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January 27, 2014

**Via Certified Mail and Electronic Mail**

Mr. John Linc Stine  
Commissioner  
Minnesota Pollution Control Agency  
520 Lafayette Road  
St. Paul, MN 55155-4104

**Subject: Comments On The 2014 MPCA Draft Impaired Waters List**

Dear Commissioner Stine:

I am writing on behalf of 3M Company ("3M") regarding the decision by the Minnesota Pollution Control Agency ("MPCA") not to delist the entirety of Pool 2 of the Mississippi River from the 2014 Draft Impaired Waters List (the "2014 Impaired Waters List") as "impaired" for perfluorooctane sulfonate ("PFOS"). In our view, the extensive data that has been generated since 2009 renders MPCA's decision not to delist the fourth Assessment Unit within Pool 2 as arbitrary and capricious. In fact, failure to delist the entire pool is inconsistent with the State's own guidelines and regulations regarding impairment listings. 3M requests that the 2014 Impaired Waters List be modified to eliminate the inclusion of the fourth assessment unit No. AUID 07010206-502 (*i.e.*, the 15-mile stretch of the Mississippi River from the Rock Island Railroad Bridge to Lock and Dam No. 2) as impaired because of PFOS levels in fish tissue and/or water. Doing so will more accurately portray the health of Pool 2 and is in the best interests of all who use and enjoy this important body of water for commercial and/or recreational purposes.

The reasons why the entirety of Pool 2 should be delisted for PFOS are several, including, but not limited to, the following:

- I. **Fish concentrations are below the threshold for impairment:** The data consistently show PFOS fish tissue levels are below the threshold for impairment. Four extensive fish sampling studies in 2009, 2011, 2012, and 2013<sup>1</sup> have collectively demonstrated that measured PFOS fish tissue concentrations have declined significantly since 2009. These data, combined with past policy, the State's own regulations, and common sense dictate that Pool 2 should have been delisted as impaired when the Minnesota Department of Health ("MDH") removed the one-meal-per-month fish consumption advisory for PFOS

<sup>1</sup> During early Fall 2013, 3M commissioned Anchor QEA to conduct an extensive sampling of four fish species in Pool 2. Relevant details on the Fall 2013 fish sampling dataset are provided in Appendix A.

**Exhibit  
2399**

State of Minnesota v. 3M Co.,  
Court File No. 27-CV-10-28862

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in June 2012. Arguably the impairment should have been removed based on the 2009 fish data but this determination became obvious with the June 2012 MDH guidance.

2. **Fish data should be the sole basis for the delisting decision:** In keeping with established protocol, where a robust fish dataset is available (as in Pool 2), an impairment determination should be based on fish concentrations (versus water concentration comparisons that attempt to project levels in fish). This has universally been the precedent with respect to PFOS-based impairment listings. MPCA should utilize the extensive and more relevant fish tissue data that are available.
3. **Impairment should be evaluated for Pool 2 in its entirety:** Narrowing the impairment to a single assessment unit within Pool 2 is contrary to the State Assessment Methodology when assessing impairment relative to fish consumption.<sup>2</sup> The impairment determination should be made for the *entire* pool, not for individual assessment units within the pool.
4. **Water concentrations are below the threshold for impairment:** Even if the State insists on improperly relying on PFOS water concentration data, Pool 2 should still not be listed as impaired. Water samples collected immediately adjacent to East Cove should not have been used in the assessment. According to MPCA's own guidance, inclusion of non-representative locations invalidates any assessment results. The remaining sampling locations in AUID 07010206-502 consistently exhibit both geometric means and arithmetic means below the applicable water quality standard.

Each of these points is discussed in more detail below.

**I. Fish Concentrations Are Below The Threshold For Impairment.**

The overall data consistently show that average PFOS fish tissue levels are below the threshold for impairment. These data, combined with past policy, the State's own regulations, and common sense dictate that Pool 2 should have been delisted as impaired when MDH removed the one-meal-per-month fish consumption advisory for PFOS in June 2012.<sup>3</sup>

Four extensive and robust fish sampling studies in 2009, 2011, 2012, and 2013 have collectively demonstrated that measured PFOS fish tissue concentrations have declined since 2009 and remain well below critical State thresholds. The geometric and arithmetic means of fish tissue concentrations for Pool 2 are shown in Table 1 for all four years by species. In

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<sup>2</sup> MPCA. 2014. Guidance Manual for Assessing the Quality of Minnesota Surface Waters for Determination of Impairment: 305(b) Report and 303(d) List; 2014 Assessment Cycle ("Assessment Methodology").

<sup>3</sup> In fact, as explained in a letter from Gary Hohenstein, 3M, to Marvin Hora and Howard Markus, MPCA, dated November 7, 2009, Pool 2 should never have been listed as impaired for PFOS because the impairment listing was neither appropriate nor warranted. In addition, as explained in a letter from Jean Sweeney, 3M, to John Linc Stine, MPCA, dated November 20, 2012, the MPCA had no rational basis for continuing to list the entirety of Pool 2 as impaired for PFOS in 2012.

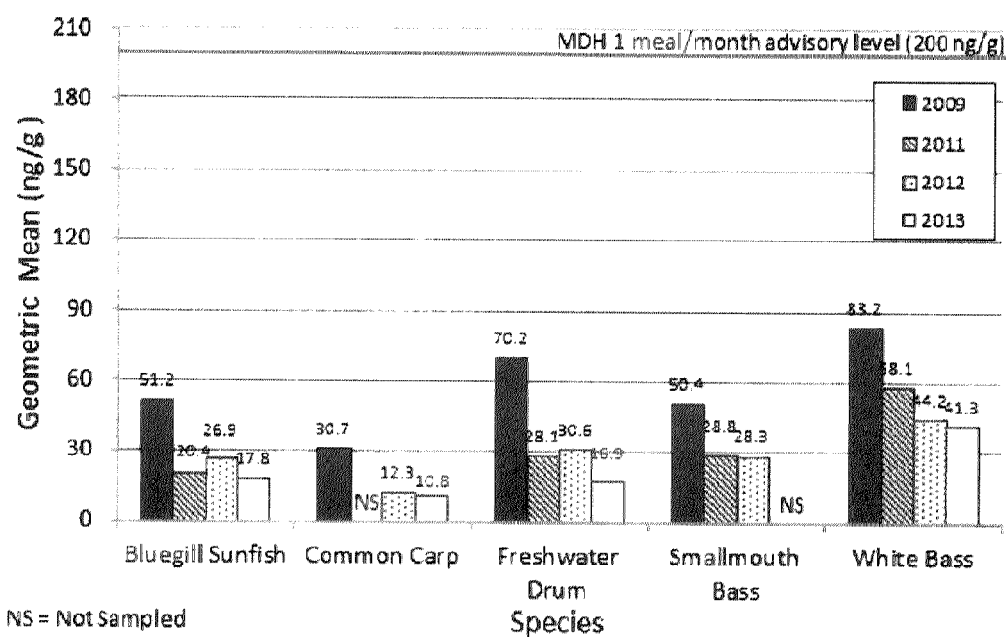
addition, the geometric means of fish tissue concentrations for Pool 2 are shown in Figure 1 for all four years by species.

Table 1. Summary of PFOS means in fish tissue samples, by species, for 2009, 2011, 2012 and 2013.<sup>4</sup>

| Species          | Geometric Mean |      |      |      | Arithmetic Mean |      |      |      |
|------------------|----------------|------|------|------|-----------------|------|------|------|
|                  | 2009           | 2011 | 2012 | 2013 | 2009            | 2011 | 2012 | 2013 |
| Bluegill Sunfish | 51.2           | 20.4 | 26.9 | 17.8 | 110.1           | 35.8 | 46.2 | 25.1 |
| Common Carp      | 30.7           | NS   | 12.3 | 10.8 | 77.4            | NS   | 127  | 18.4 |
| Freshwater Drum  | 70.2           | 28.1 | 30.6 | 16.9 | 229             | 46.4 | 109  | 32.4 |
| Smallmouth Bass  | 50.4           | 28.8 | 28.3 | NS   | 93.8            | 39.4 | 35.1 | NS   |
| White Bass       | 83.2           | 58.1 | 44.2 | 41.3 | 97.3            | 64.1 | 47.5 | 45.1 |

NS – not sampled

Figure 1. Geometric mean fish tissue concentrations of PFOS, by species, for 2009, 2011, 2012 and 2013.



<sup>4</sup> Extensive and comprehensive fish studies were conducted for Pool 2 in 2009 by MPCA, in 2011 by 3M, in 2012 by MPCA, and in 2013 by 3M. A total of 297, 396, 296, and 361 fish from target species were analyzed in the 2009, 2011, 2012, and 2013 studies, respectively.

The robust nature of the four studies supports important and relevant conclusions. *First*, all central tendencies (as measured by geometric means) are clearly well below the MDH one-meal-per-month advisory level of 200 ng/g for PFOS. The geometric mean is preferred by MPCA over the arithmetic mean in such situations because the data are not normally distributed.<sup>5</sup>

*Second*, even using the higher arithmetic mean results, which are strongly biased by a few elevated samples, no fish species exceeded the 200 ng/g one-meal-per-month threshold in 2011, 2012, or 2013. In 2009, the only species whose arithmetic mean marginally exceeded the 200 ng/g threshold was freshwater drum. The data demonstrate that measured PFOS levels in the freshwater drum have declined since 2009, leaving no rational basis for listing the pool as impaired.

*Third*, the 2011, 2012, and 2013 studies clearly demonstrate lower average concentrations than the 2009 study. In addition, good agreement exists between the data from the 2011, 2012, and 2013 studies. Thus, the overall data consistently show that average fish tissue levels are below the threshold of impairment.

*Fourth*, MPCA's adherence to MDH's fish consumption advice for impairment listings is well-established.<sup>6</sup> That was evident when Pool 2 of the Mississippi River was listed as impaired for PFOS on the 2010 Draft Impaired Waters List. Specifically, MPCA asserted that Minnesota Rule 7050.0150 Subpart 7 was "clear and unambiguous" in demanding that "the [MPCA] commissioner will use the residue levels in fish muscle tissue established by the Minnesota Department of Health...[and] [a] water body will be considered impaired when the recommended consumption frequency is less than one-meal-per-week, such as one-meal-per-month."

Given MDH's decision in June 2012 to remove the one-meal-per-month fish consumption advisory for freshwater drum, there is no rational basis for MPCA to continue to list Pool 2, or any part thereof, as "impaired" for PFOS in fish tissue.<sup>7</sup> In fact, Subpart 7 continues with "[t]hat is, a water body will not be considered impaired if the recommended

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<sup>5</sup> Geometric means (or medians) appropriately reflect the central tendencies of the data reported in the 2009, 2011, 2012, and 2013 studies because the fish tissue data more closely approximates "log-normally" distributed data. Medians can be another effective way of summarizing the results and are in close agreement with the geometric means. As is common for many environmental data sets, the results, by species, in each of the recent fish studies are not normally distributed. In such cases, MPCA (in the aforementioned Assessment Methodology) recommends against the arithmetic mean for evaluating water concentrations, as reflected by the statement: "A 30-day arithmetic mean is used, unless the data are not normally distributed, in which case a geometric mean, log mean or median is used." Additionally, MPCA has used geometric means when calculating bioaccumulation factor ("BAF") values. MPCA, Mississippi River Pool 2 Intensive Study of Perfluorochemicals in Fish and Water: 2009 (2010), available at <http://www.pca.state.mn.us/index.php/view-document.html?gid=15527>.

<sup>6</sup> Minnesota Rule 7050.0150 subp. 7.

<sup>7</sup> See Appendix B for MPCA's purported bases for declining to delist Pool 2 as impaired for PFOS in 2012, and 3M's explanation as to why those bases are not valid.

consumption frequency is one meal per week, or any less restrictive recommendation such as two meals per week, for all members of the population.”

## **II. Fish Data Should Be The Sole Basis For The Delisting Decision.**

In keeping with established protocol, where a robust fish dataset is available (as exists in Pool 2), an impairment determination for a bioaccumulative chemical such as PFOS should be based on fish concentrations, not on water concentrations. Inexplicably, for the first time, the State has listed a water body as impaired based on PFOS levels in the water column as a surrogate for fish consumption. The 2014 listing is being proposed despite four extensive and robust fish studies that have been completed in recent years, all of which were accompanied by fewer water samples than fish samples.

The greater relevance of fish tissue data (where available) over water column data is clearly evident. For example, in MPCA's *Implementation Plan for Minnesota's Statewide Mercury Total Maximum Daily Load, October 2009*, it is noted that “[t]he ultimate indicator of the Statewide Mercury TMDL is mercury concentrations in fish in Minnesota lakes and rivers.” As another example, U.S. EPA's *Elements of a State Water Monitoring and Assessment Program, March 2003* generally lists Persistent, Bioaccumulative, and Toxic Pollutants as “Recommended Core Indicators” under the category of “Fish/Shellfish Consumption” while chemicals of concern in the water column are listed as “Supplemental Indicators.”

Measuring fish tissue concentrations allows a direct assessment of whether fish tissue levels exceed the tissue concentration criterion for impairment. In contrast, measuring water column concentrations and comparing these against the water quality criteria (“WQC”) that has been derived to theoretically prevent excess accumulation of PFOS in fish introduces considerable uncertainty. Several factors contribute to this less reliable approach. For example, water concentrations often fluctuate significantly depending on water levels in the river and/or proximity to known or unknown point or non-point discharges. Furthermore, there is considerable uncertainty in the bioaccumulation factor (BAF) that enters in to the WQC derivation.

## **III. Impairment Should Be Evaluated For Pool 2 In Its Entirety.**

By proposing to delist the upper three assessment units within Pool 2 while maintaining the PFOS impairment listing for the fourth (*i.e.*, furthest downstream) unit, MPCA is contradicting its own Assessment Methodology. As stated on page 8 of the Assessment Methodology:

*Typically, the listing of impaired waters is by individual assessment unit. The major exception to this is the listing of rivers for contaminants in fish tissue. Over the time it takes fish, particularly game fish, to grow to “catchable” size and accumulate pollutants to unacceptable levels there is a good chance they have moved considerable distance to the site where they were sampled. The impaired reach is defined by the location of significant barriers to fish movement such as dams upstream and downstream of the sampled reach. Thus, the impaired*

*reaches often include several assessment units, and for lakes, will include all bays on the lake (may be listed under the -00 suffix, representing the entire waterbody). (emphasis added)*

As you know, MDH follows this same approach when developing fish consumption guidance for river systems. Because the fish data supersedes the water data (as discussed in Section I, above), a determination of impairment in Pool 2 should consider the entirety of Pool 2, following the State's own guidance and established practices.

#### **IV. Water Concentrations Are Below The Threshold For Impairment.**

Even if water data were an appropriate substitute for extensive fish data, Pool 2 should still not be listed as impaired when performing the assessment using the water data, the State's Assessment Methodology, and guidance for data applicability. Using data that may be influenced by point sources is not acceptable according to MPCA's own guidance to monitoring groups<sup>8</sup>:

*If a localized source of pollution, such as sediment from a storm sewer inlet or field runoff, is visible at a sampling location it may be tempting to collect the sample in the "plume" to document the problem. It is important to remember, however, when sampling for CWA [Clean Water Act] assessments that the results will be used to characterize the water quality of the stream throughout the reach. Sampling within the problem zone would invalidate the results because it would not be representative of the whole stream. In such a situation, sample outside the localized problem zone, in a well-mixed area that better represents the entire stream reach.*

The highest PFOS concentrations in Pool 2 are consistently measured in a localized area in the immediate vicinity of East Cove, an area that has recently undergone remedial action under the supervision and direction of MPCA. As such, this area is not representative of AUID 07010206-502 and these data should not be included in an evaluation of impairment. From the 2012 MPCA dataset, water column stations 7, 8, 9, 10, and 12 are more representative of AUID 07010206-502; the geometric mean of these stations is 8 ng/L and the arithmetic mean is 10 ng/L. Neither of these values would result in an impairment determination using a standard of 14 ng/L. Similarly, from the 2011 3M study of Pool 2, river miles 502-505, 515, 516, and 518-527 (i.e., all of the sampling locations in AUID 07010206-502 excepting the location immediately adjacent to East Cove) had a June 2011 geometric mean and arithmetic mean of 2.0 and 2.0, respectively, and an August 2011 geometric mean and arithmetic mean of 2.4 and 2.5, respectively. Collectively, these studies result in no readings above the 14 ng/L standard in the past three years and accordingly should not trigger an impairment determination, as per MPCA's own Assessment Methodology.

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<sup>8</sup> MPCA, Volunteer Surface Water Monitoring Guide, Appendix D (2003), available at <http://www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/volunteer-water-monitoring/volunteer-surface-water-monitoring-guide.html>.

**V. Conclusion**

MPCA has an affirmative duty to take into consideration the best available science and data in compiling its impaired waters list. An impaired water body should be removed from the list if new and reliable data indicate that the water body is meeting water quality standards.

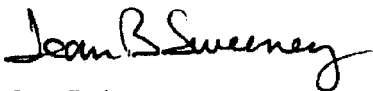
Since June 2012, MDH has repeatedly assured the public that new and reliable data demonstrate that none of the fish species in Pool 2 are subject to a PFOS advisory more restrictive than one-meal-per-week. Simply put, MDH's revised fish consumption advice, as referenced by state rule, removes any rational basis for continuing to list Pool 2 as impaired for PFOS in fish tissue. This current consumption advice and subsequent sampling data from 2012 should eliminate any ambiguity about MPCA's basis for a PFOS impairment listing. In fact, the regulation cited by MPCA in 2010, to defend its PFOS impairment listing requires that "a water body will not be considered impaired if the recommended [fish]consumption frequency is one-meal-per-week, or any less restrictive recommendation."

MPCA, however, now appears to be ignoring its own guidance and previous rationale in not delisting the lower segment of Pool 2. The basis for the lack of delisting is not explicitly stated nor justified based on the MDH fish consumption guidance, fish PFOS concentrations, or water PFOS concentrations. Thus, in our view, MPCA's decision not to delist the entirety of Pool 2 of the Mississippi River from the 2014 Impaired Waters List is arbitrary and capricious.

3M requests that MPCA revise its 2014 Impaired Waters List in accordance with MDH's fish consumption advisory and its own procedural and regulatory requirements. Doing so will provide the public with an accurate assessment of the health of Pool 2.

If you have any questions or require additional information, please do not hesitate to contact me at (651) 737-3569.

Sincerely,



Jean B. Sweeney  
Vice President, 3M Environment, Health, Safety and Sustainability Operations  
Building 224-5W-03

cc: Michelle Beeman, MPCA Deputy Commissioner  
Rebecca Flood, MPCA Assistant Commissioner  
Shannon Lotthammer, MPCA Director Environmental Analysis and Outcomes Division  
Miranda Nichols, MPCA Draft Impaired Waters List Coordinator  
Dan Abelson, Metropolitan Council  
Gary Hohenstein, 3M