Curt Andersen

[redacted]

Suamico, WI 54313

November 30, 2021

Wisconsin Department of Natural Resources

Attn: Meghan Williams - WY/3

PO Box 7921

Madison, WI 53707-7921

To Whom It May Concern:

Subject: Ground water protection

We all know that PFAS and PCBs and many other chemicals have RUINED our drinking water, ground water, and bays, lakes, and rivers. Polar bears have these contaminants in their blood, as do walruses and seals. I would guess penguins do, too. That junk is everywhere. The oceans and seas and lakes and rivers are all polluted because of ultra-lame rules regarding the use of chemicals that have not been proven *safe before they are used*, as is done in most European countries that are not hog-tied by soulless corporations.

We know that the PFAS (PFOA and PFOS) are dangerous and that they cause all sorts of maladies, so the issue is how to stop these chemicals from entering our waters and air, and how to filter out these contaminants from our drinking water, and how to safely eat fish, ducks, geese, and land animals.

I believe that such rules do not go far enough. The companies that profited from the sales of chemicals, they knew were dangerous, should be responsible for removing the pollution from all waters.

Surely, rigorous testing is done to find out how high a level can be tolerated in the general public, but also with those with compromised immune systems, or a genetic predisposition to their harmful effects.

I do not know if these chemical pollutants can be cleaned from our lakes, rivers, oceans and ground water, or how long it might take, or the cost. I have participated in years and years of attempts to get the PRPs in the Fox River cleanup to do just that with PCBs. These companies engaged in deception, arguing that the chemicals were not dangerous, and that they were trying to be good citizens by recycling, as if that made a difference to their company profits. In that case, the PCBs were discovered over 150 years ago, and their toxicity was learned within twenty years, so ignorance by the mill owners was no excuse.

I suggest that the DNR formulate rules that bar these PFAS from use in ANY capacity, and that the companies that created and discharged these chemicals pay for all studies, all cleanups, and future monitoring. I suggest that the DNR be aware that powerful industries will fight them tooth and claw to save money. I also suggest that DNR adapt the European Model for proving chemicals to be safe before using them willy-nilly.

DNR's duty is to protect the wild life, the land, and the waters of Wisconsin because doing so protects the citizens and visitors that bring money to the state.

Sincerely,

Curt Andersen

Curt Andersen

[redacted]

[redacted]

Williams, Meghan C - DNR

From: Rich and Jess Bernstein [redacted]
Sent: Wednesday, December 1, 2021 9:41 PM
To: DNR 105 PFAS Rule
Subject: Support Surface Water Standards

I'm asking you to support Board Order WY-23-19: Surface Water Standards. PFAS pollution poses serious public health risks for families across Wisconsin and threatens the treasured rivers, lakes, and streams that make our state special. No one should be forced to bear the financial and health burden of industrial pollutants contaminating our water resources in order to protect corporate profits. The proposed standards are informed by the best science available to protect public health and are in line with those put forward by other states. The DNR's efforts to set standards for PFAS in our surface water are a starting point for cleaning up the contamination already out there and preventing more from occurring.

Thank you.
Jess Bernstein

Williams, Meghan C - DNR

From: Yvonne Besyk [redacted] Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Tuesday, December 14, 2021 2:23 PM
To: DNR 105 PFAS Rule
Subject: WY-23-19 Comment

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Wisconsin Department of Natural Resources,

Thank you for the opportunity to provide input on this rule. I welcome the action taken by the Evers Administration to address PFAS. This widely-used family of chemicals is an emerging water concern and has been popping up everywhere in Wisconsin. They are linked to many negative health outcomes, including cancer, increased cholesterol, reproductive concerns, effects on the immune system, and more. Clearly, it warrants this WDNR response.

PFAS have been found in communities including Madison and Marinette, and we must act now to prevent further exposure. We support the development of a surface water standard for PFAS chemicals, which will enable the state to address industries that discharge the chemicals into waste and surface waters. The EPA has not moved quickly to list PFAS chemicals to the Clean Water Act, Clean Air Act, RCRA or Superfund, and states must move forward ahead of federal progress to control PFAS pollution. Wisconsinites are experiencing the impacts of PFAS contamination right now.

I support the adoption of the proposed surface water standards for PFOS and PFOA. In addition to the source reduction and pollution minimization plans that the state is proposing, it should immediately revise WPDES permits for those industrial dischargers known to be the source of PFAS into wastewater. This includes metal plating, landfills, airports, and some paper, chemicals, textile, and plastics manufacturing sites. These industries have historically used PFOS and PFOA, and continue to use and emit closely related PFAS compounds.

In its consideration of the costs of PFAS testing and control for industrial facilities with PFAS contamination, the state should also consider the costs of pollution to public health and ecosystems. Removing PFAS from drinking water sources is incredibly expensive. There are currently no technologies that can reduce or eliminate PFAS from fish and wildlife.

In addition to PFOS and PFOA, Wisconsin should set similar limits for chemicals like PFBS, GenX and PFHxS which have replaced PFOS and PFOA in many industries. These chemicals show similar harms to people. Regulating replacement PFAS will ensure that industries do not simply switch from PFOS and PFOA to closely related alternatives which are similarly toxic and persistent in the environment.

Thank you for your work to protect Wisconsinites? health and for the opportunity to be a part of this rule-making process.

Sincerely,

Yvonne Besyk

[redacted]
Salem, WI 53168
[redacted]

This message was sent by KnowWho, as a service provider, on behalf of an individual associated with Sierra Club. If you need more information, please contact Lillian Miller at Sierra Club at core.help@sierraclub.org or (415) 977-5500.

Williams, Meghan C - DNR

From: Robin Downs [redacted]
Sent: Thursday, December 2, 2021 7:40 AM
To: DNR NR 809 Comments; DNR 105 PFAS Rule
Cc: Robin Downs
Subject: Support for PFAS standards

I'm writing to urge you to support the adoption of BOTH Drinking Water standards and Surface Water Standards for PFAS in our water

Board Order DG-24-19 would set drinking water standards. These are needed because

- Widespread drinking water testing for PFAS will not happen until DNR has standards in place.
- We cannot wait another 2-3 years for the EPA to set national PFAS standards.
- PFAS limits established by the EPA for drinking water won't apply to private wells, leaving thousands of rural Wisconsin families unprotected, so Wisconsin must act.
- The state must act to protect our water and the health of our communities.

Board Order WY-23-19 would set Surface water standards. These are needed because

- DNR's efforts to set standards for PFAS in our surface water are a starting point for cleaning up the contamination already out there and preventing more from occurring.
- PFAS pollution poses serious public health risks for families across Wisconsin and threatens the treasured rivers, lakes, and streams that make our state special.
- No one should be forced to bear the financial and health burden of industrial pollutants contaminating our water resources in order to protect corporate profits.
- The proposed standards are informed by the best science available to protect public health and are in line with those put forward by other states.

Thank you for your work

Robin Downs
[redacted]
Cross Plains, WI 53528

Williams, Meghan C - DNR

From: Kayla Furton [redacted]
Sent: Monday, December 13, 2021 12:10 PM
To: DNR 105 PFAS Rule
Subject: Comments Re: Surface Water PFAS Standards

Follow Up Flag: Follow up
Flag Status: Flagged

My name is Kayla Furton and I am a resident and Town Board Supervisor in the Town of Peshtigo. My community faces a massive PFAS contamination in drinking water wells, surface water, and groundwater which is why I will continue to testify and submit written comments in support of all PFAS rule-making efforts. Drinking, surface, and ground water are inextricably linked and for standards to be meaningful to one, it is essential there are standards for all.

I am strongly in support of strict Surface Water Standards for PFAS as a first step since these limits would give the DNR the tools the agency needs to limit discharges of PFAS into our lakes, rivers and streams. Limiting PFAS in our surface waters would also help mitigate additional exposure pathways such as swimming in contaminated waters or consuming contaminated fish or deer. Protecting the environment is a valid reason on its own but protecting the environment also protects local economies, property values, and human health.

My community (and sadly, many other communities throughout Wisconsin) are paying for the consequences of unchecked PFAS discharges and it is time that we prioritize people over corporate profits.

Thank you,

Kayla Furton
[redacted]
Marinette, WI 54143
[redacted]

Williams, Meghan C - DNR

From: Kim Irvin [redacted] Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, December 15, 2021 9:44 AM
To: DNR 105 PFAS Rule
Subject: WY-23-19 Comment

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Wisconsin Department of Natural Resources,

Clean Water is Essential! Please Protect It!

Thank you for the opportunity to provide input on this rule. I welcome the action taken by the Evers Administration to address PFAS. This widely-used family of chemicals is an emerging water concern and has been popping up everywhere in Wisconsin. They are linked to many negative health outcomes, including cancer, increased cholesterol, reproductive concerns, effects on the immune system, and more. Clearly, it warrants this WDNR response.

PFAS have been found in communities including Madison and Marinette, and we must act now to prevent further exposure. We support the development of a surface water standard for PFAS chemicals, which will enable the state to address industries that discharge the chemicals into waste and surface waters. The EPA has not moved quickly to list PFAS chemicals to the Clean Water Act, Clean Air Act, RCRA or Superfund, and states must move forward ahead of federal progress to control PFAS pollution. Wisconsinites are experiencing the impacts of PFAS contamination right now.

I support the adoption of the proposed surface water standards for PFOS and PFOA. In addition to the source reduction and pollution minimization plans that the state is proposing, it should immediately revise WPDES permits for those industrial dischargers known to be the source of PFAS into wastewater. This includes metal plating, landfills, airports, and some paper, chemicals, textile, and plastics manufacturing sites. These industries have historically used PFOS and PFOA, and continue to use and emit closely related PFAS compounds.

In its consideration of the costs of PFAS testing and control for industrial facilities with PFAS contamination, the state should also consider the costs of pollution to public health and ecosystems. Removing PFAS from drinking water sources is incredibly expensive. There are currently no technologies that can reduce or eliminate PFAS from fish and wildlife.

In addition to PFOS and PFOA, Wisconsin should set similar limits for chemicals like PFBS, GenX and PFHxS which have replaced PFOS and PFOA in many industries. These chemicals show similar harms to people. Regulating replacement PFAS will ensure that industries do not simply switch from PFOS and PFOA to closely related alternatives which are similarly toxic and persistent in the environment.

Thank you for your work to protect Wisconsinites? health and for the opportunity to be a part of this rule-making process.

Sincerely,

Kim Irvin
[redacted]
Menasha, WI 54952
[redacted]

This message was sent by KnowWho, as a service provider, on behalf of an individual associated with Sierra Club. If you need more information, please contact Lillian Miller at Sierra Club at core.help@sierraclub.org or (415) 977-5500.

Williams, Meghan C - DNR

From: Norda Gromoll <[redacted]t>
Sent: Thursday, December 2, 2021 9:17 AM
To: DNR 105 PFAS Rule
Subject: Drinking Water Standards

Greetings,
Please support Board Order WY-23-19. Safe drinking water is essential to life. Should that not be number one priority? See below. Thank you for your attention to this matter.

- **People living near La Crosse and Marinette, Wis. cannot drink their water because of PEAS contamination.**
- **Widespread drinking water testing for PFAS will not happen until DNR has standards in place.**
- **We cannot wait another 2-3 years for the EPA to set national PFAS standards.**
- **PFAS limits established by the EPA for drinking water won't apply to private wells, leaving thousands of rural Wisconsin families unprotected, so Wisconsin must act.**
- **The state must act to protect our water and the health of our communities.**

Sincerely,
Norda Gromoll

Williams, Meghan C - DNR

From: Ned Gatzke [redacted]
Sent: Tuesday, December 14, 2021 10:48 AM
To: DNR 105 PFAS Rule
Subject: Revisions to NR 102, 105, 106 & 219

I support the proposed revisions to establish water quality standards for surface water relating to the substances perflurooctane sulfonate(PFOS) and perfluorooctanoic acid(PFOA) for the purpose of protecting public health.

NR 102 requires that substances in concentrations or combinations which are toxic or harmful to humans shall not be present in amounts found to be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant or aquatic life.

We are aware of the public health risks to humans, animals, plants and aquatic life of these substances. It is past time to address this issue and we should not wait for federal (EPA) standards to be established which may far into the future.

I strongly support the rule proposal to stress source reduction as a first step toward reducing the levels of PFOS and PFOA in effluent discharges rather than pre-treatment methods that will result in concentrated amounts of these substances that will then need to disposed in a safe manner, which I believe is problematic. We need to discontinue the creation of sources of these substances not create new ones.

I am particularly concerned with the potential impacts of the concentration of PFAS at publicly owned treatment works(POTW) and their ability to remove these substances before discharge to surface waters and land application of solids. The responsibility to remove these substance from wastewater delivered to these facilities must not be their total responsibility. These rules must require the identification, monitoring and reduction of the sources discharging to the waste water system before it reaches the POTW.

Thank you for the opportunity to comment on these important proposed rules.

Ned Gatzke
[redacted]
Sparta, WI 54656
[redacted]
Sent from Mail for Windows

Williams, Meghan C - DNR

From: laurie chagnon [redacted]
Sent: Sunday, December 5, 2021 1:56 PM
To: DNR 105 PFAS Rule
Subject: PFAS Ground water rule

Thank you for allowing us citizens to have input into the predicament of our ground water in this beautiful State of Wisconsin.
Our past mistakes are clearly seen now. Allowing CAFOs to take over and destroy our industrious, hard working, land loving farmers throughout this state was clearly a mistake. Now we have toxic manure problems that not only destroy our drinking water, but costs towns and cities millions of dollars to clean out of their wells. Or, worse yet, innocent people with wells ladened with toxins that have no means to clean it out.
The PFAS problem in lakes, soil and waterways not only impacts every single human, it also impacts our wildlife and nature! This should be of huge concern for the Department of NATURAL RESOURCES.
I have dear neighbors who go fishing in our lakes here in Madison almost every day and weekend bringing home the fish to prepare for meals. Clearly these fish they catch and eat are filled with toxins from human activity. Please, as a citizen of our state, I insist the DNR do everything possible to remove the ability to add PFAS to our soil and water! If it goes into the soil, you know it's going into the water! Please help clean it out!

Sincerely,
Laurie Chagnon
Sent from my iPadk

Williams, Meghan C - DNR

From: Julia Cechvala <[redacted]>
Sent: Friday, December 3, 2021 9:31 AM
To: DNR 105 PFAS Rule
Subject: In support of surface water standards

To Whom It May Concern:

I am writing in support of the surface water standards for PFAS pollutants. Wisconsin's waters are one of our greatest assets, and these standards are a starting point for cleaning up the existing contamination, as well as preventing more from occurring. PFAS pollution is a serious public health risk that is particularly concerning for me living near Starkweather Creek and Lake Monona in Madison. The citizens of Wisconsin should not be forced to bear the financial or health burden of these industrial pollutants contaminating our water resources in order to protect corporate profits. Please enact these important standards to protect public health.

Thank you,
Julia Richards
[redacted]
Madison, WI 53704

Williams, Meghan C - DNR

From: Vicki Quint [redacted]
Sent: Monday, December 13, 2021 11:20 AM
To: DNR 105 PFAS Rule
Subject: Surface Water Standards for PFAS

Follow Up Flag: Follow up
Flag Status: Flagged

The 80 PFAS sites within Wisconsin are far behind what needs to be tested. The Watertown tire fire incident scene is now a former SuperFund. I have previously shared water testing reports for total fluorine / PFAS levels done on the Rock River from Watertown down to Fort Atkinson. This will need to be addressed.

I support the imperative critical need to get the PFAS standards into place as quickly as possible.

PFAS in Lake Michigan needs to be addressed formally. It is disappointing that the Great Lakes' bioaccumulative #pfas damage is ignored. "The **Great Lakes provide** 42 million people with drinking **water** and **provides** billions of gallons of **water** per day for municipal, agricultural, and industrial use. [https://www.greatlakestoday.org/post/who-uses-great-lakes-water] The Department of Natural Resources is charged with protecting public resources which encompasses aquatic life and wildlife.

Vicki Quint
C. [redacted]

Williams, Meghan C - DNR

From: atpotter <[redacted]>
Sent: Wednesday, December 1, 2021 6:37 PM
To: DNR 105 PFAS Rule
Subject: PFAS standards

Please set standards for these dangerous and unregulated chemicals.

Tom Potter

Williams, Meghan C - DNR

From: Ann Plata <[redacted]>
Sent: Thursday, December 9, 2021 11:56 AM
To: DNR 105 PFAS Rule
Subject: ground water and surface water contamination via municipal sludge

Hello DNR,

Thank you for starting to address this problem.

Please do not forget the spreading of the forever chemicals that can occur when municipalities spread their waste water sludge onto farm fields. All of those chemicals (including PFAS, PFOS) can eventually make it to surface waters and also to rural wells. I am already dealing with high nitrates and atrazine and a new well did not help. I don't want to have to try to deal with more chemicals.

Why can't the companies that produce these chemicals pay for the clean up? Why do regular citizens have to shoulder the burden?

At least you are trying to start with regulations that will get the ball rolling but I am afraid that it will be too late for many rural well owners and those who fish from surface waters.

Thank you,
Ann Plata, D.V.M.

Williams, Meghan C - DNR

From: Martha Pings <[redacted]>
Sent: Wednesday, December 1, 2021 10:38 PM
To: DNR 105 PFAS Rule
Subject: PFAS and surface water

Our standards must be strict in order to prevent the forever loss of one Wisconsin's greatest assets: water. 20 and 95 PPT is too high when it has been determined no level is safe.

I live two blocks from Starkweather Creek, which carries PFAS. I raised my kids here, recreating in what are now known as contaminated waters. Indeed, with PFAS entering the Yahara chain of lakes, and from there flowing through Illinois and to the Mississippi River, we are impacting all in the path. Our irresponsibility is enormous. We know some of how PFAS impact humans, but seem unmoved to do more. We understand what it means to live in an ecosystem, and yet pretend it does not exist.

There was a time we valued our natural resources, realizing they provide the building blocks of life. It saddens me to see disregard for the precious resource of water—a resource becoming rare as pollutants and salinization spoil water resources world-wide.

Sincerely,
Martha Pings
[redacted]
Madison WI 53704

Sent from Mail for Windows

Williams, Meghan C - DNR

From: M & S Nesemann <[redacted]>
Sent: Monday, November 29, 2021 3:25 PM
To: DNR NR 809 Comments; DNR 105 PFAS Rule
Subject: Forever Chemicals (PFAS)

The title alone should tell anyone, including even the WMC) that these chemicals are dangerous and stalling for time by alluding to the plodding required for the EPA to act is immoral. Perhaps if their lobbyists would have their families drink water from the contaminated sites I would have a little respect for them, but it's someone else's problem. Kudos to the DNR for developing standards, now pass them, please!

Mike Nesemann
[redacted].
Lake Mills, Wi 53551
[redacted]

Williams, Meghan C - DNR

From: Leigh Langford <[redacted]>
Sent: Monday, December 13, 2021 10:57 AM
To: DNR 105 PFAS Rule
Cc: Williams, Meghan C - DNR
Subject: Re: DNR 105 PFAS Rule

To the Wisconsin Department of Natural Resources:

Hello, my name is Leigh Langford. I live in Monona, WI. I am very concerned by the fact that PFAS contamination has been found in our local waters. Unfortunately, I missed my chance to testify during your recent public hearing. Thus, I am writing to express my opinion that you **should** support and adopt more proactive measures, such as the Board Order WY-23-19 regarding Surface Water Standards. This is very important to the future health of many citizens, myself included. Thank you.

Sincerely,

Leigh M. Langford
[redacted]

Williams, Meghan C - DNR

From: Katherine Zimmerman [redacted] Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Tuesday, December 14, 2021 2:59 PM
To: DNR 105 PFAS Rule
Subject: WY-23-19 Comment

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Wisconsin Department of Natural Resources,

Rhinelander is a great example of PFAS contamination. 25% of the cities water is contaminated by PFAS because of firefighters using it to practice out at the airport. Has the contamination spread further than those 2 city wells they shut-down? This acid is harming the environment and the people who are using and ingesting it!

Thank you for the opportunity to provide input on this rule. I welcome the action taken by the Evers Administration to address PFAS. This widely-used family of chemicals is an emerging water concern and has been popping up everywhere in Wisconsin. They are linked to many negative health outcomes, including cancer, increased cholesterol, reproductive concerns, effects on the immune system, and more. Clearly, it warrants this WDNR response.

PFAS have been found in communities including Madison and Marinette, and we must act now to prevent further exposure. We support the development of a surface water standard for PFAS chemicals, which will enable the state to address industries that discharge the chemicals into waste and surface waters. The EPA has not moved quickly to list PFAS chemicals to the Clean Water Act, Clean Air Act, RCRA or Superfund, and states must move forward ahead of federal progress to control PFAS pollution. Wisconsinites are experiencing the impacts of PFAS contamination right now.

I support the adoption of the proposed surface water standards for PFOS and PFOA. In addition to the source reduction and pollution minimization plans that the state is proposing, it should immediately revise WPDES permits for those industrial dischargers known to be the source of PFAS into wastewater. This includes metal plating, landfills, airports, and some paper, chemicals, textile, and plastics manufacturing sites. These industries have historically used PFOS and PFOA, and continue to use and emit closely related PFAS compounds.

In its consideration of the costs of PFAS testing and control for industrial facilities with PFAS contamination, the state should also consider the costs of pollution to public health and ecosystems. Removing PFAS from drinking water sources is incredibly expensive. There are currently no technologies that can reduce or eliminate PFAS from fish and wildlife.

In addition to PFOS and PFOA, Wisconsin should set similar limits for chemicals like PFBS, GenX and PFHxS which have replaced PFOS and PFOA in many industries. These chemicals show similar harms to people. Regulating replacement PFAS will ensure that industries do not simply switch from PFOS and PFOA to closely related alternatives which are similarly toxic and persistent in the environment.

Thank you for your work to protect Wisconsinites? health and for the opportunity to be a part of this rule-making process.

Sincerely,

Katherine Zimmerman
[redacted]
Rhinelander, WI 54501
[redacted]

This message was sent by KnowWho, as a service provider, on behalf of an individual associated with Sierra Club. If you need more information, please contact Lillian Miller at Sierra Club at core.help@sierraclub.org or (415) 977-5500.

Williams, Meghan C - DNR

From: Morgan, Lynn <lmorgan@wm.com>
Sent: Wednesday, December 15, 2021 6:27 PM
To: Williams, Meghan C - DNR
Subject: WY-23-19/PFAS Surface Water Criteria

Meghan, thank you for the opportunity to submit comments regarding WY-23-19.

Conceptually, the focus on source reduction and minimization is constructive. We ask, however, that the rule clarify that a POTW's minimization plan is not required to reduce/eliminate acceptance of landfill leachate if effluent criteria can be met through other means. Restricting POTW leachate acceptance would entail significant costs and consequences that aren't associated with other industries reliant on POTW access.

As the Technical Support Document (TSD) states, PFAS concentrations in leachate are generally declining as PFAS are phased out. Reducing the prevalence of PFAS in consumer goods, manufacturing, public safety uses and other sources is beyond the power of any landfill operator, yet it is the only path to mitigating PFAS in leachate. Accordingly, the rule documents suggest that a landfill would simply divert its leachate to a POTW that isn't currently subject to a minimization plan. This understates the costs and environmental consequences of diversion, however:

- The PFAS concentration in the leachate will not be reduced, simply displaced to a new POTW.
- In addition to the state's 57 active landfills, the rule will also potentially affect all closed landfills that collect leachate for management at POTWs.
- The estimated costs of transporting diverted leachate assume that all landfills currently rely on truck transport, and consider only the additional incremental costs of trucking to a more distant POTW. Landfills that discharge directly to sewer, though, would lose their investment in that infrastructure, incur trucking costs they avoid entirely now, and potentially require infrastructure modifications to facilitate a transition to truck transport.
- The available fleet of tanker trucks and drivers is inadequate to meet the increased demand for leachate transport. The shortage will be exacerbated for landfills attempting to access POTWs in adjoining states, since transporters must be licensed for interstate service.
- At some POTWs, the revenue and volume associated with landfill leachate is integral to efficient operation.

As the Department notes, and as research in other states confirms, landfill leachate is unlikely to be a pivotal driver of POTW PFAS concentrations. Given the unique problems that would be created by forcing POTWs to restrict leachate acceptance regardless of benefit or cost, we hope you will consider adding language making it clear that a POTW's minimization plan does not have to restrict leachate if plan objectives can be met through other means.

Thank you for considering these thoughts.

Lynn

LYNN MORGAN
Public Affairs Manager II
Upper Midwest Area

lmorgan@wm.com

C: 414.429.2019
T: 262.250.8711
W132 N10487 Grant Dr.
Germantown, WI 53202

Recycling is a good thing. Please recycle any printed emails.

Williams, Meghan C - DNR

From: Bill and Cindy Verschay <[redacted]>
Sent: Monday, December 13, 2021 1:16 PM
To: Williams, Meghan C - DNR
Subject: Surface Water Comments

Follow Up Flag: Follow up
Flag Status: Flagged

To: WI DNR

Attn: Meghan Williams

Date: Dec. 11, 2021

From: Bill and Cindy Verschay

[redacted]

Porterfield, WI 54159

Re: Comments on WY23-19 Surface Water Regulations for PFOS/PFOA

We are writing as Wisconsin residents that are concerned about the harmful effects of PFAS compounds on the environment, health, economy, and vitality of Wisconsin waters. Regulation of PFAS compounds in WI surface waters is a crucial step in beginning to contain, manage and hopefully mediate the harmful effects of the compounds that are already in our water and those that will be added. Drinking, surface, and ground water needs to be strictly regulated in our state. This protects our economies, properties and the health of our residents. While it would be our choice to have **all** PFAS compounds regulated as a class, we understand why the WI DNR is starting with PFOS and PFOA for the surface water requirements.

We are in full support of the contents of WY 23-19 and appreciate the fact that the decisions made are based on **science** and not on economics and special interest groups. We also encourage the findings and recommendations for fish consumption be widely advertised and that residents could find surface water testing results that currently exist.

Williams, Meghan C - DNR

From: Susan Trier [redacted]
Sent: Wednesday, December 8, 2021 8:42 PM
To: DNR 105 PFAS Rule
Subject: WY-23-19

I'm writing to ask the DNR to take action and set surface water standards for PFAS as soon as possible—Wisconsin can not wait for the EPA to define the issue. If Wisconsin waits for the EPA, valuable time will be lost as well as funding sources from the Build Back Better plan. Other states are ahead of Wisconsin on this issue. In addition, Wisconsin communities will not move forward independently without DNR direction.

Thank you.
Susan Trier
[redacted]
Lake Mills. Wi
Jefferson County

Williams, Meghan C - DNR

From: [redacted]
Sent: Monday, November 29, 2021 3:56 PM
To: DNR 105 PFAS Rule
Subject: Surface Water Standards

I am writing in support of Board Order WY-23-19 Surface Water Standards.PFAS pollution poses serious public health risks for families across Wisconsin and threatens the rivers, lakes, and streams that make Wisconsin, Wisconsin.

No one should be forced to bear the financial and health burden of industrial pollutants contaminating our water resources in order to protect corporate profits.

The DNR's efforts to set standards for PFAS in our surface water are a starting point for cleaning up existng contamination and preventing more from occurring.

The proposed standards are informed by the best science available to protect public health and are in line with those put forward by other states.

Williams, Meghan C - DNR

From: Michelle Storms-Van Howe <[redacted]>
Sent: Thursday, December 2, 2021 6:59 AM
To: DNR 105 PFAS Rule
Subject: Water purity and PFAS monitoring/regulation

To DNR:

Water is life. Standards needs to be set regarding PFAS and other pollutants in our surface and ground water. Start monitoring for PFAS and take steps to clean up our water supply. Our lives depend on it.

Thank you,

Michelle Storms-Van Howe MD
Robert Van Howe MD
[redacted].
Hazelhurst, WI 54531
[redacted]

Williams, Meghan C - DNR

From: Mark Smith <[redacted]>
Sent: Wednesday, December 1, 2021 6:37 PM
To: DNR 105 PFAS Rule
Subject: In support of Board Order WY-23-19

- DNR's efforts to set standards for PFAS in our surface water are a starting point for cleaning up the contamination already out there and preventing more from occurring.
- PFAS pollution poses serious public health risks for families across Wisconsin and threatens the treasured rivers, lakes, and streams that make our state special.
- No one should be forced to bear the financial and health burden of industrial pollutants contaminating our water resources in order to protect corporate profits.
- The proposed standards are informed by the best science available to protect public health and are in line with those put forward by other states.

Thanks,
Mark Smith
[redacted]
Oconto Falls, WI 54154

Williams, Meghan C - DNR

From: Robert Sander [redacted] >
Sent: Thursday, December 2, 2021 11:43 AM
To: DNR 105 PFAS Rule
Subject: Board Order WY-23-19 Surface Water Standards

As a Wisconsin Family Physician, I strongly support the DNR's efforts to set standards for PFA's in our state's surface. PFA's pose a serious public health risk for our citizens. They threaten the rivers, lakes, and streams that make our state so treasured by our citizens and support our vast tourism industry. The proposed standards are supported by the best science and must be implemented.

Thank you,
Robert Sander, MD
Custer, Wisconsin

Williams, Meghan C - DNR

From: Kathy Trochlell [redacted]
Sent: Thursday, December 2, 2021 12:31 PM
To: DNR 105 PFAS Rule
Subject: PFAS water standards

water standards for harmful PFAS chemicals are needed in Wisconsin. I have a private well and I am concerned about this contamination but I am far more concerned for people in other areas such as La Crosse and Marrinette.

Kathy Trochlell
[redacted]
Mercer WI 54547
[redacted]

American Forest & Paper Association

December 15, 2021

Wisconsin Department of Natural Resources
Attn: Meghan Williams –WY/3
101 Webster Street
PO Box 7921
Madison, Wisconsin
DNR105PFASRule@wisconsin.gov

Re: AF&PA Comments on W-23-19 Proposal to Add Narrative Surface Water Criteria with Numeric Thresholds for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) and Revise the Wisconsin Pollutant Discharge Elimination System (WPDES) Permitting Program

Dear Ms. Williams:

The American Forest & Paper Association (AF&PA) respectfully submits comments in response to the Wisconsin Department of Natural Resources' (DNR) Board Order W-23-19 to add narrative surface water criteria for PFOA and PFOS and revise the WPDES permitting program (proposed rule).

AF&PA serves to advance U.S. paper and wood products manufacturers through fact-based public policy and marketplace advocacy. The forest products industry is circular by nature. AF&PA member companies make essential products from renewable and recycled resources, generate renewable bioenergy and are committed to continuous improvement through the industry's sustainability initiative — *Better Practices, Better Planet 2030: Sustainable Products for a Sustainable Future*. The forest products industry accounts for approximately four percent of the total U.S. manufacturing GDP, manufactures nearly $300 billion in products annually and employs approximately 950,000 people. The industry meets a payroll of approximately $60 billion annually and is among the top 10 manufacturing sector employers in 45 states.

Product Stewardship in the U.S. Paper Industry

The U.S. paper industry is committed to the safety of its products. A brief review of the industry's historical use of per- or polyfluoroalkyl substances (PFAS) helps provide context for our current position.

PFAS are a large and diverse class of thousands of chemicals characterized by the strong bond between fluorine and carbon atoms, which provides properties such as resilience and durability. Different PFAS have widely varying properties and levels of toxicity, and thus, there are very significant differences between individual PFAS chemicals.

In its current rulemaking, the Wisconsin DNR is focused on perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), both of which are so-called "long-chain" PFAS (i.e., C8 compounds consisting of a chain of eight carbon atoms). PFOA and PFOS are ubiquitous at low levels in the environment. Policymakers not only in Wisconsin, but in many other states and in the federal government are focused on addressing concerns about PFOA and PFOS.

The U.S. paper industry does not manufacture PFOA or PFOS or use them in the paper manufacturing process. PFOA and PFOS were phased out in the U.S. paper industry more than a decade ago.[1] Around that time, the chemical manufacturers of PFOA and PFOS phased out the production of long-chain PFAS such as PFOA and PFOS used in food packaging.

At that time, for limited applications, such as certain food packaging requiring grease and moisture resistance, the paper industry shifted to barriers using modern, "short-chain" PFAS (i.e., C6 compounds consisting of a chain of six carbon atoms or even shorter-chained PFAS). These short-chain PFAS were approved by the U.S. Food and Drug Administration (FDA) as safe for food packaging.

Over time, the industry has made significant progress in developing non-PFAS products. Remaining production relying on FDA-approved short-chain PFAS represents in the aggregate a very small percentage of the total paper and paperboard production. Based on information collected by AF&PA in 2020, products containing intentionally added short-chain FDA-approved PFAS represented less than 0.1 percent of AF&PA members' paper and paperboard production. This remaining use of short-chain PFAS is expected to be entirely eliminated by the end of 2023. This is consistent with PFAS manufacturers'

[1] As the U.S. Environmental Protection Agency (EPA) has shown in its "Multi-Industry Per- and Polyfluoroalkyl Substances (PFAS) Study – 2021 Preliminary Report" issued in September (Preliminary Report), the pulp and paper industry ceased using long-chain PFOA and PFOS approximately ten years ago, the industry has virtually completed its voluntary transition out of intentionally adding short-chain, FDA-approved PFAS in its manufacturing process, and that transition out of short-chain, FDA-approved PFAS will be fully complete within a few years. *See* Preliminary Report, Section 7.5 at p.7-7.

agreement with the FDA to voluntarily phase out the use of certain short-chain PFAS in food contact applications though those PFAS were approved by the FDA.[2]

Thus, the paper industry does not use PFOA or PFOS, which are the subject of DNR's rulemaking, to manufacture paper products.

In addition to the comments above, AF&PA supports the comments filed on the proposed rule by the Wisconsin Paper Council. We would like to highlight the Wisconsin Paper Council's recommendation that the DNR revise the term "PFAS Minimization Plan" to "PFOS/PFOA Minimization Plan" to clarify the scope of the rule.

Conclusion

Thank you for the opportunity to comment on the proposed rule. If you have any questions, please contact me at (202) 463-2581 or Jesse_Levine@afandpa.org.

Sincerely,

Jesse Levine
Senior Director
Energy & Environmental Policy

[2] https://www.fda.gov/food/cfsan-constituent-updates/fda-announces-voluntary-phase-out-industry-certain-pfas-used-food-packaging

Madison Metropolitan Sewerage District

1610 Moorland Road • Madison, WI 53713-3398 • P: (608) 222-1201 • F: (608) 222-2703

December 10th, 2021

Meghan Williams – WY/3
Department of Natural Resources
P.O. Box 7921
101 S. Webster Street
Madison, WI 53707-7921

Re: Comments on the proposed permanent rule Board Order WY-23-19

Thank you for the opportunity to comment on the proposed permanent rule WY-23-19 related to establishing water quality standards to minimize the concentration of PFOA and PFOS pollution in surface waters.

We are encouraged that the Department is undertaking this rulemaking process, as consistent rules and regulations provide the District a clearly defined goal to attain and creates an even playing field for all utilities. It also sets clear targets that the District can use when looking to reduce these compounds coming to the utility and related to the operations of our permitted industrial and commercial customers.

Narrative standards

Narrative standards that provide a threshold target for best management practices (BMPs) to achieve compliance is a better way to regulate these types of ubiquitous compounds with disparate sources than using strict numeric standards. This is especially true for large WPDES permit holders, such as the District, that receive many sources of wastewater, including from industrial pretreatment customers, major construction projects, and occasionally from other wastewater treatment plants.

We are very supportive of the Department taking an approach to WPDES permit implementation that relies on narrative standards for these compounds. This approach reflects the ubiquitous nature of these compounds and benefits utilities because the proposed rules allow for source reduction as an accepted first option to meeting permit criteria. We are hopeful that the adoption of this approach can be a model for future regulatory challenges related to other PFAS compounds or other emerging contaminants of concern.

Pollution Minimization Plan

The District agrees with the Department approach to have utilities focus on reduction of sources through a pollution minimization plan (PMP) as opposed to requiring treatment to meet a strict effluent limit. While this approach is the correct one for these types of compounds, implementation of these proposed rules will impose financial burdens on wastewater utilities. The research needed to identify current sources *and* legacy sources of PFOA and PFOS in the District's service area will be considerable. For example, sources could be businesses not currently permitted under the District's industrial pretreatment program, such as commercial laundries or upholsterers. Sources could also be sites where PFAS compounds were used in the past, such as a former industrial site where chrome plating took place.

Based on the District's own experience in creating pollution minimization plans around mercury and chloride, the initial source identification monitoring for these types of sources takes a lot of time and resources. Given

these financial challenges, the District hopes that the department will investigate options for providing funding for wastewater utilities to engage in sampling efforts and, as necessary, to implement PFAS minimization plans.

Additionally, there are two areas in the rule where further clarification will be useful:

- Section 106.98(4a) describes the method for determining the need for a municipal discharger to implement a PMP. The calculation method uses daily discharge concentrations and 30-day average discharge concentrations. Municipal dischargers are required to sample monthly (or every two months). It would be helpful for WDNR to provide the definitions of "daily sample" and "30-day average discharge concentration."

- Section 106.99(3a) and (3c) require primary and secondary plans to include an evaluation of *"Substitution of raw materials or chemical additives with low or zero PFOS, PFOA, and PFOS and PFOA precursor alternatives"* and *"Institution of alternative processes."* It would be helpful for WDNR to compile, maintain, and make available a list of acceptable alternatives for industries to consider or provide similar resources from other agencies.

Pretreatment and Waste Acceptance

With the proposed surface water standards, there is now a threshold for acceptable PFOA and PFOS levels in surface water. However, as currently drafted, the rule is unclear as to whether a utility would be able to accept waste containing PFAS over the narrative threshold and remain in compliance with the rule and any applicable pollutant minimization programs. WPDES permit holders with waste acceptance programs (e.g., pretreatment, septage) could benefit from guidance from the Department around waste acceptance thresholds and how that relates to meeting the narrative standard through pollution prevention BMPs.

For example, as part of our pretreatment program, the District accepts landfill leachate, contaminated groundwater, and other wastes that potentially contain PFAS compounds. Utilities with waste acceptance programs will need determine whether sampling and analytical results for PFOA and PFOS is necessary for acceptance of these types of waste to ensure the utility can meet the narrative surface water standards and requirements as part of a pollutant minimization program. Is the narrative standard meant to be the bar at which a utility will require sampling mitigation measures from customers before accepting the material or not accepting the material at all? WPDES permit holders need clarity in the rule or additional guidance from the Department around narrative standards of PFOA and PFOS and how that relates to the levels of compounds in the waste can be accepted, to stay in compliance and meet the pollution minimization requirements.

Thank you for the opportunity to comment on the proposed permanent rule. Please feel free to contact Martin Griffin, Director of Ecosystem Services at marting@madsewer.org or 608-222-1201 if you would like any more information or discuss this further.

Regards,

Michael Mucha, Chief Engineer and Director, Madison Metropolitan Sewerage District

Martin Griffin, Ecosystem Services Director, Madison Metropolitan Sewerage District

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
WW-16J

Ms. Marcia Willhite, Program Manager
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707

Dear Ms. Willhite,

On October 18, 2021, the Wisconsin Department of Natural Resources (WDNR) published a public notice of an informational hearing on WDNR's intent to adopt human health surface water quality standards (WQS) for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). The U.S. Environmental Protection Agency Region 5 Water Division Watersheds and Wetlands Branch has a comment below on the PFOA criterion value that WDNR is considering adopting for human health protection of non-public water supply waterbodies in the Great Lakes System.

WDNR must "use methodologies consistent with the methodologies designated as Tier I methodologies in appendix[ ] . . . C [of 40 C.F.R. Part 132] . . . when adopting or revising numeric water quality criteria" for human health protection of non-public water supply waterbodies in the Great Lakes System (40 C.F.R. § 132.4(b)); and "methodologies and procedures consistent with the methodologies designated as Tier I methodologies in appendix[ ] . . . C [of 40 C.F.R. Part 132], [and] the Tier II methodologies in appendix[ ] . . . C of [40 C.F.R. Part 132] . . . to develop numeric criteria and values when implementing narrative water quality criteria" (40 C.F.R. § 132.4(c)). However, WDNR used a different methodology than the one set forth in 40 C.F.R. Part 132, appendix C, to calculate the PFOA criterion value that WDNR is considering adopting for human health protection of non-public water supply waterbodies in the Great Lakes System.

While WDNR may use a different methodology, the value of the criterion derived using a different methodology must be consistent with the value that would be derived using the methodologies provided in 40 C.F.R. Part 132, appendix C. WDNR's calculation does not incorporate fish consumption into its criterion value. Please consider revising the PFOA criterion value for non-public water supply waterbodies to be consistent with the value calculated using EPA's methodology in 40 C.F.R. Part 132, appendix C. Alternatively, WDNR should demonstrate how the methodology that it used, including its decision to not incorporate fish consumption, is consistent with the methodology provided in 40 C.F.R. Part 132, appendix C.

Please note that EPA might have additional comments as WDNR continues development of WQS for PFOS and PFOA. If you have any questions, please contact Sydney Weiss at (312) 886-9262 or weiss.sydney@epa.gov.

Sincerely,

David Pfeifer, Manager
Watersheds and Wetlands Branch

cc via email:

Meghan Williams, WDNR

To: Wisconsin Department of Natural Resources

Lake Waubesa Conservation Association (LWCA), Yahara Lakes Association (YLA) and our members are working to promote the preservation, protection and enhancement of the Yahara Lakes ecosystem for all to enjoy. We are very concerned about PFAS entering our streams and lakes. With no water quality standards or testing requirements for PFAS, governmental bodies have been hampered in their efforts to prevent these chemicals from leaching into our surface water causing harm to the public, wildlife and our ecosystems. In addition, it will be challenging to hold accountable those parties responsible for the contamination without the establishment of these standards for purposes of measuring the impacts of current and future remediation efforts.

LWCA and YLA support the proposed water quality standards in Wisconsin DNR Rule: WY-23-19. It is important for Wisconsin to take a proactive position on surface water quality and not wait for federal level quality standards. Minnesota and Michigan have already adopted PFAS water quality standards. Wisconsin needs to be a leader, not a follower in this area. Failure to promptly adopt such standards will only result in further accumulation of these harmful pollutants in the Yahara chain of lakes, making it more difficult to restore these waters.

Sincerely,

Tamara Knickmeier — LWCA President

Scott Seymour — YLA President

LEAGUE OF WISCONSIN MUNICIPALITIES

131 W. Wilson St., Suite 505
Madison, Wisconsin 53703
phone (608) 267-2380; (800) 991-5502
fax: (608) 267-0645
league@lwm-info.org; www.lwm-info.org

December 15, 2021

Department of Natural Resources
Attn: Meghan Williams – WY/3
P.O. Box 7921
101 S. Webster Street
Madison, WI 53707

Via Email – MeghanC3.Williams@wisconsin.gov and DNR105PFASRule@wisconsin.gov

RE: Comments on WY-23-19 Revisions to chs. NR 102, 105, 106, and 219 relating to the Proposed Surface Water Quality Standards for PFOA and PFOS, including narrative criteria

Ms. Williams:

The League of Wisconsin Municipalities, a nonprofit and nonpartisan association of 594 cities and villages, welcomes the opportunity to submit the following comments on the proposed revision of chs. NR 102, 105, 106, and 219, which include establishing narrative criteria for PFOA and PFOS. The League has been a member of several PFAS related department working groups and recognizes the large amount of work that has gone into developing these rules.

It is important to note that municipal wastewater facilities are not generators of PFAS, but simply the end waste processors tasked with the final, and often most expensive, treatment of contaminants prior to discharge. The League appreciates the department's willingness to consider and include narrative criteria combined with associated numeric thresholds to potentially trigger a pollutant minimization plan and corresponding source reduction. The referenced framework is the most technologically and economically feasible option for municipalities to pursue while simultaneously achieving the largest environmental improvements. Numeric water quality effluent standards would only increase costs, rely on variances producing slower environmental benefits, and miss the cooperative opportunity to address source reduction.

The League supports the development of PFOA and PFOS surface water provisions at this time because these standards are typically established by states. We are very encouraged by the cooperative nature of the rule that the department has put forward and would like to offer these specific recommendations for consideration in the final rule package:

- We are concerned that the rule specifically addresses biosolids in the PFAS minimization plans that may need to be developed by municipal wastewater utilities. The proposed rule package establishes narrative criteria for surface waters and effluent discharge and therefore, this rule package is not the appropriate venue for regulating biosolids. We request that the references to sludge and biosolids be eliminated from this rule package and considered in a separate administrative revision.
- We seek clarification from the department regarding the use of the proposed narrative standards and thresholds with regard to their application in construction projects that involve pit trench dewatering and landfill leachate. Municipalities engage in several construction activities that require pit trench

dewatering and our municipal wastewater utilities accept groundwater from construction sites. In addition, our municipal treatment plants accept landfill leachate from landfills around the state. Will we be required to test pit trench water or leachate for PFAS? Will a minimization plan require pretreatment before the water can be sent to a wastewater treatment plant? Are those costs accounted for in the environmental impact assessment because they could increase costs substantially?

- Finally, on page 22 of the proposed rule a note references that permittees may refer to the Michigan Department of Environmental Quality's "Wastewater PFAS Sampling Guidance" for recommended sampling protocols and cost contamination prevention measures. We have two questions pertaining to this note: Why reference another state's guidance in an administrative code? And will this guidance always be the best option for sampling? The note should simply reference the most commonly accepted or approved/recommended sampling protocols, so practices are continually updated. The League requests the note be deleted or clarified to state that permittees may refer to the most up to date, generally accepted sampling protocols.

In addition, to the comments outlined above, the League fully endorses the comments submitted by Vanessa Wishart and Paul Kent on behalf of the Municipal Environmental Group Wastewater Division on December 15, 2021.

Thank you again for the process the department followed in this rule revision and the opportunity to provide municipal comments on NR 102, 105, 106, and 219 as they relate to surface water quality standards and non-numeric, narrative criteria for PFOA and PFOS. The League continues to be supportive of the department's rule revision efforts with the above requests for clarification.

Kind Regards,
Toni R Herkert
Toni Herkert, Government Affairs Director, Wisconsin League of Municipalities

Office of the Mayor
Satya Rhodes-Conway, Mayor
City-County Building, Room 403
210 Martin Luther King, Jr. Boulevard
Madison, Wisconsin 53703
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December 15, 2021

Department of Natural Resources
Attn: Meghan Williams – WY/3
101 S. Webster Street
Madison, WI 53707
DNR105PFASRule@wisconsin.gov

RE: Proposed Surface Water Standards for PFAS (WY-23-19)

Dear Mx. Williams,

I am writing to express my support for the proposed administrative rule to establish health-based standards for PFAS in surface water. As bioaccumulants, PFAS in surface water can lead to concentrations of PFAS in fish that are linked to concerning human health impacts. Protecting public health is a critical role of the public sector, and the Wisconsin Department of Natural Resources (DNR) plays an important role in protecting communities from pollution by setting standards. Setting the proposed surface water standard for PFAS is appropriate and I support the DNR's work to do so.

In the proposed rule, the DNR indicates a priority for addressing PFAS at its source rather than treating contaminated water downstream. I agree this is the optimal solution, as contamination can lead to multiple surface water, ground water, and drinking water impacts. I also recognize the technical and cost challenges of mitigation. I believe the best policy is to require producers of PFAS-containing products to take responsibility for remediation. Failing that, I recommend the State continue holding polluters accountable and supporting clean-up through technical assistance and grants.

Sincerely,

Satya Rhodes-Conway
Mayor

Cc:

Laurie Ross, Natural Resources Board
District 47 Rep. Anderson
District 48 Rep. Baldeh
District 76 Rep. Hong
District 77 Rep. Stubbs
District 78 Rep. Subeck
District 16 Senator Agard
District 27 Senator Roys

PARTNERS FOR A CLEANER ENVIRONMENT

Kevin L. Shafer, P.E.
Executive Director

December 9, 2021

Department of Natural Resources
Meghan Williams – WY/3
Post Office Box 7921
Madison, Wisconsin 53707

Subject: Amendments to Wis. Adm. Code chs. 102, 105, 106, and 219
Board Order WY-23-19

Dear Ms. Williams:

The Milwaukee Metropolitan Sewerage District supports the approach the Department is taking to regulate perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) in WPDES permits. The proposal recognizes water reclamation facilities are passive recipients of PFOA and PFOS and achieving concentrations in the range of 8 to 20 ng/L is beyond the capacity of reasonably available treatment technology. By establishing triggers for source reduction and delaying the implementation of limits, the Department and permittees avoid the complexity of implementing variances to limits based upon water quality criteria.

The District has a specific comment regarding proposed sec. NR 106.98(2), which requires both influent and effluent sampling in all cases. For PFAS, sample collection presents unique challenges and analysis is expensive. Furthermore, only effluent sampling will provide the initial critical information. The value of initial influent sampling is uncertain. Therefore, the Department should amend the proposed regulations to require influent sampling only after effluent sampling shows concentrations high enough to require a PFAS minimization program.

Regarding minimization programs, many factors will determine the complexity of the work that needs to be done, including, but not limited to, the number of industrial users, the type of industrial users, the source of drinking water, and fire-fighting experience at local airports and military bases. The Department needs to recognize minimization work will vary from location to location, depending upon location circumstances. When developing guidance for these programs or implementing compliance schedules in permits, the Department must avoid uniform schedules and prescriptive approaches. Instead, the Department must recognize the individual needs of each community.

If you have questions, please contact Sharon Mertens, Director of Water Quality Protection, at SMertens@mmsd.com or 414-277-6384. Thank you for the opportunity to comment.

Sincerely,

Kevin L. Shafer, P.E.
Executive Director
Milwaukee Metropolitan Sewerage District

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

December 15, 2021

VIA EMAIL
DNR105PFASRule@wisconsin.gov
MeghanC3.Williams@wisconsin.gov

Wisconsin Department of Natural Resources
Attn: Meghan Williams – WY/3
P.O. Box 7921
Madison, WI 53707

RE: Comments of the Municipal Environmental Group – Wastewater Division
Board Order WY-23-19

Dear Ms. Williams:

NEW Water, the brand of the Green Bay Metropolitan Sewerage District, is submitting these comments in alignment with those submitted by the Municipal Environmental Group–Wastewater Division (MEG Wastewater).

MEG Wastewater is an organization of over 100 municipalities statewide who own and operate wastewater treatment plants, including NEW Water. MEG represents facilities ranging in size from small sanitary districts to larger utilities. MEG has been an active participant in the various Wisconsin Department of Natural Resources (WDNR) forums on PFAS over the past several years. NEW Water and MEG appreciate this opportunity to comment on Board Order WY-23-19 for the revisions to chs. NR 102, 105, 106, and 219, which include establishing narrative criteria for PFOA and PFOS.

In alignment with MEG, NEW Water is encouraged by and supports the framework the Department implements in this draft rule package. Surface water standards are commonly established at state level, and it therefore makes sense to proceed with development of these rules at this time. NEW Water supports MEG's advocacy for non-numeric standards, and a pollutant minimization/source reduction approach to the regulation of PFOS and PFOA. This is because **PFOA and PFOS cannot be removed through conventional wastewater treatment processes**. And, the treatment processes wastewater treatment plants would be required to implement to meet **strict effluent limitations for PFOS and PFOA are neither economically feasible nor environmentally sound.** The Department's establishment of narrative criteria and an associated numeric thresholds is an approach that should result in actual PFAS reductions and avoid the costly and time consuming process of obtaining variances from water quality standards. This approach addresses PFOS and PFOA pollution in a scientifically and environmentally sound, expedient, and cost-effective manner.

With respect to the details of the proposed rule language, NEW Water supports the comments provided by MEG for the Department's consideration.

First, certain sections of the proposed rule require consideration of PFOS and PFOA in sludge and biosolids, which NEW Water does not believe is appropriate or necessary in this rule package. For example, proposed NR 106.99(1)(d) provides that PFAS minimization plans shall, "[w]here the permittee regularly monitors … sludge, or biosolids for PFOS and PFOA," include "any changes in PFOS and PFOA concentrations over comparable historic

data" in these media. Similarly, proposed NR 106.99(4) provides that the Department "shall consider" the concentrations of PFOS and PFOA in "biosolids or sludge, if applicable," in reviewing the appropriate elements of a PFAS pollution minimization plan (PMP). The proposed rule package establishes narrative criteria for surface waters and is not the appropriate mechanism for regulation regarding sludge or biosolids. Further, we understand that the Department is working on guidance regarding biosolids management separately from this rule package. We request that these references to sludge and biosolids be removed from this rule language.

Second, it is still unclear how the proposed narrative standards and thresholds would apply to construction projects that involve pit trench dewatering. For instance, when will it be necessary to test for PFAS? If testing occurs and the water is under the applicable thresholds, could it be discharged to storm sewer and/or surface waters? On occasion, NEW Water will receive a request to accept contaminated groundwater from construction sites that require pit trench dewatering. If the water is over the applicable thresholds, would NEW Water treatment plants be allowed to accept it, or knowing that it contains PFAS over a threshold, would a PMP have to require treatment before discharge to a sanitary sewer? We would appreciate clarification from the Department on these types of activities.

A similar question arises in the context of other known waste sources of PFAS such as landfill leachate. Will all such sources need to pretreat to the applicable thresholds before a NEW Water treatment plant would be allowed to accept such waste? That is not the current practice with other contaminates, provided that our treatment plants can stay within its permit limits, and imposing that requirement here could result in substantial costs and practical issues. We would appreciate clarification from the Department on this topic.

Finally, the proposed rules do not define the applicability of data for determining reasonable potential. NEW Water, in alignment with MEG, would appreciate clarification from the Department as to what data will be included in this calculation. This is particularly relevant given the continued challenges with ensuring validity during PFAS sampling and analysis. NEW Water would also appreciate clarification from the department as to the parameters around which historic PFOS and PFOA sampling data will be used. Once a permittee has implemented a successful PFAS minimization plan as required under this rule, such that its discharge no longer creates a reasonable potential to exceed a PFOS or PFOA threshold, the permittee should be able to have that plan removed from its WPDES permit. If, however, historic PFAS sampling continues to be used in the reasonable potential calculation, the gains made in source reduction may not be adequately accounted for in determining permit requirements. NEW Water requests that the department clarify how historic PFAS sampling results will be used in the reasonable potential calculation for permittees that have implemented successful PFAS minimization plans.

Thank you for consideration of these comments. NEW Water greatly appreciates the opportunity to participate in this process and welcomes further communication with the Department.

Sincerely,

GREEN BAY METROPOLITAN SEWERAGE DISTRICT

Thomas W. Sigmund, P.E.
Executive Director

Delivered via e-mail

December 15, 2021

Wisconsin Department of Natural Resources
Meghan Williams – WY/3
101 S. Webster Street
PO Box 7921
Madison, WI 53707

Re: Comments on Proposed Rule WY-23-19 Related to Surface Water Quality Standards for PFAS

Dear Ms. Williams,

Midwest Environmental Advocates appreciates the opportunity to submit these comments on Proposed Rule WY-23-19, which will establish surface water quality standards for perfluorooctane sulfonate ("PFOS") and perfluorooctanoic acid ("PFOA"). PFOS and PFOA are only two out of thousands of toxic chemicals in the per- and polyfluoroalkyl substances ("PFAS") family. While we support the proposed narrative surface water criteria with numeric thresholds for PFOS and PFOA as a modest but crucial step to mitigate the public health and environmental risks of PFAS pollution in Wisconsin, we recognize the need to regulate additional PFAS substances in surface water. The promulgation of the Proposed Rule is a dutiful fulfillment of the Wisconsin Department of Natural Resources' ("DNR") statutory commands and public trust obligations that will result in overall benefits to Wisconsinites and will mitigate the disproportionate risks faced by environmental justice communities. Accordingly, we urge the DNR to move forward with the rulemaking process.

I. Establishing Surface Water Quality Standards Fulfills the DNR's Statutory Commands and Public Trust Obligations under Chapter 281

The DNR not only has the explicit statutory authority to promulgate the proposed rule, but also the public trust obligation to do so under Chapter 281 of the Wisconsin Statutes. The Wisconsin Supreme Court has repeatedly held that "the legislature clearly … delegated to the DNR certain public-trust responsibilities in Wis. Stat. § 281.12."[1] Chapter 281 establishes the DNR "as the central unit of state government to protect, maintain and improve the quality and management of the waters of the state, ground and surface."[2] Thus, the DNR is required to "carry out the planning, management and regulatory programs necessary for implementing the policy and purpose of" Chapter 281.[3]

[1] *Clean Wisconsin v. DNR*, 2021 WI 72, ¶ 25; *Lake Beulah Mgmt. Dist. v. DNR*, 2011 WI 54, ¶ 34.
[2] Wis. Stat. § 281.11.
[3] Wis. Stat. § 281.12.

In this specific instance, the DNR is charged with making "the necessary rules and regulations" to protect the surface water quality in the state.[4] Acting "as the central unit of government" of water quality protection and management, the agency is not only satisfying explicit statutory mandates, but also fulfilling its active governmental duty towards "not only preserv[ing] the [public] trust, but [] promot[ing] it."[5] In other words, what the enabling statute mandates under Section 281.15, the DNR's public trust duty requires.[6] Recognizing that the public trust doctrine "is not a passive trust; it is governmental, active, and administrative," DNR's proposed narrative criteria with numeric thresholds seek to mitigate public health impacts by protecting, in relevant part, cognizable public trust uses such as fishing and recreational activities.[7] We support this recognition and the willingness of the DNR to interpret its duties broadly under Chapter 281 so that Wisconsinites "reap the full benefit of the grant secured to them" by the Wisconsin Constitution without facing [89]OBJ

II. The Proposed Rule is a Moderate Regulatory Effort that Will Result in an Overall Benefit to Wisconsinites

Promulgating the proposed surface water quality criteria will establish important public health and environmental protections for Wisconsin. It is well-established that protecting Wisconsinites and the health of our natural resources requires controlling PFAS pollution in our state's rivers, lakes, and streams. The proposed criteria will minimize toxic exposure from incidental and intentional ingestion of food and water without creating a burdensome or costly compliance barrier for regulated entities.

The proposed water quality standards will provide the DNR with the authority necessary to protect the designated uses of Wisconsin's surface waters through the Wisconsin Pollutant Discharge Elimination System program under the Clean Water Act. Through new monitoring requirements, the DNR will acquire more water quality data and will then be able to take important additional steps if background concentrations reveal that surface water bodies are impaired for PFAS, from the simple, such as issuing fish consumption advisories, to the more complex, such as developing total maximum daily loads. The development of water quality standards will also enable DNR to require permitted facilities to monitor influent and effluent for PFAS. Through this framework, the DNR will provide meaningful benefits in morbidity and

[4] Wis. Stat. § 281.13; Wis. Stat. § 281.15.

[5] *City of Milwaukee v. State*, 81 N.W.2d 71, 73-74 (1923).

[6] *See Clean Wisconsin v. DNR*, 2021 WI 72, ¶ 18 (noting that "what the DNR's [public trust] duty sometimes requires, its statutory authority likewise permits.")

[7] *See Nekosa Edwards Paper Co. v. R.R. Comm'n*, 201 Wis. 40, 47 (1930) (where the Court found that "sailing, rowing, canoeing, bathing, fishing, hunting, skating, and other public purposes" are cognizable under the doctrine).

[9] *Diana Shooting Club v. Husting*, 156 Wis. 261, 271 (1914); *See also Movrich v. Lobermeir*, 2018 WI 9, ¶ 27 (noting that the Wisconsin Supreme Court "'has long held that the public trust in navigable waters should be interpreted in the broad and beneficent spirit that gave rise to it in order that the people may enjoy the intended benefits.'")

mortality risk reduction and avoided diminished property values, resulting in overall benefits[10] to the people of Wisconsin.

While the regulatory framework places the onus on the sources of pollution—as it should be—the standards do not unduly burden regulated entities. As the Economic Impact Analysis of the Proposed Rule shows, most of the tested surface water dischargers, including wastewater treatment plants around the state, do not exceed the proposed standards.[11] This suggests that the proposed protective standards cannot be objected on the basis of being unduly burdensome.

III. The Proposed Rule Will Provide Benefits to Communities in Need of Environmental Justice

Promulgating surface water quality standards will provide risk reduction benefits to vulnerable populations facing disproportionate health risks from PFAS pollution. Environmental justice and equity are guiding principles of the statewide response to PFAS pollution. The PFAS Action Plan demands the DNR to "be mindful of systemic bias and to ensure that the allocation of information and resources is equitable between impacted communities."[12]

While health studies have shown that exposure to PFAS substances is ubiquitous, studies also show that low-income communities and communities of color are disproportionately impacted by PFAS contamination.[13] In Wisconsin, low-income communities and subsistence anglers are especially vulnerable to risky levels of toxicity from the Starkweather Creek.[14] Further, the DNR has confirmed presence of PFAS at the EPA-designated Milwaukee Estuary Area of Concern, where many low-income individuals and people of color reside.[15] Considering the environmental justice and equitable concerns of PFAS pollution, the DNR should move forward with the

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[10] We recommend the DNR to conduct a better evaluation of some of the quantifiable benefits of the regulation, e.g., avoided healthcare costs, home pricing, cost of cleanup, etc., to better reflect the quantifiable cost of inaction.

[11] Wisconsin Department of Administration, Fiscal Estimate & Economic Impact Analysis for WY-23-19 pg. 16-17 (July 19, 2021), https://dnr.wisconsin.gov/sites/default/files/topic/Rules/WY2319FiscalEstimate2.pdf

[12] Wisconsin PFAS Action Plan (Dec. 2020), https://widnr.widen.net/content/d4vyg9qqwj/pdf/EM_PFASActionPlan.pdf

[13] PFAS Contamination Is an Equity Issue, and President Trump's EPA is Failing to Fix it, Union of Concerned Scientists (Oct. 30, 2019), https://blog.ucsusa.org/genna-reed/pfas-contamination-is-an-equity-issue-president-trumps-epa-is-failing-to-fix-it/

The Union of Concerned Scientists found that nearly 39,000 more low-income households and approximately 295,000 more people of color live within five miles of a site contaminated with PFAS (15% and 22% more than expected based on the U.S. census), showing a pattern of unequal distribution of environmental risks among the population.

[14] Something Has to Be Done: Life Along Madison's Starweather Creek, One of Wisconsin's Most Polluted Waterways (Oct. 7, 2021), https://pbswisconsin.org/news-item/something-has-to-be-done-life-along-madisons-starkweather-creek-one-of-wisconsins-most-polluted-waterways/

[15] U.S. EPA's Environmental Justice Screening and Mapping Tool (Version 2020), https://ejscreen.epa.gov/mapper/

rulemaking process to protect communities in need of environmental justice as the democratically elected administration has directed.

IV. The Proposed Rule Minimizes Compliance Costs While Achieving Public Health Protections Over Time

No regulated entity can reasonably object to the Proposed Rule given the balance DNR struck between achieving important public health protections and mitigating the associated costs of compliance, including costs municipally owned wastewater treatment plants ("WWTPs") will incur. This balance is evident not only in the numeric standards themselves, but also in the fact that not a single regulated entity is going to have to comply overnight or even in the short term. That is especially important for WWTPs, which may receive PFAS in their waste streams but do not generate those chemicals.

First, no permitted entity will have to take any action to reduce PFAS in their discharges until the DNR makes a determination that the discharge has a reasonable potential to result in or contribute to an exceedance of the proposed water quality standards.[16] But the DNR cannot make that determination until permitted entities complete the required monitoring.[17] Further, the Draft Rule indicates that monitoring for PFOA and PFOS is not required until "the first reissuance of a WPDES permit after the effective date of this section."[18] Permit terms last for five years and sometimes even longer given the DNR's regular practice to grant administrative extensions of existing permits.[19] This means that monitoring, when required, will be phased over the five years following adoption of the Draft Rule.

Second, once permits are reissued, only those WWTPs discharging equal to or more than an average of one million gallons per day ("MGD") are required to monitor.[20] Smaller WWTPs are only required to monitor if there is sufficient evidence that their waste streams may contain PFAS.[21] Even then, the DNR has opted for a tiered approach where the frequency of sampling—and therefore the timeframe in which the DNR will make a reasonable potential determination—Is based on the amount of wastewater being discharged. Reductions in monitoring frequency or even waivers are also available to reduce the burden on permitting entities.[22]

For WWTPs discharging equal to or more than an average of five MGD, samples must be taken monthly.[23] For WWTPs discharging equal to or more than one MGD but less than five MGD,

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[16] Wis. Admin. Code NR § 160.985(1).
[17] Wis. Admin. Code NR § 160.98(4).
[18] Wis. Admin. Code NR § 106.98(2).
[19] Wis. Stat. § 283.53(1). *See also* Wis. Stat. § 283.53(3)(a) (allowing discharges to continue after the expiration of a permit as long as the permittee files an application for reissuance of the permit at least 180 days prior to its expiration).
[20] Wis. Admin. Code NR § 160.98(2)(a)-(b).
[21] Wis. Admin. Code NR § 160.98(2)(c).
[22] Wis. Admin. Code NR § 160.98(3).
[23] Wis. Admin. Code NR § 160.98(2)(a).

samples must be taken every other month.[24] When smaller WWTPs must monitor, sampling frequency is determined on a case-by-case basis.[25] This approach allows the DNR to address the largest discharges with the greatest potential to spread PFAS contamination first, and also ensures costs associated with monitoring are incurred at a rate WWTPs are able to absorb. In short, once required to monitor, large WWTPs will have approximately one to two years monitoring before additional steps, if any, must be taken. Smaller WWTPs will have even longer.

Third, if the DNR makes an affirmative reasonable potential determination, regulated entities still do not have to immediately comply with the proposed water quality standards. Instead, they are required to develop a pollutant minimization plan and then have seven years to implement source reduction measures.[26] Aptly named, those measures include identification and reduction of PFAS contamination at its source, i.e., before it enters the waste stream. This is important because it obviates the need for regulated entities to install expensive treatment technologies in the first instance and gives them time to pursue more cost-effective solutions like operational changes and the implementation of best management practices.

Fourth, while compliance with the proposed water quality standards may be required if those efforts fail to produce the desired results, that requirement still will likely not be immediate. That is because the next permit term may include a compliance schedule lasting up to five years, which does not necessarily result in the imposition of interim numerical effluent limitations achieved through the installation of treatment technologies.[27] Regulated entities will be provided an opportunity to identify alternative treatment technologies, select the options that is most suitable for their situation, and install pollution controls with an enforcement grace period for any problems encountered during start up.

Fifth, after all that, which in the most extreme cases may take upwards of two decades, regulated entities may be eligible for a variance to the proposed water quality standards.[28] Such a variance may be available if, for example, compliance with the criteria would result in substantial and widespread adverse economic and social impacts.[29] The hope is that source reduction measures and intervening technological advancements will reduce the cost of treatment such that variances are unnecessary, but that safety net is available if such advancements are not achieved.

The proposed rule is designed to provide significant flexibility to regulated entities while achieving incremental progress towards compliance with the proposed water quality standards and protection of public health. If anything, the timeline for compliance may be too protracted in certain instances, particularly when it comes to delays in monitoring for known PFAS dischargers who have recently been reissued permits or will be reissued permits before the Draft

[24] Wis. Admin. Code NR § 160.98(2)(b).
[25] Wis. Admin. Code NR § 160.98(2)(c).
[26] Wis. Admin. Code NR §§ 160.98(4), .985(2)(c).
[27] Wis. Admin. Code NR § 160.985(2)(d)3. *See also* Wis. Admin. Code NR § 106.117, Note.
[28] Wis. Stat. § 283.15.
[29] Wis. Stat. § 283.15(4)(a)f.

Rule takes effect. In those instances, the DNR should consider amending the rule to allow permits to be modified instead of waiting until the first permit reissuance after the effective date of the Draft Rule.

V. Revisions to Paragraph NR 102.04(1m) of the Proposed Rule

The DNR should revise and divide Paragraph NR 102.04(1m) into subsections (a), (b), and (c) to better reflect the intentions of DNR. Subsection (a) should remain the same. Subsection b), however, states that the justification for both the PFOA criterion for discharges to public water supplies and the PFOA criterion for discharges to all other waters are "[i]n order to protect against adverse public health impacts from the incidental consumption of surface waters associated with recreational activities in the water." This is incorrect as applied to the public water supply criterion. That criterion is proposed to protect against public adverse health impacts from the intentional consumption of surface waters through public water supplies. Thus, subsection (b), as it now stands, should be divided into subsections (b) and (c).

Amended subsections should read as follows:

> (b) In order to protect against adverse public health impacts from the incidental consumption of surface waters associated with recreational activities in the water, concentrations of PFOA shall not be present in amounts found to be of public health significance under sub. (1) (d), which is 95 parts per trillion for surface waters not classified as public water supplies under ch. NR 104.
>
> (c) In order to protect against adverse public health impacts from consumption of drinking water supplied by surface waters, concentrations of PFOA shall not be present in amounts found to be of public health significance under sub. (1) (d), which is 20 parts per trillion for surface waters classified as public water supplies under ch. NR 104.

Dividing the narrative criteria with numeric thresholds in such a manner will better capture the protective purpose and justification behind each proposed criterion.

Sincerely,

Tony Wilkin Gibart, *Executive Director*
Midwest Environmental Advocates
tgibart@midwestadvocates.org

WMC
Wisconsin Manufacturers & Commerce

WWA
Wisconsin Water Alliance

MWFPA
Midwest Food Products Association, Inc.

Wisconsin Civil Justice Council, Inc.
Promoting Fairness and Equity in Wisconsin's Civil Justice System

TO: Meghan Williams – WY/3

FROM: Wisconsin Manufacturers & Commerce
Wisconsin Civil Justice Council
Wisconsin Water Alliance
Midwest Food Products Association

DATE: December 15, 2021

RE: Comments on WY-23-19 (NR 105) – Surface water criteria for PFOA and PFOS

Summary:

The above referenced organizations – Wisconsin Manufacturers & Commerce, Wisconsin Civil Justice Council, Wisconsin Water Alliance, and Midwest Food Products Association – appreciate the opportunity to comment on WY-23-19 which, as proposed, will affect Wisconsin Administrative Code Chapters NR 102, 105, 106, and 219. The rule proposes surface water criteria of 8 ppt for PFOS except for surface waters that cannot naturally support fish and do not have downstream waters that support fish. For PFOA, the rule proposes a standard of 20 ppt for public water supplies, and 95 ppt for all other surface waters.

PFOA and PFOS are the two most widely studied of a family of more than 5,000 PFAS compounds. Our organizations support reasonable, science-based regulations of PFOA and PFOS. However, these regulations must be lawful, properly applied, and use the best available, peer-reviewed science. Unfortunately, just like the agency's proposed drinking water rule (NR 809), the DNR is proposing to impose Wisconsin-only standards that are *not* lawful, *not* properly applied, and created with agency modeling that was *not* subject to scientific peer-review.

Our organizations have a number of concerns with the draft rule. To emphasize our major concerns:

1. The compliance costs for this rule exceed statutory limitations, as the DNR is grossly underestimating the costs to the regulated community: The agency's final economic impact analysis (EIA) fails to appropriately include significant cost drivers, and also underestimates key costs. In particular, our coalition believes that annual costs to facilities to develop and implement a "PFAS minimization plan" will greatly exceed an average of $13,728, the estimate provided by the Department, and cumulatively will exceed $10 million over a two-year period.

2. The proposed standards deviates from procedures prescribed by the United States Environmental Protection Agency (U.S. EPA) and Wisconsin's own administrative code: The

agency appears to have misapplied key data in formulating its proposed standards. The proposed criteria for PFOA is far more stringent than any of our surrounding states – including Michigan.

3. The DNR did not follow the law: Agency staff failed to follow requirements set forth in s. 281.15 Wis. Stats. and various sections of Ch. NR 105 Wis. Admin. Code to establish water quality criteria.

4. The DNR should wait for U.S. EPA guidance and standards: The U.S. EPA is in the process of developing national criteria. The DNR should wait for national recommendations before adopting mandatory, Wisconsin-only standards.

In addition, our organizations have a number of specific concerns with the language of this rule. This includes requirements for the "mixing zone," as well as PFOA and PFOS monitoring and sampling. Specific provisions in the rule grant the Department too much discretionary authority and impose unnecessary burdens on the regulated community.

Our organizations respectfully ask the DNR to *stop* its work on the surface water criteria under WY-23-19 and instead allow the U.S. EPA to propose national recommendations under the Clean Water Act. The proposed rule is unlawful and recommends standards using a process that was not peer-reviewed. Moreover, Wisconsin-only standards for PFOA and PFOS contributes to a patchwork of confusing state PFAS regulations for businesses that contributes to regulatory uncertainty and added costs.

Background on Coalition:

Our organizations represent a diverse coalition of stakeholders interested in sound, peer-reviewed standards for PFAS, including PFOA and PFOS:

Wisconsin Manufacturers & Commerce (WMC) is the largest general business association in Wisconsin, representing approximately 3,800 member companies of all sizes, and from every sector of the economy. Since 1911, our mission has been to make Wisconsin the most competitive state in the nation to do business. WMC members depend on fair, predictable environmental standards that do not unduly target or harm Wisconsin businesses.

The **Wisconsin Civil Justice Council's (WCJC)** mission is to promote fairness and equity in Wisconsin's civil justice system, with the ultimate goal of making Wisconsin a better place to work and live. WCJS's positions are set by its board that consists of representatives of Wisconsin's leading business and professional organizations.

The **Wisconsin Water Alliance (WWA)** is a non-partisan statewide organization. Its mission is to help protect the state's water resources and advocate for sound water policies that benefit current and future generations of Wisconsin families, cities, businesses, farmers and others.

The **Midwest Food Products Association (MWFPA)** is a trade association founded in 1905 representing the food processing industry in the states of Wisconsin, Minnesota and Illinois. MWFPA's purpose includes advocating on public policy issues including food safety, workforce, and environmental regulations.

Background on Rule:

The proposed rule (WY-23-19) would revise NR 102, 105, 106, and 219 of the Wisconsin Administrative

Code to incorporate surface water criteria for PFOA and PFOS and revise procedures in the WPDES permitting program to implement the new criteria. For PFOS, the proposed surface water criterion is 8 ppt for "all waters except those that cannot naturally support fish and do not have downstream waters that support fish."[1] For PFOA, the proposed criteria are 20 ppt for waters classified as public water supplies, and 95 ppt for other surface waters.

There is no current standard for PFOA or PFOS in any chapter in the Wisconsin Administrative Code. In addition, it should be clarified the agency is not proposing a combined standard for PFOA and PFOS in WY-23-19. Conversely, the DNR is proposing a combined standard of 20 ppt for PFOA and PFOS in its pending drinking water (DG-24-19) and groundwater (DG-15-19) rules. Our coalition opposes combined standards for PFAS, as the Department lacks the statutory authority to propose such combined standards.

The proposed rule impacts businesses and other regulated entities in a number of ways. Businesses that discharge effluent directly into surface waters will be directly impacted by these standards; businesses with a Wisconsin Pollutant Discharge Elimination System (WPDES) permit or businesses that discharge to a publicly owned treatment works (POTW) will also be impacted by source reduction and pretreatment requirements. Such businesses may have to conduct sampling, develop a "PFAS Minimization Plan," and take associated actions to reduce PFOA and PFOS in its effluent. Moreover, if the PFAS Minimization Plan fails to reduce effluent to a sufficient level to meet the proposed standards, a business may need to install a treatment system if the Department declines to provide a variance.

In addition, businesses engaging in construction projects will face substantial treatment costs related to "dewatering" if there are legacy PFOA or PFOS in the soil or groundwater near the construction activity. Finally, businesses (and other ratepayers) will face higher public utility costs, as POTWs are forced to take steps to comply with the proposed standards.

As a preliminary matter, it should also be noted that the relating clause, analysis within the draft rule, and proposed permit changes seem to imply that the proposed rulemaking will regulate PFAS as a *class of chemicals*.[2] With respect to the relating clause, it states that the content of the rule is "relating to adding narrative surface water criteria with numeric thresholds and analytical methods for poly- and perfluoroalkyl substances (PFAS) including PFOS and PFOA." The analysis references "PFAS surface water quality standards," and suggests a "PFAS Minimization Plan" to address PFOA, PFOS and other PFAS.

However, the rule only proposes new surface water criteria for PFOS and PFOA and no other PFAS compound. PFAS compounds are a diverse family of chemistry – not all PFAS compounds are the same. The rule's relating clause and most subsequent descriptions[3] implies that the DNR is attempting to impose surface criteria on PFAS as a class, which is not what the rule does and would be unlawful under Wisconsin statutes.

The relating clause, rule analysis, and related program terminology (such as the "PFAS Minimization Plan") should be modified to clarify that the rule *only* proposes surface water criteria for two

[1] As described by the "Plain Language Analysis" of the rule on pg. 3.

[2] This concern echoes the coalition's concern raised in our comments on the DG-24-19, the proposed drinking water rule.

[3] The Department's December 10 Public Hearing (https://dnr.wisconsin.gov/sites/default/files/topic/Rules/WY2319PublicHearingPresentation.pdf) on this rule referred to this rule as "Surface Water Standards for PFOS and PFOA." Our coalition appreciates this change, which appropriately referred to the compounds individually instead of PFAS as a class.

compounds: PFOA and PFOS. It is unclear, at best, whether the DNR is seeking to require implementation of pollutant minimization plans for PFAS compounds other than PFOS and PFOA. The rule must be clarified that no such minimization efforts are required, as those costs were not included in the Economic Impact Analysis for this rule. Failure to include those costs would be a violation of Ch. 227 rulemaking requirements.

Concerns:

Our coalition has general, overarching concerns with the proposed WY-23-19 and specific concerns with key provisions included in the rule. The primary concerns of our coalition include problems with the final EIA, the science used to set the proposed standards, and the lack of U.S. EPA recommendations currently available before pursuing a Wisconsin-only approach.

These section includes several concerns raised on the final EIA that were raised in industry comments on the draft EIA, but remain largely unaddressed. For more details, please see the joint comments on the draft EIA submitted by WMC and MWFPA on August 18, 2021.

1. The Final EIAs for the DNR's three PFOA/PFOS rules (drinking water, groundwater, and surface water) raise questions as to whether the Department deliberately attempted to reduce estimated compliance costs.

As a preliminary matter, our coalition must raise a key process concern with respect to the DNR's final economic impact analyses (EIA) for the three PFOA/PFOS rules (DG-24-19, DG-15-19, and WY-23-19). Chiefly, the final compliance cost estimates are implausibly close together, and raise questions as to whether the Department deliberately adjusted the estimates to ensure they fell below statutory restrictions in the REINS Act against promulgating rules that cost $10 million or more over any two-years.

Recently, the final EIA for DG-15-19, the groundwater rule, was published. Each final EIA included a maximum compliance cost estimate over any two year period. These estimates are summarized in **Table 1** below:

Table 1: Final Agency Compliance Cost Estimates for PFOA/PFOS Rules

Rule	Maximum Compliance Costs Over Any Two-Year Period
Drinking Water (DG-24-19)	$9,350,949.15
Surface Water (WY-23-19)	$9,268,046
Groundwater (DG-15-19)	$9,537,243 (or $0)[4]
Statutory Threshold for REINS Act (per s. 227.139)	$10,000,000

[4] The DNR's EIA for DG-15-19 states that "there is no cost directly attributable to the standards" but later provides an estimate of $9,537,243 for "other regulatory programs and rules that refer to ch. NR 140 standards." Our coalition strongly disagrees that with the conclusion that no compliance costs are associated with the PFOA/PFOS

Although the three rules have varying standards, and implementation timelines, and impacts to the regulated community, the Department ultimately concluded that the maximum compliance costs over any two year period for each rule falls between roughly $9.27 million and $9.54 million. Notably, s. 227.139 requires the agency stop work on a rule if its internal analysis indicates a rule will trigger more than $10 million in compliance costs over any two year period.

In other words, the agency's estimates put each rule just below the statutory requirement that triggers additional legislative action before a rule can move forward. It seems unlikely this was purely coincidence. WMC and other stakeholders submitted comments on the draft EIA for each rule, and noted compliance costs far exceeding $10 million over any two year period. For example, for the surface water rule (WY-23-19), WMC and MWFPA estimated compliance costs of $58,359,816 over two years. This is more than six times the "maximum" annual compliance costs estimated by the Department.

It is hard to understand how the Department could reasonably bring costs under the statutory threshold without major, substantive revisions to each rule. Moreover, such changes did not occur.

This coalition already raised concerns with the final EIA for the PFOA/PFOS drinking water rule, as it underestimated key compliance costs and misapplied others. Our coalition also has serious concerns with the final EIA for the surface water rule, which will be laid out in these comments. Comments on the proposed groundwater rule will be submitted at a later date.

In summary, our organizations urge the Department to reconsider whether the compliance costs for each final EIA for these three rules (groundwater, drinking water, and surface water) is appropriate, given how their compliance costs so closely mirror one another, and fall just shy of the statutory cap.

2. The Department is proposing the most stringent surface water quality standards of any Wisconsin's neighboring states. The statutes require the Department to provide an explanation for this decision in the final EIA.

As noted in the joint comments submitted by WMC & MWFPA on August 18, 2021 on the draft EIA, the Department's proposed surface water standards are more stringent than any statewide standards applicable in neighboring states of Illinois, Iowa, Michigan, and Minnesota. Illinois and Iowa have no surface water quality standards for PFOS and PFOA. Minnesota has only limited site-specific requirements applicable to certain portions of the Mississippi River. Michigan has set a standard of 11 ppt for PFOS and 420 ppt for PFOA for surface waters used for drinking water. Non-drinking water standards in Michigan are set at 12 ppt for PFOS and 12,000 ppt for PFOA.

Table 2 below outlines an apples-to-apples comparison of Wisconsin's proposed standards with similar criteria from neighboring states.

Table 2: Comparison of Wisconsin vs. Neighboring States: Statewide PFOA/PFOS Surface Water Criteria

PFAS Compound	Wisconsin (Proposed)	Illinois	Iowa	Michigan	Minnesota
PFOA	20 ppt and 95 ppt	None	None	**420** ppt and **12,000** ppt	None*
PFOS	8 ppt	None	None	11 ppt and 12 ppt	None*

**Minnesota has limited, site-specific criteria.*

groundwater rule.

As shown above, Wisconsin's proposed standards are not harmonized with Michigan, despite both states being subject to the U.S. EPA's Great Lakes Initiative regulation as codified in 40 CFR 132.[5] As will be noted later in these comments, the Department appears to have reached its lower proposed criteria, in part, by deviating from federal recommendations when calculating its proposed standards. In addition, while both Wisconsin and Michigan recognize PFOA does not bioconcentrate in aquatic life, Michigan *allows* the use of a zone of initial dilution for sources with a discharge of PFOA, while Wisconsin does not.

In short, this analysis shows that the Department has proposed the most stringent PFOS surface water standards among our neighbors, and *by far* the most stringent standards for PFOA among our neighbors.

Moreover, Section 227.137(3)(a) of the statutes states the following:

"An analysis and quantification of the policy problem that the proposed rule is intending to address, including comparisons with the approaches used by the federal government and by Illinois, Iowa, Michigan, and Minnesota to address that policy problem. If the approach chosen by the agency to address that policy problem is different from those approaches, an economic impact analysis prepared by **an agency shall include a statement as to why the agency chose a different approach** [emphasis added]."

As noted above, the Wisconsin DNR clearly "chose a different approach" by proposing standards that are more stringent than any neighboring state. WMC & MWFPA raised this concern in comments on the draft EIA. The final EIA was modified to note that Minnesota chose to use site-specific criteria, and instead the Wisconsin DNR is seeking to protect "citizens use of all waters." In reference to Michigan, the Department simply notes that "Michigan has calculated statewide values as Wisconsin is proposing to do."[6]

However, this explanation still falls far short of the statutory requirement. Again, Wisconsin's proposed surface water criteria for PFOA would be far more stringent than any other state. In fact, the only neighboring state that has adopted PFOA surface water criteria is Michigan. ***Moreover, the DNR's proposed standards are 21-times more stringent for surface waters used for drinking water, and 126-times more stringent for surface water for non-drinking water.***

The EIA should be adjusted to clarify why the Department is seeking to impose standards far more stringent than neighboring states. This statement is required under s. 227.137(3)(a).

3. The final EIA continues to miscalculate costs by making flawed comparisons, underestimating key costs, and excluding important costs. If properly calculated, the rule plainly exceeds $10 million over two years.

Flaws with Michigan comparison:
Throughout the final EIA, the Department relies heavily on the experience of Michigan's Department of Energy, Great Lakes, and the Environment (EGLE) to help inform costs for this proposed surface water rule. In short, the Department anticipated that industries similar to those impacted in Michigan would be impacted by this proposed rulemaking. At times, the Department even ignored cost impacts in

[5] The significance of this section of federal code will be elaborated upon later in these comments.
[6] See the 2nd paragraph of page 7 of the DNR's final EIA.

Michigan (such as with landfill leachate),[7] and attributed this decision to the added flexibility of Wisconsin's proposed rule.

However, there are also key cost drivers in Wisconsin's approach as compared to Michigan's rule:

1. As noted previously, the proposed PFOA standards in Wisconsin are 21-times and 126-times more stringent than Michigan.
2. Michigan *allows* the use of a zone of initial dilution for sources with a discharge of PFOA, while Wisconsin does not.

Both differences will add substantial compliance costs to Wisconsin's rule. Unfortunately, these differences appear to have been actively ignored by the Department in the final EIA. For example, effluent data from the Department already identifies eleven Wisconsin facilities that exceed the proposed public water supply standard of 20 ppt.[8] This is based on very preliminary sampling conducted by the Department earlier this year. Conversely, a report from Michigan EGLE earlier this year on its statewide PFAS assessment concluded that "all the PFOA concentrations in both the influent and effluent samples were well below the lowest PFOA WQS for drinking water sources of 420 ng/L."[9] The report went on to identify 15 influent and 14 effluent samples that exceeded state criteria for PFOS.

Our coalition urges the Department to revise its EIA to appropriately address the increased costs associated with implementing Wisconsin's criteria versus Michigan criteria.

PFAS Implementation Plans

The Department's draft EIA projected costs associated with a PFAS Minimization Plan (PMP) as only $6,000 annually. The agency based this assumption on costs reported by 37 facilities currently implementing mercury pollutant minimization plans. WMC, MWFPA, and other stakeholders submitted comments strenuously objecting to this comparison, as mercury and PFAS are very different substances with different sources and available replacements.

The Department's final EIA does raise costs associated with implementing a PMP, but only marginally. The DNR assumes that "staff time" is essentially the only cost associated with a PMP. It then assumes that it will take a 30% workload of one employee making $22/hour to comply with annual costs associated with a PMP. This calculates to an average of $13,728 per facility per year. Table 3 below is extrapolated from information provided in the final EIA.[10]

Table 3: Extrapolated costs for PFAS Minimization Plan Development and Implementation

Facility Type	Number of Direct Dischargers	Number of Indirect Dischargers	Annual Costs	Annual Costs per Facility
POTWs	23	0	$315,744	$13,728.00
Metal Finishers	1	36	$507,936	$13,728.00
Paper/Packaging	12	9	$288,288	$13,728.00

[7] See section 1.38, pg. 24 of the final EIA.
[8] See chart titled "PFOA Effluent Concentrations," section 1.1, pg. 17 of the EIA.
[9] Michigan EGLE: Evaluation of PFAS in Influent, Effluent and Residuals in Wastewater Treatment Plants (WWTPs) in Michigan; April 2021; https://www.michigan.gov/documents/egle/wrd-pfas-initiatives-statewide-full-report_722902_7.pdf.
[10] See section 3, pgs. 28-29 of the final EIA

CWTs	0	7	$96,096	$13,728.00
Chemical Manufacturers	0	10	$137,280	$13,728.00
Commercial Laundries	0	8	$109,824	$13,728.00
Power Plants	2	0	$27,456	$13,728.00
Airports	2	0	$27,456	$13,728.00
Fish Hatchery	1	0	$13,728	$13,728.00
Landfills	0	11	$1,093,693	$99,426.64*
Total	41	81	$2,617,501	$22,297.88*

*The Department assumes higher annual costs for landfills relating to hauling leachate to POTWs.

In other words, except for some required sampling, the Department is assuming that for facilities such as paper mills, chemical manufacturers, power plants, and airports, the average annual costs per facility for a PMP is only related to staffing costs and only $13,728.

Our coalition strenuously objects to this assessment. Certainly staff time will be one component of complying with a PMP. However, many facilities will need to do substantially more sampling to identify sources of PFOA and PFOS, and much of this sampling may need to be ongoing. In addition, once the sources are identified, facilities may need to make major changes to its supply chain in order to engage in meaningful source reduction activities. Replacement products could be considerably more expensive or unavailable altogether. This could create costs quickly approaching millions of dollars *per facility.*

To cite one key concern, consider paper mills and the potential impact of limiting the use of recycled paper. According to the Wisconsin Paper Council,[11] recycling paper mills purchase wastepaper, and it is their single largest individual cost of operation. However, recycled paper is one potential source of PFAS. Given the commodity nature of recycled paper, it is logistically unrealistic for the DNR to force recycling paper mills to sample different grades of wastepaper and only run certain grades with certain PFOA or PFOS concentrations. The recycled paper with the highest grades of PFAS then need to be disposed of properly. In short, if the DNR requires paper facilities to limit the use of wastepaper as part of a PMP, the compliance costs will be incredibly high, and damage the Wisconsin paper's industry ability to continue to effectively utilize recycled paper.

Absurdly, the DNR's deficient EIA estimates identical costs for all paper mills, regardless of size and discharge flow. Adding to this ridiculous assumption, the EIA further makes the unsupported claim that municipal treatment plants, power plants, airports, and other manufacturers will also have identical costs to conduct source minimization – and once again – all will have identical compliance costs regardless of size. It's clear that the Department made no meaningful effort to understand or quantify the actual compliance costs for Wisconsin businesses, local governments, or ratepayers.

<u>Dewatering Costs</u>

Under *Section 1.4* of *Attachment B*, titled "Dewatering Projects and Fire Suppression Activities and Class B Firefighting Foam Facilities," the EIA acknowledges that the DNR has required a number of regulated entities in Wisconsin to "install treatment associated with construction dewatering projects" in relation to PFAS.

[11] Due to the proposed surface water rule's unique impacts to the Wisconsin paper industry, the Wisconsin Paper Council submitted separate comments from our coalition.

To clarify, there is no current surface water rule in place in relation to PFOA/PFOS. To justify this required treatment for PFAS related to dewatering projects, the EIA states [in part] the following:

"Since 2019, the department has required entities proposing dewatering projects on or near PFAS-contaminated sites to both screen the groundwater for PFOA and PFOS levels and then install treatment for PFAS if warranted based on concentrations observed. **The department determined** [emphasis added] whether concentrations observed were of public health significance based on the existing narrative water quality standard that protects public health and is included in all WPDES general permits and individual permits."[12]

In the last 24 months, the department reviewed 9 such projects near PFAS-contaminated sites or in response to use of AFFF. Of these, 6 were required to install treatment (3 per year, on average), based on **the department's interpretation** [emphasis added] of public health significance in s. NR 102.04(1)(d), Wis. Adm. Code which is a condition in all general permits. However, using this proposed rule's threshold for public health significance, only 5 (2.5 projects per year) would have been required to treat prior to discharge, amounting to a cost reduction for 0.5 treatment projects per year compared to **the department's interpretation** [emphasis added] of the existing narrative standard."

This section of the EIA then concludes that there are no new compliance costs, and instead may be a "cost reduction" since the criteria included in this rule are less stringent than the department's previous "interpretation" of the statute.

This assumption is plainly incorrect. First, it ignores the most basic requirements of ch. 227 rulemaking. In particular, s. 227.10 requires that "each agency shall promulgate as a rule each statement of general policy and each **interpretation** [emphasis added] of a statute which it specifically adopts to govern its enforcement or administration of that statute." DNR's previous "interpretation" needed to be promulgated as a rule. Requiring compliance with the previous threshold without a promulgated rule is an unlawful violation of s. 227.10.

Second, simply ignoring rulemaking requirements does not allow the Department to then ignore unlawfully imposed compliance costs. There are clearly substantial costs associated with dewatering projects. **Our coalition is aware of at least one such Wisconsin project that triggered more than $800,000 in PFAS treatment costs. We submitted these costs to the Department in our comments on the EIA for this rule, but this information was ignored and not incorporated in the cost analysis.** These costs *must* be analyzed and included in the EIA in order to comply with s. 227.137, which requires a "detailed quantification" of the compliance costs with a proposed rule. Extrapolating this $800,000 in costs to the other projects identified by the Department of three per year, the regulated community is expected to face at least $2.4 million per year in additional costs due to dewatering of construction projects. However, we think this figure is likely vastly understated, as the number of construction projects subject to PFAS regulation is likely to significantly increase over time as additional testing is done and more sites are identified.

In summary, this section of the EIA fails to meet statutory requirements under s. 227.137, and is an acknowledgement by the Department that it has been unlawfully regulating the discharge of PFAS from construction site dewatering activities in the absence of a promulgated standard. It attempts to establish the position that the Department can exclude *substantial* compliance costs for rules by simply imposing a DNR "determination" prior to engaging in statutorily-required rulemaking – despite no legal

[12] Section 1.4 of EIA, pg. 24.

authority to do so. As a result, the regulated community and the public are left in the dark as to the actual costs of the Department's previous (unlawful) enforcement actions.

Our coalition urges the Department to update the EIA to include all relevant compliance costs associated with dewatering, including previous PFAS treatment that was required by the DNR. The Department also must immediately cease the enforcement of its current threshold, which is an unlawful violation of ch. 227 rulemaking.[13]

Other Excluded Costs:

The final EIA also continues to exclude the consideration of compliance costs associated with the Tyco One Stanton Street facility and the Marinette Wastewater Utility. For the Tyco One facility, the Department indicates it is excluding costs because "they were incurred as a result of Michigan's standards applying to the interstate receiving water…" or incurred "as a result of NR 159."[14] For the costs incurred by the Marinette Wastewater Utility plant, the costs were ignored since they "are being incurred independently of this rule development as a result of…NR 159."[15]

We continue to strongly object to the exclusion of these compliance costs in the final EIA. If the Department is unlawfully enforcing a surface water standard on a project in absence of a promulgated standard, it does not mean such compliance costs are then exempt from Ch. 227 rulemaking requirements. Moreover, the final EIA appears to exclude not only compliance costs already incurred due to an unpromulgated surface water standard, but any project costs incurred in the future. Such an exclusion is not permissible under s. 227.137(3)(b)(1), which requires the inclusion of the total implementation and compliance costs for businesses and taxpayers.

Our coalition urges the DNR to revise its EIA to include compliance costs incurred by the Tyco One and Marinette Wastewater Utility, as required by Ch. 227 rulemaking requirements.

4. The proposed rule plainly exceeds the statutory threshold, and violates other requirements of Chapter 227 rulemaking.

Cost Estimate:

As noted previously, WMC and MWFPA submitted detailed comments on the draft EIA estimating compliance costs substantially higher than what was predicted by the Department. Our analysis applies Michigan's experience in implementing its PFAS standards to estimate costs in Wisconsin.

The DNR's estimated impact of $13,728/facility $6,000/facility for this rule is based on flawed assumptions and far, far too low. Instead of comparing PFAS minimization to mercury minimization efforts, a better strategy would be to actually examine PFAS minimization efforts undertaken by facilities.

Throughout the final EIA, the Wisconsin DNR frequently refers to efforts undertaken in Michigan. Indeed, Michigan is the only neighboring state that has a PFOS standard even close to what the DNR is proposing (although their standard is still less stringent).

[13] This request mirrors a request made by WMC and MWFPA on August 18, 2021, in respect to the draft EIA. Unfortunately, no changes were made to this section of the final EIA in response to this request.
[14] See Section 1.4, pg. 25 of the final EIA.
[15] See section 1.2, pg. 18 of the EIA.

The DNR's final EIA identifies 111 facilities in Wisconsin that may require a PFAS minimization plan at a cost of $13,728/facility. However, according to data from Michigan's EGLE[16], municipal wastewater treatment plants were most successful in reducing PFAS by instituting treatment at the source via GAC. For the purposes of this exercise, we will assume these "sources" are similar to the 111 facilities identified by the DNR.

Of ten municipal wastewater treatments plants identified by Michigan as successful in achieving "substantial PFOS reduction" for facilities with exceedances, seven of them did so via GAC treatment at the source, suggesting a rate of 70%. In addition, the EIA estimates the annual costs associated with a GAC Treatment system at $358,126. If we apply these rates, we can determine the following annual PFAS treatment costs for these 111 facilities (see Table 4):

Table 4: Estimated Annual Compliance Costs for PFAS Treatment by Industrial Facilities

Facilities Impacted by Rule	111
Facilities Required to Install GAC Treatment (70%)	78
Annual Cost for GAC Treatment per Facility	$358,126
Total Annual Costs (78 x $358,126)	$27,933,828

If anything, this cost estimate is likely too low for the following reasons:

- As noted above, the Michigan standard for PFOA is far higher. Wisconsin facilities may incur additional costs in order to comply with the proposed, stringent PFOA standard.
- It assumes no costs for the other 30% of facilities that need to implement a PFAS Minimization Plan.
- According to Michigan data, the City of Detroit's wastewater treatment plant is still not meeting the state's PFOS standard, despite requiring GAC Treatment for seventeen sources. Additional measures may be needed.
- The DNR's estimate for GAC treatment is too low, and assumes facilities will rent GAC systems indefinitely instead of incurring the capital costs of purchasing a system.
- It only examines costs incurred by industrial facilities, and not by wastewater treatment plants.
- It only examines treatment costs and does not consider PFOA/PFOS sampling costs.

Nonetheless, despite these limitations, this analysis demonstrates compliance costs of at least $55,867,656 over two years. This clearly exceeds the threshold of $10 million over two years prescribed by s. 227.139. Thus, the agency is required to stop work on the rule until the required bill is passed by the Legislature.

Total compliance costs:

Section s. 227.137(3)(b)1. requires the Department to provide an estimate of the total compliance costs of the rule "expressed as a single dollar figure." Although the DNR provides a series of compliance cost

[16] Michigan PFAS Action Response Team – Wastewater Treatment Plants/Industrial Pretreatment Program; Table 1; https://www.michigan.gov/pfasresponse/0,9038,7-365-88059_91299---,00.html

estimates (that underestimate costs), it fails to ever provide a figure that meets this simple, but important, statutory requirement. This helps inform the regulated community and the public of the costs of any given rule.

The closest estimate of total costs by the Department is provided in *Table 20* of its final EIA. This table lists costs as follows:

Table 20: Total Costs of Rule Implementation

Maximum Estimated Total Costs of Rule Implementation									
Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Years 9 and Beyond
24-mos. Initial Sampling	$303,278	$606,555	$606,555	$606,555	$606,555	$303,278	$0	$0	$0
Long-term* Sampling	$0	$0	$353,280	$706,560	$906,660	$1,106,760	$1,306,860	$1,153,680	$1,000,500
PFAS Minimization* Plan	$0	$0	$523,500	$1,047,000	$1,570,500	$2,094,001	$2,617,501	$2,617,501	$2,617,501
PFAS Treatment**	$0	$0	$0	$0	$0	$0	$856,252	$716,252	$716,252
Total Costs	**$303,278**	**$606,555**	**$1,483,335**	**$2,360,115**	**$3,083,716**	**$3,504,039**	**$4,780,613**	**$4,487,433**	**$4,334,253**

*Over time, costs of PMP implementation as well as long term sampling costs will likely go down.

**Includes installation of treatment in year 7 and then operational costs of treatment systems thereafter.

If we extrapolate the Department's estimate over a twenty year period, we can determine total compliance costs of $72,620,119. Again, this employs the DNR's flawed assumptions, and is still a gross underestimate of total compliance costs of the rule.

5. The Department's proposed standards deviate from procedures prescribed by the U.S. EPA and Wisconsin's own administrative code.

The scientific peer review process allows other experts in the field to offer critiques of scientific models or ideas. It is an especially critical process when an agency, such as the DNR, utilizes a process that falls outside standard practice. As noted previously, the agency did not subject its recommendations for standards for PFOA or PFOS to any type of peer review.

Basis of Per Capita Daily Consumption

The Department has proposed a Surface Water Quality Standard for PFOS of 8 ng/L derived by the agency in its September 12, 2021 *Rule Package Technical Support Document*. The derivation starts with the designation of an acceptable Maximum Fish Tissue Concentration of 50 ng/g, which is equivalent to the acceptable level of PFOS ingestion assuming 1 meal a week of 32 grams per day for adults.

The Department specified this acceptable Maximum Fish Tissue Concentration of 50 ng/g based on the document titled *Best Practice for Perfluorooctane Sulfonate (PFOS) Guidelines* (Great Lakes Consortium for Fish Consumption Advisories 2019). This value was derived assuming U.S. EPA's Reference Dose (RfD) of $2x10^{-5}$ mg/kg-day (USEPA 2016) and an average daily fish ingestion rate of 32 g/day. This average daily fish ingestion rate deviates from the agency's own regulations for the setting of Surface Water Quality Criteria and Secondary Values for Toxic Substances at Chapter NR 105. Specifically, NR 105.08 (Human Threshold Criteria) governs the setting of Surface Water Quality Criteria based on the ingestion of sport-caught fish by Wisconsin anglers. The codified value for average per capita daily consumption is 20 g/day. The assumption of 32 g/day daily fish consumption also deviates from the U.S. EPA's current

assumption of 22 g/day as noted in *Human Health Ambient Water Quality Criteria: 2015 Update* (USEPA 2015). This failure to follow legal requirements applicable to the standard-setting process is problematic for two reasons. First, it artificially inflates the daily consumption factor, leading to a standard that is more stringent than necessary. Second, it is unlawful. At a minimum, the Department should be expected to follow the law when promulgating rules establishing water quality standards.

Our coalition is aware of the agency's statements that there are two legal mechanisms for regulating chemicals in Wisconsin waters: numeric criteria using NR 105 and narrative criteria using NR 102. However, the proposed rule proposes *numeric* criteria. The Department cannot simply deviate from its own procedures in NR 105.08 on how to derive Human Threshold Criteria and choose a different ingestion rate that is 60% higher than their own regulations specify. Our coalition urges the agency to follow the law (its own administrative code) and use the appropriate thresholds.

Surface water to fish tissue modeling:

After specifying a maximum acceptable fish tissue concentration of 50 ng/g of PFOS, the Department estimated the surface water concentration that would cause fish to accumulate PFOS to a level of 50 ng/g in their tissue. Again, the agency deviated from its own regulations. The DNR's regulations for Surface Water Quality Criteria and Secondary Values for Toxic Substances at Chapter NR 105 govern the setting of surface water concentrations that are protective of Wisconsin citizen's ingestion of fish. Section 105.08 (Human threshold criteria) specifies the use of a Bioaccumulation Factor (BAF) in units of L/kg as derived in accordance with NR 105.10.

NR 105.10 is the section of the rule titled Bioaccumulation Factor. NR 105.10 (1) states the following:

> "The bioaccumulation factor used to derive wildlife, human threshold, human cancer and taste and odor criteria or secondary values is determined from a baseline BAF using the methodology provided in Appendix B to 40 CFR part 132. 40 CFR part 132, Appendix B as stated on September 1, 1997, is incorporated by reference. BAFs shall be used to calculate criteria and secondary values for human health and wildlife. Use of a BAF greater than 1000, as determined from either of the methods referred to in sub. (2) (c) or (d) for organic substances, will result in the calculation of a secondary value. The baseline BAF is based on the concentration of freely dissolved substances in the ambient water to facilitate extrapolation from one water to another."

For this proposed rule, the DNR has deviated from its regulations at NR 105.08 and NR 105.10 and instead used a different method for determining the concentration in surface water giving a specific concentration in fish tissue samples. Instead of using the surface water and fish fillet concentration data referred to on page 14 and Appendix A of the *Rule Package Technical Support Document* (DNR 2021) to calculate a BAF in accordance with the rules at NR 105.10, the Departmentwdn used this database to estimate the concentration in the surface water data set that predicted fish tissue concentrations at or above 50 ng/g using a method called a Receiver Operating Characteristics (ROC) curve.

Again, the Department ignored its own requirements specified in NR 105.10. It even failed to refer to NR 105.10 anywhere in the supporting documentation. In fact, in Appendix C, the agency stated that in addition to the ROC method, it tried several other models, including Classification and Regression Trees, Logistic Regression, and Quantile Regression. Unfortunately, what the Department failed to evaluate was the standard approach used by U.S. EPA and states, including Wisconsin, for deriving Surface Water Quality Criteria, which is the derivation of a BAF. The Department must revise its derivation to use a BAF

per NR 105.10. The ROC method utilized by the Department appears to have no basis in NR 105.10, nor is its use explicitly authorized by state statutes.

Dataset used to derive the Surface Water Quality Standard

The Department also needs to thoroughly describe the data set it used in deriving the Surface Water Quality Standard. The only data reported are:

- There were 232 fish and surface water pairs.
    - 102 were from 24 different Wisconsin waters.
    - 130 were from 24 different Minnesota waters.
- The fish samples were fish fillet samples.
    - For each surface water measurement there were from 1 to 76 "paired" fish fillet measurements.
    - Fish fillet data from multiple samples were averaged within each species.
- In some cases, a single surface water sample was "paired" with 5 or 7 fish tissue averages from up to 76 individual fish samples.

Our coalition has a number of questions in reference to the data used to derive the proposed Surface Water Quality Standard for PFOS:

- Were the large number of fish samples that were paired with the small number of surface water samples collected at the same time in the same place?
- Were the sampled fish edible sized fish?
- Were the surface water and fish fillet samples collected from 2007 to 2020 analyzed by the same analytical methods?
- Were the back-up data, such as individual data before averaging, collection methods, laboratory reports, and Quality Assurance/Quality Control documents available for public review?
- What is the variability among the multiple fish samples for which only means are reported?
- Do the individual surface water samples represent a single sample or the mean of field and/or laboratory duplicates?

It is hard to believe that all of the collected and analyzed fish fillet samples that are associated with a single surface water concentration were, in fact, collected at the same time and place. For instance, Appendix A shows that in 2009 one surface water sample was collected at the Mississippi River, Pool 2, Reach 3 (RM 821-834) and found to have PFOS at 9.41 ng/L. Paired with that *single* water sample are 76 fish fillet samples. Specifically, these are listed as:

- 15 bluegill;
- 16 common carp;
- 15 freshwater drum;
- 15 smallmouth bass; and
- 15 white bass.

Is the Department asserting that on one specific day in 2009 there were 76 fish from 5 different species really collected at the same location? On average in the entire dataset, each surface water sample is associated with 20 fish samples. This gives a great deal of weight in the analysis on each lone water sample. Additionally, no water body had more than one water sample to represent that water body over

the entire year. The DNR took one step to avoid giving each water sample too much weight by averaging the data from multiple fillet samples within each species. Still, a single water sample is associated with multiple fish fillet averages. A single surface water sample does not adequately quantify the conditions to which fish may be exposed in a given water body in a given year.

Moreover, given that there were 102 fish/surface water data pairs from 24 different Wisconsin waters, why did the DNR perform its derivation using data from a nearby state (Minnesota)? Site-specific BAFs have been derived with data sets much smaller than the available Wisconsin data set. In its supporting documentation, the Department should perform a sensitivity analysis to determine what the result would have been had only Wisconsin data been used. In addition, a sensitivity analysis should be performed that shows the result of using a single fish/surface water data pair for each water body in each year.

In summary, there are serious gaps in how the data was collected and derived from the Department. A sensitivity analysis could minimize, but not eliminate, those concerns. Our coalition urges the agency to answer the questions listed above and provide additional clarifications for the data, since inappropriate data can help lead to an inappropriate standard.

Calculation for PFOA standard using NR 105.08:

Regarding PFOA, the Department has proposed a 20 ng/L Surface Water Quality Standard for public water supplies and 95 ng/L for non-public water supplies. The formula used to calculate the 20 ng/L standard is similar to the formula used in NR 105.08 when applied for water consumption only and presuming that fish consumption is not an exposure pathway.

First, it should be noted that DHS calculated the proposed drinking water MCL for PFOA using exposure factors for a young child (10 kg), despite the fact that the Kieskamp[17] paper examined impacts of water consumption on a pregnant/lactating mother. Specifically, DHS calculated the proposed drinking water MCL for PFOA using a bodyweight of 10 kg (22 lb) and a water consumption rate of 1 L/d (equivalent to a drinking water ingestion rate to bodyweight ratio of 0.1 L/kg-d), which clearly does not correspond to a pregnant/lactating mother potentially passing PFOA through the placenta or milk per the Kieskamp model. This is another incongruity that calls into question the appropriateness of the Kieskamp paper as the basis for establishing a Wisconsin regulatory standard.

Moreover, the Department's calculation deviates from the GLI procedures prescribed by the U.S. EPA to calculate a Human Threshold Value and uses a mix/match of values ultimately leading to unrealistically conservative criteria values.

- Acceptable Daily Intake (ADI) value of 2 ng/kg/day used, rather than the U.S. EPA's 2016 Non-Cancer Reference Dose (RfD) of 0.00002 mg/kg/day (which is equivalent to 20 ng/kg/day). The Department utilized the U.S. EPA's RfD of $2x10^{-5}$ mg/kg/day when calculating the PFOS criteria, but then reduced the RfD by an order of magnitude when calculating the PFOA criteria. The U.S. EPA set the ADI based on the risk of PFOA exposure to developing fetuses and infants. The scientific validity of departing from U.S. EPA's toxicity-based RfD, which already protects fetuses and nursing infants, cannot withstand scrutiny.

[17] The Keiskamp paper was utilized by DHS as its "principal study" to inform the PFOA standard. It refers to a 2018 paper titled "Incorporation of fetal and child PFOA dosimetry in the derivation of health-based toxicity values" (Kieskamp et. al 2018).

- Body Weight and Water Consumption Rates used for children, rather than adults, which runs afoul of the procedures in the current NR 105.08 and the GLI.

    - Body Weight of 10 kg used, instead of 70 kg
    - For public water supplies, a Drinking Water Consumption rate of 1 L/day used instead of 2 L/day
    - For non-public water supplies, a Drinking Water Consumption rate of 0.21 L/day used instead of 0.01 L/day

- Relative Source Contribution of 100% used (assuming water is the only source of PFOA) instead of 80%. Applying a 100% RSC inappropriately presumes that PFOA exposure only occurs through fish consumption and fails to recognize other exposure pathways.

When all of these deviations from the NR 105.08 human threshold criterion (HTC) calculation procedure are taken together, this results in the inappropriately stringent calculated criteria values of 20 parts per trillion (ppt) and 95 ppt for PFOA. **Alternatively, if the procedures in NR 105.08 are actually followed as the law requires, the PFOA criteria would be 536 ppt for public water drinking supplies and 12,444 ppt for non-drinking water supplies.**

The two PFOA values above were derived by applying the NR 105.08 HTC calculation shown below and accounting for both water and fish consumption. In the absence of WI-specific data, the aquatic organism bioaccumulation factor variable was set equal to 4 as was done by the state of Michigan for their PFOA criteria derivation. This calculation illustrates how two states both using the U.S. EPA GLI approach should result in the derivation of numerically similar criteria. Last, the PFOA concentrations were converted from mg/L to ng/L (ppt), by multiplying the calculated HTC value in by 1,000,000. The data inputs for this calculation are provided below.

NR 105.08(4) Human Threshold Criteria:

$$HTC = \frac{ADE \times 70\ kg \times RSC}{W_H + (F_H \times BAF)}$$

Where:
HTC = Human Threshold Criterion in mg/L
ADE = Acceptable daily exposure = 2×10^{-5}mg/kg-d (2016 U.S. EPA RfD for PFOA)
70 kg = Average weight of adult male in kg
RSC = Relative Source Contribution Factor = 0.8
W_H = Average per capita daily water consumption
= 2 L/d for surface waters classified as public water supplies
= 0.01 L/d for all other surface waters for exposure through body contact or ingestion of small volumes of water during swimming or other recreational activities
F_H = Average per capita daily consumption of fish by WI anglers = 0.02 kg/d
BAF = Aquatic organism bioaccumulation factor, derived in s. NR 105.10 = 4

It should be noted that these values are nearly identical to the PFOA surface water criteria of 420 ppt and 12,000 ppt adopted in Michigan.

<u>PFOS as a bioaccumulative chemical of concern</u>:

Finally, NR 105.03(9) and NR 106.03(1r) defines a bioaccumulative chemical of concern (BCC) as “any

substance that has the potential to cause adverse effects which, upon entering the surface waters, accumulates in aquatic organisms by a human health or wildlife bioaccumulation factor greater than 1000." An aquatic organism bioaccumulation factor (BAF) must be calculated in accordance with procedures in NR 105.10 to determine whether a chemical should be classified as a BCC. The Department's TSD does not include calculations for derivation of a PFOS BAF in order to classify it as a BCC. It is unlawful for the DNR to deviate from its procedures in NR 105.10 to classify PFOS as a BCC. If PFOS is bioaccumulative in fish, then our coalition urges the DNR to revise its TSD to include the proper calculations to make this demonstration.

Conclusion on Department's methodology:

In summary, our coalition's analysis calls into question a series of calculations, the ROC Curve Tool, the data set, and other key determinations made by the Department in setting the proposed surface water criteria for PFOA and PFOS. Our calculated standards for PFOA (536 ppt and 12,444 ppt), which properly applies the agency's administrative code, are far closer to Michigan's surface water criteria than the Department's proposed standards. Again, Michigan is the only neighboring state with surface water criteria for PFOA.

For PFOS, the Department needs to clarify its methodology for defining the compound as a bioaccumulative chemical of concern.

These concerns could have been alleviated if the Department had followed the procedures prescribed by the U.S. EPA and NR 105.08 and NR 105.10, or at least subjected its model, findings, and recommendations to a peer review process. If the Department believes surface water criteria for PFOA and PFOS are necessary, our coalition urges the agency to abandon its proposed standards and instead follow the lawful procedure described in its own administrative code.

6. The DNR should wait for federal rulemaking before pursuing expensive, Wisconsin-only standards.

As noted in our comments on the Department's proposed PFOA/PFOS drinking water standard (DG-24-19), our coalition supports the U.S. EPA developing reasonable, science-based maximum contaminant levels (MCL) of PFOA and PFOS. With respect to surface water standards, these U.S. EPA criteria can be used to establish human threshold criteria under the aforementioned NR 105.08 for waterbodies that provide a public water supply. Any MCL-based values derived by the U.S. EPA would establish a nationally consistent level of human health protection for selected PFAS compounds present in any surface waterbody used as a public water supply.

For PFOS and PFOA compounds that accumulate in fish, the Department is required to follow the aforementioned criteria derivation procedures in NR 105.08. These procedures are aligned with the U.S. EPA's Great Lakes Initiative ("GLI"), as codified in 40 CFR 132. Taking this approach will result in Wisconsin promulgating numeric criteria that mirror the seven other Great Lakes states and thereby set the regulatory bar at the same height for municipal and industrial facilities throughout this region.

Importantly, the U.S. EPA has been clear that it is currently in the process of establishing criteria for both PFOS and PFOA. The U.S. EPA's strategic roadmap notes that the agency intends to propose national drinking water standards under the Safe Drinking Water Act; such standards are expected to be proposed in the fall of 2022. In addition, recommended aquatic life criteria for PFOA and PFOS are expected in the winter of 2022.

There is simply no rational technical justification to have unique, Wisconsin-only one-off numeric criteria established for statewide application. This approach will place Wisconsin businesses at a significant economic disadvantage. Thus, our coalition urges the Department to stop its work on these state-based standards, and instead allow the U.S. EPA to propose national water criteria for PFOA and PFOS.

7. The Department failed to follow Wisconsin law when establishing the surface water standards in this rule.

Chapter 281 provides the statutory authority for establishment of water quality standards. In conferring this authority on the Department, however, the Legislature did not issue the agency a blank check. Rather, there are important restrictions on this rulemaking authority, some of which were ignored by the Department. The following is a non-exhaustive list of examples where agency staff failed to adhere to legal requirements related to establishing water quality standards.

Contrary to s. 281.15(2)(b) Wis. Stats., the Department failed to consider information reasonably available to the department on the likely economic cost of the rule. During the process of preparing the EIA, WMC and MWFPA submitted to the Department detailed information describing the likely costs associated with complying with this rule. These costs included compliance costs that had not been included in the draft EIA for a wide array of impacted businesses and ratepayers. Included in these costs were actual costs incurred by a Wisconsin business that was subject to (unlawfully imposed) treatment requirements for construction dewatering – costs which exceeded $800,000. These costs were "reasonably available" to the Department because they were given to the Department in our comments. However, the Department chose to ignore these economic costs, as is evidenced by the decision to exclude them from the final EIA.

In addition, and contrary to s. 281.15(2)(c) Wis. Stats., the Department failed to establish water quality criteria which are no more stringent than reasonably necessary to assure attainment of the designated use for the water bodies in question. There are numerous examples throughout this rulemaking where the Department deliberately chose a path leading to an unnecessarily stringent criteria. Examples include the following:

- Applying the PFOA criteria at the outfall instead of the edge of the mixing zone, despite the fact that PFOA is not bioaccumulative.

- Establishing an effluent limitation applicable to new sources for PFOA equal to the criteria, despite the fact that PFOA is not bioaccumulative.

- Using a daily consumption factor for fish of 32 g/d to artificially inflate the PFOS criteria, despite NR 105 requirements to use an intake factor of 20 g/d. The result is an inflation of assumed fish consumption by 60 percent.

- Contrary to U.S. EPA and NR 105.10 procedures, the Department used the Receiver Operating Characteristics (ROC) curve to contrive a criteria that results in a substantially more stringent standard for PFOS than the law contemplates.

- Failing to adhere to NR 105.08 requirements to establish PFOA criteria that are orders of magnitude more stringent than what the law prescribes (95 ppt instead of 12,444 ppt).

It should be noted that the list above is not exhaustive, and any one of them are grounds for invalidating the rule under s. 227.40(4)(a) on the grounds that the rule exceeds its statutory authority.

Finally, and contrary to s. 281.15(2)(d) Wis. Stats., the Department failed to employ reasonable statistical techniques in interpreting the relevant water quality data. The fish tissue sample data is a striking example. As noted above, each surface water sample is associated with 20 fish samples. This gives an inordinate weight in the analysis on each lone water sample. Additionally, no water body had more than one water sample to represent that water body over the entire year. A single surface water sample does not adequately quantify the conditions to which fish may be exposed in a given water body in a given year. The relationship between fish tissue samples and the very limited water sample data is not sufficiently robust to yield a statistically valid model, and therefore should not have been used as the basis to establish a water quality criteria for PFOS.

8. Because PFOA is not a bioaccumulative chemical of concern, the narrative criterion should apply at the edge of the mixing zone and reasonable potential determinations should consider dilution in the receiving water.

The "mixing zone" generally refers to the area of a waterbody where the effluent from a point source is mixed with other existing water. As previously noted, the proposed rule prohibits the inclusion of PFOA in the "mixing zone," despite the Department explicitly acknowledging that PFOA is not a bioaccumulative chemical of concern. Our coalition urges modifications to the rule to ensure that PFOA may be included in the "mixing zone." This would reduce an unnecessary, expensive burden with the rule on the regulated community.

The narrative criteria and implementation procedures proposed for PFOA are not consistent with the facts in the Department's Technical Support Document (TSD) and statements in the Fiscal Estimate and Economic Impact Analysis (EIA). Page 13 of the TSD states (emphasis added), "The data described above demonstrates that PFOS is a highly bioaccumulative compound (**in contrast with PFOA, which is rarely detected in fish tissue samples** but widely detected in the water; fig. 7). Further, page 17 of the TSD states, "PFOA doesn't bioaccumulate to high concentrations in fish…" and page 19 states, "The data described above demonstrates that PFOA is unlikely to bioaccumulate in fish tissue." Attachment B of the EIA states how the Department intends to establish effluent limitations in WPDES Permits. PDF Page 16 of the EIA states (emphasis added):

> *Note that effluent limitations for PFOS will be set equal to the standard of 8 ng/L if facilities are unsuccessful in reducing effluent concentrations below the standard following 7 years of PFAS minimization plan implementation.* ***For PFOA, though, dilution in the receiving water will be considered, so limits are expected to be substantially higher than the standard in most cases.*** *The reason for this difference is that PFOS is a bioaccumulative chemical of concern* ***while PFOA is not*** *(see the Technical Support Document for this rule for more details on bioaccumulation).*

Proposed NR 106.985(2)(d)2. is in agreement with the TSD and EIA since it requires water quality based effluent limits to be calculated using the applicable procedures in NR 106.06 and NR 106.11 based on the applicable PFOA threshold in NR 102.04(1m). Furthermore, it clearly states that PFOA is not a bioaccumuative chemical of concern as defined in NR 106.03(1r).

However, proposed regulatory language in the following sections present conflicts: NR 102.04(1m), NR 106.98(3)(b), NR 106.98(4), NR 106.985(1), NR 106.985(3), and NR 106.996. Additional information for each regulatory citation is provided below.

- The narrative standard in NR 102.04(1m) specifies that all surface waters including the mixing zone must meet the narrative criteria for PFOS and PFOA at all times and under all flow and

water level conditions. Since PFOA is not a bioaccumulative chemical of concern, the narrative criteria should apply at the edge of the mixing zone. The reasonable potential determinations and water quality based effluent limitation ("WQBEL") calculations should evaluate whether the criteria will be met after dilution with an appropriate allowable quantity of receiving water flow, as described in NR 106.06(4). Thus, the mixing zone may be above the narrative criteria, but after dilution with an appropriate amount of receiving water flow, the narrative criteria will be achieved at the edge of the mixing zone. Furthermore, if PFOS is a bioaccumulative chemical of concern, then the procedures outlined in the Great Lakes Initiative and NR 106.06(2) should be used to consider whether to grant a mixing zone for discharges into the Great Lake System. Revisions to NR 102.04(1m) should be made to exclude the mixing zone for PFOA and to consider whether to grant a mixing zone for discharges of PFOS into the Great Lakes System.

- Proposed NR 106.98(3)(b) states, "The department may waive the requirement to conduct PFOS or PFOA sampling…if the department determines that it is unlikely that the permittee's effluent will contain PFOS or **PFOA at levels above the narrative standard under s. NR 102.04(1m)**…" For PFOA, the comparison should not be made to the narrative standard itself, but the potential WQBEL calculated using applicable procedures in NR 106.06 and NR 106.11 and based on the applicable PFOA threshold in NR 102.04(1m).

- Likewise, the proposed NR 106.98(4) states, "The department shall require creation and implementation of a PFAS minimization plan…whenever the department determines that the discharge from the point source contains PFOS or **PFOA at concentrations that have reasonable potential to cause or contribute to an exceedance of the narrative standard specified under s. NR 102.04(1m)**...If any one of the following methods indicate that there is reasonable potential for an exceedance of either the PFOS **or PFOA standard**, a PFAS minimization plan shall be required in the permit." The reasonable potential determination for PFOA should consider dilution in the receiving water and should not be directly compared to the narrative criteria. Both reasonable potential determination methods described in the section use the narrative criteria itself rather than the limit that would apply calculated by using the procedures in NR 106 and the narrative criteria. Proposed NR 106.98(4)(a) requires a PFAS minimization plan if the 30-day P99 "for PFOS **or PFOA exceeds the narrative standard** specified under s. NR 102.04(1m)." Proposed NR 106.98(4)(b) requires a PFAS minimization plan "for PFOS **or PFOA…if the arithmetic average exceeds one-fifth of the narrative standard** specified under s. NR 102.04(1m)." Both reasonable potential determination methods should be revised accordingly.

- Proposed NR 106.985(1) states, "If the department determines there is a reasonable potential **to exceed** the PFOS **or PFOA narrative standard** under s. NR 102.04(1m) based on the procedures and data collected under s. NR 106.98, the department shall require that the permittee develop and implement a PFAS minimization plan under s. NR 106.99." For PFOA, the reasonable potential determination should evaluate the potential to exceed the WQBEL, not the narrative standard itself.

- Proposed NR 106.985(3) states, "If implementation of the PFAS minimization plan reduces or eliminates the discharge of PFOS and PFOA to a level where the permitted discharge no longer has the reasonable potential **to exceed** the PFOS and **PFOA standards under s. NR 102.04(1m),**

the permittee shall maintain effluent quality below the standard." The reasonable potential determination in this section should compare the permittee's effluent to the WQBEL calculated using the narrative standard.

- Requirements for new dischargers or new sources are outlined in NR 106.996, which states: "If the department determines that a new source or new discharger may have the reasonable potential to cause or contribute to an **exceedance of the narrative standard** under s. NR 102.04(1m), the permittee shall install pollution control measures **to achieve the standard** prior to discharge, and **water quality based effluent limitations for** PFOS or **PFOA** or both **that equal the applicable threshold values in s. NR 102.04(1m)** shall be included in the permit." For PFOA, this contradicts the EIA and the proposed methodology to calculate the WQBEL specified in NR 106.985(2)(d)2. The regulatory text should be revised to resolve the conflict.

In summary, since PFOA is not a bioaccumulative chemical of concern, the narrative criterion should apply at the edge of the mixing zone and reasonable potential determinations should consider dilution in the receiving water. Moreover, such a determination is consistent with the Department's existing administrative code. In short: PFOA should not be subject to the "mixing zone" ban.

9. Preference for pollutant minimization plan over "end of pipe" controls.

For existing facilities and current WPDES permit holders, the proposed surface water rule provides for the creation of a "PFAS Minimization Plan" (PMP). Specifically, the DNR has proposed the creation of Subchapter VIII in NR 106 to specify how the department will regulate the discharge of PFOS and PFOA to surface waters of the state.

Our coalition has a number of reservations with how the Department is proposing to implement PMPs. First, as noted previously, the application of these proposed NR 106 implementation procedures must be premised on the derivation of numeric criteria that are established lawfully. Second, the department grossly underestimated costs for facilities that need to use PMPs. Third, our coalition has specific concerns with the proposed language to implement PMPs.

However, to the extent that the Department seeks to lawfully impose surface water criteria for PFOA and PFOS, our coalition prefers the use of PMPs as opposed to so-called "end of pipe" controls in cases where discharge concentrations may have a reasonable potential to exceed a water quality based effluent limit (WQBEL) calculated for a facility. We believe this approach grants facilities needed time to evaluate options that may be far more cost-effective to reducing PFAS discharges than the installation and operation of expensive wastewater treatment technologies. This is especially important since in many instances, cost-effective treatment technology may not yet exist.

10. Preference for "grab samples" over "composite samples" for PFAS sampling methodology.

The proposed NR 106.995(1) states:

> *The Permittee shall collect samples in accordance with the requirements in the permit. The Department may require either grab or composite samples. If the permittee uses a composite sampler, an equipment blank is required.*

Current analytical methods are capable of detecting PFAS compounds at sub-part per trillion (nanogram per liter) concentrations. Given the sensitivity of the analytical method, care must be taken when

samples are collected. Sampling protocol developed by the State of Michigan and noted by the Department indicate that there is a high potential for sample cross-contamination during sampling from clothing, personal protective equipment, and commonly used sampling materials such as PTFE piping and tubing, pipe thread compounds and tape.

To minimize the likelihood of contamination during the sampling process the Department should eliminate the discretionary language and exclusively require grab samples when sampling for PFAS. This would be consistent with the proposed requirements in NR 106.99(2)(c) and is in line with the sampling collection requirements identified in U.S. EPA Method 533, U.S. EPA Method 537.1, and Department guidance ("Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations", Document ID EA-19-0001, 12/16/19).

Our coalition recommends revisions to NR 106.995(1) to remove references to composite samples and equipment blanks. Suggested language is the following:

> *The Permittee shall collect samples in accordance with the requirements in the permit. The Department shall require grab samples.*

If this language is adopted, please make corresponding revisions to the proposed rule, including removal of the definition of "Composite Sample" in NR 106.975(2), the definition of "Equipment blank" in NR 106.975(3), and the Note following NR 106.995(1).

Furthermore, we appreciate the Department's inclusion of a sampling guidance document for recommended protocols and cross-contamination prevention measures, as included in the Note below proposed NR 106.99(2)(c); however, the reference is to a Michigan Department of Environmental Quality document. It seems highly unusual for a Wisconsin state-specific regulation to include a reference to materials prepared by other states. Wisconsin has no control over this document, its management or revisions, or even its publication on a public-facing website. We recommend the Department develop its own Wastewater PFAS Sampling Guidance and reference that document in the regulation. Alternatively, remove the citation to the Michigan document and include a hyperlink for the Michigan document on its website, outside of the regulatory process.

11. Opposition to recommending U.S. EPA draft Method 1633 at this time.

A proposed note to NR 219.04(1) states the following:

"If the EPA Office of Water publishes a 1600 series isotope dilution method for the analysis of PFAS in aqueous, sludge (biosolids), and tissue matrices, the department recommends use of the EPA method."

A proposed note to *Table F* of NR 219.04 includes the same recommendation.

At this time, the most relevant method is the Draft U.S. EPA Method 1633. It was published in September 2021 and is the first analytical method relevant to Clean Water Act monitoring in wastewater. Previous methods were for drinking water matrices. Notably, while the U.S. EPA Method 1633 has not been promulgated in 40 CFR 136 yet, the draft method specifies that aqueous samples or samples that flow freely "are collected as grab samples or in refrigerated bottles using automatic sampling equipment."

While the recommendation to collect grab samples is a welcome one from the U.S. EPA, it should be noted that the U.S. EPA has not yet conducted multi-laboratory validation of this method; such

validation is expected to occur later next year. A number of stakeholders have raised numerous concerns regarding the Draft EPA Method 1633.

Thus, our coalition urges the Department to clarify in the rulemaking that Draft U.S. EPA Method 1633 is not required for sampling. Moreover, we urge the DNR to withhold recommending this draft method until it has been formally promulgated for use under the Clean Water Act.

12. Clarify NR 106.98 in relation to background concentration requirements.

The proposed rule is predicated on the expectation that source reductions and minimization plans will reduce PFOS and PFOA discharges to levels below the proposed standards. For facilities that do not use poly- and perfluoroalkyl substances in their processes, or have minimized their use to the maximum extent practical, the source water may be a significant or sole contributor to the concentration of PFAS in the facility's discharge. Given that PFOS and PFOA contamination in groundwater and surface water is well documented, any new regulations must account for background concentrations when establishing water quality based effluent limits in a WPDES permit. While the concentration of a pollutant may exceed a water quality criterion, actions by a facility may result in no net addition of PFAS to a water body.

Proposed NR 106.98 establishes the procedures for determining when a permitted discharge has the reasonable potential to cause or contribute to an exceedance of the narrative PFOS or PFOA standards. However, a subsection should be added to address how to conduct reasonable potential determinations when the representative background concentration in the receiving water is greater than the water quality criterion for the substance. The text could mirror or reference NR 106.06(6), which includes procedures for making reasonable potential determinations in these circumstances. Specifically, NR 106.06(6)(b) includes five conditions that must be demonstrated, including a no net addition.

Further, NR 106.06(6)(b) is consistent with the procedures outlined in U.S. EPA's Great Lakes Initiative, as codified in 40 CFR 132 Appendix F, Procedure 5D. The Great Lakes Initiative ("GLI") was established in 1995 with water quality criteria for 29 pollutants to protect aquatic life, wildlife, and human health. Detailed methodologies were included to develop criteria for additional pollutants and implementation procedures were provided to develop consistent, enforceable water quality based effluent limits in discharge permits. As described by U.S. EPA, "Great Lakes States and Tribes are to use the water quality criteria, methodologies, policies, and procedures in the GLI to establish consistent, enforceable, long-term protection for fish and shellfish in the Great Lakes and their tributaries, as well as for the people and wildlife who consume them." Inclusion of language and procedures to address reasonable potential determinations when background concentrations are elevated should be consistent with the GLI and Department procedures in NR 106.06(6) to ensure consistency with other Great Lakes states.

Our coalition requests the inclusion of the above change (to NR 106.98) to clarify how to conduct reasonable potential determinations when the representative background concentration in the receiving water exceeds the given water quality for the substance. Such a change will help protect facilities that engage in actions that result in no net addition of PFOA or PFOS to surface waters.

13. Clarify monitoring requirements in proposed NR 106.98

The proposed NR 106.98(2) and (3) address initial and reduced monitoring frequencies for PFOS and PFOA in discharges. The first step in the process is to monitor for PFOS and PFOA for up to 2 years, unless a waiver has been granted by the Department or reduced frequency is approved.

As a general matter, our coalition supports reducing monitoring when a regulated entity is able to demonstrate compliance. However, some revisions are necessary to clarify the monitoring requirements under the proposed rule.

The last sentence in proposed NR 106.98(2) states (emphasis added), "**All** of the following sample frequencies apply to each category of permitted dischargers." The proposed regulation then addresses minimum sampling frequencies for different types of dischargers (*see Table 5*):

Table 5: Summary of Minimum Sampling Frequencies by Category

Proposed Regulatory Citation	Category	Avg Flow Rate	Minimum Sampling Frequency	Sampling Locations
NR 106.98(2)(a)	Major Municipal Discharger	≥ 5 MGD	Monthly	- Influent - Effluent
NR 106.98(2)(b)	Major Municipal Discharger	≥ 1 MGD but < 5 MGD	Every 2 months	- Influent - Effluent
NR 106.98(2)(c)	Other Municipal Discharger, commonly referred to as Minor Municipal Dischargers[1]	Not specified (assumed < 1 MGD)	Frequency specified in permit	- Influent - Effluent
NR 106.98(2)(d)	Primary or Secondary Industrial Discharger[2]	Not specified	Monthly	- Effluent
NR 106.98(2)(e)	Other Dischargers[3]	Not specified	Not specified	Not specified

[1]If Department determines PFOA or PFOS may be present in the discharge.
[2]If Department determines that permittee's effluent may contain PFOS or PFOA
[3]If the Department has a reasonable expectation that the discharge contains PFOS or PFOA at levels that will likely exceed the narrative standard. No further details are specified, such as the minimum sampling frequency or sampling locations.

First, a minor wording revision is required in the last sentence of proposed NR 106.98(2) to remove the words "All of." The sentence should read, "The following sample frequencies apply to each category of permitted dischargers." A permittee would be classified in one of the categories and only subject to the minimum sampling frequency for that category.

Second, the proposed regulation addresses reduced sampling frequencies and waivers. Proposed NR 106.98(3)(a) states (emphasis added), "The department may reduce monitoring frequency to once every 3 months **for dischargers described under sub. (2)(a), (b), or (d)** on a case-by-case basis, but only after at least 12 representative results have been generated." The reduced sampling frequency provision should be available to the entire universe of dischargers, including those described under sub. (2)(c) and (e), especially if initial monitoring for those dischargers demonstrates there is no reasonable potential. The regulatory text should be revised to state, "The department may reduce monitoring frequency to once every 3 months for dischargers described under **sub. (2)** on a case-by-case basis…"

Third, the proposed regulation addresses waivers in NR 106.98(3)(b), which provides the department with authority to waive PFOS or PFOA sampling for a discharger under sub. (2) at each permit reissuance. It is unclear how this will be implemented in permit applications and/or permit reissuances the first permit reissuance after these rules are promulgated and in subsequent permit reissuances. This section should be revised to provide basic criteria in which the Department *shall* waive PFOS or PFOA sampling. Such a waiver should not solely be based on Department discretion. Moreover, the Department should still retain the ability to issue waivers if a regulated entity does not meet the minimum criteria required, but otherwise can demonstrate that sampling is unnecessary.

Our coalition urges the Department to adopt the aforementioned changes to provide additional clarity

and regulatory certainty to PFOA and PFOS monitoring requirements.

Conclusion:

The aforementioned organizations – Wisconsin Manufacturers & Commerce, Wisconsin Civil Justice Council, Wisconsin Water Alliance and Midwest Food Products Association –appreciate the opportunity to submit detailed comments on WY-23-19 (NR 105).

Again, our organizations support reasonable, science-based regulations of PFOA and PFOS. This includes the establishment of reasonable, national standards by the U.S. EPA. Unfortunately, just like the agency's proposed drinking water rule (NR 809), the DNR is once-again proposing Wisconsin-only standards that are *not* lawful, *not* properly applied, and impose *substantial* regulatory burdens on businesses and other entities.

To emphasize our major concerns:

1. The compliance costs for this rule exceed statutory limitations: The agency's final economic impact analysis (EIA) excludes significant cost drivers, and substantially underestimates the compliance costs associated with the rule. As a key example, we believe it will cost the average business far more than $13,728 annually to comply with a PFAS minimization plan – the estimate provided by the Department.

2. The proposed standards were based on an internal model that was not peer-reviewed: The agency used a unique model and misapplied key data in formulating its proposed standards. The proposed criteria for PFOA is far more stringent than any of our surrounding states – including Michigan.

3. The DNR did not follow the law: Agency staff failed to follow limitations on establishing water quality criteria under s. 281.15 Wis. Stats., as well as various sections of Ch. NR 105 Wis. Admin. Code.

4. The DNR should wait for U.S. EPA guidance and standards: The U.S. EPA is in the process of developing national criteria. The DNR should wait for this national criteria before adopting mandatory, Wisconsin-only standards.

Our coalition has a number of additional concerns with the rule, including the exclusion of PFOA from the "mixing zone," monitoring requirements, types of sampling required, and other important concerns. We encourage the Department to carefully review these concerns and consider the suggested changes, which will lessen some burdens associated with the rule. However, these suggestions do not change how the rule is unlawful and fundamentally flawed.

Thus, our organizations respectfully ask the DNR to *stop* its work on the surface water criteria under NR 105 and instead allow the U.S. EPA to propose national standards. This will ensure that Wisconsin businesses are not subject to Wisconsin-only requirements that will add significant administrative burdens and costs.

Thank you for your consideration of our coalition's comments.

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December 15, 2021

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RE: Comments of the Municipal Environmental Group – Wastewater Division
Board Order WY-23-19

Dear Ms. Williams:

We are submitting these comments on behalf of the Municipal Environmental Group–Wastewater Division (MEG Wastewater). MEG Wastewater is an organization of over 100 municipalities statewide who own and operate wastewater treatment plants. We represent facilities ranging in size from small sanitary districts to larger utilities. As you know, MEG has been an active participant in the various department forums on PFAS over the past several years. MEG appreciates this opportunity to comment on Board Order WY-23-19 for the revisions to chs. NR 102, 105, 106, and 219, which include establishing narrative criteria for PFOA and PFOS.

MEG is encouraged by and supports the framework the department implements in this draft rule package. Surface water standards are commonly established at state level, and it therefore makes sense to proceed with development of these rules at this time. MEG has advocated for non-numeric standards and a pollutant minimization/source reduction approach to the regulation of PFOS and PFOA. This is because PFOA and PFOS cannot be removed through conventional wastewater treatment processes. And, the treatment processes wastewater treatment plants would be required to implement to meet strict effluent limitations for PFOS and PFOA are neither economically feasible nor environmentally sound. The department's establishment of narrative criteria and an associated numeric thresholds is an approach that should result in actual PFAS reductions and avoid the costly and time consuming process of obtaining variances from water quality standards. This approach addresses PFOS and PFOA pollution in a scientifically and environmentally sound, expedient, and cost-effective manner.

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With respect to the details of the proposed rule language, MEG provides the following comments for the department's consideration.

First, certain sections of the proposed rule require consideration of PFOS and PFOA in sludge and biosolids, which we do not believe is appropriate or necessary in this rule package. For example, proposed NR 106.99(1)(d) provides that PFAS minimization plans shall, "[w]here the permittee regularly monitors … sludge, or biosolids for PFOS and PFOA," include "any changes in PFOS and PFOA concentrations over comparable historic data" in these media. Similarly, proposed NR 106.99(4) provides that the department "shall consider" the concentrations of PFOS and PFOA in "biosolids or sludge, if applicable," in reviewing the appropriate elements of a PFAS minimization plan. The proposed rule package establishes narrative criteria for surface waters and is not the appropriate mechanism for regulation regarding sludge or biosolids. Further, we understand that the department is working on guidance regarding biosolids management separately from this rule package. We request that these references to sludge and biosolids be removed from this rule language.

Second, it is still unclear how the proposed narrative standards and thresholds would apply to construction projects that involve pit trench dewatering. For instance, when will it be necessary to test for PFAS? If testing occurs and the water is under the applicable thresholds, could it be discharged to storm sewer and/or surface waters? Generally, municipal wastewater treatment plants accept contaminated groundwater from construction sites, and municipalities often undertake construction activities that require pit trench dewatering. If the water is over the applicable thresholds, would municipal treatment plants be allowed to accept it, or knowing that it contains PFAS over a threshold, would a PMP have to require treatment before discharge to a sanitary sewer? We would appreciate clarification from the department on these types of activities.

A similar question arises in the context of other known waste sources of PFAS such as landfill leachate. Will all such sources need to pretreat to the applicable thresholds before a municipal plant would be allowed to accept such waste? That is not the current practice with other contaminates, provided that the treatment plant can stay within its permit limits, and imposing that requirement here could result in substantial costs and practical issues. We would appreciate clarification from the department on this topic.

Finally, the proposed rules do not define the applicability of data for determining reasonable potential. MEG would appreciate clarification from the Department as to how data will be determined to be "representative" and what data will be included in the reasonable potential calculation. This is particularly relevant given the continued challenges with ensuring validity during PFAS sampling and analysis. MEG would also appreciate clarification from the department as to the parameters around which historic PFOS and PFOA sampling data will be used. Once a permittee has implemented a successful PFAS minimization plan as required under this rule, such that its discharge no longer creates a reasonable potential to exceed a PFOS or PFOA threshold, the permittee should be able to have that plan removed from its WPDES permit. If, however, historic PFAS sampling continues to be used in the reasonable potential calculation, the gains made in source reduction may not be adequately accounted for in determining permit requirements. MEG requests that the department clarify how historic PFAS sampling results will be used in the reasonable potential calculation for permittees that have implemented successful PFAS minimization plans.

Thank you for consideration of these comments. MEG greatly appreciates the opportunity to participate in this process and welcomes further communication with the Department.

Sincerely,

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December 14, 2021

Testimony On WY-23-19 Surface Water Standards for PFOS and PFOA

My name is Doug Oitzinger. I am a former Mayor of the City of Marinette, and I am a current City Council member. I support the rule making efforts of WY-23-19, but I specifically find the standard for PFOA too high at 20 ng/L for public water supplies and 95 ng/L for other surface waters. The proposed DNR *groundwater* standard is a combined 20 ng/L for PFOS and PFOA. This rule would allow a combined PFOS/PFOA standard of 28 ng/L for surface water used for public water supplies and 103 ng/L for other surface waters.

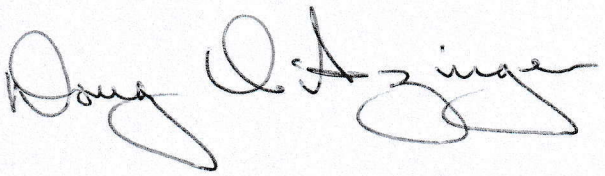
My city ward includes the source of one of the greatest PFAS contamination sites in Wisconsin and the ongoing PFAS contamination of surface water in the Bay of Green Bay of Lake Michigan: the Tyco/JCI Fire Technology Center in the City of Marinette. It is without a doubt that the PFAS contamination investigation in my community is the most mature and extensive the State of Wisconsin has conducted to date. There is a ditch ("Ditch B" designated in DNR correspondence) one-half block from my home emptying into the Bay's waters flowing twenty-four hours a day, seven days a week contaminating the water we use for recreation, the public water supply used for drinking, the fish that we catch and eat, and wildlife that drink the water. The DNR has issued a "Do Not Eat Deer Liver" advisory in our area because of the surface water that the deer use as drinking water is contaminated with PFAS and it collects in the deer's liver. The wildlife and fish testing in our area is in the early stages of investigation, but we already know there is a problem.

The proposed rule appears to base its calculations of the behavior of PFOS in fish and not on the combination of PFOS/POFA in other species and in humans. I do not understand how the science can lead the Department of Health Services to conclude that any combination of PFOS/PFOA above 20 ng/L is a risk to human health in *groundwater*, but when it comes to polluting the surface waters of Wisconsin, 103 ng/L of PFOS/PFOA is ok.

There is another ditch (designated "Ditch A" in DNR correspondence) that also emanates from the Tyco/JCI contaminated PFAS site in my Ward. The difference between Ditch A and Ditch B is that Ditch B is largely a "receiver" of PFAS contaminated *groundwater* which upwells into the surface water which then carries that contamination to the Bay of Green Bay; while Ditch A is a source of contaminated water that carries its contamination into rural Town of Peshtigo residential property and sheds its contamination to *groundwater and private drinking wells.*

By raising the combined PFOS/PFOA standard to 103 ng/L for surface water, ditches such as "Ditch A" will be contaminating *groundwater* to an unacceptable level exceeding the draft *groundwater standard* by over 500%. The description of "Ditch A" I just made isn't theoretical, it is documented in existing site investigation reports and is commonly understood in the Agency.

Therefore, I both support the rule making effort for PFOS and PFOA standards in surface waters and I urge that the standards be changed to 8 ng/L for PFOS, 20 ng/L for PFOA, or any combination of PFOS/PFOA at 20 ng/L for all surface waters regardless of their use as a public water supply.



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December 15, 2021

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Re: Comments of the PFAS Regulatory Coalition on Wisconsin Department of Natural Resources' Board Order WY-23-19 to Revise Chapters NR 102, 105, 106 and 219

Dear Ms. Williams:

The PFAS Regulatory Coalition (Coalition) appreciates the opportunity to file comments regarding the Wisconsin Department of Natural Resources' (DNR) Board Order WY-23-19 to revise chapters NR 102, 105, 106 and 219, which would add narrative surface water criteria with numeric thresholds for poly- and perfluoroalkyl substances (PFAS) including perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) (Proposed Rule).

I. The Coalition's Interest

The Coalition is a group of industrial companies, municipal entities, agricultural parties, and trade associations that are directly affected by the state's development of policies and regulation related to per- and polyfluoroalkyl substances (PFAS). Coalition membership includes entities in the automobile, coke and coal chemicals, iron and steel, municipal, paper, petroleum, and other sectors. None of the Coalition members manufactures PFAS compounds. Coalition members, for purposes of these comments, include: Airports Council International – North America; American Coke and Coal Chemicals Institute; American Forest and Paper Association; American Fuel and Petrochemical Manufacturers; American Iron and Steel Institute; Barr Engineering; Brown & Caldwell; Gary Sanitary District (IN); Illinois Association of Wastewater Agencies; Lowell, MA; Pueblo, CO; Toyota; Trihydro, and Yucaipa Valley Water District (CA).

II. Draft Rulemaking

DNR has proposed water quality standards for both PFOS and PFOA. Chapter NR 105, Wis. Adm. Code, contains specific numeric criteria for numerous toxic pollutants, as well as formulas for calculating numeric criteria for toxics that do not yet have promulgated criteria. Section NR 102.04(d) contains Wisconsin's narrative criteria for toxics. The proposed PFOS and PFOA standard interprets Wisconsin's existing narrative criterion with numeric thresholds, established under s. NR 105.04(4m) and s. NR 102.04. The Proposed Rule defines levels of public health significance of 8 ng/L for PFOS, which is based on fish ingestion; 20 ng/L for PFOA in waters classified as public water supplies, which is based on ingestion; and 95 ng/L for PFOA in non-public water supplies, which is based on ingestion incidental to recreation.

The Proposed Rule also establishes a process for listing waters on the state's impaired list when a surface water is found to contain levels of PFOS or PFOA above the public health significance thresholds. Additionally, the Proposed Rule includes revisions to ch. NR 106, Wis. Adm. Code that address WPDES permit implementation procedures for the new PFOS and PFOA threshold. With regard to permit implementation of the narrative criteria, DNR has proposed source reduction and pollutant minimization as a first step toward reducing levels of PFOS and PFOA. The Proposed Rule establishes WPDES permit requirements for PFOS and PFOA discharges to surface waters of the state, in ch. NR 106 – Subchapter VIII, Wis Adm. Code, including: the determination of the need for a PFAS Minimization Plan based on data generation in a reissued permit, a general schedule for PFAS Minimization Plan permit implementation procedures, and PFAS Minimization Plan requirements. The proposed permit requirements include standard PFOS and PFOA sampling frequencies for categories of permitted dischargers. If, after 84 months of implementing a PFAS Minimization Plan, a discharge still exceeds the numeric thresholds, DNR will impose an effluent limit.

III. PFAS Regulatory Coalition Comments

The Coalition appreciates DNR's responsibility to protect Wisconsin residents from health impacts of PFAS, while also recognizing the reality of widespread PFAS in surface water. The Coalition supports aspects of the proposed rule, including the focus on pollutant minimization as an effective regulatory tool. Nonetheless, the Coalition has concerns regarding other aspects of the rule that hinder compliance and create regulatory uncertainty for permittees.

A. The Pollutant Reduction Approach is Effective and Appropriate

The Coalition supports DNR's decision to use minimization plans to control PFAS in discharges to surface waters, as opposed to effluent limits. In particular, the Coalition agrees that "source reduction is the most cost effective approach to reducing or eliminating PFOS and PFOA in wastewater discharges and it avoids the generation of contaminated carbon filters from treatment systems which will contain higher levels of PFOA and PFOS

that will have to be disposed of in a safe manner." Importantly, Wisconsin and other permitting authorities have successfully implemented similar pollutant minimization approaches to control for toxic pollutants, including mercury. The Coalition disagrees, however, that the use of pollutant minimization plans should be limited to 84 months. Notably, DNR has not provided an adequate justification for the 84-month cutoff on the pollutant minimization efforts, and there do not appear to be compelling reasons for time-limiting pollutant minimization efforts in favor of effluent limits.

As evidenced by both USEPA's and Wisconsin's approach to reducing discharges of mercury, pollutant minimization is an appropriate and an effective compliance tool. For example, USEPA cites the following benefits of pollutant minimization to reduce mercury loadings:

> The most cost-effective approach for POTWs to substantially reduce mercury discharges appears to be pollution prevention and waste minimization programs that focus on high-concentration, high-volume discharges to the collection system, with considerable effort also directed at high-concentration, low-volume discharges. . . . Using pollutant minimization or prevention programs can also reduce the transfer from wastewater to other media through disposal of mercury-containing sludge from which mercury may subsequently reenter the environment. For example, mercury removed at a POTW through treatment is likely to reenter the environment through POTW sludges that are then incinerated or applied to land (although some is captured by air emission controls on incineration). EPA believes that a better approach for reducing mercury releases to the environment is to prevent mercury from entering the wastewater collection system at the source through product substitution, waste minimization or process modification, or removing and recycling mercury at the source (source controls) using state-of-the-art technology. These measures aimed at reducing influent loads to POTWs also reduce the use of mercury in the community, which could reduce the amount of mercury entering the environment through other media or sources. (For example, products that contain low levels of mercury may be disposed of as a nonhazardous solid waste and incinerated, releasing mercury to the air.) Where pollution prevention approaches have been implemented, substantial reductions in mercury concentrations in POTW influents, sludges, and effluents have been achieved. For a discussion of this approach, see the draft Overview of P2 Approaches at POTWs (USEPA 1999a).[1]

[1] *See* "Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion," EPA 823-R-10-001 (April 2010), *available at* https://www.epa.gov/sites/default/files/2019-02/documents/guidance-implement-methylmercury-2001.pdf at p. 120.

The same rationale applies to reducing discharges of PFAS compounds, like PFOS and PFOA, which are pervasive and susceptible to re-entering the environment. Accordingly, the Coalition supports source reduction and pollutant minimization measures as a cost-effective long-term solution to reducing PFOA and PFOS in Wisconsin's surface waters and urges DNR to eliminate the unnecessary effluent limit requirements.

Another consideration supporting a flexible pollutant minimization approach is the fact that the state has not gone through the formal process of promulgating numeric standards for PFOS and PFOA. Setting numeric standards—as opposed to the thresholds proposed here, which are based on narrative standards—requires a more extensive analysis based on the best available science, scientific literature review, established procedures for risk assessment and management, state policy, scientific peer review, and public input. The fact that the proposed thresholds are based on narrative criteria and did not undergo the more rigorous process for adoption of numeric standards further highlights the need for flexibility in implementing and enforcing the thresholds. Accordingly, the Coalition recommends that DNR remove the future effluent limitation requirements and provide flexibility to allow permittees to employ creative pollutant minimization techniques as a long-term compliance mechanism.

Additionally, the economic impact analysis developed for the Proposed Rule estimates that "only one small business will need to install treatment" in order to meet the proposed thresholds. If DNR expects that the vast majority of dischargers will be able to meet the thresholds through the pollutant minimization approach outlined in the Proposed Rule, then there will be no added benefit, in terms of water quality, of requiring effluent limits at the end of the 84-month period. Moreover, DNR does not appear to have expressly considered the economic impact of imposing effluent limits at the end of the 84-month period. Accordingly, the Coalition recommends that DNR remove reference to effluent limits in this rulemaking, in favor of focusing on pollutant minimization. Once permittees have an opportunity to implement minimization plans, DNR can evaluate the program and potentially revisit the need for effluent limits in a subsequent rulemaking. At a minimum, DNR should conduct a separate economic impact analysis specific to the imposition of effluent limits because those economic impacts would be very different from the economic impacts of the pollutant minimization approach, which were the primary consideration in this rulemaking. Additionally, the Coalition hopes and expects that testing, treatment, and disposal technologies will continue be developed in the coming years, which will further inform the need for and feasibility of effluent limits. These decisions regarding effluent limits, however, should be made in the future, after permittees have had an opportunity to implement minimization plans and after DNR has undertaken a full economic impact analysis based on the available testing, treatment, and disposal technologies.

B. Technical Basis for Proposed Numeric Thresholds

The most prevalent and available science regarding the incidence and potential health effects of PFAS is based on PFOA and PFOS, two compounds that are no longer manufactured in the United States due to voluntary phase outs over a decade ago. Still, toxicologists, whether they work for various state agencies, USEPA, international standards-setting organizations, academia, or in private practice, have not yet established specific methodologies, resources, or even agreed on which of the hundreds of studies of PFAS compounds are the appropriate or critical studies that must or should support appropriate health-based values or regulatory standards. Different methodologies, levels of experience, procedural prerequisites to standards-setting, and even local political pressures are leading to consideration of very different standards in various states and at USEPA. The same is true in the context of this rulemaking, as evidenced by "Appendix F: Adjacent States Comparison." Specifically, there is inconsistency among adjacent states relative to surface water standards for PFOS and PFOA.

For example, in comparison to DNR's proposed PFOA threshold, Michigan has a PFOA standard of 420 ppt for surface waters used for drinking water, and 12,000 ppt for non-drinking water. These levels are significantly higher than DNR's proposed thresholds and underscore the lack of scientific consensus. Considering that toxicology data are still being developed, the Coalition urges DNR to retain flexibility in the rulemaking, to minimize the regulatory uncertainty and state-by-state variability associated with the patchwork of state standards that are currently emerging. One critical way to do this in the absence of scientific consensus is to eliminate the effluent limit requirements from the Proposed Rule in favor of the more flexible pollutant minimization approach.

Additionally, the Coalition's technical reviewers have identified issues with DNR's justification for and explanation of the derivation of the thresholds. The Coalition acknowledges that there are advantages of using the Receiver Operating Characteristic (ROC) method, but is concerned that the presentation of data that were used in the model were not sufficiently detailed to allow stakeholders to thoroughly and independently assess DNR's derivation of the thresholds. *See* Exhibit 1. In particular, the Coalition is concerned that the fish tissue and associated water column data presented by DNR lack the detail necessary to adequately evaluate the ROC model results.

C. Specificity in the Type and Quantity of Regulated PFAS

Generally, any future PFAS regulations must clearly specify the individual PFAS compounds that a state seeks to regulate. Given the wide variations in possible human toxicities, environmental threats, and other characteristics exhibited by different PFAS chemicals, it is scientifically unsound to group all PFAS together for purposes of risk assessment or to assume that exposures to mixtures of PFAS necessarily bioaccumulate in one's body in interchangeable 1:1 ratios. From a toxicological perspective, regulatory agencies must have adequate science for determining health-based values before promulgating individual-compound standards, limits, and related regulations. The most

prevalent and available science regarding the incidence and potential health effects of PFAS is based on PFOS and PFOA.

The Coalition appreciates that DNR has begun with addressing these two specific PFAS compounds, on which the most scientific information is available. The Coalition, disagrees, however, with DNR's decision to title the pollutant minimization plans "PFAS" minimization plans because it is misleading. DNR explains that the rule "uses the term 'PFAS' for minimization plans because a permittee's source reduction efforts to reduce discharges of PFOS and PFOA are expected to have the added benefit of reducing the discharge of other PFAS components." Although we do not disagree that this may be a positive incidental benefit of the rulemaking, it is not within the stated scope of the rulemaking, and DNR has not thoroughly evaluated the reduction of other PFAS in order to properly include them in this rulemaking. Regulation of individual PFAS substances should reflect peer-reviewed science regarding the physical, chemical, and toxicological properties of each compound. This rulemaking has focused on PFOS and PFOA. Accordingly, the Coalition requests that DNR clarify that the minimization plans contained in the rule are "PFOS and PFOA" minimization plans.

D. Mixing Zones and Bioaccumulation

The Proposed Rule appears to ban mixing zones for both PFOS and PFOA by requiring that the surface water thresholds be met in all surface waters, including the mixing zone. The Coalition does not believe that a ban on mixing zones for PFOA is appropriate. The Coalition recognizes that the Great Lakes regulations states place restrictions on bioaccumulative pollutants of concern (BCCs), but the state has determined the PFOA is not a BCC. In fact, the Proposed Rule itself states that PFOA is not a BCC.[2] Accordingly, the Coalition believes that Proposed Rule's ban on mixing zones is inconsistent with Great Lakes policy and recommends that DNR modify the proposed rule to remove the mixing zone ban.

There remain significant data gaps in our current understanding of the bioaccumulation and ecotoxicity of many PFAS. The Interstate Technology and Regulatory Council (ITRC)[3] recently published a comprehensive summary of the current state of knowledge of PFAS bioaccumulation and ecotoxicity.[4] As described by ITRC, it was not until the early 2010s that these methods became widely available and had detection limits in water low enough to be commensurate with levels of potential ecological effects.[5]

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[2] *See* Proposed Rule, at 19 ("PFOA is not a bioaccumulative chemical of concern as defined in s. NR 106.03 (1r).").

[3] The ITRC document was developed by a team of over 400 environmental practitioners drawn from state and federal government, academia, industry, environmental consulting, and public interest groups. ITRC, "PFAS Technical and Regulatory Guidance Document, Introduction" (May 2021), *available at* https://pfas-1.itrcweb.org/1-introduction/ (ITRC Guidance).

[4] ITRC Guidance, Section 7 Human and Ecological Health Effects of select PFAS" (May 2021), *available at* https://pfas-1.itrcweb.org/7-human-and-ecological-health-effects-of-select-pfas/.

[5] ITRC Guidance, Introduction (May 2021), *available at* https://pfas-1.itrcweb.org/1-introduction/.

Over the last decade, a rapidly growing number of scientific studies have evaluated the ecotoxicity and bioaccumulation potential of certain PFAS. Ecotoxicity data are available for PFOS and, to a lesser extent, PFOA, with most studies focused on aquatic invertebrates. Although there are numerous studies on PFAS exposure in terrestrial vertebrates, there is relatively little to no ecologically relevant toxicity data for terrestrial vertebrates in the wild. In addition, our understanding of the ecotoxicity and bioaccumulation potential of PFAS compounds, beyond PFOS and PFOA, remains limited. As the ITRC concludes, differences in species sensitivities, analytical methods, environmental substrate, test conditions, and reproducibility of results make it difficult to generalize overall ecological effects of PFAS. [6,]

E. Limits of Available Validated Test Methods for PFAS

The state should regulate only those PFAS compounds for which there are EPA-validated analytical test methods; currently, there are no such methods for measuring PFAS in wastewater. The Coalition is very concerned that the Proposed Rule would require reliance on a test method that has been published but not yet approved. Method 1633, for example, is a single-laboratory validated method to test for 40 PFAS compounds in wastewater, surface water, groundwater, soil, biosolids, sediment, landfill leachate, and fish tissue that has been published but not approved. USEPA has stated that this method can be used in various applications, including the NPDES program. The Coalition, however, has significant concerns regarding the suitability of using this method in the NPDES context. In fact, the Coalition, along with several other groups, recently submitted comments to USEPA, attached as Exhibit 2, detailing its concerns with Method 1633.

Beyond these concerns with Method 1633 itself, requiring the use of this unapproved test method premature. Method 1633 has only gone througn single lab validation, and the results of that are not even available yet. Clean Water Act regulations outline a clear process for the establishment of test procedures for the analysis of pollutants, and that process has not been completed with respect to Method 1633. As such, it is inappropriate for DNR to promulgate a rule that requires reliance on an undeveloped test method. Accordingly, the Coalition urges DNR to remove all requirements related to effluent limits at least until a validated test method is approved according to the process outlined in 40 C.F.R. § 136.

F. The Presence of Solids in Non-Potable Water Supplies Can Complicate Analysis

The presence of solids in non-potable water supplies can complicate analysis of these matrices and decrease data reliability and comparability. Suspended solids in water samples represent an additional reservoir of adsorbed PFAS that, if excluded from the analysis, can bias total sample concentration. However, suspended solids can clog solid

[6] ITRC Guidance, Section 7 Human and Ecological Health Effects of select PFAS" (May 2021), *available at* https://pfas-1.itrcweb.org/7-human-and-ecological-health-effects-of-select-pfas/.

phase extraction columns and may need to be removed prior to analysis. For non-PFAS analytes, water samples are typically filtered through glass fiber filters to remove solids, but these filters have been shown to adsorb PFAS from the sample. Method 1633 specifically prohibits aqueous sample filtration. Alternatively, some laboratories may centrifuge samples to remove particles that are then extracted with the bottle rinsate. Method 1633 recommends that at least two aliquots of aqueous samples (a 500 ml and a 125–250 ml sample) be collected to allow for determination of percent solids and pre-screening analysis. Where suspended solid concentrations are greater than allowed by the method (<50 mg/L), the entire volume of the smaller aliquot can be used for analysis and an additional extraction column maybe used to avoid clogging. The lack of consensus on sample extraction procedures for aqueous samples with elevated suspended solids can introduce bias to the analysis.

G. Limits of Treatment and Disposal

Treatment technologies for PFAS are still being developed and reviewed for efficacy, and there is limited capacity for the disposal of byproducts from newly-developed technologies. For example, the economic impacts analysis assumes that granular activated carbon (GAC) will be the most common and likely treatment system that permittees will install if treatment is necessary to achieve the thresholds, but the technology is still being developed and its efficacy is unclear. The economic impact analysis further assumes that the GAC change out will occur every three weeks and acknowledges that the total compliance costs for treatment will be significant. The economic impact analysis then dismisses these significant costs by explaining that they would not be incurred until year 7 of implementation. Until reliable and affordable treatment and disposal is readily available, the Coalition urges DNR to eliminate effluent limit requirements in favor of focusing on source reduction measures. Once treatment and disposal technologies have been further developed and permittees have had an opportunity to implement source reduction measures, DNR can reevaluate the need for a feasibility of effluent limits, if necessary.

IV. Conclusion

The Coalition appreciates the opportunity to comment concerning the proposed rulemaking. We look forward to working closely with the state in its development surface water thresholds for PFOS and PFOA. Please feel free to call or e-mail if you have any questions, or if you would like any additional information concerning the issues raised in these comments.

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The PFAS Regulatory Coalition and the Wisconsin Paper Council submitted the same supporting documents from NCASI and Environmental Standards, Inc. These supporting documents can be found on pages 102 - 142 of this pdf.

WISCONSIN PAPER COUNCIL

December 15, 2021

Wisconsin Department of Natural Resources
Attn: Meghan Williams –WY/3
101 Webster Street
PO Box 7921
Madison, Wisconsin
DNR105PFASRule@wisconsin.gov

Sent Via Email

RE: Comments on W-23-19, Relating to Adding Narrative Surface Water Criteria with Numeric Thresholds and Analytical Methods for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) and Revisions to Procedures in the Wisconsin Pollutant Discharge Elimination System (WPDES) Permitting Program

Dear Ms. Williams:

These comments are submitted on behalf of the Wisconsin Paper Council (WPC). WPC is the premier trade association that advocates for the papermaking industry before regulatory bodies, and state and federal legislatures to achieve positive policy outcomes. WPC also works to educate the public about the social, environmental, and economic importance of paper, pulp, and forestry production in Wisconsin and throughout the Midwest.

The pulp and paper sector employs over 30,000 people in Wisconsin and has an annual payroll of $2.5 billion. Wisconsin is the number one paper-producing state in the United States, with the output of paper manufactured products estimated to be over $18 billion. Our members are dedicated to maintaining clean water in Wisconsin.

Many of our members are potentially impacted by this rule proposal. Consequently, we appreciate the opportunity to provide comments on this matter. Our comments are set forth below.

I. General Comments

A. Product Stewardship and the U.S. Paper Industry

The U.S. paper industry is committed to the safety of its products. A brief review of the industry's historical use of per- or polyfluoroalkyl substances (PFAS) helps provide context for our current position.

PFAS are a large and diverse class of thousands of chemicals characterized by the strong bond between fluorine and carbon atoms, which provides properties such as resilience and durability. Different PFAS have widely varying properties and levels of toxicity, and thus, there are significant differences between individual PFAS chemicals.

In its current rulemaking, the Wisconsin Department of Natural Resources (DNR) is focused on perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), both of which are so-called "long-chain" PFAS (i.e., C8 compounds consisting of a chain of eight carbon atoms). PFOA and PFOS are ubiquitous at low levels in the environment. Policymakers not only in Wisconsin, but in many other states and in the federal government, are focused on addressing concerns about PFOA and PFOS.

The U.S. paper industry does not manufacture PFOA or PFOS or use them in the paper manufacturing process. PFOA and PFOS were phased out in the U.S. paper industry over a decade ago.[1] Around that time, the chemical manufacturers of PFOA and PFOS phased out the production of long-chain PFAS such as PFOA and PFOS used in food packaging.

At that time, for limited applications such as certain food packaging barriers requiring grease and moisture resistance, the paper industry shifted to barriers using modern, "short-chain" PFAS (i.e., C6 compounds consisting of a chain of six carbon atoms or even shorter-chained PFAS). These short-chain PFAS were approved by the U.S. Food and Drug Administration (FDA) as safe for food packaging. The use of these short-chain PFAS are also being phased out.

B. Pollutant Minimization Approach

As a matter of principle, WPC believes DNR's proposed focus on "pollutant minimization" is a much better approach than pursuing an "end of pipe" controls" approach for a number of reasons. In fact, as mentioned above, the industry implemented a de facto PFOA/PFOS minimization plan when it eliminated the use of the PFOS and PFOA. This is different than DNR's experience with minimization plans and mercury.

[1] As the U.S. Environmental Protection Agency (EPA) has shown in its "Multi-Industry Per- and Polyfluoroalkyl Substances (PFAS) Study – 2021 Preliminary Report" issued in September (Preliminary Report), the pulp and paper industry ceased using long-chain PFOA and PFOS approximately ten years ago, and the industry has virtually completed its voluntary transition out of intentionally using short-chain, FDA-approved PFAS. That transition out of short-chain, FDA-approved PFAS will be fully complete within a few years. *See* Preliminary Report, Section 7.5 at p.7-7.

WPC submitted comments on August 18, 2021, pertaining to the Economic Impact Analysis associated with this rule. Those comments contained estimated costs for treatment to remove PFAS at a paper/packaging facility with a twenty-five million gallon/day wastewater flow. These cost estimates were prepared by experts at the National Council for Air and Stream Improvement, Inc. (NCASI). NCASI is an independent, nonprofit research organization that serves the forest products industry as a center of excellence, providing unbiased scientific research and technical information necessary to achieve the industry's environmental and sustainability goals.

NCASI estimated the following costs for PFOS and PFOA treatment:

> *Capital costs (in 2020) for upgrading existing secondary treatment and adding advanced treatment (microfiltration plus RO or microfiltration plus GAC) for PFAS removal for a 25 million gallon/day wastewater flow are estimated to range from $151 million to $477 million. Similarly, the net present value of operating and maintenance costs over 25 years at a discount rate of 5% were estimated to range from $131 million to $486 million.*

Importantly, NCASI also noted:

> *There are several mature tertiary treatment technologies that have been identified as potentially useful for removing PFAS; however, these technologies have not been demonstrated to be applicable to wastewater treatment and have multiple technical limitations related to wastewater constituents, scaling to typical mill wastewater flows, and managing generated byproducts.*

Furthermore, the authors also highlighted that in the United States, treatment technologies for PFAS have been focused on drinking water treatment, groundwater remediation and landfill leachates. There were no known municipal wastewater plants with tertiary systems designed specifically for PFAS removal.

Thus, given the potential costs, the uncertainties associated with treatment and the potential to obtain reductions in a much more cost-effective and reasonable manner, the pollutant minimization approach is the better approach than an "end of pipe controls" approach.[2]

[2] WPC's comments on the EIA, as well NCASI's comments on PFAS control costs, are available here:

Comments on Draft Economic Impact Analysis (EIA) for Surface Water Criteria for PFOS and PFOA

NCASI+Comments+on+PFAS+Control+Costs.pdf (squarespace.com)

C. EPA Recommendations for PFOS and PFOA Surface Water Criteria

In October of 2021, EPA released its "*PFAS Strategic Roadmap: EPA's Commitments to Action."* [3] In its Roadmap, EPA indicates it "will develop national recommended ambient water criteria for PFAS to protect aquatic life and human health." The health criteria will take "into account drinking water and fish consumption." EPA also notes the recommended aquatic life criteria are expected in the Winter of 2022, and the human health criteria are anticipated in the Fall of 2024. DNR has estimated that its proposed surface water criteria rule will be effective in the Summer of 2022.

Pursuant to the Clean Water Act, states are responsible for adopting water quality standards, which include designated uses, water quality criteria and an antidegradation policy. EPA, however, reviews those water quality standards and approves or disapproves them based upon whether the applicable requirements are met.

In addition, EPA has authority to publish national criteria recommendations, as it is proposing to do for PFOA and PFOS. Importantly, the recommendations are not binding in Wisconsin. Rather, states are authorized to adopt other scientifically defensible criteria that are different from EPA's recommendations. Criteria must be based on a sound scientific rationale, contain sufficient parameters to protect the designated use, and support the most sensitive designated use of the water body.

DNR has indicated that it believes the minimization approach will be successful in significantly reducing PFOA and PFOS. Moreover, DNR has prepared a technical support document setting forth the scientific basis for its proposed surface water standards. In addition, as referenced above, we believe the pollutant minimization approach, in principle, is significantly better than an "end of pipe controls" approach. Consequently, DNR should continue to advocate for EPA approval of its approach, regardless of EPA's announcement that it plans to publish national recommendations.

II. Specific Comments

A. Proposed PFOS and PFOA Thresholds (Section 2)

Proposed section NR 102.04(1m) contains a proposed threshold of eight parts per trillion (ppt) for PFOS, except in waters that do not support fish. This standard is intended to protect against adverse public health impacts due to fish consumption. In addition, this section contains a PFOA standard of twenty ppt for surface waters classified as drinking

[3] EPA's PFAS Strategic Roadmap is available here: PFAS Strategic Roadmap: EPA's Commitments to Action 2021—2024.

water, and ninety-five ppt for other surface waters. These levels are intended to protect against incidental consumption of surface waters.

As an initial matter, DNR's "Fiscal Estimate & Economic Analysis" provides information regarding the approaches both Michigan and Minnesota have taken regarding PFOS and PFOA surface water criteria. In contrast to the PFOA thresholds proposed by DNR, Michigan's criteria for PFOA are 420 ppt for drinking water, and 12,000 ppt for non-drinking water. This begs the question of why Wisconsin's proposed thresholds are twenty-one times more stringent for drinking water, and 126 times more stringent for non-drinking water, and which proposal is more scientifically correct.

WPC also requested that NCASI conduct a technical review of DNR's proposed rule, including reviewing DNR's proposed thresholds for PFOS and PFOA. NCASI's comments are attached and incorporated herein by reference. As you will see, NCASI notes that the outcomes "Receiver Operating Characteristic (ROC)" approach taken by DNR is highly dependent on the validity of the "paired" fish tissue and water column concentration data used in the model. The data provided in Appendix A of the Technical Support Document, along with additional information provided by DNR to WPC at our request, was insufficient to allow extensive evaluation of the ROC method of deriving threshold surface water criteria for PFOS. Please see attached memorandum for the additional information that would be needed to assess the PFOS surface water criterion.

B. Mixing Zones (Section 2)

Proposed NR 102.04(1m) specifies that practices relating to industrial and other activities shall be controlled so that surface waters, including the "mixing zone," meet the criteria referenced above at all times and under all water level and flow conditions. PFOA is not a bioaccumulative chemical of concern and should not be subject to the mixing zone ban.

C. Standard for Removal from Impaired Waters List (Section 2)

Proposed NR 102.04(8)(d) provides that for a surface water to be impaired, the level of public health significance must be exceeded more than once every three years. The rule, however, does not provide what information is necessary to demonstrate that the surface water has reached attainment and therefore will be removed from the impaired waters list. The information necessary to demonstrate attainment should be included in the rule.

D. Sampling (Section 4)

Proposed NR 106.98(2)(d) provides that industrial dischargers must monitor "at least monthly" "if the department determines the permittee's effluent may contain PFOS or PFOA." This provision should be modified to only require monitoring if the discharge exceeds the applicable PFOS or PFOA standard contained in proposed NR 102.04(1m). This is the approach DNR takes for discharges covered under NR 106.98(2)(e).

Similarly, NR 106.98(3)(b) specifies that the department "may" waive the PFOS or PFOA sampling requirement if DNR determines "that it is unlikely that the permittee's effluent will contain PFOS or PFOA at levels above the narrative standard" contained in the rule. While allowing a waiver (as well as reduced sampling) is useful, such a waiver should be mandatory when discharges are below the PFOS or PFOA standards proposed in the rule. Thus, the word "may" in NR 106.98(3)(b) should be changed to "shall."

In addition, proposed NR 106.98(2)(d) requires monitoring at least monthly. This provision should be modified to provide that monitoring will not be required more frequently than monthly.

Also, DNR revised its original sampling cost estimates in a September 2021 updated EIA. It appears DNR continues to significantly underestimate sampling costs associated with the rule. For example, the EIA, Appendix B, Table 3, indicates that the total cost for the initial 24-month sampling for 47 industrial facilities, was $661,525, equating to $586 per sample. A cost estimate for sampling by a third-party consultant was recently obtained by one of our members. For the use of the consultant's equipment, travel, data review, and other related costs, the total estimated cost per sampling event was $4850.00 per round or $58,200.00 per year, assuming monthly monitoring. Thus, costs associated with sampling are significant.

E. PFAS Minimization Plan (Section 4)

DNR uses the term "PFAS Minimization Plan" throughout its proposed rule. DNR explains in a note that it refers to "PFAS" because a permittee's reduction efforts are expected to reduce PFAS other than PFOA and PFOS. While that may be likely, NR 106.97 explains that the purpose of proposed subchapter VIII "is to specify how the department will regulate the discharges of PFOS and PFOA to surface waters of the state…." Moreover, DNR has consistently indicated that the focus of this rulemaking is PFOS and PFOA. This rule creates no legal obligation to address PFAS other than PFOA and PFOS. Consequently, the minimization plan must be referred to the PFOS/PFOA Minimization Plan. This change is consistent with the purpose of the rule and will avoid any confusion of stakeholders, including Department staff, regarding the required scope of the plan. [4]

F. Reasonable Potential for Exceedance of Standards Requiring Minimization Plan (Section 4)

Proposed NR 106.98(4) contains the methods for determining whether there is a reasonable potential to exceed the proposed PFOA and PFOS criteria, and thereby trigger a requirement for a PFAS minimization plan. The thresholds for requiring a PFAS

[4] WPC continues to use the phrase "PFAS minimization plan" throughout these comments, as that is the phrase used in this draft rule. WPC, however, strongly believe phrase should be changed for the reasons discussed above.

minimization plan are unreasonably conservative. For example, pursuant to NR 106.98(4)(b), it appears that one sample of PFOS or 1.6 ppt (one fifth of the standard) could potentially to trigger the need for a PFAS pollution minimization plan. Such results do not suggest an impact to public health or the environment and should not require the development of a minimization plan.

The methods contained in NR 106.98(4) (a) and (b) should be eliminated from the rule. Instead, a PFAS minimization plan should be required if the P99 of at least eleven daily discharge concentrations of PFOS or PFOA are greater than the applicable water quality standard contained in the rule.

G. PFAS Minimization Note (Section 4)

Consistent with the requested change in II.E above, the note to NR 106.985(1) describing the use of the term "PFAS" should be eliminated.

H. Department Review of PFAS Minimization Plan (Section 4)

NR 106.985(2)(a) indicates that a permittee shall submit an initial PFAS minimization plan to the Department by a date specified in the permit and sets forth that the Department may approve, conditionally approve, or reject a proposed PFAS Minimization Plan.

This provision, however, does not specify when the initial plan must be submitted. It is important that the timeframe be adequate for facilities to create a meaningful plan, which may include hiring a third-party consultant.

This provision should be amended to require DNR to provide the permittee with a description of why the plan was rejected, and a description of what changes DNR wants made to the plan. The rule should also require DNR to explain the basis for any conditional approval. In addition, this provision should be modified to allow the permittee to have more than 30 days to submit a modified plan upon approval of DNR.

I. Implementation of PFAS Minimization Plan (Section 4)

Proposed NR 106.985(2)(b) mostly deals with reporting to DNR annually on the PFAS pollutant minimization plan. This provision, however, also indicates a permittee "shall implement actions identified in the approved plan" within 12 months of Department approval of the plan, and annually thereafter. It would be clearer to limit the scope NR 106.985(2)(b) to reporting requirements.

Regarding implementation, proposed NR 106.985(2)(c) allows up to 84 months to investigate sources, make operational changes, install BMPs and take other actions to address PFOS and PFOA. In addition, proposed NR 106.99 requires implementation of the minimization plan, and, among other items, requires the "identification of specific activities to be undertaken and a relative timeline to implement those activities."

Consequently, the reference to a 12-month implementation period in NR 106.985(2)(b) is confusing and unnecessary and should be removed.

As stated earlier, WPC supports pollution minimization in principle; however, PFOS/PFOA minimization plans in practice are challenging since the U.S. manufacture – and use – of these substances ceased ten years ago. Given that PFOA and PFOS detections are not a result of use, DNR needs to recognize the challenges of identifying the source of, and addressing, any PFOS or PFOA detections. All minimization plan requirements must be considered in light of anticipated reductions, versus the practicality of identifying and eliminating or reducing the amount of the detection. Only actions that can be reasonably implemented and obtain a meaningful reduction in PFOS or PFOA should be taken as part of the PFAS minimization plan.

J. Barriers to Plan's Effectiveness (Section 4)

Proposed NR 106.985(2)(b)(4) provides that the PFAS minimization plan report shall include identification of barriers to effective implementation of the plan and adjustments that will be made to help address those barriers. As explained in more detail in Section II.O of these comments, there would be significant environmental and economic impacts if DNR mandated the elimination of the small amount of PFAS that may be in the wastepaper that is being recycled at some facilities. The most effective way to achieve reductions for PFOS and PFOA is to allow it to naturally reduce in the marketplace. See section I.A of these comments regarding the lack of use of PFOA and PFOS, and for a description of the phaseout of other PFAS chemicals. Such an approach could avoid interfering with the environmental benefits associated with paper recycling, as well as significant negative economic impact to the paper industry.

K. 84-Month Implementation Period for PFAS Minimization Plans (Section 4)

As mentioned above, the proposed rule (NR 106.985(2)(c)) allows up to 84 months for implementation of the PFAS minimization plan. If after implementation, the discharge from a facility still has a reasonable potential to exceed the PFOS or PFOA standards in the proposed rule, the permittee would get a water quality-based effluent limit in its permit, set at a level to meet the applicable standard.

DNR should allow permittees to obtain an extension to the 84-month period if the permittee demonstrates there is a declining trend in the amount of the relevant pollutant. As explained above, estimated costs for end of pipe controls are extremely high for large dischargers such as paper facilities, and the technology has not been shown to be effective for large wastewater discharges. Given the cost and uncertainty, allowing additional time for minimization activities and, allowing more time for natural attenuation to occur is a better option than requiring treatment.

L. PFOS and PFOA Permit Limits (Section 4)

Proposed NR 106.985(2)(d) provides that after implementation of a PFAS Implementation Plan, if there is a reasonable potential to exceed the PFOS or PFOS thresholds, a permittee would receive a water quality-based effluent limit in its permit based on the applicable threshold.

Section I.B of these comments outline the costs and feasibility concerns regarding requiring treatment at a large volume wastewater discharger, such as a paper facility. Such an approach is unproven and is not economically feasible.

M. Monitoring of PFOS and PFOA in the Absence of WQBEL (Section 4)

Proposed NR 106.985(2)(d)(4) provides that DNR may require continued monitoring for PFOS and PFOA even though a WQBEL is not required in the permit. This provision should be eliminated. There is no need for continued monitoring in this instance. The rule provides that a permittee gets a WQBEL if there is a reasonable potential to exceed the PFOS or PFOA thresholds. Conversely, if there is no WQBEL, there is no reasonable potential to exceed the thresholds, and therefore monitoring should not be required.

N. Source Identification for Primary and Secondary Industry PFAS Minimization Plans (Section 4)

Any methods used for source identification or other purposes must use matrix-specific, EPA-validated analytical methods. Note monitoring requirements in proposed NR 106.99(1)(d) and (4)(c), and NR 106.995(2).

O. Substitution of Raw Materials and Chemical Additives for Primary and Secondary Industry PFAS Minimization Plans (Section 5)

Proposed NR 106.99(3) sets forth additional PFAS minimization plan requirements for primary and secondary industries, which includes paper companies. NR106.99(3)(c) requires an evaluation of substitution of raw materials and chemical additives with low or zero PFOS, PFOA, and PFOS and PFOA precursor alternatives.

As mentioned above, the paper industry has not used PFOA or PFOS in over a decade. In addition, the intentional use of other types of PFAS, which are beyond the scope of this rulemaking, are being phased out. There may, however, be nominal amounts of PFOA and PFOS a facility as part of wastepaper that is being recycled. It is critical that DNR's efforts to address PFOA and PFOS do not hinder the paper industry's ability to be the world's largest recycler of wastepaper. Recycling has significant environmental benefits. Recycling makes beneficial reuse of huge volumes of available recyclable fibers sources.

Recycling also keeps this reusable resource out of landfills. Sending these huge volumes of wastepaper to landfills instead of recycle mills would result in landfills reaching their capacity at a much faster rate. In addition, if landfilled, the high carbon content of the material would cause increases in methane emissions at the receiving landfills. These greenhouse gas emissions would be counterproductive efforts to address climate change.

The economic impact of limiting paper recycling is also tremendous. Recycling paper mills purchase wastepaper, and it is their single largest individual cost of operation. Given the commodity nature of recycled paper and the ubiquity of PFOS/A, it is impossible to identify actual or suspected sources of PFOS/A in the wastepaper stream. Also, specialty papers that may contain some FDA- approved short chain PFAS, such as grease and water-resistant food packaging, are among the least likely to be recycled.

It would be logistically unrealistic for the proposed pollution minimization plans to force recycle mills to sample various grades of paper for PFOS/A compounds and then choose to only use those grades with the lowest available PFOS/A concentrations. The wastepaper grades with higher PFAS concentrations would end up in landfills, and the costs of newly proclaimed acceptable grades of wastepaper would increase significantly, potentially making it no longer cost effective to use 100% recycled wastepaper. This may potentially lead to an increased demand for virgin fiber to keep up with public demand of essential hygiene related tissue paper products.

It is imperative and in the best interest of the state, both from an environmental and economic perspective, to ensure that this rule does not negatively impact the reuse of recyclable materials. The Department should recognize that certain PFAS compounds may be present in available recyclable materials and not restrict current recycling practices. As mentioned above, over time, as PFAS compounds are removed from the marketplace and become less commonly used due to market pressures and regulatory restrictions, concentrations in recycled products, and therefore outputs from recycling facilities, will naturally reduce. This approach has been taken before with success, as with PCB content in recyclable paper products, and WPC encourages regulators to take a similar approach to avoid unanticipated related negative effects to both the economy and the environment.

P. Other Activities the DNR Determines are Appropriate (Section 5)

Proposed NR 106.99(3)(f) provides that the PFAS minimization plan shall include “other activities that DNR, in consultation with the permittee, determines to be appropriate for the individual permittee’s circumstances.” This provision essentially allows the DNR to

include any provisions it wants in the PFAS minimization plan. We believe this open-ended provision should be eliminated. If there are additional elements that should be

evaluated for consideration in the PFAS minimization plan, those should be set forth in the rule.

If DNR keeps this provision in the rule, it is important that the consultation be meaningful. DNR staff may have very little experience and understanding of the complex industrial processes associated with a paper facility. Consequently, they may not have the knowledge to appropriately evaluate what is or is not "appropriate."

Q. Use of 1600 Series Isotope Dilution Method (Section 5)

A proposed note to NR 219.04(1) indicates that "if the EPA Office of Water publishes a 1600 series isotope dilution method for the analysis of PFAS in aqueous, sludge (biosolids), and tissue matrices, the department recommends use of the EPA method." Moreover, a proposed note to NR 219.04 Table F contains the same recommendation.

EPA has published a draft Method 1633. As explained in the attached NCASI memorandum, EPA has only conducted a single lab verification for this method and does not anticipate completing and reporting on a multi-laboratory validation until later next year. Moreover, NCASI, as well as other entities, have raised numerous concerns regarding EPA's draft PFAS Method 1633. DNR should clarify that the recommendation to use method 1633 does not apply until it has been promulgated for use for Clean Water Act purposes.

We have also included for your information a copy Environmental Standards' comments on draft Method 1633, which addresses several issues associated with this draft.

Please contact me if you have any questions regarding these comments or would like to discuss any related matters. Thank you.

Sincerely,

/s/ Scott Suder
Wisconsin Paper Council
President

NCASI
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DECEMBER 6, 2021

TO: Patrick Stevens, Wisconsin Paper Council
Fred Andes, Federal Water Quality Coalition

FROM: Brad Barnhart, Giffe Johnson, and Paul Wiegand

SUBJECT: Technical Review of Wisconsin proposed surface water quality standards and WPDES permit provisions for PFOS/PFOA (WY-23-19)

At the request of your respective organizations and on behalf of our Members in Wisconsin, we have reviewed proposed rules and related technical support documentation provided by the Wisconsin Department of Natural Resources (WDNR) pertaining to PFOS and PFOA surface water criteria and WPDES permit provisions in WY-23-19. Our consideration of the proposal focused on the scientific and technical justifications for the proposed narrative surface water criteria with numeric thresholds for PFOS and PFOA and the analytical methods for poly- and perfluoroalkyl substances (PFAS) including PFOS and PFOA.

Surface Water Numeric Thresholds

The numeric thresholds for PFOS and PFOA were derived considering potential exposures via drinking water, fish consumption, and incidental ingestion of recreational water, and using a Reference Dose (RfD) of 2×10^{-5} mg/kg body weight. The resulting proposed criteria are:

- For PFOS, the proposed level of public health significance is 8 ng/L for all waters except those that cannot naturally support fish and do not have downstream waters that support fish.
- For PFOA, the proposed level of public health significance is 20 ng/L in waters classified as public water supplies and 95 ng/L for other surface waters.

The criteria derivation method for PFOS involved the use of a method called the Receiver Operating Characteristic (ROC) which relied heavily on the relationship between water column and fish tissue concentrations.

The ROC method is relatively uncommon for deducing in-stream criteria, though it has some advantages over other approaches (McLaughlin 2012). Among them is that it allows control over model error rates (i.e., erroneously concluding that a water column measurement above a threshold results in a tissue concentration above the target value (false positive) and that a measurement below the threshold results in a tissue value below the target value (false negative)). The Department appears to have taken advantage of this aspect by selecting a water column

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concentration that balances the error rates of the ROC method.

However, the outcome of the approach is highly dependent on the validity of the "paired" fish tissue and water column concentration data used in the model. The fish tissue and water column data presented in Appendix A of the Technical Support Document was not sufficiently detailed to allow careful consideration of the ROC model results. The Department did provide some additional detail for these data, per a request made by the Wisconsin Paper Council, however, those details were insufficient to allow extensive evaluation of the ROC method for deriving threshold surface water criteria for PFOS.

As a simple example illustrating the need for a more refined analysis of the fish tissue and associated water column data, consider the following. On May 28, 2013 tissue data were collected for four species at a location identified only as "Bde Maka Ska (Calhoun)" in Minnesota. The PFOS data for individual fish tissues from each species are summarized below.

6 Black crappie: 69 to 116 ng/g
9 Bluegill: 27 to 161 ng/g
10 Largemouth bass: 70 to 264 ng/g
11 Northern pike: 64 to 190 ng/g

Within species, the minimum to maximum range in PFOS concentrations was between 1.7x and 6x. The Department appears to have taken the average tissue concentration from each species sampled in May 2013 and "paired" it with the average of three water column samples all collected on a single day, 3 months later in the year (August 29, 2013). The average water column concentration on that day was 35.3 ng/L, though the water column concentrations at this site measured between 2006 and 2018 ranged between 11.1 and 115 ng/L.

There are some obvious concerns with this simplified approach including, but not limited to: reasons for the variation in tissue concentrations (e.g., fish age, size, sample type); the appropriateness of using species averaged tissue concentrations rather than using individual fish concentrations; the appropriateness of pairing tissue values with a single day water sample collected three months later; the spatial proximity of the tissue and water sample collection locations; and others.

Overall, the information provided in the TSD regarding the ROC method and related input data is not sufficient to assess the validity of the PFOS surface water threshold value calculated using the ROC method. The additional information needed to support a more thorough evaluation would include: the precise locations of the fish and water collections, fish weights/lengths, sample types (e.g., whole body, filets, skin on/off); knowledge about whether analytical data were reported as dry weight or wet weight; knowledge about whether sediment samples were collected to ascertain if the BAFs might have been heavily influenced by sediment contamination at some sites; an assessment of the temporal variability of water column concentrations; consideration of seasons effects, etc. The TSD did not contain any specific information regarding data management thresholds (e.g., spatial and temporal differences between water and fish sampling events, fish sizes, tissue sample types) denoting when sample parings are considered valid.

Use of Existing and Evolving Analytical Methods

The proposal contains a number of specific requirements related to the use of PFAS analytical methods that are, or may be, published by EPA. The term "published" is not defined in the proposal but would appear to be a lower standard than "promulgated" with respect to the use of methods permitting under the Clean Water Act. As such, it is unclear if, or when, these methods would be required for uses related to WPDES permitting.

As you may know, in September, EPA released draft Method 1633 for PFAS in Aqueous, Solid, Biosolid, and

Tissue Samples by LC/MS/MS (EPA 2021). EPA has only conducted a single lab validation of this method and does not expect to complete and report on a multi-laboratory validation until later next year. NCASI as well as Environmental Standards have reviewed the method, as have other analytical experts, and all have significant concerns regarding some of the analytical approaches, particularly for solids, and the observed inconsistencies that appear in the method (e.g., sample preservation and storage requirements). NCASI has previously shared with you some of our observations regarding draft Method 1633, and the extensive comments prepared by Environmental Standards are attached to this memo.

Given the numerous concerns related to EPA's draft PFAS Method 1633, WDNR might reconsider whether any final rule should obligate both the state and other stakeholders to use interim EPA methods prior to their formal public review and promulgation for use in Clean Water Act-related activities.

If you have any questions concerning the input provided here, please contact NCASI staff at pwiegand@ncasi.org, gjohnson@ncasi.org, and bbarnhart@ncasi.org.

Attachment: Comments from Environmental Standards on EPA Draft Method 1633

REFERENCES

McLaughlin, DB. 2012. Assessing the Predictive Performance of Risk-Based Water Quality Criteria Using Decision Error Estimates from Receiver Operating Characteristics (ROC) Analysis. *Integrated Environmental Assessment and Management* 8:674-684. (Corrigendum 2013, 10:149)

US EPA. 2021. Draft Method 1633: Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS. EPA 821-D-21-001, August 2021. US Environmental Protection Agency, Office of Water, Washington, D.C.

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November 12, 2021

CWA Methods Team, Engineering and Analysis Division
Attn: Adrian Hanley
Office of Science and Technology
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue
Washington, DC 20460

RE: Review Comments on Draft US EPA Method 1633 Submitted on Behalf of Listed Industrial Parties

Dear Mr. Hanley:

The US EPA Office of Water has made available the document for the draft US EPA Method 1633 titled "Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS" (Dated August 2021). The US EPA Office of Water has solicited comments on the draft methodology.

Environmental Standards, Inc. (Environmental Standards) has been engaged by a number of interested industrial parties to review and provide the US EPA with comments on the draft document. The enclosed pages provide the details of Environmental Standards' review of the draft methodology. Specifically, provided herein, Environmental Standards has presented comments and suggestions for improvement based on the draft document available for review. Environmental Standards presents the enclosed comments and suggestions to US EPA for consideration.

It was noted that the US EPA referenced a forthcoming single-laboratory validation study. As of the date this comment letter was transmitted, that single-laboratory validation study still has not been posted on the US EPA website. Comments by Environmental Standards on that single-laboratory validation study will be issued as a separate addendum.

Environmental Standards appreciates the invitation and opportunity to comment on this important document. If the US EPA would like to discuss any of the comments, suggestions, or recommendations provided herein, please contact us at (610) 935-5577 or our electronic mails listed below.

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Sincerely and respectfully submitted by,

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Enc.

RJV/DRB:nd

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REVIEW AND EVALUATION OF DRAFT US EPA METHOD 1633

Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolid, and Tissue Samples by LC-MS/MS (Dated August 2021)

November 12, 2021

Prepared for:

AMERICAN CHEMISTRY COUNCIL
AMERICAN PETROLEUM INSTITUTE
AMERICAN FUEL & PETROLEUM MANUFACTURERS
CONFIDENTIAL CLIENT – LAW FIRM
CONFIDENTIAL CLIENT – INDUSTRIAL
CSX TRANSPORTATION, INC.
EVERGREEN RESOURCES MANAGEMENT OPERATIONS
MIDDLESEX COUNTY UTILITIES AUTHORITY
PFAS REGULATORY COALITION

Prepared by :

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MCUA Middlesex County Utilities Authority

PFAS REGULATORY COALITION

1.0 Introduction

The US EPA issued the document entitled "Draft Method 1633 Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS" and dated August 2021 to the website https://www.epa.gov/cwa-methods/cwa-analytical-methods-and-polyfluorinated-alkyl-substances-pfas on September 2, 2021, and provided an errata sheet for the draft methodology on October 15, 2021. This posting was not listed as a formal draft method requesting comment to be posted to the docket, but instead solicited comments on the new analytical procedure via website posting and directing comments directly to the CWA Methods Team, Engineering and Analysis Division.

Environmental Standards, Inc. (Environmental Standards) was retained by several interested industrial parties, listed below, to provide technical services to review and evaluate Draft US EPA Method 1633. Environmental Standards' comments, suggestions, and recommendations have been reviewed and concurred by the listed sponsor representatives. The parties sponsoring this evaluation include:

- American Chemistry Council
- American Petroleum Institute
- American Fuel & Petroleum Manufacturers
- Confidential Client – Law Firm
- Confidential Client – Industrial
- CSX Transportation, Inc.
- Evergreen Resources Management Operations
- Middlesex County Utilities Authority
- PFAS Regulatory Coalition

2.0 Brief on Environmental Standards

Environmental Standards is a privately held consulting firm founded in 1987. Environmental Standards' specialty consulting offerings include environmental chemistry, geosciences, environmental data management, emergency response quality assurance oversight, and health and emergency support.

The Environmental Standards staff includes close to 40 consulting Chemists who have a total of more than 550 years of combined experience. Environmental Standards' chemistry staff includes B.S. through Ph.D. Chemists, six National Registry of Certified Chemists – Certified Environmental Analytical Chemists, and two American Society of Quality – Certified Quality Auditors.

Environmental Standards was a co-author of SW-846 Method 3060A and was responsible for the method validation studies for that method and is in the process of discussing a new light gas method for possible future inclusion in SW-846.

With respect to Environmental Standards' long, rich history in the area of fluorochemistry, our Chemists have been retained by several Fortune 500 Companies to provide chemistry quality assurance support for their perfluorinated compound (PFC; now PFAS) projects dating back to 2000. These projects have generated tens of thousands of commercial laboratory sample data representing drinking water, groundwater, surface water, wastewater, sediment, soil, and various other matrices (*e.g.*, articles of commerce, fire debris, and windshield washer fluid).

Environmental Standards respectfully offers the following comments, suggestions, and recommendations on the draft document for the US EPA to consider.

3.0 General Comments on Draft Method 1633

Environmental Standards' senior chemistry staff conducted a thorough review and evaluation of Draft Method 1633 and offers these comments, suggestions, and recommendations for US EPA's consideration.

Environmental Standards presented this work on Table 1: Environmental Standards, Inc. Detailed Comments based on Review of Draft Method 1633. The US EPA should note that this work does not include an evaluation of the single-laboratory validation study, as the US EPA indicated that the single-laboratory validation study has not been made available for review as of the date for the issue of this work. Environmental Standards will review and provide a commentary addendum on the single-laboratory validation study when the single-laboratory validation study is posted by the US EPA.

Draft Method 1633 utilizes the solid phase extraction (SPE) technique for all matrices; however, the sample extracts are not concentrated (unless multiple SPE cartridges are utilized), which negatively impacts the sensitivity of the procedure. Draft Method 1633 attempts to compensate for the decreased sensitivity for aqueous matrices by utilizing a larger sample volume, which can lead to increased sample matrix interferences, SPE clogging issues, and other potential negative impacts.

Draft Method 1633 provides two options for sample storage thermal conditions and holding times. These options, seemingly contradictory at times, will cause confusion within the regulated community.

US EPA indicated on the webpage posting the method that:

> *This draft method can be used in various applications, including National Pollutant Discharge Elimination System (NPDES) permits. The method will support NPDES implementation by providing a consistent PFAS method that has been tested in a wide variety of wastewaters and contains all the required quality control procedures for a CWA. While the method is not nationally required for CWA compliance monitoring until EPA has promulgated it through rulemaking, it is recommended now for use in individual permits.*

Draft Method 1633, in its present form, is inappropriate to use in NPDES permits. For transparency and to allow for a more complete evaluation of Draft Method 1633 and requirements provided, it is suggested that the US EPA issue the single-laboratory validation study report for evaluation and conduct the multi-laboratory validation study before suggesting that the method be included in NPDES permits.

It is apparent in many sections of the draft method that procedures and techniques described are specific to the single laboratory that was the primary author of the method. Other laboratories may have better or different approaches that will not be addressed and incorporated into the method until after completion of a multi-laboratory validation study. Until the multi-laboratory validation study is complete, comparability of PFAS data across laboratories attempting to implement the method is unlikely. Data comparability is of utmost importance for

data collection associated with permitted outfalls under the NPDES program. And, even given that the NPDES regulations in 40 CFR 122.21(e)(3)(ii) provide for use of a "suitable method" when no approved method exists in 40 CFR part 136, as is the case for PFAS, Draft Method 1633 does not pass as a suitable method for the numerous reasons identified in this report.

Finally, the US EPA should provide an explanation of the evaluation rubric and data quality objectives used to determine that Draft Method 1633 is appropriate for the purposes US EPA intended.

The major themes from the individual comments presented on Table 1 are:

- Sample handling and collection: The Draft Method 1633 includes several sample-handling steps which present opportunities for contamination and potential analyte loss during preparation. Draft Method 1633, as presented, does not include the collection of sufficient numbers of aqueous sample containers to allow for a second sample extraction if needed. Draft Method 1633 indicates that a sample that contains > 50 mg/L suspended solids should be considered a solid sample for preparation and implies that the total suspended solid procedure within the method must be used for all aqueous samples.

- Storage and holding time: Draft Method 1633 includes a conflicting approach to the laboratory storage of aqueous samples. Sections 8.2, 8.3, and 8.4 for sample storage require the storage of samples at temperatures ≤ -20°C; however, Sections 8.5.1, 8.5.2, and 8.5.3 for sample holding time include holding-time requirements for samples stored at temperatures ≤ -20°C and between 0°C and 6°C.

- Precision: Draft Method 1633 does not include a measure of precision for sample preparation and analytical performance beyond the initial calibration requirements.

- Analyte identification: Draft Method 1633 includes several requirements for the qualitative identification of PFAS analytes. In Environmental Standards' opinion, the retention time windows specified were very wide for the qualitative identification of PFAS analytes. The signal-to-noise requirement, as presented, does not specify if both the primary and secondary mass ions must meet the acceptance criterion. In addition, the need for chromatographic separation/resolution was indicated; however, the methodology did not include any measurement or requirements for chromatographic separation/resolution.

- Branched and linear PFAS: Draft Method 1633 indicates that branched and linear PFAS standards should be utilized where available. The definition of "availability" of standards is vague and will result in variability/incompatibility of PFAS analytes being reported by commercial laboratories. Additionally, branched and linear PFAS should be reported separately and not as a combined single concentration under the linear PFAS CAS Number. Alternatively, the PFAS compounds with branched and linear PFAS should be reported as total PFAS (*e.g.*, total PFOS). Reporting as a combined single concentration under the linear PFAS CAS Number is misleading to the non-Chemist and Chemist alike who are unaware of the nuances of reporting procedures. As detailed in our comments, without separate branched and linear standards, there is no assurance that what are currently reported as linear PFAS compounds are indeed only those linear compounds.

- Instrument calibration: Draft Method 1633 includes several options for instrument calibration; however, the document did not include sufficiently detailed requirements for initial calibration techniques (*e.g.*, linear or quadratic equations with weighting or forced through zero point). The document also does not include the equations necessary for the calibration techniques or to confirm the compliance of the calibrations. Finally, within the Draft Method 1633, the frequency for confirmation of the instrument calibration was not defined adequately and allows for interpretation regarding the number of injections between calibration checks.

4.0 Concluding Statements

The US EPA is respectfully requested to evaluate the comments, suggestions, and recommendations provided herein for the improvement of the Draft Method 1633 document. There are numerous preparation and analytical issues that should be considered and incorporated into the draft method prior to conducting the multi-laboratory validation study. The US EPA is requested to provide the single-laboratory validation study for evaluation and provide the rubric and data quality objectives for that study.

As there is an intense need for a PFAS method that addresses non-potable water, solid, and tissue matrices, the US EPA is congratulated on its attention and focus on continuing development of a defensible, accurate, and reproducible PFAS data set.

Report prepared and respectfully submitted by:

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Date: 11/12/2021

TABLE 1

Table 1 Environmental Standards, Inc. Detailed Comments based on Review of Draft Method 1633

Section Number	Sentence/Item	Assessment/Comment
Notice	As stated, the document represents a draft of a method currently under development by the EPA Office of Water. It is a single laboratory validated procedure and the performance data is stated to be "presented only as examples".	As of the posting of these comments on November 12, 2021, the US EPA has not posted the single-laboratory validation study. Please advise when the single-laboratory validation study will be available for review.
Notice	It is stated that the method validation process may "eliminate some of the parameters listed in this draft method".	It is unclear if parameters that may be potentially eliminated are target analytes or other aspects of the draft procedure (*e.g.*, sensitivity checks). If target analytes may be eliminated, that has potentially significant ramifications if this draft procedure is being listed in individual permits.
https://www.epa.gov/cwa-methods/cwa-analytical-methods-and-polyfluorinated-alkyl-substances-pfas	While the method is not nationally required for CWA compliance monitoring until the US EPA has promulgated it through rulemaking, it is recommended now for use in individual permits.	As this procedure (referred to as "Method 1633") is not currently formally defined by the US EPA as a draft method, it is not appropriate for this procedure to be required for CWA compliance (*e.g.*, listed in NPDES permits).
1.2	Where linear and branched isomers are present in the sample and either qualitative or quantitative standards containing branched and linear isomers are commercially available, the PFAS analyte is reported as a single analyte consisting of the sum of the linear and branched isomer concentrations.	In the commenting authors' opinion, this sentence is not accurate. Specifically, the concentrations of the individual isomers are not determined and summed. Instead, the total response of the branched and linear isomer peaks is used in the quantitation against a single response factor (that is dependent upon the ratios of the mix of isomers in a quantitative standard or solely from the linear isomer in the case of qualitative standards). This is an important distinction since, the response factors for the individual isomers would vary (sometimes greatly) such that the quantitation would be more accurate if individual isomer concentrations were determined and summed. Sums or quantitations that include the branched and linear components should be designated as such and not be reported under the CAS Number or nomenclature of the linear compounds. Additionally, in the commenting authors' opinion, branched and linear PFAS should be reported separately and not as a combined single concentration under the linear PFAS CAS Number. Alternatively, the PFAS compounds with branched and linear PFAS should be reported as total PFAS (*e.g.*, total PFOS). Reporting as a combined single concentration under the linear PFAS CAS Number is misleading to the non-Chemist and Chemist alike who are unaware of the nuances of reporting procedures. As detailed in our comments, without separate branched and linear standards, there is no assurance that what are currently reported as linear PFAS compounds are indeed only those linear compounds.
1.2	Where linear and branched isomers are present in the sample and either qualitative or quantitative standards containing branched and linear isomers are commercially available, the PFAS analyte is reported as a single analyte consisting of the sum of the linear and branched isomer concentrations.	In the commenting authors' opinion, since the commercial availability of either qualitative or quantitative standards determines whether the PFAS analyte is reported as a single analyte consisting of a mix of the linear and branched isomers and the availability of these standards is subject to change, it is important to have an easy system for laboratories to find these sources as new standards become available (instead of constantly asking different vendors, with some laboratories not being in touch with all potential vendors).
1.5	The last sentence describes that "Changes outside the scope of 40 CFR Part 136.6 and Section 9.0 of this method may require prior review or approval"	Clarity is needed as to who shall review and approve such changes. Without clarity of this change process, one might interpret it to mean the entity who made the change can review and approve their own change. Also, while Section 21.2 (Definitions and Acronyms) provides definitions for "Must" and "Should," it seems appropriate to also define "May."

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Section Number	Sentence/Item	Assessment/Comment
2.5	Results for target analytes are recovery corrected by the method of quantification (i.e., either isotope dilution or extracted internal standard quantification, see Section 10.3). Isotopically labeled compound recoveries are determined by comparison to the responses of one of seven non-extracted internal standards (a.k.a., the "recovery" standards) and are used as general indicators of overall analytical quality.	In the commenting authors' opinion this section is misleading in stating that the target analytes are "recovery corrected." The recoveries for the isotopically labeled compounds are not used to "recovery correct" the results; rather, they are used as the internal standards that are added pre-extraction to adjust results for extraction and cleanup efficiency in addition to instrumental effects. Furthermore, the pre-extraction internal standard (EIS) recoveries are impacted by the non-extracted internal standard (NIS) performance, while the target PFAS analytes are not.
4.2.1	Prior to use, glassware must be solvent rinsed then air dried. A solvent rinse procedure using methanolic ammonium hydroxide (1%), toluene and methanol is recommended	Routine laboratory procedures are to solvent rinse glassware immediately before use (without necessarily air drying). The term "must" in the context of mandating air drying after solvent rinsing appears superfluous.
4.2.2	All parts of the SPE manifold must be cleaned between samples by sonicating in methanolic ammonium hydroxide (1%) and air drying prior to use.	Routine laboratory procedures are to solvent rinse the SPE manifold before use (without necessarily air drying). The term "must" in the context of mandating air drying after solvent rinsing appears superfluous.
4.2.3	A typical solvent rinse procedure would be acetone, followed by toluene, and then dichloromethane.	As is the case in Section 4.2.1, the solvent rinse for equipment should include methanol.
4.3	All materials used in the analysis must be demonstrated to be free from interferences by running method blanks (Section 9.5) at the beginning and with each sample batch (samples started through the extraction process on a given analytical batch to a maximum of 20 field samples).	The commenting authors suggest that the batch definition also include a maximum extraction batch time frame (*e.g.*, within 8 hours of the beginning of the first extraction).
4.3.1	Ideally, the reference matrix should not contain PFAS in detectable amounts but should contain potential interferents in the concentrations expected to be found in the samples to be analyzed.	In the commenting authors' opinion, the intentional inclusion of matrix interferences for aqueous and solid samples is not a realistic expectation. Potential interferents in samples will vary from site to site, and the laboratory will likely be using one type of reference matrix per sample matrix. Section 4.4 of the document states that the most frequently encountered interferences are fluoropolymers, but it does not seem reasonable to expect fluoropolymers to be in a reference matrix. The commenting authors suggest that either the statement be removed, or US EPA should provide clarification in the draft method with regard to the potential interferents that should be present in the reference matrix.
4.3.2	The laboratory must verify that the source product used does not contain PFAS in detectable amounts.	Please clarify/define what is meant by detectable amounts – MDL, LOQ, or some multiple of signal-to-noise.
4.5	Each piece of reusable glassware may be numbered to associate that glassware with the processing of a particular sample.	The commenting authors suggest that the US EPA either strengthen the statement to be a requirement or the statement should be removed. The additional tracking of glassware has great merit; however, this is clearly a time burden on commercial laboratories, not only labeling, but the tracking and follow-up on the use of labeled glassware. If the laboratory holds glassware until samples have been analyzed, the laboratory will need to increase its expenditures. Another negative concern frequently identified for laboratories labeling glassware is the practice of using particularly numbered glassware for QC samples (*e.g.,* method blanks). Including a statement that numbered glassware must be randomized across batches would help minimize that practice.
5.1.1	PFOA has been described as likely to be carcinogenic to humans. Pure standards should be handled by trained personnel, with suitable protection to skin and eyes, and care should be taken not to breathe the vapors or ingest the materials.	The commenting authors suggest that the US EPA consider revising the passage to state, "PFOA has been described as likely to be carcinogenic to humans. Materials known or suspected to contain PFOA should be handled by trained personnel, with suitable protection to skin and eyes, and care should be taken not to breathe the vapors or ingest the materials."

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Section Number	Sentence/Item	Assessment/Comment
5.2	It is also suggested that the laboratory perform personal hygiene monitoring of each analyst who uses this method and that the results of this monitoring be made available to the analyst.	The commenting authors suggest that this statement be removed. If not required by OSHA, the methodology should not suggest or impose additional monitoring requirements.
5.3	Samples suspected to contain these compounds are handled using essentially the same techniques employed in handling radioactive or infectious materials.	The commenting authors suggest that this statement be removed and replaced with actual specifications for the area or fume hood.
5.3.1	When finely divided samples (dusts, soils, dry chemicals) are handled, all operations (including removal of samples from sample containers, weighing, transferring, and mixing) should be performed in a glove box demonstrated to be leak tight or in a fume hood demonstrated to have adequate air flow.	The commenting authors suggest that the term "air flow" be replaced with "face velocity."
5.3.1	Handling of the dilute solutions normally used in analytical and animal work presents no inhalation hazards except in the case of an accident.	The commenting authors are of the opinion that this statement is vague, and either the term “dilute solutions” should be defined, or the sentence should be removed.
5.3.2	Protective equipment – Disposable plastic gloves, apron or lab coat, safety glasses or mask, and a glove box or fume hood adequate for radioactive work should be used.	The commenting authors suggest that this section be updated to include the specifications for the fume hood. The commenting authors suggest replacing disposable plastic gloves with nitrile gloves.
5.3.4	Hands and forearms should be washed thoroughly after each manipulation and before breaks (coffee, lunch, and shift)	The commenting authors suggest that this section be updated to define the materials for washing hands and forearms. Are tap water and commercially available soap products acceptable realizing that both are likely to be a source of trace-level PFAS? In addition, the commenting authors suggest that PFAS could be transferred from Analysts to samples in the laboratory through personal care products, and care should be taken to ensure this does not occur.
5.4	Laboratory staff should know and observe the safety procedures required in a microbiology laboratory that handles pathogenic organisms when handling biosolids samples.	The commenting authors suggest that this statement be removed and replaced with actual specifications for the area.
6.1.1	Sample bottles and caps.	The commenting authors noted that this section does not indicate that the sample containers are to be confirmed on a by-lot basis to be PFAS-free. A statement indicating that the sample containers are to be PFAS-free down to the MDL for each target analyte should be added to Section 6.1.1 in the draft method.
6.1.1.1 Note:	At least two aliquots of aqueous samples are collected to allow sufficient volume for the determination of percent solids and for pre-screening analysis. One aliquot should be collected in a 500-mL container while the second aliquot may be collected in a smaller sample container (e.g., 250-mL or 125-mL).	The commenting authors suggest that a third aliquot (a second full-volume aliquot) be collected in the draft method because some of the corrective actions for QC specified later in the draft method involve re-extraction of the sample.
6.1.2	Before use, the tubing must be thoroughly rinsed with methanol followed by repeating rinsing with reagent water to minimize sample contamination.	It is appropriate to collect those methanol and reagent water rinses, extract, analyze, and verify cleanliness down the acceptable project limits. In the commenting authors’ opinion, the final rinse should be tested to confirm effectiveness of the process with every lot number of tubing used.
6.3 - 6.11	Equipment	The commenting authors noted that these sections do not indicate that the applicable sample equipment (*e.g.,* HDPE bottles, aluminum foil, *etc.*) should not contain materials that will interact with PFAS (*e.g.*, plastic) and must be determined to be PFAS-free prior to use. Statements indicating that the sample equipment, where applicable, are to be PFAS-free down to the MDL for each target analyte should be added to these sections in the draft method. The commenting authors suggest that the equipment have appropriate certificate of analysis (*e.g.*, results for all PFAS analytes) or undergo laboratory evaluation to confirm absences of PFAS analytes for each lot.

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Section Number	Sentence/Item	Assessment/Comment
6.3.10	Ultrasonic mixer (sonicator).	The commenting authors noted that the text in Section 6.3.10 does not indicate the type of sonicator to be used (immersion or bath). The text should clearly identify which type of sonicator is needed in the draft method.
6.4.3	Glass fiber filter, 47 mm, 1 µm, PALL A/E or equivalent	The commenting authors noted the filter used to determine the percent suspended solids in Section 11.1.1 is a 1 µm size. Specifically, total suspended solids are typically defined as particles exceeding 2 µm. As a question, is there a reason that a 1-µm filter was selected? For equivalency, does it have to be 1 µm?
6.10.1	Ultra-high-performance liquid chromatograph (UPLC also called UHPLC) or high-performance liquid chromatograph (HPLC) equipped with tandem quadrupole mass spectrometer (Waters Xevo TQ-S Micro or equivalent).	The commenting authors are of the opinion that this statement could be interpreted to mean that only triple quadrupole MS/MS configurations are allowed. Is that the intention? It would seem, that hybrid tandem instruments with higher resolution could be used successfully for this method. If that is the case, it should be clarified in the draft method.
7.1.1	Acetic acid – ACS Grade or equivalent, store at room temperature	The commenting authors suggest that the specification include the percent concentrated as there are variable percent concentrations available and used in commercial laboratories. “Concentrated acetic acid” is specified in Section 12.2.3.
7.1.5	Ammonium hydroxide – certified ACS + grade or equivalent, 30% in water, store at room temperature	The commenting authors suggest that the specification include a replace by/expiration date.
7.1.1 – 7.1.20	Acetonitrile, formic acid, methanol, carbon, toluene, acetone, and dichloromethane are to be “verified” and reagent water is to be “tested” by lot number prior to use. Acetic acid, ammonium acetate, ammonium hydroxide and potassium hydroxide have no testing or verification requirements listed.	In the equipment section (Section 4.2), the commenting authors noted that verification of disposable plasticware and filters are demonstrated PFAS-free to less than ½ the ML for target analytes. 1) The commenting authors noted no such criterion is listed for the reagent verifications. The document also needs to define what “verified” means. Does verified mean that the laboratory must determine the material is PFAS-free or have documentation that the material was purchased PFAS-free? 2) The commenting authors question why several reagents appear to be exempt from pre-testing, and it is recommended that all reagents and media included in the document be pre-tested to a clearly stated criterion. These issues should be clarified in the draft method.
7.1.7.1, 7.1.7.2, 7.1.7.3, and 7.1.9.	Example: “Methanolic ammonium hydroxide (0.3%) – add ammonium hydroxide (1 mL, 30%) to methanol (99 mL), store at room temperature, replace after 1 month.”	The commenting authors suggest that ammonium hydroxide 30% include the specification basis (*viz.,* 30% W/W or V/V).
7.1.12 and 7.1.13	Formic acid	The commenting authors noted the use of formic acid for pH adjustment; however, US EPA Methods 533 and 537.1 utilize acetic acid for pH adjustment. The use of formic acid should be explained and why acetic acid is not acceptable and/or indicate that acetic acid can be optionally utilized instead of formic acid. The use of formic acid may have a cost impact for analysis by this method as formic acid is not generally utilized for environmental analyses in commercial laboratory settings.

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Section Number	Sentence/Item	Assessment/Comment
7.2	Reference matrices – Matrices in which PFAS and interfering compounds are not detected by this method. These matrices are to be used to prepare the batch QC samples (e.g., method blank, and ongoing precision and recovery sample).	The commenting authors suggest that the method blank should contain only the reagents and media that are placed in the samples. If the reference medium is contaminated, it would not contaminate the samples, because the reference matrix is *never added to the samples*, and therefore, sample results would be *incorrectly* qualified as having method-borne backgrounds.
7.3	The laboratory must maintain records of the certificates for all standards for traceability purposes. Copies of the certificates must be provided as part of the data packages in order to check that proper calculations were performed.	The commenting authors suggest that records of the preparation of intermediate and working standards must also be maintained to document traceability of the sample measurements from the initial use of the certified standards.
7.3	Replace the solution if solvent loss has occurred.	The commenting authors recommend changing this sentence to, “If solvent loss has occurred, discard and replace the solution” in the draft method.
7.3	^{18}O-mass labeled perfluoroalkyl sulfonates may undergo isotopic exchange with water under certain conditions, which lowers the isotopic purity of the standards over time.	The commenting authors noted deuterated standards are also specified for use. Deuterated standards can also undergo isotopic exchange with protic solvents (such as methanol) under certain conditions. Both possibilities should be included in these precautionary statements in the draft method.
7.3	Standard solutions	The commenting authors suggest that a note should be added regarding reference materials that can also be prepared from commercially available ammonium, sodium, or potassium salts in the draft method. For the preparation of standards from these reference material salts, the measured mass, or concentration, needs to be corrected for the salt content.
7.3	When not being used, store standard solutions in the dark at less than 4 °C unless the vendor recommends otherwise in screw-capped vials with foiled-lined caps.	The commenting authors noted that the March 12, 2007, Method Update Rule states that, "aqueous samples must be preserved at ≤ 6 °C ... Also, for purposes of NPDES monitoring, the specification of ‘≤ 6 °C’ is used in place of the ‘4 °C’ and ‘< 4 °C’ sample temperature requirements listed in some methods." For consistency with this and other US EPA programs, US EPA should consider 0 - 6 °C, not frozen, rather than 4 °C when referencing sample thermal preservation.
7.3.1 and Table 3	Table 3 presents the nominal amounts of EIS compounds added to each sample.	The commenting authors noted given a final volume of 5 mL of extract (based on the volume of solvent eluted), an EIS spiked at 5 ng would result in 1 ng/mL in the extract. Since up to a 10× dilution is allowed for EIS quantitation, the EIS would be ~ 0.1 ng/mL in a diluted extract when analyzed. For the associated target analytes, the LOQ standard is at 0.2 ng/mL (per Table 4). This level of dilution would put some of the EIS in a less than appropriate, non-quantitative range. As a recommended enhancement in the draft method, it would be preferable to allow Analysts to use greater than a 10× extract dilution. In order to do this, the EIS would need to be spiked at a higher concentration. While this would add cost due to the expense of the isotopes, it would minimize the need to re-extract a sample with a smaller volume/mass (assuming additional volume/mass is available) and increase the overall range that would be achieved through a combination of subsampling and dilution.
7.3.1	Other isotopically labeled compounds may be used as they become available.	It is suggested that this sentence be strengthened to at least “should” be used, but preferably changed to “must” be used as the obvious strength in the method is the use of as many of the native and isotopically labeled compound pairs as are available.
7.3.4	The lowest level calibration standard must meet a signal-to-noise ratio of 3:1 and be at a concentration less than or equal to the Limit of Quantitation (LOQ).	The commenting authors are of the opinion that because the low calibration standard will become the *de facto* estimate of the LOQ, the signal-to-noise must be above the noise level needed to merely detect an analyte peak. Considering the likely increased noise levels anticipated in environmental samples, it is recommended that the minimum signal-to-noise ratio be specified as 10:1 or higher in the draft method. (See US EPA Method 1613B, US EPA Method 1668C, and ICH-Q2B for reference.)

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Section Number	Sentence/Item	Assessment/Comment
7.3.4	The lowest level calibration standard must meet a signal-to-noise ratio of 3:1 and be at a concentration less than or equal to the Limit of Quantitation (LOQ).	While commenting authors noted the lack of clarity, it is preferable that this requirement applies to the confirmation ion with a higher criterion for the quantitation ion as noted above. The draft method needs to be clear on the application of the signal-to-noise requirement relative to the two types of mass ions.
7.3.4 and 15.2	Section 7.3.4 states "A minimum of six contiguous calibrations standards are required for a valid analysis when using a linear calibration model, with at least five of the six calibration standards being within the quantitation range (e.g., from the LOQ to the highest calibration standard). If a second-order calibration model is used, then a minimum of seven calibration standards are required, with at least six of the seven calibration standards within the quantitation range." Section 15.2 provides only equations for calculation utilizing an average relative response factor.	The commenting authors suggest that Section 15.2 be updated to include quantitation for all calibration model types in the draft method. Without definitions, there is an obvious potential for non-comparable variation among laboratories utilizing this method. The commenting authors suggest limiting the calibration models that can be used to average RRF, linear, linear with weighting, linear forced through zero, quadratic, quadratic with weighting, and quadratic forced through zero.
7.3.4	A mid-level calibration solution is analyzed at least every ten samples or less, on an ongoing basis for the purpose of calibration verification. A mid-level calibration verification (CV) standard must also be analyzed after all sample analyses in order to bracket the analytical batch.	The commenting authors noted that this section does not indicate if QC analyses, and blank solvent injections are considered "samples." It is appropriate that the draft method define the number of analyses (*viz.,* injections) between CV standards. Without specific definition of the frequency of the CV standards, inconsistencies will occur between CV standards among laboratories utilizing this method, with some variations potentially impacting the quality of the data.
7.3.4	The calibration solutions are prepared using methanol, methanolic ammonium hydroxide (2%), water, acetic acid and the method analyte and isotopically labeled compound standard solutions. After dilution, the final solution will match the solvent mix of sample extracts, which contain methanol with 4% water, 1% ammonium hydroxide and 0.625% acetic acid (Section 7.1.9).	The commenting authors noted that this solvent mix aligns with sample extracts only if it is assumed that the final sample extract volume is 4 mL. Sample extracts are not concentrated. Extracts will consist of the amount of solvent collected after elution with 5 mL of 1% methanolic ammonium hydroxide (so up to 5 mL), with 25 µL of acetic acid and 50 µL of NIS added (for a total volume of up to 5.075 mL); however, 4 mL of eluted solvent is assumed for this statement (and for the LOQ calculation from lowest ICAL standard). Clarity in the draft method is needed as to why 4 mL of eluted solvent is used in the various calculations. The commenting authors suggest that calculations be based on the entire 5 mL and the solvents in the calibration standards be adjusted accordingly. For example, in this case, 25 µL of acetic acid into 5 mL means that the calibration standard should have 0.5% acetic acid instead of 0.625% (which is based on 25 µL of acetic acid being added to 4 mL). The commenting authors suggest that the calibration standard solutions should have the same ratios of reagents as the final sample extracts. As the document is written, the calibration standard solutions have 4% water (as in Section 7.1.9) rather than 2% water (elution solvent, Section 7.1.7.2).
7.3.4	Concentrations for seven calibration solutions are presented in Table 4.	The commenting authors noted that the concentration of the EIS and NIS in this table will only match the concentration of EIS and NIS in a sample extract if the final volume of the sample extract is assumed to be 4 mL (see previous comment), which often will not be the case. The commenting authors suggest that calculations be based on the entire 5 mL of eluted solvent.
7.3.4	All initial calibration requirements listed in Table 7 must be met.	The commenting authors noted Table 7 only provides the minimum number of standards to be used. All requirements should be added to this table in the draft method (or additional references to other sections).
7.3.5	Qualitative standards that are currently commercially available include PFOA, PFNA, PFOSA, NMeFOSA, NEtFOSA, NEtFOSE, and NMeFOSE.	The commenting authors suggest that the US EPA provide examples of where these standards can be obtained as the qualitative standard for PFOA is the only qualitative standard widely currently commercially available.
7.3.5	Qualitative standards that are currently commercially available include PFOA, PFNA, PFOSA, NMeFOSA, NEtFOSA, NEtFOSE, and NMeFOSE.	The commenting authors recommend that the US EPA mandate (*e.g.,* the word "must") which PFAS analytes are required to include branched and linear qualitative standards in the draft method.

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7.3.6	During the analysis of a batch of samples, a solvent blank is analyzed after samples containing high level of target compounds (e.g., calibration, CV) to monitor carryover from the previous injection.	The instrument (solvent) blank is not addressed in the QC section (Section 9). No acceptance criterion has been specified. It is recommended that corrective action be required if any analyte is detected above the MDL (or $^1/_3$ the LOQ if higher) and that an acceptable instrument blank be analyzed prior to sample analysis. Consistently analyzing instrument blanks immediately prior to CCVs can interfere with the ability to diagnose system carryover and chromatographic issues and should be avoided.
7.3.7	Stability of solutions – Standard solutions used for quantitative purposes (Sections 7.3.1 through 7.3.5) should be assayed periodically (e.g., every 6 months) against certified standard reference materials (SRMs) from the National Institute of Science and Technology (NIST), if available, or certified reference materials from a source that will attest to the authenticity and concentration, to assure that the composition and concentrations have not changed.	The commenting authors recommend changing the last clause of this sentence to, "… or certified reference materials from a source operating under accreditation to ISO Guide 17034 that attests to the material's authenticity and concentration, to ensure that the composition and concentrations have not changed" in the draft method.
8.2.1	Collect 500 mL of sample (other than leachates) in an HDPE bottle.	The commenting authors recognize that the use of 500-mL sample containers allows for more sensitivity; however, the sample volume also increases the impacts of matrix. The commenting authors suggest allowing the use of smaller sample containers (*e.g.*, 250 mL) and updating the text to read: "Collect a maximum of 500 mL of sample (other than leachates) in an HDPE bottle." The US EPA should recognize that in the commenting authors' experience the majority of the U.S. commercial laboratory industry has standardized to a maximum 250-mL sample size to date, and the use of a 500-mL sample size is a significant departure from the norm. In addition, US EPA Method 533 uses 250-mL bottleware with a concentration step. The commenting authors have provided information as a comment on Sections 12.2, 12.3, and 12.4 for the concentration of the sample extract to improve the sensitivity.
8.2.1 Note	Collect at least two aliquots of all aqueous samples to allow sufficient volume for the determination of percent solids and for pre-screening analysis. That second aliquot may be collected in a smaller sample container (e.g., 250-mL or 125-mL).	The commenting authors noted that, as written, there will only be one sample container for preparation and analysis; however, some of the corrective actions for out-of-criteria performance tests (*e.g.*, method blank in Section 9.5.2 and OPR in Section 14.5.3) require re-extraction. This cannot occur for aqueous samples without an extra volume (and specifically the same volume as was used for the original extraction) being provided for this purpose (although the smaller volume could be used for a smaller volume for high levels of PFAS or high levels of solids). The collection of two, but preferably three, full-volume sample containers being required in the draft method will reduce potentially lost data (*e.g.*, matrix issues or lost extracts) and reduce the need to re-collect sample points if an issue or initial QC failure occurs.
8.2.1 Note	Because the target analytes are known to bind to the interior surface of the sample container, the entire aqueous sample that is collected must be prepared and analyzed and subsampling avoided whenever possible. Therefore, if a sample volume smaller than 500 mL is to be used for analysis, collect the sample in an appropriately sized HDPE container.	The commenting authors noted that Section 11.2 clarifies that a smaller sample volume may be used for samples with elevated PFAS concentrations and/or high in suspended solids. Collecting samples in the appropriately sized container could get complicated for a site with large variations in PFAS concentrations and/or percent suspended solids, where the ideal sample volume may vary from location to location (especially given the limitation of only a 10× dilution). Once the PFAS concentrations are above the calibration range of this method, the potential of analytes binding to the interior surface should be considered negligible relative to the total PFAS concentration. Additionally, and as stated earlier, it is recommended that the EIS concentrations be adjusted in the draft method to allow for additional extract dilution (beyond 10×) to avoid subsampling and/or collection of alternative sample volumes as much as possible.

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8.2.3 and 8.5.1	Section 8.2.3 states "The laboratory must confirm that the sample temperature is 0 - 6 °C upon receipt. Once received by the laboratory, the samples must be stored at ≤ -20 °C until sample preparation." Section 8.5.1 states "Aqueous samples (including leachates) should be analyzed as soon as possible; however, samples may be held in the laboratory for up to 90 days from collection, when stored at ≤ -20 °C and protected from the light. When stored at 0 - 6 °C and protected from the light, aqueous samples may be held for up to 28 days, with the caveat that issues were observed with certain perfluorooctane sulfonamide ethanols and perfluorooctane sulfonamidoacetic acids after 7 days."	The commenting authors noted that laboratory thermal storage preservation indicated in Section 8.2.3 contradicts the laboratory storage thermal preservation options provided in Section 8.5.1. The laboratory storage thermal preservation in Section 8.2.3 needs to be updated to correspond the requirements in Section 8.5.1 in the draft method.
8.2.3; 8.3.2; 8.4.3	Once received by the laboratory, the samples must be stored at ≤ -20°C until sample preparation.	The commenting authors are of the opinion that most commercial laboratory freezer storage temperatures vary between -10 °C and -20 °C (see SW-846 Method 5035A, US EPA Method 1613, and US EPA Method 1668C for reference.) Additionally, most commercial laboratories will likely have to greatly increase their frozen sample capacity based on this requirement. It also should be noted that SW-846 Method 5035A (Table A.1) indicates that vials should <u>not</u> be frozen below -20 °C due to potential problems with vial seals and the *loss of constituents upon sample thawing*. The commenting authors are of the opinion that PFAS holding-time studies are needed to demonstrate the need for this added ≤ -20 °C freezer storage expense.
8.2.3; 8.3.2; 8.4.3	Once received by the laboratory, the samples must be stored at ≤ -20°C until sample preparation.	The commenting authors noted that samples will be required to be thawed prior to extraction; therefore, additional guidance on that thawing process is needed in the draft method.
8.3.1	Collect samples as grab samples using wide-mouth jars and fill no more than ¾ full (see Section 6.1.1.2 for container size and type).	The commenting authors recommend that the requirement in the draft method be changed to read, "Collect samples as grab samples using HDPE wide-mouth jars and fill no more than ¾ full (see Section 6.1.1.2 for container size and type)."
8.3.2 and 8.5.2	Section 8.3.2 states "Once received by the laboratory, the samples must be stored at ≤ -20 °C until sample preparation." Section 8.5.2 states "Solid samples (soils and sediments) and tissue samples may be held for up to 90 days, if stored by the laboratory in the dark at either 0 - 6 °C or ≤ -20 °C, with the caveat that samples may need to be extracted as soon as possible if NFDHA is an important analyte."	The commenting authors noted that the laboratory thermal storage preservation indicated in Section 8.3.2 contradicts the laboratory storage thermal preservation options provided in Section 8.5.2. The laboratory storage thermal preservation in Section 8.3.2 needs to be updated to correspond the requirements in Section 8.5.2 in the draft method.
8.3.2	Section 8.3.2 states “Maintain solid samples protected from light (in HDPE containers) at 0 - 6 ºC from the time of collection until receipt at the laboratory. The laboratory must confirm that the sample temperature is 0 - 6 ºC upon receipt.”	The document did not include a defined transport time for solid samples; whereas, the document indicated 48 hours for aqueous samples and 24 hours for fish and other tissue samples. The commenting authors suggest that the document be updated to indicate a 48-hour transport time for solid samples.
8.4.2	If whole fish are collected, wrap the fish in aluminum foil or food-grade polyethylene tubing, and maintain at 0 - 6 °C from the time of collection until receipt at the laboratory, to a maximum time of 24 hours. If a longer transport time is necessary, freeze the sample before shipping. Ideally, fish should be frozen upon collection and shipped to the laboratory on dry ice.	The maximum of 24 hours will likely be difficult for field sampling personnel and laboratory personnel to control. Freezing before shipping and use of dry ice may not always be practical. It is strongly suggested that a maximum time be changed to 48 hours at 0 - 6 °C, rather than 24 hours.
8.4.3	Once received by the laboratory, the samples must be maintained protected from light at ≤ -20 ºC until prepared	The commenting authors recommend adding the sentence that, "Samples may be partially thawed just prior to preparation." in the draft method.

Table 1 Environmental Standards, Inc. Detailed Comments based on Review of Draft Method 1633

Section Number	Sentence/Item	Assessment/Comment
8.5.1	Aqueous samples (including leachates) should be analyzed as soon as possible; however, samples may be held in the laboratory for up to 90 days from collection, when stored at ≤ -20 °C and protected from the light. When stored at 0 - 6 °C and protected from the light, aqueous samples may be held for up to 28 days, with the caveat that issues were observed with certain perfluorooctane sulfonamide ethanols and perfluorooctane sulfonamidoacetic acids after 7 days. These issues are more likely to elevate the observed concentrations of other PFAS compounds via the transformation of these precursors if they are present in the sample.	The commenting authors noted that Section 8.2.3 states that samples must be stored at ≤ -20 °C, but then this section goes on to provide other thermal preservation options. It is recommended that there be consistent requirements between Sections 8.2.3 and 8.5.1. Given the *caveat* for the behavior of certain compounds which may be present, the document should include details on when a holding time of 7 days for 0 - 6 °C should be applied. Specifically, how is it known that transformations will not occur soon after collection and/or during shipping at 0 - 6 °C such that these transformations have already taken place when the samples arrive at the laboratory? Holding-time studies are clearly needed in consideration of these statements regarding potential transformations.
8.5.2	Solid samples (soils and sediments) and tissue samples may be held for up to 90 days, if stored by the laboratory in the dark at either 0 - 6 °C or ≤ -20 °C, with the caveat that samples may need to be extracted as soon as possible if NFDHA is an important analyte	As a question, if the holding time is the same whether at 0 - 6 °C or ≤ -20 °C, why does Section 8.3.2 state that samples must be stored at ≤ -20 °C at the laboratory? How does/will the laboratory determine whether NFDHA is an important analyte? What is the definition of as soon as possible with regard to the stated holding time? Is there also a reason that the transformation possibilities described in Section 8.5.1 do not apply to solid samples? Holding-time studies are clearly needed in consideration of the statements regarding potential transformations made in this document.
8.5.3	Biosolids samples may be held for up to 90 days, if stored by the laboratory in the dark at 0 - 6 °C or at -20 °C. Because microbiological activity in biosolids samples at 0 - 6°C may lead to production of gases which may cause the sample to be expelled from the container when it is opened, as well as producing noxious odors, EPA recommends that samples be frozen if they need to be stored for more than a few days before extraction.	The commenting authors suggest that the passage be changed to, "Biosolids samples may be held for up to 90 days, if stored by the laboratory in the dark at < 6 °C, or, preferably at ≤ -20 °C." If the holding time is the same whether at 0 - 6 °C or ≤ -20 °C, why does Section 8.4.3 state that samples must be stored at ≤ -20 °C at the laboratory? Holding-time studies are clearly needed in consideration of the statements regarding potential transformations made in this document.
8.5.4	"Store sample extracts in the dark at less than 0 - 4°C until analyzed. If stored in the dark at less than 0 - 4 °C…"	The commenting authors noted that the requirement to have a temperature below a range is confusing. It is unclear whether the intention is to store at less than 0 °C or between 0 °C and 4 °C. It is recommended that the passage be changed to, "If stored in the dark at < 4 °C, sample extracts may be stored for up to 90 days, with the *caveat* that issues were observed for some ether sulfonates after 28 days." The confusion that exists in the way the document is currently written for sample extract storage will result in mishandling, and at least variable handling of extracts and data-comparability issues. As indicated previously and for consistency with other US EPA programs and the routine practice within commercial laboratories of storage temperatures being 0 – 6 °C, US EPA should consider specifying storage temperatures of 0 – 6 °C rather than 4 °C.
8.5.4	"...sample extracts may be stored for up to 90 days, with the caveat that issues were observed for some ether sulfonates after 28 days. These issues may elevate the observed concentrations of the ether sulfonates in the extract over time. Samples may need to be extracted as soon as possible if NFDHA is an important analyte."	The commenting authors noted that the document does not provide an indication of which specific ether sulfonates require a 28-day holding time. The extraction holding time should be updated to 28 days from collection or the document should include a specific listing of ether sulfonates that require a 28-day extraction holding time in the draft document. As final questions relating to this section, how will the laboratory determine whether ether sulfonates or NFDHA are important analytes and or likely to be present in the samples? Also, what is the definition of as soon as possible with regard to holding time?

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Section Number	Sentence/Item	Assessment/Comment
9.0	Quality Control	The commenting authors note that the QC section does not include a measure of precision, beyond program-specific field replicates. The US EPA should consider the inclusion of either a sample or OPR duplicate analyses such that an appropriate measure of laboratory precision included when the draft method is posted for comment.
9.1.2 (similar text in 1.5 and 9.1.2.1)	In recognition of advances that are occurring in analytical technology, and to overcome matrix interferences, the laboratory is permitted certain options to improve separations or lower the costs of measurements. These options include alternative extraction, concentration, and cleanup procedures, and changes in sample volumes, columns, and detectors. Alternative determinative techniques and changes that degrade method performance, are not allowed without prior review and approval.	The commenting authors are of the opinion that allowing laboratories to perform alternative extractions and/or cleanups may degrade (or improve) method performance; however, the protocol described in this, and subsequent sections of the document does not address extraction efficiency and cleanup performance in actual sample matrices. Spike recoveries measured from spiking a "clean" reference matrix or spiking the sample are not reliable indicators of extraction or cleanup performance in the natural matrix. The draft method should require demonstrations of equivalency on samples of the natural matrix be performed prior to adopting alternative extractions and/or cleanups.
9.1.4	The laboratory must spike all samples with isotopically labeled compounds to monitor method performance. This test is described in Section 9.3. When results of these spikes indicate atypical method performance for samples, the samples are diluted to evaluate whether the performance issue is caused by the sample matrix. Procedures for dilution are given in Section 15.3.	See comments to Section 15.3.2.
9.2.2	The minimum level of quantification (ML) is then calculated by multiplying the MDL by 3.18 and rounding the result to the nearest 1, 2 or 5 x 10n, where n is zero or an integer. Example matrix-specific detection limits are listed in Table 6.	The commenting authors noted that the MLs reported on Table 6 (albeit stated as examples) appear to be based on the lowest-level initial calibration standard from Table 4, assuming a final sample extract volume of 4 mL (see comment on Section 7.3.4) and not based on the method of calculating the ML from the MDL as stated here. In several cases on Table 4, the MLs are values less than 3.18 times the MDL (*e.g.*, some of the FTSs and NFDHA in water). In one case, the MDL is actually greater than the ML (NMeFOSE in tissue). As the values on Table 6 are based on the single-laboratory validation study, such discrepancies require resolution and should be aligned with the method of calculating the ML from the MDL as stated in Section 9.2.2.
9.3.3 (similar in 15.3.2)	The recovery of each isotopically labeled compound must be within the limits in Tables 9 and 10 (once the tables are finalized). If the recovery of any compound falls outside of these limits, method performance is unacceptable for that compound in that sample. Additional cleanup procedures must then be employed to attempt to bring the recovery within the normal range. If the recovery cannot be brought within the normal range after all cleanup procedures have been employed, water samples are diluted, and smaller amounts of soils, biosolids, sediments, and other matrices are prepared and analyzed, per Section 15.3.	The commenting authors question what additional cleanups can be employed as the cleanups listed in this document are already required. Any additional optional cleanups should be called out in the draft method as commercial laboratory sample analysis will not likely engage in an ongoing research project. The commenting authors also noted that an EIS can be out of limits such that that failure will not impact sample results as the EIS is quantitated with the NIS, most of which do not co-elute with the EIS (so will have different potential for interference between the NIS and EIS). Instead of relying on EIS recoveries based on NIS results, Draft US EPA Method 1633 should include a limit on the EIS peak area of 50% to 150% of the average of the initial calibration EIS responses, not based on NIS results as used in US EPA Method 533 and DoD QSM 5.3 (to be adjusted for dilution factor if dilution is performed, or alternatively quantitate EIS by external calibration). Please refer to Table 1 Attachment 1 for additional discussion on this issue. At least for non-NPDES work, the US EPA should also consider changing the corrective action to repeating the analysis and/or re-extraction (with a smaller volume if applicable due to high concentration of the associated PFAS or if there is evidence that chromatographic interference is present for the impacted EIS). If a matrix effect is confirmed, then the laboratory can report the data with an appropriate qualifier.

Table 1 Environmental Standards, Inc. Detailed Comments based on Review of Draft Method 1633

Section Number	Sentence/Item	Assessment/Comment
9.4.1	After the analysis of 30 samples of a given matrix type (water, soil, biosolids, tissues, etc.) for which the isotopically labeled compounds pass the tests in Section 9.3, compute the R and the standard deviation of the percent recovery (SR) for the isotopically labeled compounds only.	It is not clear to the commenting authors the intent of the requirement to utilize only the recoveries for the isotopically labeled compounds that pass the requirements; this seems unacceptable. Instead, the laboratory should be required to utilize all recoveries, pass or not, to obtain a realistic understanding of the laboratory performance. The requirement to utilize only the recoveries for the isotopically labeled compounds that pass the requirements in Section 9.3 (including recovery criteria on Tables 9 and 10) will result in the laboratory mis-representing their performance and likely result in additional qualified data being reported, due to unreasonably (and unrealistically) tight statistical limits. The commenting authors believe it would be appropriate to provide reasonable windows such that the determined limits cannot be wider than and use all recoveries (and standard deviations) measured by the laboratory in the draft method.
9.4.2	Update the accuracy assessment for each isotopically labeled compound in each matrix on a regular basis (e.g., after each five to ten new measurements).	The commenting authors believe that the frequency of "five to ten new measurements" for updating the accuracy assessment limits will be an undue burden on the commercial laboratory community and will result in notably variable limits being reported by the laboratory for the recoveries. This will likely cause issues with attempting to ascertain a consistent evaluation of data quality. Specifically, the limits may potentially change too frequently (albeit slightly) and be difficult for the laboratory to track appropriately and react in the event of failures.
10.1 and 10.1.5.2	This mass calibration must be performed at least annually to maintain instrument sensitivity and stability. Check the mass calibration by measuring the amount of peak drift from the exacted masses. If the peak apex has shifted more than approximately 0.1 Da. Then the instrument will need to be recalibrated following the manufacturers' instructions.	It is unclear to the commenting authors if the intent of these requirements is the same; to perform mass calibration or to *check* mass calibration at least annually. Nonetheless, the recommended frequency of checking the mass calibration should be included in Section 10.1.5.2 in draft method.
10.1.1	During the development of this method, instrumental parameters were optimized for the precursor and product ions listed on Table 2. Product ions other than those listed may be selected; however, the use of ions with lower mass or common ions that may not provide sufficient discrimination between analytes of interest and co-eluting interferences must be avoided.	The commenting authors question if all branched isomers (for analytes with quantitative or qualitative branched isomer standards) were considered with regard to the product ions selected. Some of the product ions listed have been shown not to be present (or to have a very low response) for some branched isomers due to the differences in structural properties relative to the linear isomer. If all branched isomers were not considered the document should acknowledge and/or address this issue.
10.1.4.2	Scan the MS/MS over the mass range from 20 to 3000 atomic mass units (amu) (or Daltons [DA]).	The commenting authors suggest that "scan the MS/MS" be replaced with "scan the MS" since MS/MS suggests performing an actual tandem MS analysis.
10.1.4.3	If peaks in this range are missing or not correctly identified, adjust the MS/MS, and repeat the test. Only after the MS/MS is properly calibrated may standards, blanks, and samples be analyzed.	The commenting authors suggest that the references to "MS/MS" be replaced with "MS" for the same reason as the comment for Section 10.1.4.2.
10.2.1	The chromatographic conditions should be optimized for compound separation and sensitivity.	The commenting authors believe the document needs to address linear and branched isomer chromatographic resolution. At a minimum the pending draft method should provide a chromatographic separation requirement such as 50% separation between PFOS monomethyl and linear isomer peaks (see comment on Section 10.2.2.3).
10.2.2	Retention time calibration	The commenting authors recommend the use of relative retention time (RRT) relative to the EIS (and to the NIS for the EIS) rather than solely retention time (RT). RT can be acceptably used for NIS calibration.

Table 1 Environmental Standards, Inc. Detailed Comments based on Review of Draft Method 1633

Section Number	Sentence/Item	Assessment/Comment
10.2.2.3	All branched isomer peaks identified in either the calibration standard or the qualitative (technical grade) standard must fall within in the retention time window for that analyte.	The commenting authors note that the document does not include any chromatographic separation criteria with regard to branched and linear isomer peaks. Requirements for chromatographic resolution and separation are highly recommended for greater comparability of data (*e.g.,* parties taking split samples) amongst commercial laboratories. See comment for Section 10.2.1 For example, for analytes that currently only have linear isomer standards available, the commenting authors have noted poor comparability between laboratories where one laboratory observes little to no separation between the branched and linear isomers for the known standards (*e.g.*, PFOS) and the other laboratory has good separation (*e.g.*, poor comparability has been observed between laboratories for PFHpA when one laboratory observed only one peak for branched and linear PFOS and another laboratory observed multiple peaks. For the laboratory with multiple PFOS peaks, a large, non-integrated peak was observed before the linear PFHpA peak that was not observed for the laboratory that did not observe multiple peaks for PFOS). Until branched isomer standards become available for every target PFAS, this type of discrepancy will be observed between laboratories achieving different levels (or little to no) of isomer separation.
10.2.2.3	All branched isomer peaks identified in either the calibration standard or the qualitative (technical grade) standard must fall within in the retention time window for that analyte.	It is not specifically stated whether the RT window for branched isomer peaks is also to be within 0.4 minutes of the predicted time for the analyte. Maintaining the requirement of a 0.4-minute RT limit (or similar limit) is recommended. In any event, the limit should be specified in Section 10.2.2.3.
10.2.2.4 and 14.4.1 (and similar in 15.1.2)	For all method analytes with exact corresponding isotopically labeled analogs, method analytes must elute within 0.1 minutes of the associated EIS.	This RT window seems very wide for linear isomers by isotope dilution. The commenting authors suggest using one window for branched isomers and a tighter window for the peak containing the linear isomer (a window more comparable to that in US EPA Method 1613 or US EPA Method 1668C) and using the RRT criteria. Also, a similar RRT window should be required for analytes by non-isotope dilution EIS and for the EIS relative to the NIS.
10.3	Initial calibration is performed using a series of at least six solutions, with at least five of the six calibration standards being within the quantification.	It appears that this sentence missing a word at the end (*e.g.*, quantification range). The calibration should also include the requirement that the lowest standard is at or below the LOQ as stated in Section 7.3.4.
10.3	Calibration is verified with a calibration verification (CV) standard at least once every ten field samples or less, by analysis of a mid-level calibration solution.	It is recommended to strike "or less," as it is redundant to "at least," and could be misinterpreted to mean that the CV frequency is less than 1 per 10 field samples.
10.3	Calibration is verified with a calibration verification (CV) standard at least once every ten field samples or less, by analysis of a mid-level calibration solution.	The commenting authors suggest “every ten field samples” be replaced with every ten injections, the point being QC samples and other checks should be included in the 1:10 CV count.
10.3.1	Each LC-MS/MS system must be calibrated whenever the laboratory takes corrective action that might change or affect the initial calibration criteria, or if either the CV or Instrument Sensitivity Check (ISC) acceptance criteria have not been met.	The commenting authors suggest that the word "corrective" be stricken because the laboratory could make changes that affect instrument performance that are preventive rather than corrective or may make such changes as a matter of routine maintenance.

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Section Number	Sentence/Item	Assessment/Comment
10.3.3.1 (similar in 7.3.4 and 14.2)	Sufficient instrument sensitivity is established if a signal-to-noise ratio ≥ 3:1 can be achieved when analyzing the lowest concentration standard within the quantitation range that the laboratory includes in its assessment of calibration linearity (Table 4).	Is this signal-to-noise criteria required for both quantitative and confirmation ion transitions? The document does not indicate whether the signal-to-noise ratio is applied to all ions monitored or just the quantitation ions. It is the commenting authors' opinion that there should be separate criteria for quantitative ion transition *vs.* confirmation ion transition, especially given some of the typical ion ratios given on Table 2 (*e.g.*, PFOSA with a typical ratio of 47). For quantitation, the signal-to-noise ratio should be at least ≥ 10:1 such that instrument noise has < 10% impact on integration. In fact, it is ideal if the signal-to-noise ratio criteria be even higher given that calibration standards are not extracted, while samples associated with the calibration are extracted and are likely to have extraction loss and therefore, have a lower response at a similar concentration to the lowest quantitative calibration standard. The commenting authors also note that there needs to be signal-to-noise criteria for EIS and NIS in calibration standards that are high enough to have allowance for extraction loss (taking into account the lowest %R limit on Table 9), allowable dilution (up to 10×), and instrument sensitivity as reflected by NIS response (as low as 50% per Section 14.9).
10.3.3.2 Note	Other calculation approaches may be used, such as linear regression or non-linear regression based on the capability of the data system used by the laboratory.	The document does not include guidance for the calibration regressions that can be utilized. The commenting authors suggest that the document be updated and include guidance for the calibration regressions in order to foster consistency in the data generated between commercial laboratories.
10.3.3.2 Note	Other calculation approaches may be used, such as linear regression or non-linear regression based on the capability of the data system used by the laboratory.	Many commercial laboratories force linear and/or non-linear regression curves through zero as per the US EPA drinking water methods for PFAS (*i.e.*, US EPA Methods 537, 537.1, and 533). Please clarify in the draft method whether calibration curves being forced through zero will be acceptable.
10.3.3.3	Instrument Linearity	The commenting authors suggest including the criteria of 70-130% for each individual analyte in each individual standard when refitting each analyte into the calibration model. The approaches listed in the document can still result in poor accuracy at individual concentration levels.
10.3.3.3	"Option 1: Calculate the relative standard deviation (RSD)…"	The equation to be utilized for the generation of the RSD was not included in the document. All equations to be utilized should be provided in the document. The document specifies six initial calibration standards; however, additional standards may be run as presented in Section 10.3 Note. In the commenting authors' opinion, the text should be updated to say, "Calculate the relative standard deviation (RSD) of the RR or RF values for each native compound and isotopically labeled compound utilizing all initial calibration standards analyzed."
10.3.3.3	"Option 2: Calculate the relative standard error (RSE) of the six initial calibration standards for each native compound and isotopically labeled compound. The RSE for all method analytes must be ≤ 20% to establish instrument linearity."	The equation to be utilized for the generation of the RSE was not included in the document. All equations to be utilized should be provided in the document. The document specifies six initial calibration standards; however, additional standards may be run as presented in Section 10.3 Note. In the commenting authors' opinion, the text should be updated to say, "Calculate the relative standard error (RSE) for each native compound and isotopically labeled compound utilizing all initial calibration standards analyzed."
10.3.4	If the instrument sensitivity or the instrument linearity criteria for initial calibration are not met, inspect the system for problems and take corrective actions to achieve the criteria.	The commenting authors recommend the passage be revised to state, "After corrective action the entire initial calibration must be reanalyzed."

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Section Number	Sentence/Item	Assessment/Comment
11.0	For aqueous samples that contain particles and solid samples, percent solids are determined using the procedures in Section 11.1.	As written, the assumption appears to be that the particles in the aqueous samples are the intended matrix for analysis and not the aqueous phase of the sample. As written, the sample owner/investigator will likely not be consulted to allow for a resampling if the actual target matrix of the project was the aqueous phase (or the separation and extraction/analysis as two samples). The commenting authors suggest that the document be revised to include consideration of project goals and sample owner/investigator consultation prior to proceeding.
11.0	This section describes the sample preparation procedures for aqueous samples with < 50 mg solids (Section 11.2), solid (soil, sediment or biosolid) samples (Section 11.3) and tissue samples (Section 11.4).	The commenting authors recommend the phrase, "in the volume to be extracted" after "< 50 mg" be added to the document.
11.0 Note	It is highly recommended that the laboratory pre-screens all samples prior to performing the analysis (see Appendix A). For aqueous samples, use the secondary container provided for percent solids to perform the pre-screening. If high levels of PFAS are present in the sample, a lower volume is required for analysis.	If pre-screening is to be used, additional guidance is needed regarding the targeted sample volume to be used based on screening results. For example, while individual analytes may be at high concentrations, it is not likely that all target PFAS would be at high concentrations; the volume targeted should allow for some analytes to be reported from an undiluted analysis and the highest target analytes to be quantitated from a secondary extract dilution. The targeted sample volumes based on only the highest target PFAS, will result in higher reported MLs for the other PFAS, which may not be sufficient for demonstrating compliance.
11.0 Note	The laboratory may subsample the aqueous samples as described in Appendix B; however, subsampling must meet project-specific requirements.	Appendix B limits subsampling to 60 mL or less, which may not meet project requirements. There should be additional flexibility allowed (*i.e.*, use of alternative volumes) when the draft method is published. Additionally, if samples require freezing per Section 8.2.3, additional text should be added that specify that samples need to be thawed prior to subsampling per Appendix B.
11.0 Note	The laboratory must notify the client before proceeding with subsampling.	As a commentary and suggested alternate/additional language is not offered, many clients will not likely have the knowledge to determine what to do if the laboratory notifies them regarding the need for subsampling. See Comments on Section 8.2.1 Note.
11.0 Note	Once the laboratory becomes familiar with the levels of PFAS in the samples for their clients, the samples should be collected in the appropriate sample container size to avoid subsampling.	As a commentary and suggested alternate/additional language, this could potentially mean that different sized containers are used at different locations within the same site, with a need for close tracking between the laboratory personnel and field collection personnel. This might not be practical for large site investigations but may be more practical in the case of NPDES permits. See Comments on Section 8.2.1 Note.
11.1	Determination of percent solids	This measures the concentration of suspended solids in 10 mL of sample. The draft method needs to describe how the 10 mL sample result will be used to determine the total suspended solids in a sample prior to preparation as the sample volume will only be measured once the extraction has started. Specifically, the commenting authors question if the calculation will be performed using the nominal sample volume (*e.g.*, 500 mL such that this value will be multiplied by 50 to determine if the sample has > 50 mg suspended solids?)
11.1.1.1	"Determination of percent suspended solids…"	The document is not clear whether *all* aqueous samples must undergo this percent suspended solids evaluation or just samples that have visible suspended solids. If all aqueous samples are to undergo this process, there will be a negative impact on reporting data turnaround time and most likely increased costs.
11.1.1.1	"Determination of percent suspended solids…"	As mass difference determinations are required to be reported to three significant figures, it appears to the commenting authors that multiple heating/desiccating (to demonstrate constant mass measurements) may be appropriate.

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Section Number	Sentence/Item	Assessment/Comment
11.2	"Smaller sample volumes may be analyzed for samples containing solids greater than specified for this method…"	This statement does not match with Section 11.0. It is suggested that Section 11.0 be modified to allow the reduced sample volume in compliance with Appendix B.
11.2	This method is applicable to aqueous samples containing up to 50 mg of suspended solids per sample. The procedure requires the preparation of the entire sample. Smaller sample volumes may be analyzed for samples containing solids greater than specified for this method, or when unavoidable due to high level of PFAS; however, subsampling should be avoided whenever possible.	It is the commenting authors' understanding that this passage is intended for the field sampler to collect a smaller volume of sample if > 50 mg of suspended solids are present in the sample (with a typical volume of 500 mL per Section 8.2.1 translating to samples > 100 mg/L in suspended solids); however, the presence of this level of suspended solids may not be known during project planning stages and/or could be unexpected by the sample owner/investigator. In other words, the sample owner/investigator may not have the appropriately sized container or may not have the ability to judge the appropriately sized container. As such, it is likely that commercial laboratories may routinely receive samples (especially for wastewater) in excess of this 50 mg suspended solids decision point and they will need guidance on how to proceed, especially if sample recollection by the sample owner/investigator is not an option. The commenting authors suggest that the Agency consider including an option that allows the laboratory to centrifuge the sample, extract the aqueous and solid portions separately, and then combine the sample extracts prior to analysis. This procedure should include the following guidance: • The sample should be centrifuged, and the aqueous and solid portions separated after addition of the EIS solution and the pH adjustment of the aqueous sample, if needed (after the step in Section 11.2.5). • The QC samples (method blank and OPRs) should be made to be representative of these types of samples and taken through all the steps with the samples (including centrifuging and separation). • The sample bottle should be rinsed as part of the SPE and cleanup for the aqueous portion (as in Section 12.2.2). • The sample volume in its entirety should be determined using the procedure for aqueous samples (*i.e.*, the difference in bottle weight before and after extraction). • As the solid sample extraction will not require a weight determination or the addition of additional EIS, the solid sample extraction will begin with the step in Section 11.3.4. • Aqueous sample extraction will proceed through 12.2.3 and solid sample extraction through 12.3.3. At this point, the extracts will be combined and concentrated (per the note at the beginning of Section 12.2).
11.2	Typical sample size is 500 mL; however, sample size may be up to 1000 mL. The sample is to be analyzed in its entirety and should not be filtered. Leachate samples are analyzed using a 100-mL sample volume. Therefore, they must not be included in the same sample preparation batch as aqueous samples analyzed which are analyzed using 500-mL sample volumes.	The commenting authors interpret this section to indicate that 100-mL leachate samples must not be included in the same preparation batch as 500-mL aqueous samples solely due to the difference in sample volume. Intuitively, there may be other reasons for the laboratory to use different sample volumes. (*e.g.,* differences in PFAS levels, or solids content, and even the fact that up to a 1000-mL sample volume could be used). The commenting authors suggest that US EPA add further guidance on how much variation in sample volume within the same preparation batch is allowed given this statement.
11.2.3, 11.3.2, and 11.4.2 Note	If matrix spikes are required for a specific project, spike the field sample bottles designated for use as MS/MSD samples with native standard solution (Section 7.3.3) at a concentration 3 to 5 times the background concentration determined during screening of the unspiked sample.	MS/MSDs should not be optional given the number of analytes (16 of 40) that are not quantitated by isotope dilution and that without an MS/MSD (as the commenting authors noted previously), there are no other measures of laboratory precision required in the document as currently drafted.
11.2.3, 11.3.2, and 11.4.2 Note	If matrix spikes are required for a specific project, spike the field sample bottles designated for use as MS/MSD samples with native standard solution (Section 7.3.3) at a concentration 3 to 5 times the background concentration determined during screening of the unspiked sample.	The concentrations used for matrix spiking could vary greatly if spiking is based on 3 to 5 times the background concentrations which are determined during sample screening. The commenting authors question how it will be possible for laboratory recovery limits to be properly derived if the matrix spiking concentrations could vary widely?

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Section Number	Sentence/Item	Assessment/Comment
11.2.3	Spike one OPR sample with native standard solution (Section 7.3.3) at 2× the LOQ (LLOPR). This aliquot will serve to verify the LOQ.	The commenting authors maintain that spiking an OPR at 2× the LOQ does not verify the LOQ. It verifies 2× the LOQ. To verify the LOQ this spike must be performed at 1× the LOQ and meet the qualitative criteria.
11.2.5	Check that the pH is 6.5 ± 0.5.	The commenting authors recommend that the draft method specify that the pH should be checked by withdrawing a sample aliquot rather than inserting pH paper or an electrode directly into the sample to minimize the potential for sample contamination.
11.3	Remove rocks, invertebrates, and foreign objects.	Not to be trivial, but is it the intent that vertebrates be included in the extraction?
11.3 Note	Small amounts of reagent free water used for method blanks (10% of sample weight or less) can be added to unusually dry samples. This is an option, not a requirement.	If water is added to samples, an equivalent volume of water should also be added to the associated method blank. This text should be revised to be a requirement to correspond with Section 11.3.2.
11.3.1	Because biosolids samples are analyzed with a 0.5-g sample, they must not be included in the same sample preparation batch as solid samples analyzed with 5-g sample masses.	The commenting authors interpret this section to indicate that 0.5-g biosolids samples must not be included in the same preparation batch as 5-g sample masses solely due to the difference in sample volume. Intuitively, there may be other reasons for the laboratory to use different sample masses (*e.g.,* differences in expected PFAS levels). The commenting authors suggest that the US EPA add further guidance on how much variation in sample mass within the same preparation batch is allowed given this statement.
11.3.7 and 11.4.7	"...mix by occasional hand shaking for no more than five minutes…"	It appears to the commenting authors that these passages do not include a minimum shake time for the cleanup. It is suggested that the US EPA update the document to provide a time range, for the hand-shaking step of the cleanup.
11.3.10	Check the pH is 6.5+0.5 and adjust as necessary with 50% formic acid (Section 7.1.13.3) or 30% ammonium hydroxide (or with 5% formic acid [Section 7.1.13.3] and 3% aqueous ammonium hydroxide [Section 7.1.6.2].	It appears the section citation at the end of the sentence should be Section 7.1.6 as Section 7.1.6.2 is not included in the document.
11.4	The tissue sample processing section refers to dissection and grinding but does not reference maceration.	Maceration is a common tissue preparation technique, and it is suggested that the US EPA add reference to tissue maceration.
11.4	The tissue sample processing section makes no reference to homogenization blanks.	Introduction of method blanks only after homogenization, with no homogenization method blanks is insufficient to assess contamination that may occur during processing. The commenting authors recommend including the requirement to prepare homogenization method blanks with each batch of tissue samples prepared.
11.4.4	"...place tubes on a variable speed mixing table…"	The commenting authors noted that that this section does not provide a specification for the speed of the mixing table required for the sample extraction. The speed of the mixing table may impact the extraction efficiency and as such a speed range/criteria needs to be specified in the draft method.
12.0 Note	Carbon cleanup is required. Carbon cleanup may remove analytes if the sample has a very low organic carbon content (this is unusual for non-drinking water environmental samples). This will be apparent if the isotope dilution standard recoveries are significantly higher on the reanalysis. If the laboratory can demonstrate that the carbon cleanup is detrimental to the sample analysis (by comparing results when skipping the carbon cleanup during reanalysis), then the carbon cleanup may be skipped for that specific sample.	As noted by the commenting authors, carbon cleanup may actually be detrimental to some samples. In order to determine that carbon cleanup is not necessary for a single sample, the laboratory has to extract and analyze that sample both ways and compare the two analyses. This approach is not realistic for a large site investigation in a production laboratory setting. It also means that it is necessary to submit extra volume for aqueous analyses in addition to the volume needed for percent solids and the volume needed for pre-screening. The commenting authors suggest that additional guidance is needed in the draft method as the laboratory will likely not analyze that sample both ways (*viz.,* with and without carbon cleanup) and will end up reporting results that are negatively impacted by automatically defaulting to performing carbon cleanup.

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Section Number	Sentence/Item	Assessment/Comment
12.2, 12.3, and 12.4	"Extract Concentration"	As noted in Section 12.2, the only sample extract concentration that was included in the document occurs when two SPE cartridges are used for an aqueous sample extraction. The commenting authors suggest that the document be updated to include extract concentration utilizing low temperature (*e.g.*, 30°C) and low flow nitrogen (*e.g.*, 1 mL/min) to an extract volume of approximately 1 mL. In the commenting authors' opinion, the extract concentration will improve sensitivity and allow for reduced initial sample volumes.
12.2 Note	This concentration step is only applicable to situations where two SPE cartridges were eluted, each with 5 mL of elution solvent.	Concentration is only required for samples where two SPE cartridges are necessary when the first one clogs, which will not be for every sample in the batch. The commenting authors suggest that guidance on the QC for this step needs to be added as the method blank and OPRs will likely not undergo concentration. Specifically, it appears to the commenting authors that sample(s) that underwent concentration will not be represented by the batch QC which is a concern because losses can occur during concentration and not all PFAS analytes are quantitated by isotope dilution.
12.2.3 (similar in 11.3.7 and 11.4.7)	Hand-shake occasionally for no more than 5 minutes.	The commenting authors noted that that this section does not include a minimum shake time for the cleanup. The draft method should be updated to provide a time range for the hand-shaking step of the cleanup.
12.2.4, 12.3.3, and 12.4.3	Cap the collection tube containing the remaining extract and store at 0 - 4 °C.	As indicated previously and for consistency with other US EPA programs and the routine practice within commercial laboratories of storage temperatures being 0 – 6 °C, US EPA should consider specifying storage temperatures of 0 – 6 °C rather than 4 °C.
12.2.4, 12.3.3, and 12.4.3	Cap the collection tube containing the remaining extract and store at 0 - 4 °C.	Several places in the document state the requirement to keep samples protected from light. If the concern relates to photodegradation in samples the commenting authors note that polypropylene is not a UV absorber, and the same concern would exist for sample extracts.
13.1	Perform mass calibration (Section 10.1), establish the operating conditions (Section 10.2), and perform an initial calibration (Section 10.3) prior to analyzing samples.	Section 13.1 seems to imply that mass calibration must be run with each sequence of samples analyzed. Section 10.1 and Table 7 indicate that mass calibration must be performed at a minimum frequency of annually. The commenting authors suggest that the text be updated to "Perform mass calibration, establish the operating conditions, and perform an initial calibration (at the frequencies and requirements in Section 10.1, 10.2, and 10.3, respectively) prior to analyzing samples."
13.2	Only after all performance criteria are met may blanks, MDLs, IPRs/OPRs, and samples be analyzed.	The commenting authors question if the performance criteria being referenced here also relates to instrument analysis (*e.g.,* mass calibration and verification and initial calibration and verification.) It is noted that performance criteria for IPRs and MDLs (Section 9.2) will also have to be met prior to analysis of blanks, OPRs, and samples.
13.3 (items 10 and 13)	Samples (10 or fewer)	The document does not indicate specifically if dilutions, reanalyses, or QC samples would be counted as separate samples. As noted for Section 10.3, the commenting authors suggest "every ten field samples" be replaced with every ten injections, the point being QC samples and other checks should be included in the 1:10 CV count.
13.4 Note	If the analytes that exceed the calibration range in the original analysis are known to not be of concern for the specific project (e.g., are not listed in a discharge permit), then the laboratory may consult with the client regarding the possibility of reporting that sample from the undiluted analysis.	The commenting authors note that distinction should be made between analytes that are simply over the calibration range *vs.* those that saturate the detector. The US EPA should consider adding language regarding that distinction.

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Section Number	Sentence/Item	Assessment/Comment
14.2	The signal-to-noise ratio of the ISC standard (Section 7.3.4) must be greater than or equal to 3:1. If the requirements cannot be met, the problem must be corrected before analyses can proceed.	Please see the commenting authors comments on Section 10.3.3.1. This standard defines the lower end of the calibration range and should, therefore, be subject to a higher signal-to-noise criteria than that required for analyte identification in samples. The concentrations of the ISC are to set the LOQ. Specifically there should be a minimum of a 10:1 signal-to-noise ratio for standards at the LOQ. Highly inaccurate integrations can occur in the presence of chromatographic and non-chromatographic noise encountered in the analysis of investigative samples. The commenting authors believe that this approach can easily result in an overstatement of the quantitative robustness of the method for PFAS target analytes reported at the LOQ.
14.2	The signal-to-noise ratio of the ISC standard (Section 7.3.4) must be greater than or equal to 3:1. If the requirements cannot be met, the problem must be corrected before analyses can proceed.	It is not clear to the commenting authors if this signal-to-noise ratio criteria refers to both the quantitation and confirmation ion transitions. This ISC standard should also be required to meet the ion transition response ratio (see comments to Section 15.1.3).
14.2 Note	An interim limit of 70-130% for 90% of the native and isotopically labeled compounds should be used, with the other recoveries achieving 50-150%.	As this note is in the section for the Instrument sensitivity check, the commenting authors assume that these recovery limits apply to this standard; however, it is noted that recovery limits are not stated elsewhere in the method. Additionally, it seems appropriate that method required criteria should not be included as a narrative enhancement note, but instead be a citable section of the draft method. Finally, the commenting authors suggest the US EPA adopt the U.S. Department of Defense's (DoD's) requirement of 70-130%, without exception.
14.3.3	The recovery of native and isotopically labeled compounds for the CVs must be within 70 - 130%.	In the commenting authors' opinion, with a calibrated system under proper control, the recovery of native compounds quantitated by isotope dilution can easily meet a tighter criterion. Accordingly, it is recommended that a criterion of 80-120% be included in the draft method for native compounds quantitated by isotope dilution.
14.3.4	If the CV criterion in Section 14.3.3 is not met, recalibrate the LC-MS/MS instrument according to Section 10.3.	As the CV is required at the end of the sequence and samples will be bracketed by passing CVs, corrective action should be added that includes reanalysis of samples and batch QC associated with out-of-criteria sequence ending CVs. The commenting authors also suggest including exceptions being made for high CV recoveries associated with not-detected sample results.
14.3.4	If the CV criterion in Section 14.3.3 is not met, recalibrate the LC-MS/MS instrument according to Section 10.3.	The commenting authors routinely observe commercial laboratories attempting an additional (and even *more*) CV shot before recalibration occurs. The US EPA should consider including language in the draft method regarding circumstances that would allow a second CV shot confirming the recovery failure(s) before recalibrating the LC-MS/MS instrument according to Section 10.3.
14.4.1 and 15.1.2	For all method analytes with exact corresponding isotopically labeled analogs, method analytes must elute within ± 0.1 minutes of the associated EIS.	In the commenting authors' opinion, the requirement of ± 0.1 minutes or ± 6 seconds between the EIS and corresponding isotopically labeled analogs is excessive. US EPA Method 1613 Table 2 requires remarkably tighter RRTs between the native and labeled isomers. The US EPA should consider tightening the RT requirement (*e.g.*, ± 0.01 minutes) in the draft method.
14.4.2	The retention times of each native and isotopically labeled compound must be within ± 0.4 minutes of the ICAL or CV used to establish the RT windows for the samples and batch QC.	The commenting authors suggest that the US EPA consider the use of RRT criteria rather than absolute RT (with the exception of the NIS). In addition, the commenting authors suggest that the US EPA then center the RRT windows to the calibration verification RRTs using a tighter window appropriate for RRT.
14.5 (with 11.2.3, 11.3.2, and 11.4.2)	Ongoing precision and recovery (OPR)	The commenting authors question if this section is applicable to both traditional mid-level OPR and low-level OPR (LLOPR). In Sections 11.2.3, 11.3.2, and 11.4.2, it is noted that the LLOPR will serve to verify the LOQ whereas the mid-level OPR will serve as the traditional OPR. It is noted in this regard that separate criteria for the LLOPR is not provided in the document; therefore, it is assumed that it must meet the criteria listed in this section. Clarification on this point should be included in the draft method.

Table 1 Environmental Standards, Inc. Detailed Comments based on Review of Draft Method 1633

Section Number	Sentence/Item	Assessment/Comment
14.5.1	After verification, analyze the extract of the OPR (Sections 12.2.4, 12.3.3, and 12.4.3) prior to analysis of samples from the same batch to ensure the analytical process is under control.	The commenting authors note that the text in Section 14.5.1 does not correspond to the text in Section 13.3, which indicates that the qualitative identification standards, instrument blank, and method blank analyses occur between the verification standard and the OPR analysis. Clarification should be included in the draft method.
14.5.3	In this event, correct the problem, re-prepare, extract, and clean up the sample batch and repeat the ongoing precision and recovery test.	This text implies that the associated samples and method blank would not need to be prepared with the repeat extraction of the OPR. In the commenting authors' opinion, it is important that the samples and OPR standards are prepared during the same preparation event; therefore, it is recommended that the US EPA consider requiring the entire preparation batch be re-extracted in the event of an OPR failure.
14.5.4	If desired, add results that pass the specifications in Section 14.5.3 to initial and previous ongoing data for each compound in each matrix. Update QC charts to form a graphic representation of continued laboratory performance. Develop a statement of laboratory accuracy for each compound in each matrix type by calculating the average percent recovery (R) and the standard deviation of percent recovery (SR). Express the accuracy as a recovery interval from R - 2SR to R + 2SR. For example, if R = 95% and SR = 5%, the accuracy is 85 to 105%.	In the commenting authors' opinion, all results (including QC failures) should be used for determining variability of the method. Application of statistical outlier tests are the appropriate method for data exclusion; therefore, it is recommended that the US EPA consider striking the phrase "that pass the specifications in Section 14.5.3" and replacing with "for all results not excluded by statistical outlier tests (such as the generalized extreme studentized deviate test)" in the draft method.
14.6	Instrument blank – At the beginning of the analytical sequence and after the analysis of high concentration samples (e.g., highest calibration standard, CV), analyze an instrument blank to ensure no instrument contamination has occurred.	The commenting authors note that further acceptance criteria other than "to ensure no instrument contamination has occurred" is not provided in the document. Questions include is the instrument blank criteria the same as for the method blank? What is the corrective action if acceptance criteria are not meet? Clarification on the acceptance criteria of an "Instrument Blank" should be included in the draft method.
14.9	The QC and field sample NIS areas should be within 50 – 200% of that in the standards.	The commenting authors note that this section is an optional instrument sensitivity check; however, it is the only place that these criteria are listed for the NIS. Clarification should be included in the draft method such that Table 10 be referenced for the NIS criteria as presented in Section 9.3.3.
15.1	A native or isotopically labeled compound is identified in a standard, blank, sample, or QC sample when all of the criteria in Sections 15.1.1 through 15.1.5 are met.	There is no Section 15.1.5 in this document.
15.1.1	Peak responses must be at least three times the background noise level (S/N 3:1).	The commenting authors suggest that the draft method should specify whether this criterion apply only to the quantitation ion or also to confirmation ions. Specifically, if these criteria do not apply to confirmation ions, what signal-to-noise criteria/requirements apply to confirmation ions?
15.1.1	If the S/N ratio is not met due to high background noise, the laboratory must correct the issue (e.g., perform instrument troubleshooting to check and if needed, replace, the transfer line, column, detector, liner, filament, etc.). If the S/N ratio is not met but the background is low, then the analyte is to be considered a non-detect.	The commenting authors question what if a target analyte is determined to be above the MDL and/or LOQ but the signal-to-noise ratio criteria are not met? Background noise may relate to sample matrix and not transfer line, column, detector, liner, filament, *etc.* Clarification should be included in the draft method that addresses this conflict and how data should be reported.

Table 1 Environmental Standards, Inc. Detailed Comments based on Review of Draft Method 1633

Section Number	Sentence/Item	Assessment/Comment
15.1.3	For concentrations at or above the method LOQ, the total (branched and linear isomer) quantification ion response to the total (branched and linear isomer) confirmation ion response ratio must fall within ± 50% of the ratio observed in the mid-point initial calibration standard. If project-specific requirements involve reporting sample concentrations below the LOQ or ML, the response ratio must also fall within ± 50% of the ratio observed in the initial daily CV.	There are some analytes (*e.g.*, PFOSA) that have weak secondary ion transitions that may be lost or variable at lower concentrations (especially when considering additional reduced response due to allowable extraction loss, instrument sensitivity loss, dilution, and the possibility of reporting to the MDL). This possibility should be addressed in the document, especially if the quantitation ion transition quantitates above the LOQ, but the confirmation ion is not observed (or is too variable to meet criteria) due to sensitivity loss. Is the initial daily CV mentioned in this section referring to the Instrument Sensitivity Check (which is what would make sense based on the fact that it is referring to when low concentrations of analytes are reported)? Even when reporting only to the LOQ, all calibration, verification, and instrument sensitivity standards must meet the ratio requirement as they are all within the quantitative range. The commenting authors note that the text specifies a change in the reference standard when reporting lower concentrations from the initial calibration to the continuing verification standard for ion response ratio evaluation. It is suggested that the rationale behind this change, if intentional, should be provided in the draft method.
15.1.3	The response of all isomers in the quantitative standards should be used to define ratio.	The commenting authors question exactly which quantitative standards are to be used to define the ratio. There are several possibilities, including the average of the ratio in the initial calibration standards, the mid-point of the initial calibration or the daily calibration verification. Additionally, what if the ratio varies with concentration level in the initial calibration? Whichever standards are to be used, the procedure for defining this ratio need be to address in the draft method.
15.1.3	If standards (either quantitative or qualitative) are not available for purchase, only the linear isomer can be identified and quantitated in samples.	The commenting authors note that this passage assumes that no branched isomers co-elute with the linear isomer where only linear isomer standards are available. The US EPA should note that Wellington Certificates of Analysis for the quantitative and technical grade PFOS standards show that (on their system), the 1-methyl isomer co-elutes with the linear isomer, which could happen on other systems without a way to establish/demonstrate that branched isomers do not co-elute with linear isomers. In addition, the amount of separation between branched and linear isomers varies widely from laboratory to laboratory, as previously identified in the absence of chromatographic resolution criteria. In fact, in some cases, the commenting authors have reviewed data from accredited laboratories that have no apparent separation/resolution between branched and linear isomers (*e.g.*, only one peak is visible for the PFOS standard despite confirming that a mixed branched and linear isomer standard was used). Of primary concern is the fact that the document does not include any chromatographic resolution criteria that would ensure separation between branched and linear isomers. Where laboratories have little to no separation between branched and linear isomers for the known standards, there will also be little to no separation for the analytes without mixed branched/linear isomer standards. By default, these laboratories will potentially be reporting a mix of branched and linear isomers for all analytes. The lack of chromatographic separation requirements in this document will continue to result in significant variation from laboratory to laboratory in cases where branched isomers are present in a sample for an analyte that does not have a branched isomer standard. The commenting authors recommend that the US EPA revise this statement to state, "If standards (either quantitative or qualitative) are not available for purchase, only the peak containing the linear isomer can be identified as the analyte and quantitated in samples" in the draft method. In addition, and as a recommendation, resolution criteria should be added to the draft method for the known branched/linear standards so that there is better comparability amongst laboratories for the analytes where only the linear isomer standard is currently available.
15.1.3	The ratio requirement does not apply for PFBA, PFPeA, NMeFOSE, NEtFOSE, PFMPA, and PFMBA because suitable (not detectable or inadequate S/N) secondary transitions are unavailable.	There are other analytes (*e.g.*, PFOSA) that may have a weak secondary ion transition that is lost or variable at low concentrations/response.

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Section Number	Sentence/Item	Assessment/Comment
15.1.4	If the field sample result does not all meet the criteria stated in Sections 15.1.2 through 15.1.3, and all sample preparation avenues (e.g., extract cleanup, sample dilution, etc.) have been exhausted, the result may only be reported with a data qualifier alerting the data user hat the result could not be confirmed because it did not meet the method-required criteria and therefore should be considered an estimated value. If the criteria listed above are not met for the standards, the laboratory must stop analysis of samples and correct the issue.	For sample results associated with an out-of-criteria ion transition ratio, the commenting authors suggest that the DoD requirements be adopted and included in the draft method. Specifically, laboratories should repeat the analysis using a fresh aliquot of the extract and, if the ratio confirms the initial analysis, report with an I-flag (or other flag to acknowledge that the value is an estimate) rather than to exhaust all sample preparation avenues. As acknowledged by DoD in Section 4.1 of "Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by QSM Table B-15", ion ratio failures could be caused by matrix interference and/or be the result of the presence of isomers in the sample at different ratios than the ratio of isomers present in the calibration standards. In the case of the latter, there is no amount of extract cleanup, sample dilution, *etc*. that will change the ratio because it is related to the difference of the isomer composition in the calibration standards as compared to the samples. The mixture of isomers in the calibration standards are not going to be representative of all samples. This is a limitation of the document (see comments on Section 1.2), and sample results should be reported as estimated values when the ratios are out-of-criteria and there is no obvious matrix interference.
15.2 Note	For better accuracy, PFTrDA is quantitated using the average of the areas of labeled compounds $^{13}C_2$-PFTeDA and $^{13}C_2$-PFDoA.	The commenting authors question how much, if any, does using the average of the areas improve accuracy and if this is even necessary. For PFTrDA quantitation, what is the corrective action if one EIS meets criteria but the other doesn't? Is the corrective action only taken if the average is out of criteria? Revision or clarification that addresses this issue should be included in the draft method.
15.3.1	If the Q1 area for any compound exceeds the calibration range of the system, dilute a subsample of the sample extract with 0.1% acetic acid (Section 7.1.2) by a factor no greater than 10x adjust the amount of the NIS in the diluted extract, then analyze the diluted extract using the percent recovery of the EIS from the original analysis.	The commenting authors suggest a greater concentration of the EIS be used in order to allow for a greater dilution factor than 10×. Even at a 10× dilution factor, some of the EIS (*e.g.*, $^{13}C_9$-PFNA and those spiked similarly) will be below the LOQ standard for the corresponding target analyte. The current EIS spike concentration used by many commercial laboratories allows up to a 100× dilution of the extract (which allows for less re-extraction using smaller sample volumes). The commenting authors also suggest a minimum signal-to-noise criterion for the EIS in samples to be considered quantitative (suggest 10:1 at minimum). The US EPA should consider these suggested revisions in the draft method.
15.3.1	If the compound cannot be measured reliably by isotope dilution, dilute, and analyze aqueous sample, or analyze a smaller aliquot of soil, biosolid, sediment, or tissue sample.	The commenting authors request that this statement be clarified. In particular, does "dilute and analyze aqueous sample" indicate dilution of the sample or the extract? If it means to dilute and re-extract the sample, this will not remedy the situation unless a smaller sample volume is used (Appendix B could be referenced). Also, there is a possibility that a smaller sample volume was submitted that could be used in its entirety, instead of diluting the sample. Analyze (in this case inclusive of extraction as a re-extraction) is necessary to use a smaller sample volume; therefore, the US EPA should revise the requirement to indicate re-extraction and analysis in the draft method. In addition, it is suggested that the draft method be revised to allow dilutions to be extended beyond 10×. It should also be noted that re-extraction is an added time/cost to the laboratory community that most commercial laboratories will not anticipate when a QC failure is not involved.
15.3.2	If the recovery of any isotopically labeled compound in the diluted sample is outside of the normal range, the method does not apply to the sample being analyzed and the result may not be reported or used for permitting or regulatory compliance purposes. In this case, an alternative column could be employed to resolve the interference. If all cleanup procedures in this method and an alternative column have been employed and isotopically labeled compound recovery remains outside of the normal range, extraction and/or cleanup procedures that are beyond this scope of this method will be required to analyze the sample.	In the commenting author's opinion, some of these suggested procedures (alternate column or cleanups beyond those included in the document) do not seem realistic in a commercial production laboratory setting – analysis of the majority of samples cannot become a research project. In many cases, most laboratories will merely report PFAS data with a qualifier.

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Section Number	Sentence/Item	Assessment/Comment
15.4	The data reporting practices described here are focused on NPDES monitoring needs and may not be relevant to other uses of the method.	In the commenting authors' opinion other requirements, beyond Section 15.4, may be geared toward NPDES permits, as results associated with QC failures cannot be used to demonstrate regulatory compliance. The data reporting practices, and corrective actions and those requirements listed throughout this document should be reviewed by the US EPA and expanded to address all matrices and reporting anticipated in the draft method. For example, see comments on Sections 8.2.1 Note, 9.3.3, 11.0 Note, 12.0 Note, 15.1.1, 15.1.4, and 15.3.2.
15.4.2.1	Report a result for each analyte in each field sample or QC standard at or above the ML to 3 significant figures.	This text indicates that the reporting for the method blank (Section 15.4.2.2) is different from the reporting of sample results which, in the commenting authors' opinion, will result in data evaluation difficulties that may end up with more sample results being qualified due to method blank results.
15.4.2.2	Report a result for each analyte in a blank at or above the MDL to 2 significant figures.	This text indicates that the reporting for the method blank is different from the reporting of sample results (Section 15.4.2.1) which, in the commenting authors' opinion, will result in data evaluation difficulties that may end up with more sample results being qualified due to method blank results.
15.4.2.4	Report recoveries of all associated EIS compounds for all field samples and QC standards.	The commenting authors request that the US EPA clarify if this is required for all analyses of samples and QC standards, if sample results are reported from multiple analyses and/or dilution analyses in the draft method.
Table 1	CAS Number	The CAS Numbers reported in this table correspond to the CAS Numbers of the linear isomer despite the fact that, for some PFAS analytes, a concentration representative of a mix of branched and linear isomers may be reported. At a minimum, this should be acknowledged in the draft method where CAS Numbers are listed. Ideally, a different CAS Number would be used for PFAS analytes where a concentration of a mix of isomers are determined since, as more branched isomer standards become commercially available, there is no way to distinguish in a database where older results may have been reported with a linear isomer only *vs.* a mixture of isomers in later years (or other isomer mixes due to a change in laboratories). For example, this document (Section 7.3.5) states that qualitative standards with a mix of branched and linear isomers are now available for PFNA, PFOSA, NMeFOSA, NEtFOSA, NEtFOSE, and NMeFOSE, which have not typically been used in the past.
Table 2	Typical Ion Ratio	The commenting authors question why is "NA" reported for PFPeA when both a quantification and confirmation ion mass is listed. In Section 15.1.3, it is stated that the ratio requirement does not apply to PFPeA because suitable secondary transitions are unavailable. Perhaps, the confirmation ion mass should not be included on this table. In any event, clarification on the quantification and confirmation ion masses should be included for PFPeA in the draft method.
Table 2	Typical Ion Ratio	For analytes where a mix of branched and linear isomers is being reported, there should be a footnote with information regarding the isomer or isomer mixture for which that ratio represents.
Table 4	Extracted Internal Standard (EIS) Analytes	The commenting authors noted that the concentrations of EIS listed on this table appear to be equivalent to the EIS amounts (in ng) listed on Table 3 divided by 4 mL; however, for samples, 5 mL of elution solvent is used without concentration of the extract. Accordingly, it appears that the EIS concentration in the calibration standards should be equivalent to that in the sample extracts. Clarification on this issue should be included in the draft method.
Table 4	Non-extracted Internal Standard (NIS) Analytes	The commenting authors noted that the concentrations of NIS listed on this table appear to be equivalent to the NIS amounts (in ng) listed on Table 3 divided by 4 mL; however, for samples, 5 mL of elution solvent is used without concentration of the extract. Accordingly, it appears that the NIS concentration in the calibration standards should be equivalent to that in the sample extracts. Clarification on this issue should be included in the draft method.

Table 1 Environmental Standards, Inc. Detailed Comments based on Review of Draft Method 1633

Section Number	Sentence/Item	Assessment/Comment
Table 5 (as referenced in 9.2.1.3, 14.5.3, and 15.3.2)	Data for this table are derived from the single-laboratory validation study and are only provided as examples for this draft method. The data will be updated to reflect the interlaboratory study results in a subsequent revision. Therefore, these criteria will change after interlaboratory validation. Several sections of this method state that Table 5 criteria are required, this is standard language that will be applicable when the method is finalized.	While the commenting authors acknowledge that these limits are only examples, some of the example limits for the isotopically labeled compounds are very concerning to the commenting authors. Specifically, for tissue matrices, some of the lower limits are 0% because negative values were calculated. The lower limit cannot be 0% as this would mean that there is no internal standard response from which to calculate results. The commenting authors recommend to the US EPA that the lowest recovery limit should be 10%. There are also several cases where the upper control limit is well below 100% (< 35%), suggesting very poor extraction efficiency. The commenting authors noted several cases where the lower recovery limit is above 100% suggesting that the NIS match is not ideal. Correction/revision for these criteria should be considered in the draft method.
Table 7	Specification and Frequency	The commenting authors noted that the column with this header only provides frequency information.
Table 7	Sections 7.3.1, 9.4 -Extracted Internal Standard (EIS) Analytes	The commenting authors noted that the method reference should probably be Section 9.3 rather than 9.4.
Table 7	Calibration Verification - At the beginning and every 10 samples	The commenting authors noted that the Section 14.2 reference is not correct, it should be Section 14.3.
Table 7	Calibration Verification - At the beginning and every 10 samples	The commenting authors noted that the frequency should state that it is also required at the end of the analytical sequence as per Section 14.3.1
Table 7	Limit of Quantitation Verification (LLOPR) - Prior to analyzing samples	Based on Sections 11.2.3, 11.3.2, and 11.4.2, an LLOPR is prepared each time a method blank and mid-level OPR is prepared. The commenting authors noted that the frequency specified on this table is not consistent with that frequency requirement.
Table 8	Cross-reference of Abbreviations, Analyte Names, CAS Numbers for the Acid and Anion Forms of the Perfluoroalkyl carboxylates and Perfluoroalkyl sulfonates	The commenting authors noted that the PFAS analytes included on this table do not encompass all of the PFAS analytes included in the document. Table 8 should be updated to include all analytes in the draft method.
Appendix A	Sample Pre-screening Instructions	The commenting authors recommend that screening results be a required deliverable with the sample owner/investigator data reports in the draft method.
Appendix B	Aqueous Sample Subsampling Instructions	The commenting authors suggest that the draft method include a recommendation for the laboratory to document in the laboratory Case Narrative whenever a sample is subsampled.
Appendix B	Because some target analytes may be stratified within the sample (e.g., AFFF-contaminated media, surfactants), or adhere to the walls of the sample container, subsampling may only be done on a project-specific basis.	The commenting authors noted that the subsampling procedure does not address rinsing the sample container. The commenting authors recommend that the draft method indicate that the remaining sample be disposed of, or transferred to a second container, and the initial sample container be rinsed as part of the sample preparation as conservative approach to gather any PFAS analyte that may have adhered to the container.

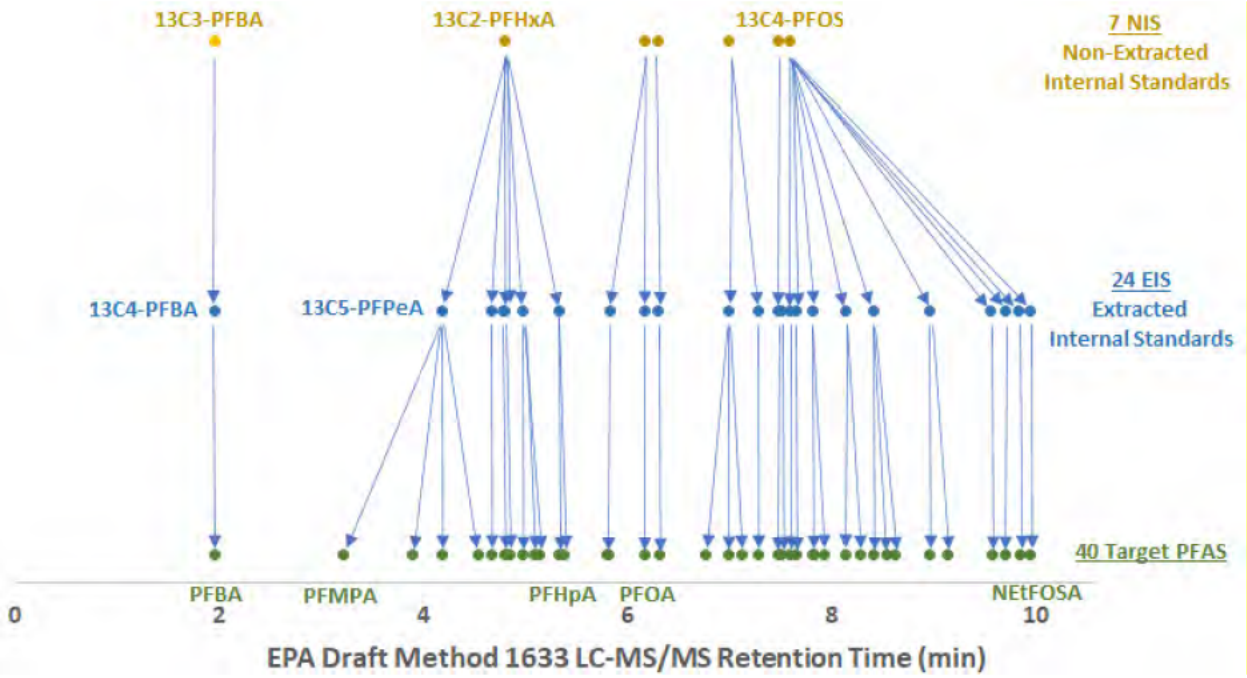
ATTACHMENT 1 OF TABLE 1

Table 1 Environmental Standards, Inc. Detailed Comments based on Review of Draft Method 1633

Attachment 1: Additional Information for Comment on Section 9.3.3

Section 9.3.3 of the draft document states, "The recovery of each isotopically labeled compound must be within the limits in Tables 9 and 10 (once the tables are finalized). If the recovery of any compound falls outside of these limits, method performance is unacceptable for that compound in that sample. Additional cleanup procedures must then be employed to attempt to bring the recovery within the normal range. If the recovery cannot be brought within the normal range after all cleanup procedures have been employed, water samples are diluted, and smaller amounts of soils, biosolids, sediments, and other matrices are prepared and analyzed, per Section 15.3." The commenting authors provide a broad comment relating to this requirement on Table 1. The following text provides additional detail to support the commentary on Table 1.

A potential problem occurs because there are so few non-extracted internal standards (NISs) relative to extracted internal standards (EISs) and target analytes. Seven NISs are used to monitor instrument effects as well as calculate recoveries for the 24 EISs. The 24 EISs are used to evaluate possible loss during sample preparation as well as calculate concentrations for the 40 targeted PFAS. The relationship between NISs, EISs, and unlabeled target analytes (PFAS) are shown in this figure:



When all three compounds (NIS/EIS/target PFAS) are essentially chemically identical (*e.g.*, $^{13}C_4$-PFOS, $^{13}C_8$-PFOS, and PFOS), there is a 1:1:1 relationship amongst the NIS, EIS, and target PFAS. In these cases, there will generally be no problem in identifying and understanding interference. For example, a low $^{13}C_4$-PFOS NIS response will notify the analyst that an interferant is present, and the suppression of the EIS $^{13}C_8$-PFOS will be compensated for by the suppression of the NIS and the suppression of the target analyte (PFOS in this example) will be compensated for by suppression of its corresponding EIS, $^{13}C_8$-PFOS. The impact of the interference on the quantitation of the EIS and target analyte would be negligible in this example (unless sensitivity becomes an issue). Or, when there is potential extraction loss, a low recovery will be observed for the EIS relative to the non-extracted NIS. The target

analyte should have the same extraction loss due to the chemical similarity and the quantitation should not be impacted (unless sensitivity is impacted).

However, there is not a 1:1:1 relationship amongst the NIS, EIS, and majority of the target analytes. This 1:1:1 relationship is only present in the method for seven target analytes. There is not a 1:1 relationship between NIS and EIS when there is still a 1:1 relationship between the EIS and 17 of the target PFAS. For these 17 analytes, there will be cases where interference for the NIS will result in an out-of-criteria EIS recovery even when there is no interference present for the EIS or target analyte. For the remaining 16 target analytes, there is not a 1:1 relationship between the NIS and EIS or the EIS and target analyte. For these 16 analytes, there will be times where there is interference present or extraction loss for the target analyte that cannot be identified if that same issue is not present for the NIS or EIS (other than through the possible use of matrix spike samples). Also, for these 16 analytes, there will be times when there is an interference present for the NIS or EIS (or extraction loss), but a similar effect is not present for the target analyte. Until such time additional labeled PFAS become available, these possibilities will exist.

Instead of relying on EIS recoveries based on NIS results, Draft US EPA Method 1633 should include a limit on the EIS peak area of 50% to 150%, not based on NIS results as used in US EPA Method 533 and DoD QSM 5.3 (to be adjusted for dilution factor if dilution is performed, or alternatively quantitate EIS by external calibration). This will improve evaluation of the 17 target analytes that are quantitated by isotope dilution but there is not a 1:1 relationship between the EIS and NIS. It will also simplify the evaluation of the 16 target analytes that are not quantitated by isotope dilution by removing a 3rd, non-chemically similar analyte from the evaluation (*i.e.*, the NIS). It would still be advantageous to include NIS to monitor for instrumental impacts since they would not be influenced by potential extraction loss; however, these compounds would now be instrument performance checks (IPCs) as opposed to NIS.

As an example, for the 17 PFAS that do not have a chemically similar NIS, while there is a 1:1 relationship between the EIS D_5-NEtFOSA and the target analyte NeEtFOSA, there is not also a 1:1 relationship between the EIS D_5-NEtFOSA and its associated NIS, $^{13}C_4$-PFOS. Suppression of the NIS $^{13}C_4$-PFOS (which often happens when there is a high concentration of PFOS) may not correspond with suppression of the EIS D_5-NEtFOSA or target NEtFOSA, as they do not closely elute to NIS $^{13}C_4$-PFOS. When there is suppression of the NIS without suppression of the EIS, there will be a high recovery for EIS, D_5-NEtFOSA in this example. The method indicates that the high EIS recovery means that the method performance is unacceptable for NEtFOSA and then guides the laboratory to perform additional cleanup procedures or re-extract the sample with a smaller volume for NEtFOSA. However, there very easily could have been no actual interference present for the EIS D_5-NEtFOSA or the target PFAS NEtFOSA. While the suppression of the NIS impacted the EIS quantitation, the impact of the interference on the quantitation of the target analyte would have still been negligible (or even non-existent). While dilution (via the use of a smaller sample volume) may improve the EIS D_5-NEtFOSA recovery by decreasing the concentration of the interference that was suppressing the NIS, it could not improve an EIS or target analyte response that did not undergo the same suppression to begin with. Dilution in this example case will likely introduce more error and may result in over-dilution of the target analyte.

Some of the potential scenarios for when the 1:1:1 relationship amongst the NIS/EIS/target PFAS analyte is not present are:

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Attachment 1: Additional Information for Comment on Section 9.3.3

A. No interferant present or no extraction loss. NIS, EIS, and target PFAS analyte are not suppressed, resulting in good recoveries and target analyte quantitation.

B. Interferant present (or there is extraction loss). NIS, EIS, and target PFAS analytes all elute close to each other and are chemically similar. NIS is not suppressed, EIS is suppressed (or has extraction loss), and target PFAS analyte is suppressed (or has extraction loss). Low recoveries for the EIS notify the analyst that there is a potential issue, but suppression/loss of the target PFAS analyte will be compensated for by suppression/loss of its corresponding EIS (if not to the point that there is a sensitivity issue). Unless there is a sensitivity issue, excessive cleanups and/or re-extraction with a lower sample volume will likely not change the target PFAS quantitation.

C. Interferant present. NIS, EIS, and target PFAS analytes all elute close to each other. NIS, EIS, and target PFAS analyte are all suppressed. While there is a low response for the NIS, there will be an acceptable EIS recovery (as it is compensated by the NIS suppression) and suppression of the target PFAS analyte will be compensated for by suppression of its corresponding EIS (if there is not a sensitivity issue). Additional cleanup or re-extraction would not be required by the method in this case. Even if not used for quantitation of the EIS, NIS could still be used to monitor for this type of scenario.

D. Interferant present. NIS, EIS, and target PFAS analytes do not elute close to each other (as they are not chemically similar). NIS is not suppressed, EIS is suppressed, target PFAS analyte is NOT suppressed because it does not elute near the NIS or EIS. The EIS recovery will be flagged as having a low recovery, and a low bias may be assumed. Due to suppression of the EIS without suppression of the target PFAS, any positive result for the target PFAS result will actually be biased high (with no impact on non-detected results even though the EIS recovery is low). Because the EIS areas are directly used to calculate concentrations for the associated target PFAS analytes (in the denominator), any decrease in the EIS areas will result in a corresponding increase in the target PFAS analyte concentration when it is not equally suppressed. In this case, following the method guidance to remove interference through additional cleanup, or re-extract using a lower sample volume to possibly minimize the interference or improve extraction efficiency would likely improve quantitation.

E. Interferant present. NIS, EIS, and target PFAS analytes do not elute close to each other (as they are not chemically similar). NIS is suppressed, but EIS and target PFAS analyte are not suppressed. A high out-of-criteria recovery will be reported for the EIS (as the NIS is in the denominator in the calculation). The EIS is not evaluated based on its own response, and unnecessary corrective action (*e.g.,* re-extraction with a smaller sample volume) is taken resulting in raised detection limits. The raised detection limits may be higher than the concentration of the target analyte present in the sample resulting in a “not-detect” that would have been reported as a detection using the original detection limits. This is the example given above for NEtFOSA. By evaluating the EIS based on response rather than recovery relative to an NIS, the unnecessary corrective action could be avoided.

F. Interferant present. NIS, EIS, and target PFAS analytes do not elute close to each other (as they are not chemically similar). NIS is not suppressed, EIS is not suppressed, target PFAS analyte is suppressed but this is not observed because it does not elute near the NIS or EIS. The analyst does not see an interferant because EIS recoveries are good, but true target PFAS analyte concentrations are greater than reported. A similar scenario could happen if there is

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extraction loss of the target PFAS without equivalent loss of the EIS, as it is not chemically similar. This is one of the worse-case scenarios as there is target PFAS loss that cannot be identified, and data will not be flagged because the NIS and EIS were acceptable. This scenario cannot be addressed until additional labeled EIS become available.

With the potential issues with the relationship between the NIS, EIS, and target compounds, the commenting authors suggest that the NIS be utilized to monitor instrument performance only (as an IPC) and not utilized for quantitation of the EIS. The commenting authors suggest instead of relying on EIS recoveries based on NIS results, Draft US EPA Method 1633 should include a limit on the EIS peak area of 50% to 150% compared to the average of the initial calibration EIS responses.

Public Comments on a permanent rule Board Order WY-23-19 to revise chapters NR 102, 105, 106 and 219, relating to adding narrative surface water criteria with numeric thresholds for certain PFAS

(Speakers were limited to 3 minutes)

Testimony by Laura Olah, Executive Director
Citizens for Safe Water Around Badger (CSWAB), Merrimac WI
on December 10, 2021

My name is Laura Olah and I live in Merrimac WI in rural Sauk County, and I am here today on behalf of Citizens for Safe Water Around Badger.

I am one of those lucky people who live near the Lower Wisconsin Riverway and have the privilege of observing a wide variety of bird species like the American Bald Eagle – in fact eagles are a big deal where I live. We have Eagle watching days and people come from all over to see them in the wild. In the dead of winter, when the rest of the river is frozen over, they rely on the open water at the outfall of the Prairie du Sac dam – it makes for easy fishing. And in the evening, the eagles fly away at dusk to roost along the riverway. A growing number having established substantial perennial nests, raising young that also rely on fish from the river.

In addition to eagles, we have many other bird species here that rely on fish as their principal food source. We also have osprey, blue herons, and cormorants.

Other bird species like swallows are at risk from exposure to PFAS but in a different way. Instead of fish, they rely on benthic invertebrates (which readily bioconcentrate PFAS) as their main food source. In fact, some of the scientific studies on this subject were conducted right here in Wisconsin and Minnesota.

In the Great Lakes region, elevated levels of PFAS have also been found in deer— in Michigan, leading to a Do Not Eat advisory for deer in at least one county.

For these reasons, one of the things that I was hoping to see, in addition to assessing risk to human health through consumption of fish, was an analysis that documents that the proposed surface water standards are also protective of other species.

Some of us are old enough to remember when eagles became endangered due to effects of another group of persistent bioaccumulative toxins – PCBs.

As with other organic contaminants like PCBs, some PFAS chemicals can both be taken up at the base of food webs (like free-floating algae, or phyto-plankton), and increase in concentrations going up the food web to forage fish, predator fish, and fish-eating wildlife.

The potential impact of PFAS-contaminated military sites in Wisconsin alone is significant. These bases encompass more than 70,000 acres of land and threaten freshwater systems in major watersheds like the Kickapoo River, the Lower Wisconsin Riverway and the Yahara River.

I understand from speaking with WDNR staff that there were internal discussions about risks to birds and wildlife but this analysis was not included in the support documents.

While we support the proposed standards as a critical first step in protecting public health, we hope that this additional analysis will be conducted as soon as possible and made available for public review and incorporated in the decision-making process.

In nature, nothing exists alone. We are just one part of the circle.

References:

https://www.audubon.org/magazine/summer-2019/birds-are-living-proof-forever-chemicals-pollute

https://www.nwf.org/-/media/Documents/PDFs/NWF-Reports/2019/NWF-PFAS-Great-Lakes-Region.ashx?la=en&hash=1299665082D4DAEBC613AE6DBF845C31084BB839&_ga=2.235641412.457382037.1638914155-1451865719.1638914155

https://blog.nwf.org/2020/12/bipartisan-defense-bill-begins-to-address-toxic-pfas-chemicals/

December 15th, 2021

Re: Comments on the proposed rule Board Order WY-23-19 relating to adding narrative surface water criteria with numeric thresholds for poly- and perfluoroalkyl substances (PFAS), including perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA)

Clean Wisconsin is a non-profit environmental advocacy organization working on clean water, clean air, and clean energy issues. We were founded over fifty years ago and have over 20,000 members and supporters around the state. We employ scientists, policy experts, and attorneys to protect and improve Wisconsin's air and water resources.

We appreciate the opportunity to comment on the proposed rule to establish surface water standards for PFOS and PFOA.

Clean Wisconsin supports the proposed rule and thanks the Department of Natural Resources for taking this step towards protecting Wisconsin residents from harmful exposure to toxic PFAS chemicals. Scientific understanding of the health impacts of PFAS is continually evolving, but there is good evidence for PFAS exposure being related to a variety of problems including: thyroid disease, liver damage, kidney and testicular cancer, reduced response to vaccines, lower birth weights, delayed organ development, and increased cholesterol levels.

High levels of PFAS found in surface waters and fish tissue prompting several fish consumption advisories around the state demonstrate how this is a problem that needs to be addressed immediately. These proposed rules are a first step towards protecting the public from the harmful effects of these chemicals. As the Economic Impact Analysis indicates, the economic value of the public health benefits of promulgating these standards will likely far exceed the compliance costs.

1. Wisconsin will join neighboring states who have already established surface water standards for PFOA and PFOS to protect their residents.

Wisconsin will not be alone in establishing surface water protections for PFOA and PFOS. Michigan has established surface water standards for PFOA and PFOS, while Minnesota has established a site-specific PFOS surface water standard.

2. PFAS contamination disproportionately impacts low income and BIPOC communities.

The Union of Concerned Scientists published a report[1] finding that non-military PFAS contamination sites are more likely to be found closer to minority and low-income populations.

[1] Desikan, Anita, Jacob Carter, Shea Kinser, and Gretchen Goldman. 2019. Abandoned Science, Broken Promises: How the Trump Administration's Neglect of Science Is Leaving Marginalized Communities Further Behind.

For example, around the 23 sites examined in Michigan, 48% more minorities and 49% more low-income people lived within 5 miles of the PFAS contamination site than would be expected if the sites and populations were randomly distributed.

Specifically with respect to PFAS exposure from fish consumption, subsistence anglers—who are disproportionately non-white—are more likely to eat contaminated fish, and non-white anglers are significantly less likely to be aware of fish consumption advisories.[2]

3. The use of a 100% relative source contribution assumption is not conservative

The Department chose to use a 100% relative source contribution for both the proposed PFOS and PFOA standards and provided its justification making this assumption in the technical support document. We don't necessarily disagree and do not have the expertise to say whether this assumption is inappropriate. However, we do want to note that this is not a conservative assumption. Minnesota had access to the same Great Lakes Consortium for Fish Consumption Advisories (GLCFCA) analysis that the Department relied on for its 100% RSC assumption, but still chose to use an RSC of 20% when calculating its PFOS surface water standard based on exposure from consumption of contaminated fish[3].

Similarly, for the PFOA standard based on ingestion of the water, there is scientific evidence indicating that for most people water ingestion accounts for about 20% of total PFAS exposure[4], indicating that the RSC could be justifiably set to a lower level than 100%.

4. The reference dose used for the PFOS standard is not conservative

The Department does not explain why the reference dose for PFOS used in its analysis is different than the allowable daily intake identified by DHS in its recommendation for a PFOA groundwater standard (and adopted by the DNR in its drinking water PFOA standard). We presume it's based on the GLCFCA analysis assuming the immune benefits of eating fish cancel out the immune risks of PFAS exposure, but the Department should explicitly justify its choice, especially since it deviates from the groundwater and drinking water analyses. Furthermore, MN doesn't appear to use the same justification (benefits cancelling out risks) when choosing its reference dose.

Cambridge, MA: Union of Concerned Scientists. https://www.ucsusa.org/resources/abandoned-science-broken-promises

[2] See, e.g., Stevens et al. 2018. Differences in mercury exposure among Wisconsin anglers arising from fish consumption preferences and advisory awareness. Fisheries 43: 31-41; He et al. 2021. Fish consumption and awareness of fish advisories among Burmese refugees: a respondent-driven sampling study in Milwaukee, Wisconsin. Environmental Research 197: 110906; Lauber et al. 2017. Urban anglers' adherence to fish consumption advisories in the Great Lakes region. Journal of Great Lakes Research 43: 180-186; Imm et al. 2005. Fish consumption and advisory awareness in the Great Lakes Basin. Environmental Health Perspectives 113: 1325-1329.

[3] https://www.pca.state mn.us/sites/default/files/wq-s6-61a.pdf

[4] Hu et al. 2019. Tap water contributions to plasma concentrations of poly- and perfluoroalkyl substances (PFAS) in a nationwide prospective cohort of U.S. women. Environmental Health Perspectives 127: 067006; Sunderland et al. 2019. A review of the pathways of human exposure to poly- and perfluoroalkyl substances (PFASs) and present understanding of health effects. J. Expo. Sci. Environ. Epidemiol. 29: 131-147.

5. The body weight assumption for the PFOS standard is not conservative

We note that the PFOS standard to protect against exposure from contaminated fish consumption does not protect younger children, who are more vulnerable to the harmful effects of PFAS. Using an assumed body weight of 70 kg in the calculations results in a standard that could result in children being exposed to PFOS in excess of the acceptable daily intake level.

6. The surface water standards should include a combined PFOA + PFOS standard to align with the proposed drinking water and groundwater standards.

The proposed standards calculate PFOA standards to protect against ingestion of surface waters contaminated by PFOA. However, this standard should be combined PFOA + PFOS concentration to align with the groundwater standards recommendation from the Department of Health Services (DHS), which was adopted by the proposed drinking water standards. Given the similar health impacts of the two chemicals indicating interactive effects, the DHS recommended a combined standard for PFOS and PFOA. However, under the proposed rules, a combined 28 ppt of PFOA + PFOS (8 ppt PFOS + 20 ppt PFOA), is allowed in surface waters used for drinking water which is excess of the health-based cumulative standard recommended by the DHS. The standards for surface waters could be adjusted to accomplish the following:

- Surface waters used for drinking water AND support natural fisheries or are upstream of surface waters that support natural fisheries: must meet a maximum of 8 ppt PFOS and 20 ppt PFOA + PFOS.
- Surface waters used for drinking water AND do not support natural fisheries or are not upstream of surface waters that support natural fisheries: must meet a maximum of 20 ppt PFOA + PFOS.
- Surface waters not used for drinking water AND support natural fisheries or are upstream of surface waters that support natural fisheries: must meet a maximum of 8 ppt PFOS and 95 ppt PFOA + PFOS.
- Surface waters not used for drinking water AND do not support natural fisheries or are not upstream of surface waters that support natural fisheries: must meet 95 ppt PFOA + PFOS.

7. There should be a mechanism to update the PFOS standard should additional data collection support a change.

We think the logic of the Department's analysis for determining a PFOS surface water standard is sufficiently justified. However, the statistical relationship underpinning this standard is only as good as the data that goes into it. Right now, only 25 Wisconsin waterbodies are included in this analysis (in addition to a larger number of Minnesota waterbodies). As more data is collected over time, the statistical relationship between PFOS concentrations in fish tissue and the water column may change, which could suggest that a different standard is appropriate.

Furthermore, it appears as though the Department is lumping together all fish species into the regression analysis. An analysis demonstrating that this is appropriate would be helpful to justify this approach. Are there certain species that tend to bioaccumulate PFOS more rapidly than

others? If so, it would better protect public health to base the regression analysis on these species specifically, particularly if they are commonly-consumed species.

Given the potential for the scientific understanding of these relationships to change with additional information, we suggest adding a provision that would allow this part of the analysis to be revisited periodically in an expeditious manner as additional sampling is conducted and a more complete picture of the relationship between fish tissue and water column PFOS concentrations around the state is developed.

8. <u>The proposed standards should only be a first step in protecting the public from harmful PFAS in their drinking water.</u>

PFOA and PFOS are only two of thousands of PFAS compounds. They are the best-studied and understood PFAS compounds, so they make for a logical starting point. However, Wisconsin needs to continue to work to reduce all PFAS contamination of our water resources. Importantly, we need to stop this pollution before it is on a path to getting in our water instead of trying to clean it up afterwards. These rules send the signal to industry to avoid introduction to water or wastewater whenever possible.

Respectfully submitted this 15th day of December, 2021.

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December 15, 2021

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RE: WY-23-19 relating to surface water criteria for PFOS an PFOA

The River Alliance of Wisconsin (RAW) submits these comments in support of proposed rule WY-23-19 that would add to NR 102 narrative surface water criteria with numeric thresholds and analytical methods for poly- and perfluoroalkyl substances (PFAS) including PFOS and PFOA. We appreciate the opportunity to submit comments on this important rule.

Wisconsin needs to act on PFAS to protect public health and the environment. This rule and the other rule packages on drinking water and groundwater are small steps in the right direction. While US EPA may start to act in some of these areas Wisconsin must *not wait*. The design of the Clean Water Act intends states to move to regulate substances in the manner appropriate for their conditions which Wisconsin has done consistently over the years and should continue to do so.

This rule is in line with what neighboring states are doing. Wisconsin's proposed criteria of 8 ng/L for PFOS is more stringent than Michigan's value of 11 ng/L and, less stringent than Minnesota's criterion of 0.05 ng/L. For PFOA, Wisconsin's proposed thresholds of 20 ng/L and 95 ng/L for PFOA in public drinking water supply waters and non-public drinking supply waters, respectively, are more stringent than Michigan's standards. Finally, the rule has a potentially very long compliance schedule for those facilities that will be required to address these two substances.

However, this rule and the others related to PFAS also point out weaknesses in the system Wisconsin has used to regulate toxic substances for almost forty years. PFAS are a prime example of these weaknesses. PFAS are a particularly difficult problem because it is a large

family of chemicals which has led them to be ubiquitous in the environment, and they are also extremely difficult to destroy. Given this the only prudent course would have been to prevent them from entering the environment to begin with. No one has the right to pollute or impose risk on others. To prevent more "discoveries" like PFAS Wisconsin needs to initiate a system that screens chemicals *before* allowing them to be used to prevent problematic substances from entering the environment to prevent illness and harm to the environment, in other words prevent harm instead of managing risk.

The other flaw that PFAS demonstrate is the fact that our system does not take into account the interaction between substances. The system assumes we are exposed to chemicals one at a time which is not the case. Particularly, where you have a family of chemicals that are used for similar proposes and/or have similar chemical properties, we need to determine whether there is increased danger when we are exposed to multiple substances.

Finally, we must develop a better system than dollars for comparing relative burden from pollution. Again, no one has the right to pollute. Spending a million dollars on a piece of control technology is not the same as spending even half a million dollars in health care and other support for someone who suffers from a debilitating condition because of exposure to a substance that the control technology would prevent. It is simply not an apples-to-apples comparison and yet this is too often how we evaluate whether to regulate or not. Similarly, an economic comparison does not adequately evaluate long-term or is some cases permanent changes in the environment from pollution. Instead of moving in this direction in the last several years Wisconsin has moved the wrong way so that only costs of implementation and not benefits (however measured) are the dominate consideration. This is a disservice to the people of Wisconsin and the environment.

Sincerely,

Allison Werner
Executive Director
River Alliance of Wisconsin

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December 15, 2021

Comments related to proposed Rule WY-23-19

Thank you for the opportunity to comment on proposed rule WY-23-19, concerning PFOS and PFOA in surface water. I am submitting these comments on behalf of Sierra Club Wisconsin's 20,000 members and supporters in Wisconsin who care deeply about clean water.

Sierra Club Wisconsin supports the proposed surface water limits of 8 parts per trillion for PFOS and 20 parts per trillion for PFOA. These limits are justifiable due to the intense toxicity of PFAS chemicals to people, their extreme persistence in the environment, and the accumulation in fish and wildlife. Minnesota estimates that emissions of no more than 1 gram per year of PFOS from a metal plating site in the state resulted in fish contamination and a "do not eat" advisory for a downstream water body.[1] In light of the slow pace of EPA regulation of PFAS in wastewater, Wisconsin must take quick action to limit discharges of PFAS chemicals into the environment.

Wisconsin and other neighboring states are poised to intervene more quickly to enforce the Clean Water Act and limit pollution of water resources. We support the proposed efforts to identify and reduce PFAS inputs into the wastewater system through pollution minimization plans.

Work by EPA and states can be useful to identify the types of industries most responsible for PFAS discharges. EPA's 2021 Multi-Industry Study for PFAS identifies several key industries that discharge PFAS chemicals into wastewater systems.[2] The state of Michigan has also done extensive tracking of PFAS in wastewater, and identified a list of highest priority industries for intervention.[3]

Industries discharging PFAS in water and wastewater:
Chemical industry (PFAS manufacturing and formulating)
Metal plating
Landfills
Textile manufacturers that use PFAS
Paper/pulp mills using PFAS
Centralized waste treaters
Commercial industrial laundries

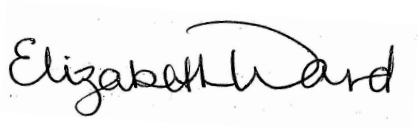
[1] Minnesota PFAS Blueprint. 2021. https://www.pca.state.mn.us/waste/minnesotas-pfas-blueprint
[2] EPA. 2021. Multi-Industry Per- and Polyfluoroalkyl Substances (PFAS) Study - 2021 Preliminary Report. https://www.epa.gov/system/files/documents/2021-09/multi-industry-pfas-study_preliminary-2021-report_508_2021.09.08.pdf
[3] Michigan EGLE. 2020. Michigan Industrial Pretreatment Program (IPP) PFAS Initiative: Identified Industrial Sources of PFOS to Municipal Wastewater Treatment Plants. (August 2020). https://www.michigan.gov/documents/egle/wrd-ipp-pfas-intiative-identified-sources_699494_7.pdf

Industries with historic and on-going uses of PFAS for fire fighting and training:
Airports
Military bases
Fire training
Refineries and petroleum storage
AFFF contaminated sewers

While Wisconsin's approach is sound and will eventually limit PFOS and PFOA emissions to wastewater and surface waters, we are concerned that it could do little to prevent the emissions of closely related chemicals which are widely replacing PFOS and PFOA in industrial uses and firefighting. These chemicals are proving to be similarly potent, long lasting in the environment with many also accumulating in fish and wildlife. It would be safest to assume any of the industries that historically discharged PFOS and PFOA will be currently using other PFAS chemicals, unless presented with information to the contrary.

Wisconsin should require pre-treatment of PFAS-contaminated effluent instead of just process changes that address only PFOS instead of all PFAS chemicals. Many of the treatment technologies that can be employed to remove PFOS in wastewater effluent would effectively remove all other types of PFAS chemicals. Wisconsin should immediately set surface water standards for all the PFAS that are currently regulated in drinking water - Massachusetts, Maine and Vermont set a drinking water limit of 20 parts per trillion for the sum of 5 or 6 PFAS chemicals (PFOS, PFOA, PFNA, PFHpA and PFHxS in Massachusetts). Other states have set limits for PFBS, PFBA, PFHxA, PFPeA, and GenX - other newer generation PFAS in widespread use.

Yet hundreds if not thousands of other PFAS chemicals are possibly made, used or emitted in Wisconsin. EPA has a poor handle on the production and use sites for most PFAS, and its current TRI rules are nearly exclusively phased out longer chain compounds. EPA has also not moved quickly enough to develop its own Effluent Limits for PFAS in wastewater. Most of the replacement chemicals are poorly studied for their presence in water supplies, impacts to people and wildlife, and ultimate fate in the environment. State regulators and scientists will need to use innovative analytical methods like the TOP Assay, and total organic fluorine methods to quantify the amount of synthetic fluorochemicals in surface water and other media. These methods can also gauge the extent that pollution minimization and pre-treatment are effective at reducing emissions of novel and currently unidentified fluorochemicals in the environment.



Elizabeth Ward, Chapter Director
Sierra Club Wisconsin

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REPLY TO THE ATTENTION OF:
WP-15J

December 8, 2021

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Wisconsin Department of Natural Resources
Post Office Box 7921
Madison, Wisconsin 53707

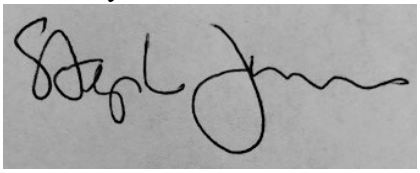
Dear Ms. Willhite,

On October 18, 2021, the Wisconsin Department of Natural Resources (WDNR) published a public notice of an informational hearing on WDNR's intent to adopt human health surface water quality standards (WQS) for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). The rule language specifies that substances shall not be present in amounts found to be of public health significance.

The U.S. Environmental Protection Agency, Region 5, Water Permits Branch reviewed the draft implementation procedures, embodied in draft changes to ch NR 106 *Wis. Adm. Code*, and has prepared the enclosed comments for your consideration. These comments do not constitute final Agency action.

Thank you for the opportunity to comment on WDNR's draft PFOA and PFOS water quality standard draft implementation procedures. If you have any questions regarding our comments, please contact Rob Pepin of my staff at (312) 886-1505 or pepin.robert@epa.gov.

Sincerely,



Stephen M. Jann
Chief, Permits Branch
Water Division

Enclosure

cc via email w/enclosure:

Meghan Williams, WDNR (electronic)

Enclosure – EPA Comments on WDNR Proposed PFOA and PFOS WQS Implementation Procedures

Comment 1. Water quality-based effluent limits (WQBELs) may not be imposed despite a determination of reasonable potential.

WDNR proposes 24 months of sampling for municipal and industrial permittees during the initial permit reissued after the effective date of the PFAS rules. During the subsequent permit reissuance process, it is EPA's understanding that WDNR will complete a "reasonable potential analysis". If the data for a facility indicates reasonable potential, WDNR will require a pollutant minimization plan to identify and reduce PFAS in the effluent, but would delay any potential inclusion of WQBELs until a subsequent (i.e., third or later) permit. Where reasonable potential is determined, 40 C.F.R. § 122.44(d)(1)(i) requires the permitting authority to establish WQBELs; WDNR's draft rules appear to be inconsistent with this federal rule.

Separately, EPA recommends that, rather than prescribing monitoring as a condition of a permit for the purpose of a future reasonable potential analysis, WDNR instead revise its permit application forms such that data are supplied prior to public notice of the first permit to be issued after final adoption of amendments to ch. NR 106. We observe that effluent can be characterized by means of a sampling regimen that is shorter in duration than 24 months, with the only expectation being that the regimen produce data which are representative of the discharge.

Comment 2: The draft rules imply that a minimum data set of 12 effluent measurements is necessary before any reasonable potential determination can be made. WDNR's draft rules suggest that 12 data points are the minimum required to characterize effluent and perform a reasonable potential analysis (proposed rule NR 106.98(4)). Note that under 40 C.F.R. § 122.44(d)(1)(ii), permitting authorities shall use procedures which account for effluent variability when conducting reasonable potential analyses, an exercise which can be done with data sets smaller than 12. In fact, EPA's *Technical Support Document for Water Quality-based Toxics Control* (1991) includes methods that can be used with as few as one data point. WDNR should complete reasonable potential analyses when data sets are smaller than 12.

Comment 3: NR 106.975 Definitions.

Best management practices. Definition is not consistent with the 40 C.F.R. § 122.2 definition.

New discharger. Definition is not consistent with the 40 C.F.R. § 122.2 definition. Like the draft definition of "New source," the definition of new discharger should state that it has the meaning specified in s. NR 106.117.

Comment 4: NR 106.985 PFAS minimization plans.

The draft rule does not provide that a PMP will be incorporated directly or by reference as conditions in a permit. A document that exists outside a permit, even one that is approved by the

permit-issuing agency, may not be enforceable for the purpose of the Clean Water Act. To the extent a PMP contains best management practices under 40 C.F.R. § 122.44(k) or elements of a POTW pretreatment program under 40 C.F.R. § 122.42 or 40 C.F.R. part 403, those practices and elements need to be incorporated into a permit, and the act of incorporation needs to be subject to public participation under 40 C.F.R. part 124 and available for EPA review under 40 C.F.R. § 123.44.

Comment 5: Proposed rule 106.985(2)(d) states that water quality-based limits will be established as average monthly limits. 40 C.F.R. § 122.45(d) requires POTW limits for continuous discharges to be established as average weekly limits as well, and for non-POTWs as daily maximum limits. Therefore, the proposed rule 106.985(2)(d) is inconsistent with 40 C.F.R. §122.45(d).

December 13, 2021

Meghan Williams

Environmental Toxicologist Bureau of Water Quality

Wisconsin Department of Natural Resources

Ms. Williams,

Thanks for the invitation to provide public commentary regarding the WI Adm. Code NR 105, NR106, and NR 219 revisions that address state regulations development for poly- and perfluoroalkyl substances (PFAS) as part of new water quality criteria language.

I am writing to advocate for the development of class regulations for PFAS and PFOS compounds in relation to groundwater, surface water, and biosolids. Because there are currently no regulations for these ubiquitous compounds, and because the EPA's health advisory status is not enforceable, it is urgent that we address these toxic pollutants to protect public health, welfare, recreational uses, and aquatic life. Per- and polyfluoroalkyl substances are mobile and highly resistant to oil, water, and high temperatures. These substances, often referred to as "forever chemical" with half-lives extending into hundreds of years, have been found to bioaccumulate in fish muscle tissue, and other animals' vital organs. The human health risks are profoundly extensive. We cannot afford to wait for federal EPA guidelines as some have suggested. We have immediate need for state-level regulations that the EPA can complement at some point.

While your proposed rule changes apply to municipal and wastewater facilities, source reduction of these substances is critical so clearly other processing systems must be incorporated to meet the needs of manufacturing and firefighting. Additionally, I'm advocating for testing provisions applicable to private wells within a 2-mile radius of landfills, known industrial point source pollution and/or land spread biosolids application sites.

The Wisconsin DNR agency, WI Governor, and Legislature collectively urgently need to proceed with PFAS codified health standards. In closing, I would further encourage follow-up infrastructure bill funding be utilized as a resource for subsequent testing, PFAS clean-ups and remediation.

Sincerely,

Dwight and Ruth Swenson

[redacted]

Hixton, WI 54635

Wisconsin's Green Fire Public Hearing Comments in Support of
WY-23-19, Administrative Rule Revisions to
Promulgate Surface Water Quality Standards for PFOS and PFOA and
Provisions to Implement those Standards through the Wisconsin Pollutant Discharge Elimination System Permits.

In our "Opportunities Now" report, "PFAS — Forever Chemicals in Wisconsin", Wisconsin's Green Fire calls for establishing science-based environmental standards for drinking water, groundwater and surface waters for PFOA and PFOS. Consistent with this position, Wisconsin's Green Fire supports the promulgation of the proposed administrative rules to promulgate surface water quality standards for PFOS and PFOA and to implement those standards through the Wisconsin Pollutant Discharge Elimination System point source permits.

Wisconsin's Green Fire (WGF) supports the conservation legacy of Wisconsin by promoting science-based management of Wisconsin's natural resources. Our members represent extensive experience in natural resource management, environmental law and policy, scientific research, and education. Our members have backgrounds in government, non-governmental organizations, universities and colleges and the private sector.

Our specific comments are as follows:

1. S. NR 102.04 (1m) (a) PFOS Standard

   WGF concludes that DNR derived the PFOS numeric value of 8 parts per trillion using an appropriate data set of Wisconsin and Minnesota fish tissue and water column data and analyzed the data using the ROC curve method, a method endorsed by USEPA as part of its "Causal Analysis/Diagnosis Decision Information System (CADDIS) for biological systems".

   Given the significance of the fish consumption ingestion pathway, especially relative to drinking water, WGF is supportive of DNR following the advise of the Great Lakes Consortium for Fish Consumption Advisories to use fish consumption as the sole pathway considered.

   WGF supports use of the "one meal per week" level of fish consumption, but at the same time understands Minnesota's approach of using a level corresponding to more sensitive groups, such as children.

2. S. NR 102.04 (1m) (b) PFOA Standard

   WGF supports use of the proposed drinking water maximum contaminant level (MCL) for PFOA as the basis for the 20 parts per trillion numeric value for surface waters classified as public drinking waters, such as Lake Michigan, Lake Superior and Lake

Winnebago. WGF further concludes DNR used appropriate methods to derive the 95 parts per trillion for other surface waters.

3. S. NR 106.98 (4) Determination of need for a PFAS Minimization Plan.

   a. WGF supports the manner in which the PFOS and PFOA numeric values to determine whether a discharge from a point source will "cause or contribute to an exceedance" of the narrative standard.

   b. However, the administrative rules should clearly state the method DNR will use to determine what PFOA value to use for dischargers upstream from public water supply waters. This method should be consistent with methods used to determine effluent limits that are protective of downstream waters.

4. S. NR 106.985 (2) PFAS minimization plans, permit implementation procedure schedule.

   a. WGF believes the use of PFAS minimization plans is appropriate given the nature and magnitude of PFOS and PFOA found in most municipal and industrial wastewater discharges. Also a maximum of 84 months to implement such a plan is appropriate in many cases.

   However, WGF believes it is sound public policy to limit the period of time for each step in the schedule to develop and implement the PFAS minimization plan. Specifically:

   b. S. NR 106.985 (2) (a) does not limit the amount of time the permittee has to submit an initial PFAS minimization plan. We suggest no longer than six months.

   c. S. NR 106.985 (2) (a) does not limit the amount of time DNR has to approve, conditionally approve, or reject the plan. We suggest not longer than six months.

   d. S. NR. 106.985 (2) (c.) DNR unnecessarily limits the time it may require the permittee to submit a revised and updated PFAS minimization plan, presumably for being ineffective, but no sooner than 60 months. DNR should be able to require a revised plan sooner in the process, if appropriate.

   e. S. NR 106.985 (2) (c.) allows the permittee to carry over implementation of the PFAS minimization plan into a third permit term with either no schedule limitations or up to another 84 months compliance schedule when the PFAS minimization plan needs to be revised and updated. This appears to create an unnecessary incentive to permittees to submit and implement inadequate progress reports. This option should be eliminated.

5. S. NR 106.985 (3) Maintenance of PFAS Effluent Quality

   WGF supports the inclusion of an anti-backsliding provision, consistent with federal regulations, that permittees shall maintain effluent quality below the standard once achieved.

6. S. 106.99 PFAS minimization plans

   WGF strongly supports suggestions in this section related to source identification, source management and product substitution.

7. S. NR 219.04(1) Note and s. NR 219 Table F Note

   WGF does not understand these two notes calling for use of a yet-to-be published EPA Office of Water dilution method. That is, if EPA publishes the method. We suggest the notes be clarified to explain why a yet-to-be method is superior to current methods.

   Thank you for your consideration of Wisconsin's Green Fires comments. Feel free to contact me at Robinson.john@ hotmail.com. with any questions you may have.

   John Robinson
   Chair of Wisconsin's Green Fire
   PFAS Working Group

Testimony on Adopting PFAS Surface Water Rule WY-23-19
Peter Burress, Government Affairs Manager
December 10, 2021

Good afternoon. My name is Peter Burress, and I am the Government Affairs Manager with Wisconsin Conservation Voters. We have offices in Madison, Milwaukee, and Green Bay, where we work with our network of over 40,000 members and supporters to engage voters to protect our environment. I appreciate the opportunity to testify in support of the DNR's rule to establish surface water standards for certain per- and polyfluoroalkyl substances, or PFAS.

Wisconsin is home to 84,000 miles of river and over 15,000 lakes.[1] Our surface water is one of the state's biggest treasures, yet we are not taking the necessary steps to protect it. Across the state, uncertainty surrounding PFAS contamination is bringing into question whether it's safe to eat fish from our streams, swim in our rivers, and drink the water from our lakes. Wisconsinites living with poisoned water are not responsible for the pollution that contaminated it. And yet, our elected officials have not done the work to stop the pollution.

That is why we appreciate this rulemaking to establish surface water standards for PFAS. It is an important opportunity to finally drive substantive change on this issue, and deliver results for poisoned communities across the state. Today, I'd like to make three main points:

1. PFAS are one of the most serious threats to our surface water, and in turn are having a profound impact on our public health.
2. Those responsible for PFAS surface water pollution must be the ones who are first-and-foremost expected to address it.
3. We cannot wait for the federal government. Standards for PFOS and PFOA are needed today, as an important first step toward tackling the larger issue.

First: PFAS are one of the most serious threats to our surface water, and are having a profound impact on our public health.

[1] https://dnr.wisconsin.gov/topic/DrinkingWater/SafeWaterForAll.html

PFAS are frequently referred to as "forever chemicals" because they do not break down in the environment. For decades, these chemicals have been used for industrial applications, firefighting foam, and consumer products such as carpeting, waterproof clothing, upholstery, food packaging, and various paper products. As we are seeing with the DNR's more than 80 PFAS-related investigations in every corner of the state, we are just beginning to learn about the wide-scale exposure to these chemicals.

The U.S. Centers for Disease Control have advised doctors that PFAS have been linked to increased rates of testicular and kidney cancer. Exposure can also lead to increased cholesterol levels, liver damage, decreases in infant birth weights, and increased risk of high blood pressure in pregnant women.[2]

Another immediate health concern is that there are numerous studies showing that PFAS have a negative impact on the effectiveness of various vaccinations, a particularly scary finding in the age of COVID-19.[3] In 2016, the National Toxicology Program reviewed PFAS immunotoxicity and concluded that PFOA and PFOS can pose an immune hazard to humans. This negative impact was observed in people of all ages.[4]

Some of the various findings related to PFAS' impact on vaccine response:

- In 2013, a study published in *Toxicological Sciences* provided evidence that certain blood level concentrations of PFOA were associated with reduced immunity to flu vaccines.[5]
- In 2017, a study published in the *Journal of Immunotoxicity* reported that elevated PFAS levels during the first six months of infancy were associated with a weaker response to tetanus vaccination.[6]
- In 2020, a study published in *Environmental Health Perspectives* found that children with exposure to PFOS demonstrated a lower response to the measles vaccination.[7]

We are also just beginning to learn how these chemicals are having a disproportionately large impact on Black communities, Indigenous communities, and other communities of color. Industrial contamination sites are often situated along surface waters, and disproportionately located within Black, Indigenous, and other communities of color. [8] This is concerning both because of surface waters' impact on our drinking water, and also because of surface waters' impact on the food that we eat.

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[2] https://www.atsdr.cdc.gov/pfas/health-effects/index.html
[3] https://www.ewg.org/news-and-analysis/2019/06/pfas-chemicals-harm-immune-system-decrease-response-vaccines-new-ewg
[4] https://ntp.niehs.nih.gov/ntp/ohat/pfoa_pfos/pfoa_pfosmonograph_508.pdf
[5] https://academic.oup.com/toxsci/article/138/1/76/1671296
[6] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6190594/
[7] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7416537/
[8] https://blog.ucsusa.org/genna-reed/pfas-contamination-is-an-equity-issue-president-trumps-epa-is-failing-to-fix-it/

Because of PFOS's tendency to quickly bioaccumulate within fish tissue, contamination presents a major concern for every Wisconsinite who consumes fish, and particularly for Wisconsin children who are small and still developing. Across the State in waters including Lake Superior, the Mississippi River, the Wisconsin River, and the Yahara chain of lakes, the DNR has issued fish consumption advisories related to PFOS. These advisories are meant to ensure that Wisconsinites can get the health benefits from eating fish, while reducing the risk of PFOS poisoning.[9] While we understand and appreciate this advisory, no Wisconsinite should ever have to choose between protecting themselves from PFAS contamination, or getting the nutritional benefits of fish.

Until we establish enforceable standards for PFAS, we will not know just how many Wisconsinites, and particularly Wisconsin children, might be poisoned by the fish in our waters. This is a concern for every Wisconsinite, and a particular concern for communities that rely on subsistence fishing from surface waters, which are disproportionately Black, Indigenous, and other communities of color. We appreciate this proposed rule recognizes PFAS' risk to our public health, and begins to more fully address the issue.

Second: Those responsible for PFAS surface water pollution must be the ones who are first-and-foremost expected to address it.

Despite their significant threat to our public health, we do not yet know all the sources of PFAS contamination, nor do we know who in our state is at risk. By not acknowledging that PFAS are already present in some of our surface waters, we ignore the current threats they pose and allow them to continue spreading throughout our surface water. This makes future treatment more expensive and difficult.

For these reasons, we are happy to see source reduction included as an important first-step preventative measure for reducing levels of PFOS and PFOA. Establishing PFOS and PFOA permit requirements is key to this. The DNR's proposed permitting requirements will help us identify where these chemicals are being used, determine whether their use could be endangering human health, and ensure that pollution stays clear of our surface water. This is a necessary, but insufficient, step toward protecting Wisconsinites from PFAS pollution. Long-term, we encourage the DNR consider requirements for other PFAS chemicals, as well as identify corrective measures that help address the pollution already in our surface water.

Finally: We cannot wait for the federal government. Standards for PFOS and PFOA are needed today, as an important first step toward tackling the larger issue.

As mentioned, the failure to quickly adopt policies that keep PFAS pollution out of our environment and set standards that protect our children is a public health crisis. Despite the large and growing number of known PFAS-related challenges across Wisconsin, there are no state or federal requirements for testing and cleaning up existing pollution.

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[9] https://dnr.wisconsin.gov/topic/PFAS/Advisories.html

Wisconsin Manufacturers and Commerce has suggested we wait for federal standards.[10] But the truth is, we cannot afford to wait.

We understand that the EPA is beginning rulemaking to restrict PFAS discharges from chemical, plastic, synthetic fibers, metal finishing, and electroplating industries. That said, completion of this rulemaking isn't expected until Summer 2024. Beyond this, there are a number of industrial categories not currently covered under this rulemaking process (e.g., electrical and electronic components, textile mills, leather tanning and finishing, plastics molding and forming, and paint formulating).[11] Meanwhile, across the state, Wisconsinites are dealing with the impact of PFAS contamination today. Waiting years for protection is not an option for those facing heart surgeries, for those comforting friends with testicular cancer, for those paying for bottled water, for those trying to find the resources to care for a sick child, or for those who have miscarried a long-wanted baby. Wisconsinites pay when our policies fail to address the urgency of the crisis.

In closing, we strongly support this administrative rule for surface water. The proposed rule will be a major step toward protecting our public health. Permit requirements will ensure that those responsible for the pollution are also held responsible for keeping it out of our surface waters. We appreciate the proposed water quality standards for PFOS and PFOA developed based on public health-based Department of Health Services standards, and hope to see future standards for other PFAS chemicals, along with guidelines on corrective measures that help address the pollution already in our surface water.

Particularly in a year where the Wisconsin legislature has passed zero legislation that would protect Wisconsinites from PFAS, we appreciate the DNR's efforts to pass this rule, alongside rules for protecting drinking and groundwater from PFAS. These rules are an important step toward quickly beginning to tackle PFAS contamination. Attached to the copy of my written testimony, you will find a letter of support for these rules, signed by 292 of our members. We thank you for your efforts, and appreciate you doing everything you can to protect our surface water from these dangerous forever chemicals.

Thank you for your time,

Peter Burress
Government Affairs Manager
Wisconsin Conservation Voters

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For more information, contact Peter Burress at peter@conservationvoters.org or 920-421-3601. Visit Wisconsin Conservation Voters at www.conservationvoters.org.

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[10] https://www.wpr.org/groups-say-state-lawmakers-are-undermining-efforts-protect-public-pfas-firefighting-foam

[11] https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf

Petition to Protect Our Water from Toxic PFAS Chemicals

Every person has a right to safe drinking water. As Wisconsinites, from every corner of the state, we appreciate your efforts to protect our communities from PFAS by implementing administrative rules related to drinking water (Natural Resources Board Order Number DG-24-19), surface water (Natural Resources Board Order Number WY-23-19), and groundwater (Natural Resources Board Order Number DG-15-19) from PFAS.
PFAS are a class of highly toxic, human-made chemicals that for decades have been used for industrial applications and consumer products such as carpeting, waterproof clothing, upholstery, food packaging, firefighting foam, and various paper products. Commonly referred to as "forever chemicals," PFAS do not break down over time. There is mounting evidence linking these chemicals to a wide variety of serious long-term health risks including:

- Increased cholesterol levels
- Decreased responsiveness to vaccines
- Increased risk of thyroid disease
- Decreased fertility
- Increased risk of high blood pressure in pregnant women
- Lower infant birth weights

PFAS are already presenting well-known public health risks in communities like Campbell, La Crosse, Eau Claire, Madison, Peshtigo, Marinette, and Rhinelander. The list of impacted communities continues to grow. Across the state, the DNR has already opened more than 80 PFAS-related investigations in over 35 communities.

Still, the truth is, we don't know how widespread the exposure to these dangerous chemicals might be. There are no state or federal requirements for testing and cleaning up existing pollution. Without immediate comprehensive public health-based action, PFAS will continue to poison our communities and threaten future generations. The Department of Natural Resources' proposed rules are central to tackling PFAS' threat to Wisconsin communities.

We appreciate the Department's efforts, and urge you to do everything you can to ensure these rules are adopted.

Bruce Lisiecki, Cascade
Karen Ackroff, Eagle
Glory Adams, Eau Claire
Mary Beth Adams, Whitefish Bay
Daniel Agne, Rice Lake
Joanne Allen, Black River Falls
Eric Andersen, Kaukauna
Edna Anderson, Beloit
Kimberly Anderson, Salem
Lisa Anderson, Nelsonville
Melissa Anglin, Verona
Evan Arnold, Madison
Barbara Arnold, Madison
Mary Arthur, Milwaukee

Gary Austin, Green Bay
Duane Barmore, Middleton
Deborah Bascom, Wauwatosa
Rhonda Bast, Racine
Gerry Baudendistel, Fredonia
Brent Bauer, Durand
John Beck, Sturgeon Bay
Andrew Becker, Eau Claire
Lisa Bee, Osseo
Karolyn Beebe, Madison
Leigh Begalske, Green Bay
Ann Behrmann, Madison
Mara Beldavs, Shorewood
Vitauts Beldavs, Shorewood
Jeremy Beloungy, Madison
Kate Bernardo, Ashland
Jess Bernstein, Mount Horeb
Anna Biermeier, Middleton
Erin Bloodgood, Milwaukee
Fred Braby, Hartland
Marya Bradley, Milwaukee
Judith Brey, Reedsburg
Dianne Brooks, New Glarus
Michelle Buerger, Middleton
Karen Cannestra, Milwaukee
Christine Carollo-Zeuner, Oregon
Cindy Carter, Appleton
Chris Casper, Stevens Point
Dawn Casper, Madison
Rebecca Cecchini, Madison
Matthew Coffey, Eau Claire
Nancy Coffey, Eau Claire
Ed Cohen, Oconomowoc
Connie Connour, Green Bay
Kate Cooper, Barneveld
Andrew Corbisier, Stevens Point
Sue Costoff, Elkhorn
Joseph Crumrine, Milwaukee
Dorothy Curtis, Fall River
Carol Czarnecki, Oshkosh
Stanley Czarny, Wisconsin Rapids
G Allen Daily, Milwaukee
John Davy, Chippewa Falls
Paul Dearlove, Madison
Heather DeLuka, Eau Claire
Lyle Dickson, Clintonville
Dick Dierks, Appleton
Jeff Dix, Wausau
Colleen Dodge, Neopit
Thomas Duffey, Appleton
Harry Engle, Tomahawk
David Erickson, Oconomowoc
Gregg Ewert, Neenah
Don Ferber, Madison
Joanne Fetting, Milwaukee
Helen Findley, Madison
Marcia Finger, Madison
Susan Foote-Martin, Arlington
Corita Forster, Durand
Nanette Franze, Waukesha
Pat French, Green Bay
Joyce Frohn, Oshkosh
Everett Fuchs, Hudson
Kathleen Fullin, Madison
Mary Garnett-Hayes, Kenosha
Ned Gatzke, Sparta
Steve Gausman, Eau Claire
Terrence Gerlach, Waupaca
Kevin Giehl, Milwaukee
Jennifer Giesler, Madison
Patti Gmeiner, Niagara
Ann Godfrey, Ripon
Patricia Golner, Pewaukee
Cheryl Goodman, Madison
Gordon Gottbeheut, Nekoosa
Paul Gravunder, Greenville
Lance Green, Madison
James Greer, Sun Prairie
Gordon Grieshaber, Mineral Point
Norda Gromoll, Eagle River
Mary Hahn, Spring Green
Karen Etter Hale, Lake Mills
Scott Halvorson, Lake Geneva
Debbie Haman, Richland Center
Einar Hanson, Hudson
Vicky Harris, De Pere
Tom Hauge, Prairie Du Sac
Cathy Haupert, Catawba

Gini Heersma-Covert, Blue River
Marnie Hersrud, Eau Claire
Sidney Herszenson, Milwaukee
Marci Hess, Blanchardvlle
E. Hesseling, Milwaukee
Randi Hoffmann, Fond Du Lac
Kimberly Hollis, Winter
Leah Holloway, Milwaukee
Amy Holt, Fitchburg
Michael Horejs, Plover
Penny Howell, Green Lake
Edward Hubbard, Madison
Beth Huizenga, Waukesha
Cal Huizenga, Waukesha
Patricia Hung, Madison
Michael Iltis, Madison
Phil Immerfall, Appleton
Jo Jacobi, East Troy
Jolie Jacobus, Columbus
Sharon James, Madison
Debbie Johnson, Rice Lake
Harold Johnson, Rice Lake
Keith Johnson, Muscoda
Elaine Dorough Johnson, Fort Atkinson
Diana Jonen, Kewaskum
Harold Jones, Onalaska
Daniel Kaemmerer, Milwaukee
Lance Kammerud, Blanchardville
B Kehl, Neshkoro
Barbara Kelly, Hayward
Daniel Kiernan, Green Bay
Hunter Klapperich, Jim Falls
Susan Knapp, Wauwatosa
James Kneisler, Waupaca
David Koeller, Shawano
Lynn Koob, Rice Lake
Greg Koshak, Larsen
Aleks Kosowicz, Abrams
Susan Kozinski, Saint Francis
Laura Kracum, New Auburn
Honora Kraemer, Madison
Bruce Krawisz, Marshfield
Asenath La Rue, Lone Rock
Dana LaFontsee, Waterford
Jeffrey Lamont, Marinette
Barbara Landis, West Bend
Donald Langenfeld, Hartford
Mark Laustrup, Hayward
Kathleen Lea, Cadott
Linda Lehman, Wausau
Marc LeMaire, Viroqua
Mike Lessard, Wauwatosa
Eva Lewis, Eau Claire
Rick Lewis, Eau Claire
James Limbach, Stevens Point
David Lindberg, Milwaukee
Raymond Litzsinger, Green Bay
Dale Long, New Richmond
Constance Lorig, De Pere
Carol Losey, Eau Claire
C MacCrindle, Kansasville
Elizabeth MacKelvie, Appleton
Vic Mandarich, East Troy
Thomas Mandli, Peshtigo
David Manthey, Arpin
Lynn Markham, Stevens Point
Frances Martin, Racine
Paul Martin, Baraboo
Nichelle Martin, Baraboo
Diane Martin, Milwaukee
Sr Annice McClure, Green Bay
Joan McCormick, Milwaukee
Brian McKeon, Monroe
Nancy McMahon, Madison
Autumn Meade, Three Lakes
Dan Melton, Madison
Karen Mesmer, Baraboo
Stephen Meyer, Middleton
Susan Michetti, Mount Horeb
Mary Miller, Milwaukee
Lisa Mink, Rice Lake
Yolan Mistele, Arbor Vitae
Dave Mittlesteadt, Deerfield
Samuel Morningstar, Milwaukee
Christine Morrissey, Appleton
Elise Moser, Sauk City
Martha Munger, Mondovi
Sue Murphy, Shorewood

Charles Myers, Sussex
Tom Nacey, Superior
Paul Nasvik, Hudson
Jane Natzke, De Pere
Ronald Natzke, De Pere
Howard Nelsen, Eau Claire
Peter Nelson, Eau Claire
Patricia Nelson, Eau Claire
Cheryl Nenn, Milwaukee
Forrest Netzel, New Berlin
Daniel Never, Madison
Anne Nischke, Stevens Point
Russell Novkov, Madison
Mariette Nowak, East Troy
Michael O'Brien, Sturtevant
Ellen Ochs, Menomonie
Laura Olah, Merrimac
Barb Olson, Madison
Cindie Olson, Superior
Diane Olson Schmidt, Milwaukee
James Omohundro, Madison
Sam Orlich, Milwaukee
Patricia Orthwein, Scandinavia
Roger Packard, Lake Mills
Jill Page, Brookfield
Barbara Parsons, Platteville
William Pennoyer, Madison
Joan Peterson, La Farge
Pat Pire, Milwaukee
Cheri Price, Racine
Danny Proud, Madison
Dan Pubanz, Shawano
Eleanor Quint, Milwaukee
Joyce Radtke, Milwaukee
Christine Reichelderfer, Madison
MC Reisdorf, Madison
Barb Reithel, Holmen
Beth Rendall, Lake Geneva
Dante Renzoni, Medford
Steve Reusser, Eau Claire
David Rieckmann, Pardeeville
Cameron Roberts, La Crosse
Jeannie Roberts, Madison
Eric Robson, Madison
Madolyn Rogers, Cross Plains
Tazzaleen Rogers, Milwaukee
Suzanne Row, Mequon
Kristine Ruffatto, Waukesha
Fannie Ryals, Milwaukee
Peggy Savides, Mondovi
Karen Schlais, New Berlin
Roger Schmidt, Monona
Richard Schoemer, Cambridge
David Schramm, Belleville
Tami Schraufnagel, Eau Claire
Sheila Schrieber, Brookfield
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John Shelley, Plymouth
Larry Shepler, Eau Claire
Kent Shifferd, Trego
Jane Maya Shippy, Stevens Point
Lynn Shoemaker, Whitewater
Kathlin Sickel, Green Bay
Carol Siewert, Madison
Gladys Simerl, Brookfield
Karla Jo Skinner, Chippewa Falls
Mark Smith, Oconto Falls
Robert Smith, Shorewood
Ken Somerville, Lake Geneva
Kathleen Spaeth, Chippewa Falls
Terri Stanley, Eau Claire
Michael Steele, Middleton
Rick Stel, Markesan
Marsha Stelzer, Rice Lake
James Tenorio, Menomonie
Eric Thompson, Fitchburg
Carol Tolejano Tolejano, Middleton
Julie Toman, Waukesha
John Twiggs, Marshfield
Lisa Vieth, Kendall
Edward Vlach, Black River Falls
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Barbara White, Madison
Herman Whiterabbit, Madison
Sara Willadsen, Sheboygan
Margaret Wilson, Green Bay
Sylvia Witte, Eau Claire
Thomas Wolfe, Fish Creek
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December 15, 2021

Meghan Williams – WY/3
Department of Natural Resources
PO Box 7921
Madison, WI 53707

Submitted electronically via: DNR105PFASRule@wisconsin.gov

Re: Comments on Draft Surface Water Quality Criteria and Analytical Methods for PFAS – WY-23-19

Dear Ms. Williams:

The 3M Company ("3M") appreciates the opportunity to review and comment on the proposed PFAS public health significance levels for surface water quality issued by the Wisconsin Department of Natural Resources ("DNR") on September 14, 2021 ("Proposed Rule"). The Proposed Rule establishes water quality standards for perfluorooctane sulfonate (PFOS) of 8 ppt for both public and non-public water supplies, and for perfluorooctanoic acid (PFOA) of 20 ppt for public water supplies and 95 ppt for non-public water supplies. As a science-based company with substantial experience, expertise, and product stewardship of these chemicals, 3M is well positioned to provide input on the Proposed Rule. To summarize briefly some of our main issues, the Proposed Rule relies on weak scientific evidence, uses EPA health advisory information improperly, and violates Wisconsin law. We would ask that the DNR take a step back as it works on these rules to address the issues cited below and others raised in the public commenting process.

I. EPIDEMIOLOGICAL RESEARCH DOES NOT SUPPORT HEALTH IMPACTS

The conclusions of many of the epidemiological studies on various PFAS "suggesting probable health effects" have been called into question by additional scientific research. In fact, Wisconsin's own Department of Health Services (DHS) conceded that using epidemiological studies to set health-based values for PFOS and PFOA is imprecise.[1] For example, several observational epidemiological studies reported an association between PFOA exposure and increased cholesterol levels, however these findings are inconsistent with experimental studies which have observed decreased cholesterol levels associated with markedly higher PFOA concentrations. These experimental studies now include a Phase 1 clinical trial in humans (Convertino et al. 2018) and a transgenic mouse model that mimics human lipoprotein

[1] Available at https://www.dhs.wisconsin.gov/publications/p02434v.pdf, at p. 190 (last visited Dec. 10, 2021).

metabolism (Pouwer et al. 2019). A primate study on PFOS (Chang et al. 2017) also presents observations inconsistent with the assertion that PFOS would result in increased cholesterol levels.

In 2018, the EFSA Scientific Panel on Contaminants in the Food Chain (CONTAM Panel) released a provisional tolerable weekly intake (TWI) for PFOA and PFOS based on cross-sectional epidemiological studies that reported positive associations between serum cholesterol and PFOA/PFOS (Knutsen et al. 2018). However, after careful consideration of the experimental evidence, the EFSA CONTAM Panel has acknowledged the uncertainty regarding its cholesterol assessment to be larger than what was assumed in 2018.

In its Toxicological Profile for Perfluoroalkyls, the U.S. Agency for Toxic Substances and Disease Registry ATSDR characterized the toxicologic and adverse health effects information for perfluoroalkyls, including PFOS, based on "all relevant toxicologic testing and information that has been peer-reviewed," reflecting data from hundreds of studies. ATSDR concluded regarding the carcinogenicity of perfluoroalkyls: "The available human studies have identified some potential targets of toxicity; however, *cause and effect relationships have not been established for any of the effects, and the effects have not been consistently found in all studies*" (emphasis added).[2]

The Expert Health Panel for per- and poly-fluoroalkyl substances (PFAS) was established to advise the Australian Government on the evidence for potential health impacts associated with PFAS exposure. In its 2018 assessment of the latest available systematic reviews of human epidemiological studies and national/international governmental studies on PFAS, the Panel concluded "there is mostly limited or no evidence for any link with human disease" and that "there is no current evidence that supports a large impact on a person's health as a result of high levels of PFAS exposure."[3] The Panel reviewed five key national and international reports and three systematic reviews compiling studies that analyzed human epidemiological evidence regarding exposure to PFAS (primarily PFOS and PFOA) and cancer. Like ATSDR, the Australian Expert Health Panel analyzed hundreds of studies in reaching this conclusion. With respect to cancer, the Panel concluded "there is no current evidence that suggests an increase in overall cancer risk."

3M commented has commented extensively on the lack of relationship between human health effects and PFAS, including in recent comments to Wisconsin's Department of Natural Resources proposed MCLs for PFOS and PFOA.[4]

II. THE PROPOSED PFOS STANDARDS ARE NOT TECHNICALLY SOUND

[2] Agency for Toxic Substances and Disease Registry (ATSDR). 2018. Toxicological profile for Perfluoroalkyls. (Draft for Public Comment), https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

[3] Australian Government, Department of Health. 2018. Expert Health Panel for PFAS Report, https://www1.health.gov.au/internet/main/publishing nsf/Content/ohp-pfas-expert-panel.htm.

[4] *See* 3M Comments on Proposed Rule DG-24-19, Amendments to NR809, submitted to DNR on December 8, 2021.

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A. The Technical Assumptions Underlying The Proposed PFOS Standards are Incorrect

The assumptions underlying the proposed PFOS surface water quality standards are based on faulty data and cannot serve as the basis for such standards. As discussed above the latest available research has failed to show a causal relationship between exposure to PFAS – including PFOS – and health effects. DNR also relies on research showing a questionable relationship between fish consumption and PFOS concentrations and improperly applies the wrong reference dose to assess the health risk as a result of fish consumption.

In addition**,** the Natural Resources Board (NRB) relies on the Great Lakes Consortium for Fish Consumption Advisories Best Practice for Perfluorooctane Sulfonate (PFOS) Guidelines (PFOS Guidelines) as the basis for using fish consumption as the appropriate surface water exposure pathway.[5] The PFOS Guidelines rely on a general finding that "the body burden of PFOS is positively correlated with fish consumption,"[6] without pointing to studies that discuss the impacts of that finding. However, even if this were true, its significance is undermined by the fact that, as the Consortium acknowledges: "Larger cohort and cross-sectional studies have yielded somewhat conflicting results… [A] study by Christensen et al. (2017) using National Health and Nutrition Examination Survey (NHANES) data (considering a large population across many geographic areas) *did not find correlations between fish consumption and increased PFOS concentrations in adjusted analyses*, but PFOS was positively associated with shellfish consumption."[7]

B. DNR Proposed PFOS Standards are Improperly Based on EPA's Reference Dose used for its Drinking Water Advisory

NRB begins its analysis by asserting: "there are established PFOS thresholds corresponding to recommended fish consumption frequencies which are designed to reduce risks from exposure to PFOS while still receiving the benefits of fish consumption… [i]n other words, the proposed definition of public health significance aims to ensure that levels of PFOS in fish will be such that people can consume fish at a frequency of up to one meal per week (32 grams/day) *without exceeding EPA's non-cancer toxicity RfD of 2 x 10-5 mg/kg-day*.[8] However, EPA's non-cancer RfD of 2 x 10-5 mg/kg/day is used to calculate EPA's lifetime health drinking water advisory of 70ppt and may only be used for the drinking water exposure pathway.[9]

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[5] WY-23-19 Surface Water Quality Standards for PFOS and PFOA Rule Package Technical Support Document at 11-13 (September 14, 2021) (herein after, TSD).

[6] Great Lakes Consortium for Fish Consumption Advisories Best Practice for Perfluorooctane Sulfonate (PFOS) Guidelines, at 2, (November 2019) Available at https://www.health.state.mn.us/communities/environment/fish/docs/consortium/bestpracticepfos.pdf (last visited Dec. 10, 2021).

[7] *Id.* (emphasis added).

[8] TSD at 11.

[9] Peter C. Grevatt, Director, EPA Office of Ground and Drinking Water, Clarification about the Appropriate Application of the PFOA and PFOS Drinking Water Health Advisories (November 15, 2016) (emphasis added),

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Because EPA's noncancer toxicity reference dose is meant solely to inform a drinking water exposure pathway, NRB's reliance on that reference dose to inform fish consumption frequencies and associated public heath significance levels contravenes EPA guidance and is scientifically unsound. Specifically, EPA issued guidance in 2016 clarifying the "appropriate application of the PFOA and PFOS drinking water health advisories"[10] and explaining the Health Advisories (HAs) "only apply to exposure scenarios involving drinking water and *cannot be used in identifying risk levels for ingestion of food sources, including… fish…*Calculation of specific risk levels for food would require development of entirely different exposure assumptions and is not a part of the HA derivation methodology."[11] Therefore, NRB's exposure risk calculation based on fish consumption is incorrect, and 3M respectfully submits that NRB should revise its methodology, including making it consistent with EPA guidance.

III. THE PROPOSED PUBLIC HEALTH SIGNIFICANCE LEVELS FOR PFOA IN PUBLIC AND NON-PUBLIC WATER SUPPLIES ARE DEFICIENT UNDER THE APA

A. DNR's Standard for PFOA in Public Water Supplies is Technically Flawed

The proposed standard for PFOA in public water supplies is technically flawed. DNR acknowledged in its technical support document (TSD) that "PFOA doesn't bioaccumulate to high concentrations in fish" and therefore asserted that "water ingestion is the exposure pathway of most concern for PFOA" and "it is reasonable to define public health significance based on the likelihood that, and degree to which, surface waters could be ingested tissue."[12]

As an initial matter, DNR's public health significance for public water supplies is fundamentally flawed because it is premised on the previously-defined Departments of Health Services (DHS) and Natural Resources (DNR) level, which is the subject of a concurrent rulemaking process. In the proposed amendments to NR809 relating to the promulgation of new drinking water maximum contaminant levels (MCLs) for PFAS, DNR improperly relied on DHS's groundwater-related analysis to set the standard for PFOA. However, as 3M highlighted in its comments on that proposal, DHS's analysis was scientifically unsound.[13] 3M incorporates those comments by reference with respect to the PFOA standard in the Proposed Rule. In short, the proposed MCLs do not reflect the body of scientific literature on health effects from exposure to PFOA and are therefore overly conservative, technically flawed, and provide no additional protection compared to EPA's current drinking water health advisories.

Second, according to DNR, the 20 ppt PFOA standard was designed to protect children by using 10kg as the reference body weight – roughly the weight of a 12 month old child – and

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available at https://www.epa.gov/sites/default/files/2016-11/documents/clarification_memo_pfoapfos_dw_has.pdf (last visited Dec. 13, 2021).

[10] *Id.*

[11] *Id.*

[12] TSD at 17.

[13] *See* 3M Comments on Proposed Rule DG-24-19, Amendments to NR809, submitted to DNR on December 8, 2021.

assuming a drinking water intake rate of one liter per day, both of which inform the Proposed Rule's drinking water MCL formula.[14]

As discussed above, 3M incorporates by reference its comments on the concurrent PFOA MCL rulemaking. For purposes here, 3M notes that DNR fails to explain why its assumptions informing the "Acceptable Daily Intake" (ADI) aspect of the drinking water MCL formula are scientifically appropriate. In this regard, the only source DNR cited to support the ADI is a 2019 DHS "Scientific support document for PFOA groundwater standard." That guidance document explicitly states that the 20 ppt PFOA groundwater enforcement standard recommendation "is based on a study that used modeling to estimate how much PFOA a mother has to be exposed to in order to protect the infant from developmental effects."[15] However, DNR's purported formula in the Proposed Rule does not use a mother's weight – instead, it uses an infant's weight (10kg), which underscores one of many flaws in DNR's approach. For the reasons described above, DNR's technical rationale is erroneous, and the resulting standard is flawed.

B. DNR'S Assumptions Underlying the Proposed PFOA Standard for Non-Public Water Supplies are Incorrect

DNR's proposed standard for non-public water supplies is problematic for numerous reasons. First, the proposed non-public water supply standard is premised on the incidental ingestion rate. In this regard, DNR explains that it "followed an approach published by EPA in 2019" to determine the incidental ingestions rate.[16] That approach is set forth in U.S. EPA guidance titled "Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin." That guidance document addresses cyanobacteria, commonly referred to as blue-green algae, not PFOA. More importantly, in setting levels for microcystin, which can be produced by a variety of toxigenic cyanobacteria genera, and cylindrospermopsin, which can be produced by a variety of toxigenic cyanobacteria species, the guidance states:

> Given that toxigenic cyanobacterial blooms typically are seasonal events, recreational exposures are likely to be episodic, and may be short term in nature . . . *If used as a water quality criterion for assessment and listing purposes, the EPA recommends a maximum of three excursions across a recreational season and observation of that pattern across multiple years to reflect seasonal dynamics and occurrence patterns of HABs* [harmful algal bloom].[17]

Setting aside the propriety of relying on U.S. EPA guidance for cyanobacteria as a proxy for PFOA – the constituent that DNR seeks to regulate here – DNR has not indicated that it

[14] TSD at 19.
[15] Available at https://dnr.wi.gov/topic/Contaminants/documents/pfas/PFOAScientificSupport.pdf (last visited Dec. 15, 2021).
[16] TSD at 20.
[17] Available at https://www.epa.gov/sites/default/files/2019-05/documents/hh-rec-criteria-habs-document-2019.pdf at p. 17 (last visited Dec. 10, 2021).

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sampled surface water as EPA recommends, i.e., multiple times over a recreational season and across multiple years.[18]

Moreover, the datasets of samples analyzed for PFAS that DNR reviewed are not statistically significant and therefore are an inappropriate grounds on which to set the proposed standard.[19]

Not only is DNR's sampling approach flawed, its proposed regulation is premised on data derived from time spent in outdoor swimming pools – as opposed to freshwaters – which underscores the rushed, arbitrary and capricious nature of the Proposed Amendments. DNR acknowledges that the EPA's selected recreational exposure data on which it relies "do not directly measure time spent in freshwater" although DNR asserts "previous research demonstrates that time spent in outdoor swimming pools is similar to time spent in freshwaters and thus EPA (2019) concluded that these data could reasonably be used to represent recreational exposure to freshwaters."[20] Even if it were true that such data were representative, DNR's flawed sampling approach coupled with the lack of actual freshwater recreational exposure data renders the Proposed Rule arbitrary and capricious. DNR should evaluate *actual* recreational exposure to PFOA in freshwaters, rather than rushing and relying on purported representative data.[21]

The assumptions underlying the calculations of the PFOA standard for non-public water supplies are also flawed. The technical support document states that the threshold level was calculated through an incidental ingestion rate of .21 liters per day, which DNR explains is based in the 90th percentile of exposure for children aged 6 to 10. DNR selected this incidental ingestion rate asserting that it is "consistent with EPA's Human Health Methodology." TSD at 20. This EPA Guidance document, which is over 20 years old, specifically states that "the 2000 Human Health Methodology does not routinely include criteria to address incidental ingestion of water from recreational uses." Moreover, it provides:

> EPA reviewed information that provided estimates of incidental water ingestion rates averaged over time. EPA generally believes that the averaged amount is **negligible** and will not have any impact on the chemical criteria values representative of both drinking water and fish ingestion.[22]

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[18] *See, e.g.*, TSD at 18 (discussing how DNR determined PFOA exposure pathways and listing surface water samples from 42 waterways collected in 2020 *alone* as part of "long term trends" monitoring in Wisconsin).
[19] *See id.* (indicating the "paired fish and water" dataset involved 124 water samples and the rivers long term trends dataset involved 42 water samples).
[20] *Id.* at 21-22.
[21] The shortcomings of DNR's rushed approach are evident in its revised EIA. DNR initially published a proposed Economic Impact Analysis (EIA) for the Proposed Rule that predicted a $2.2 million maximum annual cost of compliance with the Proposed Amendments and the maximum cost of any two-year period to be $4.2 million. In response to comments received on the draft EIA, DNR re-evaluated its economic analysis and revised the estimates to $4.8 million and $9.2 million, respectively. DNR's compliance cost estimates have more than doubled since initially publishing the EIA for public comment.
[22] Available at https://www.epa.gov/sites/default/files/2018-10/documents/methodology-wqc-protection-hh-2000.pdf at 4-3 (emphasis added) (last visited Dec. 12, 2021).

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At the same time, however, the guidance states "EPA also believes that incidental/accidental water ingestion could be important for the development of microbial contaminant water quality criteria, and for either chemical or microbial criteria for States where recreational uses such as swimming and boating are substantially higher than the national average."[23] Even if the analyses in this more than two-decade-old guidance document were correct, DNR has not even suggested, let alone provided data to support, that swimming or boating in Wisconsin is substantially higher than the national average. DNR's reliance on this guidance document and its associated incidental ingestion rate assumptions are technically unsound, which, combined with the other shortcomings discussed above, render its proposed PFOA standard for non-public water supplies arbitrary and capricious.

IV. DNR'S PROPOSED STANDARDS ARE NOT NECESSARY TO PROTECT HUMAN HEALTH

In proposing surface water quality standards for PFOS, the Wisconsin Natural Resources Board (NRB) asserts that "global distribution is of concern" because "PFAS have documented toxicity to animals and because epidemiological studies have suggested probable links to several human health effects."[24] However, distribution of PFOA and PFOS in the United States has been declining. Neither PFOS or PFOA have been manufactured in, or imported into, the United States for many years. In fact, over twenty years ago, 3M announced it would voluntarily phase out production of PFOA and PFOS as a precautionary measure. That phase out has been complete for nearly two decades.

PFAS manufacture and use has significantly declined in recent years. EPA regulations prevent manufacturers from manufacturing or importing PFOS or PFOS precursors, subject to a handful of very narrow critical use exceptions with limited exposure potential approved by EPA. These regulations have been in place for nearly two decades, and PFOS has not been reported to EPA as manufactured or imported into the United States since at least 2006. EPA has also reported a decrease of over 75% in the 95th percentile serum PFOS concentrations between the 1999-2000 cycle and the 2015-2016 cycle.[25]

V. THE PFOS AND PFOA STANDARDS VIOLATE WISCONSIN LAW

Wis. Stat. § 281.15 (2015) mandates that the department promulgate water quality criteria which are not more stringent than reasonably necessary to ensure attainment of the designated use for the waterbodies. NRB does not explain the designated uses of the water bodies subject to the 8ppt for PFOS, nor does it explain why 8ppt is reasonably necessary to ensure attainment of those uses. Similarly, for PFOA, NRB does not explain why 20 ppt and 95 ppt for public and non-public water sources respectively are appropriate. Further, the Proposed Rule cites to

[23] *Id*.
[24] TSD at 3.

[25] *See* Order Granting Approval of a Proposed Rule Change To Align Certain MSRB Rules to Securities Exchange Act Rule 15 l, 85 Fed. Reg. 14115 (July 1, 2020).

neighboring states such as Michigan that have higher proposed thresholds, without explaining why the standards that DNR proposes are necessary and not overly stringent.

3M has provided extensive comments to other agencies, including the Agency for Toxic Substances and Disease Registry, regarding the lack of scientific support and consensus around claimed impacts of PFAS exposure on fetuses and infants, cancer, antibody response, and other issues. 3M respectfully requests that DNR revise its analysis and proposed surface water quality standards to be based on the most precise and up-to-date science, as well as to address gaps in the underlying analysis.

3M appreciates the opportunity to provide comments on the proposed regulation and requests that DNR revise its proposal consistent with these comments.