high intake of drinking water compared

pregnant women and adults in the general population. The Health Advisories apply to short and long term exposures and are protective of systemic (e.g. liver), immunological, developmental and cancer effects based on the quantified studies. The animal findings on adverse effects are supported by extensive epidemiology data.

The OST Peer Reviewed Health Effects Support Documents and Health Advisories for each chemical are based on the latest peer-reviewed science to provide drinking water system operators, and state, tribal and local officials with information on the health risks of these chemicals, so they can take the appropriate actions to protect their residents. For further information see: <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>.

Texas Commission on Environmental Quality's Reference Dose for Hexavalent Chromium

The Texas Commission on Environmental Quality (TCEQ) has recently finalized a reference dose (RfD) derived to be protective of both the potential carcinogenic and non-carcinogenic effects of oral exposure to hexavalent chromium (CrVI). The RfD is based on the third peer-reviewed scientific article published by the TCEQ on oral exposure to CrVI (Haney 2015), which was recognized at this year's Society of Toxicology conference along with another TCEQ CrVI paper as two of the top ten best published papers in 2015 demonstrating an application of risk assessment (<https://www.toxicology.org/groups/ss/RASS/pastwinners.asp>). The open access Regulatory Toxicology and Pharmacology article is available at: <http://www.sciencedirect.com/science/article/pii/S0273230015300957>. The TCEQ development support document (DSD) for the CrVI RfD can be found on TCEQ's website at: https://www.tceq.texas.gov/assets/public/implementation/tox/dsd/final/chromium_ord.pdf

Clean Water

Mental Health and Toxicology Risk Assessment

The Health and Ecological Criteria Division (HECD) in the Office of Science and Technology, Office of Water, EPA, is working to develop materials to provide additional support to states and tribes and to protect human health and welfare through the explicit consideration of the mental health implications of exposure to degraded water bodies.

The Clean Water Act (sections 101, 103, and 104) and the Code of Federal Regulations (40 CFR §131.2) call for standards to “protect the public health or welfare”. However, when discussing human health and welfare considerations for water quality standards, policy and technical discussions are often limited to the exposure effects on human “physical” or “bodily” health, and do not explore other dimensions associated with the protection of “public health and welfare”. The project seeks to provide information and resources that describe the need to protect human access to a healthy natural environment, and to protect aquatic resources from degradation through the integration of mental health considerations into risk analyses and water quality standards development.

To explore the other dimensions of protecting human health and welfare, HECD is: 1) identifying scientifically defensible mental health impacts related to waterbody and associated ecosystem degradation as they pertain to nutrient pollution, and potentially other stressors, 2) identifying projects and Clean Water Act programs within the Office of Water where mental health considerations are most relevant, and 3) developing educational tools to provide technical support to EPA, states, territories, and tribes to integrate mental health considerations into toxicology risk analyses.

Natalie Spear (Knauss fellow to the Nutrient Criteria program in HECD) is the project lead and point of contact. Please contact her at spear.natalie@epa.gov with any questions you may have.

Development of Recreational Water Quality Criteria for Coliphage – 2016 Coliphage Experts Workshop

EPA held a Coliphage Experts Workshop in March 2016 as part of EPA's ongoing efforts to build the scientific basis for developing coliphage-based water quality criteria. EPA convened a group of twelve internationally recognized experts on the state of the science of coliphage and their usefulness as a viral indicator for the protection of public health in recreational waters. Experts represented a spectrum of perspectives from academia, federal agencies (EPA, CDC, FDA), and the wastewater industry. Agenda discussion topics included: the need for a viral indicator; coliphage as a predictor of gastrointestinal illnesses; how coliphage may be useful as an indicator of wastewater treatment performance; male-specific versus somatic coliphage; a systematic literature review of viral densities; and future research. This fact sheet outlines Workshop topics and overall findings. EPA plans to publish a peer-reviewed meeting proceedings report on the Workshop in early 2017.

<https://www.epa.gov/wqc/development-recreational-water-quality-criteria-coliphage-documents>

Evaluation of Microbiological Risks Associated with Direct Potable Reuse, Publication in Microbial Risk Analysis

The U.S. EPA Office of Water conducted a Quantitative Microbial Risk Assessment (QMRA)

to evaluate the potential microbial risks associated with various direct potable reuse (DPR) treatment train combinations for recycled water. The assessment methodology leveraged readily available peer-reviewed pathogen density and log removal data. The results illustrate quantitative human health-based advantages for DPR projects in which product water is introduced into the raw water supply immediately upstream of a conventional drinking water treatment facility, compared to those in which product water is introduced directly into a potable water supply distribution system. The results also indicate that a single day can drive annual risks, highlighting the need for robust and reliable on-line monitoring of unit treatment processes within DPR facilities. The QMRA methodology employed is adaptable to other DPR treatment trains and could be iteratively refined as additional data become available. This work will be useful to federal and state regulators considering DPR as source water, state and local decision makers as they consider whether to permit a particular DPR project, and design engineers as they consider which unit treatment processes should be employed for particular projects. The U.S. EPA is currently planning to create a Technical Guide highlighting some of the findings of this work.

Western North American Mercury Synthesis

Through the compilation of existing datasets on mercury pollution across western North America, a team of scientists with support from EPA Region 10, the U.S. Geological Survey John Wesley Powell Center for Analysis & Synthesis, and the National Parks Service used a landscape-scale approach to understand how mercury cycling and bioaccumulation varies across this region.

The results from this effort are summarized in 16 peer-reviewed scientific manuscripts that were published in a special issue of the journal *Science of the Total Environment*, titled: “Mercury in Western North America—Spatiotemporal Patterns, Biogeochemistry, Bioaccumulation, and Risks.” Overall, the findings show that mercury contamination is widespread, but heterogeneous, across western North America. The fate and transport of inorganic mercury across landscape gradients is heavily influenced by climate and

land cover factors such as plant productivity and precipitation. Trends of methylmercury in aquatic food webs were found to be decoupled from concentrations and sources of inorganic mercury. These results highlight the importance of focusing on efforts to reduce methylmercury production as opposed to focusing simply on sources of inorganic mercury in order to reduce food web exposure.

If you would like more information, please contact Chris Eckley at eckley.chris@epa.gov.

High Natural Arsenic Levels Flowing from Yellowstone National Park: Measured by Science and Managed by Policy and Regulation

The geothermal waters from Yellowstone National Park (YNP) are the main source of natural arsenic loads to the Yellowstone and Madison Rivers, resulting in concentrations that exceed the Montana human health standard extending from the YNP Boundary to areas deep into the state. For example, water quality samples taken from the Madison River near the West Entrance to YNP average 300 µg/L, more than 30 times Montana’s human health standard. Within the United States, high natural concentration of arsenic in surface water is unique to Montana due to the magnitude of the geothermal activity and the resulting volumes of water flowing northward from the park. While this ecological condition is natural by any reasonable definition, the social management of the issue is complicated by the nature of arsenic. Arsenic is a carcinogen and public is the main concern. Arsenic behaves conservatively in aquatic systems in Montana with minimal geochemical processes affecting the original Yellowstone National Park arsenic loads. Under summer and fall base-flow conditions, the arsenic load remains relatively constant throughout the Yellowstone, Madison, and Missouri reaches and dilution from tributaries is the main process for concentration reduction as the rivers flow through the state.

Montana is currently in the process of navigating through policy, rules, and regulations of this natural carcinogen. The Montana Department of Environmental Quality is conducting an investigation to characterize the actual level of natural arsenic in the Madison, Missouri, and Yellowstone Rivers. The challenge lies in the development of an arsenic rule

that protects the health of Montana's citizens. The science is actually the simplest part with the major complexity being the development of suitable policy and regulation. This is a first step towards adapting state policy to a natural ecological condition and may act as a template for other existing natural metal conditions in Montana.

If you would like more information, please contact Melissa Schaar at mschaar@mt.gov.

Setting Site-Specific Selenium Criteria in a Transboundary Waterbody

Montana Department of Environmental Quality (MT DEQ) and British Columbia Ministry of Environment (BC MOE) are pursuing a site-specific selenium standard for Lake Koocanusa. MT DEQ, BC MOE, U.S. Geological Survey, Army Corps of Engineers, Montana Fish, Wildlife and Parks, and Fish and Wildlife Service are just several of the agencies working together to gather the necessary data to develop the site-specific standard. Joe Skorupa, Theresa Presser, Lana Miller, David Naftz, David Janz and Joe Beaman compose the selenium technical subcommittee chaired by MT DEQ and BC MOE, and Karen Jenni is developing the site-specific conceptual model. The model will consider multiple endpoints, including birds and fish, and will take into account downstream waters.

Additional details on this project are provided on Montana DEQ's website: <http://lakekoocanusaconservation.pbworks.com/w/page/100633354/FrontPage>

Drinking Water Contaminant Occurrence Information

UCMR 4: The UCMR 4 proposal was published on December 11, 2015 (<https://www.epa.gov/dwucmr/fourth-unregulated-contaminant-monitoring-rule>). The public comment period ended February 9, 2016. The draft UCMR 4 final is currently being reviewed by OMB. The UCMR 4 final is expected to be published late 2016/early 2017.

UCMR 3: The UCMR 3 quarterly Data Summary and detailed sample results (based on data reported as of July 1, 2016) were posted to the National Contaminant Occurrence Database on August 31, 2016 (<https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3>). UCMR 3 required monitoring for 30 contaminants (28 chemicals and 2 viruses) during the monitoring period of January 2013 through December 2015. The small water system sample results are complete. A very limited number of large water systems that had to repeat or reschedule their sampling may still report results to EPA's data reporting system (SDWARS 3) until it closes on December 31, 2016. The final dataset will be posted in early 2017.

Upcoming Events and Conferences

Upcoming FSTRAC Webinar

The Winter 2017 FSTRAC Webinar is tentatively scheduled for January 2017. Additional details will be provided to FSTRAC members in the coming weeks.

SETAC North America Annual Meeting

SETAC will be holding its 37th annual North America meeting on November 6–10, 2016, in Orlando, Florida. Additional information is provided on the SETAC Website: <http://orlando.setac.org/>

SOT Annual Meeting

SOT will be holding its 56th annual meeting on March 12–16, 2017, in Baltimore, Maryland. Information about the March 2017 meeting and other upcoming events is provided on the SOT website: <http://www.toxicology.org/>

EPA IRIS Upcoming Events

EPA IRIS holds public meetings and workshops on issues in risk assessment. IRIS will be holding a SAB Review (Teleconference) Meeting for RDX on November 17, 2016. Additional information is provided on the EPA IRIS workshop website: <https://cfpub.epa.gov/ncea/iris2/events.cfm>.