

**Western Michigan University**

# Stormwater Management Program (SWMP)



**WESTERN MICHIGAN UNIVERSITY**

**KIESER & ASSOCIATES**  
ENVIRONMENTAL SCIENCE & ENGINEERING

**Kieser & Associates, LLC**

**536 East Michigan Ave, Suite 300**

**Kalamazoo, MI 49007**

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**National Pollutant Discharge Elimination System (NPDES)  
Permit Application for Discharge of  
Stormwater to Surface Waters of the State from a  
Municipal Separate Storm Sewer System (MS4)**

**Table of Contents**

Glossary ..... 3

Introduction..... 6

Regulated Area..... 6

Outfalls and Points of Discharge ..... 6

Enforcement Response Procedure ..... 7

Stormwater Management Program ..... 8

1. Public Participation/Involvement Program (PPP) ..... 9

2. Public Education Program (PEP)..... 10

3. Illicit Discharge Elimination Program (IDEP) ..... 12

4. Construction Stormwater Runoff Control Program ..... 16

5. Post-Construction Runoff Control Program ..... 17

6. Pollution Prevention and Good Housekeeping Program ..... 18

Total Maximum Daily Load (TMDL) Implementation Program ..... 23

References..... 25

## Glossary

**Annual monitoring frequency** refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

**Best management practices (BMPs)** means structural devices or non-structural practices that are designed to prevent pollutants from entering into storm water flows, to direct the flow of storm water, or to treat polluted storm water flows.

**Certificate of Coverage (COC)** is a document, issued by the Department, which authorizes a discharge under a general permit.

**Discharge** means the addition of any waste, waste effluent, wastewater, pollutant, or any combination thereof to any surface water of the state.

**Discharge point** is the location where the point source discharge is directed to surface waters of the state or to a separate storm sewer. It includes the location of all point source discharges where storm water exits the facility, including outfalls which discharge directly to surface waters of the state, and points of discharge which discharge directly into separate storm sewer systems.

**Illicit Connection** means 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.

**General permit** means a National Pollutant Discharge Elimination System permit issued authorizing a category of similar discharges.

**Illicit Discharge** means 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. A discharge that originates from the applicant's property and meets the illicit discharge definition is considered an illicit discharge.

**Inlet** means a catch basin, roof drain, conduit, drain tile, retention pond riser pipe, sump pump, or other point where storm water or wastewater enters into a closed conveyance system prior to discharge off site or into waters of the state.

**Maximum extent practicable** means implementation of best management practices by a public body to comply with an approved storm water management program as required by a national permit for a municipal separate storm sewer system, in a manner that is environmentally beneficial, technically feasible, and within the public body's legal authority.

**Municipal separate storm sewer system (MS4)** means all separate storm sewers that are owned or operated by the United States, a state, city, village, township, county, district, association, or

other public body created by or pursuant to state law, having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law, such as a sewer district, flood control district, or drainage district, or similar entity, or a designated or approved management agency under Section 208 of the Federal Act that discharges to the waters of the state. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

**Outfall** means a discharge point from an MS4 directly to surface waters of the state.

**Point of Discharge** means a discharge from an MS4 to an MS4 owned or operated by another public body.

**Point source** means an outfall from a drainage system to waters of the state, or a point where a storm water drainage system discharges into a system operated by another public body.

**Pretreatment** is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

**Regulated areas** means urbanized areas and areas identified by the permit applicant to be subject to a watershed planning process.

**Separate storm water drainage system** means drainage systems that convey storm water to waters of the state excluding combined sewer systems and sanitary sewer systems (separate storm water drainage systems are not intended to carry sanitary wastewater). The conveyance may be opened or enclosed, and may contain the non-stormwater discharges specified in Part I.A.1.c. and d.

**Stormwater** includes storm water runoff, snow melt runoff, and surface runoff and drainage.

**Total Maximum Daily Loads (TMDLs)** are required by the Federal Act for waterbodies that do not meet Water Quality Standards. TMDLs represent the maximum daily load of a pollutant that a waterbody can assimilate and meet Water Quality Standards, and an allocation of that load among point sources, nonpoint sources, and a margin of safety.

**Urbanized area** means a place and the adjacent densely populated territory that together have a minimum population of fifty thousand (50,000) people, as defined by the United States Bureau of the Census and as determined by the latest available decennial census.

**Water Quality Standards** means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of Act No. 451 of the Public Acts of 1994, as amended, being Rules 323.1041 through 323.1117 of the Michigan Administrative Code.

**Waters of the State** means all of the following, but does not include drainage ways and ponds used solely for wastewater conveyance, treatment, or control:

- The Great Lakes and their connecting waters,
- All inland lakes,
- Rivers,
- Streams,
- Impoundments,
- Open drains, and
- Other surface bodies of water within the confines of the state.

## **Introduction**

This document has been prepared in direct connection with a 2015 National Pollutant Discharge Elimination System (NPDES) Permit Application for Discharge of Stormwater to Surface Waters of the State from a Municipal Separate Storm Sewer System (MS4) prepared by Kieser & Associates, LLC (K&A) on behalf of Western Michigan University (WMU).

The NPDES Program protects the surface waters of the state by assuring that discharges of wastewater comply with state and federal regulations. Anyone discharging or proposing to discharge wastewater to the surface waters of the state are required to make application for and obtain a valid NPDES permit prior to wastewater discharge.

NPDES permits are required under Section 402 of the Federal Clean Water Act (the “Federal Act”), as amended (33 U.S.C. 1251 et seq., P.L. 92-500, 95-217), and under Part 31, Water Resources Protection, of Michigan’s “Natural Resources and Environmental Protection Act”, 1994 PA 451, as amended (NREPA). Part 31 of the NREPA also provides authority for the State to issue NPDES permits. The Michigan Department of Environmental Quality (MDEQ) administers the NPDES permit program for the State of Michigan.

## **Regulated Area**

A map identifying the urbanized area associated with the WMU jurisdictional boundary (as defined by the 2010 Census) is provided as Figure 1. The WMU MS4 system is located within the Kalamazoo urbanized area and discharges stormwater into surface waters of the state via stormwater outfalls to Arcadia Creek and/or points of discharge to the adjoining City of Kalamazoo MS4 drainage network.

## **Outfalls and Points of Discharge**

The surface water of the state that receives stormwater discharge from the WMU MS4 footprint is Arcadia Creek. All WMU stormwater outfalls and points of discharge are summarized in Table 1 and are likewise mapped in Figure 2. WMU Facilities Management maintains this map. There are a total of 10 stormwater outfalls that discharge to Arcadia Creek. Additionally, there are 24 stormwater points of discharge where the WMU storm sewer system enters an adjoining MS4 drainage network owned by the City of Kalamazoo. These City outfalls also discharge to Arcadia Creek.

## **Enforcement Response Procedure**

The WMU campus is regulated as an MS4 under the NPDES Permit program. Unlike other municipalities, the University has total control over the storm sewer system within the campus footprint. More specifically, there are no opportunities or mechanisms to allow other entities to connect to the WMU MS4 infrastructure within the campus footprint. As a result, the University is solely responsible for its own MS4 permit compliance. As summarized within this SWMP, the proactive and voluntary WMU approach to stormwater management and implementation of stormwater control measures (or best management practices) serves as a model for others within the Kalamazoo River Watershed to follow.

### ***Tracking Non-Compliance***

WMU will utilize a spreadsheet to track instances of non-compliance. The following information will be documented:

- Description of violation
- Location of violation
- Date violation occurred
- Name of responsible person/department
- Enforcement action taken by WMU
- Date compliance was reestablished
- Action(s) taken to reduce, eliminate and prevent recurrence of the non-compliant discharge

Detailed information and copies of correspondence for each violation will be maintained in a separate file.

## Stormwater Management Program

The WMU Stormwater Management Program (SWMP) is comprised of six major elements. These six major elements include the minimum measures required by the U.S. EPA, MDEQ, and are listed as follows:

1. **Public Participation/Involvement Program (PPP)** - 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
2. **Public Education Program (PEP)** - to share components of the SWMP and encourage participation in its review and implementation
3. **Illicit Discharge Elimination Program (IDEP)** - to detect and eliminate illicit connections and discharges to the MS4
4. **Construction Stormwater Runoff Control Program** - to augment Part 91 rules dealing with soil erosion, offsite sedimentation and other construction-related wastes
5. **Post-Construction Runoff Control Program** - (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
6. **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

The following chapters of this text are intended to demonstrate compliance with these six minimum control measures and applicable water quality requirements as part of the NPDES Permit Application and SWMP.



## **1. Public Participation/Involvement Program (PPP)**

WMU Environmental Health and Safety (EHS) 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 WMU public education program has been developed to ensure that the targeted audiences are reached with the appropriate messages to meet the intent of the stormwater permit.

The procedure for making the SWMP available for public inspection and comment involves posting an electronic copy of this document to the EHS website. An email address is provided on the website to allow for public comments to be received by a designated WMU representative. All SWMP email comments received by WMU will be documented as well as each WMU response. As a result, the WMU website will provide a direct means for public communication (refer to Attachment A for WMU EHS website information).

### ***Mechanisms to Invite Public Involvement and Participation***

Further outlets to inform the student population include announcements from educators within WMU environmental classes (Biological Sciences, Environmental Sciences, Geological Sciences), WMU booth at Bronco Bash (attended by 15,000 people), and/or Benefits Expo (attended by 200-500 people). Tracking will involve final number of pamphlets distributed, as well as comments received on the SWMP. The entirety of WMU student body will be encouraged to visit the website and provide comments. Data tracking will include final number of students informed, comments received on the SWMP, as well as the number of visitation hits on the stormwater website.

To further involve the students and public at WMU the following mechanisms will be used:

- Landscaping crews will daily maintain catch basins, inlets, and BMPs. They will also report any illegal dumping of chemicals/debris from students or contractors on campus. This mechanism that is already in place serves as an example for students and visitors as to how a community or residence needs to be maintained. The idea being, we lead by example so that the student population will bring these practices with them to their communities and know how a stormwater system should work.
- BMPs themselves will be used to involve the students and a countless number of visitors to the campus. The thirty plus BMPs on campus is a working model of how communities can solve water management issues. Most BMPs on campus include signage that highlights the importance of stormwater management and WMU's role in protecting local surface water resources. The goal of the signage is to educate WMU students and visitors on the adverse effects of urban stormwater and how best management practices can mitigate the impacts and improve water quality. This information will ultimately initiate interest and promote stewardship of water resources.

## 2. Public Education Program (PEP)

The WMU Public Education Plan (PEP) is designed to raise awareness among faculty, staff, students and visitors to campus about the importance of Arcadia Creek, the Kalamazoo River and protecting water quality. The WMU EHS website also provides information and educational materials related to these topics (refer to Attachment A for WMU EHS website information).

### ***Partner Collaboration***

The permitted MS4 communities within Kalamazoo County are working together with local nonprofits, consulting firms, and other water quality initiatives on public education efforts to benefit the larger community engagement goals of the Kalamazoo River Watershed Plan (and the management plans for other local waterbodies and other environmental initiatives). The Kalamazoo River TMDL Nonpoint Source Implementation Committee shares many of the same goals as the Kalamazoo River Watershed Council, local MS4 permit holders, and other conservation organizations when it comes to educating residents about basic watershed concepts, awareness of water quality concerns, pollution prevent activities, and general appreciation of our local water resources. The purpose of this collaboration is to increase the efficacy of public outreach efforts by promoting cohesive messages that are consistent throughout the county and beyond.

The following information is related to the WMU PEP (PEP Topics A-K). This information is provided to comply with minimum control measure requirements for the PEP to the maximum extent practicable. WMU has and will continue to collaborate with other local watershed organizations as new or additional opportunities arise. WMU EHS staff will evaluate PEP effectiveness on an annual basis, and/or whenever PEP is determined to be ineffective, with respect to each listed measurable goal and will consider PEP modifications as appropriate to maximize awareness and measurable outcomes. Each of these PEP elements listed below are important to WMU and are therefore not prioritized or ranked in any order of importance. Refer to Table 2 for a complete copy of the WMU PEP, which includes information related to the following topics:

- A. WMU approach to promote public responsibility and stewardship within the Arcadia Creek watershed:
- B. Methods used to inform and educate the public about the connection of the WMU MS4 to area waterbodies and the potential impacts discharges could have on the surface waters of the state:
- C. Educate the public on illicit discharges and promote public reporting of illicit discharges and improper disposal of materials into the MS4.
- D. Promote preferred cleaning materials and procedures for car, pavement, and power washings.

- E. Inform and educate the public on proper application and disposal of pesticides, herbicides, and fertilizers.
- F. Promote proper disposal practices for grass clippings, leaf litter, and animal wastes that may enter into the MS4.
- G. Identify and promote the availability, location, and requirements of facilities for collection or disposal of household hazardous wastes, travel trailer wasters, chemicals, and motor vehicle fluids.
- H. Inform and educate the public on proper septic system care and maintenance, and how to recognize system failure. ***Not applicable to WMU; there no septic systems on WMU campus.***
- I. Educate the public on, and promote the benefits of, green infrastructure and Low Impact Development.
- J. Promote methods for managing riparian lands to protect water quality.
- K. Identify and educate commercial, industrial, and institutional entities likely to contribute pollutants to stormwater runoff. ***Not applicable to WMU; only WMU campus contributions.***

WMU will make attempts to further monitor and measure effectiveness of the PEP through informal surveys conducted at public events on campus and during staff training events. Surveys will include information about public dumping, household hazardous waste, washing cars in yards, rain gardens, etc. One planned location will be a social survey table set up at the open event known as “Bronco Bash” that is held annually during the first two weeks of the school year. The goal is to discern and measure public awareness and behavior; along with changing behavior and informing the public about stormwater issues and best practices. These surveys will be reviewed, and if there are any concerns related to the effectiveness, or if improvements can be made, the PEP will be updated and/or modified annually during SWMP review. At any point in time during a survey review, topics are found to be ineffective; changes will be made to future topics.

Surveys and Facebook postings will direct students and visitors to the EHS website for information and comments. Regular Facebook postings through Office of Sustainability will contain information and links such as “Landscaping for Water Quality,” from MDEQ at ([https://www.michigan.gov/deq/0,4561,7-135-3313\\_71618\\_3682\\_3714-106374--,00.html](https://www.michigan.gov/deq/0,4561,7-135-3313_71618_3682_3714-106374--,00.html)); Highlighting a WMU BMP and function; Campus stewardship and stormwater improvements; BMP maintenance around campus (“What are those vector trucks doing?”). WMU plans to set a

baseline for 2018 and increase its numbers by 10% each year. The numbers will be based on Sustainability Facebook page “followers” along with EHS’s website visitor tracker, and other social media outlets.

### **3. Illicit Discharge Elimination Program (IDEP)**

All non-stormwater discharges are strictly prohibited from entering into the WMU MS4 infrastructure. WMU has complete authority and control over its MS4. Refer to Attachment B - WMU Stormwater Control Policy. The following definitions apply to the IDEP:

**Illicit Discharge:** Any discharge to, or seepage into, a Municipal Separate Storm Sewer System (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.

A current WMU storm sewer system map is available at the WMU Physical Plant and is also available on the WMU intranet system. This storm sewer system is part of the larger campus Geographic Information System (GIS) that is maintained by WMU Facilities Management staff. As previously identified in this document, a hard copy storm sewer map is attached as Figure 2. WMU outfalls and points of discharge are typically inspected during the same year and therefore these locations are not prioritized or ranked in any order of importance. However, all such locations will be screened at least once during each permit cycle. As part of this IDEP inspection program, WMU will also include the stormwater discharge pipes entering the Goldsworth Valley Stormwater Detention Pond (refer to Figure 3). This pond is designed to overflow during heavy rain events into the City of Kalamazoo MS4 network via the City’s pond outflow structure (Kalamazoo Storm Structure ID# STCVIKC20390) that serves the stormwater pond.

The WMU IDEP plan involves a standard operating procedure (i.e., standardized, step-wise approach) for performing field observations at stormwater outfalls and points of discharge within the entire MS4 footprint during dry weather at least once during each permit cycle. Documented checklist observations include, but are not limited to, discernable flows, water clarity, odor, color, and floatables. A copy of the IDEP checklist used during field observations is provided in Attachment C.

If unusual flow is observed during dry weather screening (i.e., no obvious explanation), the flow will be tracked upstream within the MS4 drainage network to determine the source. The source flow will then be containerized in sterile laboratory bottles in the field, at the time of observation, by the field inspection crew. The collected samples will be properly labeled, stored on ice in a

cooler, and submitted to KAR Laboratories in Kalamazoo within 24-hours for analyses including ammonia, fluoride, detergents, and pH at a minimum.

If the source of flow is not immediately apparent, one or more of the following methods listed below will be initiated by WMU staff via the existing WMU internal Work Order process. Potential illicit sources will be available for identification since they are on WMU property.

- Indicator parameter sampling
- Dye testing
- Video testing
- Smoke testing
- Documented visual observations or physical indicators
- Drainage area investigations

If an illicit discharge is reported, or a complaint is filed, it will be investigated within 24 hours. If an illicit discharge is reported, identified, and confirmed, through sampling or other means described above, WMU Facilities Management will further assist to identify the source, and the source will be stopped immediately. Downstream storm sewers will be cleaned and vactored within 24-hours to prevent any further influence on surface waters. Illicit discharge response activities will be fully documented and kept in a separate file maintained by WMU staff. Illicit discharge response activities along with field inspection sheets will be kept during each permit reporting period. IDEP response information is outlined below in further detail.

Illicit Discharge Response	Schedule
<p>Once an illicit discharge is detected and the source is immediately discovered the following occurs:</p> <ul style="list-style-type: none"> <li>• The source will be stopped; the storm lines will be cleaned and vactored</li> <li>• A work order will be created to determine if a simple solution is available such as permanent or temporary capping or whether an engineered resolution is required</li> <li>• Releases will be reported to EHS to ensure compliance with spill notification requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Create work order: same day/within 24-hours</li> <li>• Evaluate for quick fix or engineering fix: within 48-hours</li> <li>• Engineering design solution if necessary: within 10 days</li> <li>• Implement/construct permanent fix within 40-days of discovery.</li> <li>• Work order remains open until work completed.</li> </ul>
<p>If the source of an illicit discharge is not immediately apparent, dye testing or other methods will be initiated.</p>	<p>Completed and approved application for tracer dye testing for the current permit cycle</p>

Clean problematic sanitary lines to prevent overflow and inspect lines to evaluate cracks and the potential for breaks.

Facilities management reports annual preventative maintenance activities performed on sanitary sewers.

### ***Responding to Illicit Discharges and Spills***

Spill response procedures require prompt and decisive action and well-trained staff. WMU is committed to providing the required level of manpower, equipment, and materials to ensure timely and effective action to minimize impacts to the environment as a result of a spill or illicit discharge. EHS staff shall work with Facilities Management staff to determine the source of any known or reported illicit discharge.

In addition to dry weather field screening, the University utilizes specific language within the Stormwater Control Policy (Attachment B) to prohibit illicit connections. WMU Public Safety or EHS is notified if a potential or confirmed release of polluting materials from our MS4 to surface waters of the State is identified. Upon receiving such notification, EHS will call the local MDEQ District Office unless determination is made that the release is not in excess of the threshold reporting quantities in Part 5 Rules. If the notice is provided after regular working hours, EHS will call the MDEQ's 24-hour Pollution Emergency Alerting System (PEAS) telephone number at 800-292-4706. Upon discovery of a spill or illicit discharge, trained facility personnel will initiate the following actions:

1. Identify exact source and extent of the released materials.
2. Deploy booms or pads as needed.
3. Notify Facilities Management and/or WMU Public Safety, as needed.
4. Evacuate all non-essential personnel from the immediate area, if required.
5. Stop processes and operations that may be causing release.
6. Take all steps necessary to minimize and mitigate the spill and contact outside emergency contractor, if necessary.
7. Use inert absorbent materials to clean up the spill. Place booms around outfalls with illicit discharge.
8. Collected spilled material and/or cleanup materials will be properly managed and disposed of by a WMU approved licensed contractor.

Depending on the type of material spilled, proper protective equipment shall be worn prior to response activities. All spill cleanup debris will be disposed of according to local, state, and federal regulations.

### ***Reporting Any Releases of Polluting Materials***

All response agencies required to respond to the spill event will be notified as necessary by EHS staff personnel, including state and federal authorities.

## Emergency Contact List

<b>Michigan Department of Environmental Quality, PEAS</b>	<b>800-292-4706</b>
<b>National Response Center</b>	<b>800-424-8802</b>
<b>Kalamazoo Fire Department</b>	<b>911</b>
<b>Kalamazoo Police Department</b>	<b>911</b>
<b>Kalamazoo County Environmental Health Department</b>	<b>269-373-5210</b>

WMU provides training to employees and regular staff related to techniques for identifying an illicit discharge or connection, field observation and screening, and source identification. Training also includes proper illicit discharge reporting protocols and is conducted at least once during each permit cycle, or within the first year of hire for new staff, if applicable.

IDEP Training	Schedule
Train affected employees and regular staff on requirements of permit and to notify EHS if an illicit discharge is detected for following up on proper notification requirements.	EHS and Facilities Management complete training prior to dry weather screening in this permit cycle. If dry weather screening runs over into a second year with new employees, the training will be repeated.

WMU uses the following procedure for evaluating and determining the overall IDEP effectiveness.

IDEP Effectiveness	Schedule
At the end of the dry weather testing, the results and data collected will be reviewed and notes made on how the screening could be improved.	Completed once during each permit cycle.

The WMU stormwater website provides a list of prohibited activities for employees, faculty and students such as not allowing wastewater, oils, paints or other materials into the storm sewer system and reporting to WMU Public Safety or EHS immediately upon discovery.

### ***Non-Stormwater Discharges***

In the event of a fire emergency on campus, the Fire Marshall (or Chief in charge) will make a determination if fire water will generate a significant source of pollution to surface waters of the state. Non-stormwater discharges are discouraged from entering into the WMU MS4 drainage infrastructure network.



#### 4. Construction Stormwater Runoff Control Program

This chapter of the WMU SWMP is intended to summarize the University's procedures to address stormwater runoff from construction activities on campus. These are specific to discharges from construction activities where potential pollutants can enter the WMU MS4 drainage network 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.*

WMU is not a Part 91 Agency. As a result, the University relies upon the Office of the Kalamazoo County Drain Commissioner as the County Part 91 Soil Erosion and Sediment Control (SESC) Agent for appropriate construction permits when work involves earth disturbance of one acre or greater. WMU has a two-step process. First, WMU requires an SESC permit to be approved and filed with EHS. Secondly, WMU requires the permit to be posted on site and observed by EHS prior to commencement of any permitted earthwork activity. Furthermore, as the property owner for all WMU construction projects on campus, the University fully complies with the State of Michigan Permit by Rule (Rule 323.2190). Permitted activities are inspected once per week, and within 24 hours of rain event, for all sites with 1 acre or more of soil disturbance, and a point source discharge to waters of the state, and/or when concerns are raised. Complaints and other information submitted by the public or identified internally, as it relates to construction stormwater runoff control, will be reported to the WMU construction project manager and EHS. In the event of a construction related release of other pollutants, all potential concerns are reported to EHS to ensure compliance with spill notification requirements to MDEQ. Specifically, where pollutants are discharged from a construction activity in violation of applicable Part 91 statutes to WMU'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 WMU construction site, the University's construction administrator assigned to that project location will notify EHS immediately. EHS staff will then contact Kalamazoo County and consult with them regarding MDEQ 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 WMU construction administrator assigned to that project location will immediately notify EHS, which will subsequently report the discharge to MDEQ.

## **5. Post-Construction Runoff Control Program**

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 new development or significant redevelopment. Under Michigan's MS4 stormwater permit, post-construction stormwater runoff from new and redevelopment projects that disturb one acre or more, must meet the criteria as identified in the WMU Stormwater Control Policy within Attachment B.

### ***Stormwater Design Standards***

The WMU Stormwater Control Policy sets forth the University's stormwater design standards associated with new and redevelopment projects that disturb one or more acre of land. These design standards also include projects less than one acre that are part of a larger common plan of development that encompasses one acre or more or where significant runoff is expected. WMU stormwater guidelines are enforced by the University within each Professional Service (A/E) contract for new and redevelopment projects on campus. No new outfalls or discharges to Arcadia Creek will be installed. Post-construction runoff rate and volume of discharge will not exceed the pre-development rate and volume for all storms up to the two-year, 24-hour storm. Furthermore, these design guidelines require designer review and direct adherence with MDEQ standards (for both water quality and quantity) to ensure WMU maintains full compliance. Each item enumerated within the stormwater Design Guidelines, along with the stormwater checklist, are used during the WMU plan review process. These Design Guidelines also apply to water quantity projects (i.e., flood control).

Each Professional Service (A/E) contract for new development or redevelopment must comply with these WMU design standards. The site plan review is based on the initial guidelines for the BMP and approved contractor. All new BMPs will be installed in areas absent soil and groundwater contamination. Currently there are no areas of soil and/or groundwater contamination on WMU campus. The need for site-specific BMPs will be determined during the review process.

### ***Operation and Maintenance***

New and redevelopment projects on WMU campus are required to have a written inspection and maintenance plan for each BMP installed. WMU provides routine maintenance, and maintenance schedules are developed and implemented to ensure pollution removal effectiveness at design performance and to ensure that the controls are maintained in a condition to reduce to the maximum extent practicable, the contribution of pollutants to the Surface Waters of the State.

These maintenance activities apply for the life of practice for each BMP on campus, or until such time that the BMP is replaced or upgraded with no change in performance outcomes. WMU owns and operates each BMP on campus and is obligated to maintain them as part of their SWMP. Therefore, BMP maintenance agreements are not applicable.

## **6. Pollution Prevention and Good Housekeeping Program**

NPDES stormwater requirements stress the importance of developing proper pollution prevention procedures and maintaining good housekeeping practices for 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; and turf and landscape management for municipal properties.

WMU's separate stormwater drainage system consists of separate storm sewer pipes, manholes, inlets, catch basins, bioretention areas and other green infrastructure facilities, and proprietary devices for treating stormwater runoff. Web-based University utility maps are available which identify catch basins, storm drains and structural controls. These records are located at the WMU Physical Plant and are maintained on a continuous, real-time schedule by WMU Facilities Management. Furthermore, EHS will provide written notification to Facilities Management when changes are necessary. Structural stormwater controls are serviced by WMU Landscape Services.

As part of the campus-wide good housekeeping activities, WMU Public Safety and WMU Landscape Services contracts street sweeping on an annual basis (i.e., not prioritized). These annual efforts occur either in spring, summer or fall and also include parking lots, bridges, and parking ramps/structures. WMU landscaping crews daily inspect and clean road and parking lots as needed. This is accomplished by sweeping, blowing, and/or shoveling debris from impervious surfaces to minimize sediment loading to surface waters during runoff events. The practice of keeping roads and parking lots clean is a high priority for landscaping due to the visual aspect of keeping our campus clean. Reduced pollutant runoff is a benefit of this practice. Street sweeping equipment is operated in accordance with manufacturers operating instructions to maximize effectiveness for water quality protection. These practices remove several tons of sediment annually. Seasonal leaves are typically mulched or composted onsite. Collected materials from street sweeping activities are properly manifested and disposed of by the licensed sweeping contractor.

Snow and ice removal on campus is another responsibility of WMU Landscape Services. A delicate balance of maintaining safe conditions while reducing the use of deicing products is prioritized each winter season. The overall salt usage has been reduced by 28% since 2009 with

the use of beet juice for prewetting. Landscape Services also picks up trash on paved surfaces 5-days per week, all year long except on heavy snow days.

University vehicle washing activities are conducted in a contained garage area with an oil/water separator connected to the sanitary sewer collection system or at local commercial carwashes. These and other WMU good housekeeping efforts are evaluated annually by EHS and reported to MDEQ within the MS4 Permit Annual Report.

WMU Landscape Services employees are trained in vegetative land management. A significant number of employees have achieved certification in the Michigan Turf Grass Environmental Stewardship Program and are certified pest control applicators, master gardeners and arborists. WMU has purchased and applied only non-phosphorus fertilizers since 2004. Vegetated stormwater BMPs utilize native Michigan vegetation and buffer zones.

Other important WMU pollution prevention and good housekeeping efforts on campus are summarized as follows:

<b>Operation/Maintenance Activity</b>	<b>Potential Pollutant</b>	<b>BMP</b>	<b>Assessment Updating Process</b>
Laboratory/hazardous waste	Drugs, chemicals, electronics, lamps, brine from salt dome, oil-water separator waste	Disposal through licensed firms by incineration or licensed landfills	Ongoing through EHS; volume of waste collected
Storm drain cleanout	Dredge and spoils	Landscape employees report full catch basins; Documented and disposed of via Clean Earth Company	Ongoing through Facilities Management
	Yard waste, vegetation	Inspect and remove nuisance species and yard waste semiannually	Ongoing through Facilities Management
	Trash and debris	Clean out 5 days/wk (except in heavy snow)	Landscape Services, ongoing
Roadway/parking lots	Sand	No sand used	Ongoing through Landscape Services
	Road salt and deicing materials	Beet juice used to reduce salt application	Ongoing through Landscape Services
		Salt dome operation and maintenance procedure	WMU employees and contractors

<b>Operation/Maintenance Activity</b>	<b>Potential Pollutant</b>	<b>BMP</b>	<b>Assessment Updating Process</b>
		Snowmelt systems on sidewalks	WMU Facilities Mgmt as budget allows with construction projects
	Debris, sediment on curbs and roads	Street cleaning annually	WMU Public Safety contractors
		Parking lots cleared of sediment by power blowing into vegetated areas annually	Public Safety
	Coal tar emissions from asphalt	No coal tar used	WMU Design Guidelines
	Automotive and equipment spills	Clean up by EHS, Landscape Services, Public Safety. Notice in parking guide that no vehicle leaking fluids is allowed to park on campus.	Ongoing; number of spills cleaned
	Trash and debris	Remove 5 days/wk	Landscape Services ongoing
Vehicle Fleet maintenance	Automotive fluids	WMU Garage & Recycling Services, Maintenance at least annually	WMU garage, ongoing
	Car washing	Washing occurs in WMU garage w/ oil-water separator or commercial car wash	NA
	Lawn equipment fluids	WMU Landscape Services annual preventative maintenance via WMU garage	Ongoing
	Batteries, diesel fuel, hydraulic oil	Storage of emergency equipment at Physical Plant	Ongoing
	Gas pumps	Gas pumps and above ground storage tanks at Lot 95	Inspections

Operation/Maintenance Activity	Potential Pollutant	BMP	Assessment Updating Process
Grounds maintenance	Phosphorus	WMU uses only phosphorus-free fertilizers on lawns; no fertilizer in buffer zones	Ongoing
	Plant materials	Staff trained to sweep grass clipping off sidewalks and roads; maintain 20' buffer around Goldsworth Valley Detention Pond	Ongoing and continuing
	Pesticide/herbicide use (only certified staff, and certified outside contractor)	Employee certification as master gardeners, pest control applicators, arborists; portable mixing pads for pesticide mixing	Landscape Services, EHS, ongoing
	Eroded soils	Leak detectors on sprinklers	Ongoing
Refuse handling	Pesticide containers	Pesticide containers triple-rinsed before disposal and placed in dumpster with no runoff	Ongoing
	Oil cans, oil filters, antifreeze containers, batteries	Stored inside prior to recycling to appropriate source	WMU Garage and Recycling Services

### ***Facility-Specific Stormwater Management***

The WMU Stormwater Committee (comprised of Director of Engineering, Landscape Services Director, Maintenance Director, Director of Environmental Health and Safety, GIS Coordinator, and other Facilities Management staff) continues to review the facilities with the potential to discharge pollutants to surface waters of the state. The Stormwater Committee meets biannually to review campus-wide stormwater issues, catch basin cleaning, BMP inspection results, along with a SWMP review of facilities with pollutant potential. All updates are made to the SWMP following decisions made in committee meetings. Changes made to policy are disseminated down through management of affected departments. When assessing the pollution potential of a facility, the committee takes into account the following factors:

- Amount of urban pollutants stored at the site (e.g., sediment, nutrients, metals, hydrocarbons, pesticides, fertilizers, herbicides, chlorides, trash, bacteria, or other site-specific pollutants)
- Identification of improperly stored materials
- The potential for polluting activities to be conducted outside (e.g., vehicle washing)
- Proximity to waterbodies

- Housekeeping practices
- Discharge of pollutants of concern to impaired waters

### ***Priority Facilities***

The WMU Stormwater Committee has identified the following priority facilities:

1. Campus Services (High Potential - structural best practices in place, daily maintenance and oversight, routine monthly inspection)
2. Waldo Stadium (Medium Potential - structural best practices in place, routine monthly inspection)

The current Physical Plant conducts all maintenance activities within the building and has no exposure of industrial activities or storage outside, and therefore has been changed to low potential.

A Stormwater Pollution Prevention Plan (SWPPP) has been developed for each of these WMU facilities. Each SWPPP includes site-specific structural and non-structural stormwater controls implemented and maintained to prevent or reduce pollutant runoff at each facility. Information related to potential polluting materials, preventative maintenance, routine maintenance inspections, and site-specific structural stormwater controls are provided in Attachments D, E, F and G, respectively. The presence of stormwater controls, scheduled routine and comprehensive inspections provide WMU with a means to assess any need for changes or corrections. Facilities Management will confirm annually if any corrections are warranted.

The goals of each SWPPP include:

1. Maximize control of significant polluting materials
2. Reduce the potential levels of these materials that could enter stormwater
3. Ensure that stormwater discharges from the site will not cause a violation of Michigan's water quality standards.

A copy of the SWPPP is located at EHS. A designated Industrial Stormwater Operator EHS staff person is responsible for monitoring the implementation of the plans.

Separate procedures for spill prevention and control are documented in the University's Spill Prevention, Control and Countermeasure (SPCC) plans for campus, which are designed to meet federal requirements under 40CFR Part 112 dealing with aboveground oil storage facilities. WMU's Pollution Prevention Incident Plan (PIPP) exists to meet the requirements of Part 5 Rules of the State of Michigan associated with chemical and petroleum storage.

### ***Catch Basin Cleaning and BMP Inspection***

WMU Facilities Management is responsible for the cleaning of the separate storm sewers and catch basins and inlets associated with the stormwater infrastructure and structural controls. This work is contracted out to a licensed utility contractor. These efforts are conducted as a corrective action when warranted but are typically conducted as preventative measures. All existing

stormwater BMPs (i.e., detention, retention, infiltration, bioretention, etc.) are inspected annually by Landscape Services (see Attachment G). All catch basins are inspected on a rotating basis during each permit cycle in accordance with the MDEQ SAW Grant. Prioritization and cleaning is then based upon these field inspections (if observed greater than 6" sediment depth) and the internal WMU Work Order process. Materials removed from catch basin cleaning activities are properly manifested and disposed of by the licensed utility contractor. Any updates or revisions to this inspection and cleaning process are made within 30 days of a change in priority level.

### ***Contractor Requirements and Oversight***

Contractors hired by WMU to perform municipal operation and maintenance activities relative to stormwater receive stormwater-related information provided by the associated WMU department contracting work to be performed. Stormwater information is also incorporated into a pre-construction meeting prior to beginning new projects. In addition, project representatives are trained to provide oversight to contractors to ensure that WMU pollution prevention and good housekeeping requirements are followed.

### ***Employee Training***

WMU EHS staff provides pollution prevention and good housekeeping classroom training for employees in Maintenance Services, Power Plant, Landscape Services, Facilities Management, Project Managers and Custodian Services. These employees are trained once during each permit cycle, or within the first year of employment. Training includes topics on how to reduce pollutants at home such as washing cars in yards or adding a rain garden.

## **Total Maximum Daily Load (TMDL) Implementation Program**

Western Michigan University (WMU) has taken the lead on adaptive management to address stormwater runoff challenges in their community. WMU is a permitted Municipal Separate Storm Sewer System (MS4) within the Portage-Arcadia Creek Watershed in Kalamazoo, Michigan. As such, it falls within the nonpoint source (NPS) load allocation for a phosphorus total maximum daily load (TMDL) developed for the Kalamazoo River and Lake Allegan. The Kalamazoo River TMDL was established in 2001 and requires a 50% reduction in total phosphorus (TP) originating from NPSs, using the 1998 load as a baseline. The original timeline outlined in the TMDL set 2009 as the target date for meeting the NPS reduction goal. WMU has been able to document quantifiable progress and demonstrate compliance with this load allocation.

WMU set out to become the first local MS4 to document progress as well as achieve the TMDL 50% TP reduction goal. With a stormwater footprint of approximately 807 acres, including more than 100 buildings and approximately 25,000 students, this was a substantial challenge. Over the past 16 years, WMU has been an active partner and a leader in implementation of stormwater controls on its campus and within the watershed. Since 1998, WMU has implemented over 30 stormwater control projects. The University's efforts have utilized federal/state grant funding

and strategic MS4 partnerships to implement stormwater controls identified within an EPA-approved Watershed Management Plan. In 2011, WMU conducted an initial evaluation of stormwater loads with the aid of federal grant funds. WMU documented that their efforts had achieved compliance with the 50% reduction goal (K&A, 2011).

In 2011, WMU also embraced a larger vision to become “Stormwater Neutral® verified” for TP (i.e., “net-zero” phosphorus load for their stormwater footprint). In an effort to be cost-effective, the University is approaching this goal through additional on-campus projects, and implementation of off-campus stormwater controls within the watershed as TP offsets. These projects have focused on multiple goals: reducing direct discharges of urban stormwater runoff to surface waters, naturalizing conveyances and stream corridors, repairing erosion caused by urban runoff, reducing phosphorus and sediment loads to tributaries of the Kalamazoo River, reducing flood potential and increasing groundwater recharge.

In 2012, WMU was awarded an MDEQ Water Quality Monitoring Grant to assess improvements within the Arcadia Creek subwatershed. This project was specifically intended to evaluate 2013 water quality conditions within Arcadia Creek at the discharge to the Kalamazoo River with respect to previously documented conditions at the same location in 2003. The result of this 1-year monitoring project revealed that Arcadia Creek was now discharging 39% less TP and 35% less TSS to the Kalamazoo River with respect to the same study in 2003 (K&A, 2014). It is estimated that the total WMU contribution to these improvements ranges between 20-25% of these Arcadia Creek subwatershed improvements.

WMU’s adaptive stormwater management efforts have been successful in large part because the University utilized quantified metrics to identify and apply cost-effective offsets (Boyer and Kieser, 2012). Quantifying the load reductions achieved by the university since the 1998 baseline year allowed WMU to document compliance with its TMDL load allocation. In addition, conducting a cost-effectiveness analysis enabled the University to prioritize future BMPs based on the options that would maximize reductions for the least cost. The application of stormwater offsets has also helped the University minimize treatment costs and stretch limited available funding within a built MS4 environment. These stormwater offsets have provided the University with additional flexibility for generating TP load reductions. As a result, WMU has now become the first MS4 to become Stormwater Neutral® verified within this TMDL watershed (greater than 100% reduction status with respect to the 1998 TP baseline load). Finally, and most importantly, WMU exceeded its goal by doubling it. Therefore, the margin-of-safety provided by that extra implementation is more than sufficient to cover any errors within the TMDL reduction goal modeling estimates. These WMU efforts are unmatched within the Lake Allegan/Kalamazoo River Watershed with respect to the TMDL reduction requirements.

Any land use changes, or future stormwater control measures (SCMs) installed on the WMU campus that target water quality/quantity will be modeled. A maintenance and inspection plan is in place for current SCMs, and will continue for future projects. The benefits of current and future SCMs will continue to be tracked, and include information such as; TP load reduction,



treatment area, volume of stormwater captured, or may include any new anticipated TMDL requirements. Modeling will be planned for the beginning and end of each permit cycle, however, models may be updated in the course of the permit cycle when SCMs have been installed or land use changes have occurred. Through modeling and a dedication to improving water quality, WMU has proven to be a leader in stormwater management. As a good steward of our watershed, WMU plans to continue implementing new SCMs throughout campus in a mission to continue improving water quality.

## References

- Boyer, K. B. and Kieser, M.S. (2012) Urban Stormwater Management—An MS4 Success Story for Western Michigan University. *Journal of Green Building* (7):1, pp. 28–39.
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