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FSTRAC Newsletter

FEDERAL-STATE TOXICOLOGY RISK ANALYSIS COMMITTEE

What Is FSTRAC?

FSTRAC's purpose is 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. 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. Information on FSTRAC can be found on the EPA web page (https://www.epa.gov/water-research/federal-state-toxicology-risk-analysis-committee-fstrac)

Recent Webinars

FSTRAC holds several webinars each year to share information through presentations and discussions regarding human health risk analysis and water quality issues.

May 2017 FSTRAC Webinar

EPA held a FSTRAC Webinar in May 2017 during which the following topics were discussed:

HECD Accomplishments and Workplan for FY 2017 (presented by Ms. Betsy Behl, EPA/OW): Ms. Behl presented an overview of EPA OST/HECD's 2017 accomplishments since October 2016 in the areas of aquatic life (e.g., final technical report on protecting aquatic life from the effects of hydrologic alteration, plastics white paper), nutrients (e.g., responding to Ocean Acidification Petition from the Center for Biological Diversity), and human health (e.g., Contaminant Candidate List 4, support for perchlorate peer review of biologically-based dose response [BBDR] model). She also described EPA OST/HECD's 2017 priorities, including developing draft updated aluminum aquatic life criteria, developing a biosolids screening model, revising nutrient criteria for lakes and reservoirs for designated uses, supporting Safe Drinking Water Act activities (e.g., perchlorate peer review, regulatory determinations), performing biological condition gradient pilot projects, and developing draft criteria for coliphage-a viral indicator.

EPA's Human Health Benchmarks for Pesticides in Drinking Water (presented by Dr. Jamie Strong, EPA/OW): Dr. Strong presented an overview of EPA's human health benchmarks for pesticides in drinking water, including background information, details on how benchmarks were calculated, and how the Food Quality Protection Act Safety Factors were applied. Dr. Strong also provided a description of the overall changes to the updated human health benchmarks.

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).

The Fourth Unregulated Contaminant Monitoring Rule (UCMR 4) (presented by Ms. Melissa Simic, EPA/OW): Ms. Simic presented information on EPA's Fourth Unregulated Contaminant Monitoring Rule (UCMR 4), including a description of the general flow of the Safe Drinking Water Act regulatory processes, background information on the UCMR, UCMR 4 applicability to public water systems, and a timeline of UCMR 4 implementation. She noted that the contaminants to be monitored for UCMR 4 would include cyanotoxins, haloacetic acids, metals, pesticides, alcohols, and semivolatile organic chemicals. Ms. Simic presented information on UCMR 4 sampling frequency, timing, and locations, as well as reporting data elements for large and small public water systems.

The Penobscot River and Environmental Contaminants: Assessment of Tribal Exposure through Sustenance Lifeways (presented by Ms. Valerie Bataille and Dr. Richard Sugatt, EPA Region 1): Ms. Bataille and Dr. Sugatt described the Regionally Applied Research Effort (RARE) that was designed to assess the potential level of contaminant exposure and risk faced by Penobscot Indian Nation Tribal Members who fish, hunt, trap, and gather according to their cultural lifeways for sustenance practices. The presenters explained that this was a preliminary screening to assess the levels of PCBs, dioxins/furans, mercury and methylmercury in flora and fauna significant for maintaining cultural lifeways. This preliminary risk screening provided the Penobscot Indian Nation Tribal members with new information regarding the safe levels of ingestion for snapping turtle and safe levels of consumption to tribal members who maintain sustenance practices according to their cultural lifeways. The RARE Study also developed visualization of the data depicting the risk level for each sample location by species to assist tribal members when determining where they should and should not maintain their cultural lifeways.

October 2017 FSTRAC Webinar

EPA held a FSTRAC Webinar in October 2017 during which the following topics were discussed:

OW OST HECD 2017 Accomplishments and Workplan for FY 2018 (presented by Dr. Jamie Strong, EPA/OW): Dr. Strong presented an overview of EPA OST/HECD's 2017 accomplishments and priorities for 2018 in the areas of aquatic life criteria, human health criteria, nutrients, biosolids, and biocriteria.

Draft National 304(a) Aluminum Aquatic Life Criteria (presented by Ms. Diana Eignor, EPA/OW): Ms. Eignor provided an overview of EPA's draft national 304(a) aluminum aquatic life criteria, including background information on sources of aluminum, EPA's current 1988 aluminum criteria, and state aluminum standards. She provided details on the criteria development process, framework for the updated draft aluminum criteria, aluminum criteria calculator, and overall status of aluminum aquatic life criteria development.

Tools to Support Cyanotoxin Recreational Water Quality Standards/Advisories (presented by Ms. Tracy Bone, EPA/OW): Ms. Bone provided an overview of tools to support cyanotoxin recreational water quality standards and advisories, including EPA's webpages for *Monitoring and Responding to Cyanobacteria and Cyanotoxins* and for *Monitoring and Responding to Cyanotoxins in Recreational Waters* (https://www.epa.gov/nutrient-policy-data/monitoring-and-responding-cyanobacteria-and-cyanotoxins-recreational-waters). She described additional tools that would be developed in the future to support cyanotoxin recreational water quality standards and advisories.

The Application of an Updated Cramer et al. Decision Tree to Safety Assessment (presented by Dr. Szabina Stice, U.S. Food and Drug Administration): Dr. Stice provided background information about the Cramer et al. Decision Tree (CDT) and Threshold of Toxicological Concern (TTC). She provided details about the comprehensive revision of the CDT, called the Expanded Decision Tree (EDT). Dr. Stice also described the applications of EDT, including food safety assessment; post-market surveillance; safety assessment of impurities in pharmaceuticals, contaminants in ground water, and personal care products/cosmetics and their ingredients; and evaluating the toxicity of mixtures.

Information from States Developing Guidance for Specific Chemicals

Montana Department of Environmental Quality

The Montana Department of Environmental Quality (DEQ) and British Columbia Ministry of Environment and Climate Change Strategy (ENV) are jointly leading an effort to develop a site-specific selenium criteria/objective for Lake Koocanusa. Lake Koocanusa is a reservoir in northwestern Montana and southeastern British Columbia formed by Libby Dam. Coal mining along the Elk River in British Columbia is the main source of selenium in the lake.

The two agencies have invited selenium experts to participate on a technical committee to provide information and analysis for the development of a site-specific selenium criteria/objective for the lake. A model framework has been developed, and 2017 is the third year of water and suspended particulate collection www.sciencebase.gov/catalog/item/58ecf623e4b0b4d95d335366. In addition, selenium concentrations in plankton and fish have been collected. DEQ and ENV are expected to begin criteria/objective development within the next twelve months. For more information on this work please see the following website: http://lakekoocanusaconservation.pbworks.com.

Texas Commission on Environmental Quality Development Support Documents

The Toxicology Division at the Texas Commission on Environmental Quality (TCEQ) finalized three Development Support Documents (DSDs) in August 2017: Cobalt and Cobalt Compounds, Decane and C10 Isomers, and Hexane and C6 Isomers. The TCEQ also proposed two DSDs for public comment: (1) Ethylene Dibromide and (2) Manganese and Inorganic Manganese. Information on these and other projects currently in progress can be found on the TCEQ's Toxicology Webpage: https://www.tceq.texas.gov/toxicology.

Risk Assessment

Drinking Water

Minnesota Department of Health

The Minnesota Department of Health (MDH) has recently completed toxicology reviews and derived health-based water guidance for the following chemicals: dinoseb, glyphosate and degradate aminomethylphosphonic acid (AMPA), perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS), and thiamethoxam. More detailed information can be found on MDH's Human Health-Based Water Guidance Table website at: http://www.health.state.mn.us/divs/eh/risk/guidance/gw/table.html. Chemicals currently under full toxicology review by MDH include: N-nitrosodimethylamine (NDMA), boron, perfluorobutane sulfonate (PFBS), and bromodichloromethane.

MDH has also been working on re-evaluating existing guidance and updating values where needed. These re-evaluations are a quick examination of the available data for a chemical and include an update to the methodology where applicable, and sometimes trigger a full toxicology review. Re-evaluation reviews have been completed for numerous (19) chemicals, and updated guidance has been issued for (partial list): alachlor, acetochlor, chloroform, dichlorofluoromethane (DCFM), 1,1,1-trichloroethane, and others. This guidance is contained in the table hyperlinked above. Information specific to the re-evaluation process can be found under the "Updating Guidance" section at: http://www.health.state.mn.us/divs/eh/risk/guidance/devprocess.html.

Minnesota Department of Health

The MDH has finalized its review of PFOS and PFOA. Since the early 2000s, Minnesota has been grappling with per- and polyfluoroalkyl substance (PFAS) contamination of drinking water sources impacting thousands of residents. Recently, in May 2017, MDH published updated guidance for PFOS and PFOA. This guidance leverages EPA's 2016 Health Advisories, specifically the toxicological review of the database.

To further pinpoint the most sensitive and/or most highly exposed population, MDH assembled a kinetic model to study the impact of drinking water/formula exposures and breastfeeding exposures. Based on this model, the highest exposure potential (predicted serum level) was found for infants who breastfeed from a mother who was chronically exposed. MDH's website contains further information:

- PFOS: http://www.health.state.mn.us/divs/eh/risk/guidance/gw/pfos.pdf
- PFOA: http://www.health.state.mn.us/divs/eh/risk/guidance/gw/pfoa.pdf

More detailed information (review worksheets, model background document, Excel-based model) is also available upon request. Contact Helen Goeden (helen.goeden@state.mn.us) at MDH.

New Jersey Department of Environmental Protection

On November 1, the New Jersey Department of Environmental Protection announced that it plans to set Maximum Contaminant Levels (MCLs) for perfluorooctanoic acid (PFOA) and perfluorononanoic acid (PFNA). New Jersey will be the first state to set MCLs requiring statewide testing of public drinking water systems for these compounds. An MCL of 13 ng/L for PFNA was proposed in August 2017, and the public comment period has ended. A proposal of an MCL of 14 ng/L for PFOA will be forthcoming. A press release announcing the plans to set these MCLs and providing additional information about PFOA and PFNA in New Jersey is found at http://www.nj.gov/dep/newsrel/2017/17_0104.htm.

The NJDEP MCLs for PFOA and PFNA are based on recommendations made by the NJ Drinking Water Quality Institute (DWQI), an advisory body established in the New Jersey Safe Drinking Water Act. The DWQI considers three factors in developing recommended MCLs: the Health-based MCL (the health based goal), the analytical Practical Quantitation Level (PQL; the level to which the chemical can be reliably measured by the certified laboratory community), and the capability of available treatment removal technology. The MCLs for PFOA and PFNA are based on the Health-based MCLs since achievement of the Health-based MCLs is not limited by the PQLs or treatment removal capability. The documents providing the basis of the MCLs for PFOA and PFNA are found on the NJ DWQI website at http://www.nj.gov/dep/watersupply/g_boards_dwqi.html.

Additionally, the NJ DWQI has developed draft documents that provide the basis of a recommended MCL of 13 ng/L for perfluorooctane sulfonate (PFOS). These documents are posted for a 60 day public comment period on the NJ DWQI website at http://www.nj.gov/dep/watersupply/g_boards_dwqi.html.

Clean Water

EPA Materials for Cyanobacterial Bloom Management in Recreational Waters

EPA released a suite of materials states and communities can use to protect public health during harmful algal bloom (HAB) outbreaks caused by cyanobacteria. Some blooms are capable of producing toxins, called cyanotoxins, which can harm humans and animals, affect drinking water sources and impact local economies. Public health officials and outdoor water recreational managers can use EPA's online resources to develop a cyanotoxin monitoring program, communicate potential health risks to the public, and address HAB outbreaks. View the materials at: https://epa.gov/nutrient-policy-data/monitoring-and-responding-cyanobacteria-and-cyanotoxins-recreational-waters

March 2016 Coliphage Experts Workshop

EPA has published a peer-reviewed proceedings document on our March 2016 Coliphage Experts Workshop. The workshop is part of an ongoing effort to build the scientific basis for coliphage-based water quality criteria. The proceedings document outlines workshop topics and overall findings. Twelve internationally recognized experts on the science of coliphage and its usefulness as a viral indicator in recreational waters participated in the workshop. Experts represented a spectrum of perspectives from academia, federal agencies (EPA, CDC, FDA), and the wastewater industry. The findings were presented publicly at EPA's 2016 Recreational Waters Conference in New

Orleans. View the document at: https://www.epa.gov/wqc/microbial-pathogenrecreational-water-quality-criteria#coliphage

Algal Indicators in Streams: A Review of their Application in Water Quality Management of Nutrient Pollution

EPA has published a summary paper on the application of algae as an indicator of nutrient pollution in streams. This paper describes the use of algal indicators to develop water quality diagnostics for nutrient pollution in the United States and reviews scientific developments in the application of algal indicators across the world. Water quality managers can use this technical resource to better understand when and how to utilize algae as indicators of nutrient pollution in stream ecosystems.

Background. Algae are critical components of stream ecosystems. They are primary producers of organic matter, take up nutrients, and serve as a food resource in streams. In this way, algae supply stream food webs with energy and mediate a variety of stream chemical processes. Their population and biomass dynamics affect the stream food web, and clearly impact the ability of people to obtain benefits from these systems. There are a wide variety of methods for sampling, identifying, and enumerating algae in streams. The methods are inexpensive, easy to apply, and can be designed to detect sensitivity to a variety of pollutants, including nutrient pollution. Algae's ecological relevance, clear links to designated uses, and the practicality of measuring them make them an important indicator of nutrient pollution and useful as an assessment endpoint in the development of numeric nutrient criteria.

Application of Algal Indicators in the U.S. Despite their practicality and variety, algal indicators of nutrient pollution — the quantitative measures of algae that are associated with or correlate to excess nitrogen and phosphorus — are not widespread. Less than 50 percent of U.S. states appear to evaluate algae regularly. However, those states using algae have applied them to both the development of nutrient and biocriteria, as well as assessment and stressor diagnosis. For example, Maine, Montana, and Kentucky have active monitoring and assessment programs that focus on stream algae, including incorporating both algal species composition and biomass measures into their assessment programs and into nutrient criteria development.

Algal Indicator Research. From the literature, it appears algal indicators are more widely employed in Europe, where they are used to assess water quality, biological condition, and identify water quality stressors like nutrients and acidity. The European Union (EU) is ahead of the U.S. not only in applying this assemblage, but also in working across jurisdictions to resolve methodological and interpretive differences in algal assessment information. EU methodologies and their application are well documented, which should help the U.S. in developing consistent application.

Where can I find more information? Please contact Brannon Walsh for more information on this paper: Walsh.Brannon@epa.gov. Access the full text of the white paper here: https://www.epa.gov/nutrient-policy-data/algal-indicators-streams-review-their-application-water-quality-management.

For additional information on EPA efforts regarding nutrient pollution, visit EPA's Office of Water Nutrient Pollution website (https://www.epa.gov/nutrientpollution) which houses updates on nutrient pollution research, reports, and technical resources.

Water Reuse Studies in Minnesota

MDH is partnering with the University of Minnesota to complete two studies on microbial occurrence in non-potable water reuse systems. The first study, which focused on a rainwater system for flushing toilets and a stormwater system for irrigating fields in a park has been completed. We expect to have an overview of results available from our website within the next couple of months. A second study, which will involve collecting samples from several different types of systems in Minnesota, is just starting. We hope to have that study completed in a couple of years.

In addition, MDH is working with other agencies and stakeholders to make recommendations for regulatory and nonregulatory approaches to water reuse. A final report will be available in late 2017 or early 2018.

Treatability Issues for Contaminants

EPA Region 10's Assessment of Carbon Amendments to Reduce Impacts of Tailings from an Abandoned Mercury Mine

Cinnabar mine is an abandoned mercury (Hg) mine which operated from 1921 to 1958 and is located in central Idaho. Cinnabar Creek flows through the tailings at the mine site and delivers water with elevated Hg concentrations into the East Fork of the South Fork of the Salmon River. The majority of the Hg load to the river occurs as particulate-bound Hg during periods of elevated discharge in the spring snow-melt period. Limited road access to the mine site precludes traditional heavy equipment removal options. As a result, alternative remediation strategies are being considered that involve the addition of organic material to the tailings pile to promote vegetation growth and decrease erosion. While this action could reduce the bulk loading of Hg to Cinnabar Creek, it also has the potential to increase methylmercury (MeHg) production at the site through methylation by anaerobic bacteria. MeHg is more toxic and the form that can bioaccumulate in fish downstream of the site. Selected remediation of the site aims to reduce Hg loading to the creek and at the same time not increase downstream MeHg concentrations.

The Region 10 Laboratory, Office of Environmental Review and Assessment (OERA)-Environmental Services Unit and Office of Environmental Clean-up conducted a study that focused on addressing potential increases in MeHg production at the Cinnabar mine site as a function of organic matter amendments. The study was designed to help site managers make effective decisions regarding site removal and remediation options focused on reducing water concentrations of total-Hg and not increasing concentrations of MeHg. The controlled laboratory experiments involved a paired experimental design involving six mesocosms of tailings material which assessed the impact of Hg mobility and MeHg formation from tailings with organic material amendments and those left un-amended. The experimental results showed that if the mesocosm tailings are allowed to go anoxic, the organic carbon amendments can result in an increase in the MeHg and total-Hg concentrations in porewater. However, if the tailings do not become saturated and are oxic, the increase in MeHg production as a result of carbon amendments would be greatly reduced. These results are currently being used by site managers to design effective remediation options at the site that are optimized to reduce MeHg production and decrease Hg mobility to downstream waterbodies.

Dr. Chris Eckley (EPA Region 10), prepared the above description. For additional information, please contact Mr. Julius Nwosu (nwosu.julius@epa.gov) of EPA Region 10.

Publications Pertinent to Drinking Water Issues

Mudumbi, J.B.N., S.K.O. Ntwampe, T. Matsha, L. Mekuto, and E.F. Itoba-Tombo. 2017. Recent developments in polyfluoroalkyl compounds research: a focus on human/environmental health impact, suggested substitutes and removal strategies. *Environ Monit Assess.* 189(8):402. doi: 10.1007/s10661-017-6084-2. Epub 2017 Jul 18. Review. PubMed PMID: 28721589.

Bartell, S.M. 2017. Online serum PFOA calculator for adults. *Environ Health Perspect.* 125(10):104502. doi: 10.1289/EHP2820. PubMed PMID: 29068316.

Upcoming Events and Conferences

Upcoming FSTRAC Webinar

The next FSTRAC Webinar is tentatively scheduled for winter 2018. Additional details, including the date of the next FSTRAC Webinar, will be provided to FSTRAC members in the coming weeks.

SRA 2017 Annual Meeting – Society for Risk Analysis

SRA will be holding its annual meeting on December 10–14, 2017, in Arlington, Virginia. Additional information is available on the SRA website: http://sra.org/2017-annual-meeting

SOT Annual Meeting – Society of Toxicology

SOT will be holding its 57th annual meeting on March 11–15, 2018, in San Antonio, Texas. Additional information about the March 2018 meeting is provided on the SOT website: http://www.toxicology.org/events/am/am2018/

ASM Microbe 2018 – American Society for Microbiology

ASM will be holding its annual meeting on June 7–11, 2018, in the Georgia World Congress Center, in Atlanta, Georgia. Additional information is available on the SRA website: https://www.asm.org/index.php/asm-microbe-2018

SETAC North America Annual Meeting – Society of Environmental Toxicology and Chemistry

SETAC will be holding its 39th annual North America meeting on November 4–8, 2018, in Sacramento, California. Additional information is provided on the SETAC Events website: https://www.setac.org/events/event_list.asp