



NORTH CAROLINA
Environmental Quality

April 30, 2019

ROY COOPER

Governor

MICHAEL S. REGAN

Secretary

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Director

«PT_Contacts_Formal_Name»
«PT_Contacts_Title»
«WWTP_Name»
«PT_Contacts_B1_Addr_1»
City, NC «PT_Contacts_B1_Zip»

Dear «PT_Contacts_Formal_Name»,

Several emerging compounds have been found in North Carolina waters, specifically, 1,4-dioxane and a group of chemicals known as perfluoroalkyl and polyfluoroalkyl substances (PFAS, also referred to as PFCs). Data reviewed as part of the UCMR (Unregulated Contaminant Monitoring Rule) has indicated elevated concentrations for these compounds in the Cape Fear River Basin. In addition, ambient monitoring performed by DWR's Water Sciences Section have confirmed the presence of these compounds in the Cape Fear River Basin (<https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/1-4-dioxane>).

Background

1,4-dioxane is a clear liquid that is highly miscible in water. It has historically been used as a solvent stabilizer and is currently used for a wide variety of industrial and manufacturing purposes. The compound can be found in industrial solvents, paint strippers, and varnishes and is often produced as a by-product of chemical processes to manufacture soaps, plastics, and other consumer products.

The U.S. EPA has not established a maximum contaminant level for 1,4-dioxane in drinking water but has characterized it as "likely to be carcinogenic to humans" and has established a drinking water health advisory of 35 ug/L. North Carolina has a calculated human health surface water criterion with an associated estimated lifetime cancer risk of one in one million at a concentration for 1,4-dioxane of 0.35 ug/L in water supplies and 80 ug/L in all other waterbodies (15A NCAC 02B .0208).

PFAS compounds are most often associated with nonstick coatings, plating operations, firefighting foams, and stain- and water-resistant treatments for clothing, furniture and carpeting.

PFAS has been found to have adverse effects in laboratory animals and humans when ingested. To provide Americans with a margin of protection from a lifetime of exposure to PFAS from drinking water, EPA has established the health advisory levels of 70 ng/L individually and combined for two of the most common PFAS compounds: PFOA (perfluorooctanoic acid) and PFOS (perfluorooctane sulfonate).

Required Actions

To assess the levels of these compounds throughout the Cape Fear and to assist DWR in developing a Management Strategy to address and reduce levels of these emerging compounds, POTWs with approved Pretreatment Programs are hereby required to perform investigative monitoring at the treatment plant influent for 1,4-dioxane and total PFAS monthly for three consecutive months starting in July 2019. Such investigative actions can be required under 15A NCAC 02B .0508 (b)(2) and G.S. 143-215.66.



North Carolina Department of Environmental Quality | Division of Water Resources
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Samples collected should be representative of the typical wastewater flow to your facility. Sufficiently sensitive test methods shall be used.

- To locate a lab capable of performing the PFAS analysis, please visit <https://www.denix.osd.mil/edqw/accrreditation/accrreditedlabs/> and search by method “PFAS by LCMSMS Compliant with Table B-15 of QSM 5.1 or Latest Version”.
 - Grab samples are required to avoid cross-contamination and ensure consistency.
 - Please refer to Attachment B for the analyte list. Each facility shall provide results for as many of the PFAS compounds as possible, specifically including PFOA and PFOS.
- To locate a lab certified to perform 1,4-dioxane analysis using EPA Method 624.1, please visit <https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/certified-laboratory-listings>. Be sure to specify 1,4-dioxane by EPA method 624.1 when contacting the labs.
- All sample results shall be submitted to PERCS by October 31, 2019 and shall be sent to the following email address (please include the lab sheets with the test results): Pretreatment.Results@ncdenr.gov. Please include your NPDES permit number in your subject heading.

Attachment A outlines recommended actions on how to assess potential sources, monitor, and work with your industries to reduce potential sources of these compounds. You are not required to implement these actions until you have received notification from the Division to do so. However, if your influent samples exceed the human health surface water criteria for 1,4-dioxane pertaining to your receiving stream classification, contact your DWR Pretreatment Program coordinator to discuss your facility’s allowable discharge concentration. If your influent levels exceed your facility’s allowable discharge concentration, you should take proactive steps to begin reducing or eliminating 1,4-dioxane discharges to your facility.

The PFAS drinking water health advisory of 70 ng/L is the target concentration for the sum of sample results for PFOA and PFOS. Therefore, actions to reduce these compounds will be required for facilities with influent levels greater than a total PFAS value of 70 ng/L if there are water supply intakes downstream of your facility’s discharge. Again, you are not required to implement actions in Attachment A until you have received notification from the Division to do so. Please be aware that criteria are being developed for PFAS compounds and are likely to be lower than the current drinking water advisory level. Results for PFAS that do not currently require action may trigger reduction activities in the future.

More Information

DWR will be holding a technical informational session on May 21, 2019 from 10 am to 3 pm at the Herbert C. Young Community Center, 101 Wilkinson Ave., Cary, NC. At this time registration for this workshop is limited to approved Pretreatment Program POTW staff due to space limitations. Please register at <http://tinyurl.com/NCECTIS>.

The Department looks forward to working closely with you on this important public health issue. Data from the UCMR and other sources will continue to be evaluated to determine next steps to reduce the discharge of 1,4-dioxane and PFAS throughout the State.

Please contact the appropriate PERCS staff member if you have any questions or concerns: Deborah Gore 919-707-3624, Monti Hassan 919-707-3626 or Vivien Zhong 919-707-3627 or via email (firstname.lastname@ncdenr.gov).

Sincerely,

Linda Culpepper, Director
Division of Water Resources, NCDEQ

Cc: Dana Satterwhite, WSS

Attachment A

<due dates for activities will be added on a case-by-case basis>

1. **Conduct Initial Screening:** Conduct a review of your industrial users to identify industrial users that may be potential significant sources of 1,4-dioxane and/or PFAS. The following types of industrial users may be potential significant sources for these chemicals:

Potential Sources of PFOA & PFOS for POTWs:

- Platers/Metal Finishers
- Paper and Packaging Manufacturers
- Tanneries and Leather/Fabric/Carpet Treaters
- Manufacturers of Parts with PTFE (polytetrafluoroethylene, Teflon type) Coatings (i.e., Bearings)
- Landfill Leachate
- Centralized Waste Treaters
- Contaminated Sites
- Firefighting Foam
- Any other known or suspected sources of PFAS

Potential Sources of 1,4-dioxane for POTWs:

- Paints, Varnishes and Lacquers Manufacturers
- Cosmetics, Deodorants, Cleaning and Detergent Manufacturers
- Pharmaceutical Manufacturers
- Organic and Inorganic Chemical Manufacturers
- Plastics manufacturers or recyclers
- Rubber Manufacturers
- Centralized Waste Treaters
- Photographic Film, Paper and Plate Manufacturers, Commercial Printing
- Electroplating/ Polishing, Semiconductors and Electronic Components Manufacturers
- Pesticide and Agriculture Manufacturers
- Solid Waste Combustors and Incinerators
- Cement Manufacturers
- Abrasive Product Manufacturers
- Roofing, Siding, and Insulation Material Merchant Wholesalers
- Scintillating Fluids Manufacturers
- Dyes and Fiber Manufacturers
- Any other known or suspected sources of 1,4-dioxane

2. **Develop a Monitoring Plan:** Once you have developed a list of *potential* 1,4-dioxane and PFAS sources, you will need to evaluate each one to determine whether it is a *probable* source of 1,4-dioxane or PFAS and develop a strategy for sampling these probable sources. You will likely need to review records and interview your contacts to find out which sources use/have used or accept/have accepted 1,4-dioxane or PFAS containing materials or wastes.

Once you have a list of probable sources, develop a plan to monitor them. Your plan will most likely include your commitment to monitor all your probable sources, when and where you will sample, how you will conduct sampling, transport your samples and analyze them at your chosen laboratory. You may be able to eliminate several probable sources located near one another with one downstream collection system sample. If you have many probable sources, you may also need more time to

conduct monitoring. No pre-approval of your plan is required. You should submit your plan to PERCS by DATE.

3. **Perform Source Monitoring:** Sample the discharge from each probable source identified in your monitoring plan for 1,4-dioxane or PFAS depending on your identification as a probable source following the sampling procedures your chosen labs recommended. Begin this sampling no later than DATE.
4. **Reduce/Eliminate Sources:** If significant sources of 1,4-dioxane or PFAS are found through source monitoring, you are required to follow-up with the source(s) to reduce and/or eliminate 1,4-dioxane or PFAS in their effluent. Source reduction and elimination efforts may include product substitution, operational controls, pretreatment and clean-up of historical contamination.
5. **Submit an Interim Report:** Summarize the list of potential sources and your determination regarding whether they are a probable source, sampling data collected, and evaluation conducted to-date for items 1 – 4 above to the PERCS Unit by DATE.
6. **Evaluate Impacts:** If you find sources discharging 1,4-dioxane or PFAS to your WWTP from this monitoring, you are required to monitor your WWTP influent and effluent for the chemicals detected at the sources for three consecutive months beginning DATE. If effluent results are found to be greater than the applicable criterion you are required to continue working with those sources to achieve further reductions.
7. **Submit a Summary Report:** Submit the results of any additional monitoring data (WWTP influent, effluent, or source monitoring) and summary of 1,4-dioxane and PFAS source reduction and/or elimination effort to DWR/PERCS by DATE. Staff will review the information reported and will contact you about any required follow-up actions.

Attachment B

To locate a lab capable of performing the PFAS analysis, please visit <https://www.denix.osd.mil/edqw/accreditation/accreditedlabs/> and search by method “PFAS by LCMSMS Compliant with Table B-15 of QSM 5.1 or Latest Version”. Grab samples are required to avoid cross-contamination and ensure consistency.

It is the Division’s understanding that this test method is capable of providing results for the listed PFAS compounds listed below. The Division recognizes that there may be variations from lab to lab. Each facility shall provide results for PFOA, PFOS, and shall include as many of the following PFAS compounds as possible:

Analyte Name	Acronym	Fluorinated Carbon Chain Length	Molecular Formula	CAS Number
Perfluorotetradecanoic acid	PFTeA	C ₁₄	C ₁₃ F ₂₇ COOH	376-06-7
Perfluorotridecanoic acid	PFTriA	C ₁₃	C ₁₂ F ₂₅ COOH	72629-94-8
Perfluorododecanoic acid	PFDoA	C ₁₂	C ₁₁ F ₂₃ COOH	307-55-1
Perfluoroundecanoic acid	PFUnA	C ₁₁	C ₁₀ F ₂₁ COOH	2058-94-8
Perfluorodecanoic acid	PFDA	C ₁₀	C ₉ F ₁₉ COOH	335-76-2
Perfluorononanoic acid	PFNA	C ₉	C ₈ F ₁₇ COOH	375-95-1
Perfluorooctanoic acid	PFOA	C ₈	C ₇ F ₁₅ COOH	335-67-1
Perfluoroheptanoic acid	PFHpA	C ₇	C ₆ F ₁₃ COOH	375-85-9
Perfluorohexanoic acid	PFHxA	C ₆	C ₅ F ₁₁ COOH	307-24-4
Perfluoropentanoic acid	PFPeA	C ₅	C ₄ F ₉ COOH	2706-90-3
Perfluorobutanoic acid	PFBA	C ₄	C ₃ F ₇ COOH	375-22-4
Perfluorodecanesulfonic acid	PFDS	C ₁₀	C ₁₀ F ₂₁ SO ₃ H	335-77-3
Perfluorononanesulfonic acid	PFNS	C ₉	C ₉ F ₁₉ SO ₃ H	68259-12-1
Perfluorooctanesulfonic acid	PFOS	C ₈	C ₈ F ₁₇ SO ₃ H	1763-23-1
Perfluoroheptanesulfonic acid	PFHpS	C ₇	C ₇ F ₁₅ SO ₃ H	375-92-8
Perfluorohexanesulfonic acid	PFHxS	C ₆	C ₆ F ₁₃ SO ₃ H	355-46-4
Perfluoropentanesulfonic acid	PFPeS	C ₅	C ₅ F ₁₁ SO ₃ H	2706-91-4
Perfluorobutanesulfonic acid	PFBS	C _{4OMG}	C ₄ F ₉ SO ₃ H	375-73-5
Perfluorooctanesulfonamide	PFOSA	C ₈	C ₈ F ₁₇ SO ₂ NH ₂	754-91-6
2-(N-Ethylperfluorooctanesulfonamido) acetic acid	N-EtFOSAA	C ₈	C ₈ F ₁₇ SO ₂ N(C ₂ H ₅)CH ₂ COOH	2991-50-6
2-(N-Methylperfluorooctanesulfonamido) acetic acid	N-MeFOSAA	C ₈	C ₈ F ₁₇ SO ₂ N(CH ₃)CH ₂ COOH	2355-31-9