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CBP Water Quality Goal Implementation Team
Toxic Contaminants Workgroup
Meeting Minutes

Date: *Wednesday, February 10, 2020*
Time: 1:00 - 3:00 PM
Location: Conference Call (remote only)
Calendar Page: Link.

Chesapeake Bay Program
A Watershed Partnership

Agenda Item and Desired Outcome	Time	Background Docs, Notes, and Action Items
1. Introductions and Announcements • Final SRS Materials were approved at the January Management Board meeting • *Reminder:* STAC Proposals due February 16th • USGS Fact sheet on Microplastics in the Delaware River (https://pubs.er.usgs.gov/publication/fs20203071)	1:00	• Complete the toxic contaminant indicator • Update the PCB Story Map • STAC Proposal follow- up • Mercury Monitoring Network Follow- up
2. Round robin on Ongoing PFAS Work – TCW Leadership (30 min.) • Quick review of PFAS activities and revised Management Strategy and Logic and Action Plan • Follow up from SRS quarterly Management Board meeting • UMCES PFAS Report • Other Jurisdictions and Agencies round table to provide quick summary on ongoing efforts	1:10	• Discussion • Paper from UMCES/ MDE • Management Strategy and Logic and Action Plans
3. PFAS Proposal Development Work Session– TCW (1 hr. 20 min.) • *Objective 1:* To affirm there is a unique need to be met through a STAC Workshop related to presence and risk of PFAS in the Chesapeake Watershed. • *Objective 2:* If affirmed in Objective 1, invite input into content for the STAC Workshop Proposal • *Objective 3:* If not affirmed, lay out ideas for PFAS work for the coming 2 years.	1:40	• Discussion • STAC Workshop Overview • STAC RFP FY2021
4. Wrap Up and Adjourn	3:00	• ***Next meeting:* March 10, 2021**

Summary of Actions and Decisions

Action: Dave Whitall will investigate what additional PFAS efforts are occurring across NOAA and provide this information to TCW leadership. Additionally, Dave Whitall will share the project page for the Mussel Watch work in the Chesapeake Bay Watershed with TCW.

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Action: For more information, or to discuss Tom Ihde's biomagnification model of PFAS contamination in seafood, TCW members should email Tom Ihde at thomas.ihde@morgan.edu.

Action: If TCW members see an opportunity to collaborate when fish are collected for filets for potentially looking at the fish with histopathology to better understand the associated biological changes/effects, please reach out to Heather Walsh, USGS (hwalsh@usgs.gov).

Action: TCW are encourage to reach out to Lee Blaney (blaney@umbc.edu) if interested in working with him once passive samplers are developed for PFAS.

Action: TCW will draft an outline for the letter of support and send it to Denise Keehner and Rebecca Warns from MDE.

Action: TCW leadership and other interested parties will draft the PFAS STAC proposal. This will be sent out to the TCW for review prior to submission to STAC.

Action: TCW leadership will add Kelly Smalling to the writing group for the STAC proposal.

Action: TCW will add the following participants to the STAC Committee:

1. Michelle Lorah
2. Denise Keehner and/or Rebecca Warn
3. Kelly Smalling

Meeting Minutes

1. **Introductions and Announcements**
   - **a.** No additional announcements
2. **Round Robin on Ongoing PFAS Work**
   - **a.** Overview of PFAS activities and review of MS and LAP for the Research and Policy and Prevention Outcome within the Chesapeake Bay Program. Current plan within Research Outcome strategy outcome identified needs and actions related to PFAS (it was designated as a priority within the workgroup particularly related towards ecological risk and wildlife harm). Specific Management Approaches: MA 2: understand the influence of contaminants in degrading the health, and contributing to mortality, of fish and wildlife (MA 2.2, 2.3, 2.4); MA 3: Document the occurrence, concentrations, and sources of contaminants in different landscape (MA 3.2).
   - ***b.*** *MDE (Denise Keehner):*
     i. We have been focusing increased efforts to understand occurrence of PFAS in MD, to communicate to public, and manage risks that we find. We know that every state has a PFAS footprint of some kind based on combination of manufacturing, military, and possible AFFF sites. Our particular focus has been on human health and what are the most important roots of exposure to human health to reduce risks and identify continuing points of release to address those points. We did a pilot study of PFAS in oysters and integrated PFAS into fish tissue monitoring (about 19 PFAS compounds being considered). Survey of 135 POTW planned for 12/year over 5 years. Held a round table discuss in October to effectively look at current efforts, gaps, and next steps. MD have populations whose summer diet is blue crabs and there is PFAS in blue crabs. There are other kinds of uses of crab shells that could result in contamination elsewhere that

we are looking into. Also, we looked at gradient of salt and freshwater and how that could impact transportation and bioaccumulation potential of PFAS. We do not have a lot of resources, so we have to be strategic with what we do have.

c. *UMBC (Lee Blaney):* Our biggest effort is focused on developing new passive samplers and more diverse PFAS compounds into methods to develop new sampling strategies. Once prototypes are built, we would be happy to work with anyone. We also have collaborations to look at PFAS treatment for wastewater and drinking water. We have done some analytical work as well. We have some big plans for stabilization of PFAS in biosolids. We also have a proposal under review to look at PFAS within blue crabs (see Tom Ihde's information below). Kelly Smalling suggested discussing this with USGS once passive samplers are developed.

d. *MDNR (Denise Keehner):* DNR has been a partner with MDE on PFAS issues along with MDH. Just recently their PFAS analytical lab was selected to participate in a round table to discuss new methods for EPA.

e. *VA DEQ (Jeff Steers):* We also are working with a small budget. First thing we are doing is identifying sources to groundwater and public water systems. We continue to work with federal facilities with known sources. Main thing we are trying to do is look at finding groundwater hotspots for PFAS. We can identify about 700 facilities where they may have historically used or currently use of PFAS. We have GPS coordinates for these sites so we know where the discharge sources are. We are beginning a survey now to ask questions about current and past use which will allow us to identify higher risk areas. We are also looking at unlined landfills that are potentially causing contamination to ground and surface water. We will be potentially adding PFAS to these landfill's list of compounds to monitor. The strategy we are trying to take is identifying the needs and what actions we need to take. We will be forming a multi-agency task force to look at human health and natural resource impacts. We are also looking at developing a communication plan for PFAS compounds with VDH.

f. *DE (John Cargill):* Like other jurisdictions, DE is in a process of discovery. To date, most information we have is related to drinking water testing. Currently DNREC is leading a multi-agency response team to develop a monitoring system for PFAS; part of this will be developing a mobile carbon filtration system to clean contaminated drinking water sources. We will continue source tracking along with all the data we collect. Specific to CB watershed, site in Blades, DE was listed on NPL recently (plating sites along the Nanticoke River) . I also have started adding PFAS to fish tissue sampling. I have a study going on looking at mercury in largemouth bass and I am adding PFAS to see what I get. I also have some samples from other rivers that I will look at too. I would like to see drinking water, wildlife and human health criteria for PFAS like we've talked about with PCBs. We have an opportunity to collect information on an equal base which makes it easier to share.

g. *DOEE (John Maleri):* The District is in a similar state of discovery and most of our work has focused on drinking water (DC Water helps with this effort). We've just included PFAS as part of our fish studies. We are also looking at PFAS from the human health component in relation to service ware within the restaurant industry.

h. *PA DEP (Matt Kundrat):* Last year, we completed an extensive survey in conjunction with USGS and sampled areas suspected as hotspots. I haven't talked USGS closely, so I don't know when it will be officially published. This was the first step to assess how big a problem PFAS is in the state. Our next step is to start surveying fish and streams to find out where we are finding PFAS in fish. From a regulatory standpoint, we are moving forward with a couple things. The one I hope to move forward with the fastest is with a fish consumption advisory for PFAS. We have been working with the Great Lakes Consortium (GLC) on this. We are scheduling a meeting with our Fish and Boat Commission and Health department to present this work and hopefully they will approve our number for the advisory. Our safe drinking water people are working on coming up with an drinking water standard .

i. *WV (John Wirts):* Similar to other states we have focused on drinking water. We, along with our department of health and USGS, sampled all our drinking water systems. We looked at 20 different PFAS analytes. This is almost complete. We have not moved towards adding PFAS to fish tissue sampling, but I appreciated hearing from other states that they are moving in this direction. We probably will be too.

j. *NOAA (Dave Whitall, AK Leight):* Not familiar with PFAS work across all of NOAA. I will try to investigate that and get back to the group. We quantified PFAS oyster tissues and sediment in the Chesapeake. This was in the Mussel Watch report. We also are looking at ecotoxicity in some of the new compounds proposed for firefighting foam. We do have a close relationship with the NIST and invited one of them to the round table in MD. Moving forwards, if there are interests in standardizing methods, that's the group I would recommend working with. AK would be happy to be a liaison.

k. *EPA (Raffi Marano):* nothing at this time, at least in the work that Raffi does. Region 3 water division doesn't have this on their radar. Bay Program office is working on it.

l. *USGS (Chris Custer, Heather Walsh, Kelly Smalling):* USGS has been looking at PFAS using tree swallows as the indicator species. Chris has been looking at study sites in the Bay. We are hoping to add additional sites with the Bay Watershed. Greg Allen asked how tree swallows became the indicator species. Tree swallows were chosen because they feed on the aerial stage of benthic invertebrates. If there are contaminants in the sediments it gets in to the invertebrate and then the birds. These birds will also use artificial nest boxes and you can put these up along areas that have suspected PFAS contamination. The swallows forage close to the nest box and their feeding habits don't fluctuate. There is also a lot of reproductive data already available that we can use as comparison. We are also using smallmouth bass for fish sampling because this is what we use the most, but it would also be good to see the effects in other types of fish. Natalie Karouna and Michelle Walsh lead the team for the North Atlantic PFAS group.

m. *Morgan State University (Tom Ihde):* Their proposed work uses an existing model that incorporates a wide variety of environmental factors spatially. Once developed it can be used for any contaminant. The approach here is intended to be a cost-effective alternative to estimate PFAS contamination in species. The first species we are using is Blue Crab. This pilot study is designed to provide the concentration information spatially because contaminated animals move, and their diets are dynamic.

n. *CBC (Marel King):* In MD, in particular, there is some legislation being introduced for firefighting foam. The MD bill also addresses carpets, food containers, and gloves used in food service. We are definitely focused on the source side of it. Any information on how to better target our efforts, whether its source or remediation or the level founding and where that needs to go that would be helpful.

o. *Links:*

i. **Link to the report summarizing the UMCES-MDE Roundtable:** https://mde.maryland.gov/programs/Water/water_supply/Documents/PFAS-Roundtable2020-10-05.pdf

ii. **Link to Phase 1 Public Water System Study approach:** https://mde.maryland.gov/programs/Water/water_supply/Documents/PFAS_PWSPFAS_Study_Factsheet.pdf

iii. **Link to information on St. Mary's pilot study measuring PFAS concentrations in oyster tissue and surface water:** https://mde.maryland.gov/programs/Water/FishandShellfish/Pages/StMarys_PFAS.aspx

iv. **NOAA CEC work in CB**: https://repository.library.noaa.gov/view/noaa/20268

v. **USGS Capability PFAS:** https://www.usgs.gov/centers/nj-water/science/region-1-north-atlantic-appalachian-pfas-capability-team?qt-science_center_objects=0#qt-science_center_objects

vi. **Here is the project page for the NOAA Mussel Watch work in Chesapeake Bay, which included PFAS work**. At the bottom of the page, there is a link to the scientific report (tech memo, click on the "Products" button): https://coastalscience.noaa.gov/project/mussel-watch-program-assessment-chesapeake-bay-charleston-harbor/

3.

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4. PFAS Proposal Development Work Session

a. Discussion:

i. *John Cargill:* consistency across the basin is important for achieving our goals. Understanding differences or having someone who does understand them and explain them to the group would be useful.
ii. *Tom Parham:* I would like to hear more from Denise on the round table and whether this workshop would go beyond that workshop.
iii. *Denise:* the PFAS round table we had looked at what we are doing and then looked at key data gaps in MD and then advice on where to focus efforts to use resources effectively. *Most of the focus of the workshop was focused on the human health side of things*. We did not focus at all on ecological and species impacts. The discussion was through the lens of human health.
iv. *Tom:* I think we need to point out that this early work has been done but that we are going to be focusing on other areas. I would argue that you should extend it to human health because seafood advisories are results of ecological impacts, but they still affect human health.
v. *Scott Phillips:* Fish consumption advisories seem like an important link between human health and ecological risk.
vi. *John Cargill:* I was on a call and I seem to recall that someone was developing aquatic life indicators for PFAS.
vii. *Jeff Steers:* It would be helpful to VA to have a Chesapeake Bay wide model sampling program. How are we doing it in each state, especially along waterways that are share between states? It would be important to have a model plan that could be individualized for each state.
viii. *Scott Phillips:* So, what you are suggesting is creating agreed upon guidelines for sampling within each state.
ix. *Emily Majcher:* We would need to understand the state of science from methods and analytical perspective. John Cargill has raised in past meetings that the way the fish is sampled should possibly be different than other contaminants. I would suggest that we won't be able to design a model unless we know what every is doing.
x. *Jeff Steers:* It could be a springboard for a longer discussion. It may not be solved before a workshop but hopefully we have enough fruit on the tree that it could create additional, future discussion.
xi. *Scott Phillips:* theoretically, we could summarize what is being done as part of the prework and then synthesize that during the workshop. Any other on gaps you would like addressed?
xii. *Lee Blaney:* something that should be a focus on the workshop should be on the dose factors. It's been established for some of the compounds but what about the rest of them? The reference doses will be the basis for developing those thresholds. I didn't even know that states were developing the aquatic life criteria. How can they even develop that right now etc.
xiii. *Matt Kundrat:* A lot of the data that we have is for PFOS and PFOA. Almost 70% of the compounds the GLC saw was PFOS because it bioaccumulates the most. There can be 4-8,000 compounds out there and we are using the two we know the most about to extrapolate. As far as aquatic life criteria, the best state to look at is Michigan. Minnesota also had some criteria, but it was more site specific. The

numbers I saw were orders of magnitude less stringent compared to protecting human health, which is parts per trillion. For the aquatic life community, it was only parts per million. Is it going to be worth all the time and effort if we know the human health are going to be much more stringent?

xiv. *Chris Custer:* I realize PFAS is 60-70% of the total in birds. There has been some research out of Denmark and Sweden about other PFAS compounds. I think it's important to keep an open mind to make sure we aren't overlooking a PFAS compound that has more of an impact.

xv. *Marel King:* where can we target our efforts to get the most bang for our buck. The legislation currently out there is directed towards sources. What will have the most impact?

xvi. *Scott Phillips:* it is important to think about mitigation. Good point.

xvii. *Emily Majcher:* I was going to raise that question because our past efforts in workshops has been directed towards occurrence and science. Are we biting off too much or is it better to focus our efforts on a delineation/ monitoring/ status component? Is that an objective we would like to include? Or is it enough to just try to wrap around the monitoring piece?

xviii. *Tom Parham:* this is an excellent and necessary question. I don't mind having such a wide scope as long as we have a directed discussion towards specific parts of this. If we want to go deeper though this may too broad.

xix. *Michelle Lorah:* I agree that remediation is a whole other issue. That would be more than enough for a day and a half workshop. I think it's more about those transformations in other parts of the watershed. Looking at pathway changes is important, I think. Where the sources are in relation to historical inputs compared to present ones, is an important question, and how slow/ fast is it moving through the system? That would give you an idea of what the mitigation might need to be.

xx. **Participants:**
    1. Michelle Lorah would be interested in participating
    2. MDE will draft support letter
    3. Denise Keehner and/or Rebecca Warn would be interested in participating
    4. Kelly Smalling can help with the proposal

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5. Wrap up and Adjourn

Call Participants
Hilary Swartwood, CRC
Lisa Ochsenhirt, AquaLaw

Marel King, CBC
John Cargill, DNREC
John Maleri, DOEE
Raffi Marano, EPA
Greg Allen, EPA
Doug Austin, EPA
Rebecca Warns, MDE
Denise Keehner, MDE (Ass. Sec.)
Paul Hlavinka, MDE
Tom Parham, MDNR
Tom Ihde, Morgan State University
AK Leight, NOAA
Dave Whitall, NOAA
Matt Kundrat, PA DEP
Rebecca Whiteash, PA DEP
Chris Custer, USGS
Scott Phillips, USGS
Kelly Smalling, USGS
Ken Hyer, USGS
Heather Walsh, USGS
Emily Majcher, USGS
Michelle Lorah, USGS
Caitlyn Dugan, USGS
John French, USGS
Natalie Karouna, USGS
Lee Blaney, UMBC
Jeff Steers, VA DEQ
Mark Richards, VA DEQ
John Wirts, WV DEP