STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
LANSING

GRETCHEN WHITMER
GOVERNOR

LIESL EICHLER CLARK
DIRECTOR

VIA E-MAIL

TO: Senate Appropriations Subcommittee on Natural Resources and Environment, Great Lakes, and Energy Members
House Appropriations Subcommittee on Environment, Great Lakes, and Energy Members
Kathryn Summers, Director, Senate Fiscal Agency
Mary Ann Cleary, Director, House Fiscal Agency

FROM: Amy Epkey, Senior Deputy Director

DATE: March 23, 2022

SUBJECT: Report on the Status of the Implementation Plan for the Western Lake Erie Basin Collaborative Agreement for Fiscal Year 2020

In accordance with Section 410 of Article 4, Part 2, of 2020 PA 166, attached is the Department of Environment, Great Lakes, and Energy's (EGLE) report on the Status of the Implementation Plan for the Western Lake Erie Basin Collaborative Agreement for fiscal year 2020.

If you need further information, please contact Phil Argiroff, Assistant Director, Water Resources Division, at 517-290-3039 or ArgiroffP@Michigan.gov; or you may contact me at 517-242-7407.

Attachment
cc/att: Chris Harkins, Director, State Budget Office
George W. Cook, III, Legislative Affairs Director, Governor's Office
Marc Rehmann, Policy Director, Governor's Office
Ben Dawson, Senate Fiscal Agency
Austin Scott, House Fiscal Agency
Jacques McNeely, State Budget Office
Zach Hendrix, State Budget Office
Liesl Eichler Clark, Director, EGLE
Aaron B. Keatley, Chief Deputy Director, EGLE
James Clift, Deputy Director, EGLE
Travis Boeskool, Legislative Liaison, EGLE
Paul McDonald, EGLE
Dale Shaw, EGLE
Teresa Seidel, EGLE
Phil Argiroff, EGLE
Mike Alexander, EGLE
Lois Marinangeli, EGLE

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Legislative Report

STATUS OF THE IMPLEMENTATION PLAN FOR THE WESTERN LAKE ERIE BASIN COLLABORATIVE AGREEMENT

Report Period:
Fiscal Year 2020

Authority:
Section 410 of Article 4, Part 2, of 2020 PA 166

Western Lake Erie Basin Collaborative Agreement Update

Lake Erie has nuisance and harmful algal blooms (HAB) in the western basin and dissolved oxygen depletion in the central basin. In June 2015 Governor Rick Snyder signed the Western Basin of Lake Erie Collaborative Agreement (Agreement) with the Premier of Ontario and the Lieutenant Governor of Ohio. The Agreement with Ohio and Ontario calls for a 40 percent reduction in phosphorus loading to the Western Lake Erie Basin (WLEB) by 2025. Each party was to develop an implementation plan to accomplish this. Michigan published its final implementation plan in January 2016 after considering public comments. The Michigan Departments of Environment, Great Lakes, and Energy (EGLE); Agriculture and Rural Development (MDARD); and Natural Resources (MDNR) (collectively, the Quality of Life [QOL] agencies) are working together, building on Collaborative Agreement Implementation Plans, in part, to develop and implement the Domestic Action Plan (DAP), which was called for under Annex 4 of the Great Lakes Water Quality Agreement. The DAP was finalized and submitted to the United States Environmental Protection Agency (USEPA) in February 2018.

In accordance with Executive Directive 2019-14 and within the framework of the DAP, EGLE, MDARD, and MDNR developed an Adaptive Management Plan (AMP) that was approved and released on December 17, 2021. The AMP serves as a companion document to the DAP and identifies additional steps needed to ensure that Michigan meets its specific DAP objectives. The AMP outlines a process that will allow managers to determine systematically whether activities are succeeding or failing by integrating structured decision-making into planning and implementation efforts and include enhanced monitoring and assessment initiatives into a deliberative adaptive management process and decision-making feedback loop over time.

Section 410 of Article 4, Part 2, of 2020 PA 166, requires EGLE to compile a report on the status of the implementation plan for the WLEB Agreement. To learn more about the presence and timing of HABs, the report shall contain all the following:

a) An estimated cost of removal of total phosphorus (TP) per pound at four major wastewater treatment plants (WWTP).

   The Great Lakes Water Authority (GLWA) Water Resources Recovery Facility (WRRF) (formerly the Detroit WWTP) estimates an annual expense of approximately $1 million to reduce TP loads by 400 metric tons. This is equivalent to about $1.13/pound. The TP reductions are continuing, and the GLWA WRRF typically discharges from its main outfall in the 0.2-0.4 milligram per liter (mg/l) TP concentration range (the new limit is 0.6 mg/l growing season average). The TP reductions at the GLWA WRRF are the primary cause for the TP reductions at the mouth of the Detroit River into the WLEB. EGLE continues to hold bimonthly calls with the GLWA (which now operates the Detroit WWTP) and the Detroit Water and Sewerage Department.

   The cost of TP reductions being made at the Monroe Metro WWTP and Downriver WWTP are not yet available. The National Pollutant Discharge Elimination System (NPDES) permit for the Monroe Metro WWTP was issued in May 2016 with more stringent TP limits (0.6 mg/l growing season average) that are consistent with those for the GLWA WRRF and has achieved those tighter limits in 2020. Similarly, EGLE issued the NPDES permit for the Downriver WWTP in 2017 with the more stringent TP limits to be achieved by 2020 that are consistent with those specified in the GLWA WRRF

NPDES permit (i.e., a growing season average of 0.6 mg/l). The Downriver WWTP is required to achieve those tighter limits as well.

TP removal at the Ypsilanti Community Utilities Authority WWTP was implemented for protection of the lower Rouge River and prior to the Lake Erie TP load baseline year of 2008. As a result, costs of these control measures should not be attributed to the load reductions necessary to meet Lake Erie goals.

b) A description of the grants that have been awarded.

The QOL agencies have secured funding for the installation of United States Geological Survey (USGS) gaging stations in four priority hydrologic unit code (HUC) 12 watersheds to monitor flow, phosphorus concentrations, and ultimately nutrient loading. These gage stations, along with MDARD's Best Management Practices (BMP) database will allow the QOL agencies to track progress and adjust implementation strategies as part of the adaptive management process. Three additional gages were installed by the USGS (funded by the USEPA) to help track progress for the Maumee River tributaries in Michigan.

Gaining additional understanding of HABs in the WLEB is a critical issue of importance, especially since HABs often produce toxin(s). A HAB work group, coordinated by EGLE with input from several state and local agencies, continues to make progress to provide a better understanding of bloom presence and timing. In May 2016 EGLE issued a request for proposals to develop a deeper understanding of how HABs develop and how to prevent them. To assist in the development of technology to combat HABs, $241,887 was awarded in two grants: one to Grand Valley State University and one to Oakland University, Wayne State University, Lake Superior State University, and Northern Kentucky University. The objectives of these projects were to develop methods to rapidly evaluate blooms for the presence of algal toxins as well as to develop models that can be used to assess the potential risk of HABs throughout Michigan.

Grand Valley State University conducted methods development research on two DNA-based methods to rapidly evaluate Microcystis blooms for the presence of genes associated with algal toxin production. Their evaluation of the Imaging Flow Cytometry combined with a molecular tagging technique (Recognition of Individual Genes by Fluorescence In-Situ Hybridization [RING-FISH] method) found several steps omitted from the previous publication and identified potential cross-reactivity issues with the fluorescent probe. Experimentation with quantitative Polymerase Chain Reaction noted issues with the higher variability of toxin genes from field samples compared to the plasmids used for calibration. They did find a significant relationship between mycD gene abundance and concentration of Microcystin. A standardized procedure was developed for the method and they recommended that other laboratories investigate the applicability of the method in other surface waters experiencing HABs.

Oakland University partnered with Wayne State University, Lake Superior State University, and Northern Kentucky University to assess 29 different inland lakes throughout Michigan's Lower Peninsula. The lakes ranged from oligotrophic with no known history of cyanobacteria blooms to hypereutrophic with known cyanobacterial bloom occurrences. For two years, from June to October, monthly grab samples were

collected for nutrients, chemical/physical parameters, cyanobacterial toxins, toxin-producing genes, and cyanobacteria taxa identification. Passive samplers were deployed throughout the recreation season and continuously absorbed toxins. Photographs of observed cyanobacteria blooms were collected and associated with taxa collected to develop a cell phone application for future bloom identification, and a land use analysis was conducted for lake watersheds. This information is being used to create a HAB risk analysis map throughout Michigan. The larger goal for the model is to apply it to all Michigan inland lakes when assessing the risk of HAB occurrence.

EGLE partnered with MDARD and provided $400,000 toward a grant to Michigan State University to study the effectiveness of drain water management practices in reducing nutrient loads, including dissolved reactive phosphorus (DRP), from tiled fields. The study is focused on quantifying reductions of nutrients including DRP and TP from drain water management control structures implemented at farms in the WLEB. The calibration phase of the study ended in 2020 as monitoring was completed at test and control fields with unmanaged drainage. Tile drainage is now being controlled at the test fields and monitoring is being conducted at the test and control fields.

New BMPs to mitigate on-farm losses of nitrogen and phosphorus will be introduced to farms in the River Raisin watershed through a $769,336 grant awarded by EGLE to the Lenawee Conservation District in 2017. BMPs to be implemented include 50 blind inlets, 75 saturated buffers, 66,000 feet of buffer strips, and 1,000 new acres of drain water management. The grantee is providing $347,386 in local match.

The River Raisin Institute received a $286,275 grant from EGLE to address agricultural sources of nutrients from the S.S. Lapointe Drain, a direct discharge to Lake Erie. The grant was awarded in 2019 and will fund implementation of cover crops, filter strips, reduced tillage, drain water management, and nutrient management plans. The grantee has committed to providing $110,855 in local match.

The Legacy Land Conservancy received a $360,233 grant from EGLE in 2019 to protect 4,750 linear feet of critical riparian property along the Upper River Raisin through the purchase of 5 permanent conservation easements. The grantee has committed to providing $119,943 in local match.

The Lenawee Conservation District received a $773,522 grant from EGLE in 2019 to implement agricultural BMPs to reduce nutrient loads from the River Raisin. The grantee has committed to providing $542,641 in local match.

The Southeast Michigan Council of Governments (SEMCOG), in partnership with EGLE, has received $300,000 from the USEPA to implement a regional project to address urban green storm water infrastructure. Local and county governments within SEMCOG's seven-county jurisdiction were eligible to apply to fund projects that address nutrient inputs from runoff to local rivers. Six communities were selected by SEMCOG’s Regional Review Committee, which is comprised of local elected officials, and were awarded funding to complete projects by October 1, 2020.

c) A description of the work that has commenced on the issue of DRP, the expected objectives and outcomes of that work, and a list of the parties involved in that effort.

Developed Partnership Effort to Research DRP: EGLE partnered with the MDARD and provided $400,000 toward a grant to Michigan State University to study the effectiveness of drain water management practices in reducing nutrient loads, including DRP, from tiled fields. The study is focused on quantifying reductions of nutrients including DRP and TP from drain water management control structures implemented at farms in the WLEB. The calibration phase of the study ended in 2020 as monitoring was completed at test and control fields with unmanaged drainage. Tile drainage is now being controlled at the test fields and monitoring is being conducted at the test and control fields.

d) A description of the efforts and outcomes aimed at the TP reduction for the River Raisin watershed.

Little to no progress has been achieved in reducing nonpoint source (NPS) nutrients to the WLEB from the River Raisin since 2008. Initial monitoring results appeared to indicate significant nutrient reduction in the downstream monitoring location of the River Raisin, but recent results have shown an increase in nutrient loading in the last few years. Those initial reductions may have been attributable to conservation practices within the River Raisin that were removed, or they may have been attributable to lower stream flows and, thus, reduced loadings. EGLE is continuing to work with our federal partners, including the USEPA, USGS, and National Oceanic and Atmospheric Administration, to better understand how flow and conservation practices impact nutrient loading from the River Raisin. As our understanding improves, a more definitive statement will be made regarding trends in loading from the River Raisin. Until that understanding is improved, all we can say is that the nutrient loadings from the River Raisin remain unchanged.

It is our opinion that the only way to achieve the NPS nutrient reduction goals for the WLEB will be through targeted BMP implementation. EGLE and MDARD will need to work together to develop the needed watershed planning to identify the highest priority locations for BMP implementation. Once these priorities have been identified, we must work with local stakeholders such as the agricultural community, conservation districts, Michigan Farm Bureau, and environmental groups to get the needed conservation practices in place. The QOL agencies are proposing to develop Agricultural Inventories for a list of high priority subwatersheds within the River Raisin watershed and the Maumee River tributaries.

The NPS Agricultural Inventory Process utilizes a modeling component, a desktop analysis component, and a windshield inventory to collect specific data to locate and prioritize sites that have the potential to impact water quality. This data and prioritization of sites is one part of the watershed management planning process for a given watershed.

The Agricultural Conservation Planning Framework (ACPF), the modeling component of the process, is an ArcGIS compatible toolbox that utilizes high resolution LiDAR (light detection and ranging) data to identity slopes within a given farm field, overland flow paths within a watershed, and candidate locations for specific BMPs such as grassed waterways.

The desktop analysis utilizes aerial photos and includes digitizing the entire HUC 12 watershed, which is necessary to run the ACPF tool and to complete components of the windshield inventory. The final component of the desktop analysis also uses the aerial photos to identify locations within the watershed that have land use activities that are causing visible impact to surface waters.

The final component is the windshield inventory, which includes driving the watershed and utilizing the digitized watershed boundaries to document what land use practices are being used that can be seen from the road. The land use practices documented include the type of crop being grown in fields, whether fall tillage occurs and the type of fall tillage, whether cover crops are planted after harvest, whether manure applications are observed, and the percentage of residue that is left on the field after spring planting. In addition, windshield inventories are used to confirm that BMPs, such as filter strips, that were identified during the desktop analysis are still in place and a visual inspection of livestock operations that were identified as a priority during the desktop analysis.

These inventories will provide a baseline condition and a prioritized list of BMPs that will bring about the best chance for NPS reduction within each priority HUC 12 watershed. The QOL agencies will then use this information to work with local stakeholders as discussed above for implementation. Implementation will be tracked in a database that will allow the QOL agencies to better evaluate progress over the long-term. These Agricultural Inventories will allow the QOL agencies to establish achievable and trackable nutrient reduction goals for the HUC 12 watersheds in which they are developed.

MDARD has worked with the Erb Foundation to provide funding to the Environmental Working Group to develop the ACPF modeling tools in several HUC 12 watersheds in the WLEB and will provide all the geographic information tools needed to develop the ACPF in all of our remaining WLEB HUC 12 watersheds. These tools will allow the QOL agencies to develop the watershed planning needed to be successful. That said, implementation funding will be a significant hurdle to overcome.