
Michigan State University

Phase II NPDES Stormwater Progress Report

Covering the Period

January 1, 2021 to December 31, 2022

Submitted to the

Michigan Department of Environment, Great
Lakes and Energy

April 1, 2023

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General Information and Regional Stormwater Management

This progress report is being submitted by Michigan State University (MSU) in partial fulfillment of the requirements of the Phase II Stormwater National Pollutant Discharge Elimination System (NPDES) Permit No. MI0059342. The permit allows for discharges from a municipal separate storm sewer system (MS4). The Michigan Department of Environment, Great Lakes and Energy (EGLE) requires that a progress report be submitted on the implementation status of the current permit. This progress report covers the period of January 1, 2021 through December 31, 2022.

MSU is working to meet its permit requirements by implementing campus-based stormwater management activities and collaborative activities with other communities within the Greater Lansing urbanized area. The regional and campus-based frameworks for these activities are described below.

Greater Lansing Regional Committee (GLRC)

The Greater Lansing Regional Committee (GLRC) for Stormwater Management is a guiding body comprised of participating permitted Municipal Separate Storm Sewer System (MS4) communities within the Greater Lansing Region. The committee has been established to guide the implementation of the Phase II Program for the communities within three identified urbanized watersheds: the Grand River, the Red Cedar River and the Looking Glass River watersheds.

GLRC Background

In November 1999, nine communities and three counties in the Greater Lansing Area organized to discuss the federal regulations for the Clean Water Act's Stormwater Phase II Program. The result of this organization was an agreement to pool resources on a regional basis to fulfill the requirements of the program. Initially, based on 1990 census population data, these nine communities and three counties were the only entities in the Greater Lansing Area that were designated to participate in the Phase II "Voluntary Permit Program" by the Michigan Department of Environmental Quality, now Department of Environment, Great Lakes and Energy (EGLE). Following several meetings of this group during late 1999 and early 2000, a resolution was drafted to establish the "Greater Lansing Area Regional NPDES Phase II Stormwater Regulations Committee" and representatives from each jurisdiction were named to serve on the committee.

Soon after the organization of the committee in 2000, the Tri-County Regional Planning Commission (TCRPC) began to assist the committee in providing contractual, fiduciary, and administrative support. Tetra Tech was selected to produce a permit strategy study, and later to prepare the Voluntary Grant Permit Applications for each community. Again in 2002, Tetra Tech was retained to prepare watershed management plans (WMPs) for the Grand River and Red Cedar River watershed areas, and would later prepare a WMP for the Looking Glass River watershed area.

Based on the increased population data following the release of the 2000 Census, ten additional communities were designated to meet the stormwater MS4 requirements under Federal and State regulations. Ultimately, seventeen communities and the three counties agreed to participate in a regional approach until 2007, when a lawsuit determined some townships no longer required an MS4 permit. GLRC members then took formal action to establish an Associate Membership category within Memorandum of Agreement (MOA). The MOA with GLRC member communities continues to be

updated and reapproved, most recently in 2022 to align with the current permit cycle. The current MOA was adopted by GLRC members and establishes the GLRC through April 30, 2027. There are also a number of interested parties that are consistently involved with the planning activities associated with this program such as parks departments, conservation districts, utility authorities, and transportation authorities. The participating communities recognize the substantial benefits that can be derived through cooperative management of the watersheds in order to meet the MS4 permit requirements and protect area waterways.

GLRC Members

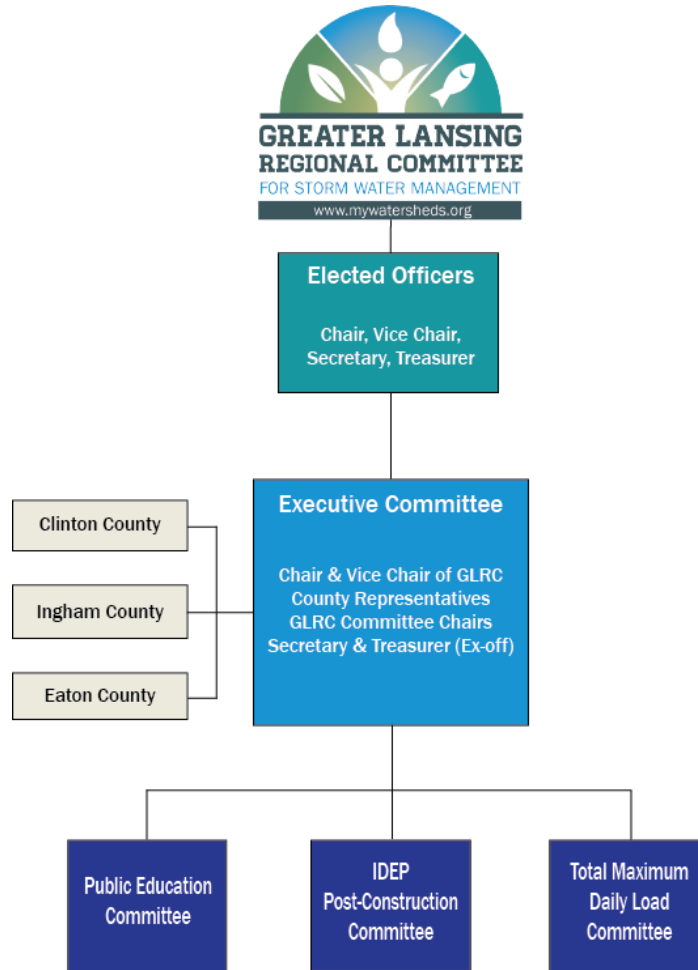
The participating MS4 entities that currently make up the GLRC are as follows:

- City of DeWitt
- City of East Lansing
- City of Grand Ledge
- City of Lansing
- City of Mason
- Delhi Charter Township
- Delta Charter Township
- DeWitt Charter Township
- Lansing Charter Township
- Meridian Charter Township
- Lansing School District
- Waverly Community Schools
- Clinton County
- Clinton County Road Commission
- Eaton County
- Ingham County
- Michigan State University

GLRC Organization

Within the GLRC, a number of committees have been established to guide various components of the MS4 program. Other committees may be established as needed throughout the course of the program. A list of the committees including a brief description of their responsibilities follows.

Current GLRC Organization



Executive Committee

The GLRC Executive Committee is comprised of a maximum of eight voting members consisting of the Chair and Vice Chair of the GLRC, one representative from each of the three counties, and the chairs of the Illicit Discharge Elimination Program (IDEP)/Post-Construction Committee, Public Education Program (PEP) Committee, and Total Maximum Daily Load (TMDL) Committee. The Executive Committee meets five times a year and the Full Committee meets twice a year.

Public Education Program (PEP) Committee

The PEP Committee guides the overall public education, participation, outreach, and involvement process. This also includes evaluation of the program and assessment of public knowledge and activities.

Illicit Discharge Elimination Program (IDEP) / Post-Construction Committee

The IDEP/Post-Construction Committee guides the organization and implementation of the Illicit Discharge Elimination Program, mapping guidelines, field-sampling protocols, and how the watershed will be monitored for progress, as well as advises on matters regarding Post-Construction measures. The Committee has reviewed and provided recommendations related to pet waste reduction techniques, septic tank maintenance issues, staff training, as well as channel protection and TSS removal practices.

Total Maximum Daily Load (TMDL) Committee

Makes recommendations regarding the Grand River and Red Cedar River E. coli Total Maximum Daily Load (TMDL) requirement. The committee provides education and updates to GLRC members to assist in the development and implementation of TMDL programs.

Watershed Partnerships and Related Efforts

Middle Grand River Organization of Watersheds (MGROW)

MGROW is an outgrowth of the Grand River Expedition 2010, founded in 2011 and established as a 501c3 in February 2012. MGROW is striving to bring together local communities, watershed groups and other stakeholders in the Middle Grand River Watershed to build a greater understanding of and stewardship for our water resources. MGROW's mission: *To protect and preserve the history and the natural resources of the Middle Grand River Watershed by promoting education, conservation, restoration, and wise use of watershed resources.* While the Upper Grand River Watershed Alliance (Jackson area) and the Lower Grand River Organization of Watersheds (or LGROW, in the Grand Rapids area) assist local watersheds in their respective regions, serving as umbrella organizations to network and share ideas with local watersheds, the Middle Grand River Watershed has been without such support until the formation of MGROW. Local watersheds and program administrators in the MGROW area include: Friends of the Looking Glass River; Friends of the Maple River; Friends of the Red Cedar; GLRC; local conservation districts; Michigan State University Institute of Water Research (MSU-IWR); TCRPC and Mid-Michigan Environmental Action Council (Mid-MEAC). These groups have been operating independently from one another but have been exploring avenues for collaboration.

The GLRC Coordinator continues to work with MGROW to identify collaborative opportunities related to education, recreation and conservation and the GLRC Coordinator serves on the board of MGROW. Visit <http://www.mgrow.org/> for more information on this valuable partner.

Water Trail Planning/Grand River Partnership

The GLRC Coordinator assisted MGROW with the development of the DNR-designated Middle Grand River Water Trail and associated materials, with the goal of inspiring new watershed stewards through recreation. The GLRC Coordinator serves on the Water Trail Committee and has been working to establish a Regional Middle Grand River Water Trail Development Plan Advisory Group. The Advisory Group will bring all stakeholders together to further the Plan and ensure proper safety, education, marketing, and maintenance of the Middle Grand River Water Trail. The GLRC Coordinator also participates in the Grand River Partnership, a group composed of LGROW, MGROW, and Upper River Watershed Alliance who work together to promote watershed wide educational opportunities, collaborate on watershed protection, and collaborate on a headwaters to Lake Michigan paddle trail planning effort. Most recently, the group is leading the planning effort for the 2025 Grand River Expedition and has planned the Hugh Heward Challenge on April 29th, 2023. The annual paddling event reenacts a one-day, 50-mile sprint down the Grand River in Mid-Michigan by British fur trader Hugh Heward and his French-Canadian crew in two birchbark canoes on April 24, 1790. The event includes a 50-mile route, a 25-mile route, and a 13-mile route.

Looking Glass River Watershed Efforts

Friends of the Looking Glass River Watershed Council host local paddling events and log jam clean ups. The GLRC partners on related events and activities to promote recreation and awareness of the river. Friends of the Looking Glass River Watershed Council hosted local paddling events such as a Spring, Summer and Fall River Clean Up Float on May 1st, July 17th, and September 18th, 2022. The group also gathered volunteers for log jam removals in May, August, September and October of 2021. Friends of the Looking Glass River also participated in a program with 260 fourth graders in September of 2021 to learn about the life and health of the river. The group has also established a can and bottle collection drop off and has successfully produced and sold a beautiful Friends of Looking Glass 2021 and 2022 sticker with all proceeds going to improving the watershed and keeping it clean and accessible. The two groups are currently exploring further opportunities for partnering.

Red Cedar River Watershed Efforts

Since forming in 2019, the Friends of the Red Cedar River have worked to promote watershed stewardship and recreation. Working with the city through a grant, the group completed a new launch site with a ramp of steps to down to the river and a parking lot with 16 spots in Williamston in 2022. The group has worked diligently to clear the river with partners and volunteers including finding funding for contractual work. The upper part of the Red Cedar from Webberville to Meridian Road is clear and the group worked with Meridian Township on a grant to clear the river in the summer of 2021. The group actively works with a local Boy Scout troop to monitor the river, remove debris, and clear small log jams. In November of 2022, they also partnered with a local enthusiast who convinced Adrian and Blissfield Railroad Company to retrieve trees and logs piled at their S. Cedar Street Bridge. The Railroad has promised to help again in 2023. Volunteers also worked in August and October 2022 to clear log jams. The GLRC Coordinator has worked regularly with the group to provide guidance on Red Cedar River Water Trail effort with the goal of inspiring new watershed stewards and educational opportunities through water-based recreation and sits on a new MGROW Red Cedar River Water Trail Committee. A grant through the Ingham County Parks millage has funded signage for the water trail, and the GLRC Coordinator worked with the group to design a logo similar to MGROW. The group has been coordinating with MSU to clear the river and provide additional education. The group has successfully partnered with rotary clubs along the river to further development of a water trail, and a river celebration event is planned for September, 2023.

Maple River Watershed Efforts

While outside of the urban area, the GLRC partners with Maple River stakeholders in their watershed planning efforts. The GLRC Coordinator sits on the Upper Maple River Non-Point Source Steering Committee as well as the Stony Creek Planning Project, a tributary of the Maple. The Friends of the Maple River held their annual Maple River Cleanup and Logjam Removal Day on Saturday, April 23, 2022, but were not able to host the event in 2021. The group has undergone much turnover and is currently reorganizing.

Dam Removal Exploration Workgroup (DREW)

The GLRC Coordinator participates with a group of watershed stakeholders exploring feasibility of removing Lansing's two dams, advising on possible green infrastructure solutions to post-removal riparian restoration. DREW has successfully secured Army Corps of Engineer funds to remove the N. Lansing Dam via their Section 206 Aquatic Restoration Program. This would fund the entire dam removal up to \$10 million. The federal funds will not cover removal of contaminated sediments that might be found behind the dam, and it was noted PCBs are commonly found in the river here. The City of Lansing, Army Corps, and Board of Water & Light are formalizing a Feasibility Cost Share Agreement (FCSA). Next steps are executing the FCSA and initiating a draft detailed project report and environmental assessment.

Capital Area Sustainability Partnership (CASP)

In 2021, a group of regional stakeholders began meeting to discuss regional sustainability and climate change planning efforts. The GLRC Coordinator, through the capacity of planner at the Tri-County Regional Planning Commission, assisted in the facilitation of these discussions and has helped include stormwater management as a focus of these conversations. The GLRC Coordinator has worked to bring additional watershed partners into the planning effort to share knowledge and resources. With the passage of the Infrastructure Investment and Jobs Act in 2021 that provided approximately \$11 billion to Michigan for infrastructure improvement and the Inflation Reduction Act of 2022, much of the focus of CASP has been to help municipalities understand the availability of federal funding for sustainability and resiliency and how to apply for that funding.

IMPLEMENTATION COMMITTEE ACTIVITIES

Public Education Program (PEP) Committee

During this reporting period, the PEP Committee met on the following dates:

January 20th, 2021
April 11th, 2022
July 28th, 2022
September 22nd, 2022

Committee Activities:

The PEP Committee has developed a variety of educational materials and implemented a number of outreach activities that are described in detail in the Public Education Plan later in this report. In addition to those activities, the committee has worked on the following:

Regional Water Quality Survey – As stated in previous progress reports, the survey results continue to be used as a tool for the PEP Committee regarding all educational efforts and public participation. Surveys were conducted in 2006, 2012, and 2018. The surveys provide comparison data and demonstrate progress that has been made through GLRC educational efforts as well as identify areas that need improvement. This is used to craft and evaluate the success of PEP activities. The survey results can be found on the GLRC website at mywatersheds.org/water-quality-surveys. The PEP Committee has met recently and decided our next required assessment tool will be an additional survey in 2024. The Committee is working to budget for the next iteration of the survey.

GLRC Annual Report – The first GLRC Annual Report was developed in early 2012 (reporting on 2011). The intent of the report is for GLRC members to share it with their boards, councils, and commissions in order to demonstrate the work that has been done throughout the year. TCRPC also shares the report with TCRPC Commissioners, subscribers to our newsletter, and on the website. The effort continues with reports developed through 2021 (the 2022 report is due by March 2023).

The following table indicates the annual report mailing to the GLRC newsletter subscriber list. These recipient numbers reflect members of the public who have volunteered to receive these updates, not partner/governmental contacts. This list has seen consistent growth but was late in distribution in 2021 due to staff turnover.

| Edition | Date Sent | Number of Recipients |
|----------------|------------------|-----------------------------|
| 2020 | 1/26/2021 | 525 |
| 2021 | 5/31/2021 | 182 |

GLRC Quarterly Newsletters – The GLRC began publishing quarterly newsletters in January 2010 and continues to do so. The newsletters are posted on the GLRC and TCRPC websites and are shared through an email distribution list of over 500 stakeholders. It is recommended that GLRC members share the newsletters with elected officials and appropriate boards, councils, and commissions.

| Edition | Date sent | Number of Recipients |
|----------------|------------------|-----------------------------|
| Winter 2021 | 1/26/2021 | 525 |
| Spring 2021 | 4/20/2021 | 525 |
| Summer 2021 | 7/27/2021 | 527 |
| Fall 2021 | 10/18/2021 | 528 |
| Winter 2022 | 1/31/2022 | 580 |
| Spring 2022 | 4/25/2022 | 530 |
| Summer 2022 | 7/19/2022 | 349 |
| Fall 2022 | 10/25/2022 | 675 |

General Outreach/Education Efforts – The GLRC Coordinator partners with several different groups, agencies, and organizations in the region. Here is a summary of general collaboration and activities related to stormwater and pollution prevention:

- MWEA Watershed Committee – The GLRC Coordinator attended all MWEA Watershed Committee meetings in 2021 and provided some support to the group related to the MS4 permit application process. This is a good networking opportunity for GLRC to share our experiences and learn what others are doing around the state. This group plans the Watershed and Stormwater summits, which the GLRC coordinator has presented at.
- December 2021; 2022 – The GLRC Coordinator promoted and attended the annual MWEA Stormwater Seminar.
- In 2021, and 2022, GLRC participated in the virtual Quiet Adventures Symposium events as a sponsor. In 2021, sponsorship included a viewing of the What is the GLRC video, and in 2022, sponsorship included a viewing of the educational Road Salt and Water Quality video. Both virtual events had an estimated 500 participants.
- January – June 2021 – Served as an advisor to the Wayne State Microplastic Project on their outreach team. The overall effort included an exploration of using Green Stormwater Infrastructure to capture microplastics in stormwater. The GLRC Coordinator helped Wayne State and the

Ingham County Conservation District prepare for pilot project implementation in Pontiac and Williamston in the summer of 2021.

- February 2021 – Provided a letter of support for Clinton County Conservation District’s 2021 Annual Looking Glass River Summer Cleanup project.
- July 2021 – Provided a letter of support for the Mid-Michigan Watershed Connections grant through NOAA’s BWET program. Worked with the Eaton Conservation District and Mid-MEAC to develop and submit the grant and gathered letters of support from area watershed groups.
- May – August 2022 – Worked with the Eaton Conservation District and Elkhart County Soil and Water Conservation District to build an Augmented Reality Sandbox for use in education.
- November 2022 – Donated two Landscaping for Water Quality Designs for Homeowners 3rd edition books, 10 rain garden seed cards, a pet waste dispenser with bags, a green stormwater infrastructure map and a GLRC sports water bottle for a rainwater-themed basket for the 123rd Winter Drain Commissioners Conference for the Southwest District.
- The GLRC Coordinator has consistently provided notices to GLRC members regarding anything relevant to the MS4 program including seminars, training, webinars, legislative updates, etc.

IDEP Committee/Post-Construction Committee

All GLRC members are well into implementation of their individual IDEP programs. The GLRC Coordinator continues to work with regional partners on watershed protection efforts focused on pollution prevention and Illicit Discharge Elimination.

The GLRC developed a reporting page on MyWatersheds.org to more easily advertise the contact information for reporting illicit discharges to member communities. MyWatersheds.org/REPORT is easy to remember and promote. A Septic Smart webpage was also developed to educate residents on reducing illicit connections to the storm sewer. But the primary focus of this committee has been staff training.

Committee Activities:

In 2022, the IDEP/Post-Construction Committee met routinely with the PEP Committee to help plan the free and public educational seminar GLRC seminar on Stormwater Treatment in Clay Soils: Mechanical Devices or Nature-Based Solutions.

IDEP Training Video –

Group Training: The GLRC hosts training video viewings for members and their staff. During the reporting period, two training dates were held in May 2022. MSU purchased a copy of the training video for in-house training, and thus did not participate in these group trainings.

The GLRC routinely hosts field training for outfall screening. Two hands-on dry weather screening training sessions were also held on July 20th and 21st, 2022 at Hawk Island County Park for area municipalities with 31 attending. An MSU representative from MSU Environmental Health and Safety attended one of these training sessions.

TMDL Committee

The TMDL Committee provides a forum for discussing TMDL implementation. Members have individual TMDL implementation plans but utilize GLRC's Quality Assurance Project Plan (QAPP) to standardize sample collection and guide field operations related to wet weather monitoring. The QAPP informs project managers and field staff of laboratory requirements and options for analysis. In the summer of 2022, the QAPP was updated and distributed to all members with new lab contact information and all procedural changes/recommendations from EGLE and US EPA.

Other GLRC Activities

Good Housekeeping Training - The GLRC hosts training video viewings for members and their staff. During the reporting period, two training dates were held in May 2022. MSU purchased a copy of the training video for in-house use, and thus did not attend these training sessions.

GLRC Stormwater Seminar – In November of 2022, the GLRC held a technical, educational seminar for members and the public to explore Stormwater Treatment in Clay Soils. GLRC hosted national expert Don Carpenter, PhD, PE, LEED AP, Executive Director of the Great Lakes Stormwater Management Institute at Lawrence Technological University to help engineers learn how to address stormwater quality goals by evaluating mechanical separators and the retention and infiltration of Michigan's clay soils. A total of 55 people attended, including four representatives from MSU.

EGLE Industrial Stormwater Operator –The MSU Stormwater Committee includes an Industrial Stormwater Operator.

Ingham County Surface Water Program -- The Ingham County Health Department regularly tests sites for *E.coli* and have done so through this program for 17 years. Several Ingham County based GLRC members support this effort. MSU is a member of this program, with sampling conducted at the Farm Lane Bridge throughout the recreation season.

Recreation Efforts

The GLRC promotes partner efforts and recreational events through the website and social media, like paddling expeditions and races and other opportunities for residents to connect to our watershed and water resources. The GLRC understands that residents will be more likely to adopt pollution prevention strategies if they use and love the resources those actions would protect.

Green Infrastructure Code Audit – The GLRC is working to develop a document that will provide model ordinances and language to standardize and improve the region's landscape and surfacing requirements in a way that promotes the use of green infrastructure. The document is still being finalized.

Coal Tar Seal Coat – The GLRC is also assisting area communities in the development of coal tar seal coat bans, as Polycyclic Aromatic Hydrocarbons or PAHs within are showing up in significant concentrations in runoff. So far, two of GLRC's members have passed a total coal tar seal coat ban, requiring contractors to register and certify that they are not using mixtures with PAH content greater than .1%. In 2021, GLRC developed a fact sheet on coal tar sealcoating. The educational piece outlines the cancer risk for people as the PAHs make it into their homes on shoes and pets. The GLRC will continue to work to develop a resource guide to standardize the region's approach to these contaminants.

Michigan State University Stormwater Management Program (SWMP)

Stormwater is managed on the MSU campus by a team of faculty, staff and students representing a broad cross-section of the University. Units and Departments that are playing a role in managing stormwater runoff and implementing the University's Stormwater Management Program (SWMP) include the Office of Environmental Health and Safety (EHS), Infrastructure Planning and Facilities (IPF) Planning, Design and Construction (PDC), IPF Landscape Services, IPF Power and Water, AgBioResearch, MSU Sustainability, Residential and Hospitality Services, Institute of Water Research, MSU Police, Department of Community Sustainability, Department of Biosystems and Agricultural Engineering, and Department of Horticulture.

A Stormwater Committee comprised of representatives from a subset of these units is chaired by IPF Planning Design and Construction Director John Lefevre. The committee meets monthly to oversee SWMP activities and to direct additional campus-based stormwater activities. A list of University representatives responsible for carrying out SWMP duties (including a list of Stormwater Committee members) is included in **Appendix A**.

Stormwater Management Program Components

The following are required components of the SWMP:

Public Education Plan (PEP), to promote, publicize, and facilitate education for the purpose of encouraging the public to reduce the discharge of pollutants to stormwater to the maximum extent practicable.

Public Participation/Public Involvement (PPP), to share components of the SWMP and encourage participation in its review and implementation

Illicit Discharge Elimination Program (IDEP), to detect and eliminate illicit connections and discharges to the MS4.

Post Construction Stormwater Runoff for New Development and Redevelopment Projects, to address post-construction stormwater runoff from projects that disturb one acre or more, including projects less than one acre that are part of a larger common plan of development that would disturb one acre or more.

Construction Stormwater Runoff Control, to augment Part 91 rules dealing with soil erosion, offsite sedimentation and other construction-related wastes.

Pollution Prevention and Good Housekeeping Program, to minimize pollutant runoff to the maximum extent practicable from municipal operations that discharge stormwater to the surface waters of the state.

Public Education Plan and Public Participation

The MSU Stormwater Public Education Plan (PEP) seeks to promote, publicize, and facilitate watershed education for the purpose of encouraging the public to reduce the discharge of pollutants in stormwater to the maximum extent practicable. The PEP has been developed to ensure that the targeted audiences are reached with the appropriate messages for the following topics:

- 1. Promote public responsibility and stewardship in the applicant's watershed(s).*
- 2. Inform and educate the public about the connection of the MS4 to area waterbodies and the potential impacts discharges could have on surface waters of the state.*
- 3. Educate the public on illicit discharges and promote public reporting of illicit discharges and improper disposal of materials into the MS4.*
- 4. Promote preferred cleaning materials and procedures for car, pavement, and power washing.*
- 5. Inform and educate the public on proper application and disposal of pesticides, herbicides, and fertilizers.*
- 6. Promote proper disposal practices for grass clippings, leaf litter, and animal wastes that may enter into the MS4.*
- 7. Identify and promote the availability, location, and requirements of facilities for collection or disposal of household hazardous waste, travel trailer sanitary wastes, chemicals, yard wastes, and motor vehicle fluids.*
- 8. Inform and educate the public on proper septic system care and maintenance, and how to recognize system failure.*
- 9. Educate the public on, and promote the benefits of, green infrastructure and Low Impact Development.*
- 10. Identify and educate commercial, industrial, and institutional entities likely to contribute pollutants to stormwater runoff.*

As required by the stormwater permit, the GLRC PEP Committee prioritized the public education topic areas into high, medium and low categories. Many factors were considered in this process including survey results, available resources, cost effective outreach methods, existing public knowledge levels and potential for collaborating with other programs currently underway.

High priority topics areas include:

- *Inform and educate the public about the connection of the MS4 to area waterbodies and the potential impacts discharges could have on surface waters of the state.*
- *Educate the public on illicit discharges and promote public reporting of illicit discharges and improper disposal of materials into the MS4.*
- *Educate the public on, and promote the benefits of, green infrastructure and Low Impact Development.*

The following PEP activities were undertaken by MSU and the GLRC during the period January 1, 2021-December 31, 2022. Activities in the PEP include those that are watershed-wide and thus implemented in partnership with the GLRC as well as activities planned and implemented solely on the MSU campus.

Pollution Isn't Pretty (PIP) - Funded by TCRPC's Mid-Michigan Program for Greater Sustainability, MGROW originally facilitated the use of the water resource education campaign titled: Pollution Isn't Pretty. The PIP campaign was professionally designed and has been consistently used across the region. PIP materials are now housed on the GLRC website. Partners from throughout the watershed, including the GLRC, distribute materials from this campaign with the domain pollutionisntpretty.org. GLRC members and MGROW will continue to distribute the campaign's printed materials at watershed-related events throughout the region until supplies are depleted.

The following GLRC members have placed the Pollution Isn't Pretty signs in their communities: Lansing Charter Township (3), City of East Lansing (20), Ingham County Parks (5), Clinton County Parks (2), DeWitt Charter Township (3), Meridian Charter Township (4), City of Lansing (5), City of Grand Ledge (4), and MSU (1). Several signs have also been placed on the Lansing River Trail.



Watershed Signage – With the help of local road commissions, signage was placed along roads to indicate watershed boundaries to passing vehicles, cyclists, and pedestrians. These were installed between 2005-2006 but are being maintained indefinitely.

MSU maintains a watershed sign at the Farm Lane Bridge:



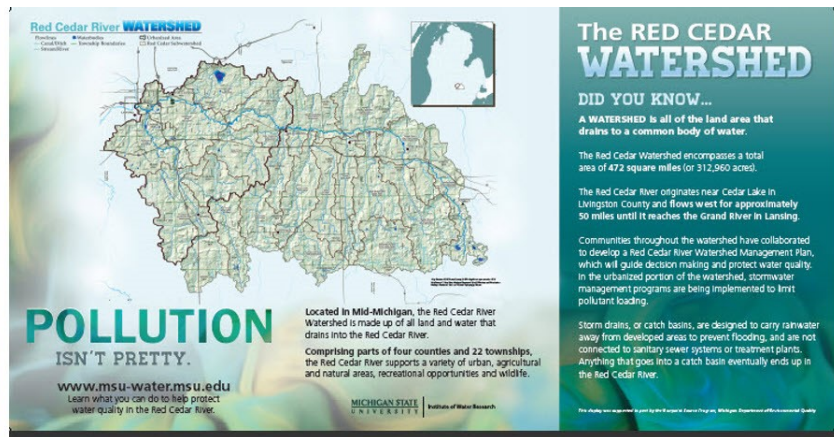
GLRC Exhibit Display – The traveling exhibit display was developed in 2008 and has been used extensively at local workshops, conferences, community lobbies, etc. When the display is not being used for a special event, it travels throughout the region at GLRC member offices. The GLRC display panels were redesigned in 2014 to incorporate the PIP campaign, and in 2017 a scroll style “pop up” banner was developed that could be utilized in more places, like outdoor events. It was designed with a header titled “We All Live in a Watershed” in order to address survey results that indicate many residents don’t know that they live in a watershed. In 2019’s Public Education Plan update, most GLRC members agreed to display the scroll style banner in their lobbies (or other public place, such as a library) for 2-3 weeks each year*. Multiple communities purchased their own scroll banners to display for longer periods. In addition to the display itself, copies of GLRC publications and watershed brochures are handed out to interested parties. *Due to the Covid-19 pandemic, display use at lobbies and public events was temporarily replaced with digital PEP BMPs, per the GLRC PEP Amendment submitted in summer 2020. EGLE requested that in-person activities resume in 2022.



Enviroscape – In late 2017, the GLRC purchased an Enviroscape watershed model, a hands-on, interactive demonstration of the sources and impacts of stormwater pollution. It is utilized at events where time and setting allow for hands-on learning. The GLRC also frequently partners with EGLE at events and utilizes their interactive floodplain model. The GLRC displays and Enviroscape unit have been utilized by the GLRC Coordinator and members. In July 2022, the Enviroscape model was used to train 24 teachers in watershed education.

MSU Displays – The University continues to use three campus-based displays. These include a large table-top display panel, a smaller tri-fold display for use in outdoor settings and a telescoping display to use during events where space is limited. The MSU-specific displays were used at a number of events during the reporting period. These include:

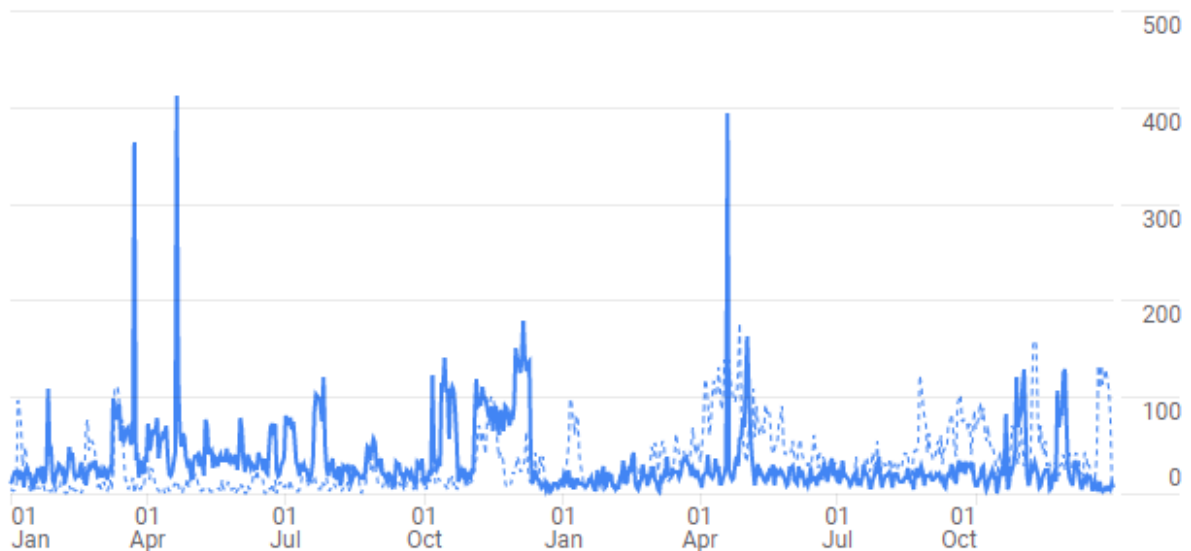
- MSU Environmental Science & Policy Program (Feb. 2021)
- Okemos HS (Mar 2021)
- Water Fundamentals Training (Apr 2021)
- MSU Earth Day Event (Apr 2021)
- MSU Women’s Basketball Sustainability Day (Nov 2021)
- Conservation Stewards Observation Experiment (Mar 2022)
- MSU Extension Green Stormwater Infrastructure Tour (June 2022)



GLRC Website www.mywatersheds.org – The public website for the GLRC is maintained and updated on a regular basis. The website includes a significant amount of information relating to watersheds, stormwater stewardship, GLRC reports, educational information, links to other environmental organizations and much more. All public education outreach materials direct the viewer to our website so we can further educate them about pollution prevention. A 2020 update was driven by survey data which indicated many residents do not realize they live in a watershed. This is why “EVERYONE LIVES IN A WATERSHED” remains the home page header and the first thing visitors see. Results also indicated that residents prefer learning about environmental issues from videos, which are also included on the home page and throughout the website. All content was reviewed for accuracy in 2021. In 2022, a new webpage was added to showcase the new Augmented Reality Sandbox and serve as a landing page to direct teachers and the public in how to use the free educational tool.

The PEP Committee reviews the website stats on a regular basis. There have been over 71,000 total hits on the website, as indicated by the “ticker” at the bottom of the webpage. Google Analytics show a total of 26,381 page views and 22,296 users during the Progress Report period. Spring continued to be the most popular time of year to visit the website.

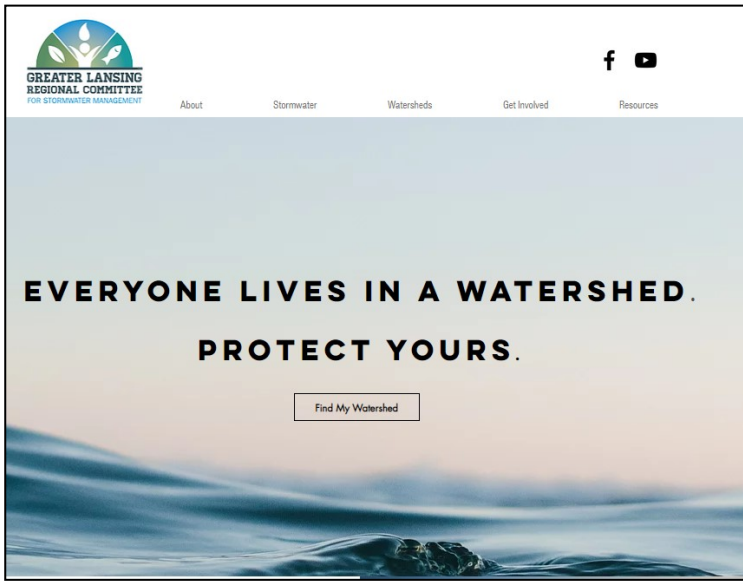
- 2021: 16,945 pageviews
- 2022: 9,369 pageviews



Jan 1, 2021 - Dec 31, 2022 ▼

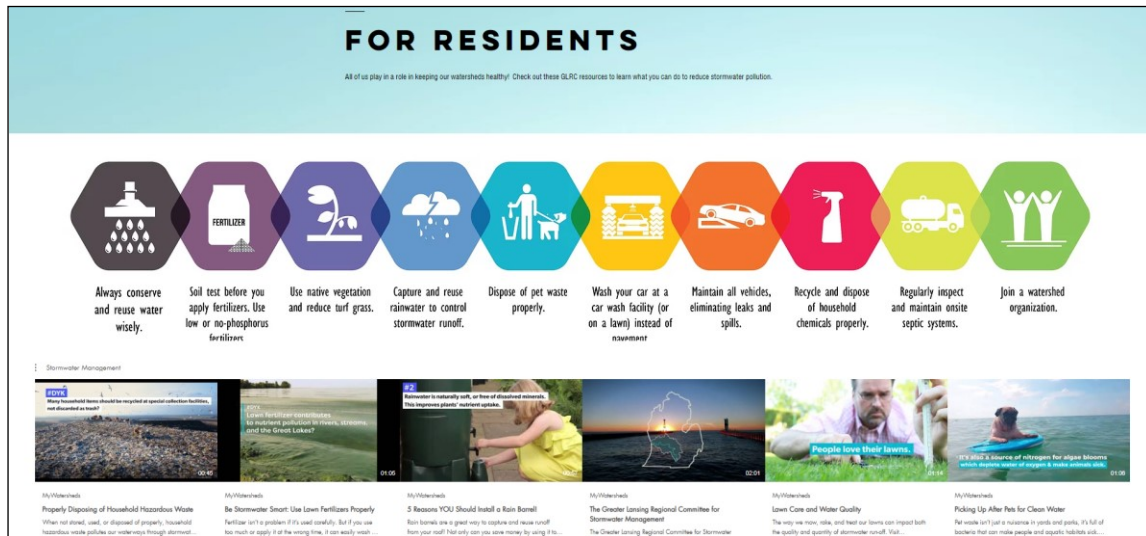
[AUDIENCE OVERVIEW >](#)

The committee also tracks traffic to individual pages to monitor the strength of individual pages and interpret what information resonates well. GLRC’s “Rain Garden 101” continues to be the most popular with 6,158 views in 2021 and 2022. A new how-to video and additional resources were added to the page in 2022. Our “Pet Waste Management” and “Different Types of Sewers” pages received a total of 6,240 views during the reporting period.



Subpages --

For Residents Webpage – This page was developed on the website to allow GLRC members and the public to review files for educational purposes. These files include brochures, posters, articles, seasonal tips, and other information to educate residents on stormwater pollution prevention. The webpage is updated regularly to add new materials and per survey results, video content is emphasized near the top and in focus. The For Residents webpage had 778 views during the reporting period.



For Educators Webpage – The PEP Committee maintains a webpage on the GLRC website for educators in the region. The page serves as a resource guide for local teachers, workshop leaders, or anyone interested in environmental education. State and federal environmental curriculum is highlighted as well as links to lesson plans. It includes resources and example projects that the schools can integrate into their current activities. The webpage also serves as a toolbox for teachers and school district officials that are required to meet MS4 permit requirements. This page continues to be updated on a regular basis. This webpage includes multiple at-home-learning

lessons to assist parents and teachers with finding lessons and activities suitable for online learning. During the reporting period, this webpage had 11 views.

For Members Webpage – The GLRC developed this webpage in 2019 to house relevant documents and information for municipalities. There is particular focus on making it easier to view and use digital PEP materials and request physical resources for outreach events. During the reporting period, this webpage had 52 views.

Be Septic Smart Webpage – The GLRC developed a septic focused webpage to house info on septic systems, time of sale programs, and our septic-focused video. It was updated to contain additional “Be Septic Smart” videos from US EPA during the reporting period. The “Be Stormwater Smart” webpage received 33 views during the reporting cycle.

Rain Garden 101 – Our most popular webpage, Rain Garden 101, includes manuals, videos, and planting resources to help homeowners plan and install their own native plant rain garden. Residents were commonly directed to this page and its updates during this reporting cycle. GSI focused webpages received nearly 13,000 views during the reporting period.

Local Green Infrastructure Projects - This page was added to highlight Lansing area GSI projects and includes the video clip developed as part of the Greening Mid-Michigan project. It had 146 views during the reporting period.

Household Hazardous Waste Calendar – Respondents to the GLRC survey indicated they were not utilizing household hazardous waste sites because they didn’t know where they were. In response, the GLRC created a webpage dedicated to these resources. It includes an event calendar and information on disposal in the tri-county area. This received 569 views during the reporting cycle.

Reporting Webpage – To simplify the GLRC’s shared outreach efforts, MyWatersheds.org/REPORT was created to house the IDEP reporting information for all members. This allows the GLRC to easily promote a one-stop reporting resource to the region’s residents in a simple, easy to remember domain. The IDEP and reporting webpages received a total of 51 visits during the reporting period.

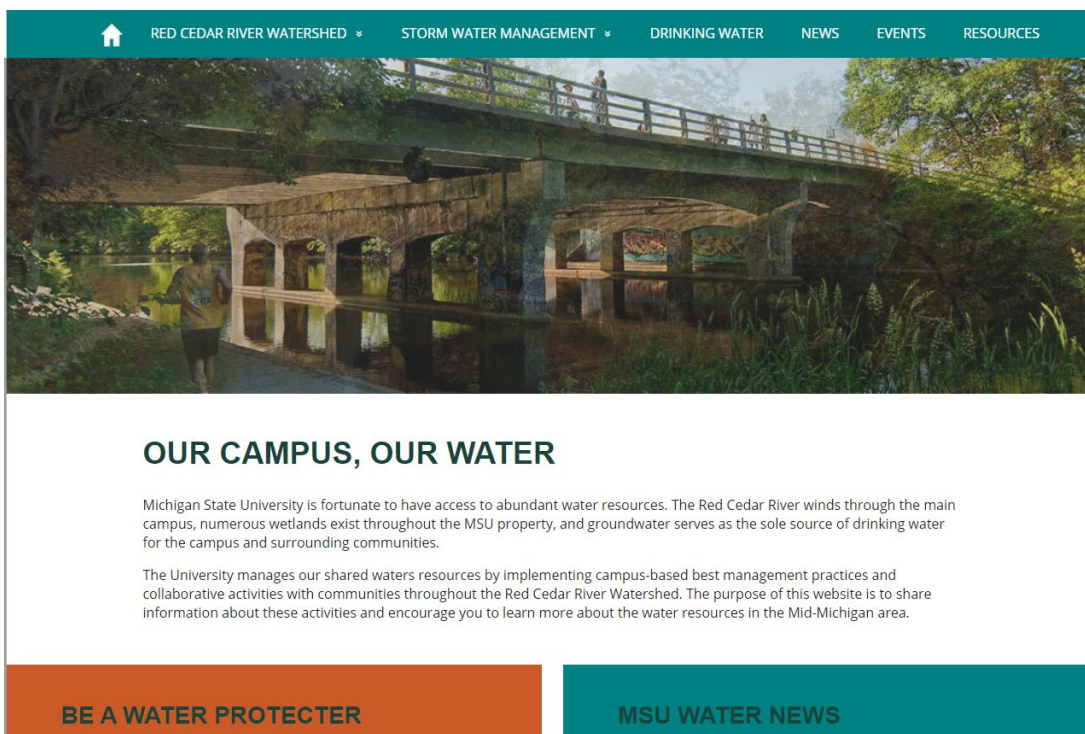
Event Calendar– The committee is continuously updating the GLRC calendar with applicable meetings, webinars, educational opportunities, and recreation and cleanup activities throughout the watersheds. The Events page received a total of 143 views during the reporting cycle.

MSU-WATER Website www.msu-water.msu.edu – the website includes information about the Red Cedar River, educational materials and links to the GLRC website and other stormwater-related sites. The website was redesigned in 2017 to match the rebranded outreach materials. The website includes who to contact: in case of spills <http://msu-water.msu.edu/report-spills/>; with questions about the University’s Stormwater Management Program <http://msu-water.msu.edu/what-is-storm-water/managing-storm-water-on-the-msu-campus/>; and how to volunteer for activities <http://msu-water.msu.edu/you-can-play-a-role-in-protecting-campus-water-resources/>.

Google Analytics data show that in this reporting period, the website had more than 10,000 views, with a total of 6,376 new users. No spills were reported or inquiries made through the website.

MSU Water

PROTECTING WATER RESOURCES ON CAMPUS



Educational Articles – The PEP Committee continues to use and promote a series of news articles. They are posted on the GLRC website so GLRC members can easily access them to periodically include in their local newsletters. They are also located in the “For Residents” page and included in each quarterly newsletter. The articles cover the following topics:

What is a Watershed?
Riparian Buffers
Illicit Discharges
Adopt Your Catch Basin
Vehicle Maintenance
Septic System

Pet Waste and the Environment
Storm vs. Sanitary Sewer Systems
Responsible Car Washing
Safe Fertilizer Use
Wetlands: An Overview
Maintenance

The articles are updated periodically for content and design updates, most recently in 2020. The articles are available on the MSU-WATER website.

GLRC Media Toolkit – In fall of 2020, the GLRC developed a Media Toolkit for members and their communications staff. It was designed to clearly illustrate the content available for municipal newsletters, social media, and other outreach and provide “plug and play” language. Municipal communications staff often lack the technical knowledge or time to craft stormwater related content, but the Media Toolkit features 71 pages of resources that they can pull from and customize to their needs. This reduces the barrier to frequent stormwater related outreach.

Press Releases – A suite of press release templates was developed in 2020. Covering Pet Waste, Soil Erosion, Industrial Facilities, and Dumpster/Trash BMPS, they are structured as customizable news articles for inclusion in community newspapers or municipal newsletters.

GLRC Presentations – The following presentations were given by the GLRC Coordinator within the reporting period:

- January 27th, 2021: Meridian Green Neighbor presented to residents. A total of 28 residents attended.
- April 8th, 2021: Presented at a Michigan State University environmental planning class. A total of 100 students and teachers attended.
- April 26th, 2021: Ingham County Health Department surface water roundtable discussion with 20 participants.
- April 28th, 2021: Moderated the MWEA Watershed Summit, where 100 people attended.
- May 25th, 2022: Mid-Michigan Watershed Connections teacher training introduction to the GLRC with 34 educators.
- July 23rd, 2022: Conducted an interview with Meridian Township’s Green Team on what it means to be green during the Green Fair at the Farmers’ Market and spoke with all participants at environmental booths.
- July 25th, 2022: Presented Mid-Michigan Watershed Connections teacher training on how to use the Augmented Reality Sandbox with 35 educators.
- August 9th, 2022: Presentation to librarians and Writer’s Workshop at CADL’s South Lansing Library on the Augmented Reality Sandbox (ARS) with 10 participants. The ARS remained on view at the library and where the public engaged with the interactive model for two weeks.
- August 6th, 2022: 20th Annual Chuck Gorman Youth Day. Discussed the watershed and how to protect it while teaching 100 youth how to paddle a kayak. An estimated 250 people attended the event, with a parent presence required at the kayaking station on Stony Creek.

- November 30th, 2022: Presented on who the GLRC is and what we do to 55 engineers and planners attending the GLRC's seminar on Stormwater Treatment in Clay Soils: Mechanical Devices or Nature-Based Solutions.
- Throughout 2021 and 2022, the GLRC Coordinator attended Meridian Township's weekly Wednesday Green Dialogue meetings at least once a month. Township residents interested in environmental issues meet for free-flowing discussion. The GLRC Coordinator provides regular updates on Committee activities to this group and helps connect them with regional resources.

MSU Presentations – Presentations about the Red Cedar River and MSU's stormwater management activities within the reporting period include:

- Feb 2021 – ESPP Guest Lecture
- Mar 2021 – Okemos HS Guest Lecture
- Apr 2021 – Water Fundamentals Training
- Apr 2021 – MSU Earth Day Event
- Oct 2021 – MSU Extension (MSUE) Conservation Stewards Program
- Mar 2022 – MSUE Conservation Stewards Observation Experiment (Red Cedar River Tour)
- June 2022 – MSUE Stormwater Walking Tour
- June 2022 – East Lansing Rotary Club

Residence Hall Outreach Materials – 300 copies of a poster emphasizing personal responsibility were printed for distribution in residence halls in 2021-2022. The poster is available on the MSU-WATER website: <http://msu-water.msu.edu/you-can-play-a-role-in-protecting-campus-water-resources/>.

MSU Student Training – MSU Sustainability shared information about stormwater practices on campus and being stewards of campus water resources at trainings for Campus Tour Guides and Resident Assistants. This included discouraging feeding of geese on campus.

Pollinator Garden - A new pollinator garden was planted along the River Trail by the Sustainable Spartans Club in Fall of 2021. The garden uses many native plant species that are also commonly found in rain gardens.

Green Roofs on Campus - The Sustainable Spartans Club is advocating for adding more green roofs to campus.

Outdoor Green Wall - The Sustainable Spartans Club, in partnership with Infrastructure Planning and Facilities and the Office of Sustainability installed the first ever outdoor green wall along a highly trafficked pedestrian bridge between the MSU Library and Spartan Stadium in the summer of 2021. The students intended the project to demonstrate sustainable design principles to the public while enhancing the aesthetics of the bridge.

W.J. Beal Botanical Garden is increasing its conservation efforts along its portion of the River Trail. This includes invasive species removal, installation of deterrents to reduce foot traffic and erosion along the river bank (low fencing made from invasive shrubs), and increasing educational signage about these activities.

Red Cedar River Clean-Up

An MSU Red Cedar River Clean-up event was held in September 2022. MSU IPF, Department of Fisheries and Wildlife and the East Lansing Rotary Club collaborated for this event.

MSU Sustainable Stormwater Walking Tour

Walking tour signs and posters were updated to match the new branding in 2020. They are currently available on the MSU-WATER website and posted at campus green infrastructure sites.

MSU Riverbank Restoration

The riverbank restoration project that kicked off in 2018 along the walking and biking path adjacent to Spartan Stadium is currently being expanded. Bioengineered lifts were used to stabilize approximately 275' of the riverbank. This technique uses rock, natural materials, and native plants to reduce riverbank erosion, to reduce phosphorus and nutrient into the river. A second phase is planned for 2023.

GLRC Fact Sheet – A fact sheet describing the Phase II program and purpose of the GLRC was created in 2017 to help community leaders quickly understand the requirements of the program and how the GLRC helps meet them. The fact sheet was updated in 2022. This educational piece is distributed with annual reports, dues invoices, and to new TCRPC Commissioners to help those in leadership roles understand their municipality's responsibilities and the GLRC resources available to them.

Social Media – The GLRC joined Facebook and Twitter in December 2009. Regular posts/updates are related to watershed stewardship, public involvement, and participation. GLRC and partner events are also posted frequently. Currently 1,412 people follow GLRC on Facebook and we have 383 followers on Twitter. The GLRC places emphasis on the use of paid advertising through Facebook boosts to spread our messaging on required PEP topics. This tool allows the GLRC to target residents within the urban area of the tri-county region and ensure that we are reaching people who do not already interact with our page. During this reporting period, a renewed emphasis was placed on Twitter to grow our audience beginning in May of 2022, and the GLRC Coordinator also began posting on Instagram. GLRC's Instagram currently has 59 followers and had a total reach of 727 accounts in 2022.

Over the past two years, our posts have reached 447,076 Facebook accounts and have been shared 1,090 times. Reached is defined as the number of Facebook and Instagram accounts that saw a post at least once and is separate from impressions, which may include multiple views of your post by the same Facebook and Instagram accounts. Paid posts or Facebook boosting has allowed GLRC to target all urban areas within the tri-county region. When boosting, posts can be displayed not just on Facebook, but also on Instagram, Messenger, Facebook Marketplace, and in the sidebar of Facebook.

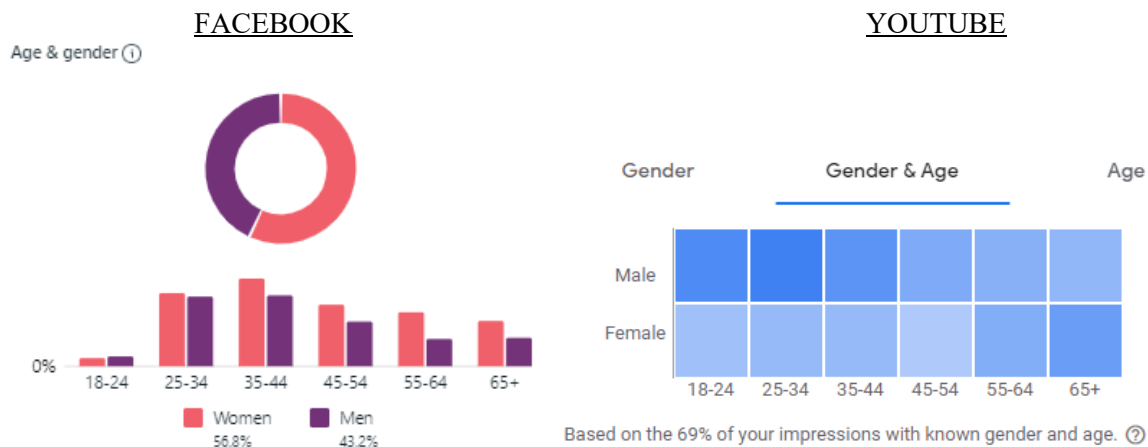


The GLRC has not advertised on Twitter during the reporting period. During 2021, total tweet impressions were 362 with only 36 profile visits. In 2022, tweet impressions increased threefold to 1,847 and profile visits increased 100 times to 3,625 visits. Impressions on Twitter is a total tally of all the times the tweet has been seen, and a profile visit refers to people who clicked on our profile to learn more about GLRC.

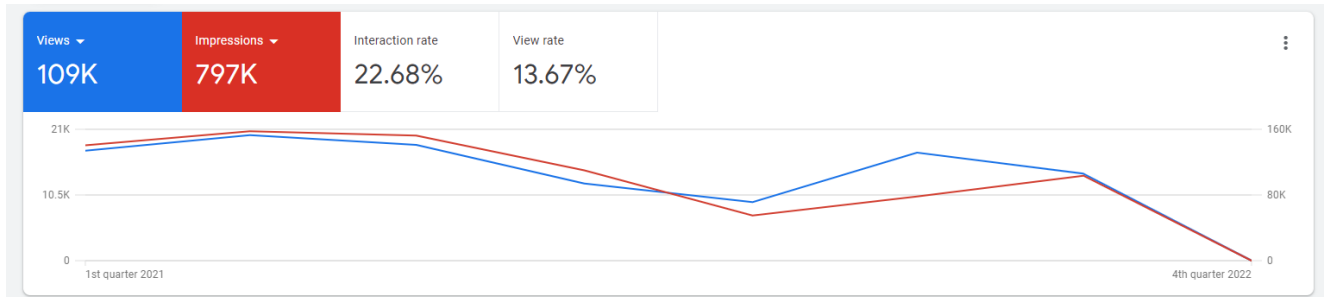
View our pages here: facebook.com/GLRC4stormwater/ and twitter.com/GLRC4stormwater and instagram.com/mywatersheds/.

YouTube -- Survey results indicated that respondents prefer learning about environmental issues through video. As such, GLRC invested in a suite of videos for inclusion on the website, Facebook, and YouTube. One video is two minutes and explains the GLRC and basic stormwater pollution prevention, other videos cover the required PEP topics. Most topics have two videos: one that is roughly 60-90 seconds and one that is under 15 seconds, as 15 seconds is the maximum length of a non-skippable ad. The GLRC pays to promote these videos as “pre-roll” advertisements on YouTube, utilizing both the short, non-skippable ads and traditional skippable ads. While Google indicates that a “good” view rate is 15%, GLRC’s is 23%, indicating that nearly a quarter of users presented our videos are watching them. Data also indicates that many users continue to watch our pre-roll advertisements even when given the option to skip ahead to their intended video.

Utilizing YouTube has also expanded our audience demographic. While Facebook analytics indicate that content is reaching more females than males that are typically 25 years or older, a quarter of our YouTube views are from younger men. Our multimedia approach is meeting our residents where they are and ensuring our outreach material has a broad reach. It also helps us diversify the places our ads display, because these ads show up throughout the Google ecosystem and on any website that uses Google Ads. View the YouTube channel here: youtube.com/channel/UCm-2OdB67N_dSAnR5osYSFw.



During Covid-19, the GLRC Coordinator and GLRC members were unable to satisfy in-person outreach events. In summer 2020, GLRC members submitted a PEP amendment to replace in-person PEP BMPs with a commitment to fund YouTube ads. This amendment remained in place until June 2022. The GLRC began utilizing these YouTube ads at the beginning of 2020, with use tapering off in the last half of 2022 as in-person events resumed. A total of \$5,807 was spent on YouTube ads from January 1st, 2021, to December 31st, 2022. The results are reflected in this graph:



Dog Calendar Contest – One of our most successful outreach initiatives, the annual Dog Photo Calendar Contest, offers residents a chance to see their dog as a month’s feature photo and win a \$20 gift card to an area pet store. To enter, contestants must read about pet waste’s impact on water quality and pledge to pick up after their pets. The GLRC launched the first contest in 2018 and it grew steadily through 2020 with 300 plus participants each year but declined in 2021 with 121 participants and again in 2022 with only 27 participating. The GLRC Coordinator will discuss how best to engage with pet owners in the future and the fate of the contest with the PEP Committee.

The submittal form includes an option for entrants to subscribe to the GLRC newsletter, allowing us to continue to reach these new contacts and engage them in our messaging in the future. The following indicates the number of newsletter signups resulting from each contest.

- 2018:** 107 signups
- 2019:** 75 signups
- 2020:** 118 signups
- 2021:** 45 sign ups
- 2022:** 19 sign ups

Brochures – In late 2018 and early 2019, the GLRC redesigned its suite of brochures and added Green Infrastructure as an additional topic. Redesigned tri-fold brochures also include Pet Waste Management, Fertilizer and Lawn Care, Responsible Car Washing, Motor Oil Management, and Do You Know Your Watershed? These are distributed at events and lobbies. The GLRC Coordinator distributed 1,487 brochures at events during the reporting period. The brochures were also available on GLRC webpages that received 853 views. The following reflects distribution of brochures related to individual required PEP topics.

- Topic A: 1,487 brochures distributed
- Topic B: 1,487 brochures distributed
- Topic D: 335 brochures distributed
- Topic E: 315 brochures distributed
- Topic F: 475 brochures distributed

- Topic G: 150 brochures distributed
- Topic I: 475 brochures distributed

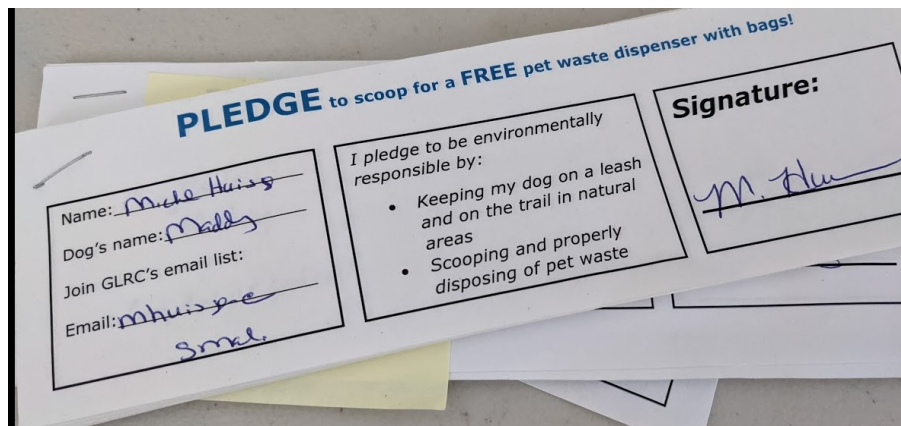
Similar information is presented digitally on the website and on social media.

Overall, 661 total pieces of outreach material - including MyWatersheds.org stickers, cups, water bottles, bracelets, pet waste bag dispensers, etc. were distributed by the GLRC coordinator at events during the reporting period. An additional 2,550 pieces were purchased for use at members during their events. These totals will increase in 2023 as in-person events resume.

Rain Garden Seed Cards – In 2017, the GLRC began distributing rain garden information cards printed on paper embedded with native black-eyed Susan seeds. These provide information on the benefits of native plantings and provide residents with seeds to plant their own. They have proven very popular at events. Since 2017, 821 have been distributed through the GLRC Coordinator, with distributed during the reporting period. GLRC looks forward to continuing this campaign as more in-person events are scheduled.

Dog Waste Bag Dispensers -- In 2017 the GLRC began distributing branded dog waste bag dispensers with the tagline “In The Bag, Not The River” to meet pet waste education requirements. To receive one at events, attendees must sign a pledge to pick up after their pets. The pledge form also gives them the option to sign up for the GLRC newsletter. Since 2017, 1,093 dog waste bag dispensers have been distributed by the GLRC Coordinator, with 18 being distributed during the reporting period. The GLRC will continue to distribute this popular tool to encourage all residents to pledge to scoop at area events.

Dog Park Map and Pledge: In 2017, the GLRC developed a map of local dog friendly parks that includes information on pet waste’s impact on our water resources. These were hung up at area park and trail head bulletin boards. An additional version was developed for in-person events that included the pledge mentioned above. Signatories received a dog waste bag dispenser and a copy of the dog park map to take home.



Green Infrastructure Bike Tour – A bicycle tour of area green infrastructure was developed in 2019 to provide users an interactive experience and inspire them to install green infrastructure on their own properties. The bike tour follows area bike trails and includes a printable map as well as a custom Google Map.



View the online map!
for additional information on Greater Lansing GSI, visit:
www.MyWatersheds.org/BikeTour

This map of Green Stormwater Infrastructure (GSI) is brought to you by the Greater Lansing Regional Committee for Stormwater Management (GLRC). The GLRC guides the implementation of the MS4 stormwater program for participating communities in the Red Cedar, Looking Glass, and Grand River Watersheds.
www.MyWatersheds.org



Green Stormwater Infrastructure
When it rains in an urban environment, water flows off of impervious surfaces like driveways, buildings, and roads. This run-off is called stormwater. Any pollutants on the ground, like pet waste, leaking motor oil, and litter can be swept up by stormwater run-off as it flows towards our waterways. This is the number one cause of water pollution in urban environments.

Green Stormwater Infrastructure (GSI) addresses this by mimicking the natural landscape to slow, absorb, and filter run-off. Using GSI to manage stormwater not only helps improve water quality, it's cost-effective, low maintenance, and beautifies our cities!

GSI you will see on this tour:

-  **Rain Gardens**
are depressed vegetated gardens that allow rain water to pool before being absorbed by soil and vegetation.
-  **Rainwater Harvesting**
systems collect and store rainfall for later use. When designed appropriately, they slow and reduce run-off and provide a source of water. A rain barrel collecting roof run-off is an example.
-  **Riparian Buffers**
are vegetated areas adjacent to a stream or river that preserve water quality by filtering sediments and pollutants from run-off before it enters the waterbody. It also protects banks from erosion and provides storage area for flood waters.
-  **Permeable Pavement**
consists of a permeable surface that allows stormwater to pass through it into storage reservoir below rather than become run-off.
-  **Green Roofs**
are rooftops that include a covering of vegetation that enables rainfall infiltration and evapotranspiration of stored water. They can aid in stormwater management by reducing runoff and improving water quality.
-  **Bioretention**
is a water quality practice that utilizes landscaping and soils to treat stormwater runoff by collecting it in shallow depressions before filtering through a fabricated planting soil media.
-  **Waterway or Drain**
indicates a river confluence or nearby county drain.
-  **Stormwater Trees and Urban Canopy**
are trees in urban settings that intercept and absorb rainfall, reducing flow volumes. Their leaf canopies help reduce erosion caused by falling rain and provide surface area where rain lands and evaporates.



3. Moores Park Urban Canopy



2. Towar Rain Gardens



17. Michigan Ave Rain Gardens



15. Barnes Ave Permeable Pavement



4. Beal Gardens Riparian Buffer



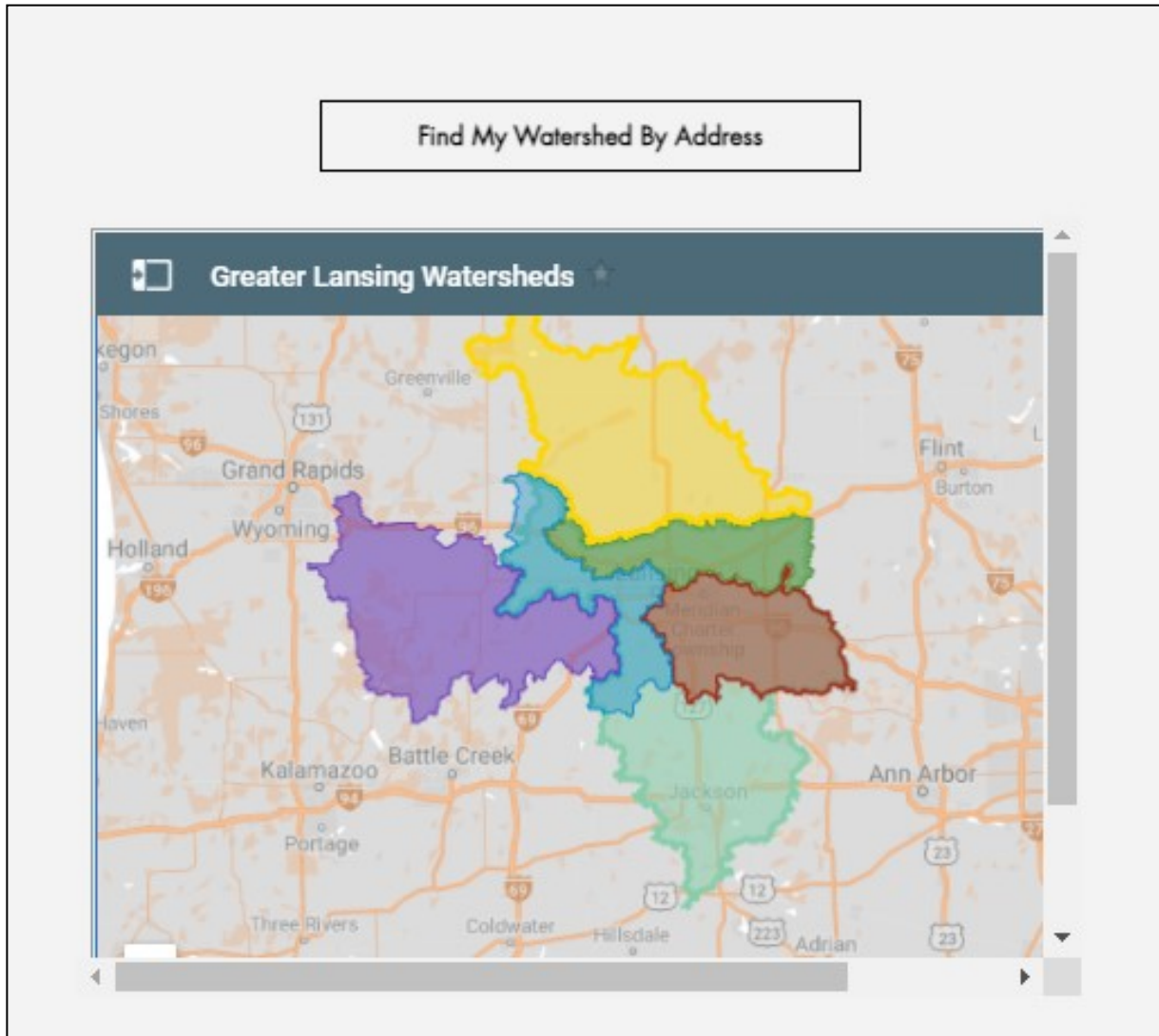
5. I.M Sports West Porous Asphalt

Watershed Tattoos – The GLRC added an additional “swag” item to distribute during the permit cycle: a temporary Middle Grand River watershed tattoo. Sized to fit a hand, it creates a geographically accurate depiction of the Middle Grand River watershed overlaid the Michigan “mitten”.



Color Changing Cups and Sport Water Bottles – In 2021 and 2022, the GLRC designed a reusable cup and sport water bottle for event giveaways. As the cup changes with the temperature of the water, it engages children and both promotional items allow for discussion on how the GLRC works to protect our water. These lasting items drive residents to the website, and the cups were also utilized by participants at the GLRC seminar in 2022.

Find My Watershed Tool – In 2019, GLRC developed a Find My Watershed Tool. Users can plug in their home address and see which watershed they live in and where they live within it. It also provides information about the watershed, links to 319 plans, and contact information for watershed organizations focused on stewardship within its boundaries. Survey results indicate that many residents do not know that they live in a watershed and this tool has made it easier for them to learn about the watershed they call home. This tool has been viewed 46,706 times since its debut.



General Outreach/Education Efforts – The GLRC Coordinator partners with several different groups, agencies, and organizations in the region. The following summarizes general collaboration and activities related to stormwater and pollution prevention:

Business Outreach: The GLRC has developed a variety of resources for local businesses to help educate them and staff on pollution prevention at their facilities and as part of their operations:

For Business Webpage – In 2020, a For Businesses webpage was developed to house outreach information particular to businesses and industrial facilities and flyers/posters detailing industrial BMPs. Since its debut, the page MyWatersheds.org/businesses has been viewed 192 times.

Business Mailing – In 2020 the GLRC is developed a mailable poster focused on business and industrial BMPs. This was mailed to industrial facilities and is available online for other businesses.

Business Posters – Ten posters/flyers focusing on business and industrial facilities were produced in 2020 and included on the GLRC For Business webpage. It includes facility management BMPs for salt usage, vehicle cleaning, landscaping, and more. They are designed to be utilized on break room bulletin boards and other public areas.

**STOP THE SPILLS
PREVENT POLLUTION**

As an industrial facility, you are responsible for all pollutants that leave your property and play a big role in keeping our waterways clean. Follow these tips to prevent spills at your facility and reduce stormwater pollution.

DO **DON'T**

- Inspect facilities yearly and perform maintenance activities as needed.
- Ensure floor drains and other drains are properly connected to sanitary sewer systems.
- Keep up-to-date maintenance and inspection records on-site.
- Train employees to respond to spills.
- Keep spill response kits in accessible locations throughout the facility, especially near areas where spills may occur.
- Consider purchasing drain cover seals to isolate areas to prevent spilled materials from entering the drainage system and local waterways.

- Don't leave chemicals and hazardous materials in open or loosely sealed containers. Store them in closed and labeled containers.
- Don't store chemicals and hazardous materials outside. Containers should be kept inside secure buildings and on impervious surfaces.
- Don't forget to wear appropriate protective equipment, such as gloves, goggles, and hazmat boots, when cleaning up a spill.
- Don't allow spills to enter storm drain systems. Report & monitor any spills to storm sewer or waterways to appropriate state and local authorities.

WHY IS THIS NECESSARY?
Rain that falls on and around your site can pick up trash, dirt, and chemical residue as it drains away. Much of this water, or stormwater, flows into storm drains before discharging directly into our lakes, rivers, and streams. It's one of the top causes of water pollution in the country. By keeping pollution off the ground, you prevent it from entering and impacting our waterways.

Business owners can do their part to keep Michigan's waterways clean.
Find more tips like these at www.MyWatersheds.org.

**IT'S TIME TO CURB
PARKING LOT POLLUTION**

As a business owner, you play an important role in keeping our waterways clean and healthy! Follow these tips to reduce polluted runoff, prevent flooding, and make a good impression with your customers.

DO **DON'T**

- Maintain storm drains and stormwater structures regularly and clean and repair as necessary.
- Sweep parking lots regularly to collect trash and debris.
- Provide covered trash cans, recycling bins, and cigarette butt receptacles in highly visible areas.
- Consider a dumpster enclosure, pad or fence around dumpsters.

- Don't wash vehicles in your parking lot. Use a car wash or vehicle wash bays that direct dirty wash water to the sewer, not storm drains.
- Don't leave dumpsters open.
- Don't let trash carts overflow.

WHY IS THIS NECESSARY?
Rain that falls on and around your site can pick up trash, dirt, and chemical residue as it drains away. Much of this water, or stormwater, flows into storm drains before discharging directly into our lakes, rivers, and streams. It's one of the top causes of water pollution in the country. By keeping pollution off the ground, you prevent it from entering and impacting our waterways.

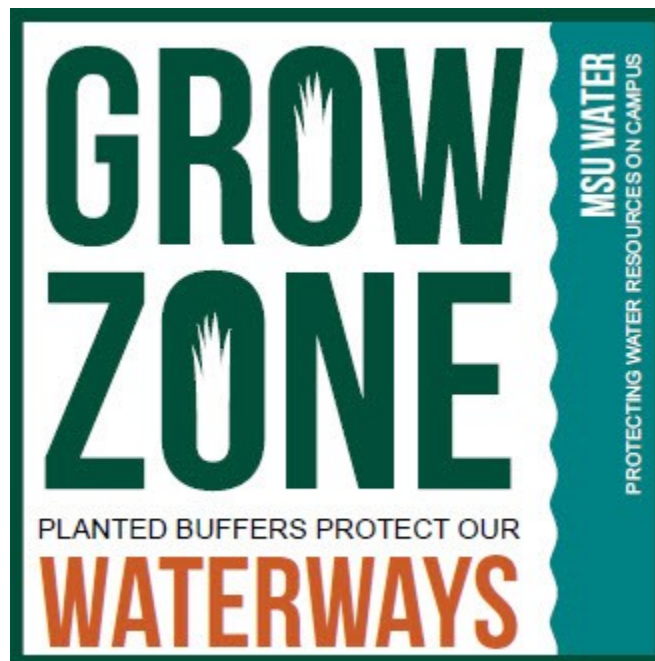
Business owners can do their part to keep Michigan's waterways clean.
Find more tips like these at www.MyWatersheds.org.

Customer Education Collaboration – The GLRC seeks to work with area businesses to educate their customers on stormwater pollution prevention:

- Between 2019 and 2021, the GLRC worked with the Capital Area Humane Society to provide 750 dog waste bag dispensers and pet waste brochures to be included in the adoption packets for new pet owners. These materials highlight the importance of picking up pet waste while providing owners with the tools needed to start good dog ownership habits. This relationship will continue.
- Throughout 2021, the GLRC worked with a group of MSU students to develop an educational campaign focused on car washes as the most environmentally-friendly choice for customers versus at-home car washing. The GLRC Coordinator met with the PEP Committee upon multiple occasions in 2022 to further refine the campaign, which will be implemented in 2023.
- In 2022, the GLRC Coordinator reached out to all developers in the region, as well as consulting engineering firms, to invite them to attend the free and public GLRC educational seminar on Stormwater Treatment in Clay Soils: Mechanical Devices or Nature-Based Solutions.

Campus Storm Drain Labeling – Catch basins across campus are labeled in order to bring awareness to the general public that storm drains flow to waterways of the state, and to not dump pollutants into the drains. Curb markers are checked each summer season, with approximately 300 labels replaced each year. EHS maintains records of the replacements.

Grow Zone Signs are maintained on campus to emphasize the importance of buffers for protecting waterways.



Sustainability Pledge - The MSU Office of Sustainability launched the MSU Sustainability Pledge in June 2020 as a means to engage all incoming students through New Student Orientation. At the start of the Fall 2020 semester, the pledge was expanded for faculty, staff and community members. The pledge incorporates sustainable actions that members of the Spartan Community can engage whether on campus or at home across seven categories: energy, water, food, health, transportation, waste and engagement. During this reporting period, 421 people have agreed to "protect the Red Cedar River or other waterways by not dumping anything down a storm drain" via the MSU Sustainability Pledge.



Illicit Discharge Elimination Program

The Illicit Discharge Elimination Program (IDEP) describes current and proposed Best Management Practices (BMPs) to meet the minimum control measure requirements to the Maximum Extent Practicable.

The following definitions apply to the IDEP:

- **Illicit Discharge:** Any discharge to, or seepage into, an MS4 that is not composed entirely of stormwater or uncontaminated groundwater except discharges pursuant to an NPDES permit.
- **Illicit Connection:** A physical connection to an MS4 that primarily conveys non-stormwater discharges other than uncontaminated groundwater into the MS4; or a physical connection not authorized or permitted by the local authority, where a local authority requires authorization or a permit for physical connections.

In addition to prohibiting illicit connections as part of the Plumbing Code in the University's Construction Standards, Standard Operating Procedures that prohibit illicit discharges into the University's storm sewer system are in place, and are under the purview of MSU's Office of Environmental Health and Safety (EHS).

All outfalls and points of discharge for the MSU campus have been documented. That information is available in **Appendix B**.

As part of the riverbank restoration work completed in 2020, outfalls 018 and 019 (south side riverbank, north of Spartan Stadium) were repaired and incorporated into the adjacent riverbank restoration work. No other outfalls have been modified or added during the permit reporting period. As part of the Farm Lane Bridge Replacement project, outfall 033 will be replaced/improved during the 2023 and 2024 construction season. The replacement is not enlarging or changing the current stormwater discharge - only improving the physical condition of the current outfall. The work will be completed under City of East Lansing SESC and EGLE construction permits.

IDEP Inspections and Corrective Actions

All MSU outfalls were located and screened for dry weather flow in 2022. In total, we sampled 12 outfalls that did have dry weather flow present. These outfalls were tested for pH and temperature in the field, and then sent to Brighton Analytical to test for E. coli, surfactants, ammonia, fluoride, and hardness. Three samples (outfalls 20, 22, and 53) tested with high levels of E. coli only. None of the other parameters were excessive. Those same outfalls were re-sampled in the first quarter of 2023 and came back with low or no levels of E.coli. These three outfalls will be re-checked in summer 2023 to verify that the E. Coli is not a continuing problem. At this point, no further investigation of illicit discharges is warranted.

The MSU Environmental Health and Safety (EHS) Office responds to all concerns or questions regarding potential illicit discharges to the Red Cedar River. Calls from the public and the campus community are routed from either the MSU Police or the IPF to the Environmental Compliance Office of EHS. The Environmental Compliance Office then makes a record with the time/date of the call and the nature of the concern. As soon as practicable, a staff member physically verifies any issues. If any discharges are noted, a sample is taken and analyzed, and further investigation is undertaken to determine the source of the discharge. If no issues are verified by the MSU staff, a note will be made on the record, and the

approximate location will be watched in the future to see if the issue arises again. Records of these calls and responses are maintained by the MSU EHS Department.

Illicit Discharge Concerns for this reporting period

Possible sheen on the river – 6/12/2021, 1:30pm. A call came into the EHS after-hours pager from the MSU Police cadet desk. A caller had stated that they observed a “weird sheen on the Red Cedar River near the Farm Lane Bridge.” MSU staff arrived on-site approximately 20 minutes later, but no sheen was observed at the time. A visual investigation of the river between Bogue Street and Kalamazoo showed nothing out of the ordinary on or near the river. This area was also checked the following Monday, 6/14/21, and nothing out of the ordinary was noted.

River Monitoring

MSU continues to collaborate with the Ingham County Health Department and other jurisdictions within the county on the Ingham County Surface Water Roundtable, which conducts weekly *E. coli* sampling throughout the Red Cedar River Watershed April-October. That data is available as a link from the MSU-WATER website.

IDEP Staff Training

In addition to online stormwater training that includes an illicit discharge detection component (see Good Housekeeping section), MSU staff members participated in IDEP training hosted by the GLRC on July 20, 2022.

Evaluation of IDEP Program

The MSU Stormwater Committee reviews the Illicit Discharge Program activities annually to discuss progress toward goals and necessary changes. The committee discussed its IDEP program on the following dates: Dec 1, 2021 and December 7, 2022.

Post Construction Stormwater Runoff

Post-construction stormwater runoff controls are necessary to maintain or restore stable hydrology in receiving waters by limiting surface runoff rates and volumes and reducing pollutant loadings from sites that undergo development or significant redevelopment. Under Michigan's MS4 stormwater permit, post-construction stormwater runoff from all new and redevelopment projects that disturb one acre or more, must meet the following stormwater discharge criteria:

- Treatment methods shall be designed on a site-specific basis to achieve discharge concentrations of total suspended solids (TSS) not to exceed 80 milligrams per liter (mg/l) resulting from up to one inch of rainfall.
- The channel protection criteria shall maintain post-development site runoff volume and peak flow rate at or below existing levels for all storms up to the 2-year, 24-hour event (2.42 inches).

Stormwater Design Standards and Off- Site Mitigation

The approach for MSU views the campus as one parcel with the Red Cedar River as its outlet. Each individual development or redevelopment project is required to evaluate a method of complying with the stormwater requirements at the site and prepare a cost estimate for construction, following the procedures in the MSU Stormwater Design Standards, which will then be submitted to the campus Stormwater Review Committee. The methodology used in the development for the design standards was vetted through EGLE staff in a series of meetings.

Projects that may alter the stormwater volume or peak-rate characteristics are tracked on a campus-wide basis and tabulated in a credit system or bank. Projects contributing to the bank will include demolition projects (e.g., buildings, parking lots, roadways) and stormwater improvement projects (e.g., porous pavement parking lots, bio-retention areas, etc.).

Recognizing that new projects located in highly developed zones of campus will have difficulty meeting the stormwater permit standards without incurring excessive costs or without resorting to impractical solutions such as stormwater pumping, the Stormwater Committee may recommend that a project use credits from the campus bank to meet its stormwater requirements under the new general permit. This decision will be made on a project by project basis after a site-specific evaluation and cost estimate has been completed. If a project applies for bank credits, the project may be charged a proportionate cost to help pay the capital costs associated with a larger, regional project that would be implemented to maintain the stormwater bank. Under the alternative approach, regional projects would have to demonstrate effectiveness of a 1.2 multiplier for all permit parameters over a site-specific solution. Larger development projects that have enough land area available for LID techniques that exceed their stormwater requirements may also contribute to the campus bank. If the offset bank has been expended and an offsite project is deemed necessary, the regional stormwater control project must be completed concurrently with the development or within one calendar year of substantial completion of the project.

Documentation of Existing System

The MSU IPF Division is responsible for maintaining the storm sewer maps and infrastructure records for the campus. All storm sewer pipes and structures have been mapped and documented in a Geographic Information System (GIS) database. The storm sewer pipes range in size from 12 inches to 84 inches and provide stormwater conveyance for approximately 2,200 acres of north campus. All storm sewer revisions completed on construction projects are recorded as the projects are completed so the GIS system stays current. A number of green stormwater infrastructure techniques have been implemented across the campus, including bioretention areas, green roofs and porous pavement. Proprietary treatment systems have been installed as well, including numerous stormwater separators located throughout campus and a nutrient separating baffle box that was installed at Birch and Wilson Roads.

Stormwater BMPs are tracked by MSU IPF. As required by the NPDES Stormwater Permit, the BMP and impervious summary for the reporting period is included as **Appendix C** of this report.

Site Specific Requirements

The Stormwater Committee is also responsible for reviewing the use of infiltration BMPs to meet the water quality treatment and channel protection standards for new development or redevelopment projects in areas of soil or groundwater contamination in a manner that does not exacerbate existing conditions. The committee meets monthly to discuss upcoming development projects, including proposed stormwater treatments options. Design review methodology discourages infiltration BMPs in areas of known soil or groundwater contamination. In these areas, alternative BMP designs are discussed and proposed.

The committee reviewed this procedure at its December 2021 and 2022 regular meeting. The committee maintains that the monthly meetings and ongoing discussions regarding these site-specific considerations is effective and appropriate.

Upcoming Activities

New BMPs that are slated to come online beyond this reporting period are included in the summary report, which is included as **Appendix C**.

Construction Stormwater Runoff

The Federal National Pollutant Discharge Elimination System (NPDES) Stormwater Program is part of the Clean Water Act administered by US Environmental Protection Agency. One aspect of this program addresses runoff from construction activities. Administration of the NPDES Stormwater Program in Michigan has been delegated to EGLE. These permit requirements specifically reference discharges from construction activities where the pollutants enter the MS4 owned or operated by the permittee and when the pollutants are in violation of any of the following:

- Section 9116 of Part 91 of the Michigan Act- *Sec.9116. A person who owns land on which an earth change has been made that may result in or contribute to soil erosion or sedimentation of the waters of the state shall implement and maintain soil erosion and sedimentation control measures that will effectively reduce soil erosion or sedimentation from the land on which the earth change has been made.*
- Michigan's Permit-by-Rule at R 323.2190(2)(a)- *Not directly or indirectly discharge wastes such as discarded building materials, concrete truck washout, chemicals, lubricants, fuels, liter, sanitary waste, or any other substance at the construction site into the waters of the state in violation of Part 31 of the Act or rules promulgated there under.*

Procedure to Ensure that Construction Activity One Acre or Greater in Total Earth Disturbance with the Potential to Discharge is Conducted by an Approved Authorized Public Agency

The University works with the City of East Lansing, Ingham County and Meridian Township, which are designated by EGLE as Authorized Public Agencies and Municipal Enforcing Agencies pursuant to Part 91. As such, campus development projects must obtain a Grading/Soil Erosion and Sedimentation Control permit from the City, County or Township. A number of staff members from the MSU IPF Division and AgBioResearch have successfully completed the Certified Stormwater Operator (CSWO) training and passed the CWSO/SESC Inspector exam. These individuals serve as the campus project representatives to ensure that all SESC requirements are met for new development projects.

Procedures to Ensure Adequate Allowance for Soil Erosion and Sedimentation Controls on Preliminary Site Plans, as Applicable:

The City's ordinance requirements provide for even more stringent requirements than required by EGLE, the most significant being that the minimum one-acre size limitation has been reduced to 6,000 square feet where the site is more than 500 feet from any lake, stream or drainage course or 225 square feet where the site is less than 500 feet from any lake, stream or drainage course.

As part of standard design and construction procedures on campus, staff members from IPF Planning, Design and Construction (PDC) or the AGBIORESEARCH review or prepare all Soil Erosion and Sedimentation Control Plan drawings and specifications. These documents are produced by a consultant or internally, PDC or AgBioResearch staff members begin site analysis in the Schematic Design stage or earlier. The SESC document is being produced by a consultant, they are provided with the SESC/Stormwater Discharge checklist and other information as appropriate.

The acreage of the project and proximity to surface waters determines whether the proposed construction will require a permit. If a permit is required, the site location determines the appropriate governing agency; City, County or Township. The SESC documents are reviewed by PDC or AgBioResearch staff, in cooperation with the appropriate governing agency, multiple times throughout the design process to ensure that the appropriate controls will be in place according to the specific site. Documents are put out for bid and PDC or AgBioResearch staff confirm that all necessary SESC devices and techniques are clearly located and quantifiable.

Throughout the construction process regular site visits are performed by PDC or AgBioResearch staff members, who are Certified Storm Operators.

All SESC documentation is available at IPF PDC or AgBioResearch as appropriate.

Procedures to Provide Notice When Pollutants Are Discharged from Construction Activities:

Where any pollutants are discharged from a construction activity in violation of any of the above noted statutes, to MSU's storm sewer system, the University will provide the following notifications:

- If soil, sediment or any other wastes that may adversely affect adjacent properties or public rights-of-ways, are discharged from a site, the University's CSWO assigned to that project location will notify the Authorized Public Agency within 24 hours of becoming aware of the discharge and consult with them regarding EGLE notification.
- If the University suspects that the discharge may endanger public health or the environment, the violation will be reported within 24 hours of becoming aware of the discharge. The CSWO assigned to that project location will work with the MSU Office of Environmental Health and Safety (EHS), which will ultimately report the discharge to EGLE.

Files are maintained by the City of East Lansing.

Procedures for the Receipt and Consideration of Complaints or Other Information Submitted by the Public Regarding Construction Activities Discharging Wastes to the MS4:

The University's CSWOs from the IPF and AgBioResearch inspect all permitted construction sites on a regular basis. As part of the Public Education Plan activities, individuals will be instructed to contact the IPF main dispatch number at 517-353-1760 with concerns about construction activity discharges. If a complaint is received dispatch operators will then notify the CSWO assigned to that location for immediate review. All complaints will be reviewed by no later than the next business day after receipt. Any action required by the contractor will be processed immediately.

Pollution Prevention and Good Housekeeping Program

The NPDES stormwater requirements stress the importance of developing proper pollution prevention procedures and maintaining good housekeeping practices on municipal property.

Municipal operations cover a wide variety of activities and land uses that are potential sources of stormwater pollutants. These include, but are not limited to roadways; parking lots; transportation and equipment garages; fueling areas; warehouses; stockpiles of salt and other raw materials; open ditches and storm sewers; turf and landscaping for all municipal properties, including parks; and waste handling and disposal areas.

IPF Landscape Services has developed Good Housekeeping and Pollution Prevention Standard Operating Procedures. That document is included as **Appendix D**. In addition, operating procedures pertaining to specific requirements in the stormwater permit are included below.

High-Priority Sites

The MSU Stormwater Committee identified the following facilities as high-priority:

- 1) MSU Transportation Services
- 2) MSU Surplus Store & Recycling Center
- 3) Forest Akers Golf Course Maintenance Facility.

MSU maintains separate Stormwater Pollution Prevention Plans (SWPPP) for these facilities. MSU EHS conducts monthly housekeeping inspections at each of these locations, looking specifically at areas of high concern (e.g., fuel tanks, outdoor storage, etc.). In addition, EHS staff also conduct quarterly comprehensive site inspections at each location to verify that the entire site is in compliance with the SWPPP. Inspection records are available at EHS.

Medium-and Low-Priority Sites

MSU's parking lots and parking ramps have been identified by the Stormwater Committee as medium-priority facilities. For these and the remaining facilities identified as lower-priority sites, standard operating procedures as included in the GLRC "Good Housekeeping and Pollution Prevention for Municipal Activities" guide as well as procedures documented in the SWMP.

Structural Stormwater Control Operation and Maintenance Activities

Landscape Services is responsible for collecting and disposing of debris and wastes from MSU's sewer and catch basin cleaning; street sweeping and other sources of pollution that may otherwise be discharged into the separate stormwater drainage system. MSU's Office of Environmental Health and Safety (EHS) oversees compliance with Part 121 rules dealing with liquid industrial wastes, including ensuring that contractors meet all applicable requirements. The IPF Division is responsible for ensuring compliance with Part 115 solid waste disposal.

Collections for this reporting period are listed below:

- In 2021: 958 catch basins were serviced, with 433,360 lbs. of debris collected. No oil separators required service.
- In 2022: 240 catch basins serviced, with 56,420 lbs. of debris collected. 22 oil separators were serviced, with 2000 lbs. of water/slurry removed.

Municipal Operations and Maintenance Activities

IPF staff members have developed a stormwater facilities inspection spreadsheet that includes various BMPs and routine inspection and maintenance tasks for each. IPF also maintains a map of BMPs, with an accompanying spreadsheet to document inspection and maintenance dates and labor hours for each BMP. The spreadsheets are housed on the IPF server.

Currently 47 stormwater devices are being inspected and maintained by MSU IPF Landscape Services at a minimum of one visit per year. A Landscape Architect from Planning Design and Construction and the GIS Analyst from Landscape Services conduct bi-annual inspections as well. Each device has been assigned an equipment number which is used to track costs of inspection and maintenance. A map-based mobile application, typically used on iPhones, is being used in the field to track scheduled inspection and maintenance activities such as debris removal, invasive plant eradication and mowing. This application allows the user to locate items on an interactive map that are scheduled for maintenance or inspection. Elements (Equipment) are only highlighted when they are due for an action.

MSU currently has 22 oil separators, all of which were cleaned in 2022. Absorbent socks are replaced in the spring and the fall. Inspection and maintenance records are available in the Collector App.

Street Sweeping, Parking Lot, Sidewalk and Bridge Maintenance

Landscape Services is responsible for sweeping streets and parking lots on the MSU campus. All equipment is maintained on a fixed schedule; streets and parking lots are currently swept a minimum of two times per year. Structures are swept monthly and washed annually or as needed. Sweepings are stored in a roll-off bin and hauled to an approved landfill. No street sweepings are composted. Parking lots are swept on a regular basis following the street sweeping rotating schedule.

- In 2021, 169,410 lbs. of debris were collected from the streets and parking lots
- In 2022, 286,800 lbs. of debris were collected from the streets and parking lots
- Debris was placed in ten-yard dumpsters and hauled away to the local landfill.

Cold Weather Operations

Snow and ice removal on the Michigan State University campus is a major priority of MSU Landscape Services. Documentation for this reporting period includes:

- Over the 2021-2022 snow season 2,065 tons of salt were applied, in addition to 65,903 gallons of salt brine.

Employee/Contractor Training Related to Stormwater Management Activities

MSU has an online stormwater training program in place through Ability Training Compliance (On the MSU EBS Portal). The training program includes three (3) sections: Stormwater Protection (45 min.), SPCC/PIPP Management (30 min.) and Wellhead Protection Program (30 min.). MSU-specific information is included at the end of the training videos, as well as a short quiz. The Stormwater Protection segment is mandatory for all Landscape Services staff. Farm Managers complete Stormwater Training on a regular basis.

During this reporting period, 181 people completed the stormwater training, and 336 completed the SPCC/PIPP training. Documentation is maintained by EHS.

MSU staff members leading stormwater maintenance activities are required to retain a Soil Erosion and Sediment Control Certification with the State of Michigan. A Certified Stormwater Operator regularly inspects construction sites for stormwater deficiencies and generates documentation for each inspection.

Contractor training pertaining to stormwater is required of all sub-contractor field personnel. These contractors are required to annually review and monitor the policies and practices relating to reporting of health, safety and environment, and incidents with respect to employees, facilities and operations, in compliance with applicable laws and regulations in Michigan.

Managing Vegetated Properties

University employees who apply pesticides and fertilizers are required to possess a valid commercial applicator's license from the State of Michigan. As part of the continuing education/recertification requirements, employees are trained in proper storage, handling and use of pesticides, herbicides, and fertilizers on the MSU campus. All full-time staff receive funding to attend conferences and seminars for continuing education credits.

A new artificial turf complex called "Spartan Greens" was built on Service Road. Stone mulch is being utilized in many locations around campus. Some examples include the Business College, locations near the green houses, ITSB Courtyard, Breslin Center, and the Surplus Store.

South Campus Farms

All of the South Campus Farms have obtained and continue to operate under the Michigan Agricultural Environmental Assurance Program (MAEAP) through MDARD. This program promotes overall environmental protection, which includes nutrient management through an extensive Comprehensive Nutrient Management Program (CNMP).

An extensive field tiling system is managed and maintained to provide land drainage for enhanced crop production and agronomic research opportunities.

Grassed waterways and vegetative strips are utilized whenever feasible for stormwater conveyances.

Septic systems are maintained on a regular basis and are replaced with sanitary sewer connections whenever feasible.

Total Maximum Daily Load

Section 303(d) of the federal Clean Water Act (CWA) and the United States Environmental Protection Agency's (USEPA) Water Quality Planning and Management Regulations (Title 40 of the Code of Federal Regulations, Part 130) requires states to develop Total Maximum Daily Loads (TMDLs) for water bodies that are not meeting water quality standards. A TMDL was established by EGLE for portions of the Red Cedar River and subsequently approved by the USEPA. A TMDL establishes the allowable level of pollutants for a water body based on the relationship between pollution sources and in-stream water quality conditions. TMDLs provide a basis for determining the pollutant reductions necessary from both point and nonpoint sources to restore and maintain the quality of water resources.

The State of Michigan has officially established the limits for its *E.coli* TMDL to be a concentration-based standard as follows: "For this TMDL, the WQS of 130 *E.coli* per 100mL as a 30-day geometric mean and 300 *E.coli* per 100mL as a daily maximum to protect the TBC use are the target levels for the TMDL reaches for May 1 through October 31, and 1,000 *E.coli* per 100mL as a daily maximum year-round to protect the PBC use."

Procedure for identifying and prioritizing BMPs currently being implemented or to be implemented during the permit cycle to make progress toward achieving the pollutant load reduction requirement the TMDL

The MSU Stormwater Committee reviewed the EGLE document entitled *Total Maximum Daily Load for E. coli in Portions of the Red Cedar River and Grand River Watersheds* as well as the *Red Cedar River 319 Watershed Management Plan*, which was approved by the EGLE and USEPA in 2015, to set priorities for the *E. coli* TMDL implementation. Available monitoring data was also reviewed. The committee meets on a monthly basis, annually assesses progress in meeting TMDL requirements, and directs management strategies to address sources and causes of bacterial loading.

Monitoring conducted by the Ingham County Health Department and the 319 watershed project showed that bacteria were present during both dry and wet weather events throughout the watershed. Pollution presence during certain weather conditions can be indicative of the sources of the pollution. Based on work in the mid-Michigan area and elsewhere, dry weather sources of *E.coli* throughout the Red Cedar River Watershed may potentially be attributed to such things as leaky septic tanks, illicit connections, livestock, wildlife and regrowth of bacteria. Wet weather sources of *E.coli* are often associated with overland runoff. Source tracking in the Red Cedar 319 project showed the presence of both equine and bovine DNA in a majority of the subwatersheds analyzed.

Monitoring plan for assessing the effectiveness of the BMPs currently being implemented or to be implemented, in making progress toward achieving the TMDL pollutant load reduction requirement, including a schedule for completing the monitoring.

In addition to IDEP low-flow sampling, MSU participates in the ongoing sampling and monitoring program established by the Ingham County Health Department (ICHHD) in 2004. The ICHHD currently samples at 10 sites along the Red Cedar River, including sites at S. Hagadorn Road; Farm Lane Road; S. Harrison Road; and Kalamazoo Street. Sample results are available online.

Along with this continued in-stream weekly monitoring during the recreation season, wet-weather, end-of-pipe sampling was conducted in October 2020 within five subwatersheds on the MSU campus to comply with TMDL requirements: the drainage areas for outfalls 33, 37, 41, 42, 53. Those subdistricts encompass the campus academic core with continued development and expansion. In addition, subdistrict 53 includes drainage from the south campus farms area. Together, these subdistricts represent 78% of the main campus land area. A map of these areas is included as **Appendix E**.

A second round of sampling is planned for the 2023 sampling season.

Summary

The University is committed to continuing its commitment to managing campus water resources in a holistic manner. A watershed management plan was developed for the Red Cedar River Watershed, with an emphasis on *E. coli* bacteria. MSU faculty, students and staff members are working with numerous local partners in this effort. Along with those broader, watershed-wide efforts, good working relationships have developed among the members of the Greater Lansing Regional Committee for Stormwater Management (GLRC), and MSU will continue to be a full partner with these communities in the urbanized portion of the watershed as a member of this organization. In addition, the campus Stormwater Committee, comprised of staff members from multiple service units and departments, continues to emphasize an integrated approach to managing stormwater on campus.



APPENDIX A

MSU Stormwater Roles and Responsibilities

MSU Stormwater Management Roles and Responsibilities 2023

Environmental Health and Safety – (Kevin Eisenbeis and Mary Lindsey)

- Approve and sign off on all permit applications and related documents
- Coordinate low flow outfall screening once per permit cycle
- Maintain all outfall chemical testing files and ensure follow up with IPF at suspect outfalls
- Maintain IDEP database
- Direct drain marker program – maintain database and ensure annual reconnaissance
- Regularly inspect all facilities with a Stormwater Pollution Prevention Plans (currently Transportation Services, Recycling Center and Surplus Store and Golf Course Maintenance Facility)
- Respond to discharges and complaints about the river and track in database
- Meet illicit discharge reporting requirements for off campus properties in urbanized areas
- Work with AgBioResearch as related to manure and nutrient management requirements
- Work with IPF to ensure compliance with stormwater runoff from construction sites
- Serve on stormwater committee (Mary Lindsey)

MSU-IWR with BAE, Horticulture and other academic departments (Ruth Kline-Robach)

- Manage/coordinate campus stormwater activities with EHS
- Ensure active role of MSU in Greater Lansing Regional Committee activities
- With input from all service units, write permit applications and annual reports
- Update Stormwater Management Program as needed
- Serve as liaison with EGLE representatives
- Conduct research and report on BMP/LID technique efficacy
- Plan and host outreach events, coordinate stormwater public education efforts
- Link with local 319 watershed planning efforts
- Work with faculty to incorporate service learning and additional course work featuring the river and stormwater controls
- Serve on stormwater committee

Infrastructure Planning and Facilities (IPF) – Planning, Design and Construction (Dave Wilber, John LeFevre and Scott Gardner)

- Ensure compliance with post construction controls and stormwater design standards for all new development projects
- Maintain offset database for post construction controls
- Annually, complete offset database summary
- Maintain accounts and track budgets for long term maintenance of stormwater BMPs
- Maintain central file sharing service (accessible by all service units) for all stormwater-related documents
- Survey General Fund buildings for illicit connections and prioritize corrective actions
- Track BMP maintenance schedules
- Maintain storm drain maps, sewershed maps and outfall database
- Provide design guidance to outside consultants working on capital projects to maintain adherence to the stormwater design standards
- Provide design guidance on alternative approaches when deemed appropriate by the stormwater committee
- Maintain the stormwater design standards accessible on the EAS website
- Serve on stormwater committee (Wilber and Lefevre)

IPF Campus Planning (Steve Troost)

- Link stormwater and wellhead protection planning with University Facilities and Land Use Plan
- Coordinate with PDC and AgBioResearch to ensure land base for future stormwater controls
- Serve on stormwater committee

IPF Landscape Services (Matt Bailey)

- Inspect and maintain structural and nonstructural stormwater BMPs
 - Rain gardens and vegetated roofs, Landscape Bed Chemical Application (Paul Harper, Scott Feick, Josh Ridner)
 - Riparian zones, wetlands, detention ponds, low-mow zones (Paul Harper, Scott Feick, Josh Ridner)
 - Pervious pavement, catch basins, storm separators (Matt Fehrenbach)
- Document and follow Good Housekeeping procedures, including street sweeping, fertilizer and pesticide applications, snow and ice removal and other items in the SWMP (Matthew Bailey and Paul Harper)
- Mandate stormwater training for selected staff members at least once per permit cycle (Matthew Bailey)
- Serve on stormwater committee (Matt Bailey)
- Tree Chemical Application (Jerry Wahl)

IPF (Misc) –

- Chair stormwater committee to review stormwater controls (John LeFevre)
- Inspect/track Soil Erosion and Sedimentation Control permits to ensure compliance with stormwater regulations (Jeff West – Interim)
- Track grease trap cleaning at all campus cafeterias (Shawn Kelly)
- Ensure regular sanitary sewer maintenance and cleaning (Sam Fortino)
- Maintain Lift Stations (Sam Fortino)
- Include stormwater in training activities (e.g., Contractors and Consultants Forum) (Leisa Williams-Swedberg)
- Include stormwater on IPF website (Fred Woodhams)

IPF Power and Water

- Coordinate campus Wellhead Protection Program and complete updates every six years (Sherri Jett with Ruth Kline-Robach)
- Consider linkages with stormwater permit requirements

AgBioResearch (Ben Darling, Jolene Bott)

- Ensure compliance with stormwater standards for areas of new development
- Ensure good housekeeping and recordkeeping practices on south campus to comply with stormwater regulations
- Maintain MAEAP certification for south campus farms
- Mandate stormwater training for farm managers at least once per permit cycle
- Mandate regular septic system maintenance and develop/maintain database
- Maintain structural and nonstructural BMPs and track in database
- Coordinate Soil Erosion and Sedimentation Control permits obtained for the South Campus Farms, with IPF, to ensure compliance with stormwater regulations
- Manage stormwater conveyances and field tile systems on south campus
- Liaison with Ingham County Road Dept and Drain Commissioner
- Serve on stormwater committee (Ben Darling, Jolene Bott)

Forest Akers Golf Course (Ben Keeler)

- Ensure good housekeeping practices for stormwater control
- Mandate stormwater training for selected staff members at least once per permit cycle
- Track BMP maintenance
- Track fertilizer applications

Athletics (Andy Flynn)

- Ensure good housekeeping practices for stormwater control
- Track fertilizer applications
- Mandate stormwater training for selected staff members at least once per permit cycle

Campus Sustainability (Interim-Laura Young)

- Include stormwater information on Be Spartan Green website, and include links to other sources of stormwater information
- Periodically track University-owned rolloff bins for proper use (Kris Jolley)

Residential and Hospitality Services (Joe Petroff and Carla Iansiti)

- Mandate stormwater training for selected staff members at least once per permit cycle
- Regularly clean grease traps and work with IPF to track in database
- Encourage additional training for RHS Environmental Stewards

MSU Police (Stephanie O'Donnell)

- Incorporate stormwater controls into MSU parking system
- Serve on stormwater committee

MSU Stormwater Committee Members:

John LeFevre (Chair), Dave Wilber, Steve Troost, Matt Bailey, Paul Harper, Mary Lindsey, Jeff West, Ben Darling, Ruth Kline-Robach, Jolene Bott

MSU Stormwater Committee Responsibilities

- Meet monthly to review and approve stormwater control designs for new development projects
- Forward approvals to Campus Planning and Infrastructure Work Group
- Periodically review offset database to ensure compliance with Post Construction Controls Alternative Approach agreement with MDEQ
- Review and approve offset database summary annually
- Discuss and address campus stormwater permit issues pertaining to the federal stormwater regulation's six minimum measures:
 - 1) Public Education
 - 2) Public Involvement
 - 3) Illicit Discharge Detection and Elimination
 - 4) Construction Stormwater Runoff
 - 5) Post Construction Stormwater Runoff
 - 6) Pollution Prevention and Good Housekeeping

APPENDIX B
MSU Stormwater Outfalls

| Michigan State University Stormwater Management Program | | | | | | | |
|---|---------------|-----------|----------|-----------|-----------|-------------------------------------|---|
| Stormwater Outfalls | | | | | | | |
| Shaded outfalls are either abandoned or not owned by MSU. | | | | | | | |
| Outfall Number | Diameter (in) | Owner | *Easting | *Northing | Status | District | Comment |
| 1 | 36 | E Lansing | 13088057 | 448212 | Active | | Outside Campus boundary |
| 2 | 27 | MSU | 13088115 | 448196 | Active | Red Cedar River Via Campus Outfalls | |
| 3 | 10 | MSU | 13088438 | 448183 | Active | Red Cedar River Via Campus Outfalls | |
| 5 | 15 | MSU | 13088950 | 448175 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 6 | 12 | MSU | 13089106 | 448222 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 7 | 12 | MSU | 13089171 | 448228 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 8 | 18 | MSU | 13089511 | 448273 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 9 | 42 | MSU | 13089632 | 448673 | Active | Red Cedar River Via Campus Outfalls | |
| 10 | 10 | MSU | 13089353 | 449264 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 11 | 10 | E Lansing | 13089304 | 449398 | Active | | Diameter per 2002 report, not listed in GIS |
| 12 | 36 | MSU | 13090892 | 449226 | Active | Red Cedar River Via Campus Outfalls | |
| 13 | | MSU | | | Abandoned | | Replaced by Outfall 87 |
| 14 | 10 | MSU | 13090912 | 448937 | Active | Red Cedar River Via Campus Outfalls | |
| 15 | 6 | MSU | 13090946 | 448893 | Active | Red Cedar River Via Campus Outfalls | |
| 16 | 30 | MSU | 13091056 | 448884 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 17 | 18 | MSU | 13091184 | 448775 | Active | Red Cedar River Via Campus Outfalls | |
| 18 | 6 | MSU | 13091150 | 448695 | Active | Red Cedar River Via Campus Outfalls | |
| 19 | 15 | MSU | 13091346 | 448542 | Active | Red Cedar River Via Campus Outfalls | |
| 20 | 36 | MSU | 13091485 | 448410 | Active | Red Cedar River Via Campus Outfalls | |
| 21 | 15 | MSU | 13091865 | 448261 | Active | Red Cedar River Via Campus Outfalls | |
| 22 | 6 | MSU | 13091876 | 448160 | Active | Red Cedar River Via Campus Outfalls | |
| 23 | 12 | MSU | 13092597 | 447790 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 24 | 10 | MSU | 13092599 | 447701 | Active | Red Cedar River Via Campus Outfalls | |
| 25 | | | | | Abandoned | | Replaced by Outfall 56 |
| 26 | 24 | MSU | 13092766 | 447707 | Active | Red Cedar River Via Campus Outfalls | |
| 27 | 12 | MSU | 13092813 | 447575 | Active | Red Cedar River Via Campus Outfalls | |
| 28 | 12 | MSU | 13092903 | 447531 | Active | Red Cedar River Via Campus Outfalls | |
| 29 | 6 | MSU | 13092918 | 447623 | Active | Red Cedar River Via Campus Outfalls | |
| 30 | 12 | MSU | 13092966 | 447607 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 31 | | MSU | 13093194 | 447406 | Active | Red Cedar River Via Campus Outfalls | BMP overflow- Unknown Diameter |
| 32 | 18 | MSU | 13093318 | 447451 | Active | Red Cedar River Via Campus Outfalls | |
| 33 | 18 | MSU | 13093284 | 447372 | Active | Red Cedar River Via Campus Outfalls | |
| 34 | | | | | Deleted | | Farm Lane bridge abutment-not an outfall |
| 35 | | | | | Deleted | | Farm Lane bridge abutment-not an outfall |
| 36 | 8 | MSU | 13088718 | 448111 | Active | Red Cedar River Via Campus Outfalls | |
| 37 | 72 | MSU | 13088977 | 448100 | Active | Red Cedar River Via Campus Outfalls | |
| 38 | 24 | MSU | 13089735 | 448334 | Active | Red Cedar River Via Campus Outfalls | |
| 39 | 18 | MSU | 13089727 | 448555 | Active | Red Cedar River Via Campus Outfalls | |
| 41 | 36 | MSU | 13093525 | 447419 | Active | Red Cedar River Via Campus Outfalls | |
| 42 | 36 | MSU | 13093536 | 447324 | Active | Red Cedar River Via Campus Outfalls | |
| 43 | 18 | MSU | 13093843 | 447297 | Active | Red Cedar River Via Campus Outfalls | |
| 44 | 15 | MSU | 13094000 | 447409 | Active | Red Cedar River Via Campus Outfalls | |
| 45 | 12 | MSU | 13094066 | 447419 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 46 | 18 | MSU | 13094320 | 447369 | Active | Red Cedar River Via Campus Outfalls | |
| 47 | 10 | MSU | 13094299 | 447469 | Active | Red Cedar River Via Campus Outfalls | |
| 48 | 10 | MSU | 13094342 | 447482 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 49 | 30 | MSU | 13094476 | 447527 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 50 | 12 | MSU | 13094514 | 447426 | Active | Red Cedar River Via Campus Outfalls | |
| 51 | 12 | MSU | 13094957 | 447663 | Active | Red Cedar River Via Campus Outfalls | Serves bogue street/EL ROW |
| 52 | 24 | MSU | 13095131 | 447583 | Active | Red Cedar River Via Campus Outfalls | |
| 53 | 84 | MSU | 13097636 | 447649 | Active | Red Cedar River Via Campus Outfalls | Diameter per 2002 report, not listed in GIS |
| 54 | 18 | MSU | 13091771 | 448214 | Active | Red Cedar River Via Campus Outfalls | |
| 55 | 21 | MSU | 13089685 | 448367 | Active | Red Cedar River Via Campus Outfalls | Sanitary Sewer |
| 56 | | MSU | 13092704 | 447735 | Active | Red Cedar River Via Campus Outfalls | Diameter not listed in GIS |
| 57 | 24 | MSU | 13093359 | 447439 | Active | Red Cedar River Via Campus Outfalls | Sanitary Sewer |
| 58 | 84 | MSU | 13089306 | 449405 | Active | Red Cedar River Via Campus Outfalls | Sanitary Sewer |
| 59 | 28 | MSU | 13088450 | 448185 | Active | Red Cedar River Via Campus Outfalls | Sanitary Sewer |
| 60 | 12 | MSU | 13092404 | 447921 | Active | Red Cedar River Via Campus Outfalls | |
| 61 | | MSU | | | Abandoned | | |
| 62 | | MSU | | | Abandoned | | Sanitary Sewer |
| 63 | | MSU | 13089611 | 448739 | Deleted | | Bridge abutment, not an outfall |
| 64 | | MSU | 13089681 | 448761 | Deleted | | Bridge abutment, not an outfall |
| 65 | | E Lansing | 13089601 | 449535 | Active | | |
| 66 | | MSU | | | Abandoned | | |
| 67 | | MSU | | | Abandoned | | |
| 68 | | MSU | | | Abandoned | | |
| 69 | | MSU | | | Abandoned | | |
| 71 | | MSU | | | Abandoned | | |
| 72 | | MSU | 13091906 | 448250 | Deleted | | Bridge abutment, not an outfall |
| 74 | | E Lansing | | | Abandoned | | Sanitary Sewer |
| 75 | | E Lansing | 13089828 | 449582 | Active | | |
| 76 | | MSU | | | Abandoned | | |
| 77 | | MSU | | | Abandoned | | |
| 78 | | MSU | | | Abandoned | | |
| 79 | | MSU | | | Abandoned | | |
| 80 | | E Lansing | | | Active | | |
| 81 | | E Lansing | | | Active | | |
| 82 | | E Lansing | | | Active | | |

| Outfall Number | Diameter (in) | Owner | *Easting | *Northing | Status | District | Comment |
|---|---------------|-----------|----------|-----------|--------|-------------------------------------|--|
| 83 | | E Lansing | | | Active | | |
| 84 | | E Lansing | | | Active | | |
| 85 | | E Lansing | | | Active | | |
| 86 | | MSU | 13089187 | 448164 | Active | Red Cedar River Via Campus Outfalls | Added-Diameter not listed in GIS |
| 87 | | MSU | 13090967 | 448956 | Active | Red Cedar River Via Campus Outfalls | Added - previously inadvertently omitted |
| 88 | 6 | MSU | 13091977 | 448102 | Active | Red Cedar River Via Campus Outfalls | Added - previously inadvertently omitted |
| 89 | 6 | MSU | 13092127 | 448023 | Active | Red Cedar River Via Campus Outfalls | Added - previously inadvertently omitted |
| 90 | | MSU | 13092248 | 447933 | Active | Red Cedar River Via Campus Outfalls | Added-Diameter not listed in GIS |
| 91 | 4 | MSU | 13089449 | 449041 | Active | Red Cedar River Via Campus Outfalls | Added - previously inadvertently omitted |
| 92 | | MSU | 13087685 | 447712 | Active | Red Cedar River Via Campus Outfalls | Added-Diameter not listed in GIS |
| 93 | 24 | MSU | 13089207 | 444507 | Active | Service West | Added - previously inadvertently omitted |
| 94 | 78 | MSU | 13087544 | 444503 | Active | Spartan Village | Added - previously inadvertently omitted |
| 95 | Open Drain | MSU | 13086232 | 440994 | Active | Red Cedar Tributary | Added per 2010 Urban Area |
| 96 | 18 | MSU | 13087642 | 430674 | Active | Pawloski Creek/Banta Drain | Added per 2010 Urban Area |
| 97 | 12 | MSU | 13091002 | 426355 | Active | Sycamore Creek | Added per 2010 Urban Area |
| * Coordinates are provided per MSU base map in Michigan State Coordinate System South Zone, NAD 83 (US Ft). | | | | | | | |
| | | | | | | | |

APPENDIX C
MSU Impervious Coverage

Table 1
Impervious Change Summary
2021-2022

| Year | Project Number and Name | Watershed | Outfall | Project area (AC) | Pre-construction Impervious Area (AC) | Post-construction Impervious Area (AC) | Net Impervious Discharge Change (AC) | Area Treated for 80% TSS (AC) | Comments |
|---|--|-----------|--------------|-------------------|---------------------------------------|--|--------------------------------------|-------------------------------|--|
| Projects in Planning, Design or Under Construction | | | | | | | | | |
| 2023-24 | CP23017 IM West Outdoor Pool Demo | RC | 20 | | | | | | TBD Removing outdoor pool |
| 2024 | PR222914 IPF Storage Bldg | RC | 37 | | | | | | TBD |
| 2024 | CP22084 Plant and Env Science -new bldg | RC | 42 | | | | | | TBD |
| 2023 | CP21010 Parking lot 62 (IM West) | RC | 20 | | | | | | minimal storage due to close proximity to river. (2) pretreatment chambers, rain garden |
| 2023-26 | CP21088 Student Rec and Wellness | RC | 37 | | | | | | underground storage/infiltration, rain gardens |
| 2023 | CP21062 Duffy Daugherty SAAC | RC | 37 | 3.3 | 1.87 | 2.53 | 0 | 0.66 | underground storage/infiltration, rain garden |
| 2023 | CP19101 Multicultural Center | RC | 42 | | | | | | minimal storage due to close proximity to river |
| 2024 | CP19012 Bogue-Service intersection | RC | 53 | | | | | | TBD, Anticipate an overall reduction in impervious. Removal of parking. Existing large scale Bay Saver Hydrodynamic Separator within project limits. |
| 2025 | Shaw Lane Reconstruct . Harrison to Chestnut | | | | | | | | remove boulevard |
| 2023-24 | CP18107 Farm Lane Bridge and Utilities | RC | 32,33, 41,42 | | | | | | TBD |
| | Sub Total in Design or Under Construction | | | | | | 0.00 | 0.66 | |
| Completed in 2021-2022 | | | | | | | | | |
| 2021 | CP20013 TechSmith Private Office Building | SV | 94 | 5.04 | 0.04 | 3.06 | 0 | 3.02 | Subsurface infiltration system. Rain Garden/Vegetated Swale. Weighted Runoff Coefficient, C=0.67 |
| 2022 | CP18024 Engineering Activities Center | RC | 53 | 1.89 | 0 | 0.81 | 0 | 0.81 | Two dry detention ponds |
| 2022 | CP21061 Service rd Fields - Spartan Green | RC | 53 | 8.32 | 0.08 | 6.15 | -2.32 | 8.27 | hydrodynamic separator and underground storage/infiltration treats a portion of adjacent parking lot (lot 91) |
| 2022 | modification to Surplus and Recycling lot | RC | 53 | | | | 0.57 | -0.57 | removed porous bituminous pavement due to deterioration replaced with impervious Bituminous pavement. 30% continues to drain to raingarden/swale |
| | Sub Total - 2021-2022 | | | | | | -1.75 | 11.53 | |
| | Sub Total - 2008-2020 | | | | | | -15.19 | 224.42 | |

| KEY |
|-----------------------------------|
| RC = Red Cedar via campus outfall |
| PC = Pawlowski Creek |
| RCC = Red Cedar Area C |
| HC = Herron Creek |

Total change since 01/01/2008 **-16.94 235.95**

Note: Runoff Coefficients (C-Values) are based on MSU Storm Water Design Standards, Table 9 - Rational Method Runoff Coefficients.

APPENDIX D

MSU Good Housekeeping/Pollution Prevention Standard Operating Procedures

2023 Good Housekeeping and Pollution Prevention Activities Infrastructure Planning and Facilities - Landscape Services

Oversight by: Matt Bailey

Controls used for Reducing/Eliminating the Discharge of Pollutants from Streets, Roads, Highways, Parking Lots & Maintenance Garages

- **What types of BMPs are used for the following activities: (Jonckheere)**
 - Concrete Cutting – contractors utilize a wet-saw and shop vac areas when completed
 - Sidewalk Repairs – contractors install silt-sacks in CB's, erosion eels at low points in walks to reduce run-off.
 - Asphalt Patching – contractors install silt-sacks in CB's, erosion eels at low points in pavement as necessary.
 - Curb and Gutter Repair – contractors install silt-sacks in CB's, erosion eels as needed.

Catch Basin Cleaning (how many are owned, cleaning schedule, targeted areas, tracking, and record keeping) (Harper)

- Utilize CB Inspection and CB Cleaning Collector Application.
- Inspect all CB's on an annual basis to determine amount of debris in sump. If sump is more than half full, schedule CB for cleaning.
- Clean identified CB's as needed and record total amount of debris collected on an annual basis and add to spreadsheet located: L:Lawver/Hard Surface Crew Documents/Catch Basin Cleaning/ CB Cleaning Volume History
- CB's located within construction sites are monitored by the SESC plan and inspected post construction. If sumps are more than 50% full, CB is scheduled for cleaning.
- CB cleaning contractor utilizes Collector app to locate and document cleaning activities. Detailed invoices are maintained at IPF Landscape Services.
- History of when each structure was cleaned and inspected for past couple of years were uploaded into CB Cleaning app.

Oil/Water Separator Cleaning (maintenance procedures, disposal of waste, record keeping) (Harper)

- Maintenance Procedures- See Appendix 6 in SWPPI
- Waste is disposed of in two ways- surface parking lots and parking ramp waste are treated differently. See Appendix 6 in SWPPI
- Diesel fuel pump area with secondary containment. Monitored daily, spills cleaned up, sheen removed from water before draining into separator with absorbent added and then to sanitary sewer.
- All structures are monitored every 6 months and oil absorbent pads replaced as needed.
- Maintenance history is included in Collector Application.

Parking Lot Sweeping (schedule, disposal of debris, record keeping) (Harper)

- Parking lot sweeping is primarily done during spring, summer and fall with winter cleaning done on an as needed basis. Cleaning is prioritized in the spring starting with lots that have a larger amount of

debris on them and then parking areas near Commencement Sites are cleaned. The remainder of the parking lots are done after that throughout the summer. Like street sweeping, parking lot sweeping is an ongoing project throughout the year and we are constantly monitoring the parking lots and keeping them clean and safe.

- All debris from parking lot sweeping is collected in a 10 yard roll-off bin (which is used only for the street sweepings) that is staged at the Landscape Services Building.
- Maintenance location maps are documented by hand from the operators and then digitized in the computer and filed in L:Lawver/Hard Surface Crew Documents/Street Sweeping/ then the year. We also save an Excel spreadsheet of the total amount of debris collected from CB waste and Oil Separator waste in this folder also.
- Debris collected while sweeping the porous pavement areas in the parking lots will be weighed separately, and the totals will be kept in the collector app for our records. We will also keep track of the condition of the porous pavement in the maintenance records.
- All the porous pavement is broomed or vacuumed every year.

Parking Structure Cleaning (schedule, disposal of debris, BMPs to protect storm drain inlets) (Harper)

- Parking ramps are swept throughout the year on an as-needed basis and washed, using a machine mounted pressure washer, during the summer months.
- All debris gathered from the parking deck sweeping is landfilled and collected in a 10-yard roll-off bin staged at the Landscape Services Building.
- The Grand River Ramp (#6) and the Shaw Ramp (#1) have storm separators installed to help treat the storm water. Each oil separator is cleaned on an annual basis through our contractor utilizing the Collector App.
- Big Orange E which contains natural citrus solvents is used in conjunction with pressure washing in all parking ramps. Big Orange E is a non-petroleum degreaser and is completely biodegradable.
- Where applicable, drain socks or other catchment devices are used to stop sediment from entering storm drains while pressure washing.

Street Sweeping (schedule, types of sweepers, disposal of debris, record keeping, evaluation of effectiveness) (Harper)

- Street sweeping is primarily done during spring, summer and fall with winter cleaning done on an as needed basis. Cleaning is prioritized in the spring starting with streets that have a larger amount of debris on them and then streets near Commencement Sites are cleaned. The remainder of the roads are done after that with the goal of having all streets initially swept by the end of May. Street sweeping is an ongoing project throughout the spring, summer and fall and we are constantly monitoring the streets and keeping them clean and safe.
- We utilize one large sweeper (Johnston) and one small vacuum (Tennant 636 Green Machine).
- We utilize a tractor with a blower to blow leaves and other organic material that falls in the roadways and parking lots back onto lawn areas which are then mown with mulching deck mowers to reduce the amount of organic debris that ends up in CB's and to maintain safe bicycle lanes.

- All debris from parking lot sweeping is landfilled and collected in a 10-yard roll-off bin staged at the Landscape Services Building and is used only for street sweepings.
- Maintenance location maps are documented by hand from the operators and then digitized in the computer and filed in L:Lawver/Hard Surface Crew Documents/Street Sweeping/ then the year. We also save an Excel spreadsheet of the total amount of debris collected from CB waste and Oil Separator waste in this folder also.
- Records of the debris hauled away from parking lots, street sweepings, and catch basins are available in our Good Housekeeping Folder.

Power Washing (types of washing, control of debris, processes)

- **Graffiti Removal**
 - Use only Bio-degradable cleaning supplies
 - Graffiti is typically on concrete, asphalt, signs, bollards, etc.
 - Identify existing sewer destinations. If sewer drain is present, after seeking permission from P.O.T.W install sediment barrier where runoff water will enter the drain. Once collected by the sediment barrier, staff members will physically collect sediment/paint and send to landfill disposal.
 - If storm water sewer is present, deflect wastewater to exiting grass panel/vegetation or collect using approved collection system.
 - Instances where substantial amount of paint/toxic fluid are near drain to waterway, call ORCBS for proper extraction and cleaning. If water and power washing won't remove the graffiti, we have graffiti remover wipes that will often work. In many instances if the graffiti is on a painted surface, we are able to paint over it to cover it up.
- **General Power Washing**
 - Use only pressure and water, no cleaning chemicals
 - Identify existing sewer destinations. If sewer drain is present, after seeking permission from P.O.T.W install sediment barrier where runoff water will enter the drain. Once collected by the sediment barrier, staff members will physically collect sediment/paint and send to landfill disposal.
 - If storm water sewer is present, deflect wastewater to exiting grass panel/vegetation or collect using approved collection system.
- **Ramp Power Washing**
 - **Option 1:** Obtain permission to direct the wastewater to a publicly Owned Treatment Works (POTW) through sanitary sewer or combined sewer system at the job site. If sewer destination is unknown, then contact the local Public Works Department to learn appropriate destination.
 - **Option 2:** Collect wastewater from the job site and arrange for disposal at a POTW. If there is not direct access to a sanitary sewer system, another option is to collect the

wastewater after arranging disposal at sites that have notified the waste and Hazardous Materials Division WHMD about their waster operations.

Oversight by: Joseph Grulke

Maintenance Garages and Storage Yards (chemical/bulk storage, vehicle washing, spill kits, sanding/grinding waste disposal, vehicle maintenance, oil filter disposal, storm drain inlet maintenance, yard sweeping)

- All chemicals are stored in flame proof cabinets (with built-in containment) and bulk oil is stored in oil room.
- Vehicles are all washed in areas that are plumbed to sanitary sewer. No storm sewer connections.
- Spill kits are located around shop for easy access.
- Wastes from sanding and grinding are disposed of in landfill.
- Oil filters are crushed and recycled.
- All drains inside garage and in vehicle storage area are plumbed into sanitary sewer and all are cleaned regularly.
- The yard around our maintenance garage is swept (vacuumed) regularly as well as inside the shop.

Disposal of Operation and Maintenance Waste (dredge spoil, accumulated sediments, floatables, other debris)

- All maintenance waste is land filled.

Oversight by: John Jonckheere

Deicing Activities (type of deicing agents used, storage, tracking of locations/volumes calibration of trucks)

- All documents are stored in L: MASTER SNOW PLAN/ then by the specific year
- Sodium Chloride- Rock Salt
- Sodium Chloride Brine- made from rock salt to 23.3% salinity.
- Beet Heet (beet juice/calcium chloride brine)
- Magnesium Chloride- MAG – utilized in the parking ramp structures due to non-corrosive factors on structure concrete/steel.
- Magnesium Chloride Brine - utilized in the parking ramp structures due to non-corrosive factors on structure concrete/steel.
- Sno-N-Ice Melter- blend – “pink” in color and utilized at building entrances so customers can see it and don’t think they need to spread more salt.
- All granular (bulk and bagged) product is stored in covered buildings. Liquid product is stored in tanks with secondary containment. Total volumes of material used are documented.
- Large salt trucks are calibrated at the beginning of each season and gates are locked to keep calibration accurate.
- Storage is in accordance with the MDEQ Salt and Brine Storage Guidelines.

- We try to use brine as much as possible for our ice and snow control. We attempt to minimize our salt usage as much as possible. A new brine maker was purchased this fall to help make sure we are able to meet the demands of the brine required for our snow removal efforts.

Snow Removal (snow piling and disposal) (Jonckheere)

- A campus snow removal plan outlining each department's responsibility and a video to explain the process has been developed by IPF.
- Review snow maps and snow piling locations indicated on individual route maps: L: MASTER SNOW PLAN/ then by the specific year

Oversight by: Jerry Wahl, Josh Ridner, Scott Feick & John Jonckheere

Pesticide, Herbicide and Fertilizer Applications

Certification of applicators

- All applicators are required to have a Michigan Pesticide Applicators Certificate with endorsements in categories 3A (turf), 3B (ornamentals) and 6 (right-of-way), 7 (Mosquito)

Chemical Storage

- Self-contained safety designed storage unit inside building with designed mix and fill pad
- Fertilizer stored in secured building separate from chemical storage
- Minimum amounts stored for time delivery and application

Application plans

- Pre-emergent herbicide with fertilizer last week in March to end of May
- Grub control with fertilizer applied late July to early August
- Growth regulator applied late April to early June
- Post emergent herbicide applied late May to late September
- Dormant application of fertilizer applied late October thru November
- Applications pending environmental and turf conditions
- Insect and disease control products are only applied after inspection and diagnose of pest problems.
- Many insect and disease problems in trees are being controlled by trunk injection of pesticides. No environmental release of product occurs.
- Tree fertilizers are soil injected in controlled amounts in water suspension, 6-10 inches below the surface to target the root zone.
- All application of foliar is limited near the river.
- 385 acres to be fertilized twice per year. About 77,000 pounds of fertilizer or 1540- 50lb bags to cover approximately 385 acres.
- There will be 1-spring and 1-fall application. Both applications use 100% slow-release fertilizer.
- Spring application to be completed beginning May 12th and to be concluded no later than June 1st.
- Fall application is to be completed beginning October 24th, and to be concluded by no later than November 18th.

- Product used is 100% slow-release encapsulated fertilizer
- All our chemical applications are entered into an app. called CP App, there is also a list of all our certified applicators on the CP List app

IPM activities

- Continuous monitoring by turf crew and additional observations/input from gardening staff
- Mapping of areas for level of maintenance and usage
- Arborists monitor and control insects and diseases by removing infected plant and material. (Sanitation pruning)
- Insects are targeted. Blanket sprays are not conducted.
- Use of cultural methods to stimulate the health of the plants to promote their resistance of diseases and insects.

Alternative landscaping

- Artificial playing fields as funding allows
- Brick and stone mulch instead of bark mulch.

Educational activities for applicators (Bailey)

- Continuing education classes offered each year by university staff and agricultural extension.
- Attend regional trade shows
- Attend seminars put on by professional organizations
- CEU's are continually being attained to maintain ISA certification and the Commercial Pesticide Applicators certificate.
- All full-time staff receive funding to attend conferences and seminars for continuing education credits

BMP's in right-of ways and playing fields

- Application pending on wind and temperature conditions
- Avoid/remove all fertilizer from hard surfaces areas
- Mark all areas of applications
- Recalibration of equipment every 2 weeks or as needed
- Daily log of applications, volume, location, rates and weather conditions

Oversight by: Josh Ridner & Scott Feick

Grassed Swales, Rain Gardens, Pond Perimeters, Other Vegetated Controls Maintenance

All inspections and maintenance done in Grassed Swales, Rain Gardens, Pond Perimeters, and other Vegetated Controls are entered into the Collector App. for our records.

Grassed Swales

- Mapping of swales are included in the campus low-mow areas
- Areas are mowed 1-2 times annually

Rain Gardens

- Mapping of rain gardens is performed during the construction process and added to the campus base map and Collector App.
- The gardening staff is responsible for weeding, pruning, mulching, and litter control on a daily/weekly basis.
- Annual inspections will be performed in the spring and fall to verify invasive weeds, monitor sediment levels and check invert out structure/pipe for blockages.

Pond Perimeters

- Retention and Detention ponds are mapped and entered into the campus database.
- The gardening staff is responsible for maintaining the buffer zone of plant material.
- The mowing staff are responsible for maintaining the low-mow buffer zone along the perimeter

Yard Debris Reduction and Disposal (mulching/composting, leaf litter removal)

- Mowers are outfitted with mulching decks which reduce the amount of grass trimmings collected annually. There are only a few sites in which we collect the trimmings and take out to the Beaumont Topsoil Facility to combine with topsoil to add organic material.
- All campus hardwood trimmings/brush and wood debris is stockpiled at the TB Simon Power Plant and tub-ground on a semi-annual basis. The woodchips are then hauled away by the tub-grinding contractor to sell.
- Woodchips are purchased in through a blanket purchase order contract, stockpiled at Beaumont and issued out to the gardening staff and landscape staff on a per project or location basis.
- Leaf litter is performed in the fall and early spring by the gardening, mowing, and hard surface crew staff. The leaves collected in the streets and curbs are blown into the lawn panels by a tractor and blower to reduce the amount of leaves entering the storm drainage system. The mowers outfitted with mulching decks chop up the majority of leaf matter. Leaves collected in landscape beds are taken out to Beaumont and mixed in with the topsoil to add organic matter.

APPENDIX E

MSU Total Maximum Daily Load Sampling Coverage

MICHIGAN STATE UNIVERSITY

