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June 14, 2016

Dr. Thomas Armitage, Designated Federal Officer
EPA Science Advisory Board Staff Office
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW.
Washington, DC 20460

Submitted via email at armitage.thomas@epa.gov

Re: Written Statement for the Public Meeting of the Science Advisory Board; Lake Erie Phosphorus Objectives Review Panel

Dear Dr. Armitage and Science Advisory Board Members:

Thank you for the opportunity to provide a written statement to the Science Advisory Board Lake Erie Phosphorus Objectives Review Panel. Michigan Farm Bureau is our state's largest general farm organization, representing more than 45,000 farming families across Michigan. Our members have a strong commitment to responsible environmental stewardship while maintaining thriving agricultural operations, taking part in the vital task of providing food, fiber and fuel for 7 billion people around the world.

We appreciate being part of this process for reviewing and recommending actions to reduce harmful and nuisance algal blooms and hypoxia in Lake Erie. Attached are our previous comments from the Panel's 2014 meeting, which we would like to incorporate into our statement for this meeting. Addressing those concerns remain a priority for our organization as we work toward the common goal of algal bloom and hypoxia reduction in the Lake, including incorporation of additional sources and factors such as changing seasonal climate patterns, background/legacy soil conditions in both fields and riparian areas, influence of invasive species and changing water chemistry that influence the Lake's water quality and condition.

Reviewing the Annex 4 Ensemble Modeling Report draft of May 2016, it is significant that in section 2.5, Total phosphorus loadings to Lake Erie, water quality monitoring shows differences in dissolved reactive phosphorus (DRP) as a percentage of total phosphorus (TP) depending on the year tested. Section 3.2, Western Basin Cyanobacteria Blooms, further discusses the different forms of phosphorus entering the Lake. DRP is much more bioavailable than TP, so percentage differences in the amount of each entering the Lake can mean the difference between a 40% TP reduction goal being successful in reducing harmful algal blooms or failing.

Further, the on-farm practices used to control loss of phosphorus may differ – or require a different suite of practices depending on which form of phosphorus is being lost and needs to be controlled. Farmers need to know that the practices they implement, which often come at significant expense, time, and investment in equipment and/or farm work, are as effective as they can be to address the real problem. Both the 2011 and 2016 Conservation Effects Assessment Project (CEAP) reports by the Natural Resources Conservation Service demonstrated that per-acre averages of phosphorus loss across the Western Lake Erie Basin were low, so even small changes in recommendations for practices can make a key difference in the results seen in the Lake.

A series of models, no matter how well configured together in the ensemble process, is only as good as the data that goes into it. We appreciate the inclusion of the Appendices to the Modeling Report that detail the models used in this process, their calibration methods, and uncertainty/sensitivity information. For such modeling to be useful to farmers however, we need to understand that results being seen in monitoring and modeling reflect real-world conditions and practices farmers use. These practices and their distribution are changing rapidly, particularly as additional practice cost-share funding, technical assistance, and new technology enters the Basin.

For instance, Heidelberg University's monitoring of the River Raisin in Michigan has shown a sharp drop – by 36% – in mean flow-weighted phosphorus loading into that river from 2008 to 2014. The Michigan Department of Environmental Quality referred to this monitoring in its Implementation Plan Lake Erie Western Basin Collaborative, and credited the bulk of the reduction to nonpoint source practices implemented in that watershed, primarily by farms. The CEAP reports are useful due to their widespread assessment, but we urge the Panel and any state or federal agencies using the Ensemble Modeling process to incorporate additional sources of data as well. Not all farmers access one program or use one method to achieve their conservation goals.

In Michigan, the Department of Agriculture and Rural Development is preparing to launch a database that will track conservation practices used by farmers working toward verification under the Michigan Agriculture Environmental Assurance Program (MAEAP). We discussed this program in our previous comments and have been continuing to promote its use among farmers: now more than 10,000 farms have begun the process of working with MAEAP, and the program has achieved more than 3,300 verifications. In Ohio's Maumee River Basin, the Ohio Farm Bureau has launched three demonstration farms to track the real world effectiveness of nutrient reduction practices, which can inform both farmers about best practices to implement, as well as researchers seeking to reduce uncertainty about the impacts of on-farm changes.

Farmers in Michigan are dedicated to promoting environmental stewardship. Michigan Farm Bureau's grass roots member-developed policy supports education about phosphorus, all farmers participating in MAEAP and using the state's Generally Accepted Agriculture and Management Practices to protect water quality, involvement and leadership in local watershed action and plan development, and in timely enforcement of environmental regulations. We

supported and participated in the development of Michigan's statewide Water Strategy, the first part of which was released in June identifying the importance of a 40% phosphorus reduction from 2008 levels into the Western Lake Erie Basin. We are eager to work with researchers, universities, industry, and state and federal agencies to promote and expand the responsible, proactive actions farmers in our state have already started, in order to do our part toward achieving water quality goals. Our members are interested in taking these actions to not only support good water quality, but also to avoid burdensome and costly regulation of their practices, which would be a much less effective or efficient way to achieve a cleaner Lake Erie.

Thank you for your time and attention.

Attachment

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December 12, 2014

Environmental Protection Agency, Region 5
Attn: Mr. Thomas Carpenter
Submitted via email to carpenter.thomas@epa.gov

Re: Public Meeting on the Science Advisory Board Lake Erie Phosphorus Objectives Review Panel

Dear Environmental Protection Agency Staff at Region 5 and the Members of the Science Advisory Board Review Panel,

On behalf of Michigan Farm Bureau (MFB), thank you for the opportunity to speak to you and to staff of the Environmental Protection Agency (EPA) about our concerns regarding the Agency's proposed Lake Erie Phosphorus Objectives, and about Michigan's agricultural programs to protect water quality. I was pleased to attend the meeting and hear many of the same issues being discussed which we felt were important to note about EPA's Objectives and proposals for ensemble modeling of water quality in Lake Erie.

MFB agrees with concerns raised by many members of the panel regarding the Objectives. While the Objectives are not in and of themselves policy directing state and federal action, they are the bases for developing those policies and should provide the best possible information for state and federal agencies when directing actions of the regulated community. Therefore we strongly encourage the Agency to consider the following when finalizing its Objectives:

- Minimize the extent of hypoxic zones in the Waters of the Great Lakes associated with excessive phosphorus loading, with particular emphasis on Lake Erie;
    - Acknowledgment needs to be made that hypoxic conditions are highly variable and in many years depend on weather conditions as much if not more so than nutrient loading; additionally, hypoxic conditions may occur due to internal lake cycling events.
- Maintain the levels of algal biomass below the level constituting a nuisance condition;
    - Many studies have noted the presence in high concentration of nuisance algae such as *Cladophora sp.* in waters with much lower nutrient concentration; additionally, changes to Lake Erie such as the presence of Dreissenid mussel species that increase lake clarity and provide opportunities for algae growth may reduce effectiveness of nutrient loading controls.
- Maintain algal species consistent with healthy aquatic ecosystems in the nearshore Waters of the Great Lakes;
- Maintain cyanobacteria biomass at levels that do not produce concentrations of toxins that pose a threat to human or ecosystem health in the Waters of the Great Lakes;
    - For both of these Objectives, acknowledgment needs to be made that complex ecological and cycling functions frequently drive the concentrations of different species of algae in the Lake; therefore, controls on nutrient loading may not have expected impact on algal populations.

- Maintain an oligotrophic state, relative algal biomass, and algal species consistent with healthy aquatic ecosystems, in the open waters of Lakes Superior, Michigan, Huron and Ontario; and
- Maintain mesotrophic conditions in the open waters of the western and central basins of Lake Erie, and oligotrophic conditions in the eastern basin of Lake Erie.
    - For both of the above Objectives, acknowledgment needs to be made that changing climatic conditions such as precipitation patterns and seasonal temperatures heavily influence algal biomass, species composition, and trophic status of fresh water systems, and therefore, specific nutrient loading targets may not achieve expected impacts.

When considering EPA's ensemble modeling approach and selection of the models proposed to be used in this process, we again have many of the same concerns expressed by panel members that these models may be inadequate to demonstrate the true Lake activity causing increasing algal bloom severity. Agriculture runoff is a popular scapegoat for algae and cyanobacteria blooms in popular media, but these blooms are occurring despite a decreasing use of phosphorus fertilizer over the last 30 years in the watershed, according to the Ohio Lake Erie Phosphorus Task Force.

Invasive species such as Dreissenid mussels have changed water quality and clarity. Increasing populations place increasing demands on water systems. EPA and Heidelberg University have noted that total phosphorus in the Lake has remained roughly the same since its initial reduction following passage of the Clean Water Act, but the ratio of dissolved reactive phosphorus to total phosphorus is increasing, making the nutrient more bioavailable to algae.

Research discussed at this meeting identified a number of anomalous occurrences in Lake Erie, such as the failure of models to predict bloom severity when analyzed against phosphorus loading. This suggests that either the algae present may be selecting for more efficient use of available phosphorus, or that more complex interactions of other nutrients or minerals may play a role in algal bloom severity. Food web interactions have changed lake-wide, changing predation upon the algae and therefore their population and composition dynamics.

Legacy phosphorus in the tributary and lake sediments have an unknown effect on phosphorus availability, as do inputs such as combined sewer overflow contributions from wastewater treatment plants, failing septic systems, and open water disposal of dredged material, particularly from Maumee Bay. When taken together, all of these influences—particularly those related to biological and internal Lake cycling effects—may not be able to be adequately captured by the existing models selected for the ensemble approach, and we concur with the suggestion made by several panel members that biologically-related models be added to the system to account for these effects.

As I noted in my oral statement, Michigan farmers have a long history of caring for the fresh water around them and have not waited for a crisis in the Great Lakes to act. They understand the importance of farming in the heart of the Great Lakes, which hold 20% of the world's fresh surface water. Conservation practices to help keep soil, nutrients, and pest control measures on farm fields are vital to that concern. Working proactively with partners such as agriculture and environmental agencies, farming and agribusiness suppliers, Conservation Districts, and Michigan Farm Bureau, farmers can implement the practices that will continue to improve both agricultural production and protection of Michigan's fresh water resources.

One of the primary ways farmers in Michigan voluntarily maximize their conservation efforts is through the Michigan Agriculture Environmental Assurance Program, or MAEAP. Started in 2002 by farmers who

wanted to improve their farm management for protecting watersheds, the program developed a holistic approach to environmental protection that helps farmers evaluate their entire farm and make sustainable management decisions balancing the environment and economics. The Michigan Department of Agriculture and Rural Development (MDARD) established third-party verification of those farm practices.

As the program developed, it attracted over 50 partners including universities, the Environmental Protection Agency, farm and commodity organizations, the Natural Resources Conservation Service (NRCS), and others. Then in 2011 the program was signed into law by Governor Rick Snyder, which provided farmers with additional incentives for following environmental standards. This allowed the practices to not only receive additional support, but also to give farmers and the public the peace of mind that their practices follow approved science.

Now over 2,500 verifications on Michigan farms provide producers with the tools necessary to actively protect Michigan waters, using practices such as filter and buffer strips, conservation wetlands, restricting livestock access to streams, nutrient management plans, conservation tillage, drain management, responsible manure and fertilizer storage and use, and many others. Because of voluntary action through the MAEAP program, MDARD reports that Michigan farmers have:

- Implemented responsible manure application and other conservation practices on almost 700,000 acres of Michigan farmland.
- Kept over 1 million tons of farming soil where it belongs: in farm fields. EACH YEAR, that's almost 32,000 10-yard dump trucks of soil not reaching streams and lakes.
- Reduced phosphorus delivery to lakes and streams through sedimentation by 1.7 million pounds in the last 3 years. That's almost 600,000 pounds PER YEAR through MAEAP, enough to grow almost 150,000 TONS of algae in lakes and streams.
- Implemented approved pesticide management on over 600,000 acres in the last 3 years.
- Installed over 14,000 acres of filter strips, stabilized 2,800 gullies in the last 3 years.
- Reduced enough phosphorus and nitrogen in the last three years to grow algae over 83% of Houghton Lake. (Information from MDARD annual environmental impact statements, with 2014 information added which will be publicly available soon.)

These statistics represent just the farmers who have completed the rigorous verification process. Each year over 1,500 farmers are working with MAEAP technicians on risk assessments for their farms, and over 6,000 are attending education sessions to begin the process of MAEAP and learn about environmental stewardship. In addition, NRCS technical and financial assistance through Farm Bill programs help farmers voluntarily implement conservation practices on hundreds of thousands of acres of farmland. Clean Water Act Section 319 grants for Best Management Practices and Great Lakes Restoration Initiative programs also help farmers implement hundreds of conservation practices each year, all voluntarily, and all using funds and time from the farmers' own pockets in addition to the money and time spent by the programs' sponsoring agencies.

Overall, research shows that the recent blooms of algae and cyanobacteria in western Lake Erie such as the one that shut down Toledo's water system have increasingly complex causes. Simple solutions cannot solve these concerns. This is the advantage of MAEAP when it comes to agriculture's part of the solution: it is a living system, annually updated with new science and findings about what works in environmental stewardship. Best of all, because it was started by farmers and supported by so many

partners, it has the ability to really help farmers adapt to increasing complexity and the need for new practices to solve new problems.

Michigan Farm Bureau, representing over 46,500 farming families across Michigan, is proud to support the MAEAP program. Our members believe in proactive, responsible action to protect water quality, and will continue to help farmers of all sizes and types become MAEAP verified. We understand that when conservation is done for the right reasons—because farmers see its value to protect fresh water and farms—the practices will be continued and farmers will continue to be leaders in environmental stewardship across our state.

We look forward to working with EPA and other state and federal agency to develop Objectives reflecting conditions in Lake Erie and actions that can be taken to protect water quality throughout its watershed. We appreciate the Agency's attention to concerns and suggestions brought forward by members of the Science Advisory Board panel as well as by MFB, and hope to reach a workable solution that will both protect the Lake Erie watershed and also protect the livelihoods of farmers throughout the Great Lakes region.

Thank you for your time and consideration.