Fiscal Note for Adoption of 15A NCAC 02B .0512 and 02H .0923

Rule Citation Number 15A NCAC 02B .0512 and 15A NCAC 02H .0923

Rule Topic: PFOS, PFOA, and GenX Monitoring and Minimization

Agency: Environmental Management Commission
(Water Quality Committee)

DEQ Division: Division of Water Resources

Staff Contacts: Stephanie C. Bolyard, PhD, CPM, DEQ
Stephanie.Bolyard@deq.nc.gov

Julie Grzyb, DWR (Permitting)
Julie.Grzyb@deq.nc.gov

Karen Preston, DWR (Permitting)
Karen.Preston@deq.nc.gov

Impact Summary:

State government:	Yes
Local government:	Yes
Private Sector:	Yes
Substantial impact:	Yes

Authority: G.S. 143-215(a); 143-215.1(a); 143-215.1(b); 143-215.1(c); 143-215.3(a)(1); 143-215.3(a)(2); 143-215.3(a)(14); 143-215.6A; 143-215.6B; 143-215.6C; 143-215.65; 143-215.66; 143-215.67; 143-215.69

Necessity: Rules 15A NCAC 02B .0512 and 15A NCAC 02H .0923 are intended to achieve two key objectives: (1) Characterize the presence of PFOS, PFOA, and GenX in discharges from PFOS, PFOA, and GenX industrial NPDES dischargers and their associated indirect dischargers (i.e., SIUs going to POTWs with pretreatment programs), and (2) require affected entities (subset of industrial direct dischargers and SIUs) to develop minimization plans that identifies approaches to reduce PFOS, PFOA, and GenX (where applicable) discharges directly or indirectly to surface waters.

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Abbreviations

Abbreviation	Term
BMPs	Best Management Practices
CWT	Centralized Waste Treatment
DEQ	Department of Environmental Quality
DWR	Division of Water Resources
ELG	Effluent Limitation Guideline
EMC	Environmental Management Commission
EPA	Environmental Protection Agency
GenX (HFPO-DA)	Hexafluoropropylene oxide dimer acid
MCLGs	Maximum contaminant level goals
NAICS	North American Industry Classification System
NC	North Carolina
NCAC	NC Administrative Code
NCDEQ	North Carolina Department of Environmental Quality
NCGS	North Carolina General Statutes
NPDES	National Pollutant Discharge Elimination System
OCPSF	Organic chemicals, plastics & synthetic fibers
PFAS	Per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonic acid
POTW	Publicly owned treatment works
PV	Present Value
SIC	Standard Industrial Classification
SIUs	Significant Industrial Users

I. Reason for Rule Adoption

Per- and polyfluoroalkyl substances (PFAS) are widely used, long lasting chemicals, components of which break down very slowly over time. The chemicals are used in a variety of industrial and commercial processes as well as consumers products. Because of their widespread use and their persistence in the environment, many PFAS are found in the blood of people and animals all over the world, including NC, and are present at low levels in a variety of food products and in the environment. PFAS are found in water, air, fish, and soil at locations across the nation and the globe. Scientific studies have shown that exposure to some PFAS in the environment may be linked to harmful health effects in humans and animals.[1] There are thousands of PFAS chemicals, and they are found in many different consumer, commercial, and industrial products. This makes it challenging to study and assess the potential human health and environmental risks.[2]

The rationale for this proposed rule adoption is to support the state's commitment towards understanding and characterizing the extent of perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA), and hexafluoropropylene oxide dimer acid (GenX)levels from National Pollutant Discharge Elimination System (NPDES) dischargers. The Environmental Management Commission (EMC) has prioritized and committed to taking the first steps towards understanding the sources and levels of targeted PFAS and promoting voluntary actions by affected entities to reduce these discharges to the environment. The EMC Water Quality Committee passed the following motion on November 13, 2024 - "*The WQC directs DWR staff to develop a PFAS Minimization Initiative for major and minor industrial direct dischargers to surface water and all Significant Industrial Users (SIUs) that discharge to Publicly Owned Treatment Works (POTWs). The minimization initiative will require monitoring for PFAS, and implementation of minimization activities required to eliminate or significantly reduce discharges of PFOS, PFOA, and GenX, (levels TBD) over a 3-to-5-year period*."

Currently, the Department of Environmental Quality (DEQ or Department) is adding PFAS monitoring conditions to permit renewals that include required PFAS sampling but reporting data separately from Discharge Monitoring Reports until a certified test method is available. This condition has only been added to a limited number of POTW permits to date and the conditions do not include requiring minimization. These proposed rules will enable the Department to collect PFAS data more quickly and assess, after one-year, industrial facilities that should pursue a minimization plan. This proposed Rule will expedite the process of seeking reductions of PFOA, PFOS, and GenX (HFPO-DA) in surface waters. Since the state does not have surface water standards for PFAS compounds or a certifiable test method,

[1] https://www.epa.gov/system/files/documents/2024-04/pfas-npdwr_final-rule_ea_appendices.pdf
[2] https://www.epa.gov/pfas/pfas-explained

requiring PFAS minimization and assessing appropriate limits for NPDES industrial permits is difficult except for certain situations where technology-based standards can be determined. PFOS and PFOA are legacy PFAS contaminants found throughout the state and of most concern in water supplies. GenX is a contaminant that is produced by a major manufacturer in Fayetteville and has impacted surface waters throughout NC.

A. Prevalence of the PFAS Compounds in NC Surface Waters

Through the current NC ambient water quality sampling program, PFAS were added as analytes in recent measurement campaigns specifically at drinking water reservoirs starting in 2018. The sampling locations for PFAS include lakes greater than 10 acres and other surface waters that are a source of water for public water systems. There are 17 river basins in NC, 13 river basin water supply reservoirs/lakes have been sampled for PFAS, and the results are shown below in Table 1 (data collected from 2018 to 2023). The table summarizes the breakdown of the minimum, maximum, and average of PFOS, PFOA, and GenX concentrations across each of the 13 river basin water supplies sampled. At least one PFOS, PFOA, and GenX compound was detected in 10 basins with none were detected in the Hiwassee, Watauga and French Broad basins. The Cape Fear River basin had the highest concentrations relative to the other basins.

Table 1. Summary of PFOS, PFOA, and GenX Data for North Carolina Public Water Supply Reservoirs

River Basin	PFAS Concentration (ng/L)								
	PFOS			PFOA			GenX (HFPO-DA)		
	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
Broad	2.1	3.4	2.6	2.3	2.6	2.4	ND		
Cape Fear	2.9	110	18	2.2	86	11	4.2		
Catawba	2	2.5	2.1	5.3			ND		
Chowan	No data*								
French Broad	ND			ND			ND		
Hiwassee	ND			ND			ND		
Little Tennessee	1.9	2.3	2.1	ND			ND		
Lumber	No Data+								
Neuse	2.1	23	5.8	2.1	9.3	4.1	ND		
New	4.1			ND			ND		
Pasquotank	No data*								
Roanoke	2.5	9.1	4.9	1.9	4.1	3.1	ND		
Savannah	No data+								
Tar-Pamlico	5.9			3.7			ND		
Watauga	ND			ND			ND		
White Oak	2.1			ND			ND		
Yadkin	2.3	34	6.4	2.1	11	3.7	2.1		

ND Indicates that the parameter was analyzed but not detected above the detection limit.

* Reservoirs in the Chowan and Pasquotank River Basins will be sampled in 2026.

\+ There are no water supply reservoirs in the Savannah and Lumber River Basins.

II. Proposed Rules

The proposed rules are the first steps towards achieving the goal of reducing discharges of PFOA, PFOS, and GenX to surface waters through the following objectives:

1. Characterize the presence of PFOS, PFOA, and GenX in discharges from industrial NPDES dischargers and their associated indirect dischargers (i.e., SIUs going to POTWs with pretreatment programs)

2. Require affected entities that are known to discharge PFOS, PFOA, and GenX (industrial direct dischargers and SIUs) to develop and implement minimization plans

that identify approaches to reduce these PFAS discharges (where applicable) directly or indirectly to surface waters

These rules require POTWs and industrial direct dischargers to report their monitoring data and minimization activities (where applicable) directly to DEQ. Minimization efforts and activities implemented by the SIUs will be reported in the associated POTW's annual pretreatment report. This information will be made available to the public through a dedicated website maintained by the Department. This website will show aggregated results for each industrial direct discharger and POTW (including SIU information as reported in the POTW's pretreatment annual report). These rules also establish a process that allows a facility to demonstrate that PFOS, PFOA, and/or GenX detected in its discharge originate from its intake water -- when the levels in the intake water are comparable to those found in the facility's discharge -- rather than from the facility's own industrial processes. The effect of PFAS present in the intake will be considered on a case-by-case basis at the request of the facility.

A. NPDES Schedule for Implementing Proposed PFAS Minimization Rules

Based on the rulemaking process, these rules could be effective as early as April 2026. Considering requirements outlined in the proposed rules, the following timeline is projected (Table 2). Since each Minimization Plan must be updated every two years, the overall time period used to determine the fiscal impacts of these rules is selected to be 2026 to 2031. It is anticipated that costs will be realized by the affected entities beyond 2031.

Table 2. Summary of Rule Implementation Process and Projected Timeline

Rule Implementation Process	Timeline
Rule Effective Date	April 2026
Notification of Baseline Sampling (60 days from effective date)	June 2026
Start Baseline Monitoring (within 3 months of notification)	Sept 2026
End Baseline Monitoring (sample quarterly for one year)	Sept 2027
Control Authority receives all baseline monitoring data (within one month of last sample)	Oct 2027
Notification of Ongoing Monitoring and Minimization Plan requirement (within 120 days of receiving all baseline monitoring data)	Jan 2028*
Start Minimization Plan Development	Jan 2028*
Start Ongoing Monitoring (start within 3 months of notification; ongoing semi-annually)	Apr 2028*
Submit Minimization Plan for Review (within 365 days of notification)	Jan 2029*
Minimization Plan Approval (within 120 days of receipt of complete plan)	April 2029*
Start Minimization Plan Implementation (within 120 days of plan approval)	July 2029*

*Facilities with historical data documenting PFOS, PFOA, and GenX above detection levels will move directly to developing a minimization plan and complete the starred tasks approximately 18 months prior to the dates in Table 2.

III. Estimating the Fiscal Impacts

An agency must prepare a regulatory impact analysis for permanent rule changes as required by G.S. 150B-21.4. The purpose of conducting a regulatory impact analysis is to improve rule design, inform decision-makers, and communicate with the regulated community and the public. These analyses identify, describe, and quantify the expected effects of the proposed rule changes to the greatest extent possible. This section discusses the fiscal impacts of implementing the PFOS, PFOA, and GenX monitoring and minimization rules aimed at determining the presence of PFOS, PFOA, and GenX in industrial wastewaters discharging to publicly owned treatment works (POTWs)/municipal facilities and industrial individual NPDES permittees discharging directly to state surface waters. This information will also enable the municipalities to determine the loading of PFOS, PFOA, and GenX from its SIUs versus its residential or solely domestic customers. The fiscal impacts of these rules were estimated through a systematic approach that included the following steps:

- Identification of potentially affected permittees and related sources
- Evaluation of PFOS, PFOA, and GenX data (where applicable) for each permit and related sources to determine the potential for needing continuous monitoring and development of a minimization plan
- Determination of costs for monitoring, minimization plan development, and minimization plan implementation
- Projection of fiscal impacts for private (i.e., industries) and public entities (i.e., local and state government).
- Review of potential impacts to Department of Environmental Quality (DEQ) program from proposed rules

A. Potential Impacts to DEQ Programs from Proposed Rules

NPDES Discharge Individual Permits

The proposed rules state that the following permit programs will be required to conduct monitoring and develop minimization plans for PFAS: (1) POTWs with local pretreatment programs (monitor only), (2) industrial direct dischargers with an individual NPDES permit (majors and minors), and (3) SIUs. The proposed rules also specify the types of permit programs not required to monitor for PFAS and develop minimization plans (i.e., one-hundred percent domestic wastewater treatment plants, water treatment plants with an individual NPDES permit, seafood processing or aquaculture facilities with an individual NPDES permit, and NPDES facilities with General Permits).

Other permitting programs not expected to be impacted include:

- General NPDES Permits for Industrial Stormwater Dischargers - Since this rule focuses on process wastewaters containing PFOA, PFOS, and GenX, the intent of

the rule is not to target general NPDES for Industrial Stormwater Dischargers. Therefore, these entities would not be required to sample and develop a minimization plan as a result of the proposed rules.

- DWR Non-Discharge – DWR non-discharge permits fall under separate rules that fall outside of the proposed rules. This program falls under separate state regulations and not federal.
- DWR Animal Feeding Operations – These programs do not conduct activities that discharge process wastewaters to surface water. These wastewaters are discharged to land. At this time, non-discharge animal feeding operations will not be covered under these.
- DWR Ambient Monitoring Program - DEQ does not anticipate any changes to the ambient monitoring program from the proposed rules.

B. Affected Sources

The proposed rules specifically outline requirements for direct and indirect industrial dischargers and specify the affected NPDES permit types. Under the indirect discharger rules, all SIUs that send wastewater to POTWs with pretreatment programs are required to complete baseline monitoring. The direct discharger rules affect all industrial direct dischargers (except one-hundred percent domestic wastewater treatment plants, water treatment plants with an individual NPDES permit, seafood processing or aquaculture facilities with an individual NPDES permit, and NPDES facilities with General Permits) and POTWs with local pretreatment programs issued through Division of Water Resources (DWR). EPA has identified industry categories known or suspected to discharge PFOS, PFOA, and GenX. EPA acknowledges that restricting the discharge of PFAS at such sources is the best way to protect the water quality and human health. Domestic wastewater that is non-industrially impacted is likely to have PFAS but the sources are considered uncontrollable (e.g., households). Water treatment plants may discharge PFAS, but they are passive receivers (do not create/generate these compounds). Therefore, these facilities are not being identified by EPA to take action until the sources upstream are addressed first. Seafood processing and General permits do not apply to any of the industries suspected of discharging PFAS based on EPA's industry category list. Based on these requirements, the number of facilities likely to be affected by the proposed rules are as follows:

Indirect Dischargers (15A NCAC 02H .0923)

- Significant Industrial Users: 595

Direct Dischargers (15A NCAC 02B .0512)

- Industrial Direct Dischargers: 216
- POTWs with Pretreatment Programs: 126

These affected entities are in 14 of the 17 river basins across NC (Table 3 and Figure 1). The 595 SIUs discharge indirectly to surface water through POTWs across NC. Therefore, the exact location of each SIU is not shown. As described in the EPA memo dated Dec. 5, 2022, the industries most likely to have wastewaters containing PFAS include: organic chemicals, plastics & synthetic fibers (OCPSF); metal finishing; electroplating; electric and electronic components; landfills; pulp, paper & paperboard; leather tanning & finishing; plastics molding & forming; textile mills; paint formulating, and airports. This is not an exhaustive list and additional industries may also discharge PFAS. For example, Centralized Waste Treatment (CWT) facilities may receive wastes from the aforementioned industries and should be considered for monitoring. There may also be categories of dischargers that do not meet the applicability criteria of any existing Technology Based Effluent Limitation Guideline (TBELG); for instance, remediation sites, chemical manufacturing not covered by OCPSF, and military bases.

Table 3. Summary of the Total Number of Affected Entities by River Basin

	SIUs Under POTW Pretreatment Control Authority	**NPDES POTWs with Pretreatment Programs Under DEQ Control**	**NPDES Industrial Direct Dischargers Under DEQ Control**
Broad	25	7	7
Cape Fear	165	29	51
Catawba	120	17	47
Chowan	-	-	2
French Broad	28	6	13
Hiwassee	3	1	2
Little Tennessee	1	1	1
Lumber	21	7	6
Neuse	71	16	29
New	3	3	1
Pasquotank	-	-	-
Roanoke	15	7	13
Savannah	-	-	-
Tar-Pamlico	21	6	8
Watagua	-	-	-
White Oak	-	-	3
Yadkin	122	26	33
Total	**595**	**126**	**216**

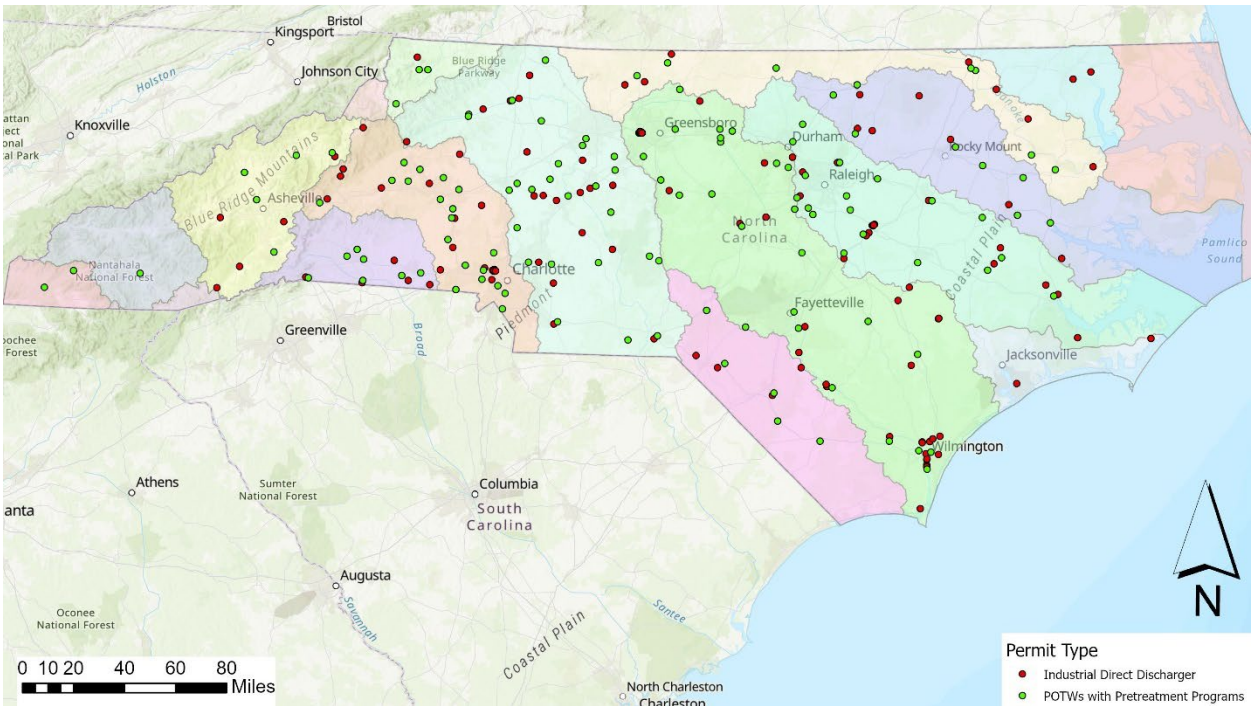

Figure 1. Map of Affected POTWs and Industrial Direct Dischargers
(not shown are locations of SIUs discharging to POTWs)

1. Selection of Sites Projected to Monitor for PFAS

Since the proposed rules specify that all affected permittees, which are not exempted in the rule, and affected entities (SIUs) will conduct initial baseline monitoring, all sites were estimated to incur expenses related to PFAS monitoring and personnel costs for reporting. Further, POTWs with pretreatment programs will monitor their discharges and incur associated costs of sampling and reporting of data to DEQ. If the monitoring entities measure detectable levels of any PFOS, PFOA, and GenX, they will be required to continue monitoring.

2. Selection of Sites Projected to Have Ongoing Monitoring and Develop a Minimization Plan

Once all SIUs (indirect dischargers), and industrial direct dischargers complete baseline monitoring, a subset of these entities are expected to develop minimization plans and perform ongoing monitoring. The trigger for continued monitoring and the development of minimization plans is based on an entity that has a level at or above the lowest reportable concentration for any of the PFOS, PFOA, and GenX based on the lowest reporting concentration for the parameter based on the test method used for analysis. Currently, the lowest reporting concentrations ranges for PFOA and PFOS are 1-4 ppt

and 2-8 ppt for GenX[3,4]. EPA sets a maximum contaminant level goal (MCLGs) for PFOA and PFOS at zero. According to the EPA, the MCLG is the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, allowing an adequate margin of safety. Setting the trigger at the lowest reportable level ensures a precautionary approach and supports maintaining optimal drinking water quality. Therefore, having a trigger at or above the lowest reportable level is protective of designated uses of surface waters across NC.

The entities that will likely fall into this group were projected based on site-specific and industry-specific influent PFAS data as well as their associated North American Industry Classification System (NAICS) or Standard Industrial Classification (SIC) and whether that industry is known to be associated with PFAS. Since the trigger for developing a minimization plan was set at or above the lowest reporting concentration for PFOS, PFOA, and GenX, it is projected that a majority of these sites will be required to continue monitoring and develop a minimization plan.

A PFAS "Minimization Plan" means a strategy to reduce or eliminate pollutants at the source before they are discharged into the environment. A minimization plan includes:

a) Identification of applicable best management practices (BMPs), such as: preventative measures to control and reduce pollution, pollution prevention techniques, good housekeeping practices (e.g., regular changing or cleaning of equipment and tanks), identifying and eliminating PFOS, PFOA, and GenX in raw materials, predicting processes or operations generation of PFOS, PFOA, and GenX as byproducts; improving operational efficiency to minimize the quantity of waste generation, product substitution to eliminate the introduction or generation for PFOS, PFOA, and GenX, and installing treatment technologies. Although wastewater treatment is included as a possible BMP, this fiscal note does not project costs for facilities choosing to implement treatment technology as this is not the focus of the proposed rules.
b) A timeline for implementation.
c) Estimated annual reductions from implementation.
d) Reduction goals, such as a target concentration or percent reduction.

[3] https://www.epa.gov/system/files/documents/2024-12/method-1633a-december-5-2024-508-compliant.pdf

[4] These values could go lower over time as analytical capability become more sensitive. The lower ranges are typically only observed in a smaller subset of the laboratories across the US and the higher ranges are more broadly representative of what most laboratories can reliably achieve. All permittees are expected to use sufficiently sensitive test methods.

C. Estimated Costs

For the purpose of this analysis, the regulatory baseline is the absence of required PFAS monitoring and development of minimization plans. For the regulated community, the cost-benefits for the proposed rules were compared to a "zero cost" baseline.

The cost analysis approach is based on executing the minimization rules which includes (1) baseline monitoring, (2) continued monitoring, (3) development of minimization plans (SIUs and industrial direct dischargers only), and (4) implementation of minimization plan BMPs. The proposed rules will result in costs to public and private entities. The anticipated costs to a regulated entity include baseline monitoring, personnel time, development of a minimization plan, implementation of the minimization plan, and continued monitoring.

All active POTWs with pretreatment programs, industrial direct dischargers, and SIUs will be required to undergo a specified period of monitoring of their effluent to determine the presence and concentrations of PFAS. Monitoring costs consider the sampling that is required during baseline monitoring period, which consists of quarterly sampling. Quarterly sampling was selected as a means to capture a representative profile based on EPA guidance for NPDES programs. This frequency captures variability over time (e.g., seasonality or operational changes), reduces sampling burdens due to the complexity of testing and the higher costs relative to conventional parameters, ensures practical implementation, and keeps consistency across NPDES programs. This frequency is continued until a facility develops a minimization plan when the frequency shifts to semiannual. The frequency is reduced in this phase to account for minimization efforts to be implemented that aim to reduce PFOA, PFOS, and GenX discharges. These costs include supplies; staff time to collect samples, analyze results, and report to North Carolina Department of Environmental Quality (NCDEQ) or the control authority (i.e., SIUs report to POTWs); and the lab fees for analysis and report data back to the permittee. The anticipated costs to the SIUs were based on a POTW requiring each of their pretreatment permittees to conduct monitoring.

These rules will be enforced through existing mechanisms. POTWs are inspected or audited 3 times within a 5-year period. At that time records and enforcement activities are reviewed. Additionally, POTWs must submit for review annual reports identifying PFAS minimization plan requirements and reduction activities by SIUs. In accordance with G.S 143.215.6, up to a $25,000 civil penalty can be assessed for violating a rule of the Commission. This fiscal analysis did not project civil penalties.

The number of facilities projected to be required to develop a minimization plan and perform ongoing monitoring is summarized in Table 3. The Environmental Protection

Agency's (EPA's) BMPs for minimizing pollution focus on preventing discharge of pollutants at the source whenever feasible, then recycling and treating pollution that cannot be prevented. Selection of any particular BMP is left up to the discretion of the SIU or industrial direct discharger. The associated costs of implementing the minimization plan can be variable based on the size of the facility, the type of BMPs implemented, complexity of operation, and the scale of the targeted reduction. The cost factors for individual BMPs are not available. For this reason, a range of costs per facility is estimated for the purpose of this fiscal analysis. Providing a narrow range of costs per facility would not be accurate, as it would fail to capture the full variability of potential costs. This approach would introduce significant uncertainty, since it would not reflect the entire range of possible expenses that facilities might incur. Table 5 outlines some of the commonly deployed BMPs to minimize PFAS discharges in process wastewaters. Additional details that outline what is entailed for each BMP can be found in Appendix A. These costs vary depending on scope and scale of the actions necessary to minimize PFAS. Regardless of the type of BMP deployed, the following factors will impact these costs: size of the facility and process complexity, pollutant type (e.g., PFOA, PFOS, and/or GenX), concentration, disposal of residuals requirements, desired reduction target, and operation and maintenance requirements of a selected BMP. Specific factors that can affect the costs of BMPs outlined in Table 5 are outlined in Appendix A. After reviewing PFAS minimization plans submitted by facilities in Michigan under their Industrial Pretreatment Program PFAS Initiative[5], it is anticipated that many of the facilities that implement minimization BMPs would lean towards the less intensive (does not include treatment) efforts to achieve reductions. A majority of the implemented BMPs were less intensive relative to utilizing treatment. In addition, the success of these BMPs for other pollutants have been demonstrated through EPA's Pollution Prevention program. These reports included measures such as material substitution and modifications, product modifications, process and equipment modifications, operating practices and training, and inventory and material management. Overall, the EPA's analysis of source reduction projects across chemical pollutants found that implementation of these BMPs resulted in an average reduction in chemical releases of between 9 and 16% in the year the project was implemented. [6]

[5] https://www.michigan.gov/egle/about/organization/water-resources/industrial-pretreatment/pfas-initiative
[6] https://www.epa.gov/toxics-release-inventory-tri-program/measuring-impact-source-reduction

Table 4. Number of Facilities Anticipated to Conduct Baseline and Continued Monitoring and Develop a Minimization Plan

Permit/Facility Type	Baseline Monitoring	Continued Monitoring Only	Continued Monitoring and Minimization Plans
Significant Industrial Users	595	N/A	583
Industrial Direct Dischargers	216	N/A	154
POTWs with Pretreatment Programs	126	126	N/A

Table 5. List of Best Management Practices to Minimize PFAS in Process Wastewaters

BMPs	Estimated Values
General Housekeeping Approaches	Costs will vary
Spill containment	Costs will vary
Proper disposal of legacy PFAS chemicals	Costs will vary
Cleaning out a tank of solids containing PFAS	$120,000-$300,000 for dewatering and removing sludge from a large digester per event. [7-8] If a facility does not eliminate PFOA, PFOS, or GenX from their process then cleaning would be needed more frequently[1].
Replacing parts containing PFAS in manufacturing infrastructure (e.g., gaskets, fittings)	Costs will vary
Leachate Minimization	Costs will vary
Switching to PFAS-free chemicals	Increase of $5.50-$200 per lb of PFAS-free alternative relative PFAS-containing additives[9]
Increased Production Time	Added costs related to an increase in production time using PFAS-free alternatives
Replace piping with PFAS residuals after removing PFAS from the industrial process	$50 to over $50 per linear foot[10]

[7] https://bristola2.com/blog/the-true-cost-of-anaerobic-digestion-are-you-paying-more-than-you-should/

[8] https://www.tpomag.com/whitepapers/details/reducing_the_costs_for_wwtp_digester_clean_outs_outs_sc_001s5

[9] https://apps.ecology.wa.gov/publications/documents/2104004.pdf (Page 117 Figure 17)

[10] Cost details by pipe size, material, and example replacement costs by facility type/size is summarized in Appendix A.

1. These costs include disposal. At this time PFOA, PFOS, or GenX are not considered directly hazardous waste and could be managed through incineration, CWT, or a landfill depending on waste acceptance criteria.

Discounting was used to compare costs occurring at different points and times. All calculated costs were discounted at a rate of 7% to determine an overall present value (PV in estimated cost in 2026 dollars). The estimated costs of the proposed rules are projected to impact the private sector, NC local governments, and NC state government. The respective costs for each group will be outlined separately as well as summarized at the end of this section. All costs are based on the timing associated with proposed rules text and requirements.

1. Private Sector Costs

The private sector includes industrial direct dischargers and SIUs. Out of the 216 industrial direct discharge permits, a total of 154 were included in the costs associated with developing a minimization plan and continued monitoring. These facilities were identified following the approach outlined in Section III B2. All 595 SIUs discharging into the 126 POTWs were projected to incur baseline monitoring costs while 583 of those facilities were projected to develop a minimization plan and to continue monitoring.

Industrial Direct Dischargers

The following cost categories were associated with industrial direct dischargers:

- ***Monitoring and Reporting***
  Baseline monitoring will take place quarterly for one year for approximately 216 permittees starting within three months of notification. Notification is to occur within 60 days from the effective dates of these rules assuming to be April 2026. Note, some permittees with historical data documenting PFOS, PFOA, and GenX above detection levels will be required to move directly to the development of minimization plans for the PFOS, PFOA, and GenX instead of performing baseline monitoring. However, since PFAS data is limited for many direct dischargers, it is projected that most direct dischargers will perform baseline monitoring. Baseline monitoring is to be performed quarterly for four consecutive quarters. The frequency associated with ongoing monitoring for the facilities required to develop a minimization plan converts from quarterly to semiannually when the permittee is notified of this requirement (i.e., develop a minimization plan).
- ***Minimization Plans***
  Permittees have 365 days to develop a minimization plan, anticipated to be January 2029. The Control Authority has 120 days to review and approve, then the permittee has another 120 days to implement, anticipated to be by July 2029.

- ***Implementation of Minimization Plans***
  Once the control authority approves the minimization plan the permittee has 120 days to implement. The associated costs of implementing the minimization plan can be variable based on the size of the facility, the type of BMPs implemented, complexity of operation, and the scale of the implementation. The cost factors for individual BMPs are not available. For this reason, a range of cost per facility is estimated for the purpose of this fiscal analysis.

Significant Industrial Users

The following costs categories were associated with significant industrial dischargers:

- ***Monitoring and Reporting***
  Monitoring will take place quarterly for one year for all 595 SIUs starting within three months of notification. Notification is to occur within 60 days from the effective dates of these rules assuming to be April 2026. Baseline monitoring is to be performed for four consecutive quarters and is assumed to be completed by third quarter of 2027. The frequency associated with monitoring for the facilities required to develop a minimization plan converts from quarterly to semiannually when the permittee is notified of this requirement (i.e., develop a minimization plan).
- ***Minimization Plans***
  Permittees have 365 days to develop a minimization plan, anticipated to be completed by January 2029. The Control Authority (POTW) has 120 days to review and approve, then the permittee has another 120 days to implement, anticipated to be July 2029.
- ***Implementation of Minimization Plans***
  Once the control authority approves the minimization plan the permittee has another 120 days to implement. The associated costs of implementing the minimization plan can be variable based on the size of the facility, the type of BMPs implemented, complexity of operation, and the scale of the implementation. The cost factors for individual BMPs are not available. For this reason, a range of cost per facility is estimated for the purpose of this fiscal analysis.

Summary of Impacts to the Private Sector

The estimated impact to the private sector is $120.4 million. The breakdown of impacts is summarized in Table 6, which include monitoring, development of minimization plans, and implementation minimization plans. These costs reflect expenses from 2026-2031 that have been calculated and escalated following the projected rule schedule (Table 2) and escalation factors outlined in Appendix B[11] as well as the year that expenses were realized and discounted at 7% following NC general statute requirements[12]. An annual breakdown of these costs is provided in Appendix B. Costs expected beyond 2031 include continued monitoring and minimization for facilities that do not minimize their PFOS, PFOS, and GenX to below levels outlined in the rule.

Table 6. Estimated Direct Costs to the Private Sector (2026-2031; Million $2026)

	Private Sector	Direct Costs (7% discount)
Monitoring, Reporting, and Minimization Plan Development	**Industrial Direct Dischargers**	
	Monitoring	$6.3M
	Minimization Plan Development	$20.2M
	Significant Industrial Users	
	Monitoring	$17.5M
	Minimization Plan Development	$76.4M
	Estimated Costs	**$120.4M**
Implementation of Minimization Plan	**Projected Cost Range per Facility[1]**	**$0 to over $1.0M per facility**

[1] Due to the uncertainty in this cost category, this project range is highly variable. These costs vary depending on scope and scale of the actions necessary to minimize PFAS. Regardless of the type of BMP deployed, the following factors will impact these costs: size of the facility and process complexity, pollutant type (e.g., PFOA, PFOS, and/or GenX), concentration, disposal of residuals requirements, desired reduction target, and operation and maintenance requirements of a selected BMP. It is expected that many facilities will be good environmental stewards and take meaningful steps to reduce PFAS. In these instances, there will be costs realized but these costs are uncertain. There will likely be some facilities that have marginal to no costs incurred from this rule for implementing BMPs.

[11] Escalation factors per year - Lab costs at 0.73%, labor costs at 3.22%, and supply costs at 2.49%

[12] NCGS 150B-21.4. Fiscal and regulatory impact analysis on rules

2. North Carolina Local Governments Costs

North Carolina local governments included in this analysis were POTWs with pretreatment programs.[13] All 126 active permits would incur quarterly baseline monitoring costs for one year (i.e., four sampling events). Since continued monitoring is required until levels below the lowest reportable concentration are achieved, all POTWs were projected to continue monitoring on a semiannual basis. The rule does not require POTWs with local pretreatment programs to develop a minimization plan.

- ***Monitoring and Reporting***
  Monitoring will take place quarterly for one year for all 126 POTWs with pretreatment programs starting 60 days from the effective dates of these rules assuming to be April 1, 2026. Baseline monitoring is assumed to be completed by in third quarter of 2027. The frequency associated with monitoring for the facilities required to continue monitoring changes from quarterly to semiannually when the permittee is notified of such decision. POTWs are required to submit their own discharge data and SIU data in an annual report to DEQ.
- ***Minimization Plan Development Support and Review***
  All POTWs with a pretreatment program will need to notify their SIUs of the sampling requirements and any further requirements for continued sampling and minimization plan development. POTWs will also review and approve minimization plans submitted by their SIUs. Therefore, staff time to provide this support and review is included in costs for local governments. It was projected that a POTW would spend approximately 15 hours per SIU for this support. The aggregated staff time per POTW was determined based on the number of affected SIUs at 15 hours for each entity at a loaded labor rate of $70 per hour[14]. A breakdown of what this loaded labor rate includes in outlined in Appendix B.

Summary of North Carolina Local Government Costs

The estimated cost to North Carolina local governments is estimated to be $7.9 million for monitoring, reporting, and personnel time to direct and provide technical assistance for minimization plan development by the SIUs, review, and approval. These costs reflect expenses from 2026-2031 that have been escalated based on the year that expenses were realized and discounted at 7% following N.C. General Statutes.[15] Costs per year are summarized in Appendix B. This table breaks down costs by monitoring and personnel time to support the SIUs to develop and approve minimization plans.

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[13] These rules do not impact public water supplies since they are regulated under the Safe Drinking Water Act and not the Clean Water Act

[14] This loaded rate is calculated based on a $35.98 unloaded labor rate, benefits percentage of 29.7%, and overhead of 50%.

[15] NCGS § 150B-21.4. Fiscal and regulatory impact analysis on rules

3. North Carolina State Government

The cost to North Carolina state government will be largely attributed to additional staff requirements to review baseline monitoring data generated as a result of these rules, determine and manage the permittees that are required to develop and submit minimization plans under DEQ's direct authority, review these plans, modify permits as new facilities come into NC, and provide guidance and technical support to POTWs. The state analytical lab does not process private facility samples and would not be impacted by this rule. It is projected that DEQ would utilize existing staff (2.0 FTE) at an estimated opportunity cost of $1.218 million from 2026-2031.

4. Summary of Costs to Private and Public Sectors

The cumulative costs to all entities associated with the proposed rules are summarized in Table 7. The total cost across all sectors for the 2026-2031 time period for monitoring and minimization plan development is estimated at $129.5 million and a projected range of $0 to over $1 million per site to implement minimization plan BMPs.

Table 7. Estimated Direct Costs to Private and Public Sectors (2026-2031; Million $2026)

	Direct Costs (7% discount)	
Monitoring and Minimization Plan Development	**Private Sector -** Monitoring and Minimization Plan Development	$120.4M
	NC Local Government – Monitoring and SIU Support and Review	$7.9M
	NC State Government - Personnel Opportunity Costs	$1.2M
	Estimated Cost*	**$129.5M**
Implementation of Minimization Plans	**Projected Cost Range per Facility****	**$0 to over $1.0M per facility**

* Present value in 2026$ at a 7% discount

** Due to the uncertainty in this cost category this project range is highly variable

If the EMC Water Quality Committee proceeds with the second phase of implementing surface water quality standards, these proposed rules would accelerate the necessary data collection for effective implementation. In addition, when facilities are potentially assigned effluent limits, a key step in the decision-making process is to evaluate how discharges can be reduced through BMPs, rather than immediately resorting to treatment technologies. By adopting BMPs, a facility may be able to minimize their PFOA, PFOS, and GenX discharges sufficiently to avoid or reduce the need for costly treatment. Either scenario could result in cost savings to that entity. Overall, these costs related to monitoring and minimization plan development are expected to be incurred at some point in the near future, regardless of whether or not the proposed rules are adopted.

IV. Benefits to the State and North Carolinians

These rules are projected to provide benefits to the state and North Carolinians through increased understanding and awareness of PFOS, PFOA, and GenX discharges and the outcomes associated with the development and implementation of minimization plans. One benefit of these rules is the creation of a mandatory monitoring and reporting program that increases transparency of information from industry to DEQ as well as other state and local government regulators and their individual and collective contributions to the surface waters of the state. These rules will expand DEQ's database of PFOS, PFOA, and GenX levels across NC for various NPDES permittees and indirect dischargers (SIUs) allowing for data-driven decision making. Examples of these data-driven decisions include assessing the regulatory and fiscal impacts of potential, future water quality standard(s) for these PFAS, determination of associated effluent limitations for permitted sources, targeted surface water monitoring requirements, and understanding of the relative contribution of industrial impacts versus background (i.e., household) levels at POTWs. An additional outcome of the monitoring requirements in this rule is an increase in public awareness of where PFOS, PFOA, and GenX are detected. Identifying and implementing BMPs through these rules could be an additional opportunity for industry to show environmental stewardship by minimizing PFOS, PFOA, and GenX in their discharges.

These rules also require the development of minimization plans that aim to minimize PFAS in wastewater discharges. It is expected that industries will comply by proposing and implementing BMPs that will decrease PFOS, PFOA, and GenX levels to some extent. There are currently no standardized approaches to PFAS BMPs across industry. Since these rules require site-specific BMPs to be developed and deployed, they have the potential to encourage the development of innovative approaches to minimize PFOS, PFOA, and GenX. Although it is not possible to predict what specific minimization actions will be taken, it can be qualitatively stated that there is very likely to be some reductions in PFAS loadings to surface waters. Although these rules do not propose mandatory reduction levels, studies of existing programs have shown that mandatory reporting of contaminants can lead to voluntary reductions, even in the absence of regulatory limits. Examples of such programs include EPA's Toxics Release Inventory Program, EPA Greenhouse Gas Reporting Program, California's Mandatory GHG Reporting (AB 32 Program), and New Jersey Environmental Results Program[16,17,18,19]. Reporting such data has led to varying levels of voluntary reductions through public pressure, investor influence, avoided reputational risk, internal benchmarking, cost savings, and forecasting of future regulatory action.

[16] https://www.nber.org/papers/w28761
[17] EPA's 33-50 Program 3rd Progress Update Reducing Risks Through Voluntary Action
[18] https://www.epa.gov/p2/pollution-prevention-list-milestones
[19] https://www.epa.gov/toxics-release-inventory-tri-program/measuring-impact-source-reduction

These reductions in PFAS releases to the environment will help decrease the presence of these compounds in North Carolina's water, air, fish, and soil. It is important to note that these natural resources are vital economic assets that play a significant role in supporting the state's economy. Since scientific studies have shown that exposure to some PFAS in the environment may be linked to harmful health effects in humans and animals, the reduction of these compounds will contribute to overall reductions in exposure to North Carolinians. Examples of how this rule specifically relates to each of these areas will be discussed further.

The benefit of this rule contributes to the protection of designated uses of surface water to ensure suitability for various human and ecological uses. One use of surface water is for drinking water supply. Reductions in this pollutant going into surface water will reduce its presence in intakes that are downstream of a direct discharger or multiple dischargers. This impact can translate to reduced downstream drinking water treatment needs. Even if reductions do not negate the need for treatment for PFOA, PFOS, or GenX at a public water supply, the cumulative reduction in long-term operation and maintenance costs could be meaningful in some cases. Reductions in PFAS to surface waters will also reduce the potential for accumulation of these compounds in fish, animals, and food. This is another exposure pathway for humans that can be positively impacted through this rule.

PFOA and PFOS have been linked to various harmful health impacts when exposed to these compounds over time. These impacts could result in significant healthcare costs to those that are exposed. Through this rule, reductions in PFAS may contribute to reductions in exposure to North Carolinians. Exposures to these compounds may lead to cardiovascular, developmental, immunological, neonatal, cancer, endocrine, and reproductive impacts.

Minimizing PFAS at the industrial and SIU level – prior to discharge -- is the most cost-effective strategy to prevent these compounds from entering the environment and to avoid shifting costs onto the public and local governments. This proactive approach ensures that a polluter-pays framework is maintained. Removing PFAS that has been dispersed in a POTW or in surface waters will be more costly than minimizing it as the source. It is estimated that removing and destroying PFAS from municipal wastewater at POTWs can cost between $2.7 million and $18 million per pound.[20] Implementing minimization plan BMPs that reduce PFAS in SIU discharges will lower the levels of PFOS, PFOA, and GenX entering POTWs. Any degree of minimization should also lead to reduced PFOS, PFOA, and GenX discharges into surface waters. Additionally, because PFAS can accumulate in biosolids after wastewater treatment, reducing influent concentrations will also decrease PFAS levels in biosolids.

Outcomes from this rule will achieve the objectives outlined in the motion including monitoring and minimizing PFOS, PFOA, and GenX in discharges to surface water. The EMC's

[20] https://www.pca.state.mn.us/sites/default/files/c-pfc1-26.pdf

responsibility includes continually reviewing the need for surface water standards and will use data gathered from these rules to support future rulemaking efforts that aim to protect, preserve, and enhance the state water resources. The WQC has specifically committed to leverage these data in the next phase of developing surface water standards for PFOS, PFOA, and GenX.

V. Cost and Benefit Summary

Table 8 summarizes the costs and benefits discussed in the previous sections. The total cost across all sectors for the 2026-2031 time period for monitoring and minimization plan development is estimated at $129.5 million and a projected range of $0 to over $1 million per site to implement minimization plan BMPs. While it is difficult to precisely quantify the costs and benefits of minimization activities, since the specific actions industries will take to reduce PFOS, PFOA, and GenX are not yet known, monitoring and increased transparency of this information for the public and policymakers are expected to encourage reductions in these compounds. The resulting decreases in future discharges of PFOA, PFOS, and GenX should reduce the relative presence of these compounds in air, water, fish, and soil. Scientific studies have shown that exposure to PFAS in the environment is linked to harmful health effects in humans and animals. As such, reducing the discharge of these compounds at their source will lower the overall exposure for North Carolinians. While these benefits are currently only qualitatively described, the cumulative impact of reduced PFAS exposure and lower concentrations in wastewater discharges is expected to provide significant long-term value to both the environment and public health in North Carolina. The cost and benefit estimates presented in this analysis should be viewed as indicative, serving as a directional guide for assessing overall fiscal impacts. Actual costs may vary depending on the cost estimation methods used and the uncertainties outlined in Subsection VI.C. The data presented in this fiscal analysis have been quantified to the "greatest extent possible" as required under G.S. 150B-19.1. Uncertainties and limitations are described in the next section.

Table 8. Summary of Estimated Costs and Benefits for the Proposed Rule (2026-2031; Million $2026)

	Costs (7% Discount)		Benefits
Monitoring and Minimization Plan Development	**Private Sector**		• Statewide PFOA, PFOS, and GenX database • Transparency and public awareness of concentration levels • Promotes data driven decision making • Protecting of designated uses of surface water that is suitable for various human and ecological uses. • Reductions in exposure to PFOA and PFOS that may be linked to harmful health effects. • Reduction of PFOS, PFOA, and GenX in effluent to surface waters and biosolids.
	SIUs – Monitoring and Minimization Plan Development	$93.3M	
	Industrial Direct Discharger – Monitoring and Minimization Plan Development SIUs Minimization Implementation	$26.5M	
	NC Local Government		
	POTW – Monitoring and SIU Support and Review	$7.9M	
	NC State Government		
	Personnel Opportunity Costs	$1.2M	
	Estimated Costs	**$129.5M**	
Implementation of Minimization Plans	Projected Cost Range per Facility	**$0 to over $1.0M per facility**	

A. Uncertainties and Limitations

Given the predictive nature of these estimates, some uncertainties and limitations are expected within reasonable bounds. The data presented in this fiscal analysis are quantified to the "greatest extent possible." This section provides a summary of the primary uncertainties/limitations associated with this analysis.

1. Affected Sources

- PFAS Industries
  In order to estimate the anticipated costs and impacts to affected entities, understanding the universe of where PFAS could be found in discharges for industrial direct dischargers, POTWs with pretreatment programs, and SIUs is important. This analysis relied on a database of PFAS industries that have been identified as potential sources of these compounds and goes beyond the recommended targeted industries covered by EPA NPDES permitting guidance for PFAS. The analysis intentionally included a broader list of potentially affected industries that expanded beyond just those targeted by the EPA NPDES permitting guidance. This approach ensures that the projected costs are not underestimated and were reasonable despite the potential uncertainty about exactly which entities will actually be affected.
- Controllable Sources through Control Authority
  POTWs with pretreatment programs are the control authority that permit's SIUs. When looking at the sources of PFAS coming into POTWs beyond households, the priority would be to first evaluate the SIUs for their potential to reduce PFAS in their discharge and sample for PFAS. The analysis assumes that SIUs are the primary controllable sources of PFAS, so they are prioritized for monitoring and reduction efforts. However, PFAS can also come from other sources besides SIUs, which makes it hard for POTWs to identify and manage all PFAS contributors. The current rules only address SIUs and no other types of industrial (commercial could be included as industrial) users, meaning some sources of PFAS may be overlooked.

2. Rule Design

- Selection of PFAS Compounds
  This rule focuses on PFOA, PFOS, and GenX. These compounds were prioritized due to legacy use, availability of supporting information that was used to generate drinking water MCLs (PFOA and PFOS), and localized production of GenX. Any BMPs that are implemented for these compounds are expected to have a co-benefit of reducing other PFAS. Although the rules require reporting of these three compounds only, the lab sheets/spreadsheets will be provided that includes

an additional 37 other PFAS. These compounds will be compiled by the Department for future rulemaking efforts.

- Monitoring Frequency for Baseline Monitoring
  The monitoring frequency that is included in the proposed rules is quarterly sampling. Quarterly sampling was selected to capture a representative profile based on EPA guidance for NPDES programs. This frequency captures variability over time (e.g., seasonality or operational changes), reduces sampling burdens due to the complexity of testing and the higher costs relative to conventional parameters, ensures practical implementation, and keeps consistency across NPDES programs.

  More frequent monitoring would offer more detailed data, but the benefits do not outweigh the practical, technical, and economic limitations of such an increased frequency. There would be added financial burden for additional data that might not add sufficient value to make decisions about the need for minimization efforts. The increase in samples needed to be analyzed would also add additional stress on capacity constraints for commercial laboratories, potentially leading to delays in reporting of data. Historical NPDES programs have always used a quarterly frequency to sufficiently characterize trends and support permitting decisions. Therefore, increasing the frequency would deviate from established protocols that have proven effective in maintaining compliance with the Clean Water Act.
  Reducing monitoring frequency would lower costs for affected entities; however, it would also result in insufficient data to support the rule's rationale and delay the collection of information needed for timely, informed regulatory decisions. Less frequent monitoring would fail to capture important variations due to seasonal changes, source contributions, and operational differences.
- Trigger for Continued Monitoring
  Results at or above the lowest reportable concentration for PFOA, PFOS, and GenX would require a facility to do continued monitoring as well as develop and implement a minimization plan. This level is protective of designated uses based on the EPA MCLs for PFOA and PFOS. If a higher trigger was used there would be fewer facilities that would be required to continue monitoring and develop and implement minimization plans. This would result in a lower total financial impact from the rule. It is estimated that increasing this trigger to 10 ppt could reduce the number of affected SIUs and POTWs by approximately 8-20% that would be required to continue monitoring and develop minimization plans (Table 9).
  While setting a higher trigger threshold would reduce the overall financial burden, it comes with important trade-offs. Increasing the threshold for continued monitoring and the development of minimization plans to a level above the MCLs

would provide less protection for human health and designated uses. The proposed trigger is intended to strike a balance between minimizing financial impacts and safeguarding designated uses.

Table 9. Summary of Number of Entities Required to Perform Continued Monitoring Under differ Triggers

Facility Type	Number of Facilities	Proposed Trigger (lowest reportable concentration)	Alternative Trigger (10 ppt)
Industrial Direct Discharger	216	164	164
POTWs	126	126	115
SIUs	595	583	464

3. **Cost Analysis**
   - Minimization Plan Implementation
     Beyond the costs of monitoring and preparing a minimization plan, the rules require that the minimization plan be implemented but it does not specify specific actions or reductions by the affected entity. The selection of a particular BMP is left up to the discretion of the SIU or industrial direct discharger. Therefore, the associated costs cannot be reasonably quantified and are presented as a range per facility.
   - Discount Rate
     To account for differences in timing of impacts from the proposed rules, a discount rate was used to adjust the estimated costs of the proposed rules back to the initial year of the analysis, 2026. Present value calculations for costs and benefits were done using a 7% discount rate as required by NCGS 150B-21.4.
   - Rate Payer Impacts
     The cost of PFAS monitoring and the development of minimization plans is not an expense that would be planned for in advance in the absence of regulations when considering financial forecasting. It is the decision of the private or public entity to determine how best to manage these expenses. One possibility is that utilities could pass along some of these costs to rate payers. These impacts will vary widely across utilities.

4. **Benefits Analysis**
   - Indirect Benefits to Private Entities
     The implementation of this rule will result in increased need for professional services through consultant and analytical laboratory services. Baseline and continued monitoring will rely on private analytical laboratories to process the

samples. Although it is certain that there will be an increase in sample analysis needs within the state, as of 2024, there were about 11 labs within NC that had expressed interest in becoming certified by DWR for PFAS analysis. Even if all 11 labs could run PFAS analysis required under these rules, this capacity may not be sufficient to handle the testing requirements for the affected entities. Therefore, an indirect benefit of this rule would be increasing utilization and revenue for these commercial labs in the state. It should be noted that commercial laboratories outside of the state would be expected to also take on the capacity needs for this rule. Meaning not all of the indirect benefits would be realized within NC.

The development of minimization plans will most likely rely on acquiring specialized technical support through consulting services within NC. It is understood that not all expertise needed for these reports would be found within these consulting firms in NC but could rely on expertise nationally within these companies. Regardless, the reliance on consulting services to develop the minimization plans will be another indirect benefit of this rule for private entities to some degree within NC.

- Quantification of Benefits

  Quantification is always the preferred approach in understanding the benefits of proposed regulations and weighing the costs versus these benefits. Although benefits may not be quantified, it does not mean that there is a lack of value of a rule to North Carolinians. Many benefits of cleaner water (e.g., improved ecosystem health, biodiversity, recreational use, or aesthetic value) do not have market prices that can be leveraged for such an analysis. This relationship can also be said for the value of knowledge through transparency and data sharing. EPA acknowledges that PFAS *"Scientific studies have shown that exposure to some PFAS in the environment may be linked to harmful health effects in humans and animals"* but is working towards answering critical questions about PFAS that relate to (1) How much people are exposed to PFAS and (2) How harmful PFAS are to people and the environment. Therefore, for the purpose of this fiscal note, qualitative discussions of the benefits was the preferred approach to limit uncertainty.

VI. Rules Alternatives

In accordance with N.C.G.S. 150B-21.4(b2)(5), the fiscal note for a proposed rulemaking with a substantial economic impact is required to contain a description of at least two alternatives to the proposed rules. As defined in N.C.G.S. 150B-21.4(b1), "substantial economic impact" means an aggregate financial impact on all persons affected of at least one million dollars ($1,000,000) in a 12-month period. As shown in Section IV of this fiscal note, the proposed rules are expected to have a substantial economic impact. Therefore, two alternatives have been evaluated in this section to meet statutory requirements (Table 10).

Table 10. Summary of Alternatives to the Proposed Rules that were Considered

	Proposed Rules	Alternative 1 (Inclusion of other Industrial Users)	Alternative 2 (Absence of a Rule*)
Minimization Plan Trigger	Lowest Reportable Concentration	Lowest Reportable Concentration	None
PFOS, PFOA, and GenX Reported	PFOS, PFOA, and GenX	PFOS, PFOA, and GenX	None
Specified Minimization Target	None	None	None
Indirect Dischargers	Only SIUs discharging to a POTW	Any industrial users discharging into a POTW	None

* Absence of a rule is also considered no action from a fiscal analysis perspective but does not signify the lack of any current action being taken by DEQ to address PFAS.

A. Alternative 1: Inclusion of other Industrial Users

The first alternative evaluated was requiring industrial users that are not considered significant industrial users to conduct baseline monitoring. An SIU is a facility that meets certain criteria, such as discharging a large volume of wastewater (25,000 gallons per day or more), or contributing a significant portion of the POTW's flow or treatment capacity. Extending the rules to include other industrial users would increase the number of private entities affected by these rules. There is a lack of information available to reasonably project the number of industrial users that could be pulled into monitoring, reporting, and minimization activities. Table 11 outlines the costs associated with each action required to take by each additional industrial user. The estimated costs expected per industrial user is projected at approximately $177K per industrial user that is required to conduct monitoring and minimization activities and does not include the expenses associated with implementing a minimization plan BMPs. This cost would be in addition to the amount estimated under the proposed approach. Meaning this alternative would cost more. This alternative was not selected because significant contributors of PFAS would be expected to already be included in the affected entities under the proposed rules.

Table 11. Summary of Projected Costs per Industrial User ($2026)

	Baseline Monitoring (2026-2027)	Minimization Plan Development	Continued Monitoring Period (2028-2031)	Minimization Plan Implementation
Industrial User	$10,330	$150,000	$17,038	Less than $1,000,000 due to the relative size of these facilities based on process wastewater flow

B. Alternative 2: Absence of a Rule

The second alternative evaluated was taking no action. This alternative would not require baseline monitoring, ongoing monitoring or minimization plans for PFOS, PFOA, and GenX broadly across all permittees. Monitoring is being added at permit renewals for the aforementioned affected entities once a certified test method is promulgated. Minimization plans are not included at this time. This alternative was not selected because PFOS, PFOA, and GenX information would not be collected or disclosed by affected entities on an expedited timeline which would not support informing the EMC better as to the sources of PFOS, PFOA, and GenX across NC. These data will eventually be collected through permit conditions added during renewals but that would be a slower process that could take over 5 years to add these conditions to all active permits. In the absence of this rule, minimization plans and voluntary reductions would not be implemented through permit renewals but instead would rely on Special Orders by Consent. In summary, the no action alternative would postpone data collection and the development of minimization plans across the affected industries, likely delaying the initiation of critical PFAS minimization efforts. Such a delay would negatively impact public health protection.

VII. Next Steps and Use of Data

This rule making process is the first step that the EMC Water Quality Committee is taking towards their commitment to prioritize and understand the sources and levels of targeted PFAS and promote voluntary actions by affected entities to reduce these discharges to the environment. The data generated under this rule be used as follows:

- Compile data that is made publicly available in an interactive online mapping tool that is easily understood by broader stakeholders
- The Department can use these data to prioritize areas to evaluate surface water quality relative to different source contributions
- Summarize data periodically for the EMC Water Quality Committee that assesses reductions that are occurring (i.e., effectiveness of the rule). These data will also

assist the committee with determining if it is necessary to proceed with developing surface water quality standards.

Appendix A – Summary of Best Management Practices

BMPs	Description
General Housekeeping Approaches	Spill prevention and control – secondary containment, improved storage practices Floor cleaning protocols – dry cleanup methods instead of water washdowns Equipment maintenance and decontamination procedures Employee training and awareness programs Improved chemical handling and waste segregation Good recordkeeping and PFAS inventory management

Spill containment	**1. Secondary Containment Systems**
	
	• **Purpose**: Prevent PFAS-containing liquids from reaching drains or soil.
	• **Examples**:
	  o Berms or dikes around PFAS storage areas (e.g., drums or IBC totes)
	  o Double-walled tanks or containers
	  o Spill pallets with sumps
	  o Impermeable liners or containment pads made of PFAS-resistant materials (e.g., HDPE)
	
	2. Spill Response Kits (PFAS-Compatible)
	
	• **Specialized absorbents**: Designed for fluorinated substances; standard oil/hazmat pads may not be effective for some PFAS compounds.
	• **Contents include**:
	  o PFAS-specific absorbent pads/socks
	  o Nitrile gloves and PPE
	  o Collection bags/drums for contaminated materials

	○ Neutralizing or binding agents (though limited effectiveness for PFAS itself) **3. Stormwater and Drain Protection** • **Drain covers, plugs, or seals** • **Portable berms or inflatable barriers** • **Storm drain inserts or filters (activated carbon or ion exchange resins)** **4. Proper Storage and Labeling** • All PFAS-containing materials should be: ○ Clearly labeled as hazardous/potentially containing PFAS ○ Stored indoors or under cover to prevent rain exposure ○ Located away from storm drains, floor sinks, or unsealed concrete **5. Spill Response Plan (SOP)** • Includes: ○ Identification of PFAS materials and locations ○ Notification protocols for internal staff and environmental agencies ○ Procedures for containment, cleanup, and decontamination ○ Disposal protocols (typically as hazardous waste or under state-specific PFAS rules)
Proper disposal of legacy PFAS chemicals	**1. Characterization and Inventory** • **Identify** all PFAS-containing materials: raw chemicals, AFFF (aqueous film-forming foam), sludge, contaminated containers, etc. • Use **EPA Methods 533, 537.1, or 1633** to analyze for PFAS. • Document volumes, concentrations, and physical states (liquid, solid, mixed waste).

2. Classification of Waste

- Determine whether materials are:
  - **Hazardous waste** under RCRA (not all PFAS are currently classified, but regulations are evolving)
  - **State-regulated PFAS waste** (e.g., California, Michigan, Vermont)
  - **Universal waste** (if applicable in specific jurisdictions)

3. Storage Prior to Disposal

- Use **sealed, labeled containers** (typically DOT-approved drums or IBCs).
- Store in **secondary containment** and away from drains or soil.
- Maintain manifest logs and spill control materials nearby.

4. Approved Disposal Methods

Method	Notes
High-temperature incineration	Must exceed **1,100°C (2,012°F)** with **verified destruction efficiency**. Limited to facilities permitted to accept PFAS. May generate emissions if not properly controlled.
Hazardous waste landfill	For solids (e.g., PFAS powders, contaminated PPE). Must have **double liners, leachate collection**, and **long-term monitoring**. PFAS may leach over time.
Deep well injection	Used for some PFAS liquids. Must be permitted under UIC Class I rules. **Long-term liability and monitoring concerns** apply.
Emerging destruction technologies	Supercritical water oxidation, electrochemical oxidation, and plasma arc are under evaluation. **Not yet widely available or permitted.**

5. Transportation

- Must follow **DOT Hazardous Materials regulations**.
- Use licensed hazardous waste haulers with manifests.

	• Coordinate with **TSDFs (Treatment, Storage, and Disposal Facilities)** approved for PFAS.
	
	6. Documentation and Reporting
	
	• Maintain:
	  ○ Waste profiles
	  ○ Chain-of-custody documentation
	  ○ Disposal certificates from TSDFs
	• Report to EPA/state authorities if required (e.g., TRI reporting, TSCA rules)

Cleaning out a tank of solids containing PFAS[1]	Includes pumping out and removing solids containing PFAS from a tank at a facility. This can be a one-time effort if the facility decides to eliminate PFAS from their manufacturing process. If they continue to utilize PFAS in their process this cleaning and disposal would happen more frequently depending on the scale of that facility's manufacturing process.

Replacing parts containing PFAS in manufacturing infrastructure (e.g., gaskets, fittings)	**1. Inventory and Assessment**
	
	• **Identify all components** potentially containing PFAS:
	  ○ Gaskets and seals made of PTFE (Teflon), FKM (Viton), or other fluoropolymers
	  ○ Coated pipes, valves, fittings, and hoses
	  ○ PFAS-based lubricants, coolants, and anti-stick linings
	• Review **Material Safety Data Sheets (MSDS)** or manufacturer specifications
	• Prioritize replacement based on:
	  ○ Direct contact with process materials or wastewater
	  ○ Risk of PFAS leaching or degradation
	  ○ Regulatory exposure pathways (e.g., wastewater discharge)
	
	2. Engineering Evaluation
	
	• Assess **performance requirements**:

[1] https://www.tpomag.com/whitepapers/details/reducing_the_costs_for_wwtp_digester_clean_outs_outs_sc_001s5#:~:text=%E2%80%9CIt%20cost%20$120%2C000%20for%20the%20remaining%2050%,thought%2C%20there%20must%20be%20a%20better%20way.%E2%80%9D

	- Chemical compatibility - Temperature and pressure resistance - Flexibility, abrasion, and wear resistance - Engage design or process engineers to select **PFAS-free alternatives**, such as: **EPDM, nitrile (Buna-N), or silicone** gaskets **Stainless steel or ceramic coatings** in place of PTFE-lined parts **Non-fluorinated lubricants** or barrier fluids **3. Procurement and Qualification** - Source **certified PFAS-free alternatives** from reputable suppliers - Request supplier documentation (e.g., PFAS-free declarations or compliance with EPA TSCA reporting) - Test compatibility in pilot runs or non-critical systems if performance is uncertain **4. Physical Replacement and Installation** - Schedule during planned maintenance shutdowns to avoid operational downtime - Remove and dispose of old PFAS-containing parts as **regulated waste** if required - Install new components following OEM torque and sealing specifications **5. Waste Handling and Recordkeeping** - Label and document all removed PFAS parts - Dispose of materials via: - Hazardous waste incineration (if allowed) - Secure landfill with leachate controls - Maintain records for: - Regulatory audits - Product lifecycle assessments - Customer and stakeholder transparency **6. Training and SOP Updates**

	• Train maintenance and procurement staff on:
	  ◦ PFAS-free procurement policies
	  ◦ Handling and replacing legacy PFAS components
	• Update SOPs and preventive maintenance documentation to reflect:
	  ◦ New materials
	  ◦ Service intervals
	  ◦ Storage or lubrication requirements

Leachate Minimization	**1. Stormwater Management**
	
	• **Goal**: Prevent clean surface water (rainfall/runoff) from infiltrating the waste mass.
	• **Practices include**:
	  ◦ Grading and sloping to divert water away from active and closed areas
	  ◦ Perimeter drainage ditches and berms
	  ◦ Temporary and permanent stormwater ponds
	  ◦ Use of sediment and erosion controls (e.g., silt fences, matting)
	
	2. Daily and Intermediate Cover
	
	• **Goal**: Limit water infiltration and reduce leachate formation.
	• **Methods**:
	  ◦ **Daily cover**: 6 inches of soil or alternative daily cover (ADC) like tarps, foams, or synthetic films
	  ◦ **Intermediate cover**: 12–24 inches of soil or geosynthetics on inactive areas
	  ◦ ADCs reduce the amount of soil used while limiting rainfall exposure
	
	3. Final Cover Systems (Capping)
	
	• **Goal**: Permanently seal closed sections of the landfill to minimize infiltration.
	• **Design typically includes**:
	  ◦ Geomembrane layer (e.g., HDPE)
	  ◦ Compacted clay or geosynthetic clay liner (GCL)
	  ◦ Drainage layer to remove surface water

	◦ Vegetative layer for erosion control **4. Leachate Recirculation Control** • **Some landfills recirculate leachate** to enhance waste degradation and gas production, but uncontrolled recirculation can increase leachate volume. • Minimization involves: ◦ Controlled recirculation with engineered systems ◦ Monitoring to prevent hydraulic overloading **5. Phased Cell Construction** • **Goal**: Reduce the exposed surface area at any given time. • Construct the landfill in **discrete cells** and cover them quickly after reaching capacity. • Limits the volume of water that can enter each phase. **6. Synthetic Liners and Drainage Layers** • While not minimizing leachate generation directly, they: ◦ **Prevent leachate migration into groundwater** ◦ **Facilitate collection and removal** of leachate to minimize accumulation **7. Vegetative Covers and Evapotranspiration** • Encourage **native or drought-resistant vegetation** on final cover to: ◦ Absorb precipitation ◦ Enhance **evapotranspiration**, reducing infiltration into the waste **8. Landfill Gas Collection**

	• Capturing landfill gas can also **draw moisture away** from the waste (via vacuum pressure), indirectly reducing leachate in certain conditions.

Switching to PFAS-free chemicals	**1. Chemical Inventory and Use Assessment**
	
	• **Catalog all chemicals** used in the facility, including:
	  o Raw materials, intermediates, additives
	  o Cleaning agents, surfactants, coatings, lubricants
	• **Identify PFAS content** via:
	  o SDS/MSDS reviews
	  o Supplier questionnaires or certifications
	  o PFAS analytical testing (EPA Methods 537.1, 533, or 1633)
	• **Prioritize based on**:
	  o Volume of use
	  o Risk of environmental release (e.g., wastewater discharge, volatilization)
	  o Regulatory drivers (e.g., bans, TRI reporting)
	
	2. Performance Evaluation
	
	• **Determine function of PFAS** in the current formulation:
	  o Oil, stain, or water repellency
	  o Surfactant or dispersant properties
	  o Thermal, chemical, or UV resistance
	• **Define performance criteria** required for a substitute:
	  o Chemical compatibility
	  o Shelf-life and process integration
	  o Customer specifications or certifications (e.g., FDA, NSF)
	
	3. Alternative Identification and Qualification
	
	• **Screen for PFAS-free alternatives** using:
	  o Green chemistry tools (e.g., ChemSec Marketplace, Toxnot, QCAT)
	  o Third-party certifications (e.g., GreenScreen®, Safer Choice)

	• **Engage vendors** to supply data on alternative performance, cost, and composition
	• **Lab- or pilot-scale testing** to confirm:
	  o Equivalent or acceptable performance
	  o No unintended side effects (e.g., fouling, corrosion)
	
	4. Procurement and Supply Chain Coordination
	
	• Update purchasing specifications to **exclude PFAS** (including PTFE, PFHxA, GenX, etc.)
	• Require **supplier declarations or certificates of analysis**
	• Confirm availability and pricing for large-scale use
	• Develop **dual sourcing** strategies if availability is uncertain
	
	5. Operational Changes
	
	• May require:
	  o **New equipment or maintenance routines** (e.g., for coatings or surfactants)
	  o Process optimization (e.g., dwell time, temperature adjustments)
	  o **Worker retraining** on safe handling and use of alternatives
	
	6. Regulatory and Customer Communication
	
	• Update:
	  o Safety Data Sheets (SDSs)
	  o Environmental permits (if changes affect discharges or emissions)
	  o Labels or marketing materials (e.g., PFAS-free claims)
	• Notify key customers if the chemical change affects downstream use or compliance
	
	7. Waste Handling and Legacy Management
	
	• Safely dispose of residual PFAS-containing materials:
	  o Unused inventory, containers, contaminated wipes, filters

	• Document transition efforts for internal tracking and external reporting (e.g., EPA, TSCA, EU REACH) **8. Ongoing Monitoring and Improvement** • Monitor performance, emissions, and compliance • Continue engaging suppliers for new, improved PFAS-free options • Update risk assessments and sustainability metrics
Increased Production Time	**1. Loss of Critical Functional Performance** PFAS chemicals are used for their **low surface energy, thermal stability, and chemical resistance**. When removed, substitutes may not: • Spread or coat as evenly (e.g., in anti-stick or surface treatment processes) • Provide the same durability or protection (e.g., corrosion, stain, or water resistance) • Maintain integrity under high temperatures or reactive environments **Example**: In electronics or photolithography, replacing PFAS-containing photoresists may require longer curing or etching times to achieve the same results. **2. Slower Process Dynamics** PFAS-free alternatives often: • **Evaporate more slowly** (if used as solvents or surfactants) • **Take longer to react** or dry • **Require additional application steps** to match PFAS performance (e.g., multiple coats instead of one) **Result**: Longer batch or cycle times, slower throughput **3. Equipment Compatibility Challenges**

	Substitutes may: • Be more viscous or incompatible with existing pumps, sprayers, or coating lines • Require **different temperature, mixing, or agitation profiles** This means process parameters must be adjusted—and often **re-optimized**, which temporarily reduces efficiency. **4. Increased Rework or Scrap Rates** Until the new formulation or process is stabilized, it's common to observe: • Poorer product uniformity or consistency • Failed quality tests • Need for reprocessing or extra curing steps This increases **downtime** and reduces overall productivity. **5. Additional Handling or Pre-Treatment Steps** Some PFAS-free materials require: • Pre-conditioning • Surface treatments • Compatibility layers (primers, sealers) Each of these adds **time to the production cycle**. **6. Regulatory and Quality Testing Delays** Switching chemicals often triggers: • **New regulatory approvals** (especially in pharma, food, or electronics)

	• Extensive **quality validation and shelf-life testing** These add to production lead time before full-scale implementation.

Replace piping with PFAS residuals	**1. Assessment and Planning**
	
	Actions:
	
	• **Identify affected areas** through process knowledge and **PFAS sampling** (e.g., rinsate or swab samples).
	• Review:
	  o Pipe materials (e.g., PTFE-lined, stainless steel, PVC)
	  o Pipe length and layout
	  o Accessibility (overhead, underground, confined spaces)
	
	Tools:
	
	• Piping schematics or 3D facility scans
	• EPA Method 1633 or validated swab/rinsate test protocols for PFAS
	
	2. Engineering Evaluation
	
	Determine:
	
	• Whether **cleaning or full replacement** is appropriate (cleaning may not remove adsorbed PFAS)
	• Materials for replacement (e.g., **PFAS-free liners**, alternative polymers, or metals)
	• Whether insulation or coatings also contain PFAS
	
	Consider:
	
	• Temperature, pressure, and chemical compatibility
	• Impact on process performance and downtime
	
	3. Procurement of PFAS-Free Materials

	Source:
	
	• Piping, fittings, valves, gaskets, and liners that **do not contain PTFE, PVDF, FEP, PFA, or other fluoropolymers**
	• Get supplier declarations of PFAS-free status (may be required for TSCA reporting or buyer documentation)
	
	4. Decommissioning and Removal
	
	Actions:
	
	• Drain and **triple-rinse** piping if needed to reduce PFAS residues before removal
	• Collect and containerize:
	  ○ **Removed pipes**
	  ○ Rinse water or residuals (store as potential hazardous waste)
	• Use PPE and tools compatible with hazardous waste removal and confined space protocols
	
	5. Waste Handling and Disposal
	
	Requirements:
	
	• Manage removed pipes, residues, and rinse water as **PFAS-impacted waste**
	• Disposal options may include:
	  ○ **Hazardous waste landfills** with leachate control
	  ○ **High-temperature incineration** (≥1,100°C) with validated PFAS destruction
	  ○ **Deep well injection** (for liquid rinsates, if approved)
	
	Documentation:
	
	• Waste profiles and manifests
	• Chain of custody for off-site disposal
	
	6. Installation and Startup

	Steps:
	
	• Install PFAS-free piping systems
	• Pressure test and flush (collect startup rinse water separately if required)
	• Calibrate equipment for any process parameter changes (e.g., flow resistance, heat transfer)
	
	7. Recordkeeping and Reporting
	
	Keep records of:
	
	• Materials replaced and quantities
	• PFAS test results (pre- and post-replacement)
	• Supplier PFAS-free certifications
	• Waste disposal manifests
	• Updated facility diagrams and SOPs
	
	8. Worker Safety and Training
	
	• Train staff on:
	  ○ PFAS hazards and containment procedures
	  ○ New piping system components and maintenance
	  ○ Proper PPE for PFAS contact and decontamination

Summary of Pipe Cost Information

Replacement of pipe containing PFAS residuals may be necessary if a facility has eliminated any use of PFAS in their process and has not demonstrated it is present from their portable water source. If the facility does not introduce PFAS into their process after replacement, the costs associated with replacing pipes for the purpose of removing historical PFAS residuals would be a one-time cost. Pipes come in different diameters and material. The selection of either parameter is dependent on the process scale, type and the characteristics of the wastewater produced. The information below shows cost information related to pipe type and diameter and an example breakdown of costs for a smaller plant with 5,000 linear feet of pipe.

1. **Pipe Material**
    - **PVC/CPVC**: $5–$15 per linear foot (for basic applications).
    - **Stainless Steel**: $30–$120+ per linear foot (common in food, pharma, chemical industries).
    - **HDPE (High-Density Polyethylene)**: $10–$40 per foot (popular for corrosive effluents).
2. **Pipe Diameter**
    - Costs scale significantly with pipe diameter.
    - 4" diameter vs. 12" diameter can double or triple the per-foot cost.
3. **Length and Layout**
    - Simple, straight runs cost far less than complex runs with bends, elevation changes, or hard-to-access locations.
4. **Installation Conditions**
    - Overhead or underground installations.
    - Working around existing equipment.
    - Need for shutdowns or night/weekend work.
5. **Labor Costs**
    - Union vs. non-union labor.
    - Region-specific wage rates.
    - Confined space or safety requirements.
6. **Permitting & Environmental Regulations**
    - Local permitting costs.
    - Compliance with EPA or state discharge limits.

Facility Type	Estimated Cost per Foot	Small Plant Example (5,000 linear ft)
Light industrial (PVC/HDPE)	$50–$150	$250,000–$750,000
Food or pharma (stainless)	$100–$300	$500,000–$1,500,000
Heavy chemical or refinery	$200–$500+	$1,000,000–$2,500,000+

References

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U.S. Environmental Protection Agency. (2024). *Water reuse and recycling*. Retrieved from https://www.epa.gov/waterreuse

The EPA provides guidelines and resources on water reuse practices, including information on regulations and end-use specifications.epa.gov+1epa.gov+1

Engineering Toolbox. (n.d.). *Pipe materials – Costs and installation factors*. Retrieved from https://www.engineeringtoolbox.com

This resource offers general engineering cost guidance for different pipe materials, including installation factors.

National Association of Plumbing-Heating-Cooling Contractors (PHCC). (n.d.). *Cost estimating manual for piping systems*. Retrieved from https://www.phccweb.org

The PHCC provides a manual for estimating costs associated with piping systems, useful for industrial applications.

American Society of Mechanical Engineers. (n.d.). *Process piping: The complete guide to ASME B31.3*. Retrieved from https://www.asme.org

This guide details materials, labor, and installation practices for process piping, adhering to ASME B31.3 standards.

Appendix B - Cost Calculations

This section outlines example calculations on how costs were calculated in this fiscal note. Industrial direct dischargers, SIUs, and POTWs were calculated using the same method. The example below reflects an industrial direct discharger.

I. Monitoring Costs for an Industrial Direct Discharger or SIU

Each affected entity was calculated to conduct baseline monitoring for four consecutive quarters. The following example calculations represent costs associated with one industrial direct discharger. This approach was also used for a POTW or SIU. Table 1 outlines the various cost categories and associated components. Since costs for baseline monitoring are realized in 2026 and 2027, escalation factors were used. During each sampling event, a POTW was required to collect a sample from both the influent and effluent locations. For quality assurance and quality control purposes, it was projected that one duplicate sample was taken for every 10 samples collected. Since this sampling event only included two locations, one duplicate was included. Therefore, each sampling event included three samples that were collected and sent off for analysis. The average cost for the analysis of one sample was $486 at a commercial lab (range of costs $429-$530 per sample). Costs associated with sampling also should include the supplies, staff time (i.e., collecting samples, coordination of analysis, review of data, and reporting of data to DEQ). A total of 24 hours of staff time were included for each sampling event at a loaded rate of $70 per hour. This loaded rate is calculated based on a $35.98[1] unloaded labor rate, benefits percentage of 29.7%[2], and overhead of 50%[3].

Table 1. Summary of Cost Categories and Components to Determine Monitoring Costs

Cost Categories	Cost Component Descriptions	Cost
Lab Costs to Analyze Samples	Number of Samples per Sampling Event	3
	Cost of 1633 per Sample	$486
	Total Laboratory Analysis Costs	$1,458
Supplies and Labor to Collect Samples/Review Results	Supplies	$50.00
	Field Staff Hourly Rate ($/hr)	$70.00
	Average Labor Time (hr)[3]	24
	Field staff labor costs (and/or estimates of field time)	$1,680.0
Future cost escalation factors	Lab Costs	0.73%
	Labor Costs - AWI (2000-2022)	3.22%
	Supply Costs - (2000-2022)	2.49%

[1] Rate based on early- to mid-career scientist in environmental, chemical, or life sciences
[2] https://www.bls.gov/news.release/pdf/ecec.pdf
[3] Reflects the higher end for private and profits, mid-range for state government, and lower end for a university.

II. Minimization Plan Development for an Industrial Direct Discharger or SIU

If an industrial direct discharger or SIU has concentrations of either PFPA, PFOS, and/or GenX, they will be required to develop a minimization plan. A facility could elect to develop this plan with existing staff or hire a consultant. After reviewing minimization plan submittals from permitted NPDES dischargers in Michigan under their PFAS Industrial Pretreatment Program, many of these facilities did cite that a consultant was hired to develop this deliverable. Therefore, it was projected that each facility would hire a consultant at a rate of $150,000 to evaluate the facility's data, processes, and determine how PFAS can be minimized. This range could vary depending on the scope and scale of the effort but based on best professional judgement and previous consultant contracts of similar efforts, $150,000 was a reasonable number to use. This was considered once in the projections since the time period was six years which takes a facility through baseline monitoring, continued monitoring, and the two-year period under the initial minimization plan. After 2031, a facility that does not minimize to less than the lowest reportable concentration would have to submit an updated plan. The level of effort needed to update this plan will vary and will be site specific.

III. Minimization Plan Implementation for Industrial Direct Discharger or SIU

Costs associated with implementing minimization plan best management practices were not calculated cumulatively across all affected entities. This estimate was not determined due to the uncertainty associated with the scope and scale of the reductions that would be elected to be achieved by each affected entity. Costs associated with a range of best management practices are outline in Appendix A.

Table 2. Summary of Cost Projections by Year from 2026-2031 for the Proposed Rules

Summary of Costs (2024$), Converted to Present Value (PV) @ 7% Discount Rate						
	Baseline Monitoring Period		**Continued Monitoring Period**			
Calendar Year	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Private						
Monitoring						
Industrial Direct	$1,435,026	$1,465,155	$1,066,688	$1,089,400	$1,112,755	$1,136,775
SIUs	$3,290,661	$3,283,924	$3,511,710	$3,521,280	$3,530,919	$3,540,629
Monitoring and Mitigation Plan Development						
Industrial Direct			$23,100,000			
SIUs			$87,450,000			
Total	**$4,725,687**	**$4,749,079**	**$115,128,398**	**$4,610,680**	**$4,643,674**	**$4,677,404**
Total Discounted	**$4,725,687**	**$4,438,391**	**$100,557,602**	**$3,763,688**	**$3,542,637**	**$3,334,925**
Total (Present Value | $2026)	**$120,362,929**					
Local Government						
POTWs Monitoring	$843,742	$861,457	$879,671	$898,401	$917,662	$937,470
Personnel Time	$636,300	$654,480	$649,430	$668,913	$688,980	$709,650
Total	**$1,480,042**	**$1,515,937**	**$1,529,101**	**$1,567,314**	**$1,606,642**	**$1,647,120**
Total Discounted	**$1,480,042**	**$1,416,763**	**$1,335,576**	**$1,279,395**	**$1,225,699**	**$1,174,374**
Total (Present Value | $2026)	**$7,911,850**					
State Government						
Personnel (2 FTEs)	$222,870	$229,556	$236,443	$243,536	$250,842	$258,367
Total Discounted	**$222,870**	**$214,538**	**$206,518**	**$198,798**	**$191,366**	**$184,212**
Total (Present Value | $2026)	**$1,218,303**					
Total Costs to Private, Local Government, and State Government						
Total	**$6,428,599**	**$6,494,572**	**$116,893,942**	**$6,421,530**	**$6,501,158**	**$6,582,891**
Total Discounted	**$6,428,599**	**$6,069,693**	**$102,099,696**	**$5,241,880**	**$4,959,703**	**$4,693,511**
Total (Present Value | $2026)	**$129,493,082**					

15A NCAC 02B .0512 PFOS, PFOA, AND GEN X MONITORING AND MINIMIZATION

(a) For purposes of this Rule, the following definitions shall apply:

(1) "EPA test Method 1633" means the EPA method for analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid, biosolids, and tissue samples by LC-MS/MS. Versions released on or after December 2022 by EPA are incorporated by reference, including subsequent amendments, editions and versions. The method may be accessed at https://www.epa.gov/cwa-methods/cwa-analytical-methods-and-polyfluorinated-alkyl-substances-pfas free of charge;

(2) "Gen X" means Hexafluoropropylene oxide dimer acid (HFPO-DA), CAS Registry Number 13252-13-6;

(3) "Industrial Direct Dischargers" means a person with an industrial discharge as defined in Rule .0202 of this Subchapter. Industrial Direct Dischargers does not include persons listed in 15A NCAC 02H .0102(b);

(4) "IDD-IP" means an Industrial Direct Discharger with an individual NPDES permit, except for the following types:

(A) 100% domestic wastewater;

(B) Seafood packing, rinsing, or other aquatic animal operations; and

(C) Water treatment plants;

(5) "Intake water" means the water entering the industrial establishment from surface water, groundwater, commercial, or other sources prior to any activities of the industrial establishment;

(6) "Minimization plan for PFOA, PFOS, and Gen X" means a strategy to reduce or eliminate PFOA, PFOS, and Gen X at the source before they are discharged into the environment. A minimization plan for PFOA, PFOS, and Gen X includes:

(A) Best management practices, such as: preventative measures to control and reduce pollution, pollution prevention, good housekeeping practices (e.g., regular changing or cleaning of equipment and tanks), identifying and eliminating PFOA, PFOS, and Gen X in raw materials, predicting process or operation generation of PFOA, PFOS, and Gen X as byproducts; improving operational efficiency to minimize the quantity waste generation; product substitution to eliminate the introduction or generation for PFOA, PFOS, and Gen X, and installing treatment technologies;

(C) A timeline for implementation;

(D) Estimated annual reductions from implementation; and

(E) Reduction goals, such as a target concentration or % reduction;

(7) "PFOA means Perfluorooctanoic acid, Chemical Abstracts Service (CAS) Registry Number 335-67-1;

(8) "PFOS" means Perfluorooctane Sulfonic Acid, CAS Registry Number 1763-23-1;

(9) "POTW" means Publicly Owned Treatment Works as defined in Rule .0403 of this Subchapter;

(10) "POTW-LPP" means a POTW with a local pretreatment program approved in accordance with Section .0900 of Subchapter 02H;

(11) "Semiannually" means occurring two times during a calendar year at a frequency of once per each interval of six consecutive months;

(b) All PFOA, PFOS, and Gen X monitoring outlined in this Rule shall be conducted as follows:

(1) Prior to EPA test Method 1633 being promulgated into 40 CFR Part 136:

(A) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall be conducted using the third draft of EPA test Method 1633 released on December 2022 or a more recent draft or version of EPA test Method 1633 released after December 2022.

(B) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall be exempt from the requirement in 40 CFR 403.12 to be certified.

(C) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall not require field blanks to be analyzed.

(D) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall be a representative grab sample, unless the Director approves use of either a grab-composite as specified in 40 CFR 403.12(g)(3), or 24-hour to 72-hour composites collected by an automatic sampler cleaned and prepared to prevent PFOA, PFOS, and Gen X contamination.

(2) After EPA test Method 1633 is promulgated into 40 CFR Part 136:

(A) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall be conducted using the version of EPA test Method 1633 that is promulgated into 40 CFR Part 136.

(B) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall comply with the requirement in 40 CFR 403.12 to be certified.

(C) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall require field blanks to be analyzed.

(D) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall be a representative grab sample, unless the Director approves use of either a grab-composite as specified in 40 CFR 403.12(g)(3), or 24-hour to 72-hour composites collected by an automatic sampler cleaned and prepared to prevent PFOA, PFOS, and Gen X contamination.

(c) All PFOA, PFOS, and Gen X monitoring outlined in this Rule shall be submitted to the Director as follows:

(1) PFOA, PFOS, and Gen X monitoring results reporting shall comply with the requirements in Rule .0506 of this Section, except as noted in Paragraph (b) of this Rule.

(2) PFOA, PFOS, and Gen X monitoring results for all PFOA, PFOS, and Gen X shall be reported for each sample.

(3) The lowest reporting concentration shall be reported for each PFOA, PFOS, and Gen X.

(d) PFOA, PFOS, and Gen X baseline characterization monitoring shall be required as follows:

(1) Within 60 days of the effective date of this Rule, the Director shall notify all IDDs-IP and all POTWs-LPP that either:

(A) PFOA, PFOS, and Gen X baseline characterization monitoring shall be required as described in Subparagraph (d)(2) of this Rule, or

(B) Representative historical PFOA, PFOS, and Gen X sampling as described in Subparagraph (d)(3) of this Rule shall be used to satisfy the requirement for PFOA, PFOS, and Gen X baseline characterization monitoring outlined in Subparagraph (d)(2) of this Rule.

The Director shall also notify any new applicants for an individual NPDES Industrial Direct Discharger permit or a POTW seeking approval of new pretreatment program under Section .0900 of Subchapter 02H that PFOA, PFOS, and Gen X baseline characterization monitoring shall be required as described in Subparagraph (d)(2) of this Rule.

(2) Each IDD-IP and POTW-LPP notified under Part (d)(1)(A) of this Rule shall characterize the PFOA, PFOS, and Gen X concentrations in their influent or intake water and their effluent by conducting PFOA, PFOS, and Gen X baseline characterization monitoring as follows:

(A) For each POTW-LPP, PFOA, PFOS, and Gen X samples shall be collected quarterly at each influent station and effluent station for one calendar year from the Director's notification starting within three months from the Director's notification;

(B) For each IDD-IP, PFOA, PFOS, and Gen X samples shall be collected quarterly at each intake water station and effluent station for one calendar year from the Director's notification starting within three months from the Director's notification;

(C) PFOA, PFOS, and Gen X samples shall be collected in accordance with the requirements in Rule .0505 of this Section;

(D) PFOA, PFOS, and Gen X samples shall be collected in accordance with the requirements in Paragraph (b) of this Rule; and

(E) PFOA, PFOS, and Gen X monitoring data shall be submitted to the Director in accordance with the requirements in Paragraph (c) of this Rule.

(3) Representative historical PFOA, PFOS, and Gen X sampling may be used to satisfy the requirement for PFOA, PFOS, and Gen X baseline characterization monitoring outlined in Subparagraph (d)(2) of this Rule if all of the following criteria are met:

(A) The PFOA, PFOS, and Gen X sampling follows the requirements in Paragraph (b) of this Rule;

(B) The PFOA, PFOS, and Gen X sampling follows the requirements in Subparagraph (d)(2) of this Rule; and

(C) The samples were collected within the four and one-half years prior to the Director's notification date under Subparagraph (d)(1) of this Rule.

(4) PFOA, PFOS, and Gen X monitoring required in a NPDES permit issued prior to the effective date of this Rule may be used to satisfy the requirement for PFAS baseline characterization monitoring outlined in Subparagraph (d)(2) of this Rule if all of the following criteria are met:

(A) The PFOA, PFOS, and Gen X sampling follows the requirements in Paragraph (b) of this Rule; and

(B) The PFOA, PFOS, and Gen X sampling follows the requirements in Subparagraph (d)(2) of this Rule.

(e) PFOA, PFOS, and Gen X ongoing monitoring shall be required as follows:

(1) The Director shall require PFOA, PFOS, and Gen X ongoing monitoring as described in Subparagraph (e)(2) of this Rule for any IDD-IP or POTW-LPP that reports a concentration above the lowest reporting concentration (i.e., not a non-detect) of any of the PFOA, PFOS, and Gen X in any of the quarterly effluent station samples collected under Paragraph (d) of this Rule.

(A) For each IDD-IP and POTW-LPP notified under Part (d)(1)(A) of this Rule, within 120 calendar days of receiving all of the PFOA, PFOS, and Gen X baseline characterization monitoring data as required in Paragraph (d) of this Rule, the Director shall notify each IDD-IP and each POTW-LPP whether PFOA, PFOS, and Gen X ongoing monitoring will be required or not.

(B) For each IDD-IP and POTW-LPP notified under Part (d)(1)(B) of this Rule, when the Director notifies each IDD-IP and each POTW-LPP in accordance with Part (d)(1)(B) of this Rule, the Director shall also notify each IDD-IP and each POTW-LPP whether PFOA, PFOS, and Gen X ongoing monitoring will be required or not.

(2) Each IDD-IP and POTW-LPP notified under Subparagraph (e)(1) of this Rule shall conduct ongoing PFOA, PFOS, and Gen X monitoring of their influent or intake water and their effluent as follows:

(A) For each POTW-LPP, PFOA, PFOS, and Gen X samples shall be collected semiannually at each influent station and effluent station starting within three months from the Director's notification. Sampling shall continue each calendar year until the requirements in Subparagraph (e)(3) of this Rule are met;

(B) For each IDD-IP, PFOA, PFOS, and Gen X samples shall be collected semiannually at each intake water station and effluent station starting within three months from the Director's notification. Sampling shall continue each calendar year until the requirements in Subparagraph (e)(3) of this Rule are met;

(C) PFOA, PFOS, and Gen X samples shall be collected in accordance with the requirements in Rule .0505 of this Section;

(D) PFOA, PFOS, and Gen X samples shall be collected in accordance with the requirements in Paragraph (b) of this Rule; and

(E) PFOA, PFOS, and Gen X monitoring data shall be submitted to the Director in accordance with the requirements in Paragraph (c) of this Rule.

(3) Ongoing PFOA, PFOS, and Gen X monitoring required in Subparagraphs (e)(1) and (2) of this Rule shall continue at each effluent station until the concentration for all PFOA, PFOS, and Gen X are below the lowest reporting concentration (i.e., reported as non-detects) in four consecutive quarterly effluent samples for that effluent station. If more than one sample is collected per quarter, then the highest concentration for each PFOA, PFOS, and Gen X for that quarter shall be used to determine whether ongoing PFOA, PFOS, and Gen X monitoring shall be performed.

(f) A minimization plan for PFOA, PFOS, and Gen X shall be required for IDDs-IP as follows:

(1) When the Director notifies each IDD-IP in accordance with Subparagraph (e)(1) of this Rule, the Director shall also notify each IDD-IP that meets the criteria in Subparagraph (e)(1) that a minimization plan for PFOA, PFOS, and Gen X that will reduce or eliminate PFOA, PFOS, and Gen X loading to surface waters is required.

(2) Within 365 days of receiving notification from the Director that a minimization plan for PFOA, PFOS, and Gen X is required, a minimization plan for PFOA, PFOS, and Gen X must be submitted by the IDD-IP to the Director for review and approval.

(3) Within 120 calendar days of receipt of the minimization plan for PFOA, PFOS, and Gen X from the IDD-IP, the Director shall approve the plan or notify the IDD-IP of any deficiencies identified in the plan that must be addressed before approval. The IDD-IP shall correct all deficiencies and resubmit a complete and updated minimization plan for PFOA, PFOS, and Gen X to the Director within 60 calendar days.

(4) Within 120 calendar days of the Director's approval of the minimization plan for PFOA, PFOS, and Gen X, the IDD-IP shall commence implementation of the minimization plan for PFOA, PFOS, and Gen X. Upon approval by the Director, the IDD-IP is required to comply with their approved minimization plan for PFOA, PFOS, and Gen X. The Director shall incorporate the ongoing monitoring and approved minimization plan for PFOA, PFOS, and Gen X into the IDD-IP permit upon permit renewal.

(5) The Director shall require annual reporting on the minimization plan for PFOA, PFOS, and Gen X that include at a minimum:

(A) A summary of the status of implementation of the minimization plan for PFOA, PFOS, and Gen X; and

(B) Any observed increases or decreases in the PFOA, PFOS or Gen X concentrations in the samples collected before and after implementation of the minimization plan for PFOA, PFOS, and Gen X.

(6) The minimization plan for PFOA, PFOS, and Gen X shall be reviewed every two years after the Director's approval in accordance with Subparagraph (f)(3) of this Rule. If the IDD-IP's reduction goals in their approved minimization plan for PFOA, PFOS, and Gen X are not met, then the IDD-IP shall provide an updated minimization plan for PFOA, PFOS, and Gen X to seek additional

reductions to the Director for review and approval in accordance with Subparagraphs (f)(2) and (3) of this Rule.

(7) Once the criteria in Subparagraph (e)(3) are met for all effluent stations at the IDD-IP, the requirements in Subparagraphs (f)(5) and (6) of this Rule shall no longer be required from the IDD-IP.

(g) An IDD-IP may request an exemption from the requirements in Paragraphs (e) and (f) of this Rule from the Director if the PFOA, PFOS, and Gen X concentrations meet all of the following criteria:

(1) The PFOA concentration in all of the quarterly effluent station samples is equal to or less than the PFOA concentration in all of the intake water station samples;

(2) The PFOS concentration in all of the quarterly effluent samples is equal to or less than the PFOS concentration in all of the intake water station samples;

(3) The Gen X concentration in all of the quarterly effluent samples is equal to or less than the Gen X concentration in all of the intake water station samples; and

(4) There is no increase in any of the PFOA, PFOS, and Gen X due to activities of the IDD-IP.

(h) Nothing in this Rule limits the Control Authority's authority to impose additional monitoring, reduction requirements, control or treatment requirements, or any other requirements as authorized in Section .0900 of Subchapter 02H.

(i) Nothing in this Rule limits the Commission's or Division's authority to impose additional monitoring, reduction requirements, control or treatment requirements, or any other requirements as authorized under the Clean Water Act, under the North Carolina General Statutes, or under other Rules within the North Carolina Administrative Code.

History Note: *Authority G.S. 143-215(a); 143-215.1(a); 143-215.1(b); 143-215.1(c); 143-215.3(a)(1); 143-215.3(a)(2); 143-215.6A; 143-215.6B; 143-215.6C; 143-215.65; 143-215.66; 143-215.67; 143-215.69*
Eff. DATE;

15A NCAC 02H .0923 PFOA, PFOS AND GEN X MONITORING AND MINIMIZATION

(a) For purposes of this Rule, the following definitions shall apply:

(1) "EPA test Method 1633" means the EPA method for analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid, biosolids, and tissue samples by LC-MS/MS. Versions released on or after December 2022 by EPA are incorporated by reference, including subsequent amendments, editions and versions. The method may be accessed at https://www.epa.gov/cwa-methods/cwa-analytical-methods-and-polyfluorinated-alkyl-substances-pfas free of charge.

(2) "Gen X" means Hexafluoropropylene oxide dimer acid (HFPO-DA), CAS Registry Number 13252-13-6;

(3) "Intake water" means the water entering the SIU from surface water, groundwater, commercial, or other sources prior to any activities of the SIU.

(4) "Minimization plan for PFOA, PFOS, and Gen X" means a strategy to reduce or eliminate PFOA, PFOS, and Gen X at the source before they are discharged into the environment. A minimization plan for PFOA, PFOS, and Gen X includes:

(A) Best management practices, such as: preventative measures to control and reduce pollution, pollution prevention, good housekeeping practices (e.g., regular changing or cleaning of equipment and tanks), identifying and eliminating PFA, PFOS, and Gen X in raw materials, predicting process or operation generation of PFOA, PFOS, and Gen X as byproducts, improving operational efficiency to minimize the quantity of waste generation, product substitution to eliminate the introduction or generation for PFOA, PFOS, and Gen X, and installing treatment technologies;

(C) A timeline for implementation;

(D) Estimated annual reductions from implementation; and

(E) Reduction goals, such as a target concentration or % reduction.

(5) "PFOA means Perfluorooctanoic acid, Chemical Abstracts Service (CAS) Registry Number 335-67-1;

(6) "PFOS" means Perfluorooctane Sulfonic Acid, CAS Registry Number 1763-23-1;

(7) "Quarterly" means the term as defined in 15A NCAC 02B .0503(20);

(8) "Semiannually" means occurring two times during a calendar year at a frequency of once per each interval of six consecutive months;

(b) All PFOA, PFOS, and Gen X monitoring outlined in this Rule shall be conducted as follows:

(1) Prior to EPA test Method 1633 being promulgated into 40 CFR Part 136:

(A) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall be conducted using the third draft of EPA test Method 1633 released on December 2022 or a more recent draft or version of EPA test Method 1633 released after December 2022.

(B) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall be exempt from the requirement in 40 CFR 403.12 to be certified.

(C) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall not require field blanks to be analyzed.

(D) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall be a representative grab sample, unless the Control Authority approves use of either a grab-composite as specified in 40 CFR 403.12(g)(3), or 24-hour to 72-hour composites collected by an automatic sampler cleaned and prepared to prevent PFOA, PFOS, and Gen X contamination.

(2) After EPA test Method 1633 is promulgated into 40 CFR Part 136:

(A) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall be conducted using the version of EPA test Method 1633 that is promulgated into 40 CFR Part 136.

(B) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall comply with the requirement in 40 CFR 403.12 to be certified.

(C) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall require field blanks to be analyzed.

(D) PFOA, PFOS, and Gen X monitoring and reporting under this Subparagraph shall be a representative grab sample, unless the Control Authority approves use of either a grab-composite as specified in 40 CFR 403.12(g)(3), or 24-hour to 72-hour composites collected by an automatic sampler cleaned and prepared to prevent PFOA, PFOS, and Gen X contamination.

(c) All PFOA, PFOS, and Gen X monitoring outlined in this Rule shall be submitted to the Control Authority as follows:

(1) PFOA, PFOS, and Gen X monitoring data submitted shall at a minimum include the following:

(A) Facility name;

(B) Facility number or other identification if assigned by the Control Authority;

(C) For each reported sample: sample date, sample time (on a 2400 hour clock basis), sample location, and sample collection type;

(D) PFOA, PFOS, and Gen X monitoring results for each reported sample; and

(E) The lowest reporting concentration shall be reported for each PFOA, PFOS, and Gen X.

(2) All PFOA, PFOS, and Gen X monitoring data shall be submitted to the Control Authority in accordance with the schedule outlined in the pretreatment discharge permit issued to the SIU by the Control Authority in accordance with Rule .0916 of this Subchapter.

(d) PFOA, PFOS, and Gen X baseline characterization monitoring shall be required as follows:

(1) Within 60 days of the effective date of this Rule, the Control Authority shall notify all SIUs that either:

(A) PFOA, PFOS, and Gen X baseline characterization monitoring shall be required as described in Subparagraph (d)(2) of this Rule, or

(B) Representative historical PFOA, PFOS, and Gen X sampling as described in Subparagraph (d)(3) of this Rule shall be used to satisfy the requirements for PFOA, PFOS, and Gen X baseline characterization monitoring outline in Subparagraph (d)(2) of this Rule.

The Control Authority shall specify in the notification whether the Control Authority or SIU will be responsible for completing the monitoring. The Control Authority shall also notify any new SIU pretreatment permit applicant that PFOA, PFOS, and Gen X baseline characterization monitoring shall be required as described in Subparagraph (d)(2) of this Rule.

(2) SIUs notified under Part (d)(1)(A) of this Rule or the Control Authority on behalf of the SIU shall characterize the PFOA, PFOS, and Gen X concentrations in their effluent by conducting PFOA, PFOS, and Gen X baseline characterization monitoring as follows:

(A) PFOA, PFOS, and Gen X samples shall be collected quarterly at each effluent station for one calendar year from the Control Authority's notification starting within three months from the Control Authority's notification;

(B) PFOA, PFOS, and Gen X sample location and timing shall be representative of the effluent for each effluent;

(C) PFOA, PFOS, and Gen X samples shall be collected in accordance with the requirements in Paragraph (b) of this Rule; and

(D) PFOA, PFOS, and Gen X monitoring data shall be submitted to the Control Authority in accordance with the requirements in Paragraph (c) of this Rule.

(3) Representative historical PFOA, PFOS, and Gen X sampling may be used to satisfy the requirement for PFOA, PFOS, and Gen X baseline characterization monitoring outlined in Subparagraph (d)(2) of this Rule if all of the following criteria are met:

(A) The PFOA, PFOS, and Gen X sampling follows the requirements in Paragraph (b) of this Rule;

(B) The PFOA, PFOS, and Gen X sampling follows the requirements in Subparagraph (d)(2) of this Rule; and

(C) The samples were collected within the four and one-half years prior to the date the SIU is notified by the Control Authority as outlined in Subparagraph (d)(1) of this Rule.

(4) PFOA, PFOS, and Gen X monitoring required in a NPDES permit may be used to satisfy the requirement for PFOA, PFOS, and Gen X baseline characterization monitoring outlined in Subparagraph (d)(2) of this Rule if all of the following criteria are met:

(A) The PFOA, PFOS, and Gen X sampling follows the requirements in Paragraph (b) of this Rule; and

(B) The PFOA, PFOS, and Gen X sampling follows the requirements in Subparagraph (d)(2) of this Rule.

(e) PFOA, PFOS, and Gen X ongoing monitoring shall be required as follows:

(1) The Control Authority shall require PFOA, PFOS, and Gen X ongoing monitoring as described in Subparagraph (e)(2) of this Rule for any SIU that reports a concentration above the lowest reporting concentration (i.e., not a non-detect) of any of the PFOA, PFOS, and Gen X in any of the quarterly effluent station samples collected under Paragraph (d) of this Rule.

(A) For each SIU notified under Part (d)(1)(A) of this Rule, within 120 calendar days of receiving all of the PFOA, PFOS, and Gen X baseline characterization monitoring data as required in Paragraph (d) of this Rule, the Control Authority shall notify each SIU whether PFOA, PFOS, and Gen X ongoing monitoring will be required or not. The Control Authority shall specify in the notification whether the Control Authority or SIU will be responsible for completing the ongoing monitoring of PFOA, PFOS, and Gen X.

(B) For each SIU notified under Part (d)(1)(B) of this Rule, when the Control Authority notifies each SIU in accordance with Part (d)(1)(B) of this Rule, the Director shall also notify each SIU whether PFOA, PFOS, and Gen X ongoing monitoring will be required or not.

(2) SIUs notified under Subparagraph (e)(1) of this Rule, or the Control Authority on behalf of the SIU, shall conduct ongoing PFOA, PFOS, and Gen X monitoring of their effluent as follows:

(A) PFOA, PFOS, and Gen X samples shall be collected semiannually at each effluent station starting within three months from the Control Authority's notification date per Subparagraph (e)(1) of this Rule. Sampling shall continue each calendar year until the requirements in Subparagraph (e)(3) of this Rule are met;

(B) PFOA, PFOS, and Gen X sample location and timing shall be representative of the effluent for each effluent;

(C) PFOA, PFOS, and Gen X samples shall be collected in accordance with the requirements in Paragraph (b) of this Rule; and

(D) PFOA, PFOS, and Gen X monitoring data shall be submitted to the Control Authority in accordance with the requirements in Paragraph (c) of this Rule.

(3) Ongoing PFOA, PFOS, and Gen X monitoring required in Subparagraphs (e)(1) and (2) of this Rule shall continue at each effluent station until the concentrations for all PFOA, PFOS, and Gen X are below the lowest reporting concentration (i.e., reported as non-detects) in four consecutive quarterly effluent samples for that effluent station. If more than one sample is collected per quarter at an effluent station, then the highest concentration for each PFOA, PFOS, and Gen X for that quarter shall be used to determine whether ongoing PFOA, PFOS, and Gen X monitoring shall be performed at that effluent station.

(f) A minimization plan for PFOA, PFOS, and Gen X shall be required as follows:

(1) When the Control Authority notifies each SIU in accordance with Subparagraph (e)(1) of this Rule, they shall also notify each SIU that meets the criteria in Subparagraph (e)(1) of this Rule that a minimization plan for PFOA, PFOS, and Gen X that will reduce or eliminate PFOA, PFOS, and Gen X loading to the POTW is required.

(2) Within 365 days of receiving notification from the Control Authority that a minimization plan for PFOA, PFOS, and Gen X is required, a minimization plan for PFOA, PFOS, and Gen X must be submitted by the SIU to the Control Authority for review and approval.

(3) Within 120 calendar days of receipt of the minimization plan for PFOA, PFOS, and Gen X from the SIU, the Control Authority shall approve the plan or notify the SIU of any deficiencies identified in the plan that must be addressed before approval. The SIU shall correct all deficiencies and resubmit a complete and updated minimization plan for PFOA, PFOS, and Gen X to the Control Authority within 60 calendar days.

(4) Within 120 calendar days of the Control Authority's approval of the minimization plan for PFOA, PFOS, and Gen X, the SIU shall commence implementation of the minimization plan for PFOA, PFOS, and Gen X. The Control Authority shall modify the SIU permit in accordance with Rule .0916 of this Subchapter to incorporate the ongoing monitoring and the approved minimization plan for PFOA, PFOS, and Gen X into the SIU permit within 120 calendar days of the Control Authority's approval of the minimization plan for PFOA, PFOS, and Gen X.

(5) The Control Authority shall require annual reporting on the minimization plan for PFOA, PFOS, and Gen X in the SIU permits that include at a minimum:

(A) A summary of the status of implementation of the minimization plan for PFOA, PFOS, and Gen X; and

(B) Any observed increases or decreases in the PFOA, PFOS or Gen X concentrations in the samples collected before and after implementation of the minimization plan for PFOA, PFOS, and Gen X.

(6) The minimization plan for PFOA, PFOS, and Gen X shall be reviewed every two years after the SIU permit is modified in accordance with Subparagraph (f)(4) of this Rule. If the SIU's reduction goals in their approved minimization plan for PFOA, PFOS, and Gen X are not met, then the SIU shall provide an updated minimization plan for PFOA, PFOS, and Gen X to seek additional reductions to the Control Authority for review and approval in accordance with Subparagraphs (f)(2) and (3) of this Rule.

(7) Once the criteria in Subparagraph (e)(3) of this Rule are met for all effluent stations at the SIU, the requirements in Subparagraphs (f)(5) and (6) of this Rule shall no longer be required from the SIU.

(g) A SIU may request an exemption from the requirements in Paragraphs (e) and (f) of this Rule from the Control Authority if all of the following are met:

(1) Concurrent with the PFOA, PFOS, and Gen X baseline characterization monitoring conducted in accordance with Paragraph (d) of this Rule, the SIU must also characterize the PFOA, PFOS, and Gen X concentrations in their intake water by conducting PFOA, PFOS, and Gen X baseline characterization monitoring as follows:

(A) PFOA, PFOS, and Gen X samples shall be collected quarterly at each intake water station for one calendar year from the date the SIU is notified by the Control Authority in Subparagraph (d)(1) of this Rule;

(B) PFOA, PFOS, and Gen X sample location and timing shall be representative of the intake water for each intake water station;

(C) PFOA, PFOS, and Gen X samples shall be collected in accordance with the requirements in Paragraph (b) of this Rule; and

(D) PFOA, PFOS, and Gen X monitoring data shall be submitted to the Control Authority in accordance with the requirements in Paragraph (c) of this Rule.

(2) The PFOA, PFOS, and Gen X concentrations meet all of the following criteria:

(A) The PFOA concentration in all of the quarterly effluent station samples is equal to or less than the PFOA concentration in all of the intake water station samples;

(B) The PFOS concentration in all of the quarterly effluent samples is equal to or less than the PFOS concentration in all of the intake water station samples;

(C) The Gen X concentration in all of the quarterly effluent samples is equal to or less than the Gen X concentration in all of the intake water station samples; and

(D) There is no increase in any of the PFOA, PFOS, and Gen X due to activities of the SIU.

(h) In the Pretreatment Annual Report submitted to the Division as required in Rule .0908 of this Subchapter, the Control Authority shall submit a PFOA, PFOS, and Gen X Addendum that includes:

(1) A summary of the PFOA, PFOS, and Gen X monitoring data received by the Control Authority from all SIUs as required in Paragraphs (d) and (e) of this Rule;

(2) Copies of lab reporting sheets or excel spreadsheets received by the Control Authority from all SIUs as required in Paragraphs (c) and (d) of this Rule.

(3) A list of SIUs with approved minimization plans for PFOA, PFOS, and Gen X, including their total volume discharged and their estimated mass of PFOA, PFOS, and Gen X discharged during the reporting year;

(4) A summary of the implementation status for all approved minimization plans for PFOA, PFOS, and Gen X;

(5) A summary of the estimated annual reductions of PFOA, PFOS, and Gen X reaching the POTW from implementation of the approved minimization plans for PFOA, PFOS, and Gen X;

(6) A list of any enforcement actions taken for failing to conduct ongoing PFOA, PFOS, and Gen X monitoring, failing to provide a minimization plan for PFOA, PFOS, and Gen X or for failing to implement an approved minimization plan for PFOA, PFOS, and Gen X; and

(7) A summary of status and outcomes for any enforcement actions taken.

(i) Nothing in this Rule limits the Control Authority's authority to impose additional monitoring, reduction requirements, control or treatment requirements, or any other requirements as authorized in Section .0900 of this Subchapter.

(j) Nothing in this Rule limits the Commission's or Division's authority to impose additional monitoring, reduction requirements, control or treatment requirements, or any other requirements as authorized under the Clean Water Act, under the North Carolina General Statutes, or under other Rules within the North Carolina Administrative Code.

History Note: *Authority G.S. 143-215(a); 143-215.1(a); 143-215.1(b); 143-215.1(c); 143-215.3(a)(1); 143-215.3(a)(2); 143-215.3(a)(14); 143-215.6A; 143-215.6B; 143-215.6C; 143-215.65; 143-215.66; 143-215.67; 143-215.69*
Eff. DATE;