

**3M Operations LLC's Comments to
Draft NPDES/SDS Permit No. MN0001449 for
3M Operations LLC Cottage Grove Facility
Cottage Grove, Washington County, Minnesota
August 30, 2024**

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**3M Chemical Operation LLC's Comments to
Draft National Pollution Discharge Elimination System/State Disposal System Permit
No. MN0001449**

I. Executive Summary

The Minnesota Pollution Control Agency (MPCA) and 3M Chemical Operations LLC (3M) share two important objectives with respect to the Draft National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Permit MN0001449 for 3M's Cottage Grove facility (Draft Permit): (1) to ensure that the Draft Permit establishes a clear and unambiguous path for the facility to achieve and maintain full compliance consistent with the requirements of the federal Clean Water Act and the State of Minnesota's Water Pollution Control Act; and (2) to reduce discharges of PFAS from the Cottage Grove facility. As discussed below, the Draft Permit requires modification to advance these objectives in a manner consistent with governing law.

We note for context that when Cottage Grove's advanced wastewater treatment system becomes fully operational, Cottage Grove will no longer be manufacturing PFAS. As the calendar turns to 2026, the advanced wastewater treatment system at Cottage Grove will become, with respect to PFAS, an advanced remedial system primarily supporting the cleanup of groundwater from Cottage Grove and the Woodbury disposal site. Thus, the PFAS discharges from the site will result from legacy production and from remedial activities agreed upon with the State of Minnesota.

The Draft Permit seeks to impose requirements for the operation of the advanced wastewater treatment system that are legally impermissible and unsupported by the record. We outline in detail in the sections following this Executive Summary what 3M views as the primary legal and technical issues with the Draft Permit, including: (1) MPCA's failure to follow its own regulations and guidelines in deriving the Draft Permit's WQBELs for PFOA, PFOS and PFHxS; (2) MPCA's failure to follow state and federal law in setting the WQBELs for PFOA, PFOS and PFHxS that are "reasonable, feasible, and practical"; (3) the imposition of intervention limitations that exceed MPCA's authority under the federal Clean Water Act and Minnesota's Water Pollution Control Act; and (4) the establishment of a schedule of compliance that is not supported by the record and does not reflect operational realities.¹ While too many to address in this Executive Summary, the Draft Permit contains inconsistencies and requirements that are arbitrary and capricious because they either add no value to ensuring compliance or detract from that goal.² These issues are detailed in the comments below.

¹ 3M has requested a contested case hearing on these four issues, as discussed in 3M Chemical Operation's Petition For A Contested Case Hearing Pursuant to Minn. Stat. Ch. 14 and Minn. R. 7000.1800 and 7000.1900.

² Despite its challenges to the development of effluent limitations discussed herein, 3M expects to meet the Draft Permit's "Compliance Limits" for PFOA, PFOS, and PFHxS and effluent limitations for PFBS, PFBA and PFHxA that

Notwithstanding the issues we outline in our comments, 3M remains committed to compliance with its regulatory obligations and offers these comments as a vehicle to continue to work collaboratively with MPCA to develop a final permit that meets our common objectives. As MPCA knows, 3M has made significant investments in capital improvements and changes to its operations over the last two decades since MPCA last issued an NPDES/SDS permit for the Cottage Grove facility in January 2003. These investments were made in collaboration with MPCA to reduce PFAS discharges from Cottage Grove. This history provides important context for the current discussion about the Draft Permit and includes:

- In 2007, 3M and MPCA entered into a Settlement Agreement and Compliance Order (SACO)³ under which, among other things, 3M agreed to design and implement a program to remediate at Cottage Grove PFAS-containing groundwater from the Oakdale and Woodbury disposal sites. Today that groundwater contributes a significant percentage of the mass of PFAS and wastewater treated at the facility.
- In 2020, 3M ceased the discharge of wastewater from its Cottage Grove-based PFAS manufacturing processes by capturing it and combusting it in hazardous waste-permitted incinerator.
- In 2022, 3M announced that it would exit all PFAS manufacturing by the end of 2025 and work to discontinue the use of PFAS across our product portfolio in that same timeframe. 3M is currently winding down its PFAS manufacturing operations at Cottage Grove.
- In 2023, 3M began construction of a \$300 million state-of-the-science advanced wastewater treatment system at Cottage Grove after MPCA's review and approval of that treatment system. That system is expected to begin operation in 2025 followed by a period of testing and optimization. The system is purposefully designed to treat PFAS in wastewater through the deployment of three separate technologies—granular activated carbon (GAC), reverse osmosis (RO), and ion exchange (IX). The only other state-of-the-science facility of the nature and size of the advanced wastewater treatment system currently in operation in the United States is at 3M's Cordova, Illinois facility.

3M urges MPCA to better reflect the above-listed developments as it considers revisions to the Draft Permit. MPCA seeks to impose conditions in the Draft Permit that ignore this monumental change. 3M's advanced wastewater treatment system treat PFAS at a scale that is unprecedented. 3M's experience at its Cordova facility that treats less water with similar technology has provided 3M with invaluable information regarding the amount of time needed to complete construction and stabilize and optimize the advanced wastewater treatment system and its treatment elements. Nonetheless, MPCA

MPCA proposes to take effect on January 1, 2027. See Draft Permit Conditions 5.69.128 (Compliance Limits) & 6.59.5 (final effluent limitations for PFBS, PFBA, and PFHxA).

³ The SACO is attached hereto, and incorporated herein as Exhibit L.

appears to have disregarded the substantial information submitted by 3M in explaining these developments, and in so doing has proposed issuing a final permit that is unsupported by the record.

For the reasons summarized in this Executive Summary and outlined in detail in this comment letter, 3M respectfully requests that the Draft Permit be modified to be consistent with MPCA’s statutory authority and responsibility to ensure 3M’s compliance obligations are clearly defined and demonstrated to be reasonable, feasible, and practical.

A. The Process MCPA Followed to Set Final Effluent Limitations for Certain PFAS is Inconsistent with Minnesota Law

As discussed in more detail below, MPCA failed to follow applicable regulatory requirements and guidelines in deriving the site-specific water quality criteria (WQC) that form the basis for the proposed WQBELs for PFOA, PFOS and PFHxS. For example, even though it purports to set site-specific WQC, MCPA relies on non-site-specific information to set the fish consumption rate (FCR) at two to three times greater than the value MPCA should have used had it followed its own guidance. MPCA’s reliance on reference dose (RfD) values not vetted by the Minnesota Department of Health (MDH), and its adoption without explanation of a *draft* United States Environmental Protection Agency (EPA) value that EPA declined to use in subsequent final agency actions, represent further departures from the requirements of MPCA’s own rules. These errors render the WQBELs arbitrary, capricious and not in accordance with law. MPCA also fails to explain the critical steps it used to calculate WQBELs so that its analysis can be evaluated by 3M and other members of the public.

B. The WQBELs for Certain PFAS are Arbitrary and Capricious and Exceed MCPA’s Statutory Authority

Minnesota and federal law require MPCA to take permitting actions with outcomes that are “reasonable, feasible, and practical.” See Minn. Stat. § 116.07, subd. 6. Minnesota law further requires that MPCA make a determination that the effluent limitations can be implemented at Cottage Grove. As discussed further below, MPCA has made no such determination and 3M is unaware of any record information supporting a conclusion that the WQBELs for PFOA, PFOS and PFHxS are reasonable, feasible, and practical.

The Draft Permit proposes the following WQBELs for PFOA, PFOS and PFHxS:

	Monthly Average	Daily Maximum
PFOA	0.013 ng/L (ppt)	0.022 ng/L (ppt)
PFOS	0.038 ng/L (ppt)	0.066 ng/L (ppt)
PFHxS	0.0032 ng/L (ppt)	0.0056 ng/L (ppt)

Notably, these levels are several orders of magnitude lower than EPA’s recently promulgated drinking water standards, which are 4 parts per trillion (ppt) for PFOA, PFOS and 10 ppt for PFHxS. As we discuss, the proposed WQBELs are not reasonable, feasible or practical, even considering the capabilities of 3M’s state-of-the-science advanced wastewater treatment system:

- MPCA freely admits that the proposed WQBELs for PFOA, PFOS, and PFHxS are too low to be reliably measured by current analytical technology. See MPCA National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Permit Program Fact Sheet Permit Reissuance MN0001449 at 58 (hereinafter “Fact Sheet”). That, alone, renders the limits infeasible, unreasonable and not practical.⁴
- Beyond the fact that the proposed limits are too low to measure, MPCA also has not presented any record evidence that 3M’s advanced wastewater treatment system could achieve the WQBELs. In fact, the existing record is devoid of any indication that MPCA completed the required analysis of the ability of different technologies – 3M’s advanced wastewater treatment system or any other treatment technologies – to treat PFAS in wastewater to these ultra-low levels.
- Further, evidence that MPCA could and should have considered in setting the limits does not support that the WQBELs can be reasonably, feasibly or practically achieved by 3M’s advanced wastewater treatment system or any other system. That evidence includes 3M’s treatability and pilot studies for the advanced wastewater treatment system,⁵ which were submitted to and approved by MPCA, as well as MPCA’s own study of the feasibility of different PFAS treatment technologies. Neither the Treatability Study and Pilot Study offers any indication that the advanced wastewater treatment system is expected to achieve MPCA’s proposed ultra-low WQBELs.

C. The Proposed “Intervention Limits” are Arbitrary and Capricious and Exceed MPCA’s Statutory Authority

The Draft Permit’s proposed “intervention limits” for certain internal waste streams are likewise arbitrary and capricious and exceed the Agency’s statutory authority. The imposition of intervention limits is inconsistent with state and federal law, which provide that effluent limits are to be imposed at internal waste streams only where it is impractical or infeasible to measure effluent quality at the “end-of-the-

⁴ Recognizing that it has set WQBELs for PFOA, PFOS, and PFHxS that are not measurable, MPCA proposes in the Draft Permit to set a “Compliance limit” of 2.1 ng/L for PFOA and 2.2 ng/L for PFOS and PFHxS. As discussed *infra* at Section IV, MPCA’s inclusion of this compliance limit does not remedy its failure to set effluent limits that are reasonable, feasible, and practical, as required by Minnesota law.

⁵ Montrose Environmental Group and Barr Engineering, *PFAS Treatability Study Alternatives Identification Plan, 3M Cottage Grove, MN Facility* (May 2021) and Montrose Environmental Group and Barr Engineering, *PFAS Treatability Study Alternatives Identification Plan (Updated), 3M Cottage Grove, MN Facility* (July 2021) (hereinafter collectively the “Treatability Study”). The Treatability Study is attached hereto, and incorporated herein as Exhibit A-1 and Exhibit A-2. Barr Engineering, *PFAS Treatability Study* (Dec. 22, 2021) (hereinafter the “Pilot Study”). The Pilot Study is attached hereto, and incorporated herein as Exhibit B.

pipe.” Here, effluent can be sampled and measured at the end-of-the-pipe, and therefore internal waste stream limitations exceed MPCA’s authority and are unlawful. The Draft Permit provision stating that “an exceedance of an applicable intervention limit does not constitute a violation under this permit” does not mitigate MPCA’s overreach as an exceedance of a proposed intervention limit would trigger significant enforceable mandatory, serial, and unnecessary root cause analyses, corrective actions, and reporting obligations. Put another way, “end-of-the-pipe” standards are designed to relieve those subject to regulation not only of enforcement consequences associated with internal waste streams but of the costs and burdens associated with having to measure, analyze and report them.

In addition, the proposed intervention limits are arbitrary and capricious because they are not rationally related to achievement of any discharge limits. The intervention limits are set so low that they cannot be measured using available technology and therefore cannot provide the type of meaningful information that would allow a reasonable wastewater treatment plant operator to respond by taking measures to prevent an effluent limitation exceedance. Further, because they are tied to the ultra-low proposed WQBELs, the proposed intervention limits are not related to enforceable limits.

D. Unworkable Compliance Schedule

3M has submitted to MPCA extensive information and documents supporting 3M’s proposed schedule for the completion of the construction and optimization of the advanced wastewater treatment system. 3M’s proposed schedule is based on: (1) detailed engineering and technical information and documents provided to MPCA during the construction permitting process and during the pre-publication permit period, and (2) 3M’s experience in constructing and optimizing the Cordova facility’s advanced wastewater treatment system. Nonetheless, MPCA seems to have not considered this substantial body of information that supports the schedule that is actually required for the Site’s advanced wastewater treatment system to become fully operational, and arbitrarily cut the time for optimization and stabilization in half. As such, the compliance schedule set forth in the Draft Permit is arbitrary and capricious because it does not reflect either available record information or operational realities. As discussed in detail in the body of this comment letter, 3M respectfully requests that MPCA revise the draft permit to incorporate 3M’s proposed compliance schedule, which *does* reflect construction- and operations-related realities. 3M’s request is fully consistent with both federal and Minnesota law, both of which allow for the use of schedules of compliance when time is needed to achieve WQBELs.

E. Conclusion

For the reasons set forth in this comment letter and its attachments, 3M respectfully requests that MPCA modify the Draft Permit to achieve consistency with federal and Minnesota law and provide regulatory certainty to the facility. As we note above, 3M stands ready to work with MPCA to advance our common objectives – *i.e.*, to ensure that the permit conditions are clear, unambiguous and meet the requirements of federal and state law, and to reduce PFAS in wastewater and stormwater discharges from Cottage Grove.

II. Background

A. 3M Operations LLC Cottage Grove Facility

3M Chemical Operations LLC's facility⁶ in Cottage Grove, Minnesota (Facility) is located approximately 15 miles south of St. Paul, MN, in Washington County, along the northern bank of the Mississippi River. The Facility site (Site) occupies approximately 1,700 acres and is located approximately three miles southeast of the City of Cottage Grove, Minnesota. 3M manufactures a variety of products at the Facility, including specialty paper products, adhesive products, industrial polymers, abrasives, and reflective road sign materials. 3M also conducts research and product development at the Facility. In 2022, 3M announced that it would exit all PFAS manufacturing by the end of 2025 and work to discontinue the use of PFAS across our product portfolio in that same timeframe. 3M is in the process of winding down its PFAS manufacturing operations at Cottage Grove, consistent with that announcement.

3M has undertaken multiple environmental investigation and remediation efforts at the Site. Under the SACO, 3M agreed to characterize the presence of certain PFAS in various environmental media at the Facility and develop an approach for remediating certain PFAS at the Facility. 3M also agreed to treat PFAS-containing groundwater from the 3M Woodbury Disposal Site ("Woodbury Site") at Cottage Grove.

Since 2020, 3M has captured wastewater from its Cottage Grove-based PFAS manufacturing processes for combustion in either the former Resource Conservation and Recovery Act (RCRA) permitted Cottage Grove Corporate Incinerator or an offsite RCRA-permitted hazardous waste incinerator. Other wastewater from the Facility is treated via an on-site wastewater treatment plant (WWTP). All of the water used and treated at the Facility through its existing wastewater treatment plant is groundwater, which includes groundwater captured from the Woodbury Site pursuant to the SACO. Some site stormwater is also captured and treated at the WWTP or in situ before discharge. Based on 2023 data, on average, about half (~49 percent (%)) of the water treated at the site comes from Woodbury. Amongst the various wells, the Woodbury wells are the source of about 89% of the PFHxS, 25% of the PFOA, and 31% of the PFOS, with Woodbury well 4 (~98%) being the dominant source amongst the four Woodbury wells.

In 2023, 3M commenced construction of a \$300-million state-of-the-art advanced wastewater treatment system at the Facility. Prior to beginning construction of that system, 3M submitted a Treatability Study and a Pilot Study to the MPCA. The MPCA approved both.⁷ When completed, in light of particular aspects of the composition of the Cottage Grove effluent, the advanced wastewater treatment system will utilize a combination of three technologies that have proven effect at filtering both

⁶ 3M Chemical Operations LLC has owned and operated the Facility since August 2023. Prior to that, the Facility was owned and operated by 3M Company.

⁷ Letter from MPCA to 3M, 3M Cottage Grove Wastewater Treatment Facility, Plan and Specification Approval, Building 150 and Building 151 Project, NPDES/SDS Permit Number MN0001449, (May 17, 2023). The letter is attached hereto, and incorporated herein as Exhibit C.

long and short-chain PFAS from Facility wastewater: RO, IX, and GAC. The only other state-of-the-science facility of the nature and size of the multi-stage advanced wastewater treatment system under construction at Cottage Grove that is currently in operation in the United States is at 3M's Cordova, Illinois facility.

Relevant to PFAS, and at a high-level, the system operates at follows:

- PFAS-containing wastewater passes through three stages of treatment via a process called RO, which involves forcing water through a membrane that excludes a high percentage of the PFAS.
- The filtered water that passes through the RO process is called permeate and represents approximately 85% of the original volume of water directed to the RO.
- The remaining 15% of the original volume is called reject. The reject contains the concentrated PFAS from the treated water. The reject is sent through the IX and GAC systems for removal of the PFAS concentrate.
- The filtered water from the IX and GAC systems is then combined with the RO system permeate and discharged. The remaining PFAS concentrate will be collected and sent off-site for hazardous waste disposal.

The advanced wastewater treatment system is expected to begin full operation in 2025. Once construction is complete and operation begins, there will be a period of time required to optimize and stabilize the system to ensure consistent performance. The system and its capabilities are described in more detail in the Expert Reports prepared by Arcadis U.S., Inc. (Arcadis),⁸ and Donald Kaczynski.⁹

B. Permit Background

On February 5, 2002, 3M Company submitted an application to MPCA for renewal of its NPDES permit for discharges of treated process wastewater and stormwater from the Cottage Grove facility. The renewal application noted that “fluorochemicals” were among the products manufactured at

⁸ Arcadis, Treatability Review Memorandum, prepared by Corey Theriault, PE, Keith Foster, Lauren March, PE of Arcadis (hereinafter the “Arcadis Expert Report”). The Arcadis Expert Report is attached hereto, and incorporated herein as Exhibit D.

⁹ *Impact of Intervention Limits on Advanced Wastewater Treatment System Performance*, (Aug. 28, 2024) (hereinafter the “Kaczynski Expert Report”). The Kaczynski Expert Report is attached hereto, and incorporated herein as Exhibit E.

Cottage Grove, and listed the below eight specific PFAS detected during testing of the wastewater discharge from October 1996 to October 2001:¹⁰

- Perfluorooctanoic acid (PFOA)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorohexanoic acid (PFHxA)
- Pefluorobutyric acid (PFBA)
- Perfluorooctane sulfonate (PFOS)
- Pefluoroheptane sulfonate (PFHpS)
- Perfluorohexane sulfonate (PFHxS)
- Perfluorobutane sulfonate (PFBS)

MPCA issued a final renewed NPDES permit for the Cottage Grove facility (Permit MN0001449) on January 27, 2003.¹¹ The permit had a five-year term and became effective on February 1, 2003. The final 2003 NPDES permit includes a section titled “Special Requirements for Fluorochemical Analyses” requiring 24-hour composite sampling on a monthly basis for: PFOA, PFHxA, PFOS, PFHxS, and PFBS. On or about January 2007, MPCA issued a letter to 3M requiring it to also monitor for the presence of PFPeA, PFNA, PFDA, PFUnA, PFDoA, PFTTrDA, and FOSA.

Consistent with federal and state regulations, 3M submitted a timely renewal application for the Cottage Grove NPDES permit on August 3, 2007 (i.e., at least 180 days before the expiration of the existing permit). 40 C.F.R. § 122.21(d)(2); Minn. R. 7001.0030, Subpart 3. As part of the 2007 renewal application, 3M provided monitoring results for PFAS in wastewater samples collected from January 2003 to May 2007. As a result of sampling and analytical work, 3M indicated in its permit application that PFNA (C9 carboxylic acid), PFDA (C10 carboxylic acid), PFUnA (C11 carboxylic acid), PFDoA (C12 carboxylic acid), PFTA [sic] (C13 carboxylic acid), and FOSA were “Believed Absent.”¹² 3M also identified the following fourteen (14) PFAS as “Believed Present” in wastewater:

PFBA (C4 carboxylic acid), PFPeA (C5 carboxylic acid), PFHA [sic] (C6 carboxylic acid), PFHpA (C7 carboxylic acid), PFOA (C8 carboxylic acid), PFNA (C9 carboxylic acid), PFDA [sic] (C10 carboxylic acid), PFUnA (C11 carboxylic acid), PFDoA (C12 carboxylic acid), PFTA (C13 carboxylic acid), PFBS (C4 sulfonate), PFHS [sic] (C6 sulfonate), PFOS (C8 sulfonate), and FOSA.¹³

A draft permit was issued on January 3, 2011, requiring sampling for 12 PFAS. The PFAS are: PFBA, PFBS, PFDoA, PFHpA, PFHxA, PFHxS, PFNA, PFOA, PFOS, FOSA, PFPeA, and PFUnA. Because

¹⁰ Updated application for National Pollutant Discharge Elimination System (NPDES) and State Disposal System (SDS) Permit MN0001449, dated February 5, 2002.

¹¹ MPCA, National Pollutant Discharge Elimination System (NPDES) and State Disposal System (SDS) Permit MN0001449 (Feb. 1, 2003).

¹² Application for Permit to Discharge Wastewater (Aug. 3, 2007).

¹³ Application for Permit to Discharge Wastewater, submitted on behalf of 3M Cottage Grove Center MN0001449, Attachment 2 V-B (Aug. 3, 2007).

MPCA has not reissued the NPDES permit following its expiration, 3M has continued to operate under the 2003 permit conditions as permitted by federal and MPCA rules. 40 C.F.R. § 122.6; Minn. R. 7001.0160.

3M renewed efforts to update the Cottage Grove NPDES permit and submitted an updated renewal application to MPCA on April 15, 2021. Starting in November 2023, MPCA met with 3M to discuss the NPDES permit renewal. These meetings occurred on November 30, 2023, December 14, 2024, and January 11, 2024.

On January 12, 2024, three years after submission of the 2021 renewal application, MPCA shared with 3M a Pre-Public Notice (PPN) Draft Permit.¹⁴ The PPN Draft Permit was 1,422 pages in length, with a 139-page accompanying fact sheet. MPCA requested comments on the NPDES/SDS permit be provided within 14 days.

On January 22, 2024, 3M requested that the time for it to respond and offer comments on the PPN Draft Permit be extended. MPCA agreed to grant 3M a 30-day extension to comment on the PPN Draft Permit during a meeting with 3M on January 25, 2024. MPCA provided written confirmation of this extension by email correspondence on January 25, 2024. The January 25, 2025 correspondence is attached hereto, and incorporated herein as Exhibit F-3. 3M submitted initial comments on the PPN Draft Permit on February 15, 2024. The February 15, 2024 letter is attached hereto, and incorporated here as Exhibit F-5. 3M's comments identified key conditions of the PPN Draft Permit that 3M believed required collaboration with MPCA to enhance the accuracy and quality of the permit. On March 18, 2024, MPCA issued a response to 3M's comments on the PPN Draft Permit.

3M submitted additional comments to MPCA on March 28, 2024, outlining particular issues with the proposed effluent limits for PFOS in the PPN Draft Permit. The March 28, 2024 letter is attached hereto, and incorporated herein as Exhibit F-8. On April 3, 2024, MPCA issued a letter pertaining to the Phase 3 wastewater treatment system. 3M responded to the MPCA's April 3 letter on April 11, 2024. The April 11, 2024 letter is attached hereto, and incorporated herein as Exhibit F-10. On April 23, 2024, MPCA requested that 3M provide additional figures and diagrams of the Cottage Grove facility. 3M provided the requested materials on April 26, 2024.

3M provided additional comments on the PPN Draft Permit on April 30, 2024. The April 30, 2024 letter is attached hereto, and incorporated herein as Exhibit F-13. In its comment letter, 3M proposed permit language that would ensure that discharge from the Cottage Grove facility would have the lowest level of PFOS that is technologically feasible without curtailing 3M's groundwater remediation activities at the site. 3M explained that it has an ongoing obligation to treat both onsite groundwater and groundwater from other remedial sites pursuant to a 2007 administrative settlement between 3M and MPCA.

¹⁴ Written correspondence cited in this section is attached hereto, and incorporated herein as Exhibits F-1 to F-18.

On May 1, 2024, MPCA requested that 3M provide data and calculations in support of its reporting limits for PFOS, PFOA, and PFHxS. 3M provided this information on May 7, 2024. On May 10, 2024, MPCA sent email correspondence to 3M providing new proposed WQBELs for PFAS compounds in for stations SD 001 and SD 002 as a result updated calculations performed by MPCA. The May 10, 2024 email is attached hereto, and incorporated herein as Exhibit F-15.

On May 16, 2024, 3M met with the MPCA Commissioner to discuss certain unresolved issues regarding the PPN Draft Permit. Specifically, 3M emphasized the need for an appropriate compliance schedule to complete ongoing construction, start-up and optimization of its advanced water treatment system. During that meeting, MPCA requested that 3M submitted a revised proposed compliance schedule with interim milestone dates. 3M provided a proposed compliance schedule, along with additional comments on the proposed intervention limits on the permit on May 29, 2024. The May 29, 2024 letter is attached hereto, and incorporated herein as Exhibit F-16.

On June 13, 2024, 3M submitted comments to MPCA on the proposed requirements for annual non-targeted analyses (NTAs) and instream PFAS characterization studies, included in the PPN Draft Permit. The June 13, 2024 letter is attached hereto, and incorporated herein as Exhibit F-18.

On July 1, 2024, MPCA published the Draft Permit that is the subject of these comments. MPCA also released an accompanying public notice and Fact Sheet for the Draft Permit.

III. The Draft Permit’s WQBELs for PFOA, PFOS and PFHxS are Arbitrary and Capricious and Inconsistent with Regulatory Requirements.

A. Process Flaws in MPCA’s Derivation of WQBELs for PFOA, PFOS and PFHxS

As discussed herein, MPCA’s failure to follow its own regulations in setting the WQBELs for PFOA, PFOS, and PFHxS is arbitrary and capricious and inconsistent with MPCA’s statutory authority. MPCA’s authority for establishing WQBELs for PFOA, PFOS, and PFHxS derives from Minn. Stat. § 115.03, subdivision 1(a)(3), which charges MPCA with the duty to “establish . . . reasonable pollution standards,” and from Minn. Stat. § 116.07, subdivision 6, which requires MPCA to “give due consideration to . . . material matters affecting the feasibility and practicality of an proposed action” and to “take or provide for such action as may be reasonable, feasible, and practical under the circumstances.”

Pursuant to these authorities, MPCA has promulgated a series of regulations governing its derivation of WQCs and WQBELs for PFOA, PFOS, and PFHxS. These include Minnesota regulations 7050.0217 – 0219. The regulations provide algorithms and define the factors to be used in them, including the reference dose (RfD), the bioaccumulation factor (BAF), and the fish consumption rate (FCR). In some instances, the regulations provide default values for these factors and rates, as well as requirements for when those values should be used or adjusted.

As discussed further *infra*, without adherence to its own regulations, MPCA has improperly selected the most conservative values possible to use as inputs to the algorithms for developing its criteria, as though each input is conceptually independent of the others, without regard for consistency or the unreasonable compounding of conservatism that results. Further, MPCA has provided no evidence demonstrating that MPCA has met its burden to consider the reasonableness, feasibility or practicality of its actions. The result is a set of WQBELs for PFOA, PFOS, and PFHxS that are inconsistent with Minnesota law.

The discussion in this section of 3M's comments is supported by the analysis contained in the expert report of Robyn Prueitt, Ph.D., and Tim Verslycke, Ph.D., titled "Related to Reissuance of the National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Permit MN0001449 for the 3M Cottage Grove Center Facility in Cottage Grove, Minnesota" (hereinafter the "Gradient Expert Report"). The Gradient Expert Report is attached hereto, and incorporated herein as Exhibit G.

B. MPCA's Calculation of Fish Bioaccumulation Factors (BAFs) is Technically Flawed and Inconsistent with Applicable Guidance

MPCA's regulations provide that "site-specific numeric criteria for toxic pollutants shall be derived by the commissioner using the procedures in this part." Minn. R. 7050.0218, subpart 2. MPCA relied on those provisions to develop the WQBELs for PFOA, PFOS, and PFHxS to protect fish consumers from exposure to "bioaccumulative chemicals of concern" (BCCs). Importantly, development of water quality criteria ("WQC") – that are based on so-called fish-consumption criteria is only appropriate for "chemicals of concern that have a BAF in excess of MPCA's regulatory threshold of 1,000 L/kg or greater. Minn. R. 7050.0219, subpart 15.

MCPA's regulations define the BAF as "the concentration of a pollutant in one or more tissues of an aquatic organism, exposed from any source of a pollutant but primarily from the water column, diet, and bottom sediments, divided by the average concentration in the solution in which the organism had been living, under steady state conditions." Minn. R. 7050.0218, subpart 3.G. A companion regulation setting forth the methods for deriving a BAF for developing site-specific criteria specifies that the "field-measured BAF" is the most preferred of four alternative methods and prescribes that "[t]he field-measured BAF for a nonionic organic chemical is calculated based on the total concentration of the chemical in the appropriate tissue of the aquatic organism . . . and the total concentration of chemical in ambient surface water at the site of sampling." Minn. R. 7050.0219, subpart 8.A. As discussed below, MPCA's conclusion that PFOA and PFHxS are BCC is inconsistent with MPCA's own regulatory guidance.¹⁵ As a result, MPCA's derivation of fish consumption-based WQC and the final effluent limitations that result from those criteria – are arbitrary and capricious.

¹⁵ Some of the infirmities outlined in this section regarding MPCA's approach to setting WQC for PFOA and PFHxS applies with equal force to the other PFAS identified in the Draft Permit for which MPCA includes WQBELs (e.g., the FCR).

1. Technical and Data Deficiencies

As explained in the Gradient Expert Report, studies and data relied on by MPCA do not support its conclusion that PFOA and PFHxS are BCC, while other analyses confirm that it is inappropriate to develop WQC for these chemicals based on fish consumption.¹⁶

The evidence developed by EPA and MCPA strongly support the opposite conclusion that PFOA and PFHxS are not BCC:

- EPA's recent review of BAF values in aquatic organisms reported median BAFs for fish tissue as 20 L/kg for PFHxS and 8.5 L/kg for PFOA, both of which are many times below the 1,000 L/kg threshold MPCA's regulations require for a finding that a chemical is a BCC.¹⁷
- EPA's draft aquatic life criteria analysis reports a BAF of 7.2 L/kg for PFOA.¹⁸
- MPCA concludes in its 2023 technical support document establishing WQCs for PFAS that deriving fish tissue criteria for PFOA and PFHxS is *not* appropriate because BAFs for these chemicals are well below 1,000 L/kg, having geomean BAFs in the range of 32-60 L/kg.¹⁹
- MPCA's recent analysis describes fish tissue geomeans for PFOA and PFHxS as nearly the same for trophic levels 3 and 4, indicating these chemicals do not bio-magnify.²⁰

MPCA's relies on studies collected by the Interstate Technology and Regulatory Council (ITRC) for the conclusion that the BAFs for PFOA and PFHxS are greater than 1,000 L/kg but fails to disclose and discuss the weaknesses and divergent outcomes documented in those studies.²¹ The ITRC database of studies includes only two studies in which BAFs greater than 1,000 were derived for PFOA and PFHxS from water and fish tissue samples collected in the Great Lakes Region. Other studies listed by ITRC that derived BAFs greater than 1,000 for these chemicals were conducted in aquatic ecosystems that are not comparable to the Mississippi River (e.g., estuarine waters, marine environments, and Asian rivers) and/or involved aquatic life other than fish (e.g., invertebrates, plankton).

- Both of the supposedly relevant studies calculated BAFs based on whole fish, unlike the BAFs calculated for Pool 2 of the Mississippi River based on fillet.

¹⁶ Gradient Expert Report, see Exhibit G at 12-13.

¹⁷ *Id.* at 13.

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ *Id.*

²¹ *Id.*

- In both of those studies, the collection of fish and water samples occurred at different times, sometimes years apart, creating substantial uncertainty as to their reliability.²²
- In another study listed by the ITRC, BAFs were calculated from samples collected from lakes in Ontario using fish tissue of the same species (black crappie and smallmouth bass) that 3M and MPCA sampled in Pool 2. Those BAFs ranged from 7.9 to 25.1 L/kg for PFOA and 4.0 to 20.0 L/kg for PFHxS²³. MPCA has not explained why it disregarded these findings.

In short, MPCA’s decision to develop fish-tissue WQC for PFOA and PFHxS is not supported by the science and contravenes MPCA’s regulations and its prior analysis. MPCA provides no explanation or justification for that inconsistency. In its 2023 technical support document (TSD) setting WQCs for five PFAS, including PFOA and PFHxS. In that support document MPCA states: “Of the PFAS included in this TSD, only PFOS meets the criteria of a bioaccumulative chemical of concern (BCC) for a fish tissue-based CC. The CC are based on the most recent toxicity information from the Minnesota Department of Health (MDH) and MPCA’s 2017 human health-based WQS/WQC derivation methods as adopted in Minn. R. chs. 7050 and 7052.”²⁴ The hard pivot to a different position in the 2024 TSD underlying the WQCs used for the Draft Permit warrant explanation and without it, the change can only be seen as arbitrary and capricious.

2. Technically Flawed Methodology for Calculating Fish BAFs PFOA and PFHxS

MPCA’s approach to calculating BAFs for PFOA and PFHxS is inconsistent with applicable EPA guidance. MPCA uses the “regression on order statistics” (ROS) methodology to calculate fish tissue and surface water geomeans. However, EPA guidance indicates that ROS is appropriate only for datasets with a high proportion of detected results (i.e., detections in greater than 50% of samples).²⁵ The data sets upon which MPCA relies do not meet that basic ROS threshold criteria. As Gradient reports, in seven (7) of the ten (10) instances where the ROS method was selected to calculate fish tissue geometric means across PFAS compounds and trophic levels, the detection frequency did not exceed 50% (MPCA, 2024c, Appendix A).²⁶ The use of ROS methodology produces biased-high results, which are not consistent with best risk assessment science.²⁷

This is because the ROS method can extrapolate non-detected results that are greater than detected values in the dataset, which can overestimate the geomean. MPCA’s ROS-based geomeans are even higher than geomeans calculated using the detection-limit method, an approach that EPA would

²² *Id.*

²³ *Id.*

²⁴ MPCA Health Protective Water Quality Criteria for Per- and Polyfluoroalkyl Substances (PFAS) January 2023, at page 6.

²⁵ *Id.* at 15.

²⁶ *Id.*

²⁷ *Id.*

consider inappropriately biased high. In some instances, MPCA’s values are even twice as much as values that EPA would consider to be inappropriately biased high.²⁸

Moreover, as underscored by Gradient, MPCA does not provide a rationale for using the ROS method in light of the distribution of the underlying datasets, and MPCA’s error in using ROS is compounded by its failure to discuss whether statistical tests were used to identify outliers or to discuss the potential impact of outliers on its derivation of BAFs.²⁹ MPCA has not justified its use of ROS for these data sets in light of the concerns and issues outlined above and detailed in the Gradient Expert Report. Consequently, reviewers lack the ability to meaningfully understand and critique MPCA’s derivation of BAFs used in its calculation of effluent limitations. The effluent limitations therefore are not adequately supported in the record.

3. Data Handling and Analysis

In 2021-2023, 3M conducted and submitted to MPCA the results of an extensive Mississippi River instream study.³⁰ Because MPCA relies (in part) upon the instream study data to develop BAFs, 3M has evaluated MPCA’s handling of those data. 3M has noted a number of discrepancies that call into question the validity of MPCA’s results. Examples include:

- While MPCA asserts that values presented in its Table 2-2 represented geometric means, which MPCA’s regulations require in calculating BAFs, the values are in fact arithmetic means.³¹ Arithmetic means of environmental data are typically higher than geometric means due to the log-normal distribution of the data. The BAFs resulting from this error are considerably higher than they would be had the regulatorily required geometric means been utilized, and as a result overstate the true bioaccumulation potential of the three PFAS. The following table demonstrates the impact of this departure from the regulations:

PFAS	Arithmetic mean detected water conc. (ng/L)-MPCA reported in SS WQC document	Geometric mean detected water conc. (ng/L)	LOQ REPLACEMENT METHOD
PFBS	43.7	9.05	½ DETECTION LIMIT
PFBA	153.2	87.3	½ DETECTION LIMIT
PFHxS	5.7	4.74	½ DETECTION LIMIT

²⁸ *Id.*

²⁹ *Id.* at 14

³⁰ Weston Solutions Inc., *3M 2023 Instream PFAS Characterization Study Final Report-Mississippi River, Cottage Grove, Minnesota* (June 29, 2023) (hereinafter “2023 IPC Study”). The 2023 IPC Study is attached hereto, and incorporated herein as Exhibit J.

³¹ MPCA, 2024. Human Health Protective Water Quality Criteria for Per- and Polyfluoroalkyl Substances (PFAS) in Mississippi River, Miles 820 to 812, at Tbl. 2-2. Online, <https://www.pca.state.mn.us/sites/default/files/wq-s6-69a.pdf>.

PFAS	Arithmetic mean detected water conc. (ng/L)-MPCA reported in SS WQC document	Geometric mean detected water conc. (ng/L)	LOQ REPLACEMENT METHOD
PFHxA	13.6	11.3	½ DETECTION LIMIT
PFOA	37.4	23.0	ROS
PFOS	26.9	16.4	NONE (RAW)

- 3M’s review of the data indicates that data of 148 PFBA, PFHxA, PFOA, and PFBS samples were changed from non-detect to detect. This results in significantly higher detection frequencies for those four PFAS in fish fillets and significant changes to reported mean concentrations for PFOA, PFHxA, and PFBS. Using the correct data, detection frequencies for fish fillet data are all significantly less than 50% for all PFAS except PFOS. Sixty (60) of those 148 changes were made in the dataset for Trophic Level 4 (TL4), which has significance in MPCA’s algorithms for calculating BAFs because TL4 results are heavily weighted (76% versus 24% for TL3 results).
- The change from non-detect to detect in a significant number of samples is significant because one of MPCA’s offered justifications for developing fish consumption criteria for PFAS other than PFOS was the supposed high detection frequencies of PFAS in fish, and MPCA’s use of the ROS methodology is only justified when detection frequencies exceed 50%, as discussed above. Without that change, MPCA’s use of fish consumption criteria to derive the final effluent limitations for PFOA and PFHxS would be unsupported.

C. MPCA Relied on Inapplicable Data to Derive its Fish Consumption Rate

MPCA also improperly used a FCR value of 66 g/day. As discussed below, that value is not site-specific and therefore not appropriate for use in the development of a “site specific” WQC.³² That value is also significantly out of step with the fish consumption rates used by other state and federal authorities addressing PFOS exposures:³³ Michigan uses a FCR value of 15 g/day while Wisconsin uses a 20 g/day FCR value.³⁴ EPA uses a FCR value of 22 g/day based on the 90th percentile consumption of fish and shellfish from fresh and estuarine waters for U.S. adults.³⁵

³² The infirmities outlined in this section regarding MPCA’s approach to FCRs applies with equal force to the other PFAS identified in the Draft Permit for which MPCA includes WQBELs.

³³ B. Ruffle, C. Archer, K. Vosnakis, J.D. Butler, C.W. Davis, B. Goldsworthy, R. Parkman, and T.A. Key, 2023. US and international per- and polyfluoroalkyl substances surface water quality criteria: A review of the status, challenges, and implications for use in chemical management and risk assessment. *Integrated Environmental Assessment and Management* 20: pp. 36-58.

³⁴ *Id.* at 47.

³⁵ *Id.* at 46.

As MPCA notes in its 2020 TSD, its chosen FCR is more in line with values used by tribal authorities in the Lake Superior Basin.³⁶ This appears to be the result of MPCA's reliance on a single study (the "FISH" study) that apparently included a significant proportion of participants who were women living on or within one mile of the Lake Superior shore.³⁷ Not surprisingly, these women consumed more fish than women studied nationally.³⁸ In comparison with EPA's data, noted above, these women consumed *three times* the amount of fish consumed by women nationally.

MPCA justified this choice by reference to the goal of achieving an FCR that will "account for reasonable maximum exposure (RME)."³⁹ MPCA cited EPA's definition of RME as "the highest exposure that is reasonably expected to occur at a site."⁴⁰ As the definition suggests, by its very nature the RME is site specific. At best, MPCA's FCR is specific to the small community of women living in a rural area on and near the north shore of Lake Superior; its application of that consumption rate to the urbanized metropolitan area of Minneapolis and St. Paul is unjustified.

EPA's "Final Report on Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations", released in April 2014,⁴¹ is plainly more relevant than a study performed in rural location on the shores of Lake Superior far from the urban environment through which the Mississippi River flows. EPA also estimated the FCR for women of childbearing age (WCBA) (13 to 49 years). The 95th percentile (CI) FCR value for WCBA was 23.5 g/day, slightly *lower* than the FCR value of 25.7 g/day for all adult women.⁴² MPCA's FCR value of 66 g/day for WCBA is so far above the national estimate established by EPA as to demand extraordinarily compelling justification, but MPCA offered none in the 2020 TSD.

In its 2020 TSD, MPCA asserted that its FCR "reflects similar rates found in other surveys of Minnesota's WCBA."⁴³ As discussed below, this assertion is not supported by the surveys MPCA consulted.

³⁶ MPCA, 2020. *Water Quality Standards Technical Support Document: Human Health Protective Water Quality Criteria for Perfluorooctane Sulfonate*, at 14. Online, <https://www.pca.state.mn.us/sites/default/files/wq-s6-61a.pdf> (hereinafter "2020 TSD").

³⁷ MDH, 2017. Technical Report: Fish are Important for Superior Health (FISH) Project. MDH and M. Turyk, at 1-3. Online, <https://www.health.state.mn.us/communities/environment/fish/docs/consortium/fishtechreport.pdf>.

³⁸ *Id.* at 1 (emphasis added).

³⁹ 2020 TSD at 14.

⁴⁰ *Id.* n.12.

⁴¹ U.S. EPA, 2014. *Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations (NHANES 2003-2010)*. EPA-820-R-14-002. Online, <https://19january2017snapshot.epa.gov/sites/production/files/2015-01/documents/fish-consumption-rates-2014.pdf>.

⁴² *Id.* at 51.

⁴³ 2020 TSD at 14.

In November 2022, MPCA published a document titled “Interim fish consumption rate for women of childbearing age.”⁴⁴ MPCA acknowledged that the FISH Study, covered WCBA with the highest percentage of fish consumption out of all surveys conducted in the state, and stated that this high rate of consumption could be attributed to subsistence or cultural reasons.⁴⁵

MPCA also credited the MDH Great Lakes WCBA diary survey published in 2017, which targeted women ages 18 to 48 who had fishing licenses and lived in Minnesota and seven other states bordering the Great Lakes.⁴⁶ According to MPCA, “[t]he diary study included regular and consistent tracking of all fish and shellfish consumed with estimates of portion size.”⁴⁷ MPCA said:

The results of this survey found women participating (95% Caucasian) consumed less than 30 g/d (20.7 g/d at the 90th percentile) of total freshwater fish based on the reported portion size. The average portion size was 157-166 g for caught fish. In comparison, the MDH FISH survey, which exclusively involved WCBA (ages 16 to 50) residing on the North Shore of Minnesota, their upper percentile freshwater fish consumption was much higher at 66.2 g/d.⁴⁸

Given the above, MPCA’s assertion that the MDH FISH survey results were similar to results from other surveys of fish consumption by Minnesota’s WCBA is not correct.⁴⁹ MPCA made no effort to explain why it ignored the data presented by the diary survey of WCBA living in multiple Great Lakes states or the data presented by the Family Environmental Exposure Tracking survey of minority WCBA,⁵⁰ nor why it ignored the values used by other regulators – including U.S. EPA – in setting fish consumption rates. This was arbitrary and capricious and inconsistent with regulations governing MPCA’s authority to set “site specific” WQC.

⁴⁴ MPCA, 2022. *Interim fish consumption rate for women of childbearing age*. Online, <https://www.pca.state.mn.us/sites/default/files/wq-s6-60.pdf>.

⁴⁵ *Id.* at 5, 7.

⁴⁶ *Id.* at 7.

⁴⁷ *Id.* at 7-8.

⁴⁸ *Id.* at 8.

⁴⁹ MPCA dismissed the much lower results of the MDH Great Lakes WCBA diary survey, saying “while the diary study provides a robust estimate of an upper percentile amount of freshwater fish consumed by Caucasian WCBA with fishing licenses, this amount and dataset may not represent freshwater fish consumption for WCBA of other Minnesotan local or regional cultural or racial/ethnic consumption patterns.” While that conclusion may be correct, it begs the question of whether the FISH survey or the diary survey better represents the consumption of fish from Pool 2 of the Mississippi River in metropolitan Minneapolis. *Id.*

⁵⁰ “Minnesota Family Environmental Exposure Tracking (MN FEET) was a study with the Minnesota Department of Health (MDH), HealthPartners Institute and SoLaHmo Partnership for Health & Wellness at Minnesota Community Care (formerly known as West Side Community Health Services)”; available at <https://www.health.state.mn.us/communities/environment/biomonitoring/docs/mnfeetcommreporten.pdf>

D. MPCA’s Use of Toxicological Values is Inconsistent with Applicable Regulations and Previous Approaches Used by MPCA.

1. Failure to Comply with Applicable Regulations.

MPCA failed to comply with Minnesota R. 7050.0219, subpart 4, and therefore has not sufficiently justified the use of the RfDs for each of the PFOA, PFOS, and PFHxS criteria upon which WQBELs in the draft permit are based.⁵¹ The regulation requires MPCA to either: (1) obtain RfDs from MDH; or (2) develop the RfDs according to the definitions of carcinogen and reference dose found in Minn. R. 4717.7820, subparts 5 and 21, and 7050.0218, subpart 3.

MPCA met neither requirement. The 2024 TSD specifically indicates that MPCA obtained the RfDs from the EPA, not MDH. In the recent past, MPCA has stated unequivocally that non-MDH values can be used only after evaluation and completion of any needed modifications by MDH.⁵² There does not appear to be any documentation of coordination regarding development of the RfDs between MPCA and MDH in either the 2024 TSD or the documents 3M requested from MPCA other than the MDH documents that MPCA referenced in the 2024 TSD but did not use. Furthermore, MPCA has provided no discussion of how the EPA’s RfDs or the derivation of those values complied with Minnesota’s rules. MPCA used USEPA’s RfD for PFOS and PFOA, and it appears MPCA used a draft RfD value from EPA for PFHxS.

Table 1 RfD Summary

PFAS Parameter	MPCA’s RfD (mg/kg-day)	MDH’s RfD (mg/kg-day)	USEPA’s RfD (mg/kg-day)	Source of MPCA’s RfD
PFOS	1×10^{-7}	2.6 ng/mL ^A	1×10^{-7}	USEPA
PFOA	3×10^{-8}	0.93 ng/L ^A	3×10^{-8}	USEPA
PFHxS	2×10^{-10}	9.7×10^{-6}	4×10^{-10}	USEPA (Draft)

Notes:

A. MDH did not identify a RfD for PFOS and PFOA. Instead, they used a reference serum concentration for PFOS and PFOA, which are shown in the table.

The regulations referenced in the second option for developing RfDs contain definitions of “carcinogen” and “reference dose.” The definition of “carcinogen” found in Minn. R. 4717.7820, subpart 5 incorporates by reference two EPA documents and one U.S. Department of Health and Human Services report. None of these documents was discussed or referenced in the 2024 TSD. This would support an inference that MPCA applied the definition of reference dose to obtain the toxicological values used for PFOS and PFOA.

The definition of “reference dose” found in Minn. R. 4717.7820, subpart 21 and Minn. R. 7050.0218, subpart 3 states that the RfD must be based on at least one of the five uncertainty factors listed in each rule, which include uncertainty in the extrapolation of animal data to humans, variation in

⁵¹ While 3M does not in these comments address issues with the RfDs adopted by MDH or EPA, this is not an indication of agreement with the values derived by either agency.

⁵² Gradient Expert Report, see Exhibit G at 5.

toxicological sensitivity within the human population, extrapolation of results from short-term studies to long-term effects, using studies that found effects at all doses tested, and using deficient data.

MPCA's 2024 TSD provides no discussion of whether or how EPA applied any of the uncertainty factors, and fails to provide any detailed explanation of the derivation of RfDs. MPCA should have documented how the USEPA developed RfDs for PFOS and PFHxS, as well as the CSF for PFOA, and why the methods used by USEPA comply with the MPCA's regulations and MDH's methods.⁵³

2. Inconsistency with MDH's Own Values.

Consistent with MPCA's rules, the agency based its 2020 WQC for PFOS and its 2023 criteria for PFOA, PFHxS, PFHxA, PFBS, and PFBA on RfDs developed by MDH.⁵⁴ But MPCA's 2024 development of effluent limitations based on EPA RfDs departs dramatically from MPCA's earlier work without explanation.

a. MPCA's RfD for PFOS

For PFOS, MPCA used an RfD of 1×10^{-7} mg/kg-d and a CSF of 39.5 per mg/kg-d from the EPA Final Human Health Toxicity Assessment for PFOS 224-5520. As explained in the Gradient Expert Report, while MDH developed an RfD for PFOS based on the same underlying health effect from the same study as EPA, the MDH RfD was derived by dividing the point of departure (POD) of 7.7 ng/mL in serum by an uncertainty factor (UF) of 3, whereas EPA converted the 7.7 ng/mL serum concentration to a POD human equivalent dose (POD_{HED}) and divided the POD_{HED} by a UF of 10. MDH also used a different toxicokinetic model from that used by EPA to calculate POD_{HED} values for PFOS. If MDH had calculated a POD_{HED} value using its toxicokinetic model for PFOS, this value would be 3×10^{-6} mg/kg-d; dividing this value by a UF of 3 would yield a PFOS RfD of 1×10^{-6} mg/kg-d, an order of magnitude higher than EPA's RfD.⁵⁵

In deriving its 2020 site-specific WQC for PFOS that is not specific to Cottage Grove, MPCA used an RfD of 3.1×10^{-6} mg/kg-d, as developed by MDH. This is also higher than the EPA RfD used by MPCA to derive effluent limitations in the draft permit Cottage Grove. MPCA has provided no explanation for why it decided not to use the MDH RfD, as required by the regulations.

b. MPCA's RfD for PFHxS

While it is unclear from the TSD and its references, it appears that MPCA used an RfD of 2×10^{-10} mg/kg-d from an external review draft of the EPA IRIS Toxicological Review of PFHxS and Related

⁵³ *Id.* ("MDH's methodology for developing toxicological values for PFAS has generally differed from that of US EPA, as MDH has used different toxicokinetic model parameters to convert serum levels of PFAS to human equivalent doses compared to US EPA.")

⁵⁴ *Id.*

⁵⁵ *Id.* at 6.

Salts.⁵⁶ If so, the value for this RfD is incorrect and appears to come from an erroneous value listed in Table ES-1 in the Executive Summary of the EPA draft document. The actual draft RfD value from EPA for PFHxS is 4×10^{-10} mg/kg-d.

In addition, because the draft RfD from EPA has not completed external peer review and has not been finalized by EPA, it is not a reliable basis for developing WQCs. In fact, EPA did not use this draft RfD value as a basis for its most recent (May 2024) regional screening levels for PFHxS or for its recent development of the maximum contaminant level goal for PFHxS in drinking water. Instead, EPA used the minimal risk level for PFHxS derived by Agency for Toxic Substances and Disease Registry as a basis for these values.

Last year, MDH developed an RfD for PFHxS of 9.7×10^{-6} mg/kg-d and used this value in its health-based guidance for drinking water. MPCA used this value to derive its 2023 site-specific water quality criteria for PFHxS that is not specific to Cottage Grove. MPCA has not explained why it has abruptly departed from the MDH value. MPCA's approach is not consistent with its controlling regulations.⁵⁷

c. MPCA's CSF for PFOA

MPCA used a cancer slope factor (CSF) of 29,300 per mg/kg-d from the EPA's Final Human Health Toxicity Assessment for Perfluorooctanoic Acid (PFOA) and Related Salts for PFOA to develop the effluent limitation in the draft permit for PFOA.⁵⁸ MDH also used the US EPA 224-5522 CSF as a basis to develop a CSF for PFOA of 12,600 per mg/kg-d, which differs from the US EPA CSF of 29,300 per mg/kg-d because it was converted to mg/kg-d using a different clearance rate for PFOA. Thus, the EPA CSF used for developing the PFOA effluent limitation in the draft permit for Cottage Grove is much higher than the CSF developed by MDH.⁵⁹ MPCA has not justified this departure from the MDH value whose use is mandated by MPCA's regulations.

E. Summary

For the reasons stated above, and in 3M's Petition for a Contested Case Hearing, the WQBELs for PFOA, PFOS and PFHxS should be recalculated consistent with the requirements of Minnesota and federal law.

⁵⁶ US EPA. 2023a. "Toxicological Review of Perfluorohexanesulfonic Acid [PFHxS, CASRN 335-46-4] and Related Salts (External Review Draft)." Office of Research and Development, Center for Public Health and Environmental Assessment, Integrated Risk Information System, EPA/635/R-23/148a, p. 459, July.

⁵⁷ *Id.* at 7.

⁵⁸ US EPA. 2024. *Human Health Toxicity Assessment for Perfluorooctanoic Acid (PFOA) and Related Salts (Final)*. Health and Ecological Criteria Division, Office of Science and Technology, Office of Water, EPA Document No. 815R24006. 556p.

⁵⁹ *Id.*

IV. The WQBELs for PFOA, PFOS, and PFHxS are Not Reasonable, Feasible, and Practical as Required by Minnesota Law

A. MPCA Does Not Have Statutory Authority to Promulgate Limits that are not Reasonable, Feasible, and Practical

MPCA has failed to meet its statutory obligation to promulgate WQBELs that are, reasonable, feasible, and practical.⁶⁰ As a general proposition, Minnesota law requires that “[i]n exercising all its powers the Minnesota Pollution Control Agency shall . . . take or provide for such action as may be reasonable, feasible, and practical under the circumstances.” Minn. Stat. § 116.07, subd. 6.

Section 115.03 likewise makes clear the obligation of the MPCA to set reasonable, feasible, and practical limits in NPDES permits:

Prior to establishment of any [water quality based] effluent limitation, the agency shall hold a public hearing to determine . . . *whether or not such effluent limitation can be implemented with available technology or other alternative control strategies.*

Minn. Stat. § 115.03 Subd. 1(a)(5)(v) (emphasis added). See also 33 U.S.C. § 1312(b)(2).

The best meaning of the phrase “can be implemented” in Section 115.03 is that it must be understood as employing the criteria “reasonable, feasible, and practical” used in Section 116.07. See *Loper-Bright Enterprises, et al. v. Raimondo*, 144 S. Ct. 2244, 2271 (2024) (explaining that every statute “has a best meaning, necessarily discernable by a court employing its full interpretive tool kit.”) An effluent limitation obviously cannot be implemented if it is unreasonable, infeasible, or impractical, as imposing such an effluent limitation would be contrary to the limitations on MPCA’s authority found in Section 116.07. Something is “reasonable” if it is not extreme or excessive.⁶¹ Within the framework of Section 116.07, the question should be whether the proposed effluent limitations differ from what the advanced treatment system can reasonably be expected to achieve by an extreme or excessive margin. Something is “feasible” if it is capable of being done or carried out, or capable of being dealt with successfully.⁶² Something is “practical” if it actually can be done in practice rather than merely in theory.

These statutory provisions make clear that MPCA’s authority to set WQBELs in NPDES permits are constrained by what is reasonable, feasible, and practical. Federal case law is consistent with the Minnesota statutory requirements, but for an additional reason. Agencies are not permitted to act in an unreasonable or arbitrary and capricious manner, and it is well settled that “impossible requirements imposed by an agency are perforce unreasonable.” *All. For Cannabis Therapeutics v. DEA*, 930 F.2d 936,

⁶⁰ As noted above, 3M is not challenging the Compliance Limits for PFOA, PFOS, or PFHxS. The Compliance Limits will become effective as required by the compliance schedule established in the final permit. In these comments, 3M is taking issue with the WQBELs for PFOA, PFOS, and PFHxS proposed in this permit and is doing so because those WQBELs will influence future decisions regarding discharge limits such as when this permit expires and must be reissued.

⁶¹ Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/reasonable>.

⁶² *Id.*

940 (D.C. Cir. 1991). In interpreting the requirements of the Clean Water Act, “Congress is presumed not to have intended absurd (impossible) results.” *Hughey v. JMS Dev. Corp.*, 78 F.3d 1523, 1529 (11th Cir. 1996). Indeed, EPA itself has acknowledged that it “cannot impose more protective measures than can be technically feasibly implemented, as the law cannot compel the impossible.” *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; A Holistic Approach to Closure Part A: Deadline to Initiate Closure*, 84 Fed. Reg. 65,941, 65,945 (Dec. 2, 2019).

MPCA has previously acknowledged these constraints on its authority in the context of chloride discharges in wastewater. Minnesota has set water quality-based standards for chloride, which means that chloride discharges from wastewater sources typically would be governed by either technology-based or WQBELs, whichever is more stringent. However, MPCA has determined that “[t]he current alternatives for treating chloride at Wastewater Treatment Plants (WWTPs) are not feasible for reasons ranging from engineering to cost to legal constraints.”⁶³ Accordingly, MPCA has declined to set WQBELs for chlorides in wastewater. Instead, it has relied on implementation of best management practices and other methods for reducing chloride in wastewater treatment effluent. *Id.*

MPCA also has previously acknowledged the infeasibility of setting water quality-based standards for PFAS from which individual WQBELs for individual permittees would be derived. For example, in February 2021, Minnesota’s PFAS Blueprint describes both the need for and difficulty of developing water quality-based standards for PFAS.⁶⁴ MPCA reiterated in its most recent triennial standards review, that development of water quality standards (WQS) for PFAS is a long-term need, primarily because “feasible methods to manage PFAS-contaminated water, biosolids, and other media are not yet available and are needed to broadly implement a WQS.”⁶⁵

B. MPCA Has Not Met its Obligation to Show that the Proposed WQBELs for PFOA, PFOS and PFHxS are Reasonable, Feasible, and Practical

Although the measurable Compliance Limits in the permit will govern discharge of PFOA, PFOS, and PFHxS when the advanced wastewater treatment system is fully commissioned in accordance with a final permit’s compliance schedule, the WQBELs are water quality-based limitations that MPCA

⁶³ Chloride Work Group Policy Proposal for Minnesota, at p. 6 (available at <https://www.pca.state.mn.us/sites/default/files/wq-wwprm2-24.pdf>). See also Water Permit Holds and Chloride, <https://www.pca.state.mn.us/business-with-us/water-permit-holders-and-chloride> (last visited August 15, 2024) (“The common approach to reduce pollutants in wastewater is to assign a limit in facility permits, requiring WWTPs to adjust or invest in their processes so they can lower the amount of the specific pollutant in the wastewater. However, there is no economically feasible way for plants to remove chloride from wastewater. The only available method (reverse osmosis) is hugely expensive both to install and maintain.”)

⁶⁴ See Minnesota PFAS Blueprint, February 2021, at pp. 86, 169-70 (available at <https://www.pca.state.mn.us/sites/default/files/p-gen1-22.pdf>) (describing the resources, research, outreach, expertise, and time it would take to develop PFAS WQS to protect health-based uses).

⁶⁵ See MPCA’s Water Quality Standards Work Plan, 2011-2013 (available at MPCA’s water quality standards work plan, 2021 - 2023 Minnesota Pollution Control Agency (state.mn.us)); Public Comments Received During the 2020-2021 Triennial Standards Review and MPCA’s General Response (available at <https://www.pca.state.mn.us/sites/default/files/wq-s6-64d.pdf>).

obviously intends to make enforceable at some point in the future. Under Minnesota law, MPCA must determine at the time it finalizes this permit whether those limits are reasonable, feasible, and practical. MPCA must determine whether the advanced wastewater treatment system, or any other water treatment system, can achieve the proposed WQBELs on a consistent and reliable basis. It has not done so.

The record for this permit is devoid of any evidence supporting the statutorily-required determination that the WQBELs for PFOA, PFOS and PFHxS “can be implemented with available technology” today because they are “feasible, practical and reasonable.” To the contrary, and as discussed below, the only evidence in the record of which 3M is aware supports the conclusion that the proposed WQBELs for PFOA, PFOS and PFHxS are set so low that they are not measurable. Measurability is the hallmark of a limit. Moreover, MPCA has failed to provide any basis to conclude that the WQBELs have been achieved in practice or are even theoretically achievable on a sustained basis using known treatment technology. For these reasons alone the WQBELs do not meet the legal requirements for incorporation into this permit.

C. The Advanced Wastewater Treatment System Represents the State-of-the-Science for Removal of PFAS from the Water Managed at Cottage Grove

Arcadis US, Inc., a leader in wastewater treatment technology, unequivocally opines that 3M has gone above and beyond what any other industrial site has done in developing the advanced wastewater treatment system, which is designed to meet specific conditions and requirements unique to the Cottage Grove site.⁶⁶ The robustness of the system to treat water of the nature and volume at Cottage Grove is unmatched anywhere. MPCA required 3M to investigate the full range of potential treatment technologies and to conduct a pilot test to support advanced wastewater treatment system design before ultimately approving the plan for the advanced wastewater treatment system.⁶⁷

MPCA has the relevant information to assess the expected performance of the advanced wastewater treatment system. But even with this information in hand, MPCA offers no engineering-based analysis that would demonstrate that the proposed WQBELs for PFOA, PFOS, and PFHxS can be consistently and reliably achieved by the advanced wastewater treatment system at the scale required for Cottage Grove permit compliance. Indeed, MPCA has not included in either the Draft Permit or in the Fact Sheet any meaningful engineering-based discussion of the technological capabilities of the advanced wastewater treatment system or any other PFAS treatment technologies.

This constitutes a significant deficiency in MPCA’s development and proposal of the Draft Permit. EPA emphasizes in its NPDES Permit Writers Manual that:

A fact sheet is a document that briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft

⁶⁶ Arcadis Expert Report, see Exhibit D at 26 and 29.

⁶⁷ *Id.*

permit. When the permit is in the draft stage, the fact sheet and supporting documentation serve to explain the rationale and assumptions used in deriving the limitations to the discharger, the public, and other interested parties.⁶⁸

Likewise, EPA regulations require that the Fact Sheet include a detailed rationale of permit conditions, including specific explanations of toxic pollutant limitations, limitations on internal waste streams, case-by-case requirements and other important considerations. 40 C.F.R. § 124.56. MPCA's utter failure to provide any engineering analysis demonstrating that the proposed effluent limitations for PFOA, PFOS, and PFHxS can be reasonably, feasibly and practically achieved falls far short of meeting its obligations in implementing the NPDES permit program.

D. MPCA Acknowledges the Proposed WQBELS for PFOA, PFOS and PFHxS Are Unmeasurable

The only information provided by MPCA thus far having any bearing on technological feasibility is MA's concession that the proposed WQBELS for PFOA, PFOS, and PFHxS cannot be measured, rendering futile any attempt to demonstrate that those effluent limitations can be achieved. As MPCA states in the Fact Sheet issued with the Draft Permit "[t]he PFOS, PFOA and PFHxS limits are below the conventional (<2-4 ng/L) reporting limit for currently available analytical technology such as EPA method 1633."⁶⁹ These limits are so low that a separate compliance limit must be established for the purposes of reporting limit compliance to the MPCA. See Draft Permit Condition 5.59.128 ("The monthly average and daily maximum PFOS WQBELS are below the reporting limits then reporting limits (limits of quantitation) achievable when analyzing treated effluent at Cottage Grove."). MPCA's conclusion is supported by the expert analysis of Rock Vitale.⁷⁰ Mr. Vitale evaluated data from the analysis of PFAS in Cottage Grove water, following treatment by the currently existing GAC system, to determine the consistently achievable limit of quantitation for PFOA, PFOS, and PFHxS using the analytical method preferred by MPCA, EPA Method 1633. Mr. Vitale's analysis demonstrated that the consistently achievable limit of quantitation (LOQ) for PFOS is 2.2 ng/L and 2.1 ng/L for PFOA and PFHxS.⁷¹ The Draft Permit adopts these LOQs as the basis for the Compliance Limits for these three PFAS.

3M agrees with MPCA that PFOS, PFOA, and PFHxS can consistently be measured at the levels adopted as the Compliance Limits⁷² and further agrees that it expects the Advanced Wastewater Treatment System to be able to meet these limits. These facts, however, provide no support for the unmeasurable WQBELS.

⁶⁸ Permit Writers Manual at 11-8.

⁶⁹ Fact Sheet at 70.

⁷⁰ Memorandum from Rock Vitale, CEAC, Environmental Standards, Inc., "Response to MPCA Proposed Intervention Limits for 3M's Cottage Grove, Minnesota facility, Calendar Average and Daily Maximum" (hereinafter the "Vitale Expert Report"). The Vitale Expert Report is attached hereto, and incorporated herein as Exhibit H.

⁷¹ Vitale Expert Report, Exhibit H at 3.

⁷² This does not mean that every analytical run will be able to meet these LOQs because multiple factors could cause an individual LOQ to be higher.

E. The Record does not Support a Determination that the Final WQBELS for PFOA, PFOS and PFHxS Are Reasonable, Feasible, and Practical

Putting aside measurability issues, the record does not support the conclusion that the proposed WQBELS for PFOA, PFOS, and PFHxS are reasonable, feasible or practical. At MPCA's direction 3M commissioned two engineering firms, Barr Engineering and ECT2 (part of the Montrose Environmental Group) to evaluate potential technologies for PFAS removal and to conduct a pilot study that that would support technology selection and system design. The results of this effort were published in the 2021 Treatability Study.⁷³ The Treatability Study evaluated the results from pilot-scale tests of the capability of various treatment technologies to remove a wide range of PFAS from noncontact cooling water and wastewater. Both of those streams originate as groundwater, which is the primary source of the PFAS to be addressed. As summarized in Table 3.16, reproduced below, the engineers provided their estimates of the post-treatment water quality achievable by the tested technologies that were ultimately incorporated into the advanced wastewater treatment system.

The lowest values presented in Table 3.16 for PFOA, PFOS, or PFHxS indicate performance below the LOQ achieved for each sample. The lowest LOQ was <9 ng/L. Thus, all that data point can demonstrate is that the expected performance is removal to some unknown value below 9 ng/L. This table does not mean that the advanced wastewater treatment system would not be expected to achieve lower concentrations in treated water. What that means here is that the Treatability Study does not support the proposition that the advanced wastewater treatment system can meet the WQBELS for PFOA, PFOS, or PFHxS. The data do not disprove that the advanced wastewater treatment system can go lower than the values on Table 3.16, but they offer no insights into whether the advanced wastewater treatment system can achieve any level of removal below 9 ng/L. Thus, we are aware of no support in the record for assuming that the advanced wastewater treatment system can achieve the WQBELS.

⁷³ See, supra, Footnote 4.

Table 3.16 Estimated treated effluent water quality based on Treatability Study^[1]

Source Water (Test Phase)	NCCW/SW (NCCW_B)			Phase 1/2 WW (WW)		
	# of BVs	212	212	97	241	241
AIX Resin	SORBIX/CalRes	SORBIX	CalRes	SORBIX/CalRes	SORBIX	CalRes
General Chemistry ^[2]						
Calcium	62			54		
Iron+ Manganese	<0.055			<0.055		
TOC	3.6			3.5		
TDS	367			1,150 ^[7]		
TSS	<10			14 ^[3]		
pH	5.9–8.6			6.3–8.6		
PFAS ^[4]						
Sum of 16 Detected PFAS ^[5]	--	4,218	3,570	1,807	3,385	2,069
Group 1 ^[6]						
TFA	< 700	< 3,140^[6]	< 3,140^[6]	< 700	< 2,150^[6]	< 1,775^[6]
TFMS	< 1,000	< 498	< 498	< 1,811^[6]	< 276	< 276
2,2,3,3-TFPA	< 1,000	< 500	< 500	< 2,406	< 500	< 500
2,3,3,3-TFPA	< 752	< 1,000	< 1,000	< 740	< 1,000	< 1,000
PFPA	< 700	< 691^[6]	< 50	< 700	< 1,039^[6]	< 98^[6]
HQ-115	< 1,000	< 83	< 83	133^[6]	< 104	< 104
PFBA	< 191	< 11^[6]	< 11^[6]	< 260	< 10	< 10
PFPeA	< 212	< 10	< 10	< 17	< 10	< 10
Group 2 ^[6]						
PFBS	< 444	< 16^[6]	< 16^[6]	< 9	< 36	< 36
PFPeS	< 258	< 9	< 9	< 2	< 9	< 9
PFHxA	< 241	< 10	< 10	< 2	< 10	< 10
PFHpA	< 152	< 10	< 10	< 24	< 10	< 10
PFHxS	< 239	< 10	< 10	< 5	< 10	< 10
PFHpS	< 169	< 10	< 10	< 6	< 10	< 10
PFOA	< 221	< 18	< 18	< 15	< 18	< 18
Group 3 ^[6]						
PFOS	< 200	< 9	< 9	< 4	< 9	< 9

- [1] Effluent concentrations are estimated as weighted average of RO permeate concentrations and AIX lag column effluents and not intended to include regeneration waste. BVs indicated are for lag vessels. The early BV is generally before breakthrough and thus similar for both resins, while AIX effluent concentrations varied between resins at higher BVs.
- [2] General chemistry is based on water quality sampling events for NCCW_B and WW test phases and is not expected to vary significantly by AIX BV.
- [3] Effluent TSS concentration is biased by AIX effluent TSS concentration measured at 59–71 mg/L. That concentration is unlikely to have passed through all four media vessels and may reflect precipitation of minerals between the time of sampling and analysis.
- [4] PFAS data for end-of-pilot samples (236 BVs for NCCW phase and 241 BVs for WW phase) reflect 3M data, which typically had lower detection limits than Enthalpy data. The initial sample for each water source is Enthalpy data because 3M did not collect data for these events.
- [5] Sum of 16 PFAS detected only includes parameters detected above Enthalpy LOD for that sample.
- [6] Values where one of the source readings was above LOD are **bolded**. For weighted averages with a different LOD, the LOD indicated here is the weighted average of LODs. For weighted averages with one sample above LOD, the LOD indicated here is the weighted average of the LOD and the detection.
- [7] Estimated TDS for treated Phase 1/2 WW includes 60 mg/L of NaCl added with regeneration waste brine recycled back to Phase 1/2 WW influent.

Based upon its experience with a similar, but lower volume PFAS treatment system at 3M’s Cordova facility, 3M expects that the advanced wastewater treatment system can reliably meet the Compliance Limits in the Draft Permit of 2.2 ng/L for PFOS and 2.1 ng/L for PFOA and PFHxS. This represents approximately a *one-hundred-thousand-fold reduction* from levels encountered in the influent to the wastewater portion of the system following GAC pre-treatment, and a *thirty-four-thousand-fold reduction* in the water flowing to the SW/GW/NCCW portion. Nonetheless, the Compliance Limits are

2-3 orders of magnitude higher than the proposed WQBELs and 3M does not have a basis to believe that the advanced wastewater treatment system can operate at these levels.

In summary, MPCA offers no evidence to support a conclusion that even this state-of-the-science treatment system could consistently achieve the proposed WQBELs for PFOA, PFOS, and PFHxS. 3M is likewise unaware of evidence that these WQBELs could be achieved. Thus, MPCA cannot retain these WQBELs in this permit. 3M respectfully suggests that MPCA remove these WQBELs from the permit.

F. Summary

For the reasons stated above, and in 3M’s Petition for a Contested Case Hearing, the WQBELs for PFOA, PFOS and PFHxS should be revised to ensure they are reasonable, feasible, and practical.

V. The Intervention Limits for PFOA, PFOS and PFHxS at WS001 and WS002 Should be Removed from the Permit

MPCA includes in the Draft Permit internal waste stream or Intervention Limitations at sampling locations designated at WS 001 and WS 002 (Intervention Limits). For the reasons set out below, these Intervention Limits are arbitrary, capricious or otherwise not in accordance with law. Selected intervention limits are set forth below:

Monitoring Point	Compounds	Limits ⁷⁴
WS 001 and WS 002	PFBS	22,249 ng/L (monthly avg.) 38,856 ng/L (daily max)
	PFBA (WS 001 only)	186,912 ng/L (monthly avg.) 323,808 ng/L (daily max)
	PFHxS	0.0171 ng/L (monthly avg.) 0.0298 ng/L (daily max)
	PFHxA	32,897 ng/L (monthly avg.) 56,922 ng/L (daily max)
	PFOS	0.155 ng/L (monthly avg.) 0.27 ng/L (daily max)
	PFOA	0.069 ng/L (monthly avg.) 0.117 ng/L (daily max)

⁷⁴ This table sets forth only those limits that are discussed in greater detail in these comments.

For the reasons stated herein with respect to the Intervention Limits at sampling location WS 001 and WS 002, MPCA has exceeded its authority in seeking to impose these Intervention Limits under the guise of treatment plant performance-based thresholds.⁷⁵

As an adjunct to the Intervention Limits, MPCA has also proposed conditions requiring that 3M submit an “Annual O&M Deviation & WWTP Optimization Report.”⁷⁶ Pursuant to this condition, should a performance threshold be exceeded, 3M is required to identify and implement steps to move towards those performance standards. For the reasons discussed below, these requirements are effectively effluent limits that are imposed at a location other than the outfall and are not rationally related to compliance with enforceable effluent limits. Therefore, these requirements are arbitrary, capricious and not in accordance with law.

A. There is No Legal Basis for the Imposition of Intervention Limits

Neither federal law nor state law provide a basis for imposing Intervention Limits. While an exceedance of these limits is not expressly deemed to be a permit violation, a failure to take the actions set forth in the Draft Permit in the event of an exceedance is a violation of the permit.⁷⁷ Because exceedance of an Intervention Limit triggers actions that are required by the Draft Permit, imposition of the Intervention Limits exceeds the MPCA’s authority.

EPA regulations stipulate that effluent limitations may be imposed on internal waste streams “when permit effluent limitations or standards imposed at the point of discharge are impractical or infeasible.” 40 C.F.R. § 122.45(h)(1). That federal regulation further stipulates the “exceptional circumstances” (none of which exist here) for which the imposition of intervention limits is warranted: “when the final discharge point is inaccessible (for example, under 10 meters of water), the wastes at the point of discharge are so diluted as to make monitoring impracticable, or the interferences among pollutants at the point of discharge would make detection or analysis impracticable.” *Id.* This rule is neither cited in the Draft Permit or Fact Sheet.

While early reviewing courts have upheld the rule, *See, e.g. Texas Mun. Power Agency (TMPA) v. Administrator of U.S. E.P.A.*, 836 F.2d 1482, 1487 (5th Cir. 1988); *Public Service Co. of Colorado, Fort St. Vrain Station v. U.S. E.P.A.*, 949 F.2d 1063, 1064 (10th Cir. 1991), at least two courts, including the United States Court of Appeals for the Eighth Circuit, have determined that regulation of the discharge at nonpoint source internal waste stream locations is not within the EPA’s authority. In *American Iron and Steel Institute v. E.P.A.*, the United States Court of Appeals for the District of Columbia found that although “the EPA may regulate the pollutant levels in a waste stream that is discharged directly into the navigable waters of the United States through a ‘point source’; it is not authorized to regulate the pollutant levels in a facility’s internal waste stream.” 115 F.3d 979, 996 (D.C. Cir. 1997). In *Iowa League*

⁷⁵ Draft Permit at 5.69.111; 6.60.32

⁷⁶ Condition 5.69.111.

⁷⁷ Draft Permit at 5.33.5-5.33.9; 5.35.5-5.35-9

of *Cities v. E.P.A.*, the Eighth Circuit followed the lead of the D.C. Circuit in *American Iron and Steel Institute* holding that:

[t]he EPA is authorized to administer more stringent ‘water quality related effluent limitations,’ but the CWA is clear that the object of these limitations is still the ‘discharges of pollutants from a point source.’ . . . The EPA would like to apply effluent limitations to the discharge of flows from one internal treatment unit to another. We cannot reasonably conclude that it has the statutory authority to do so.

711 F.3d 844, 877 (8th Cir. 2013); See also *Loper-Bright Enterprises, et al., v. Gina Raimondo, Secretary of Commerce, et al.*, 603 U.S. (2024). While neither the *American Iron and Steel Institute* nor the *Iowa League of Cities* decision directly addressed 40 C.F.R. § 122.45(h), the determination that effluent limitations on internal waste streams are not authorized by the Clean Water Act calls the regulation into doubt. In sum, courts have determined that the Clean Water Act does not afford permitting agencies the statutory authority to apply effluent limitations to internal waste streams.

Minnesota rules, like the federal regulations, provide that the internal waste stream limitations should only be imposed in a narrow set of “exceptional circumstances”:

Subp. 2. Effluent limitations, standards, or prohibitions.

Except as provided in subpart 3, the commissioner shall establish effluent limitations, standards, or prohibitions for each pollutant to be discharged from each outfall or discharge point of the permitted facility; *except that if the commissioner finds that as a result of exceptional circumstances it is not feasible to establish effluent limitations, standards, or prohibitions which are applicable at the point of discharge, the commissioner shall establish effluent limitations, standards, or prohibitions for pollutants in internal waste streams at the point prior to mixing with other waste streams or cooling water streams.*

Minn. R. 7001.1080, subp. 2 (emphasis added). This rule, along with others, was adopted to facilitate the MPCA’s ability to issue NPDES permits such as that at issue here:

The need for the adoption of 6 MCAR §§4.4101 - 4.4111⁷⁸ arises from the need to supplement the standard permitting rules so that federal and state requirements specifically relating to NPDES permits are included in Minnesota’s NPDES program.⁷⁹

Because the rule at issue aligns with and implements the federal rules, it should be interpreted in the same manner as the federal rule discussed above. Here, the Commissioner has made no finding that effluent limits at the point of discharge are not feasible, nor could such a finding be made, as the Draft

⁷⁸ Minn. R. 7001.1080, subp. 2 was previously found at 6 MCAR 4.4109 B.

⁷⁹ Minnesota Pollution Control Agency, In the Matter of the Proposed Repeal of Minn. Rules MPCA 5 and WPC 36, 6 MCAR §§4.9006-4.9007, and Minn. Rule APC 3; and, in Substitution Thereof, the Proposed Adoption of 6 MCAR §§4.4001-4.4021 Relating to Permits, 6 MCAR §§4.4101-4.4111 Relating to National Discharge Elimination System Permits, 6 MCAR §§4.4201-4.4224 Relating to Hazardous Waste Facility Permits, and 6 MCAR §§4.4301-4.4306 Relating to Air Emission Facility Permits; and the Proposed Amend. to Minn. Rule APC 19, Renumbered as 6 MCAR §§4.4311-4.4321, Indirect Source Permits, Statement of Need and Reasonableness, (December 15, 1983).

Permit includes effluent limitations or compliance limitations established at the point of discharge. Because there is no legal basis for the Intervention Limits in the Draft Permit, they should be removed.

B. The Proposed Intervention Limits for PFOA, PFOS, and PFHxS at WS 001 and WS 002 are Arbitrary and Capricious

The Draft Permit sets Intervention Limits for PFOA, PFOS, and PFHxS at sampling locations WS 001 and WS 002 that are not supported by the record or by any explanation from MPCA. Although water passing through these two sampling locations will be diluted downstream by the permeate from the RO systems, it will receive no further treatment before being discharged to Unnamed Creek.⁸⁰ This means that the discharge concentrations of PFOA, PFOS, and PFHxS will equal the concentrations at WS 001 and WS 002 times the dilution factor attributable to the RO permeate. The dilution factor ranges from 4 to 5.67, meaning the concentration of the PFAS will be reduced between approximately 4 and 5.5-fold before discharge.⁸¹ This would imply for example, that the concentration of PFOA must be no higher than approximately 11 ng/L at WS 001 and WS 002 to ensure that the discharge, measured at SD 001 and SD 002, is below the Compliance Limits established in the Draft Permit as 2.1 ng/L. There is, therefore, no rational relationship between the Intervention Limits and the limits that must be met at the point of discharge of water to the receiving water, as measured at sampling locations SD 001 and SD 002.

The Intervention Limits in the Draft Permit also bear no rational relationship to the expected operation of the advanced wastewater treatment system. As noted above, the Fact Sheet states that “Intervention limits at WS 001-WS 002 are calculated from the six PFAS compounds with limits at SD 001 and SD 002 using dilution ratios.” Although the Fact Sheet does not provide MPCA’s basis for calculating the Intervention Limits, basic math indicates that MPCA’s starting points for PFOA, PFOS and PFHxS are the WQBELs, not the Compliance Limits. If the Intervention Limits were based upon the Compliance Limits, they would be in the range of 0.4 to 0.55 ng/L (e.g., the Compliance Limit for PFOS of 2.2 ng/L \div 4 = 0.55 ng/L). Setting aside the impropriety of setting Intervention Limits tied to something other than meeting Compliance Limits, the question becomes whether anything in the record supports the proposition that the advanced wastewater treatment system is designed to meet the Intervention Limits or can likely do so. The answer to either inquiry is no.

The design objective for the advanced wastewater treatment system was to maximize the total mass of PFAS removal, not effluent targets for specific PFAS.⁸² Generally, the data relied upon for the Treatability Study shows removal of PFOA, PFOS, and PFHxS by the ultra-filtration, GAC and IX systems to below the limit of quantitation (LOQ). The LOQs in the study, however, ranged from a high of hundreds of ng/L (ppt) down to about 10 ng/L. Thus, even the data from the most sensitive analysis relied upon for the Treatability Study can only confirm removal of PFOA, PFOS, or PFHxS to a level that is two to three orders of magnitude higher than the Intervention Limits. These data do not demonstrate

⁸⁰ Kaczynski Expert Report, Exhibit E at 4.

⁸¹ *Id.*

⁸² *Id.* See also, Arcadis Expert Report, Exhibit D at 25.

that proper operation of the advanced wastewater treatment system would be expected to be below Limits the LOQ that 3M has demonstrated it should be able to meet at this sampling location (i.e., 2.1 or 2,2 ng/L, depending upon the PFAS at issue).⁸³ As is typically the case, the pilot study that generated data for the Treatability Study operated for a limited period and thus did not capture the range of operating conditions over a full year.

The Treatability Study contains no data from which a projection could be made regarding the ability of the advanced wastewater treatment system to meet the Intervention Limits at WS 001 and WS 002.⁸⁴ In fact, the data show instances of measured values that exceed the Intervention Limits. Thus, the intervention limits for PFOA, PFOS, and PFHxS at WS 001 and WS 002 are arbitrary and capricious.

C. The Draft Permit's Intervention Limits Will Not Operate to Further Compliance with the Permit

Exceedance of the Intervention Limits will require 3M to require an extensive array of actions:

- Sample the monitoring station again within two days of receiving sample results if the previous samples at the monitoring location did not exceed the intervention limit and a sample hasn't already been taken since the sample with the associated intervention limit exceedance;
- Evaluate the significance and the cause of the intervention limit having been exceeded. The cause shall include a thorough review of the carbon changeout frequency of the GAC system and the IX media regeneration and/or changeout frequency;
- Evaluate the need for immediate corrective action to prevent pollutant levels from exceeding the intervention limits again; and
- Evaluate the need for changes in monitoring, including but not limited to, increasing sampling frequencies, changing the characteristics monitored, installing additional monitoring stations, identifying appropriate shorter-chain sentinel compounds to monitor, identify the specific monitoring locations at which to monitor them in order to best understand what operation and maintenance actions might be needed, and to ensure such actions are reflected in the Cottage Grove O&M manual(s), and reducing pollutant loadings.

Taking the required actions could require substantial effort without providing any improvement in system performance. One-time or even multiple exceedances of the Intervention Limits is not a reliable signal that there is a problem that must be addressed in the advanced wastewater treatment system, and no responsive action should be required on the basis of a single exceedance.⁸⁵ First, there is a risk of false

⁸³ Arcadis Expert Report, Exhibit D at 27-28.

⁸⁴ *Id.*

⁸⁵ Kaczynski Expert Report, Exhibit E at 5-6

positive detections associated with limits at or below the LOQ.⁸⁶ This can occur due to interference from other analytes and anions in the sample, sample contamination, or laboratory error. 3M's experience at both its Cottage Grove and Cordova facilities demonstrates that at low LOQs some false positive results are statistically inevitable. Based upon the design of the system it is very likely that sampling results above the LOQ for PFOA, PFOS, or PFHxS at WS 001 or WS 002 are false positives.⁸⁷

Second, the advanced wastewater treatment system is a complex and interdependent system, with different treatment elements operating at different stages of that treatment element's breakthrough curve at any particular time⁸⁸. As a practical matter, this means a single sample, taken at a single point in time, does not represent the system's state of operation. For example, the IX trains in the process are constantly being switched, and there are multiple trains for each system in operation at any given time. Therefore, a sample that is taken just before a "spent" IX train is about to be removed from service has a higher potential for PFAS detection than a sample taken shortly after a switch was made from a "spent" train to a "regenerated" train. Because of the time it will take to run the large number of samples required under the Draft Permit, by the time a sample has shown an Intervention Limit exceedance, the process has almost certainly switched to running through a different set of ion exchange vessels, and the original sample is no longer representative of the overall performance of the system.⁸⁹

When determining the correct response to an Intervention Limit exceedance (especially an isolated one-time exceedance), more times than not the appropriate response would be to make no changes to the system but monitor as needed to see if something has changed in the process that would require a deeper evaluation and potentially a long-term adjustment to the way the system is running. The feasibility of such an adjustment should be evaluated in a wholistic view of the entirety of the system.⁹⁰

While 3M understands and agrees with MPCA's apparent interest in ensuring that the advanced wastewater treatment system is continually operated to meet the system design objectives, the Intervention Limits will hinder that effort rather than promote it. Therefore, the Intervention Limits at WS 001 and WS 002 are arbitrary and capricious.

D. Additional Requirements Imposed Through the Required Annual O&M Report Amount to Additional Intervention Limits

The Draft Permit contains advanced wastewater treatment system performance based thresholds that operate as Intervention Limits. Draft Permit Condition 5.69.111 of the Draft Permit requires an "Annual O&M Deviation & WWTP Optimization Report." That report requires an evaluation of the WS001-WS002 PFAS treatment performance of eight PFAS compounds: PFHpS, PFHxA, PFPeS, PFPeA, PFPrA, 2233-TFPA, TFA and TFMS.

⁸⁶ *Id.* at 6.

⁸⁷ *Id.*

⁸⁸ *Id.* at 5-6.

⁸⁹ *Id.*

⁹⁰ *Id.*

That condition provides that if any of these so-called “treatment performance thresholds”⁹¹ are not achieved, the report shall address what, if any, optimization steps the Permittee intends to implement, and on what schedule, to achieve the performance standards.⁹² This requirement, however, is unrelated to any effluent limitation in the Draft Permit, as the Draft Permit only requires that Cottage Grove monitor for the presence of these PFAS at the point of discharge from SD001 and SD002. This requirement also conflicts with the *Limits and Monitoring* section of the permit providing that these compounds are subject to monitoring only at SD001, SD002, WS001 and WS002. At best, this provision is confusing as to what constitutes compliance with the Draft Permit. At worst, it imposes an additional set of Intervention Limits with no connection to any PFAS discharge limits. This requirement is, therefore, arbitrary and capricious or otherwise not in accordance with law and should be removed.

E. Summary

For the reasons stated above, and in 3M’s Petition for a Contested Case Hearing, the intervention limits at WS 001 and WS 002 should not be included in the final permit.

VI. Compliance Schedule

MPCA proposes in the Draft Permit a schedule of compliance that establishes deadlines by which 3M must (i) complete construction of the proposed advanced wastewater treatment system, (ii) stabilize, optimize, and test the system, (iii) commence operation of the system, and (iv) attain compliance with final effluent limitations set forth in the Draft Permit. The Compliance Schedule does not reflect operational realities and is not achievable.

Prior to the issuance of the Draft Permit, 3M submitted a compliance schedule to MPCA that proposed deadlines based upon then-current construction progress and other relevant evidence and analysis. MPCA adopted 3M’s proposed timeline structure but accelerated all of the deadlines. Below is a table comparing 3M’s proposed deadlines and the Compliance Schedule included in the Draft Permit:⁹³

Section 5.68.55	3M Proposal	Draft Permit
Proposed Advanced Wastewater Treatment System	As soon as possible, but no later than April 30, 2027 , the initiations of operations of the advanced treatment system shall be complete and the Permittee shall comply with all PFAS Effluent Limits listed in the Limits and Monitoring section of this permit. In addition, the Permittee shall meet the following interim commissioning milestone dates:	As soon as possible, but no later than December 31, 2026 , the initiations of operations of the advanced treatment system shall be complete and the Permittee shall comply with all PFAS Effluent Limits listed in the Limits and Monitoring section of this permit. In addition, the Permittee shall meet the following interim commissioning milestone dates:

⁹¹ PFHpS: 10 ng/L; PFHxA: 10 ng/L; PFPeS: 9.4 ng/L; PFPeA: 10 ng/L; PFPrA: 370 ng/L; 2233-TFPA: 500 ng/L; TFA: 10,700 ng/L; TFMS: 25 ng/L

⁹² Draft Permit at 5.69.111; 6.60.32

⁹³ This table does not include proposed deadlines that 3M and MPCA agree upon.

Section 5.68.55	3M Proposal	Draft Permit
1. System A (ISW, GW, NCCW) RO Subsystem	a. Completion of construction of System A RO subsystem by no later than October 31, 2024 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than October 31, 2026 ;	a. Completion of construction of System A RO subsystem by no later than July 31, 2024 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than July 31, 2025 ;
2. System A GAC Subsystem	a. Completion of construction by no later than December 31, 2024 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than December 31, 2026 ;	a. Completion of construction by no later than September 30, 2024 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than September 30, 2025 ;
3. System A IX Subsystem	a. Completion of construction by no later than March 31, 2025 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than March 31, 2027 ;	a. Completion of construction by no later than December 31, 2024 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than December 31, 2025 ;
4. System B (WWT) RO Subsystem	a. Completion of construction by no later than November 30, 2024 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than November 30, 2026 ;	a. Completion of construction by no later than August 31, 2024 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than August 31, 2025 ;
5. System B GAC Subsystem	a. Completion of construction by no later than January 31, 2025 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than January 31, 2027 ;	a. Completion of construction by no later than October 31, 2024 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than October 31, 2025 ;
6. System B IX Subsystem	a. Completion of construction by no later than April 30, 2025 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than April 30, 2027 ;	a. Completion of construction by no later than January 31, 2025 ; b. Complete system stabilization, optimization, and conduct reliability testing by no later than January 31, 2026 ;

MPCA has neither provided an explanation nor a rationale for accelerating 3M’s proposed deadlines, and the only information in the record on the appropriate compliance schedule was provided by 3M, the entity most familiar with construction, optimization, and stabilization of the state-of-the-science advanced wastewater treatment systems.

The proposed Compliance Schedule requires completion of construction of certain advanced wastewater treatment subsystems by deadlines that have already passed or, in many instances, will have passed prior to issuance of a final permit. For example, construction of the System A RO subsystem is required pursuant to the Compliance Schedule to be completed by no later than July 31, 2024.⁹⁴ That date has already passed. Likewise, construction of several other subsystems, including the System A GAC Subsystem,⁹⁵ System B (WWT) RO Subsystem, and System B GAC Subsystem, is required to be complete on September 30, 2024, August 31, 2024, and October 31, 2024, respectively.⁹⁶ These dates, along with certain additional construction completion deadlines, will likely pass prior to issuance of the permit.

In proposing the Compliance Schedule in the Draft Permit, the MPCA inexplicably disregarded the information provided by 3M as to the time it takes to optimize and stabilize the subsystems of the advanced wastewater treatment system. 3M proposed two stages of post-construction operations – early operations and steady operations, with early operations lasting for 12 months from completion of construction. This period, however, does not conclude the optimization and stabilization process – the early operations period is followed by a period of stable operations, which involves additional optimization predicted to last at least 12 months after the end of the early operations stage.

3M's experience shows that significant challenges can arise during the early operations phase. Specifically, with respect to the RO systems, one of the primary challenges is getting the chemical dosing right to eliminate biological fouling and excessive scale formation. As it has worked to achieve steady state operations at its Cordova facility, 3M has had two biological fouling events, each impacting normal operations for approximately four weeks. With respect to GAC, the primary challenge is developing appropriate cleaning, backflushing, and chemical dosing strategies to allow the vessels to sustain flow for the necessary duration. Fouling can also impact the GAC systems, and each fouling event interferes with the collection of data to build out the operating windows for the O&M manual. Each GAC cycle will be four or more weeks. Not only does a fouling event take significant time to clear and restart operations, it also costs the time lost on the previous cycle for an incomplete data set. The IX subsystem is also subject to challenges during the early operations phase, due to the larger number of unit operations that are required. The IX vessels themselves, like the GAC vessels, require appropriate cleaning, backflushing, and chemical dosing strategies to allow the vessels to sustain flow for the necessary durations in both forward flow and during regeneration. 3M has faced challenges with fouling and plugging, both from inorganic material and biological activity, as well as challenges with the distillation column used to recover alcohol from the regenerant (leading to concentrations of alcohol in water discharge larger than design). Finally, there have also been challenges in the brine concentrating equipment which has hindered the ability to maintain an operational rhythm on the IX and regenerant recovery. Both the

⁹⁴As of the date of these comments, construction of the System A RO subsystem has been completed.

⁹⁵As of the date of these comments, construction of the System A GAC subsystem has been completed.

⁹⁶3M has ensured that construction has been moving forward quickly. Construction of the remaining subsystems is moving forward, and construction of the remaining subsystems will likely be completed within 30 days of the construction deadlines set forth in the Draft Permit.

distillation and brine handling have required many more vendor visits for troubleshooting than originally planned and prevented building of the necessary data set for by several months.

The stable operations phase presents a separate set of challenges, which also take time to address. The primary challenges with respect to the RO subsystem is continued fouling, some potentially due to shifting operating windows due to seasonal effects. Changing temperatures and variation in stormwater flows and algae content have been contributing factors. Seasonal challenges also impact the GAC subsystem in the stable operations phase, including fouling and changing breakthrough times, believed to be due to seasonal temperature changes and other potentially seasonal wastewater factors, like total organic content. Seasonal changes in water temperature can also impact the IX subsystem, impacting the PFAS adsorption (breakthrough curves) and regeneration process efficiency. Additional challenges are expected relating to shifting biological content and need for different chemical dosing to counter those shifts.

MPCA's acceleration of 3M's proposed deadlines without basis in record evidence renders the Compliance Schedule arbitrary, capricious, unreasonable, unfeasible, and impractical. Specifically, MPCA improperly eliminated an important optimization period from the Compliance Schedule without providing any reason or basis for doing so. 3M respectfully requests that MPCA revise the Draft Permit to contain a compliance schedule that is consistent with the dates originally proposed by 3M.

E. Summary

For the reasons stated above, and in 3M's Petition for a Contested Case Hearing, MPCA should adopt 3M's compliance schedule as it is supported by the record in this matter.

VII. Analyte List

3M provides the following comments regarding the extensive PFAS analyte list contained in the Draft Permit. 3M is committed to analyzing for a comprehensive list of PFAS informed by current and historic operations at Cottage Grove, the availability of approved analytical methods, laboratory certification and accreditation requirements, and the capabilities of commercial laboratories to analyze for the required PFAS compounds. MPCA's proposed PFAS analyte list arbitrarily ignores these important factors requiring significant adjustments to the analyte list.

The Draft Permit's analyte list includes a number of PFAS analytes for which there is no basis to believe such analytes will be present in the Cottage Grove effluent, and for some analytes there is strong evidence they will not be present. For these reasons, MPCA has acted in an arbitrary and capricious manner by including these compounds in the analyte list. In addition, MPCA has failed to provide any justification for its inclusion of such analytes, thereby violating its regulatory duty to provide an opportunity for public comment on the analyte list.

3M appreciates MPCA's acknowledgement of several of 3M's concerns during the pre-public notice period, which led paring down from a list of 137 to 108 PFAS analytes with total organic fluorine

(TOF) and adsorbable organic fluorine (AOF). 3M now requests that MPCA further reduce the PFAS analyte list in light of the concerns outlined above and described in detail below.

A. The Legally Required Basis for Rationally Selecting Monitoring Parameters

Analytes can only be rationally selected for monitoring based upon a valid reason to believe those analytes will be present in the effluent to be monitored. The inclusion of analytes that do not satisfy this rationale is arbitrary and capricious. Similarly, when a valid reason exists to believe an analyte will not be present, inclusion of that analyte is arbitrary and capricious. EPA's instructions for the completion of Application Form 2C, "Existing Manufacturing, Commercial, Mining, and Silvicultural Operations, NPDES Permitting Program,"⁹⁷ provide that permit applicants should "[b]ase [their] determination that a pollutant is present in or absent from [their] discharge on [their] knowledge of [their] raw materials, maintenance chemicals, intermediate and final products and byproducts, and any previous analyses known to [them] of [their] effluent or similar effluent."⁹⁸ MPCA should rely on, and explain, these factors for any analyte selected for monitoring in the Draft Permit. If MPCA has reasons to believe an analyte not identified by the applicant is present in the applicant's effluent, MPCA is obliged to present and justify its reasons for that belief. MPCA must do so in the Fact Sheet, allowing the permit applicant and others to comment on MPCA's rationale and basis in their comments on the Draft Permit. This can be done properly only on an analyte-by-analyte basis.

B. Background

MPCA has undertaken administrative actions in 2021 and 2022 that require the identification of PFAS compounds believed to be present at Cottage Grove.⁹⁹ As required by those administrative actions, 3M has developed a defensible list of PFAS analytes believed to be present in the effluent from the Facility.

In the January 2021 NOV issued by MPCA, the agency directed 3M to "amend the wastewater routine PFAS monthly monitoring protocol required by the NPDES/SDS permit to include monthly monitoring for the following additional parameters along with *any other PFAS pollutants the Regulated Party has reason to believe are potentially present in its wastewater at both SD001 and SD002...*" January 2021 NOV at 27, Corrective Action 13. (emphasis added). The list of PFAS that MPCA directed 3M to include in the monitoring protocol included nineteen PFAS compounds. *Id.* The NOV also included the same directive and the nineteen additional PFAS analytes to be monitored at all benchmark monitoring locations (BML001-BML005). NOV at 29, Corrective Action 16.

⁹⁷ Available at NPDES Permitting Program: Existing Manufacturing, Commercial, Mining, and Silvicultural Operations, Application Form 2C (epa.gov)

⁹⁸ *Id.* at p. 2C-3

⁹⁹ See January 22, 2021 *Notice of Violation, In the Matter of 3M Cottage Grove Center, Cottage Grove, Washington County* (January 2021 NOV) and December 14, 2022 *Administrative Order, In the Matter of 3M Company [Cottage Grove Stormwater]* (December 2022 AO)

In its December 2022 AO issued to 3M, MPCA directed 3M to provide an annual certification statement in which 3M must “certify that the Regulated Party is monitoring for *all PFAS believed to be present in its stormwater. . . .*” December 2022 AO at 10, requirement 6(c)ii. (emphasis added). In addition, the December 2022 AO required 3M to “analyze stormwater for the presence of” 41 specific compounds. *Id.*, requirement 6(d).

Following these actions, 3M created a combined PFAS monitoring list that included all compounds for which monitoring is required by the NOV and the AO. This list has been modified periodically (e.g., by addition of compounds identified through NTA) and currently consists of 84 PFAS compounds. (See column J of Exhibit I, PFAS Analyte Table).¹⁰⁰ The list therefore includes PFAS compounds that MPCA directed 3M to include in its monitoring *and all PFAS compounds 3M believes to be present in its wastewater and stormwater.* 3M has provided the annual certifications as required.

Discharge Monitoring Reports submitted by 3M since these monitoring requirements were imposed through the NOV and the AO confirm that 3M is meeting its monitoring requirements for the 84 PFAS compounds.

In its 2021 permit application, 3M provided, in Appendix D2, a list of 49 PFAS compounds it believed to be present in the Cottage Grove effluent. This list was compiled by 3M based upon monitoring results under the prior permit, process knowledge of PFAS manufacturing and usage at Cottage Grove and other 3M facilities, analytical results of retain samples of industrial wastewater, and analysis of Cottage Grove and Woodbury Site groundwater being treated at Cottage Grove. In short, this list comprised the PFAS compounds 3M believed could be present in effluent to be discharged from Cottage Grove. (See column G of Exhibit I, PFAS Analyte Table).

The Draft Permit includes a list of 108 PFAS, TOF and AOF. (See column E of Exhibit I, PFAS Analyte Table). This list includes the PFAS compounds that 3M believes to be present, and also compounds that MPCA directed 3M to monitor but for which 3M has no reason to believe those compounds will be present in wastewater or stormwater at 3M Cottage Grove.

C. MPCA Has Arbitrarily Included PFAS Analytes for Which There is No Reason to Believe They Are Present and, For Some Analytes, Valid Reasons for Believing They Will Not be Present

3M has no objection to inclusion in the Draft Permit of the 49 PFAS analytes it believes to be present plus TOF. However, it would be arbitrary and capricious for MPCA to include other PFAS analytes unless it can document valid reasons to believe those compounds are present in the effluent from Cottage Grove. In so doing, MPCA must address the clear evidence, discussed below, negating any reason to believe those analytes are present.

¹⁰⁰ The PFAS Analyte Table is attached hereto, and incorporated herein as Exhibit I.

It is plainly arbitrary and capricious to select PFAS analytes for the Draft Permit monitoring list that have no apparent relationship to Cottage Grove, as MPCA appears to have done here. MPCA has provided no information even suggesting a relationship of these additional analytes to chemicals that MPCA or 3M have any reason to believe are present at Cottage Grove. Those additional PFAS analytes should be removed from the permit. (See column F of Exhibit I, PFAS Analyte Table).

In discussions with MPCA concerning the PPN Draft Permit, 3M provided valid reasons why MPCA should remove selected analytes from MPCA's proposed list of PFAS compounds, but MPCA declined to do so, providing little to no explanation. The MPCA has also failed to provide any explanation in the Fact Sheet or the Draft Permit. Inclusion of compounds on the Draft Permit Analyte List in the face of valid reasons for exclusion, in the absence of any evidence to the contrary and without explanation, is arbitrary and capricious.

Most importantly, 3M has explained to MPCA that the list of 108 PFAS in the Draft Permit includes 38 PFAS that are not related to PFAS chemistries ever produced or used at 3M Cottage Grove. They are associated with materials derived from the products or processes of other PFAS manufacturers (e.g. fluorotelomer producers) and are not consistent with the expected chemistries derived from the electrochemical fluorination (ECF) processes used by 3M. These 38 compounds have never been manufactured, processed or used by 3M and are therefore not reasonably expected to be present in the discharges from the facility. (See column F of Exhibit I, PFAS Analyte Table). MPCA has provided no explanation or justification for retaining these PFAS compounds in the Draft Permit. 3M requests that each of these PFAS compounds be removed from the permit.

3M notes that three PFAS compounds not listed in the Draft Permit are currently being analyzed under 3M Cottage Grove's administratively extended NPDES permit sampling program. Those three compounds are included in the list of 84 analytes for which 3M currently is monitoring. The compounds are METSULF, MV4S-SA, and MV4S-DA. (See column J of Exhibit I, PFAS Analyte Table).

- METSULF was added to 3M's NPDES monitoring program in February 2024 based on NTA results. There were no detected results for this compound in effluent samples collected in February, March, or April.
- The MV-4S hydrolysis products (MV4S-SA & MV4S-DA) were added in February 2024 to monitor for potential presence in wastewater or stormwater samples. In February and April 2024 here were some detections in stormwater and the building 92 GAC mid- and post-bed samples. There were no detections in March. There have been no detections in samples from final outfall locations SD001 or SD002.

D. MPCA is Prohibited By Federal and State Law From Requiring Monitoring for Analytes That Lack USEPA or MPCA Approved Analytical Methods

MPCA is authorized to include in the Draft Permit only those sampling and monitoring requirements pertaining to parameters that have approved analytical methods under 40 C.F.R. Part 136

or state law. Minn. R. 7001.1060, subp. 2 provides that a permit “applicant shall perform the analysis by using the appropriate analytical techniques in 40 C.F.R. Part 136, or by using techniques found by the commissioner to be appropriate considering the circumstances and the parameters which are to be analyzed.” Many of the PFAS parameters included in the Draft Permit have no applicable standard methods under Part 136 (See Column I of Exhibit I, PFAS Analyte Table), and MPCA has not implemented the regulatory requirements in the Draft Permit in order to require the use of any alternative techniques for those parameters and the Commissioner has made no such findings as required by Minn. R. 7001.1060, subpart 2.

Under Part 136, Method 1633 is the only applicable standard method for monitoring PFAS in the media for which monitoring is required in the Draft Permit. Method 1633 is approved only for 40 PFAS compounds. Thirty-eight of those 40 compounds are included in the 108 PFAS covered by the Draft Permit.¹⁰¹ Two of the 40 compounds covered by Method 1633 are not listed in the Draft Permit or in 3M’s monitoring list of 84 PFAS compounds because MPCA previously determined 3M need not monitor for those compounds.

Accordingly, those PFAS compounds and TOF with no EPA or state approved method for analysis of those analytes in wastewater, surface water, solids (sediment) and fish tissues should be removed from the permit unless/until MPCA determines that alternative methods are appropriate, as required by Minn. R. 7001.1060, subp. 2. (See column I of Exhibit I, PFAS Analyte Table). Analytical results have consequences for compliance with permit limits and other permit requirements; MPCA is not authorized to impose those consequences based upon non-standard methods without having first met its obligation to make rational, supported findings pursuant to Minn. R. 7001.1060, subpart 2 that such methods are appropriate for that purpose.

MPCA has stated that it had been “encouraged” by EPA via a 2022 memorandum to include monitoring for PFAS analytes that do not have standard methods. But the 2022 U.S. EPA memorandum does not encourage the use of non-standard methods; it merely recommends that states implement monitoring programs “to the fullest extent available under state . . . law.”¹⁰² Until the Commissioner makes, and justifies, analyte-specific findings that non-standard methods are appropriate, state law confines MPCA to the use of Method 1633.

If MPCA wishes to consider making the requisite findings for PFAS not covered by Part 136, it must employ rigorous due diligence through a transparent process to document and justify each finding. 3M has developed methods for the 71 PFAS compounds listed in its January Annual Analytical Methods

¹⁰¹ U.S. EPA, Method 1633: Analysis of Per- and Polyfluoroalkyl Substances (PFAS) IN Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS (Jan. 2024), available at <https://www.epa.gov/system/files/documents/2024-01/method-1633-final-for-web-posting.pdf>. MPCA removed the 40th compound (8:2 FTS) at 3M’s request during review of the PPN Draft Permit because historical monitoring data demonstrated it is not present at the facility.

¹⁰² Memorandum from Radhika Fox, Assistant Administrator, to EPA Regional Water Division Directors, Regions 1-10, *Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs*, (Dec. 5, 2022), available at https://www.epa.gov/system/files/documents/2022-12/NPDES_PFAS_State%20Memo_December_2022.pdf.

Report (AAMR) (See column H of Exhibit I, PFAS Analyte Table). Thirty-nine of the PFAS on the Draft Permit list can only be analyzed internally by the 3M Global EHS Laboratory using internal 3M Method ETS-8-044 (water). No commercial laboratory capability exists to facilitate outsourcing of the analysis of those PFAS. 3M method ETS-8-044 has gone through comprehensive validation by 3M and has been included in interlaboratory performance evaluations. 3M is willing to cooperate with MPCA to support the agency's assessment of whether a finding can be made pursuant to Minn. R. 7001.1060, subpart 2 that all 3M methods listed in the 2024 AAMR, including method ETS-8-044, are appropriate.

For commercial laboratories, however, MPCA cannot justify as "appropriate" the "modified" EPA methods offered by some laboratories. For example, several commercial PFAS analysis laboratories offer a modified Method 537.1 for the purposes of analyzing wastewater, solids (sediment), and biological tissue. However, Method 537.1 was approved for only 18 PFAS analytes and was specific to drinking water; such commercial offerings go well beyond the method's originally approved scope. Without careful analysis and fact finding, MPCA can have no confidence that commercially modified EPA methods are as robust or reliable as the original methods because they have not gone through the same rigorous process that is required for an EPA or state-approved method.

In addition, not all commercial laboratories have developed and validated their methods in a uniform or consistent manner. For example, a laboratory's methods may not have been evaluated in interlaboratory evaluations to verify lab-to-lab consistency, resulting in uncertainty as to whether the inter-laboratory quality of the methods from such commercial laboratories is comparable.

3M also has found that commercial modifications of EPA procedures -- made in order to cover additional PFAS and alternative sample matrices -- may suffer from poor performance and provide results with higher uncertainty. A laboratory's commercial website listing of a modified method is not sufficient evidence that the method will be appropriate for use in demonstrating permit compliance. In 3M's experience, quality assurance/quality control (QA/QC) failures during analyses by modified methods can be frequent and result in extended turnaround times for reporting results due to additional time required for re-assays. Worse yet, such QA/QC failures can result in samples with non-reported results. MPCA also will need to confirm that commercial laboratories can reliably run these analyses at scale, with the appropriate turn-around times required by the permit, and that validation data support the conclusion that results will be of sufficient quality to meet the objectives of the permit. These are the types of problems, among others, that the Commissioner would have to thoroughly evaluate in giving consideration to a finding that non-standard methods are "appropriate."

E. MPCA Should Remove Analytes Based Upon Prior Analytical Work

In addition to the reasons discussed above for deleting (i) compounds added by MPCA without any rationale or explanation, and (ii) compounds never manufactured or used at Cottage Grove, the results of 3M's analytical work demonstrates that additional PFAS should not be included in a final permit. As MPCA is aware, 3M has undertaken considerable analytical work in the recent past, and the results of that work should necessarily inform the selection of PFAS analytes for this permit renewal. The

work includes NTA and effluent analyses over the past six months of PFAS not covered by the current permit.¹⁰³

3M has undertaken extensive NTA, as required by MPCA, covering stormwater, wastewater, ground water, soil and air. Where NTA has not detected a particular compound, that is the strongest evidence that the compound is not present at Cottage Grove. PFAS compounds included in the Draft Permit's analyte list that were not detected in NTA are included in column F of Exhibit I, PFAS Analyte Table. Unsurprisingly, for all but one of those compounds (PFODA) there also is no evidence these compounds were ever manufactured or used at Cottage Grove. It will be arbitrary and capricious for MPCA to include in the permit compounds both (i) not detected in NTA and (ii) never used or manufactured at Cottage Grove. 3M recommends that PFODA be deleted as well because NTA did not identify its presence.

Finally, from February 2024 to the present, 3M has analyzed for a number of compounds in effluent and stormwater at Cottage Grove that are not required to be monitored under the current permit. Five compounds covered by the Draft Permit's analyte list were not detected in these samples. These are 10:2 FTS, PBSA-DC, METSULF (C1 Methide), PFHxDA, and PHSA-DC. One of these, 10:2 FTS, also has never been used or manufactured at Cottage Grove. All five of these compounds should be removed from the analyte list because there is strong evidence that they are not believed to be present at Cottage Grove.

F. MPCA Must Provide an Exemption from the Draft Permit's Certification Requirement for NPDES Reporting

The Draft Permit provides that analyses required by the permit must be performed by laboratories that are either accredited by the MDH or certified by MPCA unless an exception is approved by MPCA. 3M is concerned that it will not be able to comply with this Draft Permit requirement because 3M expects to perform a significant portion of the PFAS and TOF analyses in house at the 3M Global EHS Laboratory, which is not an MPCA-certified laboratory. Indeed, as discussed above, 3M's Method ETS-8-044 is the only method used internally for thirty-nine analytes on the Draft Permit list, and no commercial laboratory capability exists for outsourcing analysis for those PFAS.

For these reasons, 3M requests that MPCA provide an explicit exception in the permit, as authorized by condition 5.82.367 of the Draft Permit for the 3M Global EHS Laboratory. Due to the volume of sampling and analysis required by the permit, 3M also requests exceptions for the EHS laboratory at Cottage Grove and those 3M-contracted commercial laboratories that are not MDH-accredited for EPA method 1633, modified method 537.1, or other methods, to meet the Draft Permit's

¹⁰³ Seven compounds also were not detected in 3M's in-stream studies. All seven of those compounds also were not detected in NTA or in recent monitoring of effluent and stormwater.

PFAS analysis requirements.¹⁰⁴ As the discussion below of commercial laboratory capabilities demonstrates, current limitations on commercial laboratory capacity may well necessitate 3M's use of some commercial laboratories that are neither accredited nor certified.

G. MPCA Must Consider the Limited Capacity and Capabilities of Commercial Laboratories to Analyze Numerous PFAS Compounds

Because MPCA has proposed frequent monitoring for an extensive analyte list at numerous sampling stations, MPCA must evaluate 3M's ability to meet its compliance obligations given the limited capabilities of commercial laboratories, coupled with uncertainty as to the validity of results obtained by the modified methods they use for expanded PFAS analysis. Without such an evaluation, MPCA will be unable to demonstrate that its proposed monitoring requirements are reasonable, feasible, and practical, as required by Minnesota Statutes, Section 116.07, subdivision 6. 3M offers the following observations to facilitate MPCA's evaluation.

Several MDH-accredited commercial laboratories currently offer Method 1633; two of those laboratories have been audited and vetted by 3M and found to be of sufficient quality with adequate turnaround times. However, those laboratories may be adequate for only the analysis of 38 of the Draft Permit's list of PFAS analytes. (See column E of Exhibit I, PFAS Analyte Table) for wastewater and surface water, and possibly for sediment and fish tissues. Other commercial laboratories offer PFAS analysis using a modified EPA Method 537.1, and 3M uses internal methods that are akin to modified method 537.1. The available capacity of these laboratories may be of limited use, however, because, as noted earlier, EPA Method 537.1 is a standard method for drinking water and was approved by EPA for 18 PFAS, all of which are captured within the PFAS listed in the recently approved EPA Method 1633.

Analyses of alternative sample matrices and analysis of additional PFAS appear to be available only through non-standard methods used by some commercial laboratories. As noted above, those methods have not gone through the rigors of the EPA development and validation process and are not approved standard methods listed in 40 C.F.R. Part 136. Even if MPCA were to justify a finding that these methods are appropriate, as discussed above, such analytical capacity is limited, and 3M will be forced to depend on only a few commercial laboratories. Particular commercial laboratories will be the single source of commercial PFAS analytical capacity for some PFAS analytes. This poses a significant risk to 3M with respect to meeting its compliance obligations should that single source become unavailable or overwhelmed. In some instances, there are no commercial or internal laboratory capabilities to analyze for specific PFAS.

In connection with utilizing 3M's inhouse laboratory capabilities, we have several, additional concerns regarding the limited options to perform analysis of the targeted PFAS compound list:

¹⁰⁴ USEPA 2024. Method 1633-Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS. <https://www.epa.gov/system/files/documents/2024-01/method-1633-final-for-web-posting.pdf>

First, 3M does not have an in-house method for 38 PFAS compounds that were never used, processed or manufactured at Cottage Grove. Those compounds can only be analyzed at a single commercial laboratory (Eurofins – Lancaster). Of those 38 PFAS, 12 are specific to Eurofins laboratories and cannot be found in the listings of any other commercial laboratories' capabilities. As explained above, 3M requests that these 38 PFAS compounds be eliminated from the permit; the lack of reliable commercial laboratory capacity further supports this request.

Second, the Draft Permit requires analysis of both TOF and adsorbable organic fluorine (AOF). No standard method exists for TOF. A standard method (EPA Method 1621¹⁰⁵) exists for AOF but Method 1621 may not well represent low-molecular-weight PFAS in the analysis. 3M currently has a sensitive TOF analysis capability by internal method ETS-8-099, which is fully validated and achieves low detection limits. Therefore, 3M proposes to provide available information to support an MPCA assessment of whether a finding is justified that ETS-8-099 is appropriate for TOF. If the finding is made, 3M would expect to use internal TOF analytical capabilities at the 3M Global EHS Laboratory for wastewater and surface water matrices. 3M notes, however, that if TOF is required to be performed at a backup commercial laboratory at any time by the currently offered methodology at those laboratories, detection limits will likely be negatively affected. Further, 3M has not developed a TOF method for fish tissue and sediment, and it is unclear whether commercial laboratory capabilities exist for fish tissue and sediment to be sampled under the Draft Permit's instream study requirements. Time will be needed to apply the TOF method to these matrices and determine whether it is even possible to use the method for them. Moreover, because AOF is captured within TOF, 3M recommends deleting AOF once the 3M TOF method is approved.

Third, analysis of the five FTOH analytes can only be performed at a single laboratory (Eurofins-Lancaster), which leaves 3M without an alternative option. It is not unrealistic to anticipate that Eurofins-Lancaster could fall behind schedule, have a catastrophic failure, or suddenly halt or curtail its offering for financial or other reasons. There also could be a lack of an available method capability at that laboratory for the analysis of the FTOHs in solids (sediment) or fish tissues; this question is still pending inquiry by 3M. 3M therefore requests that the MPCA provide an exception to deadlines for reporting sampling results for the five FTOH analytes by stating in the permit that reporting for these five analytes is dependent on outsourced laboratory performance and 3M will not be considered in violation of reporting deadlines for these specific analytes if deadlines are not met due to commercial laboratory delays. 3M also requests a waiver on analysis of these compounds in fish tissue and solids (sediment), as no commercial or internal capability exists.

Finally, based on 3M's initial inquiries of commercial laboratories, 3M is concerned that many PFAS analytes for solids (sediment) and fish tissues will not be covered by commercial laboratories using method 1633, modified method 537.1, or any other method. 3M presently has methods covering 42 of the 108 + 3 PFAS in the list for fish tissues and covering 65 of the PFAS analytes for solids (sediment),

¹⁰⁵ U.S. EPA, *Method 1621-Determination of Adsorbable Organic Fluorine (AOF) in Aqueous Matrices by Combustion Ion Chromatography (CIC)*. (Jan. 2024), available at <https://www.epa.gov/system/files/documents/2024-01/method-1621-for-web-posting.pdf>

leaving significant gaps in method availability for the complete PFAS list of 108 + 3 and TOF and AOF. Initial responses to 3M's inquiries indicate those offerings may be exaggerated on commercial laboratories' websites, but even if commercial laboratories can provide analysis for the full website listings for wastewater under method 1633 and modified method 537.1, eight (5+3) PFAS and TOF and AOF are not covered by any available methods for solids (sediment) and 18 (15+3) PFAS and TOF and AOF are not covered for fish tissues.

VIII. Non-Targeted Analysis

A. There is No Legal Authority to Impose Non-Targeted Analysis Conditions in an NPDES Permit

Non-targeted analysis (NTA) is a non-standardized, qualitative analytical research tool used to search for potential unknown compounds in a sample. There are no standard analytical methods for NTA, and as such MPCA lacks the authority to require NTA as a condition of an NPDES permit. An obligation of a permittee is to fully characterize its discharges to receiving water bodies and identify for the permitting authority the pollutants "believed to be present" in its discharge. Minn. R. 7001.1060; 7001.1050. A permittee is not required, however, to search for and identify every potential breakdown product of, or impurity in, a pollutant. If that were the case, the applicable federal and state regulations would have stated so, and permit applicants would be required to conduct NTA of pollutants "believed to be present" – after all, virtually all chemical pollutants have some potential to transform. Notwithstanding the foregoing, 3M has worked with MPCA in the past to conduct NTA sampling and analysis at Cottage Grove and stands ready to voluntarily work with MPCA outside the framework of the NPDES permit to develop and implement a properly tailored NTA program for the Cottage Grove facility.

B. Unworkable NTA Conditions in the Draft Permit

If MPCA determines it has the authority to retain NTA requirements in the final permit, to avoid being arbitrary and capricious those requirements must reflect the effort and time required to implement NTA sampling and analysis. Several of the NTA conditions in the Draft Permit fail to do so.¹⁰⁶

1. Infeasibility of Providing NTA Results Within Six Months of Sample Collection

Section 5.69.88 of the Draft Permit requires that NTA results be submitted to MPCA within six months of sample collection. This requirement is unrealistic. NTA work is resource intensive, and it is not possible to report NTA results within six months of sample collection given the qualitative nature of NTA and the amount of data that must be manually evaluated. MPCA required 3M to undertake extensive NTA work pursuant to the terms of the January 2021 NOV ¶ 24, that required more than 30 months to complete. MPCA now proposes to require 3M to undertake similarly extensive NTA sampling and

¹⁰⁶ See Exhibit F-18 (attached hereto, and incorporated herein), Letter from 3M to Emily Schnick, MPCA, *Pre-Public Notice Draft Comments – NTA / Instream Studies 3M Cottage Grove Center* (June 13, 2024).

analysis. Since the Draft Permit requires that 3M submit an NTA Sampling Result Report prior to permit expiration, all NTA sampling results should be provided to MPCA at that time.

2. Inappropriate Requirement to Provide CASRN

Condition 5.69.88 of the Draft Permit requires that “[a]ll new PFAS compounds identified as being present within the water(s) discharged from the facility shall have a MPCA verified Chemical Abstract Service (CAS) number provided along with their chemical structure.” This condition should be stricken. NTA can result in the identification of both known and unknown compounds. It is 3M’s practice to provide a tentative chemical structure, molecular formula, derived chemical name, and a CASRN should one be available. However, it is sometimes the case that the tentatively identified non-targeted PFAS have not been assigned a CASRN, since the compounds were previously unknown. When NTA tentatively identifies a previously unknown PFAS, 3M conducts a search of databases to identify any potentially applicable CASRN and reports those. Generation of a CASRN for a compound that is theoretical and not verified against a known reference standard via registration with CASRN thus would not be appropriate. The requirement to provide CASRNs for all compounds identified through NTA is arbitrary and capricious.

IX. Instream Characterization

A. Draft Permit Requirements

Draft Permit Conditions 5.69.90-92 state:

“By January 1, 2026, the Permittee shall submit a work plan for review and approval by MPCA for an instream PFAS characterization study (Characterization Study) of surface water, sediments, and fish tissue PFAS as outlined in the PFAS Surface Water Monitoring Protocol (Appendix A). The work plan must, at a minimum, repeat all sample collection in the 2022 instream characterization study; if the Permittee would like to request a reduction in sampling, they must explain why the reduction is reasonable and needed. The MPCA reserves the right to make any changes to the sampling plan prior to approval. The Permittee shall submit a work plan: Due 01/01/2026. The MPCA will review and approve the work plan by March 1, 2026.”

“By January 1, 2028, the Permittee shall submit the results of the instream PFAS characterization study (Characterization Study) of surface water, sediments, and fish tissue for the PFAS as outlined in the Surface Water Monitoring Protocol (Appendix A). The Permittee shall submit sampling results: Due 01/01/2028.”

“The Permittee shall continue to submit subsequent Characterization Study results every five years following submittal of the submittal of the 2028 study.”

Proposed Appendix A to the Draft Permit states in pertinent part:

“PFAS Variables to Be Analyzed:

Surface water: All PFAS parameters that are required to be analyzed at SD001.

Fish Tissue: All PFAS parameters from the 2023 ‘Instream PFAS Characterization Study Interim Report Mississippi River Cottage Grove MN’ report and any additional PFAS parameters required to be analyzed at SD001.”

“Characterization Report Sampling:

All sampling required in the “Instream PFAS Characterization Study Work Plan Mississippi River Cottage Grove, Minnesota Revision 01” report must be replicated every five years. This sampling event samples surface water, fish tissue, sediment, macroinvertebrates, and sediment pore water. The sampling work plan document is available upon request. If the Permittee would like to request a reduction in sampling, they must explain why the reduction is reasonable and needed. If the permit is administratively continued past the permit expiration date, then this sampling must be repeated every five years until the permit is re-issued.”

B. The Instream Study Requirements Are Not Supported by Law and Should Not be Included in a Final Permit.

The conditions requiring 3M to conduct instream studies are not supported by law and 3M requests they not be included in a final permit. MPCA proposes that 3M conduct an instream study every five years and indefinitely beyond the term of any duly-issued NPDES permit.¹⁰⁷ Under the Clean Water Act, an NPDES permit can have a term of no more than five years. 33 U.S.C. § 1342(b)(1)(B); Minn. Stat. § 115.03, subd. 1, sec. 13. First, MPCA has cited no authority that would allow it to impose requirements that extend beyond the term of the permit, and 3M is aware of no such authority. Although NPDES permits can be administratively extended in circumstances where a permittee applies for a new permit no later than 180 days prior to the expiration of its existing permit, that does not empower MPCA to impose permit conditions that assume that a permit will be administratively extended. See Minn. R. 7001.0160. Assuming that the proposed Draft Permit is issued as final in 2024, MPCA lacks the legal authority to impose the conditions in the current draft of the permit that require the conduct and submission of characterization studies “every five years following submittal of the submittal of the 2028 study” – i.e., in 2033, 2038, 2043, etc., respectively, a period of 9, 14, 19, etc., calendar years after the

¹⁰⁷ See Exhibit F-18.

permit's expiration date. See Draft Permit at 5.72.78, 5.72.79, and 5.72.80. Accordingly, the conditions of the Draft Permit that purport to require 3M to conduct instream studies after the five-year permit term exceed MPCA's permitting authority and, on that basis, 3M requests they be removed from the final permit.

Second, the instream study condition represents a dramatic expansion of any permittee's NPDES compliance obligations. The CWA imposes upon authorized states the requirement that any WQBELs be based on WQC and WQS. It is the permitting authority's obligation to establish the basis for such effluent limitations before the issuance of a permit. On the other hand, it is the permittee's obligation to monitor its discharge to ensure that any duly-issued permit effluent limitations are being met and to install appropriate controls to ensure compliance. The CWA does not impose upon a permittee the obligation to monitor and assess a waterbody for the purpose of establishing of WQC/WQS-derived effluent limitations; that is the state's obligation.

Notwithstanding that an NPDES permit is not the proper vehicle for requiring instream studies, as it has in the past, 3M is prepared to work with MPCA to develop reasonable and appropriate instream studies outside the permitting context. See, 3M 2023 Instream PFAS Characterization Study Final Report-Mississippi River, Cottage Grove, Minnesota, Weston Solutions Inc. Issued June 29, 2023 (hereinafter the "2023 IPC Study"). The 2023 IPC Study is attached hereto, and incorporated herein as Exhibit J.

C. If MPCA Issues a Permit with Instream Conditions the Currently Proposed the Period Between Studies is Arbitrary and Capricious.

If MPCA determines to retain the instream conditions in the final permit, the period between studies in the Draft Permit is not justified by the underlying facts. Based on available historical data, which has been shared with MPCA, an appropriate interstudy timeframe would be at least seven years. As such, a technically supportable interstudy timeframe cannot be accommodated by a five-year permit, further underscoring that an NPDES permit is the wrong legal vehicle for requiring instream characterization studies. Based on the 2023 IPC Study and historical sampling results generated by MPCA and 3M since 2005, there is sufficient data to provide irrefutable evidence that PFAS levels are decreasing in fish tissues for Pool 2 and Pool 3. The temporal trend data for PFOS, FOSA, PFDA, PFUnA and PFDoA in fish fillet from Pool 2 and Pool 3 of the Mississippi River all have decreased significantly. As shown in Figure 2 (see Exhibit K¹⁰⁸ at 3), PFOS median concentrations in Pool 2 fish fillets decreased by an average of 91% between 2005-2021. For this same period of time, concentrations of FOSA have decreased by an average of 92%, and concentrations of PFDA, PFUnA, and PFDoA have decreased between 75-83% (not shown). See Exhibit K.

Another reason the interstudy timeframe must be extended relates to the availability of resources. There is a limit on PFAS analytical resources. The instream studies of the nature of the 2023 IPC Study

¹⁰⁸ Relevant Tables and Figures from the 2023 IPC Study have been compiled and attached hereto, and incorporated herein as Exhibit K.

are highly resource intensive (i.e., time, people, and instruments). The studies require extraordinary efforts by 3M's internal analytical laboratories as well as contracted professional services (e.g., Weston, Axys Labs, Eurofins, University of Georgia Center for Applied Isotope Studies, and Normandeau Associates). The 2023 IPC Study was initiated on an expedited basis for field sampling in July 2021, with the final report not issued until late June 2023, nearly two full years after study initiation. Given the magnitude of that study (3M is unaware of any other instream PFAS study of this magnitude), 3M naturally encountered technical issues, such as analytical interferences, instrument failures, and analyte recovery. As MPCA is well aware, 3M went to extraordinary lengths in a highly resource-intensive effort to meet the two-year turnaround time required by the January 2021 Notice of Violation, and even then, some results could not be reported until after production of the initial results.

In the Draft Permit, MPCA proposes to require 3M to submit the first instream study plan by January 1, 2026, with a final report due January 1, 2028. However, from a practical and technical perspective, 3M would not be able to initiate field work to commence sampling until July or August, due to typical Spring high river water conditions, and a multitude of logistical issues associated with organizing boats, crews, contracted services by service providers, Department of Natural Resources permitting, etc. Hence, in effect, under MPCA's proposal 3M would have less than 1.5 years from first sample collection to issue a final report. This is an inadequate time frame due to the significant number of PFAS on the analyte list and because laboratory analysis of samples cannot commence until a sufficient number of fish tissue samples are available so that they can be extracted in bulk to facilitate more efficient sample preparation and analysis.

In sum, the MPCA proposed timeframe is not technically feasible to fully repeat the 2023 IPC Study. A comparison of the time to complete the 2023 IPC Study with those of other PFAS fish studies from the scientific literature is borne out by the magnitude of impact on resources due to the short timelines imposed by MPCA during the 2023 IPC Study (see Table 4, Exhibit K at 4). To further shorten this timeframe would invite failure to complete the instream studies within the allotted time and invite noncompliance with the permit. Thus, even if MPCA had the authority to require that 3M conduct instream studies as a NPDES permit condition, the schedule and other requirements for such a study contained in the Draft Permit would necessarily be arbitrary and capricious.

D. The Scope of the Proposed Instream Studies is Arbitrarily Broad

Should MPCA issue a permit including instream study conditions, the scope of any future instream studies be curtailed as follows to avoid being arbitrary and capricious:

Sampling should only occur in the 2023 IPC Study area identified as Reaches 02 and 03 (river miles 812-820). Reaches 01, 04, 05, 06, and 07 should be excluded from the study area. The East Cove, West Cove, and Upper East Cove locations also should be excluded. The only area relevant to the MPCA's 2024 site-specific WQC are river miles 812-820 in the main river channel, which correspond to the IPC study area identified as Reaches 02 and 03.

Sediment, porewater, surface microlayer or suspended solids should be excluded from any further characterization work; only surface water composite samples should be collected. As stated in the Draft Permit's Appendix A, the goal of the instream studies is to ensure sufficient surface water and fish tissue data are collected to perform impaired water assessments and develop fish consumption guidance values. Other environmental sampling does not support such assessments or the establishment of site-specific WQC parameters. See Draft Permit Condition Appendix A, Section 2.

Biotic sampling should be limited to six fish species, 10 fillet/each species. 3M recommends that Bluegill Sunfish, Black Crappie, and Common Carp or Freshwater Drum be collected as representative of trophic level three (TL3), and that Smallmouth Bass, White Bass and Walleye/Sauger be collected as representative of trophic level four (TL4). The recommended fish for TL3 and TL4 were used to establish the site-specific criterion for river mile (RM) 812-820 (MPCA 2024), and three TL3 fish and three TL4 fish would allow for the calculation of a geometric mean bioaccumulation factor for each trophic level. Also, the recommended species of fish are those that have been historically sampled and analyzed for PFAS in Pool 2 and Pool 3 and allow for temporal trend analysis to be conducted. The collection and sampling of other fish species, as well as the sampling and analytical testing of whole-body tissue and other aquatic biota (e.g., benthic macroinvertebrate (BMI)) performed in connection with the 2023 IPC Study, should not be required. These additional requirements do not support such assessments or the establishment of site-specific WQC parameters. Fish fillet from the recommended TL3 and TL4 species have historically been sampled and can provide temporal trends and are adequate to develop site-specific WQC and fish consumption advice.

The stable isotopes ($\delta^{15}\text{N}$ and $\delta^{13}\text{C}$) determination for biota should be excluded from future studies. 3M determined the appropriate stable isotopes in the 2023 IPC Study to establish trophic levels of fish in the aquatic food web of the Mississippi River. Nonetheless, MPCA has already designated trophic level classification for fish species for purposes of calculating WQC (MPCA 2017). Importantly, 3M's analysis of the 2023 IPC Study results shows that there is no trophic biomagnification of PFAS in the fish from the Mississippi River, demonstrating that trophic level is not a critical parameter in calculating WQC.

The condition that fish age be determined should be removed. 3M's analysis of the IPCS data shows there is no discernible association of PFAS with fish age, size, or gender, and demonstrates that this is consistent with historical observations. Therefore, the condition that 3M use the cumbersome otolith removal and laboratory examination to determine age should be removed from the permit.

In further studies 3M recommends that any laboratory analysis of instream samples include only the 22 PFAS detected in the 2023 IPC Study at a frequency of 20% in fish tissues and 50% frequency in surface water. First, while 3M analyzed for the presence of 42 PFAS as part of the 2023 IPC Study, only the above-referenced 22 PFAS were detected in fish and surface water in meaningful percentages. And of those 22 detected PFAS only a few have established water-quality criteria. Second, it is unlikely that expanding the list of PFAS to the 108 PFAS in the Draft Permit, would lead to a significant increase in the number of detected PFAS in a sufficiently high percentage of samples. Moreover, most of the 108 PFAS

identified as parameters in the Draft Permit for SD001 have not been validated for analysis using EPA Method 1633 (or equivalent methods) nor for fish tissue analytical methods. The development of such methods requires years, and would need to occur prior to any study planning, field work, or laboratory analysis. As shown in Table 1 and Table 2 (see Exhibit K at 1-2) the use of infrequently detected analytes (i.e., detected in <50% of the samples) would introduce a high level of uncertainty into the calculation of WQC as more than half of the data would be based on data at or below the limits of detection.

X. Modification of Permit

In the context of the Draft Permit, the modification of a “reporting limit” is a major modification requiring public notice and comment.¹⁰⁹ Thus, MPCA should not include in a final Cottage Grove permit the language of Draft Permit Condition 5.69.85, which states that “[t]he modification of reporting levels and/or detection levels would be considered a minor modification.”

Such a change does not qualify as a minor modification under Minnesota regulations, see Minn. R. 7001.0190(3), and hence the modification of a reporting limit is a major modification requiring public notice and comment. 3M does not consent to Condition 5.69.85.

XI. 7Q10 Unnamed Creek

The Fact Sheet incorrectly states that the 7Q10 flow in Unnamed Creek is zero. Fact Sheet at 106. The correct 7Q10 flow for Unnamed Creek is 7.22 cubic feet a second (CFS). 3M determined the correct value for the 7Q10 using the USGS StreamStats application. The methodology considers drainage area, percentage of storage based on the National Wetland Inventory, and hydrologic soil type. For ungaged streams, StreamStats calculates a 7Q10 flow from several inputs, including precipitation data, drainage area, soil types, and water storage capacity from the National Wetlands Inventory.¹¹⁰ MPCA should use the correct 7Q10 value for Unnamed Creek in developing effluent limitations for non-PFAS analytes in final permit, as shown in the table below.

Parameter	Units	Limit with 7Q10=0		Limit with 7Q10=7.22 cfs	
		Monthly Average	Daily Maximum	Monthly Average	Daily Maximum
Antimony, Total (as Sb)	ug/L	20.0	53.5	23.6	63.1
Bis(2-ethylhexyl) phthalate	ug/L	3.0	5.1	3.5	6.0

¹⁰⁹ MPCA uses the term “reporting limit” and “reporting level” interchangeably. By this comment, we assume that MPCA actually intends to use the term “reporting limit,” which is defined at Condition 5.69.127, where it uses the term “reporting level,” which is undefined in the Draft Permit.

¹¹⁰ See <https://streamstats.usgs.gov/ss/>

Parameter	Units	Limit with 7Q10=0		Limit with 7Q10=7.22 cfs	
		Monthly Average	Daily Maximum	Monthly Average	Daily Maximum
Cadmium, Total (as Cd)	ug/L	2.5	4.3	2.9	5.1
Mercury, Total (as Hg)	ug/L	0.010	0.017	0.010	0.017
Nitrogen, Ammonia, Un-ionized (as N)	mg/L	--	0.458	--	0.458
Nitrogen, Ammonia, total (Apr - Nov) ⁴	mg/L	--	1.0	--	1.0
Nitrogen, Ammonia, total (Dec - May) ⁵	mg/L	--	1.1	--	1.7
Oil & Grease, Total Recoverable (Hexane Extraction)	mg/L	--	10.0	--	10.0
Selenium, Total (as Se)	ug/L	4.70	8.20	5.59	9.69
Zinc, Total (as Zn)	ug/L	167	288	196	340

XII. Annual Average Reporting Limit

Draft Permit condition 5.69.76(A) requires 3M to achieve an annual average reporting limit of 4 ng/L for PFOS, PFOA, and PFHxS:

The Permittee must sample and analyze PFAS compounds using methodology capable of detecting PFAS to the minimum reporting levels available and specifically below a 4 ng/L reporting limit for PFOS, PFOA, and PFHxS, such as EPA method 1633, a method equivalent to EPA 1633, or a method better than EPA method 1633.

Note-Reporting limit compliance will be assessed by averaging all reporting limits at each individual monitoring station within a calendar year period and comparing against the 4 ng/L limit. The annual average of the reporting limit shall be included in the comments cell of the respective DMRs for all stations with the exception of WS 005 on the December reporting requirement. A violation at the specified station.

Note-Due to the variable stormwater characteristics, stormwater SD and WS stations may use all results from all stormwater stations when assessing compliance with the 4 ng/L reporting limit.

Note-Process control sampling does not have to meet the reporting limits established in item "A: above or any other quality assurance requirements otherwise required of the monitoring required in the Limits and Monitoring Requirement table of this permit.

3M appreciates MPCA's objective of ensuring the accuracy of PFOS, PFOA, and PFHxS results by requiring an annual average reporting limit. However, application of the annual average reporting limit at all monitoring stations is arbitrary and capricious. First, the data that 3M has provided to MPCA demonstrates that an annual average reporting limit of 4 ng/L is infeasible if applied at all monitoring locations, including SD locations. The reporting limit can exceed 4 ng/L for certain samples and compounds for a variety of reasons, including sample dilution by the testing laboratory, variability in the volume of water collected in the sample bottle by the field technicians, or the operation and performance of the laboratory and instrumentation. Sample dilution can be required for many reasons, including: to mitigate interferences (e.g., sediment, discoloration, chemicals present at high concentration, failing QA spike recoveries), to prevent compounds present at relatively high concentration from contaminating laboratory instrumentation, or to ensure the sample is within the calibration range of the instrument.

Dilution may be required for stormwater, where the target analytes can be present at a large range of concentrations and vary month-to-month based on the scale of the rain event. Notably, Method 1633, to which MPCA refers in this permit condition, expressly authorizes dilution techniques to accurately quantify target PFAS. 3M cannot control third-party laboratories operations. For example, the volume of water collected into the sample bottle by the field technicians, the standard operating procedures used by the contract laboratories, limits on the amount of PFAS that can be injected onto their instrumentation, variability in instrument sensitivity and the calibration range are all out of 3M's control. Even within its own EHS Laboratory, 3M at times may employ dilution techniques to mitigate matrix interferences or samples having a target analyte present at a relatively high concentration.

For these reasons, it is arbitrary and capricious for MPCA to include a permit condition with which it knows 3M cannot comply, especially where MPCA's prescribed test method provides for the dilution that would proportionately increase the annual average reporting limit above 4 ng/L. Accordingly, 3M respectfully requests that MPCA remove the reporting limit condition. Alternatively, 3M requests that the annual average be applied only at SD 001, 002, and 003, where achieving the reporting limit would be feasible because the effluent has been treated and would have far fewer interferences requiring dilution than the effluent monitored at the other stations.

XIII. Stormwater Notice of Violation and Administrative Order

In the January 2022 NOV, MPCA alleged certain permit violations related to wastewater and stormwater and directed 3M undertake 37 corrective actions. Separately, in a December 2022 AO,

MPCA required that Cottage Grove complete stormwater-related monitoring and control measures. 3M has substantially completed the work required by the January 2021 NOV and the December 2022 AO, including the implementation of a work plan for implementing remedial measures at stormwater discharge sampling locations to control PFAS discharges and development and implementation of a Stormwater Action Plan. Several of the conditions relating to implementation of these plans, however, require ongoing reports and submissions in perpetuity. The AO contains no termination date or termination provision. Moreover, 3M is regularly providing information and data pursuant to the NOV as well, including monthly reports, and the NOV similarly includes no termination date. Notably, much of the information and data required by the NOV and AO MPCA would also now be required under the terms of a final permit. Examples of redundant reporting requirements include:

- Section 2 of the AO requires quarterly volume data from the detention and pump basins with no specified termination date. Under the Draft Permit, MPCA will receive this same information pursuant to flow reporting and total annual flow conditions.
- Section 6 of the AO requires an NTA every two (2) years for stormwater. The Draft Permit also would require an NTA.
- Section 6(c)(ii) of the AO requires outfall sampling of stormwater to lined basins, which would be required quarterly in the Draft Permit.
- Section 6(d) of the AO requires quarterly sampling of a list of PFAS. The sampling required under the Draft Permit includes a broader list of PFAS than that under the AO.

3M requests MPCA must eliminate the duplicative requirements and obligations by either terminating the January 2021 NOV and December 2022 AO or striking any redundant and duplicative requirements from a final permit.

XIV. Additional Draft Permit Comments

Attached hereto, and incorporated herein, is Appendix 1 (Additional Draft Permit Comments) and Appendix 2 (Additional Draft Permit Comments – Compliance Dates), which highlight inconsistencies and ambiguity with the Draft Permit and recommend changes to improve the clarity of a final permit. 3M welcomes the opportunity to work with MPCA to address these comments.

XV. Commingling

The participation of MPCA enforcement division representatives in the NPDES permit issuance process presents significant concerns. See *Withrow v. Larkin*, 421 U.S. 35, 47 (1975). See, e.g., *Bethlehem Steel Corp. v. U.S. E.P.A.*, 638 F.2d 994 (7th Cir. 1980). MPCA enforcement representatives should not be participating in the permit issuance process.

XVI. Conclusion

3M offers the foregoing comments, to ensure that the Draft Permit establishes a clear and unambiguous path for the facility to achieve and maintain full compliance consistent with the requirements of the federal Clean Water Act and the State of Minnesota's Water Pollution Control Act.

For the reasons summarized in this comment letter, 3M respectfully requests that the Draft Permit be modified to be consistent with MPCA's statutory authority and responsibility to ensure 3M's compliance obligations are clearly defined and demonstrated to be reasonable, feasible, and practical.