Comments from:

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Commenting on:

Maumee Watershed Nutrient
Draft Total Maximum Daily Load Report, December 2022
Ohio EPA Technical Report AMS/2020-MWN-5

Thank you for the opportunity to comment on this report. The abbreviations I use in these comments should be very familiar to anyone familiar with this issue.

Ohio and Federal law require the following to be included in the draft TMDL report:

• An estimate of the total amount of each pollutant that causes water quality impairment from all sources. • Description of the applicable state water quality standard. • Numeric water quality target. • The loading capacity of a waterbody for the applicable pollutant. • Load allocations – the amount of pollutant allowed from nonpoint sources. • Wasteload allocations – the amount of pollutant allowed from point sources. • Margin of safety – the amount of pollutant load reserved due to various uncertainties. • Seasonal variations. • Reasonable assurances – assurance that nonpoint source control measures will achieve expected load reductions.

DRP and TP

My first comments will focus on the TMDL's insistence on setting a target only for total phosphorus (TP) and its refusal to set a target for dissolved reactive phosphorus (DRP). With that as your plan, this TMDL is doomed to failure, and we should not even waste the money to do it.

I submitted the Objectives and Targets Task Team Report in May 2015. We were charged with developing nutrient reduction targets to address HABs in the Western Basin of Lake Erie, hypoxia in the Central Basin, and nuisance algal blooms in the nearshore waters of the Eastern Basin. We determined that we did not have enough information to address the Eastern Basin problem. My comments here will focus on the Western Basin HAB problem.

To address Western Basin HABs the Task Team report called for a 40% spring (1 March to 31 July) reduction in **both** DRP and Total P loads compared to our base year of 2008. The goal of this target was to produce HABs that looked like 2004 or 2012, or smaller, 9 years out of 10. We recommended that progress be measured by monitoring the FWMC of both DRP and TP. The target FWMC for DRP was 0.05 mg/l and for TP it was 0.23 mg/l. The US and Canadian Governments officially agreed to our report and our targets in February 2016. It is also important to note that with the exception of 2019, which I will discuss later, we have seen zero progress in reducing the FWMC of DRP and TP, and the six worst HABs has all occurred since 2011.

As the Task Team developed our recommendations, we spent a great deal of time discussing DRP and TP targets. Research and data clearly showed that HABs were driven primarily by DRP, and it was DRP that had gone up since the mid-1990s while TP had gone down slightly. Furthermore, for all of Lake Erie, we were still hitting our 1970s TP target of 11,000 metric tons. However, the load of DRP within that TP target load was up somewhere between 130 and 150%. Fortunately, Heidelberg University had been monitoring TP and DRP loading and was able to catch this change. Our efforts to only monitor and control TP loading had allowed DRP to surge and cause the crisis. We had also learned that DRP was 100% bioavailable (usable by plants and algae) and TP was only about 26% bioavailable. Farmers had also learned this and, as a result, phosphorus in commercial fertilizer had become much more soluble.

Most people on our Task Team felt that we could address the HAB problem by reducing only DRP, but one of the models we were using indicated that reductions in TP were also needed, and, because the Central Basin hypoxia target was focused on TP, we included a TP target for Western Basin HABs. We knew there was absolutely no way a TP target alone would solve the problem.

One of the models we were using was developed by Dr. Richard Stumpf, and others, from NOAA. Dr. Stumpf was using that model to forecast HAB severity in the Western Basin each year. In recent years, Dr. Stumpf has modified that model and is now doing annual forecasts of Western Basin HAB severity based on bioavailable phosphorus (BP), where BP = 100% of DRP and 8% of particulate phosphorus (PP). In so doing, he has shown that DRP is even more important that we originally thought.

The concern in the TMDL draft report about DRP adsorbing onto sediment particles warrants additional research, but it should not prevent using our DRP targets for the current draft TMDL. The amount of DRP that enters Lake Erie from the Maumee is what drives the Western Basin HAB, and 2019 demonstrated that reducing fertilizer and manure applications would reduce the FWMC of DRP significantly and immediately.

The Draft TMDL report states:

> "These allocations reflect an overall load reduction of approximately 40 percent from the 2008 baseline total phosphorus load. An additional 3 percent of the load is reserved for a margin of safety."

Based on what I have stated above, if you were going to have a TMDL based only on TP, then I would suggest, as a margin of safety, increasing your target reduction from 40% to 80%. Anything less than that is certainly no "margin of safety."

What does 2019 tell us?

The Draft TMDL report states:

> "The 2019 DRP exported load is highlighted in the Guo et al., 2021 study as it fell well below expectations given the amount of streamflow discharge that year (note the bright red dot on Figure A8.3 in panel a). This load reduction, 29 percent lower than predicted by flow alone, has been explained due to a 62 percent reduction in applied phosphorous fertilizer that year (the study considered both inorganic and manure sources of fertilizer). The reduction of application occurred in 2019 because the excessively wet conditions resulted in a great many row crop fields left unplanted and thus unfertilized. The fact that such a quick, observable response to exported DRP loads due to an extensive land management change is considered a positive outcome as it shows more careful fertilization rate, timing and placement of phosphorus can quickly reduce loads. Additionally, since DRP export reduction was less than half of the reduction of applied phosphorus, it shows that legacy and/or edge-of-field/instream source-sinks processes play an important role in export. However, it remains uncertain exactly how to quantify the partition of DRP load between recently applied sources and legacy sources in a more typical year."

What I expect from this TMDL is a plan that will hit our Task Team targets. 2019 shows us that reducing the application of fertilizer and manure will produce significant and immediate results—so put together a plan that immediately reduces those applications. Nothing else that has been tried since we produced our first Ohio Phosphorus Task Force recommendations in March 2013 has produced any change in FWMC. Reducing these applications will also slow down the production of new legacy fields that occurs every time more animals are allowed into the watershed and P applications multiple times above Tri-State guidelines are allowed. The fact that we don't know the exact partitioning of DRP between recently added sources and legacy sources can be determined later. The 62% reduction in application amounts in 2019 did not produce a FWMC reduction that was greater than what is needed.

Identification of Phosphorus Sources

I was hoping to see a report that would work harder to identify phosphorus sources from agriculture, e.g., legacy fields, fields with unusually high application rates, etc. You are making no attempt to do that. It appears that you are lumping all agricultural fields in the watershed together. In so doing you are shielding the bad actors and not recognizing the many good actors that are out there. At a minimum you should be placing great emphasis on the sub-watersheds where the loads are greatest. Former Governor Kasich's failed executive order focusing greater emphasis on the tributaries on the south side of the Maumee by designating them as "watersheds in distress" should be resurrected. The excellent science in that plan showed that no sub-watershed was hitting our Task Team targets, but the sub-watersheds on the south side of the Maumee had FWMC of DRP that were each 2-3 times the target concentrations. Those watersheds should get greater attention.

Application of Manure

The draft TMDL provides no focus on the current guidelines that allow manure application when no fertilizer is needed.

The Draft TMDL report states:

> "While CAFOs are defined as point sources, unless they are designed to discharge non-agricultural stormwater, they are not compelled to seek NPDES permit coverage. No CAFOs in the Ohio portion of the Maumee watershed discharge wastes that require NPDES permit coverage. No CAFOs in the Maumee watershed have NPDES permits allowing discharges of treated wastewater. Therefore, the TMDL provides no CAFO point source allocations. Because TMDLs do not institute policy change, existing requirements regarding the management of CAFOs continue."

Anyone who knows northwest Ohio and northeast Indiana knows that the heavy clay soils in the Maumee watershed crack a lot, and some of those cracks and worm tunnels provide direct connections from the surface to drain tiles that result in manure flowing directly into the tiles and out to the tributaries when it is applied. This also occurs where tile risers or Hickenbottoms are placed in low spots (farmed wetlands) in fields. How do these fields avoid requirements for NPDES permits?

Is a 40% DRP and TP Reduction Enough?

The following quote is from page 4 of the Task Team report.

> "The monitoring program needed for the adaptive management approach must be capable of detecting critically important changes in precipitation patterns and phosphorus loads. If the frequency of severe storms increases in the future as predicted by climate change models, phosphorus loading to the lake will increase and the

> frequency and severity of cyanobacterial blooms will also increase, requiring larger phosphorus load reductions than those recommended in this report. The recommended adaptive management approach would detect these occurrences and allow for modification of target loads."

The climate models have been proven to be accurate. One of the reasons 2008 was selected as the base year for our Task Team calculations was that the amount of precipitation/discharge for the Maumee River that year had only been exceeded about 10% of the time during the past 20 years. Climate models indicated that would happen more frequently in the future. Figure A8.1 indicates that the 2008 discharge was exceeded 6 times between 2011 and 2021. Therefore, the Task Team's 40% phosphorus reduction target is too low to produce HABs like those of 2004 and 2012, or smaller, 9 years out of 10.

Suggestions to Strengthen the Report

The Task Team laid out specific targets for FWMC of DRP and TP. Monitoring to track progress at reducing FWMC and meeting the targets should be your primary focus.

Figures like that presented on pages XX and 121 are deceiving and disingenuous. The figure presents only positive impacts of changes in the watershed. You must also present the impacts of negative changes in the watershed to offset the positive impacts. One of the most important annual negative changes to the watershed is the addition of more animals and more manure. As long as guidelines allow animal operations to apply several times the amount of manure (phosphorus) needed for maximum crop production, we will continue to create and build legacy fields and create fields that bleed DRP at concentrations that greatly exceed the Task Team target. In your planning you must account for these continued negative impacts. Measuring only the positive changes is clearly unacceptable.